

**User Manual**

**PC Cards cifX**

**PCI (CIFX 50)**

**PCI Express (CIFX 50E)**

**Low Profile PCI Express (CIFX 70E, CIFX 100EH)**

**Installation, Operation and Hardware Description**



**Hilscher Gesellschaft für Systemautomation mbH**

**[www.hilscher.com](http://www.hilscher.com)**

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# 1 Introduction

## 1.1 About the User Manual

This user manual provides descriptions of the **installation**, **operation** and **hardware** of the PC Cards cifX *PCI*, *PCI Express* and *Low Profile PCI Express* under Windows®, as listed subsequently.

PC Cards cifX:

- PCI (CIFX 50),
- PCI Express (CIFX 50E),
- Low Profile PCI Express (CIFX 70E, CIFX 100EH-RE\CUBE\*)

\*only Real-Time Ethernet

for the Real-Time Ethernet systems:

- CC-Link IE Field
- CC-Link IE Field Basic
- EtherCAT
- EtherNet/IP
- Open-Modbus/TCP
- POWERLINK
- PROFINET IO
- Sercos
- VARAN

for the fieldbus systems:

- PROFIBUS DP
- CANopen
- DeviceNet
- CC-Link



For information about the **Installation of the Software** refer to the User Manual „Software Installation for PC Cards cifX“ [DOC120207UMXXEN]. For information about the **Wiring of the Protocol Interface** refer to the „Wiring Instructions“ [DOC120208UMXXEN].

The **devices described in this manual** are listed in the sections

- *PC Cards PCI CIFX 50-XX* (page 10),
- *PC Cards PCI (2 Channels) CIFX 50-2XX* (page 10) and
- *PC Cards PCI Express CIFX 50E-XX, CIFX 70E-XX, CIFX 100EH-RE\CUBE* (page 11). The devices are described in detail in the chapters *Installation*, *Commissioning* and *Uninstalling* (page 59), *Diagnosis with LEDs* (page 79), *Device Connections and Switches* (page 108) and *Technical Data* (page 119).

You can download the latest edition of a manual from the website [www.hilscher.com](http://www.hilscher.com) under **Service & Support > Downloads** or under **Products** directly with the information about your product.

## 1.2 List of Revisions

| Index | Date       | Chapter                       | Revisions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------|------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 57    | 2024-09-20 | 3.1.6,<br>10.2.10,<br>10.2.11 | PC cards CIFX 50-DE (revision 9) and CIFX 50E-DE (revision 8) with screw-on Combicon connector: Sections <i>CIFX 50-DN</i> , <i>CIFX 50E-DN</i> , <i>CIFX 50-DN</i> , <i>CIFX 50E-DN</i> and <i>Front Panel CIFX 50-DN or CIFX 50E-DN</i> .                                                                                                                                                                                                                                                                                                                                             |
| 58    | 2025-03-27 | All                           | <p>Discontinued devices:</p> <ul style="list-style-type: none"> <li>- 2-channel devices<br/>CIFX 50 2XX CIFX 50E 2XX (XX= ASM, CO),<br/>all CIFX 50 2XX\XX and CIFX 50E 2XX\XX.</li> <li>- all CIFX 70E-XX\MR.</li> </ul> <p>For the descriptions of the discontinued devices, see user manual PC cards cifX, PCI, PCI Express, Low Profile PCI Express, Revision 57.</p> <p>Discontinued: SYCON.net, AS-Interface, PROFIBUS MPI.</p> <p>Device Explorer and Communication Studio user software added.</p> <p>Section <i>Technical Data of the Communication Protocols</i> revised.</p> |
| 59    | 2025-10-02 | 9.1.10                        | CIFX 50-CC: Operating temperature range: -20 °C ... +60 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Table 1: List of Revisions

## 1.3 Obligation to read and understand the Manual



### Important!

- To avoid personal injury and to avoid property damage to your system or to your PC card, you must read and understand all instructions in the manual and all accompanying texts to your PC card, before installing and operating your PC card.
- First read the **Safety Instructions** in the safety chapter.
- Obey to all **Safety Messages** in the manual.
- Keep the product DVD as ZIP file providing the product manuals.



## 2 Descriptions of the PC Cards

### 2.1 Description

The PC Cards cifX are communication interfaces of the cifX product family of Hilscher on the basis of the communication controller netX 100 for the Real-Time Ethernet or fieldbus communication. Depending of the loaded firmware, the protocol specific PC Card cifX proceeds the communication of the corresponding Real-Time Ethernet or fieldbus system.

The used Real-Time Ethernet systems are:      The used fieldbus systems are:

- |                                   |                      |
|-----------------------------------|----------------------|
| ▪ CC-Link IE Field Basic Slave    | ▪ PROFIBUS DP Master |
| ▪ CC-Link IE Field Slave          | ▪ PROFIBUS DP Slave  |
| ▪ EtherCAT Master                 | ▪ CANopen Master     |
| ▪ EtherCAT Slave                  | ▪ CANopen Slave      |
| ▪ EtherNet/IP Scanner (Master)    | ▪ DeviceNet Master   |
| ▪ EtherNet/IP Adapter (Slave)     | ▪ DeviceNet Slave    |
| ▪ Open-Modbus/TCP                 | ▪ CC-Link Slave      |
| ▪ POWERLINK-Controlled-Node/Slave |                      |
| ▪ PROFINET IO-Controller (Master) |                      |
| ▪ PROFINET IO-Device (Slave)      |                      |
| ▪ Sercos Master                   |                      |
| ▪ Sercos Slave                    |                      |
| ▪ VARAN Client (Slave)            |                      |

The PC Card cifX handles the complete data exchange between the connected Ethernet or fieldbus devices and the PC. The data exchange is proceeded via dual-port memory.

## 2.2 PC Cards PCI CIFX 50-XX

| PC Card cifX                                                       | Description                         |
|--------------------------------------------------------------------|-------------------------------------|
| <b>PC Cards PCI with integrated Ethernet or fieldbus interface</b> |                                     |
| <b>Real-Time Ethernet</b>                                          |                                     |
| CIFX 50-RE                                                         | Real-Time Ethernet Master or Slave. |
| <b>PROFIBUS</b>                                                    |                                     |
| CIFX 50-DP                                                         | PROFIBUS DP Master or Slave         |
| <b>CANopen</b>                                                     |                                     |
| CIFX 50-CO                                                         | CANopen Master or Slave             |
| <b>DeviceNet</b>                                                   |                                     |
| CIFX 50-DN                                                         | DeviceNet Master or Slave           |
| <b>CC-Link</b>                                                     |                                     |
| CIFX 50-CC                                                         | CC-Link Slave                       |

Table 2: PC Cards PCI CIFX 50-XX

## 2.3 PC Cards PCI (2 Channels) CIFX 50-2XX

| PC Card cifX                                                             | Description                     |
|--------------------------------------------------------------------------|---------------------------------|
| <b>PC Cards PCI with two integrated fieldbus interfaces (2 Channels)</b> |                                 |
| <b>PROFIBUS</b>                                                          |                                 |
| CIFX 50-2DP                                                              | 2 x PROFIBUS DP Master or Slave |
| <b>DeviceNet</b>                                                         |                                 |
| CIFX 50-2DN                                                              | 2 x DeviceNet Master or Slave   |

Table 3: PC Cards PCI (2 Channels) CIFX 50-2XX

## 2.4 PC Cards PCI Express CIFX 50E-XX, CIFX 70E-XX, CIFX 100EH-RE\CUBE

| PC Card cifX                                                               | Description                                                                                                                                      |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PC Cards PCI Express with integrated Ethernet or fieldbus interface</b> |                                                                                                                                                  |
| <b>Real-Time Ethernet</b>                                                  |                                                                                                                                                  |
| CIFX 50E-RE or CIFX 50E-RE\ET                                              | Real-Time Ethernet Master or Slave<br><b>Note:</b> The PC card CIFX 50E-RE\ET can be used in an enlarged temperature range from -20°C to +70 °C. |
| CIFX 70E-RE                                                                | Low Profile PCI Express Real-Time-Ethernet Master or Slave (Low Profile PCIe with RTE)                                                           |
| CIFX 100EH-RE\CUBE                                                         | Real-Time Ethernet Master or Slave, (low-profile card) exclusively for the installing in KEBA KeControl industry PCs series CP 3XX (Cube).       |
| <b>CC-Link IE Field Slave</b>                                              |                                                                                                                                                  |
| CIFX 50E-CCIES                                                             | CC-Link IE Field Slave                                                                                                                           |
| CIFX 70E-CCIES                                                             | Low Profile PCI Express CC-Link IE Field Slave (Low Profile PCIe)                                                                                |
| <b>PROFIBUS</b>                                                            |                                                                                                                                                  |
| CIFX 50E-DP                                                                | PROFIBUS DP Master or Slave                                                                                                                      |
| CIFX 70E-DP                                                                | Low Profile PCI Express PROFIBUS DP Master or Slave (Low Profile PCIe with PROFIBUS)                                                             |
| <b>CANopen</b>                                                             |                                                                                                                                                  |
| CIFX 50E-CO                                                                | CANopen Master or Slave                                                                                                                          |
| CIFX 70E-CO                                                                | Low Profile PCI Express CANopen Master or Slave (Low Profile PCIe with CANopen)                                                                  |
| <b>DeviceNet</b>                                                           |                                                                                                                                                  |
| CIFX 50E-DN                                                                | DeviceNet Master or Slave                                                                                                                        |
| CIFX 70E-DN                                                                | Low Profile PCI Express DeviceNet Master or Slave (Low Profile PCIe with DeviceNet)                                                              |
| <b>CC-Link</b>                                                             |                                                                                                                                                  |
| CIFX 50E-CC                                                                | CC-Link Slave                                                                                                                                    |

Table 4: PC Cards PCI Express CIFX 50E-XX, CIFX 70E-XX

## 2.5 PC Cards PCI Express (2 Channels) CIFX 50E-2XX

| PC Card cifX                                                                     | Description                     |
|----------------------------------------------------------------------------------|---------------------------------|
| <b>PC Cards PCI Express with two integrated fieldbus interfaces (2 Channels)</b> |                                 |
| <b>PROFIBUS</b>                                                                  |                                 |
| CIFX 50E-2DP                                                                     | 2 x PROFIBUS DP Master or Slave |
| <b>DeviceNet</b>                                                                 |                                 |
| CIFX 50E-2DN                                                                     | 2 x DeviceNet Master or Slave   |

Table 5: PC Cards PCI Express (2 Channels) CIFX 50E-2XX

## 2.6 The Function „Slot Number (Card ID)“

Device revisions equipped with a **Rotary Switch Slot Number (Card ID)** are listed separately in section *Hardware: PC Cards cifX* on page 16.

The **Slot Number (Card ID)** must be set at the PC card cifX using the **Rotary Switch Slot Number (Card ID)**. The **Slot Number (Card ID)** will serve to distinguish PC cards cifX from each other clearly, especially if several PC cards cifX are installed into the very same PC. The application program requests the **Slot Number (Card ID)** from the PC card cifX via the **cifX Device Driver**.

For further information refer to section *Rotary Switch for Slot Number (Card ID)* on page 113.

## 2.7 The Function „DMA Mode“

Device revisions which provide **DMA Mode** are listed separately in section *Hardware: PC Cards cifX* on page 16.



**Note:** The functions **Slot Number (Card ID)** and **DMA Mode** are in technical view independently from each other.

The **DMA Mode** is activated via the device driver **cifX Device Driver**.



For further information on DMA mode refer to the manual for the cifX Device Driver.

## 2.8 Contents of the Product DVD



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**Note!** In order to download the product DVD, you need Internet access.

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On the **Communication Solutions DVD** you will find these installation instructions about the software installation and the necessary configuration software, the documentation, the drivers and software for your PC Card cifX, and additional auxiliary tools. You can download this product DVD as a ZIP file from the website <http://www.hilscher.com> (under Products, directly with the information on your product).

### 2.8.1 Installation Guide, Documentation Overview



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The installation guide **Software Installation and Documentation Overview** on the Communication Solutions DVD are in the directory *Documentation\0. Installation and Overview*. The installation guide includes:

- An overview on the **Content of the Communication Solutions DVD** (in the section *What is on the Communication Solutions DVD?*)
  - Overviews listing the available **Documentations** for PC cards cifX (in chapter *PC Cards cifX, Software and Documentation*).
- 

### 2.8.2 What's New



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All current version information for hardware and software described in this manual are provided in the folder *\Documentation\What's New - Communication Solutions DVD RL XX EN.pdf* on the Communication Solutions DVD.

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## **2.8.3 Important Changes**

### **2.8.3.1 EtherNet/IP Adapter Firmware Version V3.6**

#### **New firmware version 3.6 for EtherNet/IP-Adapter**

The EtherNet/IP-Adapter firmware has been revised and is now available as V3.6.

Use the EtherNet/IP-Adapter firmware V3.6 for a new installation when creating or developing your application program for the first time.

If you want to change from firmware version 3.3 to version 3.5, please refer to the Migration Guide under <https://kb.hilscher.com/x/NqhTC>.

### **2.8.3.2 PROFINET IO-Device Firmware Version V4.5**

#### **New firmware version 4.5 for PROFINET IO-Device**

The PROFINET IO-Device firmware has been revised and is now available as V4.5.

Use the PROFINET IO-Device firmware V4.5 for a new installation when creating or developing your application program for the first time.

If you want to change from an older firmware version to the latest version in an existing system, please refer to the Migration Guide, which is available under <https://kb.hilscher.com/x/IRyRBg>.

## 2.8.4 Device Description Files PC Cards cifX

The Communication Solutions DVD **EDS** directory includes the device description files for the PC Cards cifX. The device description file is required to configure the used Master device. The systems Open Modbus/TCP, and VARAN do not use device description files.

| PC Cards cifX                                                                        | System                                                                                                                                                                                                                                                                                                                                                                                                         | File Name of the Device Description File                                                                                             |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| CIFX 50-RE,<br>CIFX 50E-RE,<br>CIFX 50E-RE/ET,<br>CIFX 70E-RE,<br>CIFX 100EH-RE/CUBE | CC-Link IE Field Basic Slave                                                                                                                                                                                                                                                                                                                                                                                   | <i>0x0352_CIFX RE CCIEBS_1_en.cspp</i>                                                                                               |
|                                                                                      | EtherCAT Slave                                                                                                                                                                                                                                                                                                                                                                                                 | <i>Hilscher CIFX RE ECS V4.6.X.xml</i>                                                                                               |
|                                                                                      | EtherCAT Master                                                                                                                                                                                                                                                                                                                                                                                                | <i>Hilscher Master Redundancy Port.xml</i>                                                                                           |
|                                                                                      | EtherNet/IP Adapter (Slave)                                                                                                                                                                                                                                                                                                                                                                                    | <i>HILSCHER CIFX-RE EIS V1.1.EDS</i>                                                                                                 |
|                                                                                      | EtherNet/IP Scanner (Master)                                                                                                                                                                                                                                                                                                                                                                                   | <i>HILSCHER CIFX-RE EIM V1.0.eds</i>                                                                                                 |
|                                                                                      |  <b>Note!</b> The description files for the EtherNet/IP Master device is needed, when an additional EtherNet/IP Master device shall communicate to a Hilscher EtherNet/IP Master device via EtherNet/IP.                                                                                                                      |                                                                                                                                      |
|                                                                                      | POWERLINK Controlled Node/Slave                                                                                                                                                                                                                                                                                                                                                                                | <i>00000044_CIFX RE PLS.xdd</i>                                                                                                      |
|                                                                                      | PROFINET IO-Device                                                                                                                                                                                                                                                                                                                                                                                             | <i>GSDML-V2.35-HILSCHER-CIFX RE PNS-yyyymmdd.xml</i>                                                                                 |
|                                                                                      | Sercos Slave                                                                                                                                                                                                                                                                                                                                                                                                   | <i>SDDML#v3.0#Hilscher#CIFX_RE-FIXCFG_FSPIO#2014-01-08.xml,</i><br><i>SDDML#v3.0#Hilscher#CIFX_RE-VARCFG_FSPDRIVE#2014-01-08.xml</i> |
|                                                                                      |  <b>Note!</b> If SDDML files are used to configure the Sercos Master and one of the default settings for vendor code, device ID, input or output data number has been changed, then a new updated SDDML file must be created using Communication Studio (via Export) and then used in the configuration of the Sercos Master. |                                                                                                                                      |
| CIFX 50E-CCIES,<br>CIFX 70E-CCIES                                                    | CC-Link IE Field Slave                                                                                                                                                                                                                                                                                                                                                                                         | <i>0x0352_CIFX.cspp</i>                                                                                                              |
| CIFX 50-DP,<br>CIFX 50-2DP,<br>CIFX 50E-DP,<br>CIFX 50E-2DP,<br>CIFX 70E-DP          | PROFIBUS DP Slave                                                                                                                                                                                                                                                                                                                                                                                              | <i>HIL_0B69.GSD</i>                                                                                                                  |
| CIFX 50-CO,<br>CIFX 50E-CO,<br>CIFX 70E-CO                                           | CANopen Slave                                                                                                                                                                                                                                                                                                                                                                                                  | <i>CIFX CO COS.eds</i>                                                                                                               |
| CIFX 50-DN,<br>CIFX 50-2DN,<br>CIFX 50E-DN,<br>CIFX 50E-2DN,<br>CIFX 70E-DN          | DeviceNet Slave                                                                                                                                                                                                                                                                                                                                                                                                | <i>CIFX_DN_DNS.EDS</i>                                                                                                               |
| CIFX 50-CC,<br>CIFX 50E-CC                                                           | CC-Link Slave                                                                                                                                                                                                                                                                                                                                                                                                  | <i>0x0352_CIFX-CCS_2.11_en.cspp,</i><br><i>0x0352_CIFX-CCS_2.11_en.csppproj</i>                                                      |

Table 6: Device Description Files for PC Cards cifX

## 2.9 Revision or version status of hardware and software



**Note on Software Update:** The hardware revisions and the versions for the firmware, the driver or the configuration software listed in this section functionally belong together. For existing hardware installation the firmware, the driver and the configuration software must be updated according to the details listed in this section.

For the software upgrade system overview refer to section *Update for Firmware, Driver and Software* on page 76.

### 2.9.1 Hardware: PC Cards cifX

| PC Card cifX       | Part No.  | Hardware Revision | USB from HW Rev. | „Rotary Switch Slot Number (Card ID)“ from HW Rev. | „DMA Mode“ from HW Rev. |
|--------------------|-----------|-------------------|------------------|----------------------------------------------------|-------------------------|
| CIFX 50-RE         | 1250.100  | 6                 | -                | 3                                                  | 1                       |
| CIFX 50-DP         | 1250.410  | 6                 | -                | 5                                                  | 1                       |
| CIFX 50-CO         | 1250.500  | 6                 | -                | 5                                                  | 1                       |
| CIFX 50-DN         | 1250.510  | 9                 | -                | 5                                                  | 1                       |
| CIFX 50-CC         | 1250.740  | 2                 | -                | 2                                                  | 1                       |
| CIFX 50E-RE        | 1251.100  | 6                 | -                | 4                                                  | 4                       |
| CIFX 50E-REJET     | 1251.105  | 2                 | -                | 1                                                  | 1                       |
| CIFX 50E-CCIES     | 1251.700  | 1                 | -                | 1                                                  | 1                       |
| CIFX 50E-DP        | 1251.410  | 6                 | -                | 5                                                  | 5                       |
| CIFX 50E-CO        | 1251.500  | 5                 | -                | 4                                                  | 4                       |
| CIFX 50E-DN        | 1251.510  | 8                 | -                | 4                                                  | 4                       |
| CIFX 50E-CC        | 1251.740  | 4                 | -                | 3                                                  | 3                       |
| CIFX 50-2DP        | 1252.410  | 3                 | -                | 3                                                  | 1                       |
| CIFX 50-2DN        | 1252.510  | 2                 | -                | 2                                                  | 1                       |
| CIFX 50E-2DP       | 1.253.410 | 1                 | -                | 1                                                  | 1                       |
| CIFX 50E-2DN       | 1.253.510 | 1                 | -                | 1                                                  | 1                       |
| CIFX 70E-RE        | 1.259.100 | 1                 | -                | 1                                                  | 1                       |
| CIFX 70E-CCIES     | 1259.700  | 1                 | -                | 1                                                  | 1                       |
| CIFX 100EH-REICUBE | 9016.090  | 4                 | -                | 1                                                  | 1                       |
| CIFX 70E-DP        | 1.259.410 | 1                 | -                | 1                                                  | 1                       |
| CIFX 70E-CO        | 1.259.500 | 1                 | -                | 1                                                  | 1                       |
| CIFX 70E-DN        | 1.259.510 | 1                 | -                | 1                                                  | 1                       |

Table 7: Reference on Hardware PC Cards cifX

### 2.9.2 Driver and Software

| Driver and Software             |                                              | Version         |
|---------------------------------|----------------------------------------------|-----------------|
| <b>cifX Device Driver</b>       | cifX Device Driver Setup.exe                 | 2.8 or higher   |
| <b>Communication Studio</b>     | CommunicationStudio V1.x.xx.xxxxx Setup.exe  | 1.7             |
| <b>Device Library</b>           | Device Library V1.x.xx.xxxxx Setup.exe       | 1.7             |
| <b>Device Explorer</b>          | Device Explorer Vx.x.xxxxx Setup.exe         | 1.3             |
| <b>Microsoft .NET Framework</b> | Aktivierung in Windows® 10 or separate setup | 4.6.2 or higher |

Table 8: Reference on Driver and Software



## 2.9.3 Firmware

The downloadable cifX firmware runs on PC Cards *cifX PCI*, *PCI Express* and *Low Profile PCI Express* (unless otherwise stated). The firmware automatically detects whether it is running on a PC Cards *cifX PCI*, *PCI Express* or *Low Profile PCI Express*.

### PC Cards and PCI Express with one Channel:

| Protocol                     | Firmware File | Firmware Version* | Minimum Version of the Firmware for USB Support |
|------------------------------|---------------|-------------------|-------------------------------------------------|
| CANopen Master               | CIFXCOM.NXF   | 2.14              | from 2.5.2.0                                    |
| CANopen Slave                | CIFXCOS.NXF   | 3.8               | from 2.4.4.0                                    |
| CC-Link Slave                | CIFXCCS.NXF   | 2.13              | -                                               |
| CC-Link IE Field Basic Slave | C020Y000.NXF  | 1.1               | -                                               |
| CC-Link IE Field Slave***    | C020X000.NXF  | 1.2               | -                                               |
| DeviceNet Master             | C0206000.NXF  | 2.4               | from 2.2.7.0                                    |
| DeviceNet Slave              | CIFXDNS.NXF   | 2.7               | from 2.2.7.0                                    |
| EtherCAT Master              | CIFXECM.NXF   | 4.5 (V4)          | from 2.4.4.0                                    |
| EtherCAT Slave               | CIFXECs.NXF   | 4.8 (V4)          | from 2.5.13.0                                   |
| EtherNet/IP Scanner          | CIFXEIM.NXF   | 2.11              | from 2.2.4.1                                    |
| EtherNet/IP-Adapter          | C010H000.NXF  | 3.6 (V3)          | from 2.3.4.1                                    |
| Open-Modbus/TCP              | CIFXOMB.NXF   | 2.7               | from 2.3.2.1                                    |
| POWERLINK Controlled Node    | C010K000.NXF  | 3.4 (V3)          | from 2.1.22.0                                   |
| PROFIBUS DP Master           | CIFXDPM.NXF   | 2.8               | from 2.3.22.0                                   |
| PROFIBUS DP Slave            | CIFXDPS.NXF   | 2.11              | from 2.3.30.0                                   |
| PROFINET IO-Controller       | C010C000.NXF  | 3.4 (V3)          | from 2.4.10.0                                   |
| PROFINET IO-Device           | C010D000.NXF  | 4.5 (V4)          | from 3.4.9.0                                    |
| Sercos Master                | CIFXS3M.NXF   | 2.1               | from 2.0.14.0                                   |
| Sercos Slave                 | CIFXS3S.NXF   | 3.5               | from 3.0.13.0                                   |
| VARAN-Client                 | CIFXVRS.NXF   | 1.1               | from 1.0.3.0                                    |

Table 9: Reference on Firmware (for 1 Channel Systems)



**Note:** \*Unless otherwise indicated, in this manual data to the firmware version correspond to the stack version.



**\*\*\*Important!** Use the PC cards CIFX 50E-CCIES or CIFX 70E-CCIES only together with the CC-Link IE Field Slave firmware and do not use this firmware for any other cards.

### PC Cards PCI and PCI Express with two Channels:

| Protocol Channel X1 | Stack-Version | Protocol Channel X2 | Stack-Version | Firmware File | Firmware Version           |
|---------------------|---------------|---------------------|---------------|---------------|----------------------------|
| DeviceNet Master    | 2.4           | DeviceNet Master    | 2.4           | C0206060.NXF  | 1.2                        |
| DeviceNet Master    | 2.4           | DeviceNet Slave     | 2.5           | C0206070.NXF  | 1.2                        |
| DeviceNet Slave     | 2.5           | DeviceNet Slave     | 2.5           | C0207070.NXF  | 1.2                        |
| PROFIBUS DP Master  | 2.9           | PROFIBUS DP Master  | 2.9           | CIFX2DPM.NXF  | 1.2 (new version counting) |
| PROFIBUS DP Master  | 2.9           | PROFIBUS DP Slave   | 2.9           | C0201020.NXF  | 1.2                        |
| PROFIBUS DP Slave   | 2.9           | PROFIBUS DP Slave   | 2.9           | CIFX2DPS.NXF  | 1.1 (new version counting) |

Table 10: Reference on Firmware (for 2 Channel Systems)

## 2.10 Device Label with Matrix Code

You can identify your device by means of the device label.



**Note:** The position of the device label on your device can be seen from the device drawing.

The device label consists of a matrix code and the information contained therein in plain text.

The 2 D code (Data Matrix Code) contains the following information:

- ① Part number: 1234.567
- ② Hardware revision: 1
- ③ Serial number: 20000 (for mini matrix 20001)

The device label with matrix code can be designed as mini-sticker.

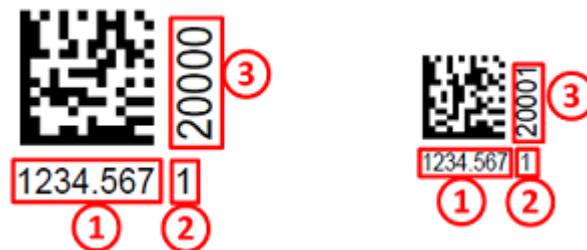


Figure 1: Example 2D Label (mini sticker on the right)

### 3 Device Drawings

#### 3.1 PC Cards cifX PCI and PCI Express

##### 3.1.1 CIFX 50-RE, CIFX 50E-RE, CIFX 50E-RE\ET

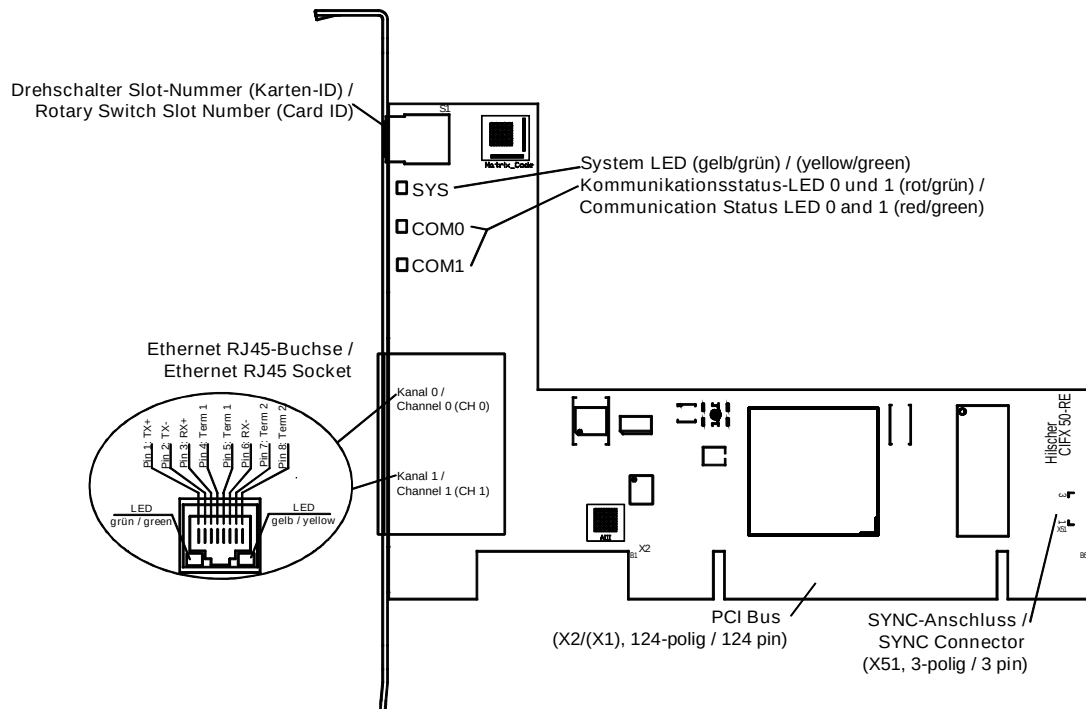


Figure 2: CIFX 50-RE\* (from hardware rev. 3)

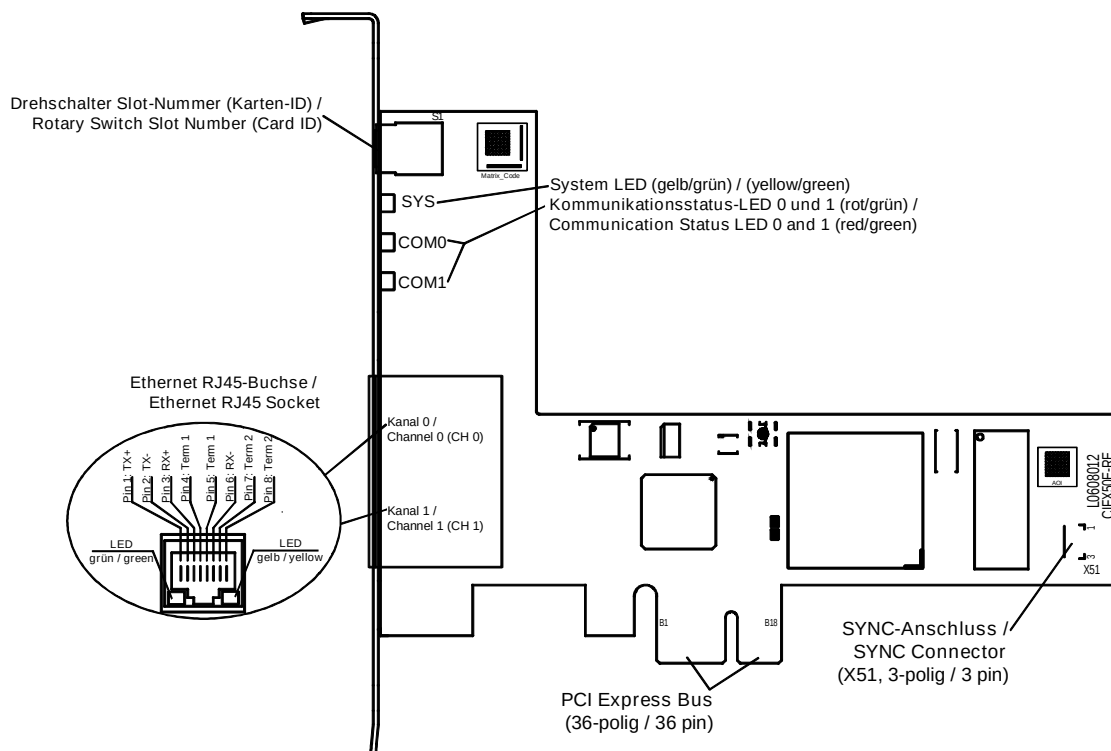


Figure 3: CIFX 50E-RE\* (from hardware rev. 4), CIFX 50E-RE\ET\* (from hardware rev. 1)



**Note:** \*Device supports Auto Crossover Function.

For the **SYNC** pin assignment of the SYNC Connector refer to section *Pin Assignment SYNC Connector, X51 (CIFX 50 50E 70E)* on page 115. Device drawings of earlier device revisions without rotary switch slot number (card ID) are included in the user manual for PC cards cifX Real-Time Ethernet up to manual rev. 32.

The figure below shows the front plate of the PC cards CIFX 50-RE, CIFX 50E-RE or CIFX 50E-RE\ET:

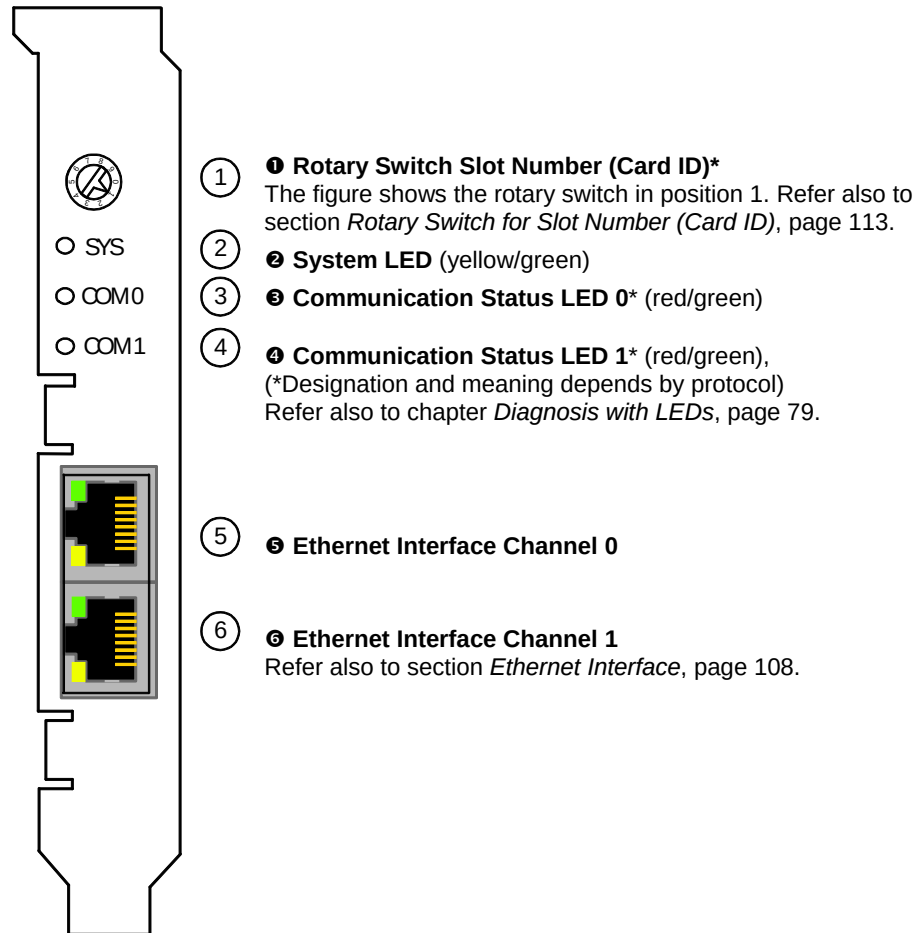


Figure 4: Front Plate for CIFX 50-RE, CIFX 50E-RE or CIFX 50E-RE\ET

\*From hardware revision 3 (for CIFX 50-RE), 4 (for CIFX 50E-RE) or 1 (for CIFX 50E-RE\ET) on, the **Rotary Switch Slot Number (Card ID)** is provided.

### 3.1.2 CIFX 50E-CCIES

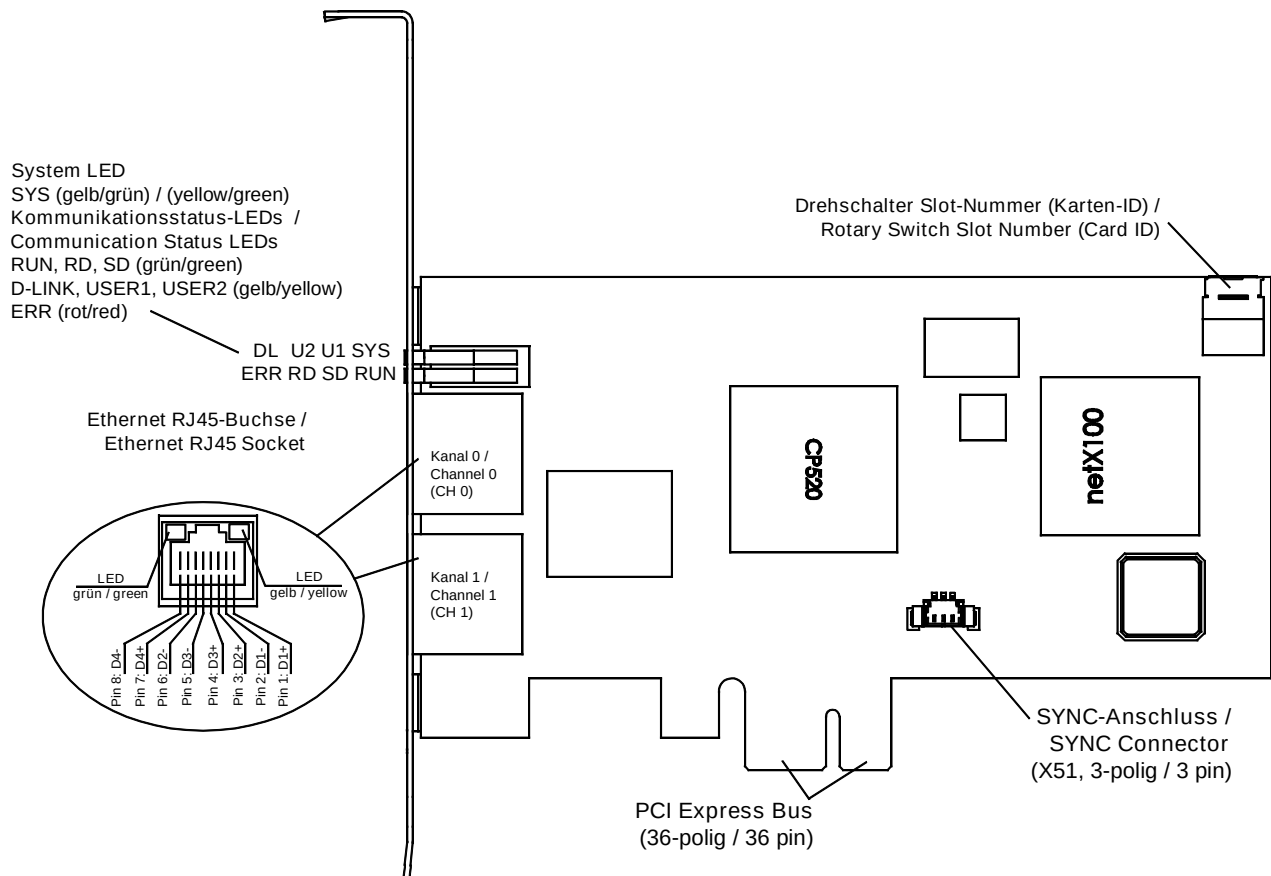


Figure 5: CIFX 50E-CCIES\* (Hardware revision 1)



**Note:** \*Device supports Auto Crossover Function.

For details about the **Rotary Switch Slot Number (Card ID)** refer to section *Rotary Switch for Slot Number (Card ID)*, page 113.

For the **SYNC** pin assignment of the SYNC Connector refer to section *Pin Assignment SYNC Connector, X51 (CIFX 50 50E 70E)* on page 115.

The figure below shows the front plate of the PC card CIFX 50E-CCIES:

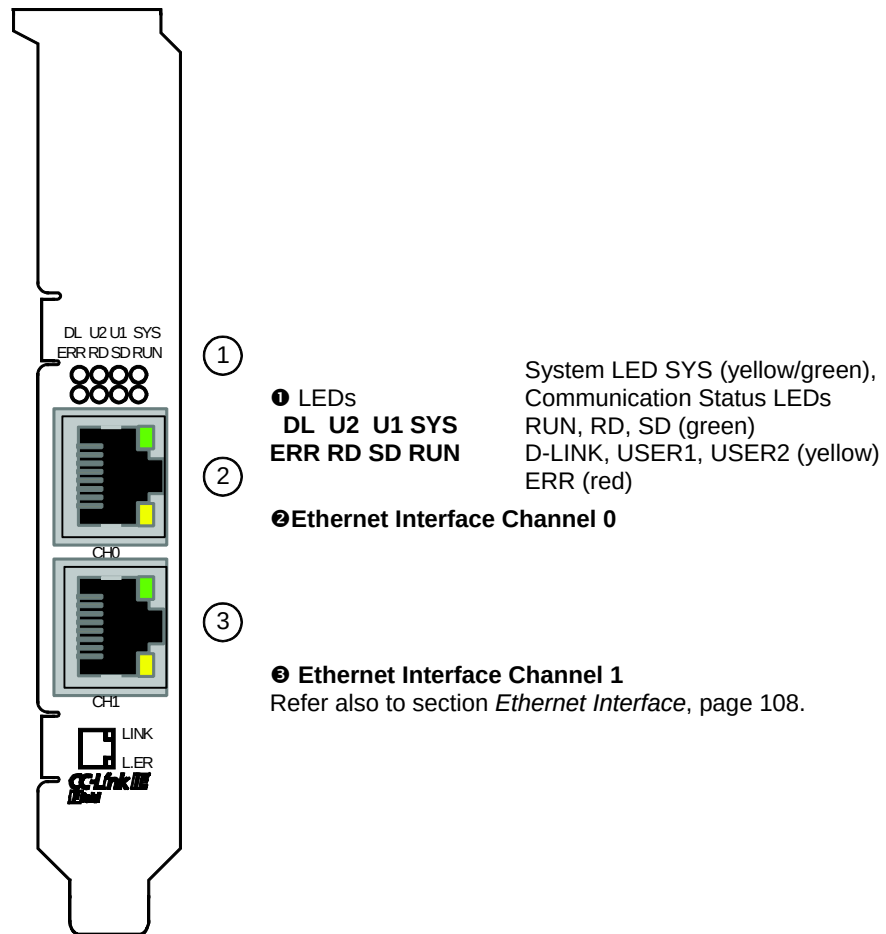


Figure 6: Front Plate for CIFX 50E-CCIES

### 3.1.3 CIFX 50-DP, CIFX 50E-DP

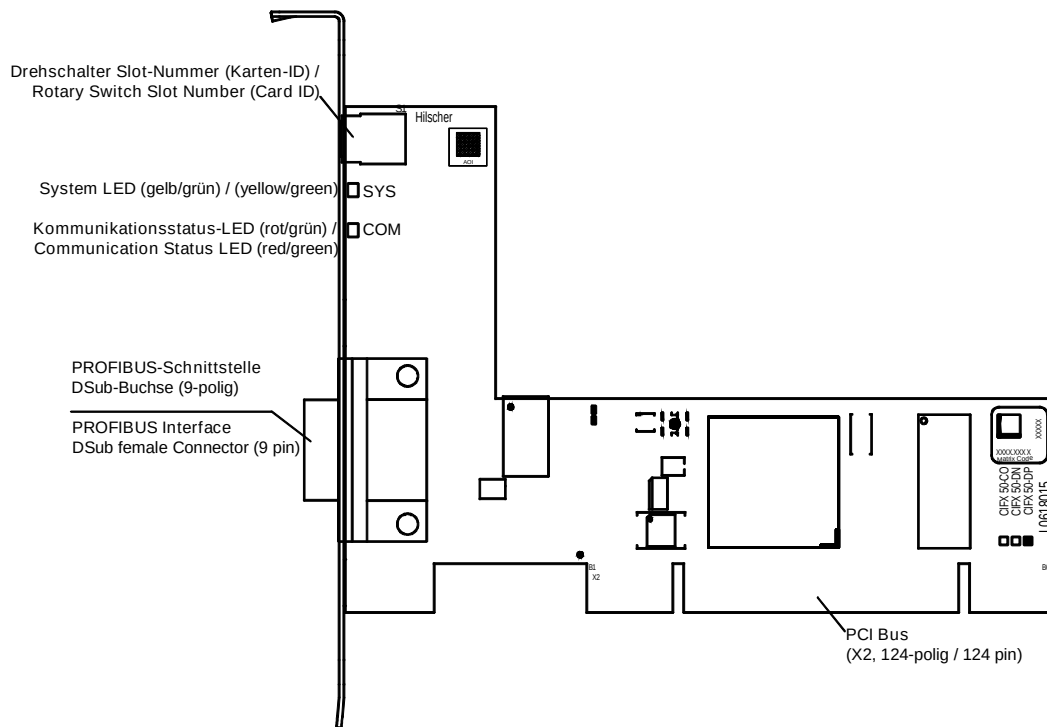


Figure 7: CIFX 50-DP (hardware revision 5)\*

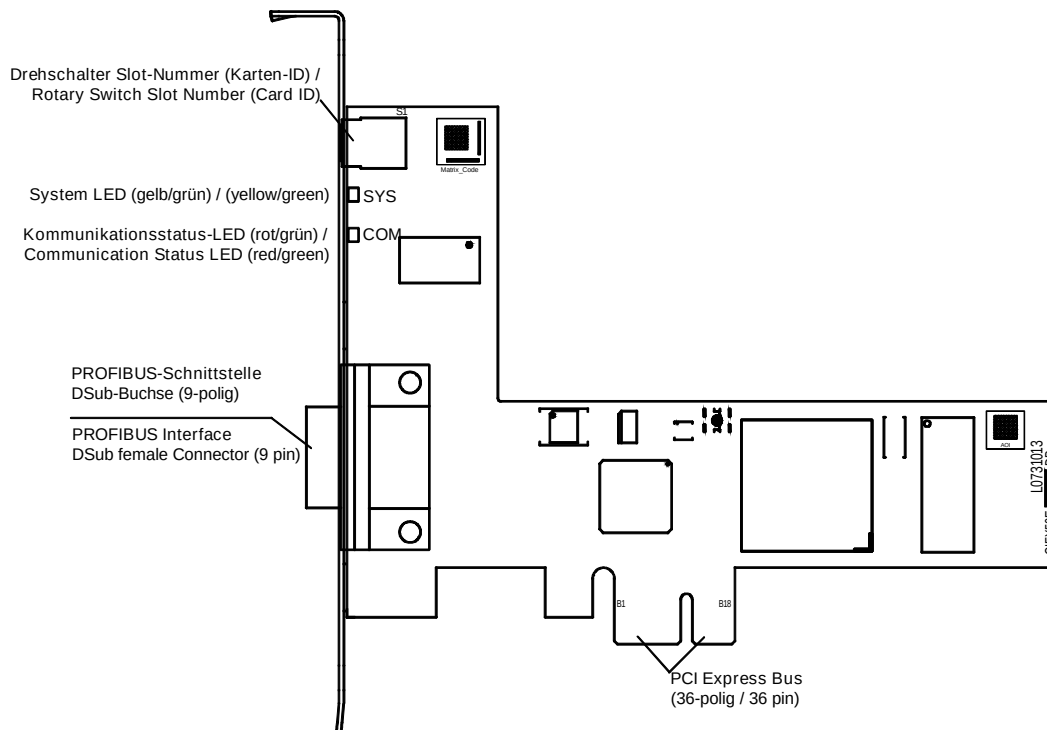


Figure 8: CIFX 50E-DP (hardware revision 5)\*

\*Device drawings of earlier device revisions without rotary switch slot number (card ID) or with two COM LEDs are included in the user manual for PC cards cifX fieldbus up to manual rev. 23.

The figure below shows the front plate of the PC cards  
CIFX 50-DP or CIFX 50E-DP:

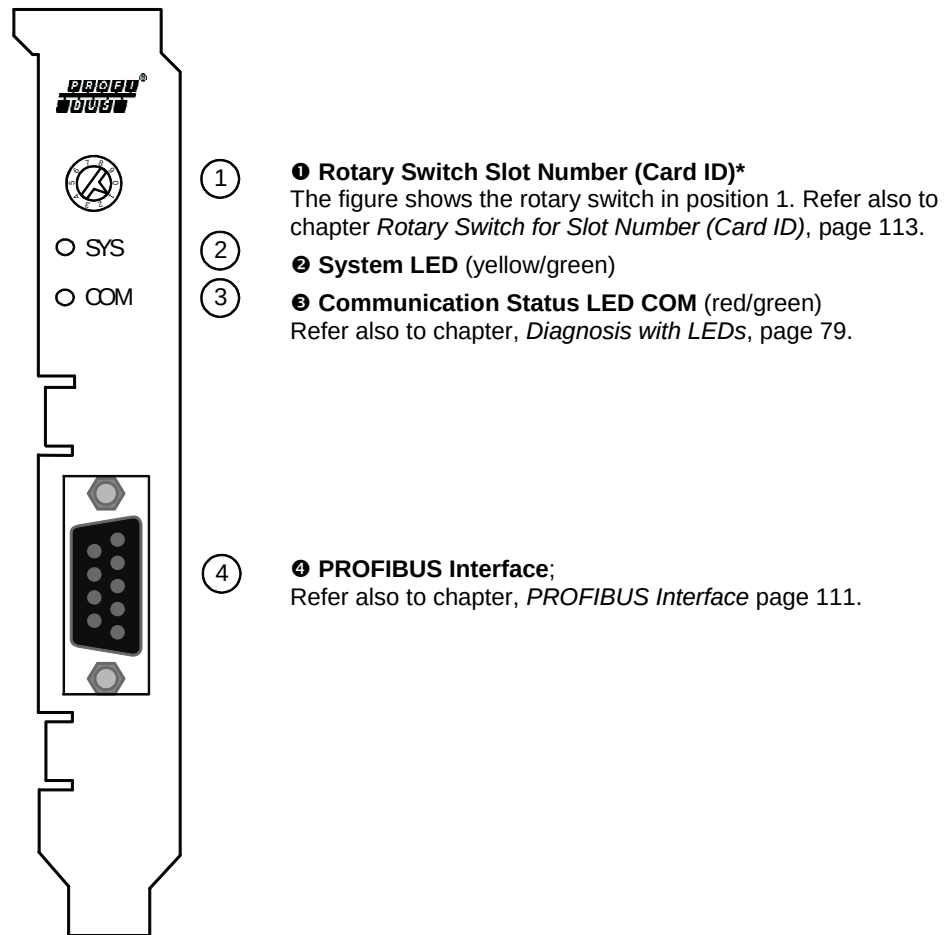


Figure 9: Front Plate CIFX 50-DP or CIFX 50E-DP

\*From hardware revision 5 (for CIFX 50-DP or CIFX 50E-DP) on, the **Rotary Switch Slot Number (Card ID)** is provided.



### 3.1.4 CIFX 50-2DP, CIFX 50E-2DP

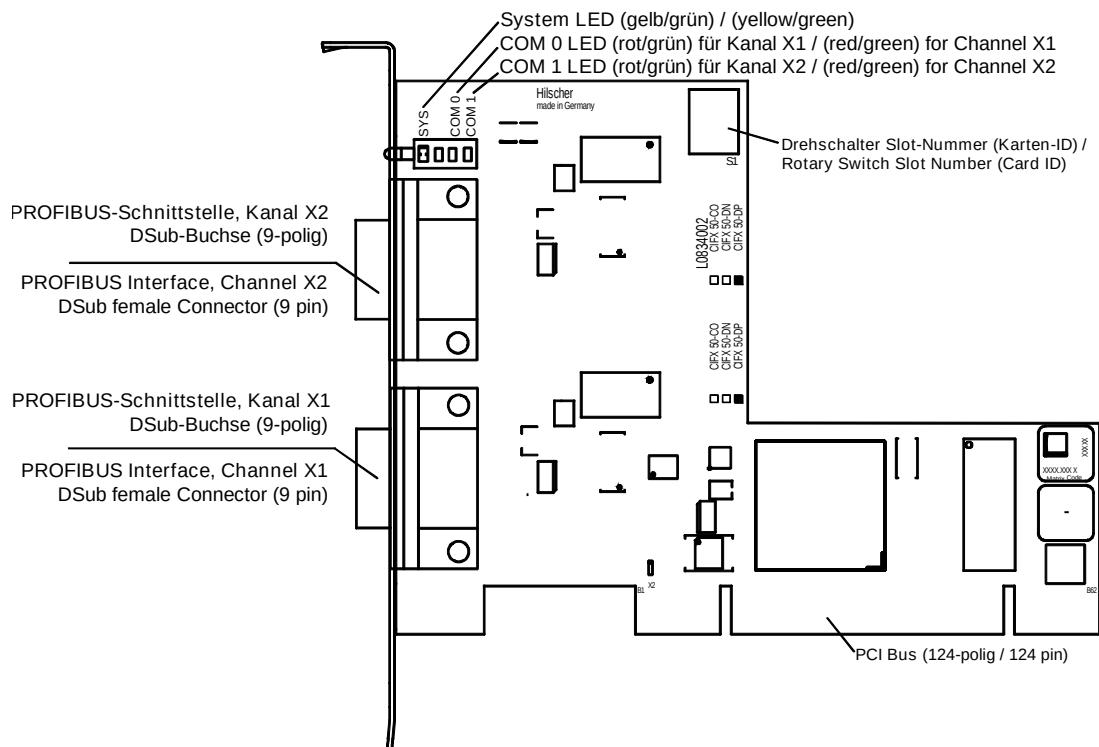


Figure 10: CIFX 50-2DP (Hardware Revision 3)

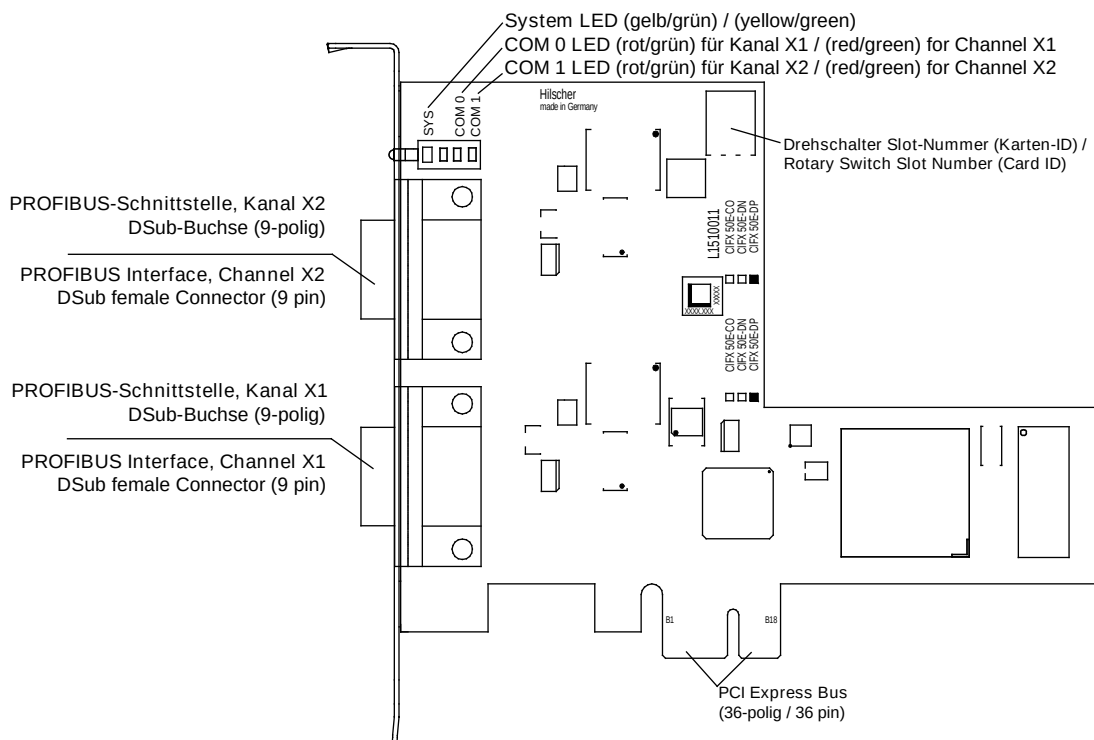


Figure 11: CIFX 50E-2DP (Hardware Revision 1)

A Device drawing of the earlier device revision without rotary switch slot number (card ID) is included in the user manual rev. 37.

The figure below shows the front plate of the PC cards  
CIFX 50-2DP, CIFX 50E-2DP:

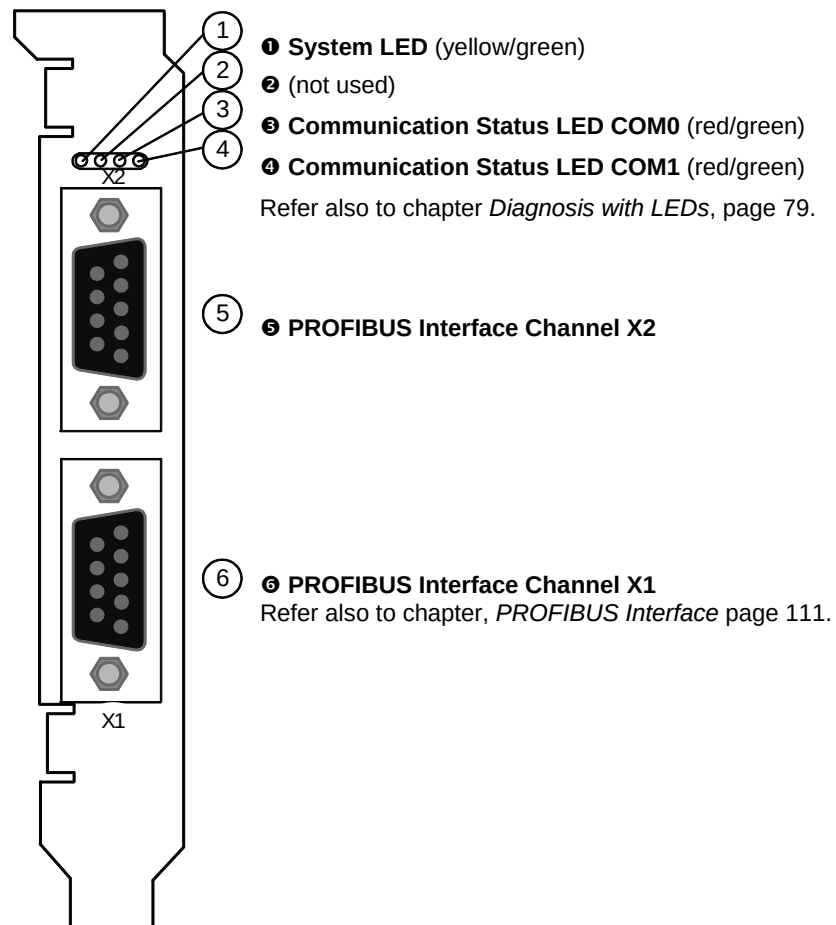


Figure 12: Front Plate CIFX 50-2DP, CIFX 50E-2DP

### 3.1.5 CIFX 50-CO, CIFX 50E-CO

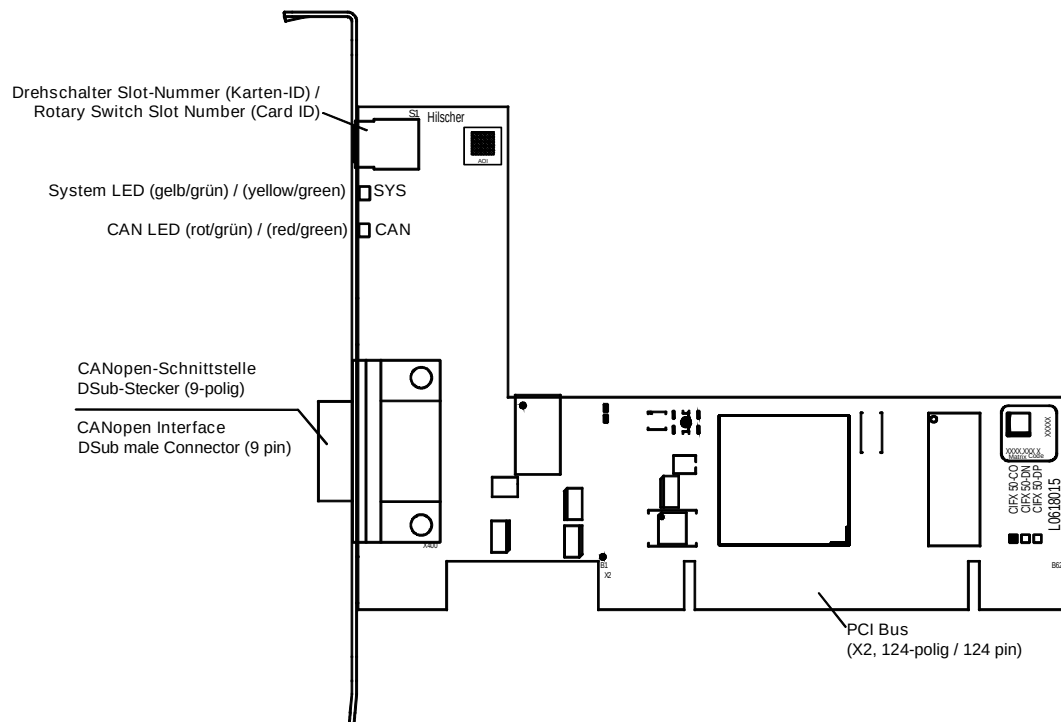


Figure 13: CIFX 50-CO (hardware revision 5)

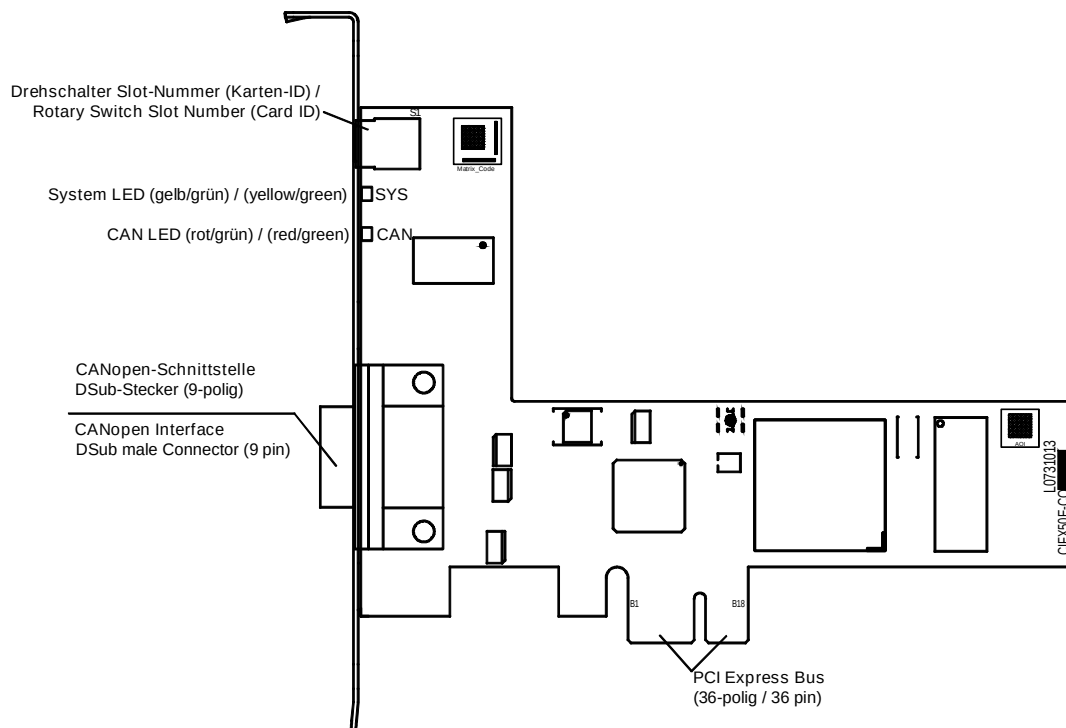


Figure 14: CIFX 50E-CO (from hardware revision 4)

Device drawings of earlier device revisions without rotary switch slot number (card ID) or with two COM LEDs are included in the user manual for PC cards cifX fieldbus up to manual rev. 23.

The figure below shows the front plate of the PC cards  
CIFX 50-CO or CIFX 50E-CO:

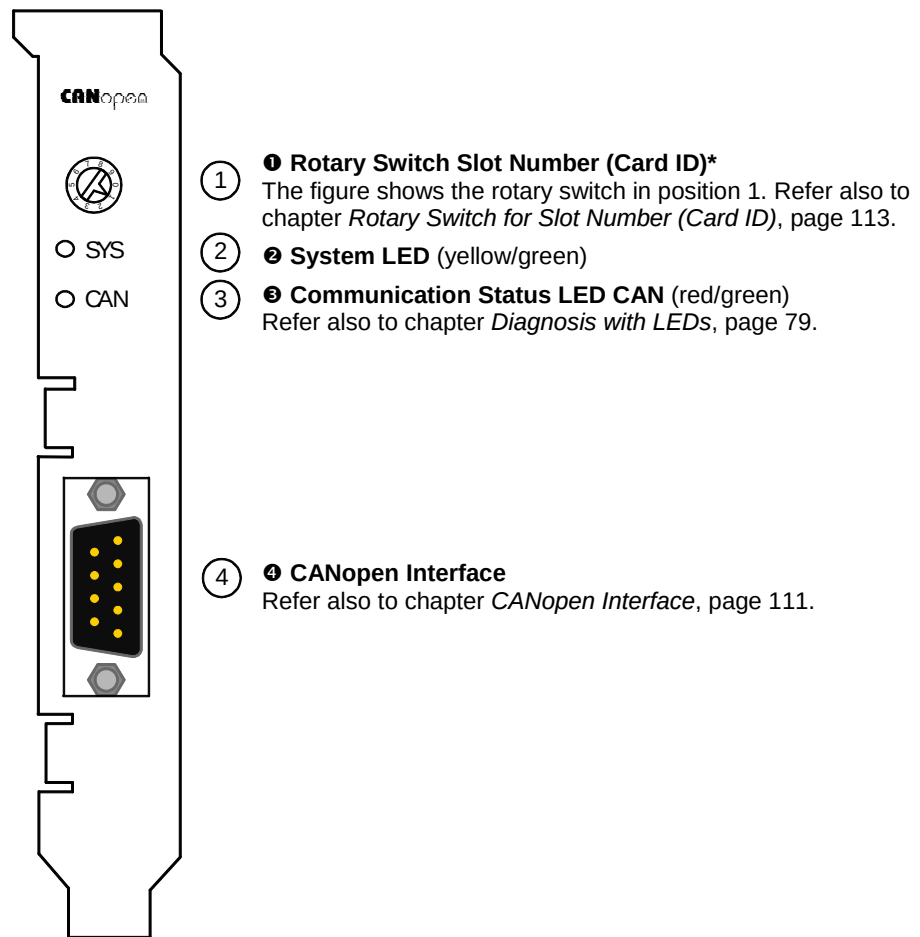


Figure 15: Front Plate for CIFX 50-CO or CIFX 50E-CO

\*From hardware revision 5 (for CIFX 50-CO or CIFX 50E-CO) on, the **Rotary Switch Slot Number (Card ID)** is provided.

### 3.1.6 CIFX 50-DN, CIFX 50E-DN

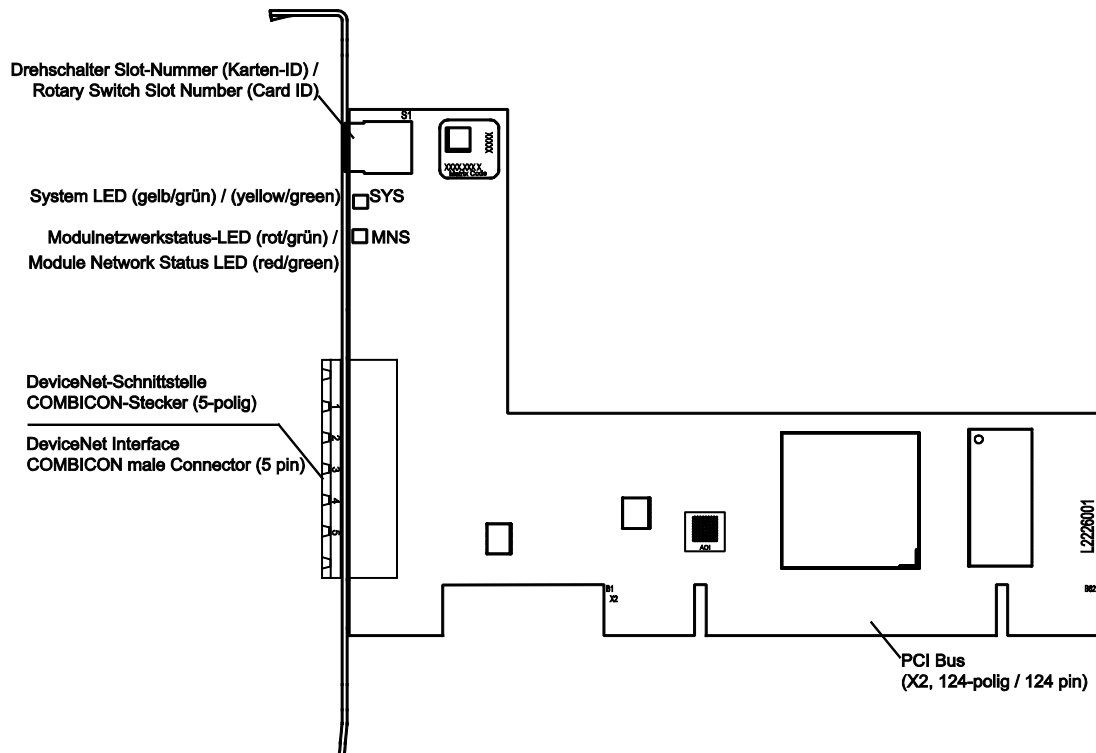


Figure 16: CIFX 50-DN (hardware revision 9)

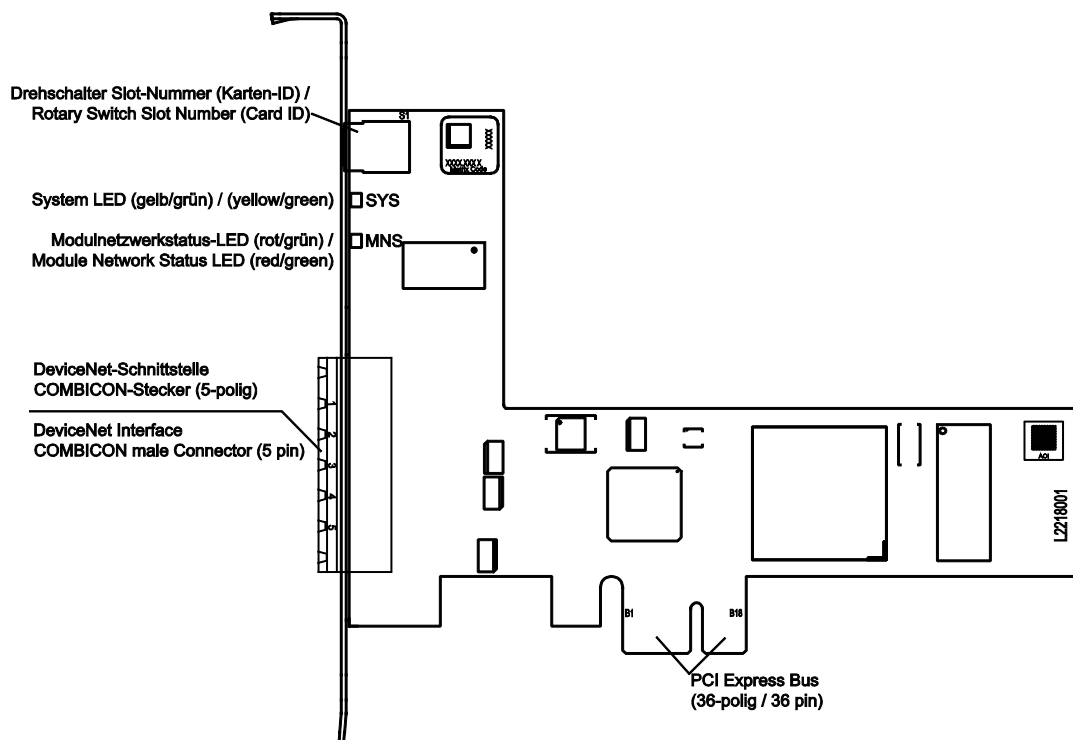


Figure 17: CIFX 50E-DN (from hardware revision 8)

Device drawings of earlier device revisions without rotary switch slot number (card ID) are included in the user manual for PC cards cifX fieldbus up to manual rev. 23.

The figure below shows the front plate of the PC cards CIFX 50-DN or CIFX 50E-DN:

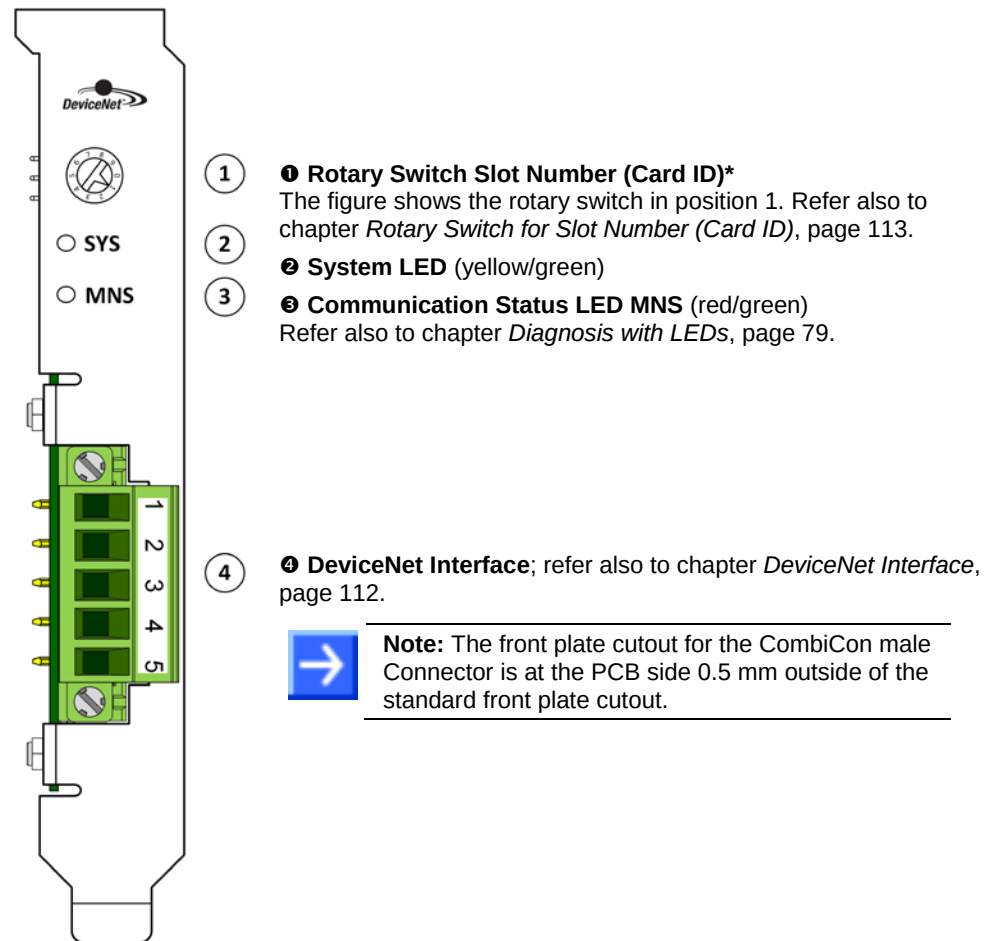


Figure 18: Front Plate CIFX 50-DN (Rev 9) or CIFX 50E-DN (Rev. 8)

\*From hardware revision 5 (for CIFX 50-DN or CIFX 50E-DN on, the **Rotary Switch Slot Number (Card ID)** is provided.

### 3.1.7 CIFX 50-2DN, CIFX 50E-2DN

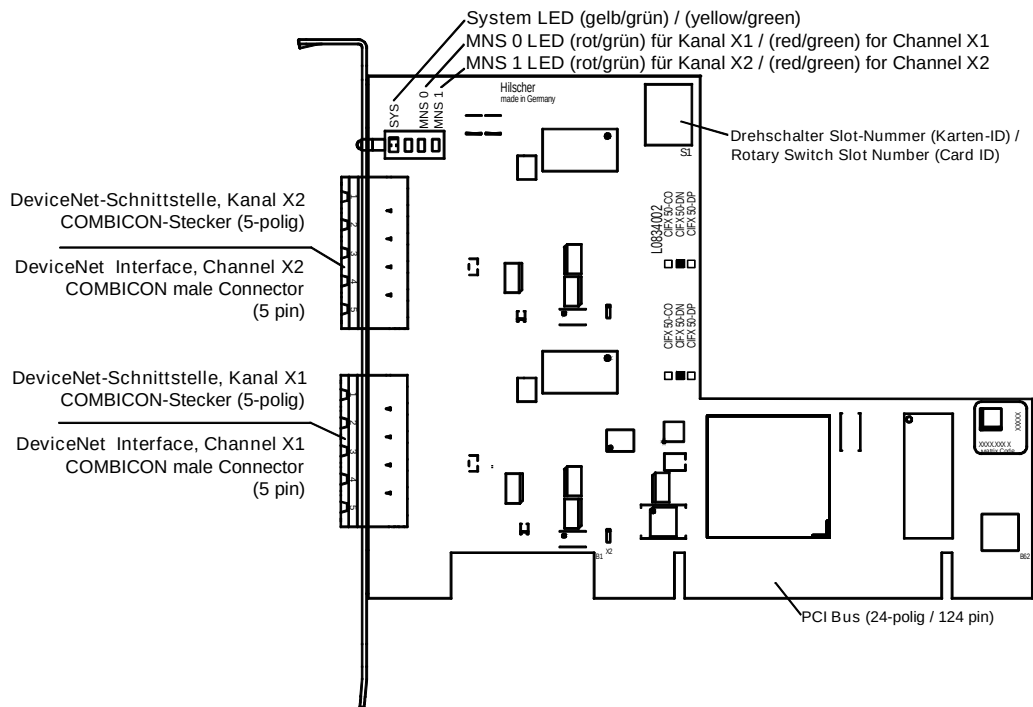


Figure 19: CIFX 50-2DN (Hardware Revision 2)

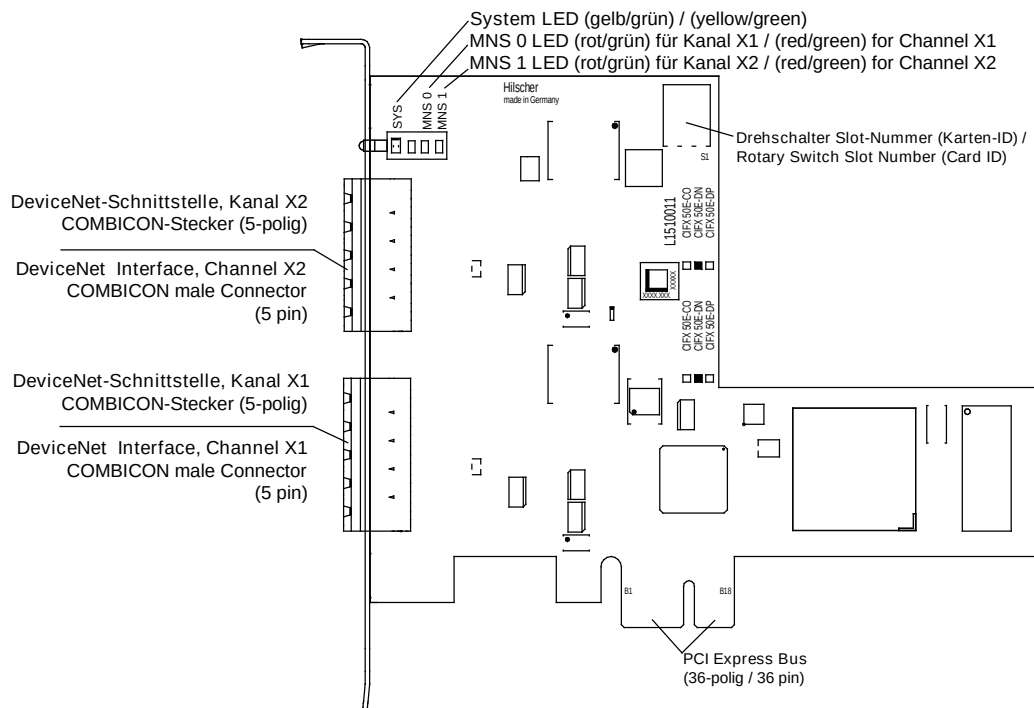


Figure 20: CIFX 50E-2DN (Hardware Revision 1)

The figure below shows the front plate of the PC cards  
CIFX 50-2DN, CIFX 50E-2DN:

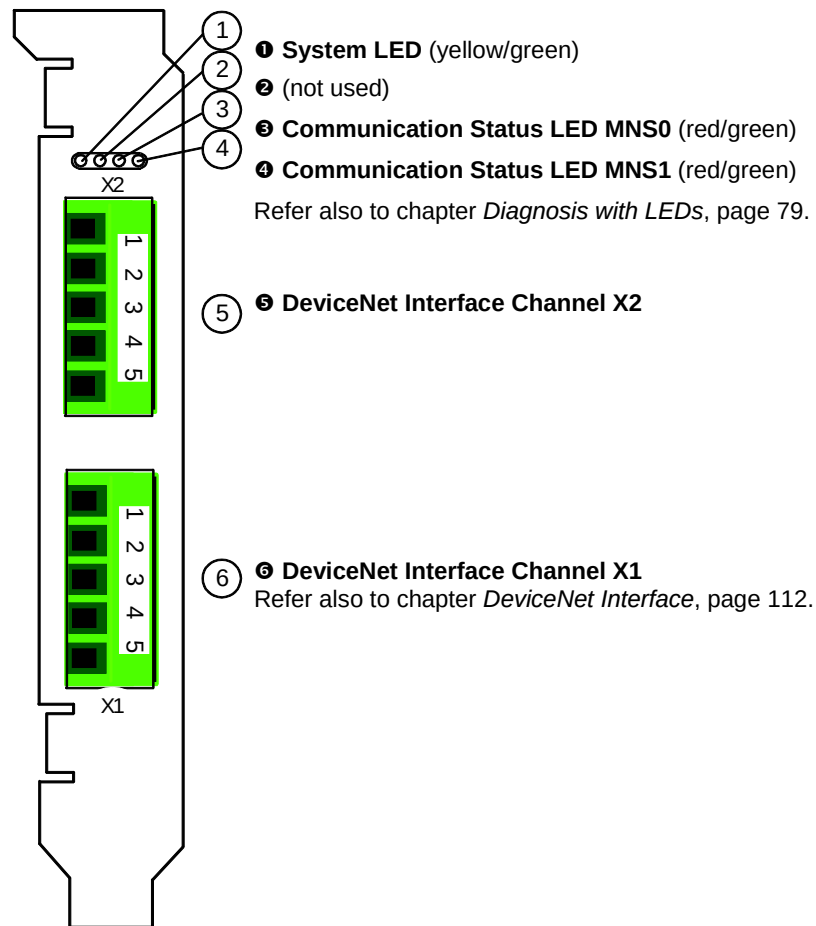


Figure 21: Front Plate CIFX 50-2DN, CIFX 50E-2DN



### 3.1.8 CIFX 50-CC, CIFX 50E-CC

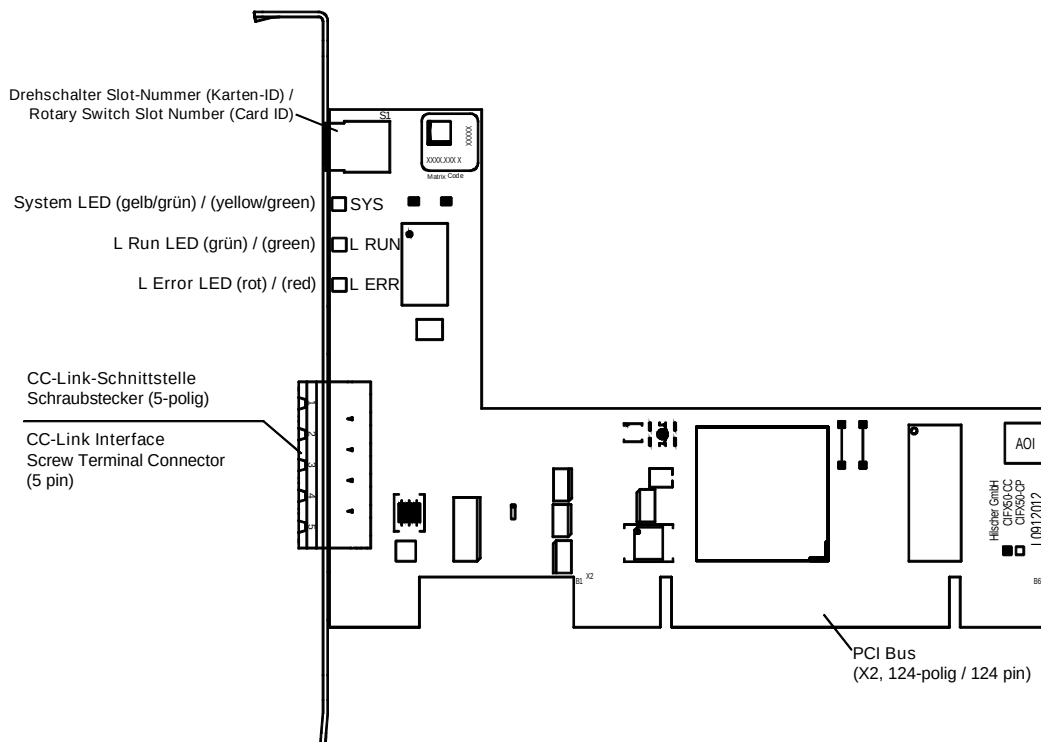


Figure 22: CIFX 50-CC (hardware revision 2)\*

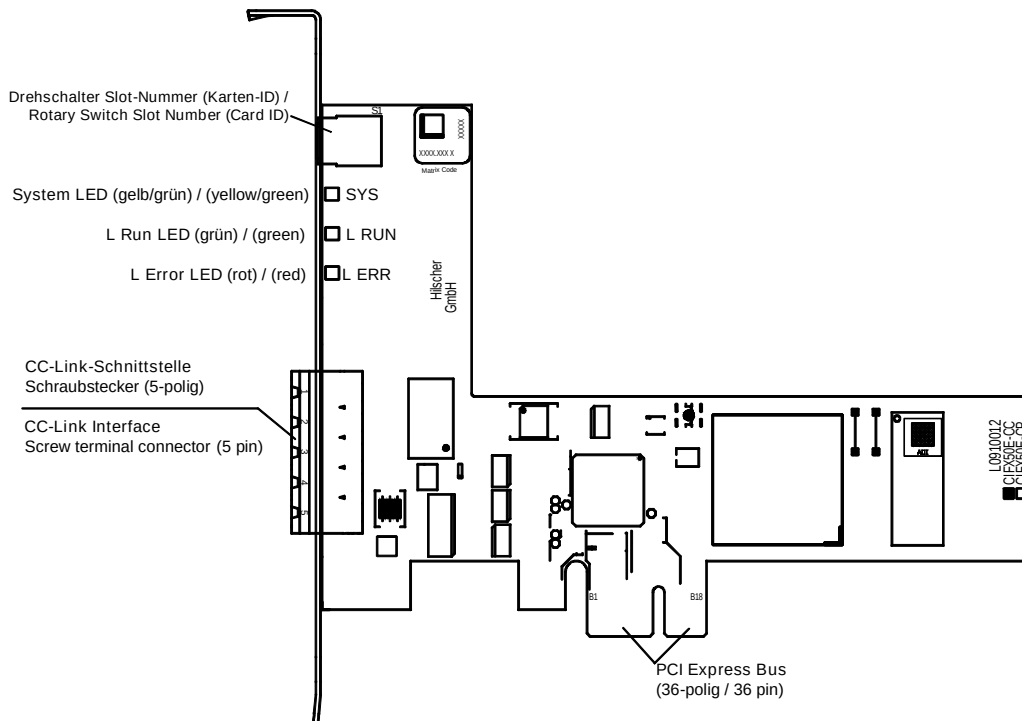


Figure 23: CIFX 50E-CC (hardware revision 4)\*

Device drawings of earlier device revisions without rotary switch slot number (card ID) are included in the user manual for PC cards cifX fieldbus up to manual rev. 23.



**Note:** \*The front plate cutout for the screw terminal connector is at the PCB side 0.5 mm outside of the standard front plate cutout.

The figure below shows the front plate of the PC cards CIFX 50-CC or CIFX 50E-CC:

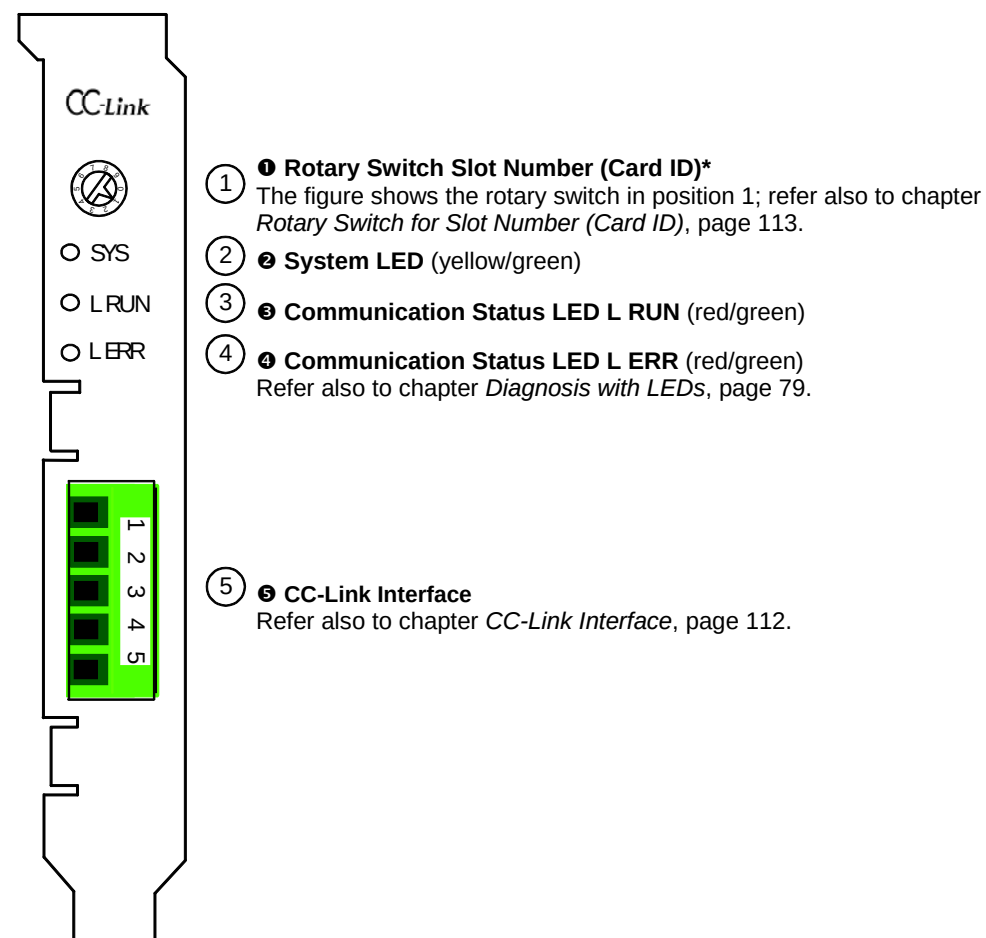


Figure 24: Front Plate CIFX 50-CC or CIFX 50E-CC

\*From hardware revision 2 (for CIFX 50-CC) on or 3 (for CIFX 50E-CC), the **Rotary Switch Slot Number (Card ID)** is provided.

3.1.9 Meaning of the Front Panel Inscriptions for 2 Channel Devices

| PC card cifX              | Channel X1 | Channel X2 |
|---------------------------|------------|------------|
| CIFX 50-2DP, CIFX 50E-2DP | COM0       | COM1       |
| CIFX 50-2DN, CIFX 50E-2DN | MNS0       | MNS1       |

Table 11: Assignment of the LEDs to the Channels

X1 and X2 indicate the bus interfaces: X1 stands for fieldbus 1 (channel X1), X2 stands for fieldbus 2 (channel X2).



**Note:** Within the configuration software Communication Studio the communication channels are named with 'Ch0', 'Ch1' ... .

## 3.2 PC Cards cifX Low Profile PCI Express

### 3.2.1 CIFX 70E-RE

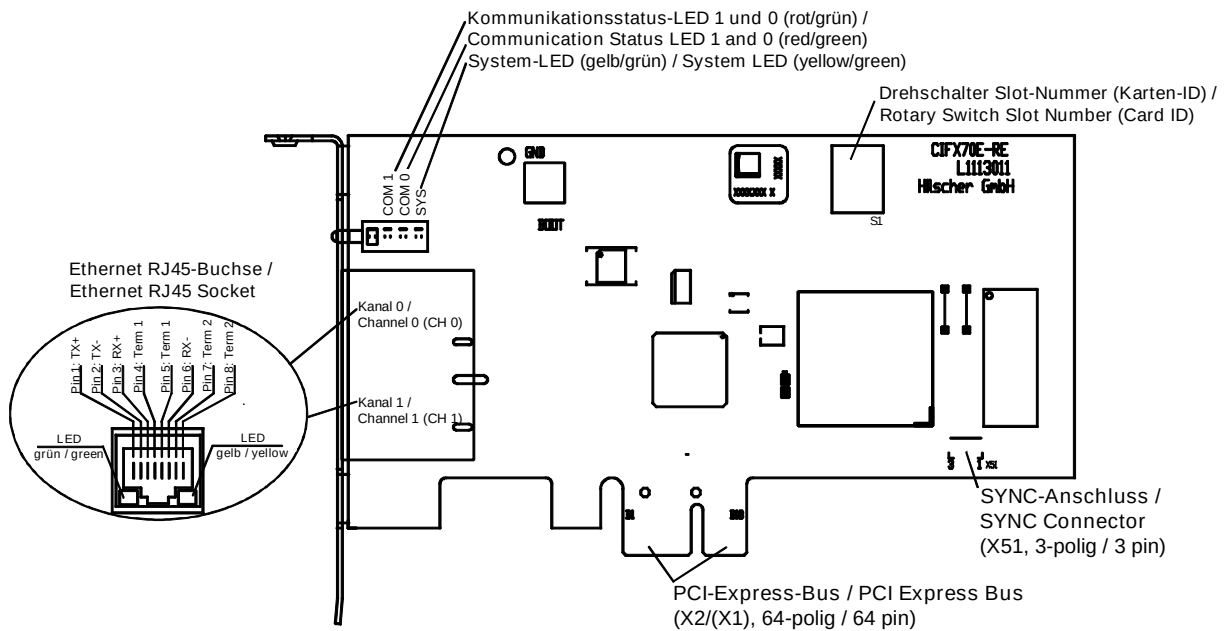


Figure 25: CIFX 70E-RE\* (Hardware revision 1)



**Note:** \*Device supports Auto Crossover Function.

About **Rotary Switch for Slot Number (Card ID)** refer to section *Rotary Switch for Slot Number (Card ID)*, on page 113.

For the **SYNC** pin assignment of the SYNC Connector refer to section *Pin Assignment SYNC Connector, X51 (CIFX 50 50E 70E)* on page 115.

The figure below shows the front plate of the PC card CIFX 70E-RE:

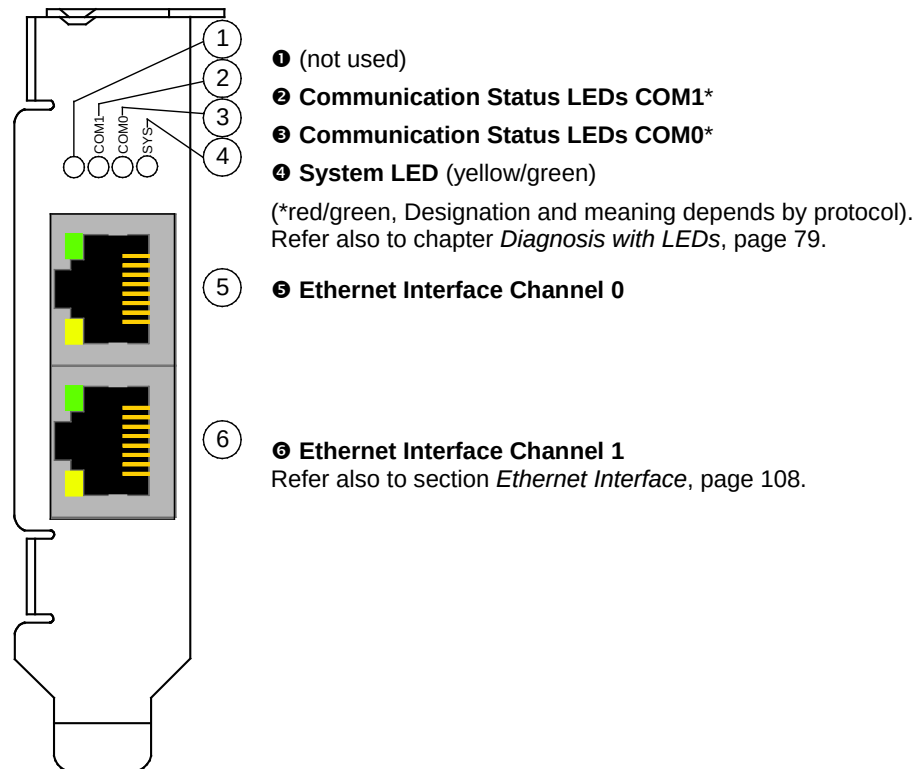


Figure 26: Front Plate for CIFX 70E-RE

### 3.2.2 CIFX 70E-CCIES

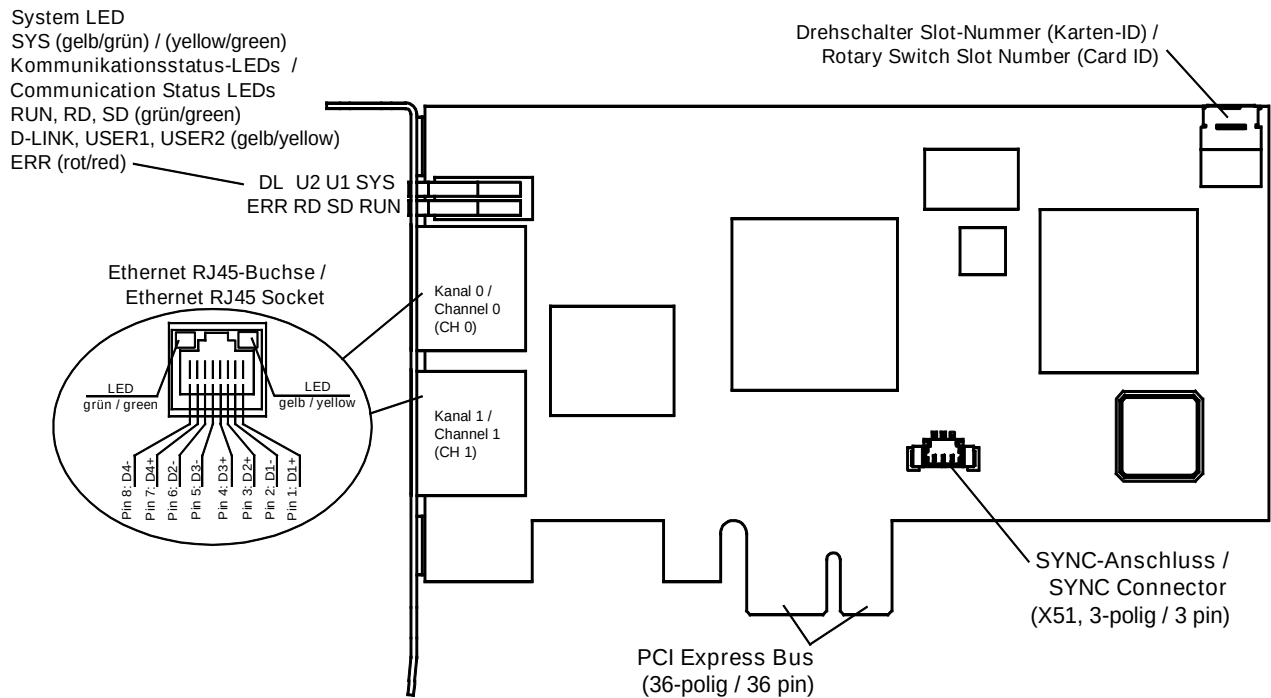


Figure 27: CIFX 70E-CCIES\* (Hardware revision 1)



**Note:** \*Device supports Auto Crossover Function.

For details about the **Rotary Switch Slot Number (Card ID)** refer to section *Rotary Switch for Slot Number (Card ID)*, page 113.

For the **SYNC** pin assignment of the SYNC Connector refer to section *Pin Assignment SYNC Connector, X51 (CIFX 50 50E 70E)* on page 115.

The figure below shows the front plate of the PC card CIFX 70E-CCIES:

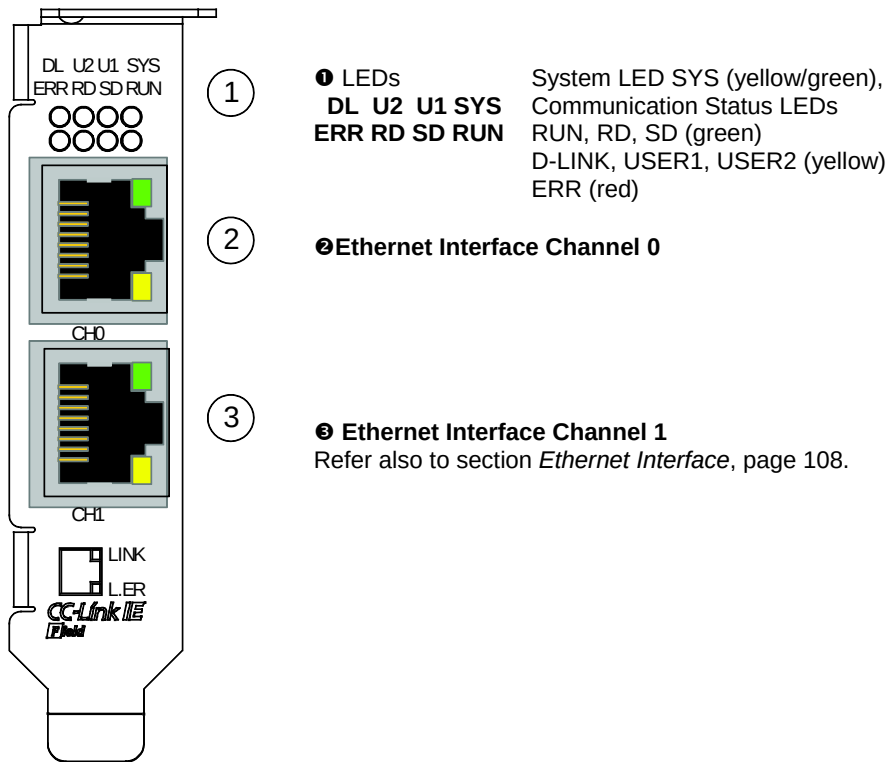


Figure 28: Front Plate for CIFX 70E-CCIES

### 3.2.3 CIFX 100EH-RE\CUBE

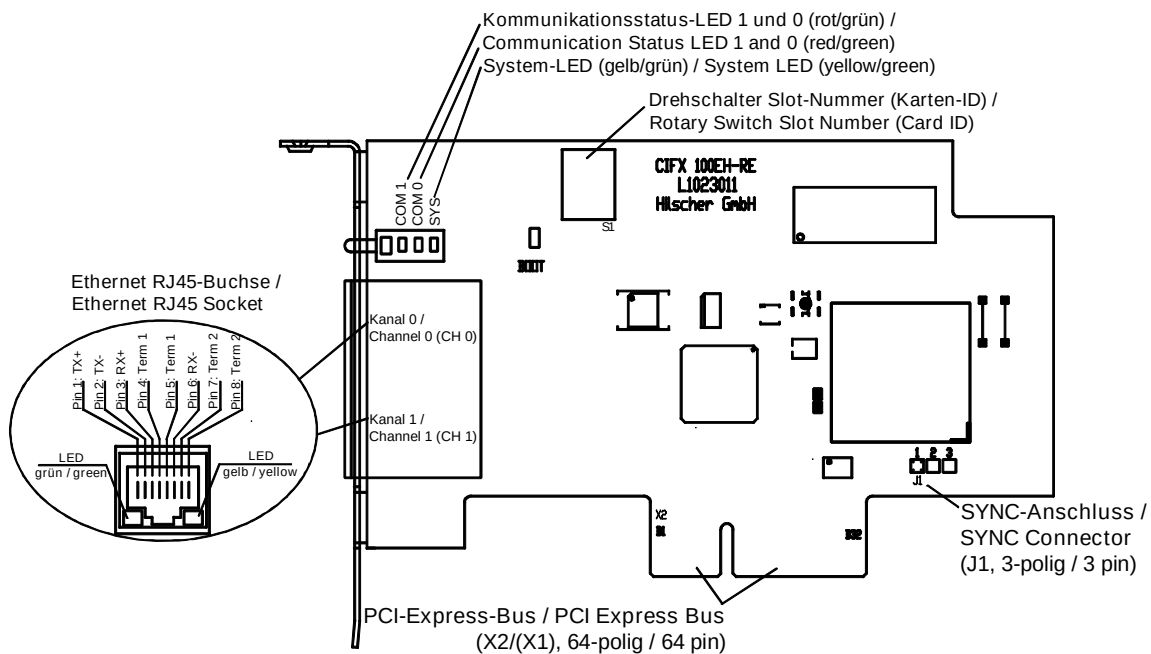
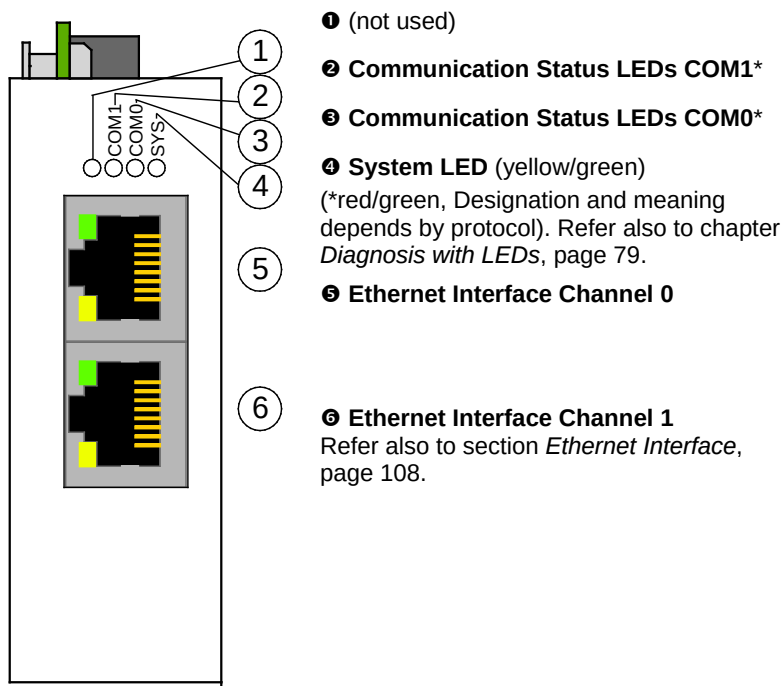


Figure 29: CIFX 100EH-RE\CUBE\*

The figure below shows the front plate of the PC card CIFX 100EH-RE\CUBE:



**Note:** \*Device supports Auto Crossover Function.

About **Rotary Switch for Slot Number (Card ID)** refer to section *Rotary Switch for Slot Number (Card ID)*, on page 113.

For the pin assignment of the **PCI Express** bus X2(X1) see section *Pin Assignment for PCI Express Bus CIFX 100EH-RE\CUBE* on page 118.

For the **SYNC** pin assignment of the SYNC Connector refer to section *Pin Assignment SYNC Connector, J1 (CIFX 100EH)* on page 115.

Figure 30: Front Plate CIFX 100EH-RE\CUBE

### 3.2.4 CIFX 70E-DP

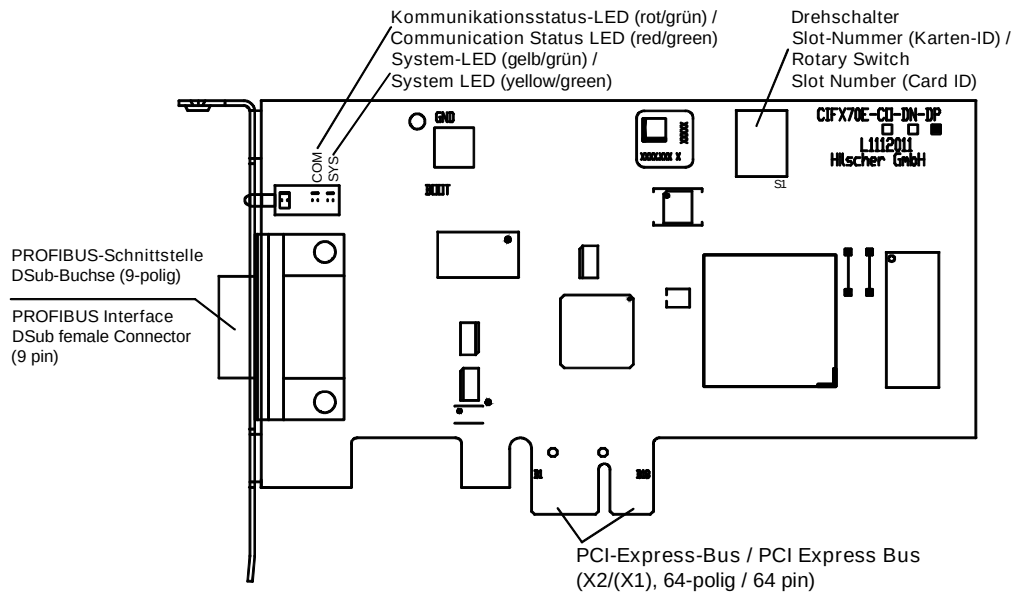


Figure 31: CIFX 70E-DP (Hardware revision 1)

About **Rotary Switch for Slot Number (Card ID)** refer to section *Rotary Switch for Slot Number (Card ID)*, on page 113.

The figure below shows the front plate of the PC card CIFX 70E-DP:

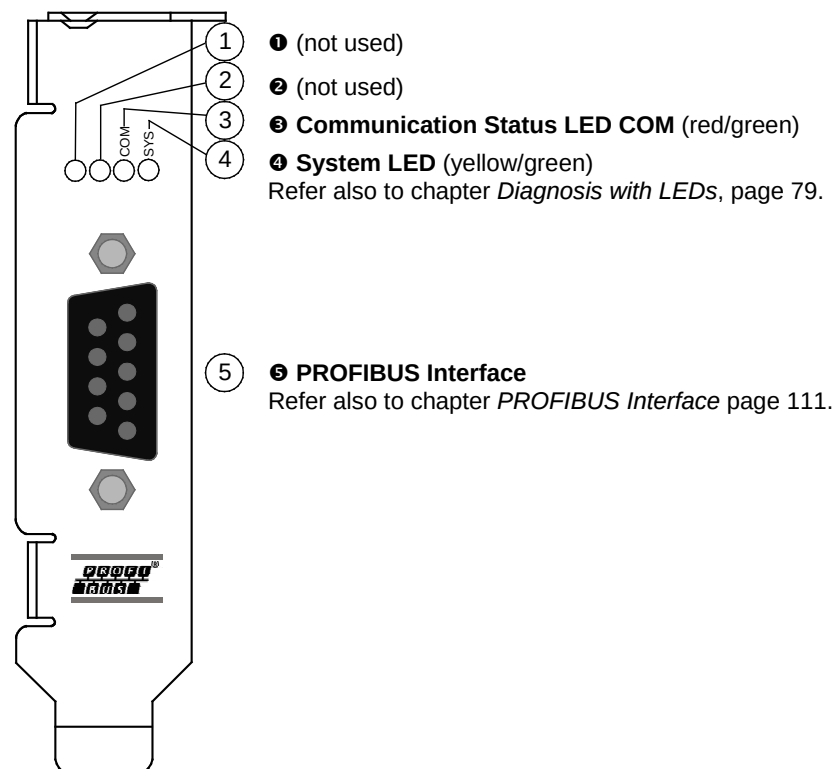


Figure 32: Front Plate CIFX 70E-DP



### 3.2.5 CIFX 70E-CO

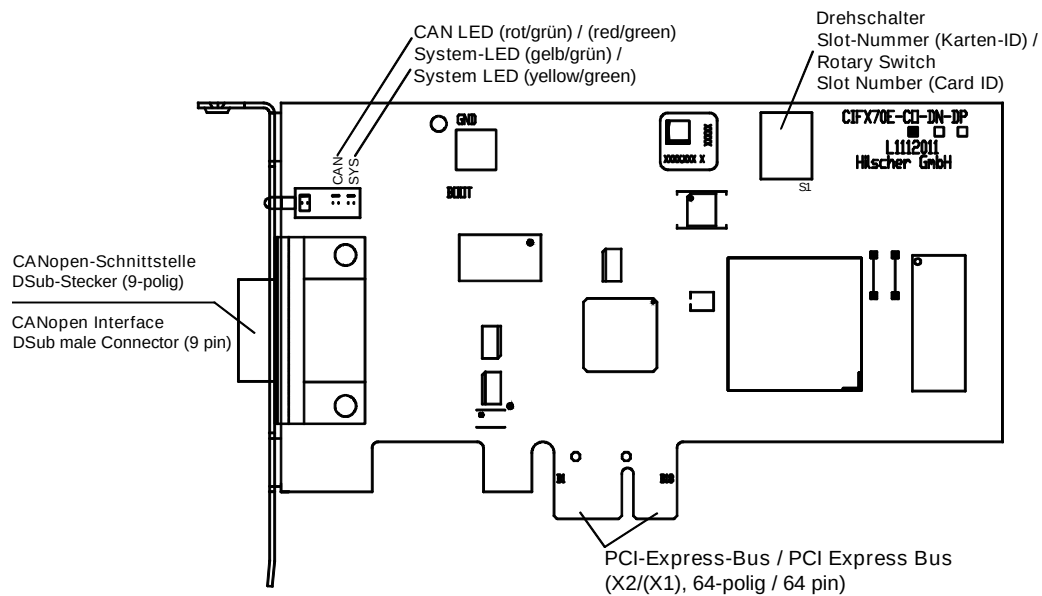


Figure 33: CIFX 70E-CO (Hardware revision 1)

About **Rotary Switch for Slot Number (Card ID)** refer to section *Rotary Switch for Slot Number (Card ID)*, on page 113.

The figure below shows the front plate of the PC card CIFX 70E-CO:

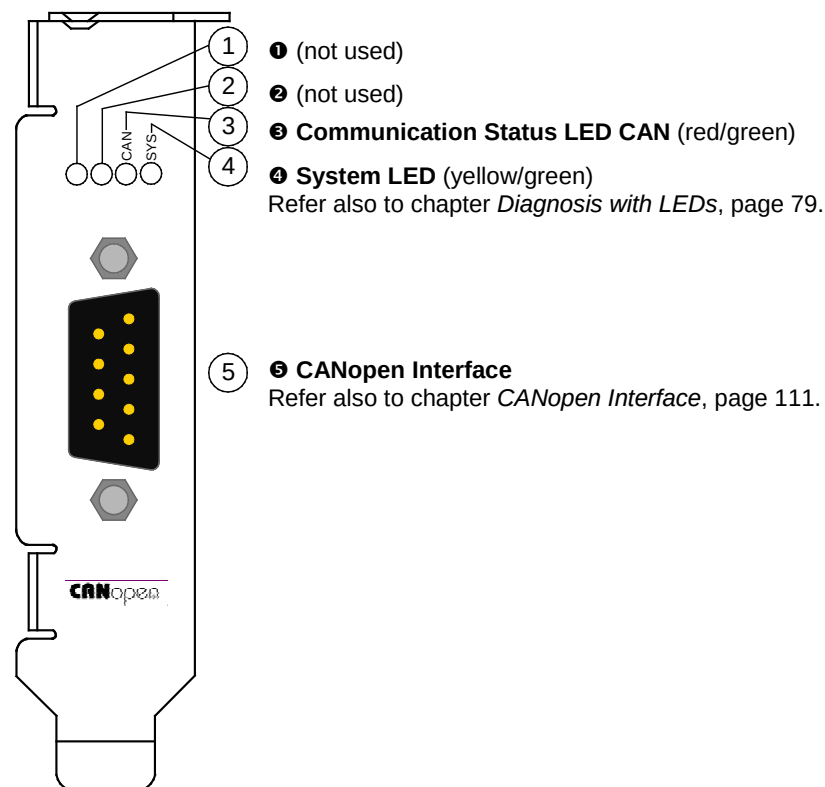


Figure 34: Front Plate CIFX 70E-CO

### 3.2.6 CIFS 70E-DN

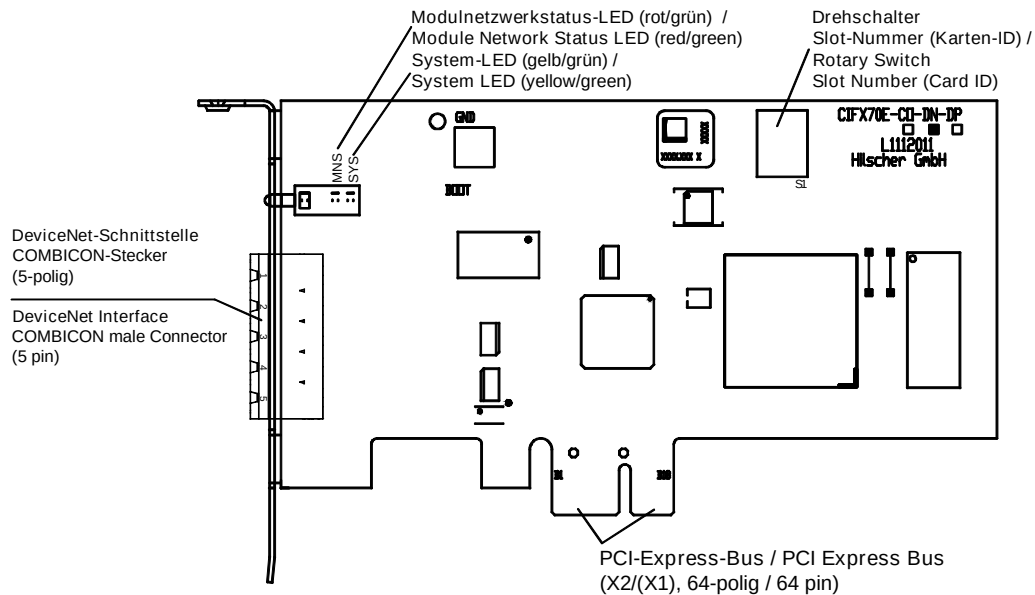


Figure 35: CIFS 70E-DN (Hardware revision 1)

About **Rotary Switch for Slot Number (Card ID)** refer to section *Rotary Switch for Slot Number (Card ID)*, on page 113.

The figure below shows the front plate of the PC card CIFS 70E-DN:

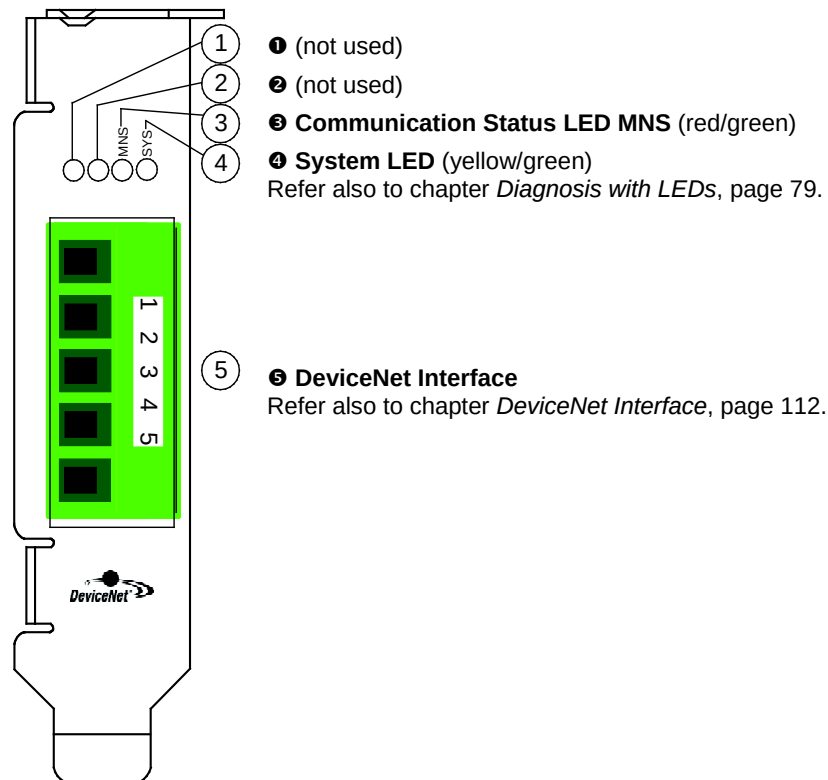


Figure 36: Front Plate CIFS 70E-DN

## 4 Safety

### 4.1 General Note

The documentation in the form of a user manual, an operating instruction manual or other manual types, as well as the accompanying texts have been created for the use of the products by educated personnel. When using the products, all Safety Messages, Integrated Safety Messages, Property Damage Messages and all valid legal regulations must be obeyed. Technical knowledge is presumed. The user has to assure that all legal regulations are obeyed.

### 4.2 Intended Use

The PC Cards cifX described in this user manual are PC cards for the Real-Time Ethernet or fieldbus communication. Depending from the loaded firmware, the Real-Time Ethernet or fieldbus systems listed in the following table can be realized using the respective PC Card cifX.

| PC Cards cifX                                                                        | Real-Time Ethernet System                                      | PC Cards cifX                                                             | Fieldbus System                          |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------|
| CIFX 50-RE,<br>CIFX 50E-RE,<br>CIFX 50E-RE\ET,<br>CIFX 70E-RE,<br>CIFX 100EH-RE\CUBE | CC-Link IE Field-Basic Slave                                   | CIFX 50-DP,<br>CIFX 50E-DP,<br>CIFX 70E-DP                                | PROFIBUS DP Master,<br>PROFIBUS DP Slave |
|                                                                                      | EtherCAT Master,<br>EtherCAT Slave                             | CIFX 50-2DP,<br>CIFX 50E-2DP                                              | PROFIBUS DP Master,<br>PROFIBUS DP Slave |
|                                                                                      | EtherNet/IP-Scanner (Master),<br>EtherNet/IP-Adapter (Slave)   | CIFX 50-CO<br>CIFX 50E-CO,<br>CIFX 70E-CO                                 | CANopen Master,<br>CANopen Slave         |
|                                                                                      | Open-Modbus/TCP<br>POWERLINK-Controlled-Node/Slave             | CIFX 50-DN<br>CIFX 50-2DN<br>CIFX 50E-DN,<br>CIFX 50E-2DN,<br>CIFX 70E-DN | DeviceNet Master,<br>DeviceNet Slave     |
|                                                                                      | PROFINET IO-Controller (Master),<br>PROFINET IO-Device (Slave) | CIFX 50-CC<br>CIFX 50E-CC                                                 | CC-Link Slave                            |
|                                                                                      | Sercos Master,<br>Sercos Slave                                 |                                                                           |                                          |
|                                                                                      | VARAN-Client (Slave)                                           |                                                                           |                                          |
| CIFX 50E-CCIES,<br>CIFX 70E-CCIES                                                    | CC-Link IE Field Slave                                         |                                                                           |                                          |

Table 12: PC Cards cifX and the Real-Time Ethernet or Fieldbus Systems realized thereby

## 4.3 Personnel Qualification

The PC Card cifX must only be installed, configured and removed by qualified personnel. Job-specific technical skills for people professionally working with electricity must be present concerning the following topics:

- Safety and health at work
- Mounting and connecting of electrical equipment
- Measurement and Analysis of electrical functions and systems
- Evaluation of the safety of electrical systems and equipment
- Installing and Configuring IT systems.

## 4.4 Safety Instructions

To ensure your own personal safety and to avoid personal injury, you necessarily must read, understand, and comply with the safety instructions and safety messages in this manual before you install and operate your PC card cifX.

For cases if both, personal injury as well as property damage (damage of equipment or device) may occur together, you find the safety instructions in this section.

### 4.4.1 Hazardous Voltage, electric Shock

Danger to life or risk of injury by electric shock may occur if you open the housing of your PC (or connection device) to install your PC card.

- **Hazardous voltages** are present in the PC (or connection device) for mounting. Strictly obey to all safety rules provided by the PC's manufacturer in the documentation!
- First disconnect the power plug of the PC (or connection device), before you open the housing.
- Make sure that the power supply is off at the PC (or connection device).
- Only then open the housing and install or remove the PC card.

Reference Safety [S2]

## 4.4.2 Communication Stop during Firmware Update or Configuration Download

If you want to perform either a firmware update (as a download) for the device in Device Explorer or a configuration download via the corresponding master DTM in Communication Studio, be aware of the following:

- Together with the firmware download, an automated reset to the device is performed that will interrupt all network communication and all established connections will drop.
- If you download the configuration during bus operation, the communication between master and slaves is stopped.

### **Possible faulty System Operation**

- An unpredictable and unexpected behavior of machines and plant components may cause personal injury and property damage.
- Stop the application program, before starting the firmware update or before downloading the configuration.
- Make sure that your equipment operates under conditions that prevent personal injury or property damage. All network devices should be placed in a fail-safe mode, before starting the firmware update or before downloading a configuration.

### **Loss of Device Parameters, Overwriting of Firmware**

- Both the firmware download and the configuration download erase the configuration data base. The firmware download overwrites the existing firmware in the network device.
- To complete the firmware update and to make the device operable again, re-load the configuration after the firmware update has been finished.

For devices with Ethernet technology

- Device parameters that have been saved volatile, e. g. as the temporarily set IP address parameters, are getting lost during the reset.
- In order to prevent loss of configuration data, make sure that your project configuration data are saved non-volatile, before you initiate a firmware update or download the configuration.

## 4.4.3 Mismatching System Configuration

Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury or damage of equipment.

- In the device use only a configuration suitable for the system.

## 4.5 Property Damage

To avoid system damage and device damage to the PC card cifX, you necessarily must read, understand, and comply with the safety instructions and safety messages in this manual before you install and operate the PC card cifX.

### 4.5.1 Exceeding permissible Supply Voltage

To avoid device damage due to high supply voltage to your PC Card cifX, you must observe the following instructions. These instructions apply to all PC Cards cifX described in this manual.

The PC Card cifX may only be operated with the specified supply voltage. Make sure that the limits of the permissible range for the supply voltage are not exceeded. A supply voltage above the upper limit can cause severe damage to the PC Card cifX! A supply voltage below the lower limit can cause malfunction in the PC Card cifX. The permissible range for the supply voltage is defined by the tolerances specified in this manual.

For the PC cards listed hereafter adhere specifically: The PC Card

- CIFX 50-RE
- CIFX 50-DP, CIFX 50-2DP,  
CIFX 50-CO,  
CIFX 50-DN, CIFX 50-2DN,  
CIFX 50-CC
- CIFX 50E-RE, CIFX 50E-RE\ET
- CIFX 50E-CCIES
- CIFX 50E-DP, CIFX 50E-2DP,  
CIFX 50E-CO,  
CIFX 50E-DN, CIFX 50E-2DN,  
CIFX 50E-CC
- CIFX 70E-RE, CIFX 100EH-RE\CUBE
- CIFX 70E-CCIES
- CIFX 70E-DP,  
CIFX 70E-CO,  
CIFX 70E-DN

may not be powered by a 5V supply voltage! The PC Card cifX may only be powered by a 3.3 V dc  $\pm 5\%$  supply voltage.

The data on the mandatory supply voltage for the PC Cards cifX described in this manual you find in section *Power Supply and Host Interface* on page 51. There the required and permitted supply voltage is provided by device type inclusively the permitted tolerance range.

## 4.5.2 Exceeding permissible Signaling Voltage

To avoid device damage due to high signal voltage to your PC Card cifX, you must observe the following instructions. These instructions apply to all PC Cards cifX described in this manual.

- All I/O signal pins at the PC Card cifX tolerate only the specified signaling voltage!
- Operating of your PC Card cifX with a signaling voltage other than the specified signaling voltage may lead to severe damage to the PC Card cifX!

The data on the mandatory signaling voltage for the PC Cards cifX described in this manual you find in the section *Power Supply and Host Interface* on page 51. There the required and permitted signaling voltage is provided by device type.

## 4.5.3 Electrostatic sensitive Devices

This equipment is sensitive to electrostatic discharge, which cause internal damage and affect normal operation. Therefore adhere to the necessary safety precautions for components that are vulnerable with electrostatic discharge if you install or replace your device. Follow the guidelines listed hereafter when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on the PC Card cifX.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.
- When not in use, store the equipment in appropriate static-safe packaging.

Reference Safety [S3]

#### 4.5.4 Power Disconnect while downloading Firmware or Configuration

If during the process of downloading a firmware or configuration

- the power supply to a PC with the software application is interrupted,
- or the power supply to the PC card cifX is interrupted,
- or a reset to the PC card cifX is performed,

this may lead to the following consequences:

##### **Loss of Device Parameters, Firmware Corruption**

- The firmware download or the configuration download will be interrupted and remains incomplete.
- The firmware or the configuration database will be corrupted and device parameters will be lost.
- Device damage may occur as the PC card cifX cannot be rebooted.

Whether these consequences occur depends on when the power disconnect occurs during the download.

- During configuration download process, do not interrupt the power supply to the PC, or to the PC card cifX and do not perform a reset!

Otherwise you might be forced to return your PC card cifX for repair.

##### **Power Drop during Write and Delete Accesses in the File System**

The FAT file system in the netX firmware is subject to certain limitations in its operation. Write and delete accesses in the file system (firmware update, configuration download etc.) can destroy the FAT (File Allocation Table) if the accesses cannot be completed if the power drops. Without a proper FAT, a firmware may not be found and cannot be started.

Make sure that the power supply to the device is not interrupted during write and delete accesses in the file system (firmware update, configuration download, etc.).

#### 4.5.5 Exceeding the maximum Number of allowed Write/Delete Accesses

**This device uses a serial Flash chip** for storing remanent data, such as firmware, configuration, etc. This chip allows a maximum of 100 000 write/delete accesses which is sufficient for a standard device operation. Writing/deleting the chip excessively (e.g. in order to change configuration or name of station) will exceed the maximum number of allowed write/delete accesses and, thus, result in damage to the device. If, e.g., the configuration is changed every hour, the maximum number will be reached after 11.5 years. If, e.g., it is changed every minute, the maximum number will already be reached after approx. 69 days.

Avoid exceeding the maximum number of allowed write/delete accesses by excessive writing.



### 4.5.6 Invalid Firmware

Loading invalid firmware files could render your device unusable.

- Only download firmware files to your PC Card cifX that are valid for this device.

Otherwise you may be forced to return your device for repair.

### 4.5.7 Information and Data Security

Take all usual measures for information and data security, in particular for PC Cards cifX with Ethernet technology. Hilscher explicitly points out that a device with access to a public network (Internet) must be installed behind a firewall or only be accessible via a secure connection such as an encrypted VPN connection. Otherwise the integrity of the device, its data, the application or system section is not safeguarded.

Hilscher can assume no warranty and no liability for damages due to neglected security measures or incorrect installation.

## 5 Requirements

### 5.1 System Requirements

#### 5.1.1 Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe

PC with slot (3.3 V) for PC cards cifX *PCI*, *PCI Express* and *Low Profile PCI Express*:

| PC Cards cifX                                                                                                               |                                                                            | PCI Bus [Pins] | Slot                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CIFX 50-RE<br>CIFX 50-DP<br>CIFX 50-2DP<br>CIFX 50-CO                                                                       | CIFX 50-DN<br>CIFX 50-2DN<br>CIFX 50-CC                                    | 124            | <b>PCI slot (3.3 V)</b>                                                                                                                                                                                                                   |
| CIFX 50E-RE<br>CIFX 50E-RE\ET<br>CIFX 50E-CCIES<br>CIFX 50E-DP<br>CIFX 50E-2DP<br>CIFX 50E-CO<br>CIFX 50E-DN<br>CIFX 50E-CC | CIFX 70E-RE<br>CIFX 70E-CCIES<br>CIFX 70E-DP<br>CIFX 70E-CO<br>CIFX 70E-DN | 36             | <b>PCI Express x1 slot (3.3 V)</b> ,<br>x1 <sup>1</sup> = One Lane [bus spec 3]                                                                                                                                                           |
| CIFX 100EH-RE\CUBE                                                                                                          |                                                                            | 64             | <b>PCI Express x4 slot (3.3 V)</b> ,<br>x4 <sup>1</sup> = Four Lane<br><br>In the PCI Express x4 slot only lane 0 is used. For further details refer to section <i>Pin Assignment for PCI Express Bus CIFX 100EH-RE\CUBE</i> on page 118. |

Table 13: Slot for the PC Cards cifX *PCI*, *PCIe* and *Low Profile PCIe*

<sup>1</sup> The terms "x1" or "x4" refer to the convention of the PCI Express specifications [bus spec 3] to the number of lanes in the slot.

## 5.1.2 Power Supply and Host Interface

For the power supply and the host interface used for the PC cards cifX *PCI*, *PCIe* and *Low Profile PCIe* you must observe the following requirements:

| PC Cards cifX                                                                                                                                         |                                                                            | Supply Voltage                 | Signaling Voltage Host Interface | Host Interface (PCI slot) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------|----------------------------------|---------------------------|
| CIFX 50-RE<br>CIFX 50-DP<br>CIFX 50-2DP<br>CIFX 50-CO                                                                                                 | CIFX 50-DN<br>CIFX 50-2DN<br>CIFX 50-CC                                    | +3.3 V dc $\pm 5\%$ / Max. 1 A | 5 V or 3.3 V                     | PCI                       |
| CIFX 50E-RE<br>CIFX 50E-RE\ET<br>CIFX 50E-CCIES<br>CIFX 50E-DP<br>CIFX 50E-2DP<br>CIFX 50E-CO<br>CIFX 50E-DN<br>CIFX 50E-CC<br><br>CIFX 100EH-RE\CUBE | CIFX 70E-RE<br>CIFX 70E-CCIES<br>CIFX 70E-DP<br>CIFX 70E-CO<br>CIFX 70E-DN | +3.3 V dc $\pm 5\%$ / Max. 1 A | PCIe-compatible                  | PCI Express               |

Table 14: Requirements Power Supply and Host Interface for PC Cards cifX *PCI*, *PCIe* Low Profile *PCIe*

The data in the *Table 14* above have the following meaning:

### Supply Voltage

The required and permissible supply voltage at the PC card cifX *PCI*, *PCIe* and *Low Profile PCIe*.



**Note:** To ensure that the compatibility between different systems is guaranteed, providing a maximum of 1 A (for +3.3 VDC  $\pm 5\%$ ) is recommended.

The typical current consumption depends on the type of the PC card cifX. For detailed values on the typical current consumption see section *Technical Data PC Cards cifX* on page 119.

### Signaling Voltage Host Interface

The required or tolerated signaling voltage at the I/O signal pins at the PCI bus of the PC cards cifX *PCI* or at the PCI express bus of the PC cards cifX *PCIe* and *Low Profile PCIe*.

**Host Interface (PCI slot)** Type of the host interface

### 5.1.3 Warnings on Supply and Signaling Voltage

When commissioning the PC card cifX, please observe the following listed warning notes for the supply and signal voltage.



NOTICE

---

#### Exceeding permissible Supply Voltage

Operating the PC card cifX with a supply voltage above of the specified range leads to device damage.

- Use only the permissible supply voltage to operate the PC card cifX.
- 



NOTICE

---

#### Exceeding permissible Signaling Voltage

All I/O signal pins at the PC card cifX tolerate only the specified signaling voltage! Operating the PC card cifX with a signaling voltage other than the specified signaling voltage may lead to severe damage to the PC card cifX!

- For the operation of the PC card cifX use only the specified signaling voltage.
- 

### 5.1.4 Warnings on Supply and Signaling Voltage (USA)

When commissioning the PC card cifX, please observe the following listed warning notes for the supply and signal voltage.

---

**NOTICE**

#### Exceeding permissible Supply Voltage

Operating the PC card cifX with a supply voltage above of the specified range leads to device damage.

- Use only the permissible supply voltage to operate the PC card cifX.
- 

---

**NOTICE**

#### Exceeding permissible Signaling Voltage

All I/O signal pins at the PC card cifX tolerate only the specified signaling voltage! Operating the PC card cifX with a signaling voltage other than the specified signaling voltage may lead to severe damage to the PC card cifX!

- For the operation of the PC card cifX use only the specified signaling voltage.
- 

### 5.1.5 Operating Temperature Range for UL Certificate

The UL certificate for the PC cards cifX is valid for the range 0°C to +55°C (for CIFX 100EH-RE 0°C to +65°C).

Regardless of this the PC cards cifX are designed for the operating temperatures (-20°C to +55°C or -20°C to +70°C) as specified in section *Technical Data PC Cards cifX* on page 119.

## 5.2 Requirements for Operation of the PC Card cifX

Operating the PC cards cifX properly, the following described requirements must be fulfilled.

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                          |                                                                                             |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Protocols</b>                                 | CC-Link IE Field Slave,<br>EtherCAT Slave,<br>EtherCAT Master,<br>EtherNet/IP Adapter (Slave),<br>EtherNet/IP Scanner (Master),<br>Open-Modbus/TCP,<br>POWERLINK-Controlled-Node/Slave,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | PROFINET IO Device (Slave),<br>PROFINET IO Controller<br>(Master), Sercos Slave,<br>Sercos Master,<br>VARAN Client (Slave),<br>PROFIBUS DP Slave,<br>PROFIBUS DP Master, | CANopen Slave,<br>CANopen Master,<br>DeviceNet Slave,<br>DeviceNet Master,<br>CC-Link Slave |
| <b>Software Installation</b>                     | <p>1. Driver for the Host Interface</p> <p>Host Interfaces: PCI and PCI Express</p> <ul style="list-style-type: none"> <li>The device driver <b>cifX Device Driver</b> must be installed.</li> </ul> <p>If you install the device into a PC, in general Windows® will be available as operating system. In this case the cifX Device Driver must be installed to communicate to the device and to exchange data via the dual-port memory.</p> <p><b>Important!</b> Upgrade older versions of the <b>cifX Device Driver</b> necessarily on the current version indicated in section <i>Driver and Software</i> on page 16.</p> <ul style="list-style-type: none"> <li>You can buy Device Driver at the company Hilscher Gesellschaft für Systemautomation mbH <a href="http://www.hilscher.com/">http://www.hilscher.com/</a>.</li> </ul> <p>2. The application programs <b>Devie Explorer</b> and <b>Communication Studio</b> must be installed, by which the PC card cifX can be parameterized.</p> |                                                                                                                                                                          |                                                                                             |
| <b>Firmware Download</b>                         | <p>3. Using the commissioning software <b>Devie Explorer</b>, the user can select and download the firmware to the PC card cifX.</p> <p>4. <b>Important!</b> Use the PC cards CIFX 50E-CCIES or CIFX 70E-CCIES only together with the CC-Link IE Field Slave firmware and do not use this firmware for any other cards.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                          |                                                                                             |
| <b>Parameter Setting</b>                         | <p>5. The PC card cifX must be parameterized, using the</p> <ul style="list-style-type: none"> <li>configuration Software <b>Communication Studio</b></li> <li>or an application program (programming required).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                          |                                                                                             |
| <b>Communication</b>                             | <p>6. For the communication of a PC card cifX (Slave) a Master device for the respective communication system is required. For the communication of a PC card cifX (Master) a Slave device for the respective communication system is required.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                          |                                                                                             |
| <b>PC Settings for PC Cards cifX PCI Express</b> | <p><b>Important!</b> If you install a PC card cifX PCI Express, you <u>always</u> must disable the Microsoft Windows "Link State Power Management". Otherwise, it cannot be excluded that your PC freezes during the PC card cifX PCI Express is in operation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                          |                                                                                             |
| <b>Environmental Conditions</b>                  | <p>Due to a plug element from ERNI the lower limit of the operating temperature for all PC cards cifX Real-Time Ethernet is 0 °C. This applies to all hardware revisions of the PC card cifX Real-Time Ethernet, unless otherwise stated.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                          |                                                                                             |

Table 15: Requirements to operate PC Cards cifX properly

## 5.2.1 Requirements „Slot Number (Card ID)“

For the application program is able to identify a PC card cifX via its **Slot Number (Card ID)** explicitly and to distinguish it from other PC cards cifX in the PC, for device revisions equipped with a **Rotary Switch for Slot Number (Card ID)** the required versions of the firmware, the driver and the bootloader must be used:

### PC Cards with one Channel:

| PC Card cifX                                                                         | From Hardware Revision | Firmware File | Protocol                     | From Firmware Version |
|--------------------------------------------------------------------------------------|------------------------|---------------|------------------------------|-----------------------|
| CIFX 50-RE,<br>CIFX 50E-RE,<br>CIFX 50E-RE\ET,<br>CIFX 70E-RE,<br>CIFX 100EH-RE\CUBE | 3                      | C020Y000.NXF  | CC-Link IE Field-Basic Slave | 1.1                   |
|                                                                                      | 1                      | CIFXECM.NXF   | EtherCAT Master              | 4.3 (V4)              |
|                                                                                      | 4                      | CIFXECM.NXF   | EtherCAT Master              | 2.4.3.x               |
|                                                                                      | 1                      | CIFXECM.NXF   | EtherCAT Master              | 2.4.3.x               |
|                                                                                      | 1                      | CIFXECS.NXF   | EtherCAT Slave               | 4.5 (V4)              |
|                                                                                      | 1                      | CIFXECS.NXF   | EtherCAT Slave               | 2.5.5                 |
|                                                                                      | 1                      | CIFXEIM.NXF   | EtherNet/IP Scanner          | 2.2.1                 |
|                                                                                      | 1                      | CIFXEIS.NXF   | EtherNet/IP Adapter          | 2.3.29                |
|                                                                                      | 1                      | CIFXOMB.NXF   | Open-Modbus/TCP              | 2.3.3                 |
|                                                                                      | 1                      | CIFXPLS.NXF   | POWERLINK Controlled Node    | 2.1.19                |
|                                                                                      | 1                      | C010C000.NXF  | PROFINET IO-Controller       | 3.2 (V3)              |
|                                                                                      | 1                      | CIFXPNM.NXF   | PROFINET IO Controller       | 2.3                   |
|                                                                                      | 1                      | CIFXPNS.NXF   | PROFINET IO Device           | 3.3.6 (V3)            |
|                                                                                      | 1                      | CIFXS3M.NXF   | Sercos Master                | 2.0.9                 |
|                                                                                      | 1                      | CIFXS3S.NXF   | Sercos Slave                 | 3.0.8                 |
|                                                                                      | 1                      | CIFXVRS.NXF   | VARAN Client                 | 1.0                   |
| CIFX 50E-CCIES,<br>CIFX 70E-CCIES                                                    | 1                      | C020X000.NXF  | CC-Link IE Field Slave       | 1.1                   |
| CIFX 50-DP,<br>CIFX 50E-DP,<br>CIFX 70E-DP                                           | 5                      | CIFXDPM.NXF   | PROFIBUS DP Master           | 2.3                   |
|                                                                                      | 5                      | CIFXDPS.NXF   | PROFIBUS DP Slave            | 2.3                   |
| CIFX 50-CO,<br>CIFX 50E-CO,<br>CIFX 70E-CO                                           | 5                      | CIFXCOM.NXF   | CANopen Master               | 2.3                   |
|                                                                                      | 4                      | CIFXCOM.NXF   | CANopen Master               | 2.3                   |
| CIFX 50-DN,<br>CIFX 50E-DN,<br>CIFX 70E-DN                                           | 5                      | CIFXDNM.NXF   | DeviceNet Master             | 2.2                   |
|                                                                                      | 4                      | CIFXDNS.NXF   | DeviceNet Slave              | 2.2                   |
| CIFX 50-CC,<br>CIFX 50E-CC                                                           | 2                      | CIFXCPS.NXF   | CC-Link Slave                | 2.4                   |
|                                                                                      | 2                      | CIFXCPS.NXF   | CC-Link Slave                | 2.4                   |

Table 16: Firmware Versions for the Function Slot Number (Card ID), (for 1 Channel Systems)

**PC Cards PCI and PCI Express with two Channels:**

| PC Card cifX                 | From Hardware Revision | Firmware File | Protocol                                                        | From Firmware Version      |
|------------------------------|------------------------|---------------|-----------------------------------------------------------------|----------------------------|
| CIFX 50-2DP,<br>CIFX 50E-2DP | 1                      | CIFX2DPM.NXF  | PROFIBUS DP Master, 2 Channels                                  | 1.0 (new version counting) |
|                              |                        | CIFX2DPS.NXF  | PROFIBUS DP Slave, 2 Channels                                   | 1.0 (new version counting) |
|                              |                        | C0201020.NXF  | PROFIBUS DP Master, 1 Channel<br>+ PROFIBUS DP Slave, 1 Channel | 1.1                        |
| CIFX 50-2DN,<br>CIFX 50E-2DN | 1                      | C0206060.NXF  | DeviceNet Master, 2 Channels                                    | 1.0                        |
|                              |                        | C0207070.NXF  | DeviceNet Slave, 2 Channels                                     | 1.0                        |
|                              |                        | C0206070.NXF  | DeviceNet Master, 1 Channel<br>+ DeviceNet Slave, 1 Channel     | 1.2                        |

*Table 17: Firmware Versions for the Function Slot Number (Card ID) (for 2 Channel Systems)*

| Driver             | Version or higher                     |
|--------------------|---------------------------------------|
| cifX Device Driver | cifX Device Driver Setup.exe<br>0.95x |

*Table 18: Versions Driver for Function Slot Number (Card ID)*

The **cifX Device Driver** versions **0.950** and higher identify PC cards cifX via its **Slot Number (Card ID)** if this is supported by the hardware.

## 5.2.2 Requirements „DMA Mode“

For device revisions providing the **DMA Mode** the required versions of the firmware and the driver must be used:

### PC Cards with one Channel:

| PC Card cifX                                                                         | From Hardware Revision | Firmware File | Protocol                     | From Firmware Version |
|--------------------------------------------------------------------------------------|------------------------|---------------|------------------------------|-----------------------|
| CIFX 50-RE,<br>CIFX 50E-RE,<br>CIFX 50E-RE\ET,<br>CIFX 70E-RE,<br>CIFX 100EH-RE\CUBE | 1                      | C020Y000.NXF  | CC-Link IE Field-Basic Slave | 1.1                   |
|                                                                                      | 1                      | CIFXECM.NXF   | EtherCAT Master              | 4.3 (V4)              |
|                                                                                      | 4                      | CIFXECM.NXF   | EtherCAT Master              | 2.4.6 (V2)            |
|                                                                                      | 1                      | CIFXECS.NXF   | EtherCAT Slave               | 4.5 (V4)              |
|                                                                                      | 1                      | CIFXECS.NXF   | EtherCAT Slave               | 2.5.5 (V2)            |
|                                                                                      | 1                      | CIFXEIM.NXF   | EtherNet/IP Scanner          | 2.2                   |
|                                                                                      |                        | CIFXEIS.NXF   | EtherNet/IP Adapter          | 2.3                   |
|                                                                                      |                        | CIFXOMB.NXF   | Open-Modbus/TCP              | 2.4                   |
|                                                                                      |                        | CIFXPLS.NXF   | POWERLINK Controlled Node    | 2.1.24                |
|                                                                                      |                        | C010C000.NXF  | PROFINET IO-Controller       | 3.2 (V3)              |
|                                                                                      |                        | CIFXPNM.NXF   | PROFINET IO-Controller       | 2.3 (V2)              |
|                                                                                      |                        | CIFXPNS.NXF   | PROFINET IO Device           | 3.4 (V3)              |
|                                                                                      |                        | CIFXS3M.NXF   | Sercos Master                | 2.0.15                |
|                                                                                      |                        | CIFXS3S.NXF   | Sercos Slave                 | 3.0.15                |
|                                                                                      |                        | CIFXVRS.NXF   | VARAN Client                 | 1.0                   |
| CIFX 50E-CCIES,<br>CIFX 70E-CCIES                                                    | 1                      | C020X000.NXF  | CC-Link IE Field Slave       | 1.1                   |
| CIFX 50-DP,<br>CIFX 50E-DP,<br>CIFX 70E-DP                                           | 1                      | CIFXDPM.NXF   | PROFIBUS DP Master           | 2.3                   |
|                                                                                      | 4<br>1                 | CIFXDPS.NXF   | PROFIBUS DP Slave            | 2.3                   |
| CIFX 50-CO,<br>CIFX 50E-CO,<br>CIFX 70E-CO                                           | 1                      | CIFXCOM.NXF   | CANopen Master               | 2.3                   |
|                                                                                      | 4<br>1                 | CIFXCOS.NXF   | CANopen Slave                | 2.3                   |
| CIFX 50-DN,<br>CIFX 50E-DN,<br>CIFX 70E-DN                                           | 1                      | CIFXDNM.NXF   | DeviceNet Master             | 2.2                   |
|                                                                                      | 4<br>1                 | CIFXDNS.NXF   | DeviceNet Slave              | 2.2                   |
| CIFX 50-CC,<br>CIFX 50E-CC                                                           | 1<br>3                 | CIFXCCS.NXF   | CC-Link Slave                | 2.4                   |

Table 19: Firmware Versions for the DMA Mode (for 1 Channel Systems)



**PC Cards PCI and PCI Express with two Channels:**

| PC Card cifX                 | From Hardware Revision | Firmware File | Protocol                                                        | From Firmware Version      |
|------------------------------|------------------------|---------------|-----------------------------------------------------------------|----------------------------|
| CIFX 50-2DP,<br>CIFX 50E-2DP | 1                      | CIFX2DPM.NXF  | PROFIBUS DP Master, 2 Channels                                  | 1.0 (new version counting) |
|                              |                        | CIFX2DPS.NXF  | PROFIBUS DP Slave, 2 Channels                                   | 1.0 (new version counting) |
|                              |                        | C0201020.NXF  | PROFIBUS DP Master, 1 Channel<br>+ PROFIBUS DP Slave, 1 Channel | 1.1                        |
| CIFX 50-2DN,<br>CIFX 50E-2DN | 1                      | C0206060.NXF  | DeviceNet Master, 2 Channels                                    | 1.0                        |
|                              |                        | C0207070.NXF  | DeviceNet Slave, 2 Channels                                     | 1.0                        |
|                              |                        | C0206070.NXF  | DeviceNet Master, 1 Channel<br>+ DeviceNet Slave, 1 Channel     | 1.2                        |

*Table 20: Firmware Versions for the DMA Mode (for 2 Channel Systems)*

| Driver                    | Version or higher                     |
|---------------------------|---------------------------------------|
| <b>cifX Device Driver</b> | cifX Device Driver Setup.exe<br>0.95x |

*Table 21: Driver Version for the DMA Mode*

## 5.3 Prerequisites for Certification

### 5.3.1 PROFINET IO Certification for IRT and SYNC0 Signal

#### 5.3.1.1 Providing SYNC0 Signal at SYNC Connector of the PC Card cifX



**Note:** A PROFINET IO certification for PROFINET IRT requires (mandatory) that your PC card cifX offers the synchronization signal (SYNC0), in order to allow e. g. connecting an oscilloscope. Therefore the SYNC connector of your PC card cifX must be accessible.

Information about where the SYNC connector is placed on your PC card cifX, you can find in the chapter *Device Drawings* on page 19.

#### 5.3.1.2 Using the SYNC0 Signal at the Host System

*Only valid for PC Card CIFX 100EH-RE\CUBE:*

If you forward the SYNC0 signal of your PC card cifX 100 EH-RE\CUBE to the PCI Express bus X2, you must adhere to the following design specification:



**Note:** A PROFINET IO certification for PROFINET IRT requires (mandatory) that the host system offers a connector for the synchronization signal (SYNC0), in order to allow e. g. connecting an oscilloscope.

For this purpose you must use the SYNC0 signal and mass of the PCI Express bus X2 of the PC card cifX 100EH-RE\CUBE at the host system and provide it at the host system via a well accessible 2-pin connector.

The PC card CIFX 100 EH-RE\CUBE provides the SYNC0 signal SYNC0. If at the SYNC connector (J1) the jumper is set on Pin1-Pin2, the SYNC0 signal is provided at pin B24 of the PCI Express bus X2. For further details on the pin assignment of the SYNC connector and on how to set the jumpers, refer to section *Pin Assignment SYNC Connector, J1 (CIFX 100EH)* on page 115. For the pin assignment of the PCI Express bus X2, refer to section *Pin Assignment for PCI Express Bus CIFX 100EH-RE\CUBE* on page 118.

The SYNC0 signal has LVTTL level (3.3 V). A maximum load of 6 mA must not be exceeded.

You should keep the cable length for the sync signals below 50 mm and take into account EMC aspects.

## 6 Installation, Commissioning and Uninstalling

To install / uninstall the PC Cards cifX **PCI** the PC Cards cifX **PCI Express**

- CIFX 50-RE,
  - CIFX 50-DP, CIFX 50-CO,
  - CIFX 50-DN, CIFX 50-CC,
  - CIFX 50-2DP,
  - CIFX 50-2DN
- CIFX 50E-RE, CIFX 50E-RE\ET,
  - CIFX 50E-CCIE,
  - CIFX 50E-DP, CIFX 50E-CO,
  - CIFX 50E-DN, CIFX 50E-CC
  - CIFX 50E-2DP,
  - CIFX 50E-2DN

and **Low Profile PCI Express**

- CIFX 70E-RE,
  - CIFX 70E-CCIE,
  - CIFX 100EH-RE\CUBE
- CIFX 70E-DP,
  - CIFX 70E-CO,
  - CIFX 70E-DN

handle as described in the sections hereafter. The device drawing of your PC card cifX gives information on the manual control elements of your device.



For the installation, uninstalling and replacement of the PC card cifX **adhere to the necessary safety precautions** given in the safety chapter.

## 6.1 Overview on Installation and Configuration

The following table describes the steps for the software and hardware installation and for the configuration of a PC card cifX PCI and PCI Express (Master and Slave) Real-Time Ethernet and fieldbus as it is typical for many cases.

The Slave device can be configured using the corresponding Slave DTM or the Master device can be configured using the corresponding Master DTM in the **Communication Studio** configuration software.

| #        | Step                                   | Description                                                                                                                                                                                                                                                                                                                                                             | Manual / section                                                  | Page |
|----------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------|
| <b>1</b> | <b>Installing Driver and Software</b>  |                                                                                                                                                                                                                                                                                                                                                                         |                                                                   |      |
| 1.1      | Installing <b>cifX Device Driver</b>   | <ul style="list-style-type: none"> <li>- Download the Communication Solutions DVD as ZIP file to the local hard disk of your PC.</li> <li>- Unzip the ZIP file.</li> <li>- Double-click the *.exe file in the root directory of the DVD to open the autostart menu.</li> <li>- Follow to the instructions of the installation wizard, to install the driver.</li> </ul> | <i>Refer to cifX Device Driver manual</i>                         |      |
| 1.2      | Installing Communication Studio        | <u>For PC Cards cifX Master or Slave:</u><br>Run the Communication Studio-Setup and follow to the instructions of the installation wizard.                                                                                                                                                                                                                              | <i>Refer to Operating Instruction Manual Communication Studio</i> |      |
| <b>2</b> | <b>Preparing Hardware Installation</b> |                                                                                                                                                                                                                                                                                                                                                                         |                                                                   |      |
| 2.1      | Safety precautions                     | Observe the necessary precautions for electrostatically sensitive components.                                                                                                                                                                                                                                                                                           | <i>Electrostatic sensitive Devices</i>                            | 47   |
| 2.2      | Glue sticker on the front plate.       | <u>For CIFX 50-RE, CIFX 50E-RE, CIFX 70E-RE and CIFX 100EH-RE\CUBE</u>                                                                                                                                                                                                                                                                                                  | <i>Fix Front Plate Sticker</i>                                    | 65   |
| 2.2      | Set the <b>Slot Number (Card ID)</b>   | Value 0 or a value from 1 to 9                                                                                                                                                                                                                                                                                                                                          | <i>Rotary Switch for Slot Number (Card ID)</i>                    | 113  |
| <b>3</b> | <b>Hardware Installation</b>           | Installing cifX. Take required safety precautions.                                                                                                                                                                                                                                                                                                                      | <i>Installation, Commissioning and Uninstalling</i>               | 59   |
| 3.1      | Safety precautions                     | Take the safety precautions to avoid the risk of injury from electric shock.                                                                                                                                                                                                                                                                                            | <i>Hazardous Voltage, electric Shock</i>                          | 44   |
| 3.2      | Open cabinet                           | Now open the cabinet of the PC or of the connection device.                                                                                                                                                                                                                                                                                                             | <i>Installing PC Card cifX PCI, PCIe, Low Profile PCIe</i>        | 68   |
| 3.3      | Installing cifX                        | Plug in and mount the PC card cifX.                                                                                                                                                                                                                                                                                                                                     |                                                                   |      |
| 3.4      | Close cabinet                          | Close the cabinet of the PC or connection device.                                                                                                                                                                                                                                                                                                                       |                                                                   |      |

| #   | Step                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Manual / section                                                                                           | Page |
|-----|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------|
| 3.5 | Plug the connecting cable to the Master or Slave | <p><u>Note for all PC Cards cifX Real-Time Ethernet:</u></p> <p><b>Note!</b> The RJ45 socket is only for use in LAN, not for telecommuni-cation circuits.</p> <p><u>Note for PC Cards cifX PROFINET IO Controller:</u></p> <p><b>Important for Hardware Wiring!</b> Connect only ports with each other, which have different cross-over settings. Otherwise a connection between the devices can not be established. If the port settings of the PC card cifX PROFINET IO controller are not set to AUTO, then Port0 is switched uncrossed and Port1 crossed.</p> <p>Plug in the connecting cable from the PC card cifX to the PC card Master or Slave.</p> | <p><i>Ethernet Interface</i></p> <p><i>See corresponding user manual of the device</i></p>                 | 108  |
| 3.6 | Connect the PC to the power / switch on.         | Connect the PC or the connection device to the power supply and switch it on.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                            |      |
| 4   | <b>Hardware Settings</b>                         | Hardware Settings in the Driver Setup                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                            |      |
| 4.1 | Slot Number (Card ID)                            | <p>In the application program possibly set the Slot Number (Card ID) which has been set at the PC card cifX (hardware).</p> <p>In Communication Studio, the slot number of the device appears.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <i>Application program manual</i>                                                                          |      |
|     | Activate DMA mode                                | Activate DMA mode via the cifX Device Driver                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <i>Refer to cifX Device Driver manual</i>                                                                  |      |
| 5   | <b>PC Settings</b>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                            |      |
| 5.1 | For PC Cards cifX PCI Express                    | <b>Important!</b> If you install a PC card cifX PCI Express, you <u>always</u> must disable the Microsoft Windows "Link State Power Management". Otherwise, it cannot be excluded that your PC freezes during the PC card cifX PCI Express is in operation.                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                            |      |
| 6   | <b>Firmware download</b>                         | <b>Download Master and Slave firmware</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                            |      |
| 6.1 | <i>Firmware Slave:</i>                           | <p>- Start <b>Device Explorer</b>,<br/>- Select and download the firmware.</p> <p>CC-Link IE Field Basic Slave,<br/>CC-Link IE Field Slave*,<br/>EtherCAT Slave,<br/>EtherNet/IP Adapter,<br/>Open-Modbus/TCP,<br/>POWERLINK-Controlled-Node/Slave,<br/>PROFINET IO Device,<br/>Sercos Slave,<br/>VARAN Client,</p> <p><b>Important! *</b>Use the CC-Link IE Field Slave firmware only together with the PC cards CIFX 50E-CCIES or CIFX 70E-CCIES and do not use any other firmware for these cards.</p>                                                                                                                                                   | <p><i>See operating instruction Device Explorer</i></p> <p><i>Device Names in Communication Studio</i></p> | 74   |
| 6.2 | <i>Firmware Master:</i>                          | <p>EtherCAT Master,<br/>EtherNet/IP Scanner,<br/>PROFINET IO Controller,</p> <p>PROFIBUS DP Master,<br/>CANopen Master,<br/>DeviceNet Master</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                            |      |

| #        | Step                                                           | Description                                                                                                                       | Manual / section                                                                                         | Page |
|----------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------|
| <b>7</b> | <b>Configuring Slave using Communication Studio</b>            | <b>Download Configuration</b><br>Use the corresponding Slave DTM in the configuration software <b>Communication Studio</b> .      |                                                                                                          |      |
| 7.1      | Configuration cifX (Slave)                                     | -Configure the PC card cifX (Slave).                                                                                              | <i>See operating instruction manual Communication Studio and operating instruction manual of the DTM</i> |      |
| 7.2      | Download Configuration                                         | - Download the configuration to the PC card cifX (Slave)                                                                          |                                                                                                          |      |
| <b>9</b> | <b>Configuring Master using Communication Studio</b>           | <b>Download Configuration</b><br>Use the corresponding Master DTM in the configuration software <b>Communication Studio</b> .     |                                                                                                          |      |
| 8.1      | Configuration cifX (Master)                                    | - Configure the PC card cifX (Master).                                                                                            | <i>Notes for the Configuration of the Master Device</i>                                                  | 72   |
| 8.2      | Download Configuration                                         | - Download the configuration to the PC card cifX (Master).                                                                        |                                                                                                          |      |
| <b>9</b> | <b>Diagnosis by Communication Studio</b><br>(Slave and Master) | <b>Diagnosis, I/O Data:</b> Use the corresponding Slave or Master DTM in the configuration software <b>Communication Studio</b> . |                                                                                                          |      |
| 9.1      | Diagnostic                                                     | - Select <b>Diagnosis</b> ,<br>- select <b>General, Firmware</b> or <b>Extended Diagnosis</b> .                                   | <i>See corresponding operating instruction manual</i>                                                    |      |
| 9.2      | I/O Monitor                                                    | - Select <b>IO Monitor</b> .<br>-Check the input or output data.                                                                  |                                                                                                          |      |

Table 22: Steps for the Software and Hardware Installation, the Configuration and for the Diagnosis of a PC Card cifX (Master and Slave)

## 6.2 Warnings on Installation and Uninstallation

Observe the following warnings when installing, uninstalling and replacing the PC card cifX:



**WARNING**

### **Hazardous voltage!**

**Danger to life, risk of injury by electric shock**

**Hazardous voltages** are present in the PC (or connection device).



- Strictly obey to all safety rules provided by the PC's manufacturer in the documentation!
- First disconnect the power plug of the PC (or connection device), before you open the housing.
- Make sure that the power supply is off at the PC (or connection device).
- Only then open the housing and install or remove the PC card.



**NOTICE**

### **Electrostatic sensitive Devices**

- Adhere to the necessary safety precautions for components that are vulnerable with electrostatic discharge.
- To prevent damage to the PC and the PC card cifX, make sure, that the PC card cifX is grounded via the endplate and the PC and make sure, that you are discharged when you install/uninstall the PC card cifX.

*PC card CIFX 100EH-RE\CUBE:*



**NOTICE**

### **Device Damage!**

- The PC card CIFX 100EH-RE\CUBE may not be installed in standard PCs. The pin assignment of the PCI Express bus does not meet the standard [bus spec 3]. By consequence malfunction can occur at the PCI express bus.
- Install the PC card CIFX 100EH-RE\CUBE exclusively in KEBA KeControl industry PCs series CP 3XX (Cube).

## 6.3 Warnings on Installation and Uninstallation (USA)

Observe the following warnings when installing, uninstalling and replacing the PC card cifX:



### **⚠ WARNING**

**Hazardous voltage!**  
**Danger to life, risk of injury by electric shock**



**Hazardous voltages** are present in the PC (or connection device).

- Strictly obey to all safety rules provided by the PC's manufacturer in the documentation!
- First disconnect the power plug of the PC (or connection device), before you open the housing.
- Make sure that the power supply is off at the PC (or connection device).
- Only then open the housing and install or remove the PC card.

### **NOTICE**



**Electrostatic sensitive Devices**

- Adhere to the necessary safety precautions for components that are vulnerable with electrostatic discharge.
- To prevent damage to the PC and the PC card cifX, make sure, that the PC card cifX is grounded via the endplate and the PC and make sure, that you are discharged when you install/uninstall the PC card cifX.

*PC card CIFX 100EH-RE\CUBE:*



### **NOTICE**

**Device Damage!**

- The PC card CIFX 100EH-RE\CUBE may not be installed in standard PCs. The pin assignment of the PCI Express bus does not meet the standard [bus spec 3]. By consequence malfunction can occur at the PCI express bus.
- Install the PC card CIFX 100EH-RE\CUBE exclusively in KEBA KeControl industry PCs series CP 3XX (Cube).



## 6.4 Fix Front Plate Sticker

### 6.4.1 Front Plate Sticker CIFX 50-RE, CIFX 50E-RE, CIFX 50E-RE\ET



**Note:** Your PC card cifX set contains a set of front plate stickers (9 different stickers). Depending from the loaded firmware the label on each sticker indicates for the respective system the following **LED names**:

- of the **system and communication status LEDs** (*above*)
- of the **RJ45 Ethernet female connector LEDs** (*below*).

Further information to this question you find also in chapter *Diagnosis with LEDs* beginning from page 79.

#### NOTICE

#### Electrostatic sensitive Devices

- To prevent damage to the PC and the PC card cifX, make sure, that the PC card cifX is grounded via the endplate and the PC and make sure, that you are discharged when you install/uninstall the PC card cifX.
- Use the sticker according to the device and firmware and glue it on the front of the PC card CIFX 50-RE, CIFX 50E-RE or CIFX 50E-RE\ET.

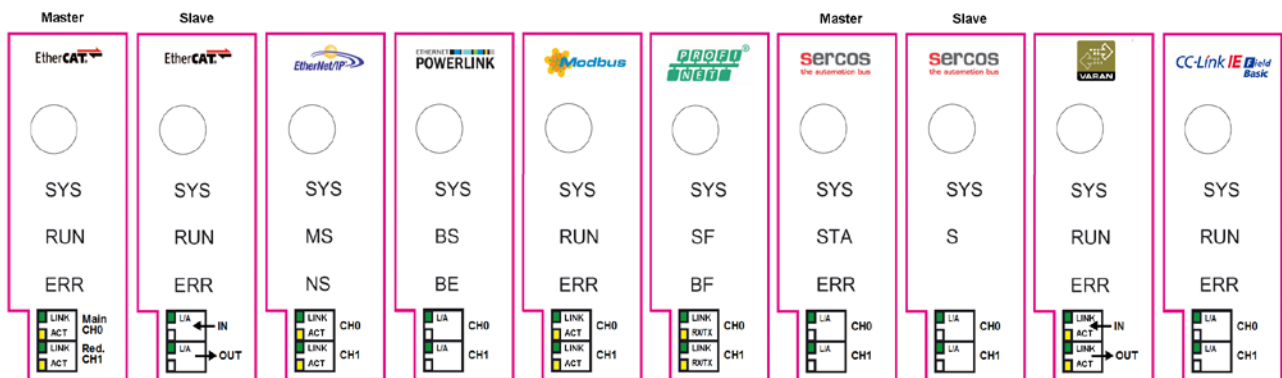


Figure 37: Front Plate Stickers for CIFX 50-RE, CIFX 50E-RE or CIFX 50E-RE\ET

| LED                | EtherCAT Master | EtherCAT Slave | EtherNet/IP | Open Modbus/TCP | POWERLINK | PROFINET IO | Sercos Master | Sercos Slave | VARAN | CC-Link IE Field Basic |
|--------------------|-----------------|----------------|-------------|-----------------|-----------|-------------|---------------|--------------|-------|------------------------|
| SYS (yellow/green) | SYS             | SYS            | SYS         | SYS             | SYS       | SYS         | SYS           | SYS          | SYS   | SYS                    |
| COM 0 (red/ green) | RUN             | RUN            | MS          | RUN             | BS        | SF          | STA           | S            | RUN   | RUN                    |
| COM 1 (red/ green) | ERR             | ERR            | NS          | ERR             | BE        | BF          | ERR           | -            | ERR   | ERR                    |
| RJ45 Ch0           | green           | LINK           | L/A IN      | LINK            | LINK      | L/A         | LINK          | L/A          | L/A   | LINK IN                |
|                    | yellow          | ACT            | -           | ACT             | ACT       | -           | RX/TX         | -            | -     | ACT IN                 |
| RJ45 Ch1           | green           | LINK           | L/A OUT     | LINK            | LINK      | L/A         | LINK          | L/A          | L/A   | LINK OUT               |
|                    | yellow          | ACT            | -           | ACT             | ACT       | -           | RX/TX         | -            | -     | ACT OUT                |

Table 23: LED Labeling depending of the loaded Firmware

6.4.2 Front Plate Sticker CIFX 70E-RE, CIFX 100EH-RE\CUBE



**Note:** Your PC card CIFX 70E-RE or CIFX 100EH-RE\CUBE set contains a set of front plate stickers (9 different stickers, each 2 parts). Depending from the loaded firmware the label on each sticker indicates for the respective system the following **LED names**:  
(1) of the **system and communication status LEDs** (*partial sticker above*)  
(2) of the **RJ45 Ethernet female connector LEDs** (*partial sticker below*).  
Further information to this question you find also in chapter *Diagnosis with LEDs* beginning from page 79.

**NOTICE**

**Electrostatic sensitive Devices**

- To prevent damage to the PC and the PC card cifX, make sure, that the PC card cifX is grounded via the endplate and the PC and make sure, that you are discharged when you install/uninstall the PC card cifX.
- Use the two part sticker according to the device and firmware and glue it on the front of the PC card CIFX 70E-RE or CIFX 100EH-RE\CUBE.

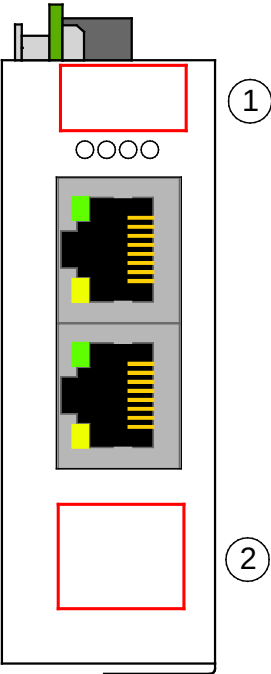
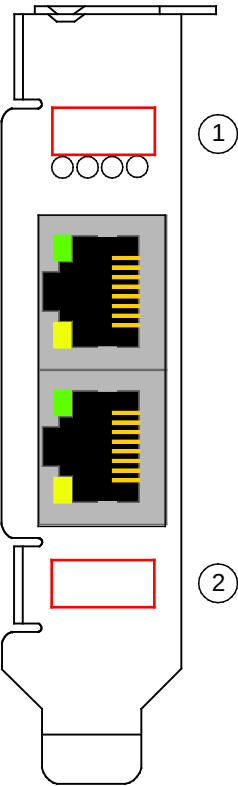
| Front CIFX 100EH-RE\CUBE                                                            | Front CIFX 70E-RE                                                                  | How to                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | <div>1. Glue the "partial sticker above" with the system specific <b>names of the system and communication status LEDs</b> above ① of the LEDs COM1, COM0 and SYS on the front plate.</div> <div>2. Glue the "partial sticker below " with the system specific <b>names of the RJ45 Ethernet female connector LEDs</b> below ② of the RJ45 on the front plate.</div> |

Table 24: Fix Front Plate Sticker at the CIFX 70E-RE or CIFX 100EH-RE\CUBE

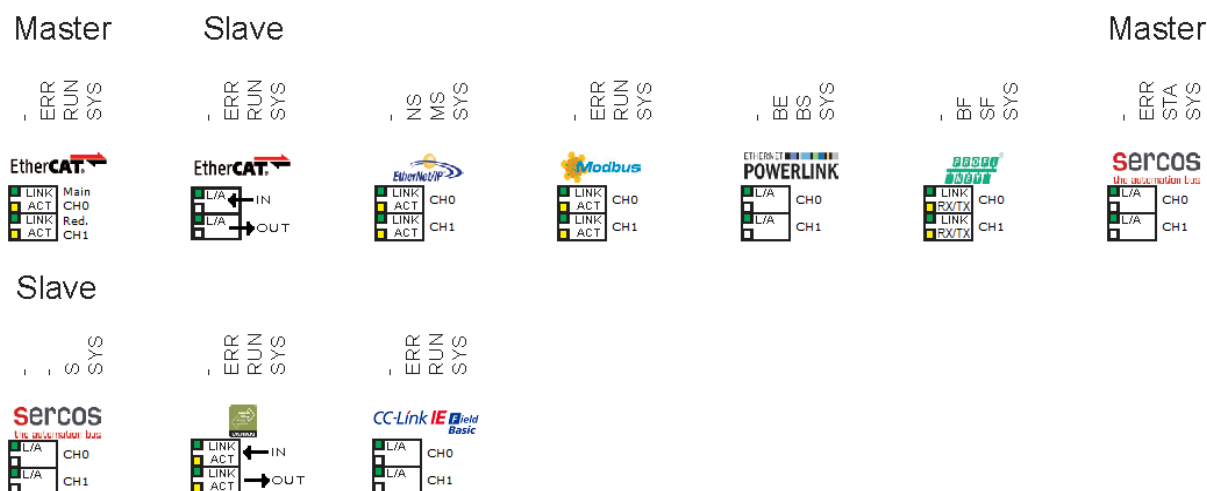


Figure 38: Front Plate Stickers for CIFX 70E-RE

| LED                | EtherCAT Master | EtherCAT Slave | EtherNet/IP | Open Modbus/TCP | POWERLINK | PROFINET IO | Sercos Master | Sercos Slave | VARAN | CC-Link IE Field Basic |
|--------------------|-----------------|----------------|-------------|-----------------|-----------|-------------|---------------|--------------|-------|------------------------|
| SYS (yellow/green) | SYS             | SYS            | SYS         | SYS             | SYS       | SYS         | SYS           | SYS          | SYS   | SYS                    |
| COM 0 (red/ green) | RUN             | RUN            | MS          | RUN             | BS        | SF          | STA           | S            | RUN   | RUN                    |
| COM 1 (red/ green) | ERR             | ERR            | NS          | ERR             | BE        | BF          | ERR           | -            | ERR   | ERR                    |
| RJ45 Ch0           | green           | LINK           | L/A IN      | LINK            | LINK      | L/A         | LINK          | L/A          | L/A   | LINK IN                |
|                    | yellow          | ACT            | -           | ACT             | ACT       | -           | RX/TX         | -            | -     | ACT IN                 |
| RJ45 Ch1           | green           | LINK           | L/A OUT     | LINK            | LINK      | L/A         | LINK          | L/A          | L/A   | LINK OUT               |
|                    | yellow          | ACT            | -           | ACT             | ACT       | -           | RX/TX         | -            | -     | ACT OUT                |

Table 25: LED Labeling depending of the loaded Firmware, CIFX 70E-RE

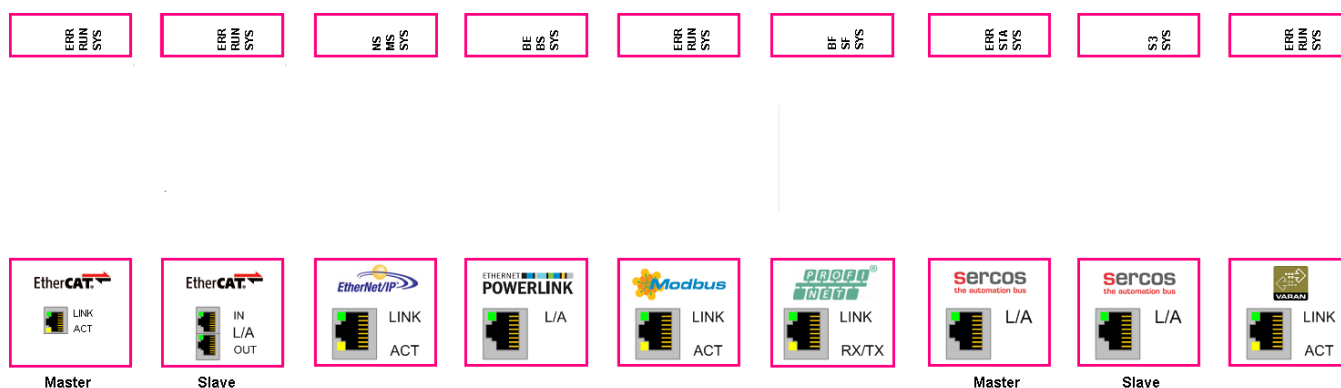


Figure 39: Front Plate Stickers for CIFX 100EH-RE/CUBE

## 6.5 Installing PC Card cifX PCI, PCIe, Low Profile PCIe

1. Adhere to the necessary safety precautions for components that are vulnerable with electrostatic discharge.

### NOTICE

#### Electrostatic sensitive Devices

- To prevent damage to the PC and the PC card cifX, make sure, that the PC card cifX is grounded via the endplate and the PC and make sure, that you are discharged when you install/uninstall the PC card cifX.
- 2. Fix front plate sticker (only for CIFX 50-RE, CIFX 50E-RE, CIFX 50E-RE\ET, CIFX 70E-RE or CIFX 100EH-RE\CUBE).
  - Use the sticker according to the device and firmware and glue it on the front of the PC card cifX (see section *Fix Front Plate Sticker* on page 65).
- 3. Set Slot Number (Card ID).
  - For devices with **Rotary Switch Slot Number (Card ID)** set the **Slot Number (Card ID)**: (Value 0 or a value from 1 to 9), (see section *Rotary Switch for Slot Number (Card ID)* on page 113).
- 4. Take safety precautions.

### ⚠ WARNING

#### Hazardous voltage!

#### Danger to life, risk of injury by electric shock

- Disconnect the power plug of the PC (or connection device).
- Make sure that the power supply is off at the PC (or connection device).

### NOTICE

#### Device Damage!

- The PC card CIFX 100EH-RE\CUBE may not be installed in standard PCs. The pin assignment of the PCI Express bus does not meet the standard [bus spec 3]. By consequence malfunction can occur at the PCI express bus.
  - Install the PC card CIFX 100EH-RE\CUBE exclusively in KEBA KeControl industry PCs series CP 3XX (Cube).
5. Open cabinet.
    - Open the cabinet of the PC or of the connection device.
  6. Install PC card cifX.
    - Plug the PC card cifX **PCI** into a free PCI slot.
    - Plug the PC card cifX **PCI Express** or **Low Profile PCI Express** into a free PCI express slot.
    - Fix the PC card cifX using the hole intended.

After this:

7. Close cabinet.
  - Close the cabinet of the PC or connection device.
8. Plug the connecting cable to the Master or Slave.
  - Note for the PC cards cifX Real-Time Ethernet::



---

**Note:** The RJ45 socket is only for use in LAN, not for telecommunication circuits. For further information refer to section *Ethernet Interface* on page 108.

---

- Plug the connecting cable from the PC card cifX to the PC card Master or Slave.
9. Connect the PC or the connection device to the power supply and switch it on.
    - Connect the PC or the connection device to the power supply.
    - Switch on the PC or the connection device.

## 6.6 Warnings on Firmware or Configuration Download

When downloading the firmware as well as the configuration into the PC card cifX, observe the warnings listed below.



### WARNING

---

#### Communication Stop caused by Firmware or Configuration Download

Initiating a firmware or configuration download process during bus operation will stop the communication and a subsequent plant stop may cause unpredictable and unexpected behavior of machines and plant components, possibly resulting in personal injury and damage to your equipment.

The firmware download overwrites the existing firmware. The communication stop may cause loss of device parameters and possible device damage may occur.

- Stop the application program, before you start the firmware or configuration download.
  - Make sure that all network devices are placed in a fail-safe condition.
- 



### NOTICE

---

#### Power Disconnect while downloading Firmware or Configuration

If the power supply to the PC or device is interrupted while the firmware or configuration is being downloaded, the download will be aborted, the firmware may be corrupted, the device parameters may be lost, and the device may be damaged.

- During firmware or configuration download process do not interrupt the power supply to the PC, or to the device and do not perform a reset to the device!
- 

*Not suitable configuration or invalid firmware*



### WARNING

---

#### Mismatching System Configuration

Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury or damage of equipment.

- In the device use only a configuration suitable for the system.
- 



### NOTICE

---

#### Invalid Firmware

Loading invalid firmware files could render your device unusable.

- Only proceed with a firmware version valid for your device.
-

## 6.7 Warnings on Firmware or Configuration Download (USA)

When downloading the firmware as well as the configuration into the PC card cifX, observe the warnings listed below.

---

### WARNING

#### **Communication Stop caused by Firmware or Configuration Download**

Initiating a firmware or configuration download process during bus operation will stop the communication and a subsequent plant stop may cause unpredictable and unexpected behavior of machines and plant components, possibly resulting in personal injury and damage to your equipment.

The firmware download overwrites the existing firmware. The communication stop may cause loss of device parameters and possible device damage may occur.

- Stop the application program, before you start the firmware or configuration download.
  - Make sure that all network devices are placed in a fail-safe condition.
- 

---

### **NOTICE**

#### **Power Disconnect while downloading Firmware or Configuration**

If the power supply to the PC or device is interrupted while the firmware or configuration is being downloaded, the download will be aborted, the firmware may be corrupted, the device parameters may be lost, and the device may be damaged.

- During firmware or configuration download process do not interrupt the power supply to the PC, or to the device and do not perform a reset to the device!
- 

*Not suitable configuration or invalid firmware*

---

### WARNING

#### **Mismatching System Configuration**

Mismatching system configuration loaded into the device could result in faulty data mapping in the application program and thus unexpected equipment operation may cause personal injury or damage of equipment.

- In the device use only a configuration suitable for the system.
- 

---

### **NOTICE**

#### **Invalid Firmware**

Loading invalid firmware files could render your device unusable.

- Only proceed with a firmware version valid for your device.
-

## 6.8 Notes for the Configuration of the Master Device

To configure the Master, a device description file is required. Note the following notes for the configuration of the Master Device:

| System                                 | Note                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>CC-Link IE Field Basic Slave</i>    | To configure the Master, a CSPP file (device description file) is required. The settings in the used Master must comply with the settings in the Slave to establish communication. Important parameters are: Slave Station Address, Input and output data, , vendor code, model type, occupied stations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>CC-Link IE Field Slave</i>          | To configure the Master, a CSPP file (device description file) is required. The settings in the used Master must comply with the settings in the Slave to establish communication. Important parameters are: Slave Station Address, Input and output data, vendor code, model code.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>EtherCAT Slave</i>                  | To configure the Master, an XML file (device description file) is required. The settings in the used Master must comply with the settings in the Slave to establish communication. Important parameters are: Vendor ID, Product Code, Serial Number, Revision Number, Output and Input Data Bytes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>EtherCAT Slave</i>                  | <p>If the XML file <i>Hilscher CIFX RE ECS V2.2.X.xml</i> is use/updated, the firmware with the version 2.2.x must be use/updated.</p> <p>The loadable firmware supports for the number of cyclic input data and for cyclic output data in total up to 400 bytes. If more than 200 bytes for input data or for output data should be exchanged via EtharCAT, then a customer specific XML file is necessary. Additionally the following formular applies: <math>(\text{number of input bytes} + 3)/4 + (\text{number of output bytes} + 3)/4</math> must be less or equal to 100.</p>                                                                                                                                                                                                    |
| <i>EtherNet/IP Adapter</i>             | To configure the Scanner/Master, an EDS file (device description file) is required. The settings in the used Scanner/Master must comply with the settings in the Adapter/Slave to establish communication. Important parameters are: Input, Output Data Bytes, Vendor ID, Product Type, Product Code, Major Rev, Minor Rev, IP Address and Netmask.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>POWERLINK-Controlled-Node/Slave</i> | To configure the Managing Node/Master, an XDD file (device description file) is required. The settings in the used Managing Node/Master must comply with the settings in the Controlled Node/Slave, to establish communication. Important parameters are: Vendor ID, Product Code, Serial Number, Revision Number, Node ID, Output and Input length.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <i>PROFINET IO Device</i>              | <p>To configure the Controller, a GSDML file (device description file) is required. The settings in the used Controller must comply with the settings in the Device to establish communication. Important parameters are: Station Name, Vendor ID, Device ID, Input and Output Data Bytes.</p> <p>Under Name of Station, the name must be typed which was also used in the configuration file of the master of this device. If no name chosen freely is used in the configuration file, then the name from the GSDML file is used.</p>                                                                                                                                                                                                                                                   |
| <i>Sercos Slave</i>                    | <p>The Sercos Master uses the Sercos address to communicate with the slave. Some Masters will verify Device ID, Vendor Code, Input Data Size and Output Data Size and will do further communication to the Slave only if all these values match. Therefor the Master reads these parameters from the Slave and compares them with the configuration stored in the Master.</p> <p>The parameters Device ID, Vendor Code, Input Data Size and Output Data Size are part of the SDDML device description file. If for the configuration of the Sercos Master SDDML files are used and a default value of one of these parameters was changed, then a SDDML file must be created in the configuration software via Export SDDML and then used in the configuration of the Sercos Master.</p> |
| <i>PROFIBUS DP Slave</i>               | To configure the Master, a GSD file (device description file) is required. The settings in the used Master must comply with the settings in the Slave to establish communication. Important parameters are: Station Address, Ident Number, Baudrate and Config Data (the configuration data for the output and input length).                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <i>CANopen Slave</i>                   | To configure the Master, an EDS file (device description file) is required. The settings in the used Master must comply with the settings in the Slave to establish communication. Important parameters are: Node Address and Baudrate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <i>DeviceNet Slave</i>                 | To configure the Master, an EDS file (device description file) is required. The settings in the used Master must comply with the settings in the Slave to establish communication. Important parameters are: MAC ID, Baudrate, Produced Size, Consumed Size, Vendor ID, Product Type, Product Code, Major Rev, Minor Rev.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |



| System        | Note                                                                                                                                                                                                                                                                       |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CC-Link Slave | To configure the Master, a CSP file (device description file) is required. The settings in the used Master must comply with the settings in the Slave to establish communication. Important parameters are: Slave Station Address, Baudrate, Station Type and Vendor Code. |

*Table 26: Notes for the Configuration of the Master Device*

Further information to the device description files you find under section on *Device Description Files PC Cards cifX* page 15.

## 6.9 Device Names in Communication Studio

The following table contains the device names displayed for the single communication protocols in the configuration software Communication Studio.

The table shows the PC card cifX and which protocol can be used. Furthermore, the table shows, for which protocol which device must be selected from the device catalog to configure the PC card cifX with Communication Studio.

| PC Cards cifX                                                                       | Protocol                        | DTM Specific Group        | Device Name                                                      |
|-------------------------------------------------------------------------------------|---------------------------------|---------------------------|------------------------------------------------------------------|
| CIFX 50-RE,<br>CIFX 50E-RE,<br>CIFX 50E-RE\ET<br>CIFX 70E-RE,<br>CIFX 100EH-RE\CUBE | CC-Link IE Field Basic Slave    | Gateway/Stand-Alone Slave | CiFX RE/CCIBS                                                    |
|                                                                                     | EtherCAT Master                 | Master                    | CIFX RE/ECM                                                      |
|                                                                                     | EtherCAT Slave                  | Gateway/Stand-Alone Slave | CIFX RE/ECS                                                      |
|                                                                                     | EtherNet/IP Scanner (Master)    | Master                    | CIFX RE/EIM                                                      |
|                                                                                     | EtherNet/IP Adapter (Slave)     | Gateway/Stand-Alone Slave | CIFX RE/EIS                                                      |
|                                                                                     | Open-Modbus/TCP                 | Gateway/Stand-Alone Slave | CIFX RE/OMB                                                      |
|                                                                                     | POWERLINK-Controlled-Node/Slave | Gateway/Stand-Alone Slave | CIFX RE/PLS                                                      |
|                                                                                     | PROFINET IO-Controller          | Master                    | CIFX RE/PNM                                                      |
|                                                                                     | PROFINET IO-Device              | Gateway/Stand-Alone Slave | CIFX RE/PNS                                                      |
|                                                                                     | Sercos Master                   | Master                    | CIFX RE/S3M                                                      |
|                                                                                     | Sercos Slave                    | Gateway/Stand-Alone Slave | CIFX RE/S3S                                                      |
|                                                                                     | VARAN Client (Slave)            | Gateway/Stand-Alone Slave | CIFX RE/VRS                                                      |
| CIFX 50E-CCIES,<br>CIFX 70E-CCIES                                                   | CC-Link IE Field Slave          | Gateway/Stand-Alone Slave | CiFX RE/CCIES                                                    |
| CIFX 50-DP,<br>CIFX 50E-DP,<br>CIFX 70E-DP                                          | PROFIBUS DP Master              | Master                    | CIFX DP/DPM                                                      |
|                                                                                     | PROFIBUS DP Slave               | Gateway/Stand-Alone Slave | CIFX DP/DPS                                                      |
| CIFX 50-2DP,<br>CIFX 50E-2DP                                                        | PROFIBUS DP Master              | Master                    | 2*CIFX DP/DPM<br>for each PROFIBUS DP<br>channel one CIFX DP/DPM |
|                                                                                     | PROFIBUS DP Slave               | Gateway/Stand-Alone Slave | 2*CIFX DP/DPS<br>for each PROFIBUS DP<br>channel one CIFX DP/DPS |
| CIFX 50-CO<br>CIFX 50E-CO,<br>CIFX 70E-CO                                           | CANopen Master                  | Master                    | CIFX CO/COM                                                      |
|                                                                                     | CANopen Slave                   | Gateway/Stand-Alone Slave | CIFX CO/COS                                                      |
| CIFX 50-DN<br>CIFX 50E-DN,<br>CIFX 70E-DN                                           | DeviceNet Master                | Master                    | CIFX DN/DNM                                                      |
|                                                                                     | DeviceNet Slave                 | Gateway/Stand-Alone Slave | CIFX DN/DNS                                                      |
| CIFX 50-2DN,<br>CIFX 50E-2DN                                                        | DeviceNet Master                | Master                    | 2* CIFX DN/DNM<br>for each DeviceNet channel<br>one CIFX DN/DNM  |
|                                                                                     | DeviceNet Slave                 | Gateway/Stand-Alone Slave | 2* CIFX DN/DNS<br>for each DeviceNet channel<br>one CIFX DN/DNS  |
| CIFX 50-CC<br>CIFX 50E-CC                                                           | CC-Link Slave                   | Gateway/Stand-Alone Slave | CIFX CC/CCS                                                      |

Table 27: Device Names in Communication Studio by Communication Protocol

## 6.10 Instructions for Problem Solving

In case of any error, follow the instructions for problem solving given here:

### General

- Check the PC card cifX operating requirements according to the requirements given in section *Requirements for Operation* on page 53.

**SYS and COM Status LEDs** Troubleshooting of the system is done by examining the LEDs behaviour. The PC cards cifX have depending by card type two or three bicolor status LEDs, which inform the user about the communication state of the device.

- The **SYS** LED shows the common system status of the device. It can be yellow or green ON or it can blink green/yellow.
- The **COM** LEDs display the status of the Real-Time Ethernet or fieldbus communication. Depending by protocol and state, the LEDs can be ON or flash cyclic or acyclic in green or red (or orange).

If the LED SYS lights statically green and the LED COM (or COM0) lights statically green (or possibly is "off"), the PC card cifX is in operational state, the Master is in data exchange with the connected Slaves and the communication is running without fault. The meaning of the LEDs is described in chapter *Diagnosis with LEDs* beginning from page 79.

### LINK-LED (for PC cards cifX Real-Time Ethernet)

- Check using the LINK LED's status whether a connection to the Ethernet is established. Therefore use the description on the LINK LED in the chapter *Diagnosis with LEDs* beginning from page 79.

### Cable

- Check that the pin assignment of the cable is correct. I. e., the cable by which you connect the PC card cifX to the PC card Master or Slave.

### Firmware CC-Link IE Field Slave

- Use the PC cards CIFX 50E-CCIES or CIFX 70E-CCIES only together with the CC-Link IE Field Slave firmware and do not use this firmware for any other cards.

### Configuration

- Check the configuration in the Master device and the Slave device. The configuration has to match.

### Diagnosis

Via **Diagnosis** (in Communication Studio) the diagnostic information of the device is shown. The shown diagnostic information depends on the used protocol.



Further information about the device diagnosis and its functions you find in the operating instruction manual of the corresponding Real-Time Ethernet DTM or fieldbus system DTM.

## 6.11 Update for Firmware, Driver and Software



**Note:** As a pre-requirement for the software update the project files, the configuration files and firmware files are to be saved.

At existing hardware installation the firmware, the driver and the configuration software must be updated according to the versions given in section *Revision or version status of hardware and software* on page 16. The following graphic gives an overview:

## 6.12 Note on Exchange Service (Replacement Case)

For the exchange service (replacement case) of a PC card cifX (Master and Slave) obey to the following note.



**Important!** For the replacement card cifX with **Rotary Switch Slot Number (Card ID)** set the same **Slot Number (Card ID)** as at the previous PC card cifX (see section *Rotary Switch for Slot Number (Card ID)* on page 113).

For PC cards cifX without **Rotary Switch Slot Number (Card ID)** in terms of a device exchange service (replacement case) you must manually download the same firmware and configuration into the replacement card cifX, as into the preceding cifX.

## 6.13 Uninstalling the PC Card cifX PCI, PCIe, Low Profile PCIe

1. Take safety precautions.

### **WARNING**

#### **Hazardous voltage!**

#### **Danger to life, risk of injury by electric shock**

- Disconnect the power plug of the PC (or connection device).
- Make sure that the power supply is off at the PC (or connection device).

### **NOTICE**

#### **Electrostatic sensitive Devices**

- To prevent damage to the PC and the PC card cifX, make sure, that the PC card cifX is grounded via the endplate and the PC and make sure, that you are discharged when you install/uninstall the PC card cifX.
2. Remove the connecting cable to the Master or Slave.
    - Remove the connecting cable between the PC card cifX to be replaced and the PC card Master or Slave.
  3. Open cabinet.
    - Open the cabinet of the PC or of the connection device.
  4. Uninstall PC card cifX.
    - Loosen the PC card cifX.
    - Remove the PC card cifX from the **PCI** slot or from the **PCI express** slot.

After this:

5. Close cabinet.
  - Close the cabinet of the PC or connection device.

## 6.14 Disposal recycling of waste electronic equipment

Waste electronic equipment must be disposed of properly after the end of use.



---

### Waste electronic equipment

This product must not be disposed of with household waste.

Dispose of this product in accordance with local regulations in your country.

---

When disposing of the product, observe the following:

- Observe national and local regulations for the disposal of waste electronic equipment and packaging.
- Delete personal data stored in the waste electronic device.
- Dispose of this product in an environmentally friendly manner at a local collection point for waste electronic equipment.
- Dispose of packaging in such a way that a high level of recycling is possible.

Alternatively, you can return our products to us for disposal. The prerequisite is that no additional foreign substances are contained. Before returning, please contact us via the Return Merchandise Authorization (RMA) form on [www.hilscher.com](http://www.hilscher.com).

In Europe, the directive 2012/19/EU waste electrical and electronic equipment applies. Different policies and laws may apply nationally.

## 7 Diagnosis with LEDs

The LEDs will be used to indicate status information of the PC card cifX. Each LED has a specific function during Run, configuration download and error indications. The descriptions hereafter show the reaction of each LED for the PC card cifX during these states.

### 7.1 Overview LEDs Real-Time Ethernet Systems



**Note:** The meaning of the communication status LEDs and of the Ethernet LEDs at the device is defined by the loaded firmware of the predocol.

| LED Naming in the Device Drawing                                                                                                    |                                                                                                 | EtherCAT Master                                                                                     | EtherCAT Slave                                                                                      | EtherNet/IP                                                                                              | Open-Modbus/TCP                                                                                     | POWERLINK                                                                                          | PROFINET IO                                                                                        | Sercos Master                                                                                         | Sercos Slave                                                                                                   | VARAN                                                                                                 | CC-Link IE Field Basic                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>SYS</b> (System Status)<br><br>(yellow/green)   |                                                                                                 | SYS                                                                                                 | SYS                                                                                                 | SYS                                                                                                      | SYS                                                                                                 | SYS                                                                                                | SYS                                                                                                | SYS                                                                                                   | SYS                                                                                                            | SYS                                                                                                   | SYS                                                                                                   |
| <b>COM 0</b> (Communication Status)<br><br>(green) |                                                                                                 | RUN<br><br>(green) | RUN<br><br>(green) | MS<br><br>(red/green)   | RUN<br><br>(green) | BS<br><br>(green) | SF<br><br>(red)   | STA<br><br>(green) | S<br><br>(red/green/orange) | RUN<br><br>(green) | RUN<br><br>(green) |
| <b>COM 1</b> (Communication Status)<br><br>(red) |                                                                                                 | ERR<br><br>(red) | ERR<br><br>(red) | NS<br><br>(red/green) | ERR<br><br>(red) | BE<br><br>(red) | BF<br><br>(red) | ERR<br><br>(red) | -                                                                                                              | ERR<br><br>(red) | ERR<br><br>(red) |
| Ethernet Ch0                                                                                                                        | <br>(green)  | LINK                                                                                                | L/A IN                                                                                              | LINK                                                                                                     | LINK                                                                                                | L/A                                                                                                | LINK                                                                                               | L/A                                                                                                   | L/A                                                                                                            | LINK IN                                                                                               | L/A                                                                                                   |
|                                                                                                                                     | <br>(yellow) | ACT                                                                                                 | -                                                                                                   | ACT                                                                                                      | ACT                                                                                                 | -                                                                                                  | RX/TX                                                                                              | -                                                                                                     | -                                                                                                              | ACT IN                                                                                                | -                                                                                                     |
| Ethernet Ch1                                                                                                                        | <br>(green)  | -                                                                                                   | L/A OUT                                                                                             | LINK                                                                                                     | LINK                                                                                                | L/A                                                                                                | LINK                                                                                               | L/A                                                                                                   | L/A                                                                                                            | LINK OUT                                                                                              | L/A                                                                                                   |
|                                                                                                                                     | <br>(yellow) | -                                                                                                   | -                                                                                                   | ACT                                                                                                      | ACT                                                                                                 | -                                                                                                  | RX/TX                                                                                              | -                                                                                                     | -                                                                                                              | ACT OUT                                                                                               | -                                                                                                     |

Table 28: Overview LEDs Real-Time Ethernet Systems

| LED                   | Name     | Meaning              |
|-----------------------|----------|----------------------|
| System Status         | SYS      | System Status        |
| Kommunikations-status | COM      | Communication Status |
|                       | RUN      | Run                  |
|                       | ERR      | Error                |
|                       | STA      | Status               |
|                       | MS       | Module Status        |
|                       | NS       | Network Status       |
|                       | BS       | Bus Status           |
|                       | BE       | Bus Error            |
|                       | SF       | System Failure       |
|                       | BF       | Bus Failure          |
|                       | S        | Status / Error       |
| Ethernet              | LINK, L  | Link                 |
|                       | ACT, A   | Activity             |
|                       | L/A      | Link/Activity        |
|                       | L/A IN   | Link/Activity Input  |
|                       | L/A OUT  | Link/Activity Output |
|                       | LINK IN  | Link Input           |
|                       | LINK OUT | Link Output          |
|                       | ACT IN   | Activity Input       |
|                       | ACT OUT  | Activity Output      |
|                       | RX/TX    | Receive/Transmit     |

Table 29: LED Names



**Note:** The PC cards CIFX 50E-CCIES and CIFX 70E-CCIES are based on their own hardware and are equipped with several LEDs that are different from those of the PC cards cifX RE variants. The descriptions of the CC-Link IE Field slave LEDs are given in the *CC-Link IE Field Slave* section on page 83.

## 7.2 Overview LEDs Fieldbus Systems

| LED                             | PROFIBUS DP<br>(1 Duo LED) | CANopen<br>(1 Duo LED)    | DeviceNet<br>(1 Duo LED)  | CC-Link (Slave)<br>(2 LEDs)               |
|---------------------------------|----------------------------|---------------------------|---------------------------|-------------------------------------------|
| System Status<br>(yellow/green) | <b>SYS</b>                 | <b>SYS</b>                | <b>SYS</b>                | <b>SYS</b>                                |
| Communication Status            | <b>COM</b><br>(red/green)  | <b>CAN</b><br>(red/green) | <b>MNS</b><br>(red/green) | <b>L RUN</b><br>(green)<br>L ERR<br>(red) |

Table 30: Overview LEDs by Fieldbus System for 1 Channel Devices

| LED                                                                                                                    | PROFIBUS D<br>(1 Duo LED/<br>channel) | DeviceNet<br>(1 Duo LED/<br>channel) |
|------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------|
| System Status   (yellow/green)                                                                                         | <b>SYS</b>                            | <b>SYS</b>                           |
| Communication Status   (red/green)<br>Channel X1 (Communication Studio: Ch0)<br>Channel X2 (Communication Studio: Ch1) | <b>COM0</b><br><b>COM1</b>            | <b>MNS0</b><br><b>MNS1</b>           |

Table 31: Overview LEDs by Fieldbus System for 2 Channel Devices

| LED                  | Name          | Meaning                   |
|----------------------|---------------|---------------------------|
| System Status        | SYS           | System Status             |
| Communication Status | COM           | Communication Status      |
|                      | CAN           | CANopen Status            |
|                      | MNS           | Module Network Status     |
|                      | L RUN / L ERR | Status Run / Status Error |

Table 32: LED Names

Descriptions for 2-Communication Status LEDs of PROFIBUS DP Master and Slave devices of earlier device revisions are included in the user manual for PC cards cifX fieldbus up to manual revision 23.



### 7.3 System LED

The System Status LED **SYS** can assume the states described below.

| LED | Color                                                                                            | State            | Meaning                                                               |
|-----|--------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------|
| SYS | Duo LED yellow/green                                                                             |                  |                                                                       |
|     |  (green)        | On               | Operating System running                                              |
|     |  (green/yellow) | Blinking, cyclic | Second stage bootloader is waiting for firmware.                      |
|     |  (yellow)       | On               | Bootloader netX (= romloader) is waiting for second stage bootloader. |
|     |  (off)          | Off              | Power supply for the device is missing or hardware defect.            |

Table 33: System Status LED States

## 7.4 CC-Link IE Field Basic Slave

For the CC-Link IE Field Basic Slave protocol, the communication LEDs **RUN** and **ERR** as well as the Ethernet LED **L/A** can assume the states described below.

| LED                                                   | Color                                                                                     | State                       | Meaning                                                                                        |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------|
| <b>RUN</b><br>(Run)<br>General name:<br><b>COM0</b>   | <b>Duo LED red/green</b>                                                                  |                             |                                                                                                |
|                                                       |  (green) | On                          | Station in operation and cyclic transmission in progress.                                      |
|                                                       |  (green) | Blinking (2.5 Hz)           | Station in operation and cyclic transmission stopped.                                          |
|                                                       |  (green) | Flickering (10 Hz)          | Station not configured.                                                                        |
| <b>ERR</b><br>(Error)<br>General name:<br><b>COM1</b> |  (red)   | On                          | Communication error.                                                                           |
|                                                       |  (red)   | Triple Flash                | DPM watchdog has expired.                                                                      |
|                                                       |  (off)   | Off                         | Station is disconnected.                                                                       |
| <b>L/A</b><br>Ch0 & Ch1                               | <b>LED green</b>                                                                          |                             |                                                                                                |
|                                                       |  (green) | On                          | <b>Link:</b> The station is linked to the Ethernet, but does not send/receive Ethernet frames. |
|                                                       |  (green) | Flickering (load dependent) | <b>Activity:</b> The station is linked to the Ethernet and sends/receives Ethernet frames.     |
|                                                       |  (off)   | Off                         | The station has no link to the Ethernet.                                                       |
| Ch0 & Ch1                                             | <b>LED yellow</b>                                                                         |                             |                                                                                                |
|                                                       |  (off) | Off                         | This LED is not used.                                                                          |

Table 34: LED states for the CC-Link IE Field Basic Slave

| LED State                   | Definition                                                                                                                                                                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Triple Flash                | The indicator shows a sequence of three short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).                                                                                     |
| Blinking (2.5 Hz)           | The indicator turns on and off with a frequency of 2.5 Hz: "on" for 200 ms, followed by "off" for 200 ms.                                                                                                                                                  |
| Flickering (10 Hz)          | The indicator turns on and off with a frequency of 10 Hz: "on" for 50 ms, followed by "off" for 50 ms.                                                                                                                                                     |
| Flickering (load dependent) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 35: LED state definitions for the CC-Link IE Field Basic Slave protocol

## 7.5 CC-Link IE Field Slave

For the CC-Link IE Field Slave protocol, the communication LEDs **RUN**, **RD**, **SD**, **D-LINK**, **ERR**, **USER1** and **USER2** as well as the Ethernet-LEDs **LINK0** or **L-ERR0** and **LINK1** or **L-ERR1** can assume the states described below. This description is valid from CC-Link IE Field Slave stack version V1.1.

| LED                                         | Color                                                                                        | State    | Meaning                                                              |
|---------------------------------------------|----------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------|
| <b>RUN</b>                                  | <b>LED green:</b> Indicates the operation status.                                            |          |                                                                      |
|                                             |  (green)    | On       | Operating normally (depending from the netX firmware "BusOn" status) |
|                                             |  (off)      | Off      | A watchdog timer error or a hardware failure has occurred.           |
| <b>RD</b>                                   | <b>LED green:</b> Displays the reception status of the data.                                 |          |                                                                      |
|                                             |  (green)    | On       | Receiving data.                                                      |
|                                             |  (off)      | Off      | Data not received.                                                   |
| <b>SD</b>                                   | <b>LED green:</b> Displays the sending status of the data.                                   |          |                                                                      |
|                                             |  (green)    | On       | Sending data.                                                        |
|                                             |  (off)      | Off      | Data not sent.                                                       |
| <b>D-LINK</b>                               | <b>LED yellow:</b> Indicates the status of the data link.                                    |          |                                                                      |
|                                             |  (yellow)   | On       | Data link in operation (cyclic transmission in progress)             |
|                                             |  (yellow)   | Blinking | Data link in operation (cyclic transmission stopped)                 |
|                                             |  (off)     | Off      | Data link not performed (disconnected)                               |
| <b>ERR</b>                                  | <b>LED red:</b> Indicates the CP520 error status.                                            |          |                                                                      |
|                                             |  (red)    | On       | Error in own station                                                 |
|                                             |  (off)    | Off      | Normal operation                                                     |
| <b>USER1</b>                                | <b>LED yellow:</b> Indicates an user-defined status 1.                                       |          |                                                                      |
|                                             |  (yellow) | On       | Currently not used                                                   |
|                                             |  (off)    | Off      | Currently not used                                                   |
| <b>USER2</b>                                | <b>LED yellow:</b> Indicates an user-defined status 2.                                       |          |                                                                      |
|                                             |  (yellow) | On       | Currently not used                                                   |
|                                             |  (off)    | Off      | Currently not used                                                   |
| <b>LINK0,<br/>LINK1<br/>Ch0 &amp; Ch1</b>   | <b>LED green</b>                                                                             |          |                                                                      |
|                                             |  (green)  | On       | Link up                                                              |
|                                             |  (Off)    | Off      | Link down                                                            |
| <b>L-ERR0,<br/>L-ERR1<br/>Ch0 &amp; Ch1</b> | <b>LED yellow</b>                                                                            |          |                                                                      |
|                                             |  (yellow) | On       | Abnormal data received or loopback in progress                       |
|                                             |  (Off)    | Off      | Normal data received or loopback not performed                       |

Table 36: LED states for the CC-Link IE Field Slave protocol

| Name   | Meaning                      |
|--------|------------------------------|
| RUN    | Run                          |
| RD     | Reception status of the data |
| SD     | Sending status of the data   |
| D-LINK | Data link                    |

| Name  | Meaning                                                      |
|-------|--------------------------------------------------------------|
| ERR   | Error                                                        |
| USER  | User-defined status                                          |
| LINK  | Link status                                                  |
| L-ERR | Error status of the received data, the line and the loopback |

Table 37: LED Names CC-Link IE Field Slave protocol

## 7.6 EtherCAT Master

For the EtherCAT Master protocol, the communication LEDs **RUN** and **ERR** as well as the Ethernet LEDs **LINK** and **ACT** can assume the states described below. This description is valid from stack version V4.0.

| LED                                         | Color                                                                                       | State                       | Meaning                                                                                                      |
|---------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>RUN</b><br>General name:<br><b>COM 0</b> | <b>Duo LED red/green</b>                                                                    |                             |                                                                                                              |
|                                             |  (off)     | Off                         | <b>INIT:</b> The device is in state INIT.                                                                    |
|                                             |  (green)   | Blinking (2,5 Hz)           | <b>PRE-OPERATIONAL:</b> The device is in PRE-OPERATIONAL state.                                              |
|                                             |  (green)   | Flickering (10 Hz)          | The device is not configured.                                                                                |
|                                             |  (green)   | Single flash                | <b>SAFE-OPERATIONAL:</b> The device is in SAFE-OPERATIONAL state.                                            |
|                                             |  (green)   | On                          | <b>OPERATIONAL:</b> The device is in OPERATIONAL state.                                                      |
| <b>ERR</b><br>General name:<br><b>COM 1</b> | <b>Duo-LED red/green</b>                                                                    |                             |                                                                                                              |
|                                             |  (off)     | Off                         | Master has no errors.                                                                                        |
|                                             |  (red)     | Single flash                | Bus Sync error threshold                                                                                     |
|                                             |  (red)     | Double flash                | Internal Stop of the bus cycle                                                                               |
|                                             |  (red)     | Triple Flash                | DPM watchdog has expired.                                                                                    |
|                                             |  (red)    | Quadruple Flash             | No Master license present in the device.                                                                     |
|                                             |  (red)   | Blinking (2,5 Hz)           | Error in the configuration database.                                                                         |
|                                             |  (red)   | Single Flickering           | Channel Init was executed at the Master.<br>Remarks: Transient error so can happen to be not visible at all. |
|                                             |  (red)   | Double Flickering           | Slave is missing.<br>Unconfigured Slave<br>No matching mandatory slave list<br>No bus connected              |
|                                             |  (red)   | Flickering (10 Hz)          | Boot-up was stopped due to an error.                                                                         |
| <b>LINK</b><br>Ch0                          | <b>LED green</b>                                                                            |                             |                                                                                                              |
|                                             |  (green) | On                          | <b>Link:</b> The device is linked to the Ethernet, but does not send/receive Ethernet frames.                |
|                                             |  (green) | Flickering (load dependent) | <b>Activity:</b> The device is linked to the Ethernet and sends/receives Ethernet frames.                    |
|                                             |  (off)   | Off                         | The device has no link to the Ethernet.                                                                      |
| <b>ACT</b><br>Ch0                           | <b>LED yellow</b>                                                                           |                             |                                                                                                              |
|                                             |  (off)   | Off                         | This LED is not used.                                                                                        |

Table 38: LED states for the EtherCAT Master protocol

| LED State    | Definition                                                                                                                                                             |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Single flash | The indicator shows one short flash (200 ms) followed by a long "off" phase (1,000 ms).                                                                                |
| Double flash | The indicator shows a sequence of two short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).   |
| Triple Flash | The indicator shows a sequence of three short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms). |

| LED State                   | Definition                                                                                                                                                                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quadruple Flash             | The indicator shows a sequence of four short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).                                                                                      |
| Blinking (2,5 Hz)           | The indicator turns on and off with a frequency of 2,5 Hz: "on" for 200 ms, followed by "off" for 200 ms.                                                                                                                                                  |
| Single Flickering           | The indicator is switched on and off once: 'on' for 50 ms, followed by 'off' for 500 ms.                                                                                                                                                                   |
| Double Flickering           | The indicator is switched on and off and on once: 'on' / 'off' / 'on' each for approximately 50 ms, followed by 'off' for 500 ms.                                                                                                                          |
| Flickering (10 Hz)          | The indicator turns on and off with a frequency of 10 Hz: "on" for 50 ms, followed by "off" for 50 ms.                                                                                                                                                     |
| Flickering (load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

*Table 39: LED state definitions for the EtherCAT Master protocol*

## 7.7 EtherCAT Slave

For the EtherCAT Slave protocol, the communication LEDs **RUN** and **ERR** as well as the Ethernet-LED **L/A IN** or **L/A OUT** can assume the states described below. This description is valid from stack version V2.5 (V2).

| LED                                         | Color                                                                                       | State                       | Meaning                                                                                                                                                                                                                                          |
|---------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RUN</b><br>General name:<br><b>COM 0</b> | <b>Duo LED red/green</b>                                                                    |                             |                                                                                                                                                                                                                                                  |
|                                             |  (off)     | Off                         | <b>INIT:</b> The device is in state INIT.                                                                                                                                                                                                        |
|                                             |  (green)   | Blinking (2,5 Hz)           | <b>PRE-OPERATIONAL:</b> The device is in PRE-OPERATIONAL state.                                                                                                                                                                                  |
|                                             |  (green)   | Single flash                | <b>SAFE-OPERATIONAL:</b> The device is in SAFE-OPERATIONAL state.                                                                                                                                                                                |
|                                             |  (green)   | On                          | <b>OPERATIONAL:</b> The device is in OPERATIONAL state.                                                                                                                                                                                          |
| <b>ERR</b><br>General name:<br><b>COM 1</b> | <b>Duo-LED red/green</b>                                                                    |                             |                                                                                                                                                                                                                                                  |
|                                             |  (off)     | Off                         | <b>No error:</b> The EtherCAT communication of the device is in working condition.                                                                                                                                                               |
|                                             |  (red)     | Blinking (2,5 Hz)           | <b>Invalid configuration:</b> General Configuration Error<br>Possible reason: State change commanded by master is impossible due to register or object settings.                                                                                 |
|                                             |  (red)     | Single Flash                | <b>Local error:</b> Slave device application has changed the EtherCAT state autonomously.<br>Possible reason 1: A host watchdog timeout has occurred.<br>Possible reason 2: Synchronization Error, device enters Safe-Operational automatically. |
|                                             |  (red)   | Double Flash                | <b>Application watchdog timeout:</b> An application watchdog timeout has occurred.<br>Possible reason: Sync Manager Watchdog timeout.                                                                                                            |
| <b>L/A IN or L/A OUT</b>                    | <b>LED green</b>                                                                            |                             |                                                                                                                                                                                                                                                  |
|                                             |  (green) | On                          | <b>Link:</b> The device is linked to the Ethernet, but does not send/receive Ethernet frames.                                                                                                                                                    |
|                                             |  (green) | Flickering (load dependant) | <b>Activity:</b> The device is linked to the Ethernet and sends/receives Ethernet frames.                                                                                                                                                        |
|                                             |  (off)   | Off                         | The device has no link to the Ethernet.                                                                                                                                                                                                          |
|                                             | <b>LED yellow</b>                                                                           |                             |                                                                                                                                                                                                                                                  |
|                                             |  (off)   | Off                         | This LED is not used.                                                                                                                                                                                                                            |

Table 40: LED states for the EtherCAT Slave protocol

| LED State                   | Beschreibung                                                                                                                                                                                                                                               |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Blinking (2,5 Hz)           | The indicator turns on and off with a frequency of 2,5 Hz: "on" for 200 ms, followed by "off" for 200 ms.                                                                                                                                                  |
| Single flash                | The indicator shows one short flash (200 ms) followed by a long "off" phase (1,000 ms).                                                                                                                                                                    |
| Double flash                | The indicator shows a sequence of two short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).                                                                                       |
| Flickering (load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 41: LED state definitions for the EtherCAT Slave protocol

## 7.8 EtherNet/IP Scanner (Master)

For the EtherNet/IP Scanner protocol, the communication LEDs **MS** and **NS** as well as the Ethernet LEDs **LINK** and **ACT** can assume the states described below. This description is valid from stack version V2.6.

| LED                                                             | Color                                                                                                                                                                                                                                                             | State                      | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MS</b><br>(Module status)<br>General name:<br><b>COM 0</b>   | <b>Duo-LED red/green</b>                                                                                                                                                                                                                                          |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                 |  (green)                                                                                                                                                                         | On                         | <b>Device operational:</b> The device is operating correctly.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                 |  (green)                                                                                                                                                                         | Flashing (1 Hz)            | <b>Standby:</b> The device has not been configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                 | <br><br>       | Flashing (green/red/green) | <b>Self-test:</b> The device is performing its power-up testing.<br>The module status indicator test sequence occurs before the network status indicator test sequence, according to the following sequence: <ul style="list-style-type: none"> <li>Network status LED off.</li> <li>Module status LED turns green for approximately 250 ms, turns red for approximately 250 ms, and again turns green (and holds that state until the power-up test has completed).</li> <li>Network status LED turns green for approximately 250 ms, turns red for approximately 250 ms, and then turns off (and holds that state until the power-up test has completed).</li> </ul> |
|                                                                 |  (red)                                                                                                                                                                           | Blinking (1 Hz)            | <b>Major recoverable fault:</b> The device has detected a major recoverable fault. E.g., an incorrect or inconsistent configuration can be considered a major recoverable fault.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                 |  (red)                                                                                                                                                                         | On                         | <b>Major unrecoverable fault:</b> The device has detected a major unrecoverable fault.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                 |  (Off)                                                                                                                                                                         | Off                        | <b>No power:</b> The device is powered off.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>NS</b><br>(Network-status)<br>General name::<br><b>COM 1</b> | <b>Duo-LED red/green</b>                                                                                                                                                                                                                                          |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                 |  (green)                                                                                                                                                                       | On                         | <b>Connected:</b> An IP address is configured, at least one CIP connection (any transport class) is established, and an Exclusive Owner connection has not timed out.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                 |  (green)                                                                                                                                                                       | Flashing (1 Hz)            | <b>No connections:</b> An IP address is configured, but no CIP connections are established, and an Exclusive Owner connection has not timed out.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                 | <br><br> | Flashing (green/red/off)   | <b>Self-test:</b> The device is performing its power-up testing. Refer to description for module status LED self-test.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                 |  (red)                                                                                                                                                                         | Blinking (1 Hz)            | <b>Connection timeout:</b> An IP address is configured, and an Exclusive Owner connection for which this device is the target has timed out.<br>The network status indicator returns to steady green only when all timed out Exclusive Owner connections are reestablished.                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                 |  (red)                                                                                                                                                                         | On                         | <b>Duplicate IP:</b> The device has detected that its IP address is already in use.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                 |  (Off)                                                                                                                                                                         | Off                        | <b>Not powered, no IP address:</b> The device does not have an IP address (or is powered off).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| LED                      | Color                                                                                         | State                               | Meaning                                           |
|--------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------|
| <b>LINK</b><br>Ch0 & Ch1 | <b>LED green</b>                                                                              |                                     |                                                   |
|                          | <br>(green)  | On                                  | The device is linked to the Ethernet.             |
|                          | <br>(Off)    | Off                                 | The device has no link to the Ethernet.           |
| <b>ACT</b><br>Ch0 & Ch1  | <b>LED yellow</b>                                                                             |                                     |                                                   |
|                          | <br>(yellow) | Flickering<br>(load de-<br>pendant) | The device sends/receives Ethernet frames.        |
|                          | <br>(Off)    | Off                                 | The device does not send/receive Ethernet frames. |

Table 42: LED states for the EtherNet/IP Scanner protocol

| LED state                         | Definition                                                                                                                                                                                                                                                 |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Blinking<br>(1 Hz)                | The indicator turns on and off with a frequency of 1 Hz:<br>"on" for 500 ms, followed by "off" for 500 ms.                                                                                                                                                 |
| Flickering<br>(load<br>dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 43: LED state definitions for the EtherNet/IP Scanner protocol



## 7.9 EtherNet/IP Adapter (Slave)

For the EtherNet/IP Adapter protocol, the communication LEDs **MS** and **NS** as well as the Ethernet LEDs **LINK** and **ACT** can assume the states described below. This description is valid from stack version V3.4 (V3).

| LED                                                             | Color                                                                                                 | State                           | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MS</b><br>(Module status)<br>General name:<br><b>COM 0</b>   | <b>Duo-LED red/green</b>                                                                              |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                 |  (green)             | On                              | <b>Device operational:</b> The device is operating correctly.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                 |  (green)             | Flashing (1 Hz)                 | <b>Standby:</b> The device has not been configured.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                 |  (green/red/green)   | Flashing fast green/red/green   | <b>Self-test:</b> The device performs a self-test after power-on. The following sequence is displayed during the self-test: <ul style="list-style-type: none"> <li>• NS-LED off.</li> <li>• MS-LED turns green for approximately 250 ms, turns red for approximately 250 ms, and again turns green (and holds that state until the power-up test has completed).</li> <li>• NS-LED turns green for approximately 250 ms, turns red for approximately 250 ms, and then turns off (and holds that state until the power-up test has completed).</li> </ul> |
|                                                                 |  (red/green/off)     | Flashing sequence red/green/off | <b>Flashing sequence:</b> The flashing sequence is used to visually identify the device. The scanner can start the flashing sequence in Identity object 1 of the device. The MS LED and NS LED perform the flashing sequence simultaneously.                                                                                                                                                                                                                                                                                                             |
|                                                                 |  (red)              | Flashing (1 Hz)                 | <b>Major recoverable fault:</b> The device has detected a major recoverable fault. E.g., an incorrect or inconsistent configuration can be considered a major recoverable fault.                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                 |  (red)             | On                              | <b>Major unrecoverable fault:</b> The device has detected a major unrecoverable fault.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                 |  (off)             | Off                             | <b>No power:</b> The device is powered off.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>NS</b><br>(Network-status)<br>General name::<br><b>COM 1</b> | <b>Duo-LED red/green</b>                                                                              |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                 |  (green)           | On                              | <b>Connected:</b> An IP address is configured, at least one CIP connection (any transport class) is established, and an Exclusive Owner connection has not timed out.                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                 |  (green)           | Flashing (1 Hz)                 | <b>No connections:</b> An IP address is configured, but no CIP connections are established, and an Exclusive Owner connection has not timed out.                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                 |  (green/red/green) | Flashing fast green/red/green   | <b>Self-test:</b> The device performs a self-test after power-on. Refer to the description of the MS LED in the self-test status.                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                 |  (red/green/off)   | Flashing sequence red/green/off | <b>Flashing sequence:</b> The flashing sequence is used to visually identify the device. The scanner can start the flashing sequence in Identity object 1 of the device. The MS LED and NS LED perform the flashing sequence simultaneously.                                                                                                                                                                                                                                                                                                             |
|                                                                 |  (red)             | Flashing (1 Hz)                 | <b>Connection timeout:</b> An IP address is configured, and an Exclusive Owner connection for which this device is the target has timed out.<br><br>The NS LED returns to steady green only when all timed out Exclusive Owner connections are reestablished.                                                                                                                                                                                                                                                                                            |
|                                                                 |  (red)             | On                              | <b>Duplicate IP:</b> The device has detected that its IP address is already in use.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                 |  (off)             | Off                             | <b>Not powered, no IP address:</b> The device does not have an IP address (or is powered off).                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| LED                      | Color                                                                                      | State                           | Meaning                                           |
|--------------------------|--------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------|
| <b>LINK</b><br>Ch0 & Ch1 | <b>LED grün</b>                                                                            |                                 |                                                   |
|                          |  (green)  | On                              | The device is linked to the Ethernet.             |
|                          |  (off)    | Off                             | The device has no link to the Ethernet.           |
| <b>ACT</b><br>Ch0 & Ch1  | <b>LED gelb</b>                                                                            |                                 |                                                   |
|                          |  (yellow) | Flickering<br>(load de-pendant) | The device sends/receives Ethernet frames.        |
|                          |  (aus)    | Off                             | The device does not send/receive Ethernet frames. |

Table 44: LED states for the EtherNet/IP Adapter protocol

| LED state                             | Definition                                                                                                                                                                                                                                                 |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flashing (1 Hz)                       | The LED turns on and off with a frequency of 1 Hz: "On" for 500 ms, followed by "Off" for 500 ms.                                                                                                                                                          |
| Flashing fast<br>green/red/green      | The MS LED or NS LED turns on green "On" for 250 ms, then red "On" for 250 ms, then green "On" (until the test is completed).                                                                                                                              |
| Flashing<br>sequence<br>red/green/off | The MS LED and NS LED each turn red "On" for 500 ms, then green "On" for 500 ms, then "Off" for 500 ms. This flashing sequence is repeated at least 6 times.                                                                                               |
| Flickering<br>(load<br>dependant)     | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 45: LED state definitions for the EtherNet/IP Adapter protocol

## 7.10 Open Modbus/TCP

For the OpenModbusTCP protocol, the communication LEDs **RUN** and **ERR** as well as the Ethernet LEDs **LINK** and **ACT** can assume the states described below. This description is valid from stack version V2.5.

| LED                                  | Color                                                                                        | State                       | Meaning                                                                                   |
|--------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------|
| <b>RUN</b><br>General name:<br>COM 0 | <b>Duo-LED red/green</b>                                                                     |                             |                                                                                           |
|                                      |  (green)    | On                          | <b>Connected:</b> OMB task has communication. At least one TCP connection is established. |
|                                      |  (green)    | Flashing (1 Hz)             | <b>Ready, not yet configured:</b> OMB task is ready and not yet configured.               |
|                                      |  (green)    | Flashing (5 Hz)             | <b>Waiting for Communication:</b> OMB task is configured.                                 |
| <b>ERR</b><br>General name:<br>COM 1 |  (off)      | Off                         | <b>Not Ready:</b> OMB task is not ready.                                                  |
|                                      | <b>Duo-LED red/green</b>                                                                     |                             |                                                                                           |
|                                      |  (red)      | Flashing (2 Hz, 25% on)     | System error                                                                              |
| <b>LINK</b><br>Ch0 & Ch1             |  (red)      | On                          | Communication error active                                                                |
|                                      | <b>LED green</b>                                                                             |                             |                                                                                           |
|                                      |  (green)   | On                          | The device is linked to the Ethernet.                                                     |
| <b>ACT</b><br>Ch0 & Ch1              |  (off)    | Off                         | The device has no link to the Ethernet.                                                   |
|                                      | <b>LED yellow</b>                                                                            |                             |                                                                                           |
|                                      |  (yellow) | Flickering (load dependant) | The device sends/receives Ethernet frames.                                                |
| <b>ACT</b><br>Ch0 & Ch1              |  (off)    | Off                         | The device does not send/receive Ethernet frames.                                         |

Table 46: LED states for the OpenModbusTCP protocol

| LED state                   | Definition                                                                                                                                                                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flashing (1 Hz)             | The indicator turns on and off with a frequency of 1 Hz: "on" for 500 ms, followed by "off" for 500 ms.                                                                                                                                                    |
| Flashing (2 Hz, 25% on)     | The indicator turns on and off with a frequency of 2 Hz: "on" for 125 ms, followed by "off" for 375 ms.                                                                                                                                                    |
| Flashing (5 Hz)             | The indicator turns on and off with a frequency of 5 Hz: "on" for 100 ms, followed by "off" for 100 ms.                                                                                                                                                    |
| Flickering (load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 47: LED state definitions for the OpenModbusTCP protocol

## 7.11 POWERLINK Controlled Node/Slave

For the POWERLINK Controlled Node protocol, the communication LEDs **BS** (Bus Status) and **BE** (Bus Error) as well as the Ethernet LED **L/A** can assume the states described below. This description is valid from stack version V2.1 respectively from stack version V3.0.

| LED                                                           | Color                                                                                       | State                       | Meaning                                                                                       |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------|
| <b>BS</b><br>(Bus Status)<br>General<br>name:<br><b>COM 0</b> | <b>Duo LED red/green</b>                                                                    |                             |                                                                                               |
|                                                               |  (green)   | On                          | Slave is in ' <b>Operational</b> ' state                                                      |
|                                                               |  (green)   | Triple Flash                | Slave is in ' <b>ReadyToOperate</b> ' state                                                   |
|                                                               |  (green)   | Double flash                | Slave is in ' <b>Pre-Operational 2</b> ' state                                                |
|                                                               |  (green)   | Single flash                | Slave is in ' <b>Pre-Operational 1</b> ' state                                                |
|                                                               |  (green)   | Flickering<br>(10 Hz)       | Slave is in ' <b>Basic Ethernet</b> ' state                                                   |
|                                                               |  (green)   | Blinking<br>(2,5 Hz)        | Slave is in ' <b>Stopped</b> ' state                                                          |
| <b>BE</b><br>(Bus Error)<br>General<br>name:<br><b>COM 1</b>  |  (off)     | Off                         | Slave has no error                                                                            |
|                                                               |  (red)    | On                          | Slave has detected an error                                                                   |
|                                                               |                                                                                             |                             |                                                                                               |
| <b>L/A</b><br>Ch0 & Ch1                                       | <b>LED green</b>                                                                            |                             |                                                                                               |
|                                                               |  (green) | On                          | <b>Link:</b> The device is linked to the Ethernet, but does not send/receive Ethernet frames. |
|                                                               |  (green) | Flickering (load dependant) | <b>Activity:</b> The device is linked to the Ethernet and sends/receives Ethernet frames.     |
| Ch0 & Ch1                                                     |  (off)   | Off                         | The device has no link to the Ethernet.                                                       |
|                                                               |                                                                                             |                             |                                                                                               |
| Ch0 & Ch1                                                     | <b>LED yellow</b>                                                                           |                             |                                                                                               |
|                                                               |  (off)   | Off                         | This LED is not used.                                                                         |

Table 48: LED states for the POWERLINK Controlled Node protocol

| LED state                   | Definition                                                                                                                                                                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Triple Flash                | The indicator shows a sequence of three short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).                                                                                     |
| Double flash                | The indicator shows a sequence of two short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).                                                                                       |
| Single flash                | The indicator shows one short flash (200 ms) followed by a long "off" phase (1,000 ms).                                                                                                                                                                    |
| Flickering<br>(10 Hz)       | The indicator turns on and off with a frequency of 10 Hz: "on" for 50 ms, followed by off for 50 ms. The red LED and the green LED are switched on alternately.                                                                                            |
| Blinking<br>(2,5 Hz)        | The indicator turns on and off phase with a frequency of 2.5 Hz: on for 200 ms, followed by off for 200 ms. The red LED and the green LED are switched on alternately.                                                                                     |
| Flickering (load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 49: LED state definitions for the POWERLINK Controlled Node protocol

## 7.12 PROFINET IO Controller

For the PROFINET IO Controller protocol, the system status LED **SYS**, the communication LEDs **SF** (system failure) and **BF** (bus failure), as well as the Ethernet LEDs **LINK** and **RX/TX** can assume the states described below. This description is valid from stack version V3.0.

| <b>SYS</b>                                | <b>SF</b>                     | <b>BF</b>                 | <b>Meaning</b>                                                                                                                                                                                       |
|-------------------------------------------|-------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System Status                             | System Failure                | Bus Failure               | LED name                                                                                                                                                                                             |
| yellow/green                              | <b>COM 0</b><br>red/green     | <b>COM 1</b><br>red/green | General LED name<br>Colours of the Duo LEDs SYS, SF or BF                                                                                                                                            |
| <b>Firmware and Configuration</b>         |                               |                           |                                                                                                                                                                                                      |
| ● Off                                     | ● Off                         | ● Off                     | Power supply for the device is missing or hardware defect.                                                                                                                                           |
| ● On, yellow                              | ● Off                         | ● Off                     | No second stage bootloader found in Flash memory.                                                                                                                                                    |
| 🌞<br>Flashing,<br>green/yellow,<br>cyclic | ● Off                         | ● Off                     | No firmware file found in Flash file system.                                                                                                                                                         |
| ● On, green                               | ● On, red                     | ● Off                     | PROFINET IO Controller is not configured.                                                                                                                                                            |
| ● On, green                               | ● Off                         | ● On, red                 | No Ethernet port has a link. E.g., no cable connected to any of the Ethernet ports.                                                                                                                  |
| ● On, green                               | ● Off                         | 🌞 Flashing,<br>red, 2 Hz  | PROFINET IO Controller is not online (Bus is switched to Off).                                                                                                                                       |
| <b>PROFINET communication</b>             |                               |                           |                                                                                                                                                                                                      |
| ● On, green                               | ● Off<br>or<br>● On, red      | 🌞 Flashing,<br>red, 1 Hz  | Not all configured devices are in data exchange.                                                                                                                                                     |
| ● On, green                               | ● On, red                     | -                         | One IO Device connected to the PROFINET IO Controller reports a problem.                                                                                                                             |
| ● On, green                               | ● Off                         | ● Off                     | All devices are in data exchange and no problem has been reported by any device.                                                                                                                     |
| <b>PROFINET IO Controller operation</b>   |                               |                           |                                                                                                                                                                                                      |
| ● On, green                               | 🌞 Flashing,<br>red, 1 Hz, 3 s | ● Off                     | A PROFINET DCP Set Signal has been received.                                                                                                                                                         |
| ● On, green                               | 🌞 Flashing,<br>red, 2 Hz      | 🌞 Flashing,<br>red, 2 Hz  | The PROFINET IO Controller has detected an address conflict.<br>Another device in the network is using the same Name of Station or IP address as the PROFINET IO Controller.<br>Or<br>Watchdog error |
| ● On, green                               | ● On, red                     | ● On, red                 | No valid Master license                                                                                                                                                                              |

Table 50: PROFINET IO Controller, SYS, COM0 and COM1 LEDs states

| LED                       | Color                                                                                        | State                          | Meaning                                           |
|---------------------------|----------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------|
| <b>LINK</b><br>Ch0 & Ch1  | <b>LED green</b>                                                                             |                                |                                                   |
|                           | <br>(green) | On                             | The device is linked to the Ethernet.             |
|                           | <br>(off)   | Off                            | The device has no link to the Ethernet.           |
| <b>RX/TX</b><br>Ch0 & Ch1 | <b>LED yellow</b>                                                                            |                                |                                                   |
|                           | <br>(gelb)  | Flickering<br>(load dependent) | The device sends/receives Ethernet frames.        |
|                           | <br>(off)   | Off                            | The device does not send/receive Ethernet frames. |

Table 51: PROFINET IO Controller, Ethernet LEDs states

| LED state                      | Definition                                                                                                                                                                                                                                                 |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flashing<br>(1 Hz, 3 s)        | The indicator turns on and off for 3 seconds with a frequency of 1 Hz:<br>"on" for 500 ms, followed by "off" for 500 ms.                                                                                                                                   |
| Flashing<br>(1 Hz)             | The indicator turns on and off with a frequency of 1 Hz:<br>"on" for 500 ms, followed by "off" for 500 ms.                                                                                                                                                 |
| Flashing (2 Hz)                | The indicator turns on and off with a frequency of 2 Hz:<br>"on" for 250 ms, followed by "off" for 250 ms.                                                                                                                                                 |
| Flickering<br>(load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 52: PROFINET IO Controller, LEDs states definitions

## 7.13 PROFINET IO-Device

For the PROFINET IO-Device protocol, the communication LEDs **SF** (System Failure) and **BF** (Bus Failure) as well as the Ethernet LEDs **LINK** and **RX/TX** can assume the states described below. This description is valid from stack version V3.x (V3).

| LED                                                      | Color                                                                                      | State                       | Meaning                                                                        |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------|
| <b>SF</b> (System Failure)<br>General name: <b>COM 0</b> | <b>Duo LED red/green</b>                                                                   |                             |                                                                                |
|                                                          |  (off)    | Off                         | No error                                                                       |
|                                                          |  (red)    | Flashing (1 Hz, 3 s)        | DCP signal service is initiated via the bus.                                   |
|                                                          |  (red)    | On                          | Watchdog timeout; channel, generic or extended diagnosis present; system error |
| <b>BF</b> (Bus Failure)<br>General name: <b>COM 1</b>    | <b>Duo LED red/green</b>                                                                   |                             |                                                                                |
|                                                          |  (off)    | Off                         | No error                                                                       |
|                                                          |  (red)    | Flashing (2 Hz)             | No data exchange                                                               |
|                                                          |  (red)    | On                          | No configuration; or low speed physical link; or no physical link              |
| <b>LINK</b><br>Ch0 & Ch1                                 | <b>LED green</b>                                                                           |                             |                                                                                |
|                                                          |  (green)  | On                          | The device is linked to the Ethernet.                                          |
|                                                          |  (off)  | Off                         | The device has no link to the Ethernet.                                        |
| <b>RX/TX</b><br>Ch0 & Ch1                                | <b>LED yellow</b>                                                                          |                             |                                                                                |
|                                                          |  (gelb) | Flickering (load dependant) | The device sends/receives Ethernet frames.                                     |
|                                                          |  (off)  | Off                         | The device does not send/receive Ethernet frames.                              |

Table 53: LED states for the PROFINET IO-Device protocol

| LED state                   | Definition                                                                                                                                                                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flashing (1 Hz, 3 s)        | The indicator turns on and off for 3 seconds with a frequency of 1 Hz: "on" for 500 ms, followed by "off" for 500 ms.                                                                                                                                      |
| Flashing (2 Hz)             | The indicator turns on and off with a frequency of 2 Hz: "on" for 250 ms, followed by "off" for 250 ms.                                                                                                                                                    |
| Flickering (load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 54: LED state definitions for the PROFINET IO-Device protocol

## 7.14 Sercos Master

For the Sercos Master protocol, the communication LEDs **STA** and **ERR** as well as the Ethernet LED **L/A** can assume the states described below. This description is valid from stack version V2.1.

| LED                                         | Color                                                                                       | State                       | Meaning                                                                                         |
|---------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------|
| <b>STA</b><br>General name:<br><b>COM 0</b> | <b>Duo LED red/green</b>                                                                    |                             |                                                                                                 |
|                                             |  (green)   | On                          | <b>CP4: Communication phase 4</b>                                                               |
|                                             |  (green)   | Triple Flash                | <b>CP3: Communication phase 3</b>                                                               |
|                                             |  (green)   | Double flash                | <b>CP2: Communication phase 2</b>                                                               |
|                                             |  (green)   | Single flash                | <b>CP1: Communication phase 1</b>                                                               |
|                                             |  (green)   | Blinking (2,5 Hz)           | <b>CP0: Communication phase 0</b>                                                               |
|                                             |  (green)   | Flickering (10 Hz)          | <b>Master is not configured and is in NRT.</b> After a status change this isn't indicated again |
|                                             |  (off)     | Off                         | <b>NRT: Non Real-Time Mode</b>                                                                  |
| <b>ERR</b><br>General name:<br><b>COM 1</b> | <b>Duo LED red/green</b>                                                                    |                             |                                                                                                 |
|                                             |  (red)     | Single flash                | Bus Sync error threshold                                                                        |
|                                             |  (red)     | Double flash                | Internal Stop of the bus cycle                                                                  |
|                                             |  (red)     | Triple Flash                | DPM watchdog has expired.                                                                       |
|                                             |  (red)    | Quadruple Flash             | No Master license present in the device.                                                        |
|                                             |  (red)   | Blinking (2,5 Hz)           | Error in the configuration database.                                                            |
|                                             |  (red)   | Single Flickering           | Channel Init was executed at the Master.                                                        |
|                                             |  (red)   | Double Flickering           | Slave is missing.                                                                               |
|                                             |  (red)   | Flickering (10 Hz)          | Boot-up was stopped due to an error.                                                            |
|                                             |  (off)   | Off                         | No error                                                                                        |
| <b>L/A</b><br>Ch0 & Ch1                     | <b>LED green</b>                                                                            |                             |                                                                                                 |
|                                             |  (green) | On                          | <b>Link:</b> The device is linked to the Ethernet, but does not send/receive Ethernet frames.   |
|                                             |  (green) | Flickering (load dependant) | <b>Activity:</b> The device is linked to the Ethernet and sends/receives Ethernet frames.       |
|                                             |  (off)   | Off                         | The device has no link to the Ethernet.                                                         |
| Ch0 & Ch1                                   | <b>LED yellow</b>                                                                           |                             |                                                                                                 |
|                                             |  (off)   | Off                         | This LED is not used.                                                                           |

Table 55: LED states for the Sercos Master protocol



| LED state                   | Definition                                                                                                                                                                                                                                                     |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Single flash                | The indicator shows one short flash (200 ms) followed by a long "off" phase (1,000 ms).                                                                                                                                                                        |
| Double flash                | The indicator shows a sequence of two short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).                                                                                           |
| Triple Flash                | The indicator shows a sequence of three short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).                                                                                         |
| Quadruple Flash             | The indicator shows a sequence of four short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long off phase (1,000 ms).                                                                                          |
| Blinking (2,5 Hz)           | The indicator turns on and off with a frequency of 2,5 Hz: "on" for 200 ms, followed by "off" for 200 ms.                                                                                                                                                      |
| Single Flickering           | The indicator is switched on and off once: 'on' for 50 ms, followed by 'off' for 500 ms.                                                                                                                                                                       |
| Double Flickering           | The indicator is switched on and off and on once: 'on' / 'off' / 'on' each for approximately 50 ms, followed by 'off' for 500 ms.                                                                                                                              |
| Flickering (10 Hz)          | The indicator turns on and off with a frequency of 10 Hz: 'on' for 50 ms, followed by 'off' for 50 ms.                                                                                                                                                         |
| Flickering (load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: 'on' for approximately 50 ms, followed by 'off' for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

*Table 56: LED state definitions for the Sercos Master protocol*

## 7.15 Sercos Slave

For the Sercos Slave protocol, the communication LED **S** as well as the Ethernet LED **L/A** can assume the states described below. This description is valid from stack version V3.2.

| LED                                       | Color                                                                                            | State                       | Meaning                                                                                                                                    |
|-------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>S</b><br>General name:<br><b>COM 0</b> | <b>Duo LED red/green</b> (orange = red/green simultaneously)                                     |                             |                                                                                                                                            |
|                                           |  (green)        | On                          | <b>CP4: Communication phase 4:</b> Normal operation, no error                                                                              |
|                                           |  (green)        | Blinking (2 Hz)             | <b>Loopback:</b> The network state has changed from „fast-forward“ to „loopback“.                                                          |
|                                           |  (green/orange) | Flashing (3 x green/3s)     | <b>CP3: Communication phase 3</b>                                                                                                          |
|                                           |                                                                                                  | (2 x green/3s)              | <b>CP2: Communication phase 2</b>                                                                                                          |
|                                           |                                                                                                  | (1 x green/3s)              | <b>CP1: Communication phase 1</b>                                                                                                          |
|                                           |  (orange)       | On                          | <b>CP0: Communication phase 0</b>                                                                                                          |
|                                           |  (orange/green) | Blinking (2 Hz)             | <b>HP0:</b> Hot-plug mode                                                                                                                  |
|                                           |                                                                                                  | (1 x orange/3s)             | <b>HP1:</b> Hot-plug mode                                                                                                                  |
|                                           |                                                                                                  | (2 x orange/3s)             | <b>HP2:</b> Hot-plug mode                                                                                                                  |
|                                           |  (orange)       | Flashing (2 Hz)             | <b>Identification:</b><br>Invoked by (C-DEV.Bit15 in the Device Control)<br>Or<br>SIP Identification Request                               |
|                                           |  (green/red)  | Flashing (2 Hz, min. 2s)    | <b>MST losses ≥ (S-0-1003/2):</b> The communication warning (S-DEV.Bit 15) is present in the Device Status.                                |
|                                           |  (red/orange) | Flashing (2 Hz)             | <b>Application error (C1D):</b> See GDP & FSP Status codes class error.                                                                    |
|                                           |  (red)        | Flashing (2 Hz)             | <b>Watchdog error:</b> Application is not running                                                                                          |
|                                           |  (red)        | On                          | <b>Communication Error (C1D):</b> Error detected according to Sercos third generation Class 1 Diagnosis, see SCP Status codes class error. |
|                                           |  (off)        | Off                         | <b>NRT-Mode:</b> (Non Real-Time Mode) No Sercos Communication                                                                              |
| General name:<br><b>COM 1</b>             | <b>Duo LED red/green</b>                                                                         |                             |                                                                                                                                            |
|                                           |  (off)        | Off                         | This LED is not used.                                                                                                                      |
| <b>L/A</b><br>Ch0 & Ch1                   | LED green                                                                                        |                             |                                                                                                                                            |
|                                           |  (green)      | On                          | <b>Link:</b> The device is linked to the Ethernet, but does not send/receive Ethernet frames.                                              |
|                                           |  (green)      | Flickering (load dependant) | <b>Activity:</b> The device is linked to the Ethernet and sends/receives Ethernet frames.                                                  |
|                                           |  (off)        | Off                         | The device has no link to the Ethernet.                                                                                                    |
| Ch0 & Ch1                                 | LED yellow                                                                                       |                             |                                                                                                                                            |
|                                           |  (off)        | Off                         | This LED is not used.                                                                                                                      |

Table 57: LED state definitions for the Sercos Slave protocol

| LED state                   | Definition                                                                                                                                                                                                                                                     |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flashing (2 Hz)             | The indicator turns on and off with a frequency of 2 Hz:<br><i>one color:</i> On for appr. 250 ms, followed by off for appr. 250 ms.<br><i>two colors:</i> First color for appr. 250 ms, followed by the second color for appr. 250 ms.                        |
| Flashing<br>(1 x green/3s)  | Flashing green for 250 ms, then orange on for 2 second and 750 ms.                                                                                                                                                                                             |
| (2 x green/3s)              | Flashing green / orange / green, each for 250 ms, then orange on for 2 seconds and 250 ms.                                                                                                                                                                     |
| (3 x green/3s)              | Flashing green / orange / green / orange / green, each for 250 ms, then orange on for 1 second and 750 ms.                                                                                                                                                     |
| (1 x orange/3s)             | Flashing orange for 250 ms, then green on for 2 second an 750 ms.                                                                                                                                                                                              |
| (2 x orange/3s)             | Flashing orange / green / orange, each for 250 ms, then green on for 2 seconds and 250 ms.                                                                                                                                                                     |
| Flickering (load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: "on" for approximately 50 ms, followed by "off" for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

*Table 58: LED state definitions for the Sercos Slave protocol*

## 7.16 VARAN Client (Slave)

For the VARAN Client protocol, the communication LEDs **RUN** and **ERR** as well as the Ethernet LEDs **LINK IN** and **LINK OUT** or **ACT IN** and **ACT OUT** can assume the states described below. This description is valid from stack version V1.0.

| LED                                               | Color                                                                                        | State                       | Meaning                                           |
|---------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------|
| <b>RUN</b><br>General name:<br><b>COM 0</b>       | <b>Duo-LED red/green</b>                                                                     |                             |                                                   |
|                                                   |  (green)    | On                          | Configured and communication is active.           |
|                                                   |  (green)    | Blinking (5 Hz)             | Configured and communication is inactive.         |
|                                                   |  (off)      | Off                         | Not configured.                                   |
| <b>ERR</b><br>General name:<br><b>COM 1</b>       | <b>Duo-LED red/green</b>                                                                     |                             |                                                   |
|                                                   |  (off)      | Off                         | Configured.                                       |
|                                                   |  (red)      | Blinking (5 Hz)             | Not configured.                                   |
|                                                   |  (red)      | On                          | Communication error occurred.                     |
| <b>LINK IN</b><br>Ch0 &<br><b>LINK OUT</b><br>Ch1 | <b>LED green</b>                                                                             |                             |                                                   |
|                                                   |  (green)    | On                          | The device is linked to the Ethernet.             |
|                                                   |  (off)     | Off                         | The device has no link to the Ethernet.           |
| <b>ACT IN</b><br>Ch0 &<br><b>ACT OUT</b><br>Ch1   | <b>LED yellow</b>                                                                            |                             |                                                   |
|                                                   |  (yellow) | Flickering (load dependant) | The device sends/receives Ethernet frames.        |
|                                                   |  (off)    | Off                         | The device does not send/receive Ethernet frames. |

Table 59: LED-Zustände für das VARAN-Client-Protokoll

| LED state                   | Definition                                                                                                                                                                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Blinking (5 Hz)             | The indicator turns on and off with a frequency of 5 Hz: "on" for 100 ms, followed by "off" for 100 ms.                                                                                                                                                    |
| Flickering (load dependant) | The indicator turns on and off with a frequency of approximately 10 Hz to indicate high Ethernet activity: on for approximately 50 ms, followed by off for 50 ms. The indicator turns on and off in irregular intervals to indicate low Ethernet activity. |

Table 60: Definitionen der LED-Zustände für das VARAN-Client-Protokoll

## 7.17 PROFIBUS DP Master

For the PROFIBUS DP Master protocol, the communication status LED **COM** can assume the states described below. This description is valid from stack version V2.6.

| LED | Color                                                                                     | State            | Meaning                                                                                                                                |
|-----|-------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| COM | Duo LED red/green                                                                         |                  |                                                                                                                                        |
|     |  (green) | On               | Communication to all Slaves is established.                                                                                            |
|     |  (green) | Flashing (5 Hz)  | PROFIBUS is configured, but bus communication is not yet released from the application.                                                |
|     |  (green) | Flashing acyclic | No configuration or faulty configuration                                                                                               |
|     |  (red)   | Flashing (5 Hz)  | Communication to at least one Slave is disconnected.                                                                                   |
|     |  (red)   | On               | Communication to all Slaves is disconnected or another serious error has occurred.<br>Redundant Mode: The active Master was not found. |
|     |  (off)   | Off              | Device is not switched on or network power is missing.                                                                                 |

Table 61: LED states for the PROFIBUS DP Master protocol

| LED State        | Definition                                                                                              |
|------------------|---------------------------------------------------------------------------------------------------------|
| Flashing (5 Hz)  | The indicator turns on and off with a frequency of 5 Hz: "on" for 100 ms, followed by "off" for 100 ms. |
| Flashing acyclic | The indicator turns on and off in irregular intervals.                                                  |

Table 62: LED state definitions for the PROFIBUS DP Master protocol



**Note:** For 2-Channel Devices per channel works 1 communication LED.

\* Descriptions for 2-Communication Status LEDs of earlier device revisions are included in the user manual for PC cards cifX fieldbus up to manual rev. 23.

7.18 PROFIBUS DP Slave

For the PROFIBUS DP Slave protocol, the communication status LED **COM** can assume the states described below. This description is valid from stack version V2.7.

| LED | Color                                                                                     | State                    | Meaning                                                                             |
|-----|-------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------|
| COM | Duo LED red/green                                                                         |                          |                                                                                     |
|     |  (green) | On                       | RUN, cyclic communication                                                           |
|     |  (green) | Flashing, cyclic (2 Hz)  | Master is in CLEAR state.                                                           |
|     |  (red)   | Flashing, acyclic (1 Hz) | Device is not configured.                                                           |
|     |  (red)   | Flashing, cyclic (2 Hz)  | STOP, no communication, connection error                                            |
|     |  (red)   | On                       | Wrong configuration at PROFIBUS DP Slave.                                           |
|     |  (off)   | Off                      | Device is not switched on or power is missing.<br>During firmware download process. |

Table 63: LED states for the PROFIBUS DP Slave protocol

| LED State                | Definition                                                                                                                      |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Flashing, acyclic (1 Hz) | The indicator turns on and off in irregular intervals, with a frequency of 1 Hz: "on" for 750 ms, followed by "off" for 250 ms. |
| Flashing, cyclic (2 Hz)  | The indicator turns on and off with a frequency of 2 Hz: "on" for 250 ms, followed by "off" for 250 ms.                         |

Table 64: LED state definitions for the PROFIBUS DP Slave protocol



**Note:** For 2-Channel Devices per channel works 1 communication LED.

\* Descriptions for 2-Communication Status LEDs of earlier device revisions are included in the user manual for PC cards cifX fieldbus up to manual rev. 23.

## 7.19 CANopen Master

For the **CANopen Master protocol**, the communication status LED **CAN** can assume the states described below. This description is valid from stack version V2.11.

| LED | Color                                                                                     | State             | Meaning                                                                                                                                                   |
|-----|-------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAN | <b>Duo-LED red/green</b>                                                                  |                   |                                                                                                                                                           |
|     |  (green) | On                | <b>OPERATIONAL:</b> The device is in the OPERATIONAL state.                                                                                               |
|     |  (green) | Blinking (2,5 Hz) | <b>PREOPERATIONAL:</b> The device is in the PREOPERATIONAL state.                                                                                         |
|     |  (green) | Single flash      | <b>STOPPED:</b> The device is in STOPPED state.                                                                                                           |
|     |  (red)   | Single flash      | <b>Warning Limit reached:</b> At least one of the error counters of the CAN controller has reached or exceeded the warning level (too many error frames). |
|     |  (red)   | Double flash      | <b>Error Control Event:</b> A guard event (NMT Slave or NMT Master) or a heartbeat event (Heartbeat consumer) has occurred.                               |
|     |  (red)   | On                | <b>Bus Off:</b> The CAN controller is in bus OFF state.                                                                                                   |
|     |  (aus)   | Off               | <b>RESET:</b> The device is executing a reset or the device has no configuration.                                                                         |

Table 65: LED states for the CANopen Master protocol

| LED state         | Definition                                                                                                                                                               |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Blinking (2,5 Hz) | The indicator turns on and off with a frequency of 2,5 Hz:<br>"on" for 200 ms, followed by "off" for 200 ms.                                                             |
| Single flash      | The indicator shows one short flash (200 ms) followed by a long "off" phase (1,000 ms).                                                                                  |
| Double flash      | The indicator shows a sequence of two short flashes (each 200 ms), separated by a short "off" phase (200 ms). The sequence is finished by a long "off" phase (1,000 ms). |

Table 66: LED state definitions for the CANopen Master protocol

\* Descriptions for 2-Communication Status LEDs of earlier device revisions are included in the user manual for PC cards cifX fieldbus up to manual rev. 23.

## 7.20 CANopen Slave

For the **CANopen Slave protocol**, the communication status LED **CAN** can assume the states described below. This description is valid from stack version V3.4.

| LED                                                                     | Color                                                                                         | State              | Meaning                                                                                                                                                   |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>cifX with 1 Communication Status LED</b> (current Hardware Revision) |                                                                                               |                    |                                                                                                                                                           |
| <b>CAN</b>                                                              | <b>Duo LED red/green</b>                                                                      |                    |                                                                                                                                                           |
|                                                                         |  (green)     | On                 | <b>OPERATIONAL:</b> The device is in the OPERATIONAL state.                                                                                               |
|                                                                         |  (green)     | Blinking (2.5 Hz)  | <b>PREOPERATIONAL:</b> The device is in the PREOPERATIONAL state.                                                                                         |
|                                                                         |  (green)     | Single flash       | <b>STOPPED:</b> The device is in STOPPED state.                                                                                                           |
|                                                                         |  (red/green) | Flickering (10 Hz) | <b>Auto Baud Rate Detection active:</b> The Device is in the auto baud rate detection mode.                                                               |
|                                                                         |  (red)       | Single flash       | <b>Warning Limit reached:</b> At least one of the error counters of the CAN controller has reached or exceeded the warning level (too many error frames). |
|                                                                         |  (red)       | Double flash       | <b>Error Control Event:</b> A guard event (NMT Slave or NMT Master) or a heartbeat event (Heartbeat consumer) has occurred.                               |
|                                                                         |  (red)       | On                 | <b>Bus Off:</b> The CAN controller is in bus OFF state.                                                                                                   |
|                                                                         |  (off)       | Off                | <b>RESET:</b> The device is executing a reset or the device has no configuration.                                                                         |

Table 67: States of the CAN LED for the CANopen Slave protocol – 1 Communication Status LED (current Hardware Revision)

| LED State          | Definition                                                                                                                                                             |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flickering (10 Hz) | The indicator turns on and off with a frequency of 10 Hz: "on" for 50 ms, followed by "off" for 50 ms.                                                                 |
| Blinking (2.5 Hz)  | The indicator turns on and off with a frequency of 2,5 Hz: "on" for 200 ms, followed by "off" for 200 ms.                                                              |
| Single Flash       | The indicator shows one short flash (200 ms) followed by a long "off" phase (1,000 ms).                                                                                |
| Double Flash       | The indicator shows a sequence of two short flashes (each 200 ms), separated by a short off phase (200 ms). The sequence is finished by a long "off" phase (1,000 ms). |

Table 68: LED state definitions for the CANopen Slave protocol

\* Descriptions for 2-Communication Status LEDs of earlier device revisions are included in the user manual for PC cards cifX fieldbus up to manual rev. 23.



## 7.21 DeviceNet Master

For the DeviceNet Master protocol, the communication status LED **MNS** can assume the states described below. This description is valid from stack version V2.3.

| LED | Color                                                                                             | State                           | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----|---------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MNS | Duo LED red/green                                                                                 |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|     |  (green)         | On                              | <b>Device operational AND on-line, connected</b><br>Device is online and has established all connections with all Slaves.                                                                                                                                                                                                                                                                                                                                                                                                   |
|     |  (green)         | Flashing (1 Hz)                 | <b>Device operational AND on-line</b><br>Device is online and has established no connection in the established state.<br>- Configuration missing, incomplete or incorrect.                                                                                                                                                                                                                                                                                                                                                  |
|     |  (green/red/Off) | Flashing (2Hz)<br>Green/Red/Off | <b>Self test after power on</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|     |  (red)           | Flashing (1 Hz)                 | <b>Minor fault and/or connection time-out</b><br>Device is online and has established one or more connections in the established state. It has data exchange with at least one of the configured Slaves. Minor or recoverable fault: No data exchange with one of the configured Slaves. One or more Slaves are not connected. Connection timeout<br>Minor or recoverable fault: No data exchange with one of the configured Slaves. One or more Slaves are not connected. Connection timeout.<br>No network power present. |
|     |  (red)         | On                              | <b>Critical fault or critical link failure</b><br>Critical connection failure; device has detected a network error: duplicate MAC-ID or severe error in CAN network (CAN-bus off).                                                                                                                                                                                                                                                                                                                                          |
|     |  (off)         | Off                             | <b>Device is not powered</b><br>- The device may not be powered.<br><b>Device is not on-line and/or no network power</b><br>- The device has not yet completed the Dup_MAC_ID test.<br>- The device is powered, but the network power is missing.                                                                                                                                                                                                                                                                           |

Table 69: LED states for the DeviceNet Master protocol

| LED state                        | Definition                                                                                                            |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Flashing (1 Hz)                  | The indicator turns on and off with a frequency of appr. 1 Hz: on for appr. 500 ms, followed by off for appr. 500 ms. |
| Flashing (2 Hz)<br>green/red/off | The indicator turns on green on for 250 ms, then red on for 250 ms, then off.                                         |

Table 70: LED state definitions for the DeviceNet Master protocol

## 7.22 DeviceNet Slave

For the DeviceNet Slave protocol, the communication status LED **MNS** can assume the states described below. This description is valid from stack version V2.3.

| LED | Color                                                                                             | State                           | Meaning                                                                                                                                                                                                                                           |
|-----|---------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MNS | Duo LED red/green                                                                                 |                                 |                                                                                                                                                                                                                                                   |
|     |  (green)         | On                              | <b>Device operational AND on-line, connected</b><br>Device is online and has established all connections with all Slaves.                                                                                                                         |
|     |  (green)         | Flashing (1 Hz)                 | <b>Device operational AND on-line</b><br>Device is online and has established no connection in the established state.<br>- Configuration missing, incomplete or incorrect.                                                                        |
|     |  (green/red/Off) | Flashing (2Hz)<br>Green/Red/Off | <b>Self test after power on</b>                                                                                                                                                                                                                   |
|     |  (red)           | Flashing (1 Hz)                 | <b>Minor fault and/or connection time-out</b><br>Device has no connectin to the Master.<br>Minor or recoverable fault: No data exchange with the Master.<br>Connection timeout.<br>No network power present.                                      |
|     |  (red)          | On                              | <b>Critical fault or critical link failure</b><br>Critical connection failure; device has detected a network error: duplicate MAC-ID or severe error in CAN network (CAN-bus off).                                                                |
|     |  (off)         | Off                             | <b>Device is not powered</b><br>- The device may not be powered.<br><b>Device is not on-line and/or no network power</b><br>- The device has not yet completed the Dup_MAC_ID test.<br>- The device is powered, but the network power is missing. |

Table 71: LED states for the DeviceNet Slave protocol

| LED state                        | Definition                                                                                                            |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Flashing (1 Hz)                  | The indicator turns on and off with a frequency of appr. 1 Hz: on for appr. 500 ms, followed by off for appr. 500 ms. |
| Flashing (2 Hz)<br>green/red/off | The indicator turns on green on for 250 ms, then red on for 250 ms, then off.                                         |

Table 72: LED state definitions for the DeviceNet Slave protocol

## 7.23 CC-Link Slave

For the CC-Link Slave protocol, the communication status LEDs **L-RUN** and **L-ERR** can assume the states described below. This description is valid from stack version V2.9.

| LED          | Color                                                                                     | State    | Meaning                                                                                                                                                                                        |
|--------------|-------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>L RUN</b> | <b>LED green</b>                                                                          |          |                                                                                                                                                                                                |
|              |  (green) | On       | After participating in the network, the device receives both refresh and polling signals or just the refresh signal normally.                                                                  |
|              |  (off)   | Off      | 1. Before participating in the network<br>2. Unable to detect carrier<br>3. Timeout<br>4. Resetting hardware                                                                                   |
| <b>L ERR</b> | <b>LED red</b>                                                                            |          |                                                                                                                                                                                                |
|              |  (red)   | Blinking | The switch setting has been changed from the setting at the reset cancellation (blinks for 0.4 sec.).                                                                                          |
|              |  (red)   | On       | 1. CRC error<br>2. Address parameter error (0,65 or greater is set including the number of occupied stations)<br>3. Baud rate switch setting error during cancellation of reset (5 or greater) |
|              |  (off)   | Off      | 1. Normal communication<br>2. Resetting hardware                                                                                                                                               |

Table 73: LED states for the CC-Link Slave protocol

## 8 Device Connections and Switches

### 8.1 Ethernet Interface

For the Ethernet interface use RJ45 plugs and twisted pair cable of category 5 (CAT5) or higher, which consists of 4 twisted cores and has a maximum transmission rate of 100 MBit/s (CAT5).

#### 8.1.1 Ethernet Pin Assignment at the RJ45 Socket

##### 100 BASE-TX and 10 BASE-T

For the PC cards CIFX 50-RE, CIFX 50E-RE, CIFX 50E-RE/ET, CIFX 70E-RE, CIFX 100EH-RE/CUBE:



**Note:** The device supports the **Auto Crossover** function. Due to this fact RX and TX can be switched. The following figure shows the RJ45 standard pin assignment.

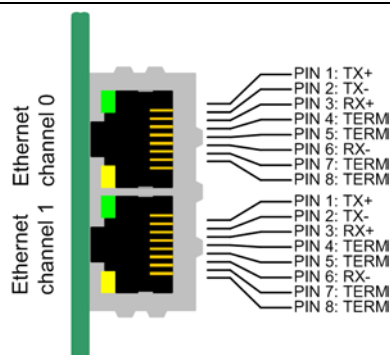


Figure 40: Ethernet Pin Assignment at the RJ45 Socket for cifX

| Pin | Signal | Meaning                                                          |
|-----|--------|------------------------------------------------------------------|
| 1   | TX+    | Transmit Data +                                                  |
| 2   | TX-    | Transmit Data –                                                  |
| 3   | RX+    | Receive Data +                                                   |
| 4   | Term 1 | Connected to each other and terminated to PE through RC circuit* |
| 5   | Term 1 |                                                                  |
| 6   | RX-    | Receive Data –                                                   |
| 7   | Term 2 | Connected to each other and terminated to PE through RC circuit* |
| 8   | Term 2 |                                                                  |
|     |        | * Bob Smith Termination                                          |

Table 74: Ethernet Pin Assignment at the RJ45 Socket for cifX



**Note:** The RJ45 socket is only for use in LAN, not for telecommunication circuits.

**1000BASE-T**

For the PC cards CIFX 50E-CCIES, CIFX 70E-CCIES:

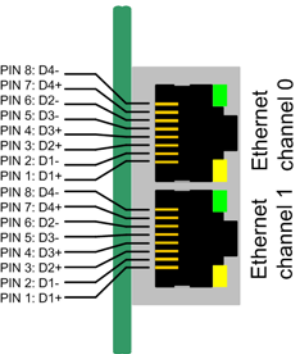


Figure 41: Ethernet Pin Assignment at the RJ45 Socket (1000 MBit/s)

| Pin                          | Signal | Meaning                                  |
|------------------------------|--------|------------------------------------------|
| 1                            | D1+    | Transmit/receive data positive channel 1 |
| 2                            | D1–    | Transmit/receive data negative channel 1 |
| 3                            | D2+    | Transmit/receive data positive channel 2 |
| 4                            | D3+    | Transmit/receive data positive channel 3 |
| 5                            | D3–    | Transmit/receive data negative channel 3 |
| 6                            | D2–    | Transmit/receive data negative channel 2 |
| 7                            | D4+    | Transmit/receive data positive channel 4 |
| 8                            | D4–    | Transmit/receive data negative channel 4 |
| Use of Bob Smith Termination |        |                                          |

Table 75: Ethernet Pin Assignment at the RJ45 Socket (1000 MBit/s)

### 8.1.2 Ethernet Connection Data

|                          | 100 BASE-TX and 10 BASE-T                          | 1000 BASE-T                                                                                      |
|--------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Medium</b>            | 2 x 2 Twisted-Pair copper cable, Cat5 (100 MBit/s) | Copper cable*, Cat6, Cat6A, Cat7, Cat7A, (1 Gbit/s)<br>*Fully occupied cable (all 8 cable cores) |
| <b>Length of cable</b>   | Max. 100 m                                         | Max. 100 m                                                                                       |
| <b>Transmission rate</b> | 10 MBit/s/100 MBit/s                               | 1 Gbit/s                                                                                         |

Table 76: Ethernet Connection Data

### 8.1.3 Use of Hubs and Switches

For the corresponding communication systems, the use of hubs and/or switches is either forbidden or allowed. The following table shows the acceptable use of hubs and switches by each communication system:

| Communication System   | Hub       | Switch                                                                                    |
|------------------------|-----------|-------------------------------------------------------------------------------------------|
| <b>EtherCAT</b>        | forbidden | only allowed between EtherCAT Master and first EtherCAT Slave (100 MBit/s, Full Duplex)   |
| <b>EtherNet/IP</b>     | allowed   | allowed (10 MBit/s/100 MBit/s, Full or Half Duplex, Auto-Negotiation)                     |
| <b>Open Modbus/TCP</b> | allowed   | allowed (10 MBit/s/100 MBit/s, Full or Half Duplex, Auto-Negotiation)                     |
| <b>POWELINK</b>        | allowed   | forbidden                                                                                 |
| <b>PROFINET IO</b>     | forbidden | Only allowed if the switch supports 'Priority Tagging' and LLDP (100 MBit/s, Full Duplex) |
| <b>Sercos</b>          | forbidden | forbidden                                                                                 |
| <b>VARAN*</b>          | forbidden | forbidden                                                                                 |

Table 77: Use of Hubs and Switches

\*Instead of hubs and switches VARAN uses splitter. [3]

## 8.2 PROFIBUS Interface

Isolated RS-485 interface:

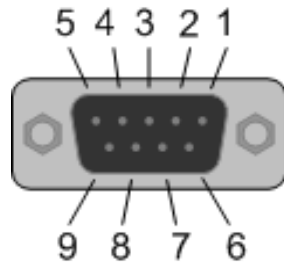


Figure 42: PROFIBUS Interface (DSub female connector, 9 pin), X400

| Connection with DSub female connector | Signal    | Meaning                                            |
|---------------------------------------|-----------|----------------------------------------------------|
| 3                                     | RxD/TxD-P | Receive/Send Data-P respectively connection B plug |
| 5                                     | DGND      | Reference potential                                |
| 6                                     | VP        | Positive supply voltage                            |
| 8                                     | RxD/TxD-N | Receive/Send Data-N respectively connection A plug |

Table 78: PROFIBUS Interface, X400

## 8.3 CANopen Interface

Isolated ISO 11898 interface:

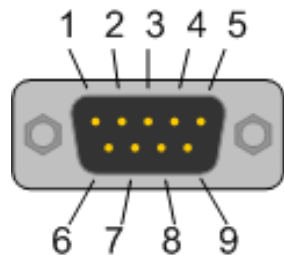


Figure 43: CANopen Interface (DSub male connector, 9 pin), X400

| Connection with DSub male connector | Signal  | Description            |
|-------------------------------------|---------|------------------------|
| 2                                   | CAN_L   | CAN_Low Bus Line       |
| 3                                   | CAN_GND | CAN Ground             |
| 7                                   | CAN_H   | CAN High Bus Line      |
| 1, 4, 5, 6, 8, 9                    |         | <b>Do not connect!</b> |

Table 79: CANopen Interface, X400

## 8.4 DeviceNet Interface

Isolated ISO 11898 interface:

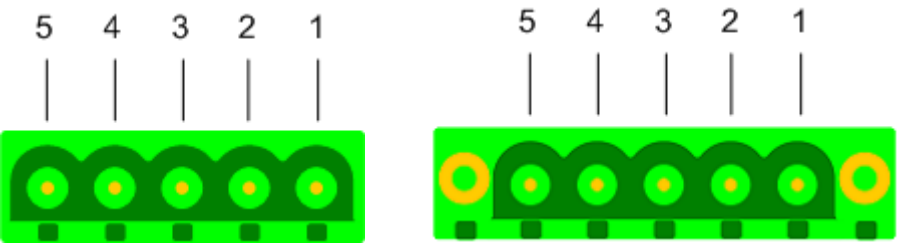


Figure 44: DeviceNet Interface (CombiCon male Connector, 5 pin), X360, right with screw holes

| Connection with CombiCon male connector | Signal | Color | Description                                  |
|-----------------------------------------|--------|-------|----------------------------------------------|
| 1                                       | V-     | Black | Reference potential DeviceNet supply voltage |
| 2                                       | CAN_L  | Blue  | CAN Low-Signal                               |
| 3                                       | Drain  |       | Shield                                       |
| 4                                       | CAN_H  | White | CAN High-Signal                              |
| 5                                       | V+     | Red   | +24 V DeviceNet supply voltage               |

Table 80: DeviceNet Interface, X360

## 8.5 CC-Link Interface

Isolated RS-485 interface:

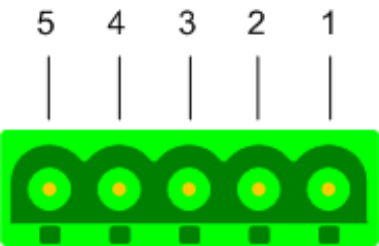


Figure 45: CC-Link Interface (CombiCon male Connector, 5 pin)

| Connection with Screw terminal Connector | Signal | Meaning      |
|------------------------------------------|--------|--------------|
| 1                                        | DA     | Data A       |
| 2                                        | DB     | Data B       |
| 3                                        | DG     | Data Ground  |
| 4                                        | SLD    | Shield       |
| 5                                        | FG     | Field Ground |

Table 81: CC-Link Interface



## 8.6 Rotary Switch for Slot Number (Card ID)

Device revisions equipped with a **Rotary Switch Slot Number (Card ID)** are listed separately in section *Hardware: PC Cards cifX*.

on page 16.

The **Rotary Switch Slot Number (Card ID)** serves to set the **Slot Number (Card ID)** of the PC cards cifX.

The figure below describes possible switch positions of the **Rotary Switch Slot Number (Card ID)**.

| Switch Position                                                                    | Meaning                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0                                                                                  | The value 0 means: <ul style="list-style-type: none"><li>▪ no <b>Slot Number (Card ID)</b>, i. e. the <b>Slot Number (Card ID)</b> is not used,</li><li>▪ for downwards compatibility purposes,</li><li>▪ characterizes PC cards cifX not equipped with a <b>Rotary Switch Slot Number (Card ID)</b>; i. e. these PC cards cifX are identified via its device number and serial number.</li></ul> |
|   | Example<br>Rotary Switch Slot Number (Card ID) <b>Switch Position 0</b>                                                                                                                                                                                                                                                                                                                           |
| 1 ... 9                                                                            | corresponds to the <b>Slot Number (Card ID)</b> 1 ... 9                                                                                                                                                                                                                                                                                                                                           |
|  | Example<br>Rotary Switch Slot Number (Card ID) <b>Switch Position 1</b>                                                                                                                                                                                                                                                                                                                           |

Table 82: Rotary Switch for Slot Number (Card ID), S1

### 8.6.1 Set Slot Number (Card ID)

If the Slot Number (Card ID) shall not be used:

- set the value 0.

Or

If the Slot Number (Card ID) shall be used:

- Set a value from 1 to 9.

### 8.6.2 Note for Device Exchange Service (Replacement Case):



**Important:** For PC cards cifX with **Rotary Switch Slot Number (Card ID)** in terms of a device exchange service (replacement case) you must set at the replacement card cifX the same **Slot Number (Card ID)** as at the preceding cifX. Then the same firmware and configuration is loaded into the replacement card cifX, as into the preceding cifX.

8.6.3 Rotary Switch Slot Number PC Cards cifX Low Profile

The *Table 83* below shows the **Rotary Switch Slot Number (Card ID)** of the PC cards cifX Low Profile PCI Express in switch position 0 and 1.

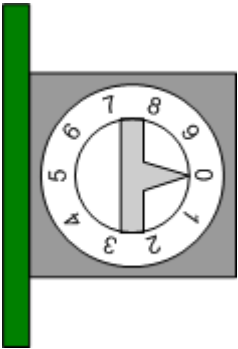
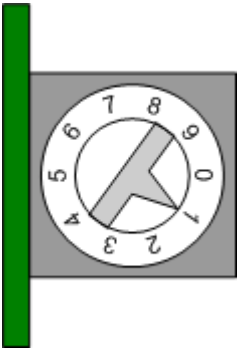
|                                                                                    |                                                                                                |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
|   | <div>Description</div> <div>Rotary Switch Slot Number (Card ID) <b>Switch Position 0</b></div> |
|  | <div>Rotary Switch Slot Number (Card ID) <b>Switch Position 1</b></div>                        |

Table 83: Rotary Switch Slot Number (Card ID) PC Cards cifX Low Profile PCI Express

## 8.7 SYNC Connector (Pin-Assignment, Hardware/Firmware)

### 8.7.1 Pin Assignment SYNC Connector, X51 (CIFX 50 50E 70E)

Only for:

CIFX 50-RE (from hardware Rev. 3 on), CIFX 50E-RE, CIFX 50E-RE\ET, CIFX 70E-RE

| Pin | Signal   |
|-----|----------|
| 1   | GND      |
| 2   | IO_SYNC0 |
| 3   | IO_SYNC1 |

Table 84: Pin Assignment for SYNC Connector, X51

### 8.7.2 Pin Assignment SYNC Connector, J1 (CIFX 100EH)

Only for: CIFX 100EH-RE\CUBE.

| Pin | Signal                                                                                                                                   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | IO_SYNC0                                                                                                                                 |
| 2   | <i>Jumper set:</i> SYNC signal is transferred to the PCI Express Bus Pin B24*<br><i>Jumper not set:</i> static high 3.3 V (with pull-up) |
| 3   | IO_SYNC1                                                                                                                                 |

Table 85: Pin Assignment for SYNC Connector, J1



#### Note! \*

- If the jumper is set on Pin1-Pin2, then the **IO\_SYNC0** signal will be transferred to the PCI Express Bus X2 (pin B24).

Or

- If the jumper is set on Pin2-Pin3, then the **IO\_SYNC1** signal will be transferred to the PCI Express Bus X2 (pin B24).

Or

- If the no jumper is set, then the signal at the PCI Express Bus X2 pin B24 will be static High **3.3 V** (with pull-up).

Compare section *Pin Assignment for PCI Express Bus CIFX 100EH-RE\CUBE* on page 118.

### 8.7.3 Items on Hardware

| Item              | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYNC Signal       | 3.3 V (LVTTTL), maximum load 6 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Connector         | <p><u>SYNC connector, X51</u> (for the PC cards cifX, as indicated under section <i>Pin Assignment SYNC Connector, X51 (CIFX 50 50E 70E)</i> on page 115.)<br/>           Female connector, 3 pin, pitch spacing 1.25 mm (for example, the type Molex series 51021) and female crimp contacts in design (e. g. type Molex series 50079/50058)</p> <p><u>SYNC connector, J1</u> (for CIFX 100EH-RE\CUBE)<br/>           Male Connector with jumper, 3 pin, pitch spacing 2,54 mm</p> |
| Max. Cable Length | <p>Recommendation: Max. 50 mm</p> <p><b>Note:</b> Take EMC into consideration for the cable laying</p>                                                                                                                                                                                                                                                                                                                                                                              |

Table 86: SYNC Connector: SYNC Signal, Connector, Max. Cable Length

### 8.7.4 Items on Firmware

The firmware determines the input signal or output signal. The following table shows the meaning of the SYNC signals for each protocol.

| Protocol       | Signal IO_SYNC0<br>Input/Output                             | Signal IO_SYNC1<br>Input/Output | From<br>Firmware<br>Version | Remarks      |
|----------------|-------------------------------------------------------------|---------------------------------|-----------------------------|--------------|
| EtherCAT Slave | SYNC 0<br>Output                                            | SYNC 1<br>Output                | -                           | Configurable |
| Sercos Master  | External trigger to start bus cycle<br>Input<br>Rising edge | -                               | 2.0.8.0                     | -            |
| Sercos Slave   | CON_CLK<br>Output                                           | DIV_CLK<br>Output               | 3.0.10.0                    | Configurable |

Table 87: Meaning of the SYNC Signals for each Protocol

## 8.8 Pin Assignment at the PCI Bus

### 8.8.1 Overview

For the PC cards cifX *PCI*, *PCI Express* and *Low Profile PCI Express* the table below gives an overview about the pin assignment at the PCI bus.

| PC Card cifX                                                                                                                               | Hardware Revision                         | PCI Bus Type | PCI Bus [Pins] | Pin Assignment at the PCI Bus |                                                                       | PCI Specification                       |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------|----------------|-------------------------------|-----------------------------------------------------------------------|-----------------------------------------|
|                                                                                                                                            |                                           |              |                | acc. to standard              | compare section, page                                                 |                                         |
| CIFX 50-RE<br>CIFX 50-DP<br>CIFX 50-CO<br>CIFX 50-DN<br>CIFX 50-CC<br>CIFX 50-2DP<br>CIFX 50-2DN                                           | 6<br>6<br>6<br>9<br>2<br>3<br>2           | PCI          | 124            | yes                           | -                                                                     | [bus spec 1]                            |
| CIFX 50E-RE<br>CIFX 50E-RE\ET<br>CIFX 50E-CCIE<br>CIFX 50E-DP<br>CIFX 50E-CO<br>CIFX 50E-DN<br>CIFX 50E-CC<br>CIFX 50E-2DP<br>CIFX 50E-2DN | 6<br>2<br>1<br>6<br>5<br>8<br>4<br>1<br>1 | PCI Express  | 36             | yes                           | -                                                                     | [bus spec 2, Rev. 2.0],<br>[bus spec 3] |
| CIFX 70E-RE<br>CIFX 70E-CCIE<br>CIFX 70E-DP<br>CIFX 70E-CO<br>CIFX 70E-DN                                                                  | 1<br>1<br>1<br>1<br>1                     |              |                |                               |                                                                       |                                         |
| CIFX 100EH-RE\ CUBE                                                                                                                        | 4                                         | PCI Express  | 64             | no                            | <i>Pin Assignment for PCI Express Bus<br/>CIFX 100EH-RE\CUBE, 118</i> | [bus spec 2, Rev. 2.0],<br>[bus spec 3] |

Table 88: Pin Assignment at the PCI Bus

## 8.8.2 Pin Assignment for PCI Express Bus CIFX 100EH-RE\CUBE

Only for: CIFX 100EH-RE\CUBE (x1 = One Lane)<sup>2</sup>

| PCI Express Bus X2 (Side B) |                                         |                                      | PCI Express Bus X1 (Side A) |           |                                  |
|-----------------------------|-----------------------------------------|--------------------------------------|-----------------------------|-----------|----------------------------------|
| Pin                         | Name                                    | Description                          | Pin                         | Name      | Description                      |
| B1                          | n. u.                                   | (not used)                           | A1                          | PRSNT1#   | Hot-Plug presence detect         |
| B2                          | n. u.                                   | (not used)                           | A2                          | n. u.     | (not used)                       |
| B3                          | n. u.                                   | (not used)                           | A3                          | n. u.     | (not used)                       |
| B4                          | GND                                     | Ground                               | A4                          | GND       | Ground                           |
| B5                          | n. u.                                   | (not used)                           | A5                          | JTAG-TCK  | JTAG Test Clock                  |
| B6                          | n. u.                                   | (not used)                           | A6                          | JTAG-TDI  | JTAG Test Data Input             |
| B7                          | GND                                     | Ground                               | A7                          | JTAG-TDO  | JTAG Test Data Output            |
| B8                          | 3V3                                     | 3.3V Power                           | A8                          | JTAG-TMS  | JTAG Test Mode Select Input      |
| B9                          | JTAG-TRST#                              | JTAG Test Reset                      | A9                          | 3V3       | 3.3V Power                       |
| B10                         | n. v.                                   | (not used)                           | A10                         | 3V3       | 3.3V Power                       |
| B11                         | n. u.                                   | (not used)                           | A11                         | PERST#    | PCIe Reset                       |
| Key                         |                                         |                                      |                             |           |                                  |
| B12                         | n. u.                                   | (not used)                           | A12                         | GND       | Ground                           |
| B13                         | GND                                     | Ground                               | A13                         | PCIe_CLK+ | PCIe Clock differential pair     |
| B14                         | PCIe_TP                                 | Transmitter Lane, differential pair  | A14                         | PCIe_CLK- |                                  |
| B15                         | PCIe_TN                                 |                                      | A15                         | GND       | Ground                           |
| B16                         | GND                                     | Ground                               | A16                         | PCIe_RP   | Receiver Lane, differential pair |
| B17                         | PRSNT2#                                 | Hot-Plug presence detect             | A17                         | PCIe_RN   |                                  |
| B18                         | GND                                     | Ground                               | A18                         | GND       | Ground                           |
| B19                         | n. u.                                   | (not used)                           | A19                         | n. u.     | (not used)                       |
| B20                         | n. u.                                   | (not used)                           | A20                         | n. u.     | (not used)                       |
| B21                         | n. u.                                   | (not used)                           | A21                         | n. u.     | (not used)                       |
| B22                         | n. u.                                   | (not used)                           | A22                         | n. u.     | (not used)                       |
| B23                         | GND                                     | Ground                               | A23                         | n. u.     | (not used)                       |
| B24                         | IO_SYNC0 / IO_SYNC1 / 3.3V <sup>3</sup> | Real-Time Ethernet SYNC <sup>4</sup> | A24                         | n. u.     | (not used)                       |
| B25                         | GND                                     | Ground                               | A25                         | n. u.     | (not used)                       |
| B26                         | SPI_CS#                                 | ID Chip Select                       | A26                         | n. u.     | (not used)                       |
| B27                         | SPI_MOSI                                | ID Slave In                          | A27                         | n. u.     | (not used)                       |
| B28                         | SPI_MISO                                | ID Slave Out                         | A28                         | n. u.     | (not used)                       |
| B29                         | SPI_CLK                                 | ID Clock                             | A29                         | n. u.     | (not used)                       |
| B30                         | GND                                     | Ground                               | A30                         | n. u.     | (not used)                       |
| B31                         | n. u.                                   | (not used)                           | A31                         | n. u.     | (not used)                       |
| B32                         | n. u.                                   | (not used)                           | A32                         | n. u.     | (not used)                       |

Table 89: Pin Assignment for PCI Express-Bus CIFX 100EH-RE\CUBE

<sup>2</sup>Pinning A19 to A32 / B19 to B32 not standard conform [bus spec 3, page 73-74].

<sup>3</sup>If at the SYNC connector J1 the jumper is set, the IO\_SYNC signal is transferred to the PCI Express Bus X2 pin B24 (jumper on pin1-pin2(J1): **IO\_SYNC0**, pin2-pin3(J1): **IO\_SYNC1**). If no jumper is set, the signal is **3,3V** static High (with Pull-up). Refer to section *Pin Assignment SYNC Connector, J1 (CIFX 100EH)*, on page 111.

<sup>4</sup>in 3V3 logic.

## 9 Technical Data

### 9.1 Technical Data PC Cards cifX



**Note:** All technical data are temporarily and can be altered without notice.

#### 9.1.1 CIFX 50-RE

| CIFX 50-RE               | Parameter                                                                              | Value                                                                                                         |
|--------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                                   | CIFX 50-RE                                                                                                    |
|                          | Part No.                                                                               | 1250.100                                                                                                      |
|                          | Description                                                                            | PC Card cifX PCI Real-Time Ethernet Master or Slave                                                           |
|                          | Function                                                                               | Communication interface with PCI and Ethernet interface                                                       |
| Communication Controller | Type                                                                                   | netX 100 processor                                                                                            |
| Integrated Memory        | RAM                                                                                    | 8 MB SDRAM                                                                                                    |
|                          | FLASH                                                                                  | 4 MB serial Flash EPROM                                                                                       |
|                          | Size of the Dual-Port Memory                                                           | 64 KByte                                                                                                      |
| System Interface         | Bus Type                                                                               | PCI, according to [bus spec 1], refer to section <i>Overview</i> , page 117.                                  |
|                          | Transmission Rate                                                                      | 33 MHz                                                                                                        |
|                          | Data Access                                                                            | DPM or DMA (Direct Memory Access)                                                                             |
|                          | Width for the data access to the Dual-Port Memory (DPM)                                | 32-Bit                                                                                                        |
| Ethernet Communication   | Supported Real-Time Ethernet communication systems (determined by the loaded firmware) | CC-Link IE Field Basic Slave                                                                                  |
|                          |                                                                                        | EtherCAT Master, EtherCAT Slave                                                                               |
|                          |                                                                                        | EtherNet/IP Scanner (Master), EtherNet/IP Adapter (Slave),                                                    |
|                          |                                                                                        | Open Modbus/TCP                                                                                               |
|                          |                                                                                        | POWERLINK Controlled Node/Slave                                                                               |
|                          |                                                                                        | PROFINET IO-Controller (Master), PROFINET IO-Device (Slave)                                                   |
|                          |                                                                                        | Sercos Master, Sercos Slave                                                                                   |
|                          |                                                                                        | VARAN Client (Slave)                                                                                          |
|                          | Ethernet Frame Types                                                                   | Ethernet II                                                                                                   |
| Ethernet Interface       | Transmission rate                                                                      | 100 MBit/s, 10 MBit/s (depending on loaded firmware)                                                          |
|                          | Interface Type                                                                         | 100 BASE-TX, 10 BASE-T (depending on loaded firmware), refer to section <i>Ethernet Interface</i> , page 108. |
|                          | Galvanic Isolation                                                                     | isolated                                                                                                      |
|                          | Isolation Voltage                                                                      | 1000 VDC (tested for 1 minute)                                                                                |
|                          | Half duplex/Full duplex                                                                | depending on loaded firmware, supported (at 100 MBit/s)                                                       |
|                          | Auto-Negotiation                                                                       | depending on loaded firmware                                                                                  |
|                          | Auto-Crossover                                                                         | depending on loaded firmware                                                                                  |
|                          | Connector                                                                              | 2* RJ45 Socket                                                                                                |

| CIFX 50-RE               | Parameter                                               | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |
|--------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Display                  | LED Display                                             | <b>SYS</b> System Status LED<br>The meaning of the following LEDs depends on the loaded firmware:<br><b>COM 0</b> LED Communication Status 0 (duo LED)<br><b>COM 1</b> LED Communication Status 1 (duo LED)<br><b>LED yellow</b> at RJ45Ch0 and RJ45Ch1,<br><b>LED green</b> for Ethernet Link status, Ethernet Activity status and additional status<br>Refer to chapter <i>Diagnosis with LEDs</i> , page 79.                                                                                                                                                          |                     |
| Power supply             | Supply Voltage                                          | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |
|                          | Current consumption at 3.3 V                            | 650 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |
|                          | Connector                                               | Via PCI Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| Operation                | Rotary Switch Slot Number (Card ID)                     | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |
| Environmental Conditions |                                                         | CIFX 50-RE (to Rev. 5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CIFX 50-RE (Rev. 6) |
|                          | Operating temperature range*                            | 0 °C ... +55 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0 °C ... +70 °C     |
|                          | *Air flow during measurment                             | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |
|                          | Storage temperature range                               | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |
|                          | Humidity                                                | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |
|                          | Environment                                             | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |
| Device                   | Dimensions (L x W x H)                                  | 120,0 x 86 x 18,5 mm (from hardware revision 3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |
|                          | Mounting/Installation                                   | PCI slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |
|                          | RoHS                                                    | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |
| Compliance with EMC      | CE Sign                                                 | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |
|                          | UKCA Sign                                               | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |
|                          | Emission                                                | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |
|                          | Immunity                                                | EN 61000-4-2 / BS EN 61000-4-2 (Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2 (Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1 (Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8 (power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1 (for industrial environments) |                     |
| UL Certification         | The device CIFX 50-RE is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |
| User software            | Download firmware and configuration to the device       | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     |
|                          | Configuration and diagnostics                           | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |

Table 90: Technical Data CIFX 50-RE



### 9.1.2 CIFX 50E-RE, CIFX 50E-RE\ET

| CIFX 50E-RE,<br>CIFX 50E-RE\ET | Parameter                                                                              | Value                                                                                                                                                                                                                                                                                                                                          |                |
|--------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Part                           | Name                                                                                   | CIFX 50E-RE                                                                                                                                                                                                                                                                                                                                    | CIFX 50E-RE\ET |
|                                | Part No.                                                                               | 1251.100                                                                                                                                                                                                                                                                                                                                       | 1251.105       |
|                                | Description                                                                            | PC Card cifX PCI Express Real-Time Ethernet Master or Slave                                                                                                                                                                                                                                                                                    |                |
|                                | Function                                                                               | Communication interface with PCI Express and Ethernet interface                                                                                                                                                                                                                                                                                |                |
| Communication Controller       | Type                                                                                   | netX 100 processor                                                                                                                                                                                                                                                                                                                             |                |
| Integrated Memory              | RAM                                                                                    | 8 MB SDRAM                                                                                                                                                                                                                                                                                                                                     |                |
|                                | FLASH                                                                                  | 4 MB serial Flash EPROM                                                                                                                                                                                                                                                                                                                        |                |
|                                | Size of the Dual-Port Memory                                                           | 64 KByte                                                                                                                                                                                                                                                                                                                                       |                |
| System Interface               | Bus Type                                                                               | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117.                                                                                                                                                                                                                 |                |
|                                | Transmission Rate                                                                      | 2 GBit/s                                                                                                                                                                                                                                                                                                                                       |                |
|                                | Data Access                                                                            | DPM or DMA* (Direct Memory Access);<br>*beginning from Hardware Revision 4                                                                                                                                                                                                                                                                     |                |
|                                | Width for the data access to the Dual-Port Memory (DPM)                                | 32-Bit                                                                                                                                                                                                                                                                                                                                         |                |
| Ethernet Communication         | Supported Real-Time Ethernet communication systems (determined by the loaded firmware) | CC-Link IE Field Basic Slave                                                                                                                                                                                                                                                                                                                   |                |
|                                |                                                                                        | EtherCAT Master, EtherCAT Slave                                                                                                                                                                                                                                                                                                                |                |
|                                |                                                                                        | EtherNet/IP Scanner (Master),<br>EtherNet/IP Adapter (Slave),                                                                                                                                                                                                                                                                                  |                |
|                                |                                                                                        | Open Modbus/TCP                                                                                                                                                                                                                                                                                                                                |                |
|                                |                                                                                        | POWERLINK Controlled Node/Slave                                                                                                                                                                                                                                                                                                                |                |
|                                |                                                                                        | PROFINET IO-Controller (Master),<br>PROFINET IO-Device (Slave)                                                                                                                                                                                                                                                                                 |                |
|                                |                                                                                        | Sercos Master, Sercos Slave                                                                                                                                                                                                                                                                                                                    |                |
|                                |                                                                                        | VARAN Client (Slave)                                                                                                                                                                                                                                                                                                                           |                |
|                                | Ethernet Frame Types                                                                   | Ethernet II                                                                                                                                                                                                                                                                                                                                    |                |
| Ethernet Interface             | Transmission rate                                                                      | 100 MBit/s,<br>10 MBit/s (depending on loaded firmware)                                                                                                                                                                                                                                                                                        |                |
|                                | Interface Type                                                                         | 100 BASE-TX,<br>10 BASE-T (depending on loaded firmware),<br>refer to section <i>Ethernet Interface</i> , page 108.                                                                                                                                                                                                                            |                |
|                                | Galvanic Isolation                                                                     | isolated                                                                                                                                                                                                                                                                                                                                       |                |
|                                | Isolation Voltage                                                                      | 1000 VDC (tested for 1 minute)                                                                                                                                                                                                                                                                                                                 |                |
|                                | Half duplex/Full duplex                                                                | depending on loaded firmware,<br>supported (at 100 MBit/s)                                                                                                                                                                                                                                                                                     |                |
|                                | Auto-Negotiation                                                                       | depending on loaded firmware                                                                                                                                                                                                                                                                                                                   |                |
|                                | Auto-Crossover                                                                         | depending on loaded firmware                                                                                                                                                                                                                                                                                                                   |                |
|                                | Connector                                                                              | 2* RJ45 Socket                                                                                                                                                                                                                                                                                                                                 |                |
| Display                        | LED Display                                                                            | <b>SYS</b> System Status LED<br>The meaning of the following LEDs depends on the loaded<br><b>COM 0</b> LED Communication Status 0 (duo LED)<br><b>COM 1</b> LED Communication Status 1 (duo LED)<br><b>LED yellow</b> at RJ45Ch0 and RJ45Ch1,<br><b>LED green</b> for Ethernet Link status, Ethernet Activity<br>status and additional status |                |
|                                | Refer to chapter <i>Diagnosis with LEDs</i> , page 79.                                 |                                                                                                                                                                                                                                                                                                                                                |                |

| CIFX 50E-RE,<br>CIFX 50E-RE\ET | Parameter                                                | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                 |
|--------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Power supply                   | Supply Voltage                                           | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |
|                                | Current consumption at 3.3 V                             | 800 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                 |
|                                | Connector                                                | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |
| Operation                      | Rotary Switch Slot Number (Card ID)                      | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                 |
| Environmental Conditions       |                                                          | CIFX 50E-RE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CIFX 50E-RE\ET  |
|                                | Operating temperature range*                             | 0 °C ... +55 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0 °C ... +70 °C |
|                                | *Air flow during measurment                              | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |
|                                | Storage temperature range                                | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |
|                                | Humidity                                                 | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |
|                                | Environment                                              | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |
| Device                         | Dimensions (L x W x H)                                   | 120,0 x 86 x 18,5 mm (from hardware revision 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |
|                                | Mounting/Installation                                    | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |
|                                | RoHS                                                     | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |
| Compliance with EMC            | CE Sign                                                  | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |
|                                | UKCA Sign                                                | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |
|                                | Emission                                                 | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |
|                                | Immunity                                                 | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |                 |
| UL Certification               | The device CIFX 50E-RE is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 |
| User software                  | Download firmware and configuration to the device        | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |
|                                | Configuration and diagnostics                            | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |

Table 91: Technical Data CIFX 50E-RE, CIFX 50E-RE\ET

### 9.1.3 CIFX 50E-CCIES, CIFX 70E-CCIES

| CIFX 50E-CCIES,<br>CIFX 70E-CCIES | Parameter                                                                            | Value                                                                                                                          |                                                                             |
|-----------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Part                              | Name                                                                                 | CIFX 50E-CCIES                                                                                                                 | CIFX 70E-CCIES                                                              |
|                                   | Part No.                                                                             | 1251.700                                                                                                                       | 1259.700                                                                    |
|                                   | Description                                                                          | PC Card cifX PCI Express CC-Link IE Field Slave                                                                                |                                                                             |
|                                   | Function                                                                             | Communication interface with PCI Express and Ethernet interface                                                                |                                                                             |
| Communication Controllers         | Type                                                                                 | netX 100 processor<br>CP520 (CC-Link IE Communication Controller)                                                              |                                                                             |
| Integrated Memory                 | RAM                                                                                  | SDRAM 64MBIT                                                                                                                   |                                                                             |
|                                   | FLASH                                                                                | 4 MB or 32 MBIT serial Flash EPROM                                                                                             |                                                                             |
|                                   | Size of the Dual-Port Memory                                                         | 64 KByte                                                                                                                       |                                                                             |
| System Interface                  | Bus Type                                                                             | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117. |                                                                             |
|                                   | Transmission Rate                                                                    | 2 GBit/s                                                                                                                       |                                                                             |
|                                   | Data Access                                                                          | DPM or DMA (Direct Memory Access)                                                                                              |                                                                             |
|                                   | Width for the data access to the Dual-Port Memory (DPM)                              | 32-Bit                                                                                                                         |                                                                             |
| Ethernet Communication            | Supported Real-Time Ethernet communication system                                    | CC-Link IE Field Slave                                                                                                         |                                                                             |
|                                   | Ethernet Frame Types                                                                 | Ethernet II                                                                                                                    |                                                                             |
| Ethernet Interface                | Transmission rate                                                                    | 1 Gbit/s                                                                                                                       |                                                                             |
|                                   | Interface Type                                                                       | 1000 BASE-T, refer to section <i>Ethernet Interface</i> , p. 108.                                                              |                                                                             |
|                                   | Galvanic Isolation                                                                   | isolated                                                                                                                       |                                                                             |
|                                   | Isolation Voltage                                                                    | 1000 VDC (getestet für 1 Minute)                                                                                               |                                                                             |
|                                   | Auto-Negotiation                                                                     | Constantly on                                                                                                                  |                                                                             |
|                                   | Auto-Crossover                                                                       | Constantly on                                                                                                                  |                                                                             |
|                                   | Connector                                                                            | 2* RJ45 Socket                                                                                                                 |                                                                             |
|                                   | Channel 0 and 1                                                                      | Always 2 channels can be used.                                                                                                 |                                                                             |
| Display                           | LED Display<br>For Details refer to section <i>CC-Link IE Field Slave</i> , page 83. | <b>SYS</b>                                                                                                                     | System Status LED                                                           |
|                                   |                                                                                      | <b>RUN</b>                                                                                                                     | Run                                                                         |
|                                   |                                                                                      | <b>RD</b>                                                                                                                      | Reception status o the data                                                 |
|                                   |                                                                                      | <b>SD</b>                                                                                                                      | Sending status o the data                                                   |
|                                   |                                                                                      | <b>D-LINK</b>                                                                                                                  | Data link                                                                   |
|                                   |                                                                                      | <b>ERR</b>                                                                                                                     | Error                                                                       |
|                                   |                                                                                      | <b>USER</b>                                                                                                                    | User-defined status                                                         |
|                                   |                                                                                      | At RJ45Ch0 and RJ45Ch1:                                                                                                        |                                                                             |
|                                   |                                                                                      | <b>LINK</b><br>(LED yellow)                                                                                                    | Link status (for Ethernet)                                                  |
|                                   |                                                                                      | <b>L-ERR</b><br>(LED green)                                                                                                    | Error status of the received data, the line and the loopback (for Ethernet) |
| Power supply                      | Supply Voltage                                                                       | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                       |                                                                             |
|                                   | Current consumption at 3.3 V                                                         | 880 mA (typical)                                                                                                               |                                                                             |
|                                   |                                                                                      | 1200 mA (maximum)                                                                                                              |                                                                             |
|                                   | Connector                                                                            | Via PCI Express Bus                                                                                                            |                                                                             |
| Operation                         | Rotary Switch Slot Number (Card ID)                                                  | To set the Slot Number (Card ID)                                                                                               |                                                                             |

| CIFX 50E-CCIES,<br>CIFX 70E-CCIES | Parameter                                         | Value                                                                                                                     |                   |
|-----------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------|
| Environmental<br>Conditions       | Operating temperature range*                      | CIFX 50E-CCIES                                                                                                            | CIFX 70E-CCIES    |
|                                   |                                                   | -25 °C ... +70 °C                                                                                                         | -25 °C ... +70 °C |
|                                   | *Air flow during measurment                       | 0,5m/s                                                                                                                    |                   |
|                                   | Storage temperature range                         | -40 °C ... +85 °C                                                                                                         |                   |
|                                   | Humidity                                          | 10 ... 95% relative humidity, no condensation permitted                                                                   |                   |
| Device                            | Dimensions (L x W x H)                            | 120,0 x 69,0 x 18,5 mm (length incl. front plate)                                                                         |                   |
|                                   | Mounting/Installation                             | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50. |                   |
|                                   | RoHS                                              | Yes                                                                                                                       |                   |
| Compliance with EMC               | CE Sign                                           | Yes                                                                                                                       |                   |
|                                   | UKCA Sign                                         | Yes                                                                                                                       |                   |
|                                   | Emission                                          | Refer to CE declaration of conformity / UK Declaration of Conformity                                                      |                   |
|                                   | Immunity                                          | Refer to CE declaration of conformity / UK Declaration of Conformity                                                      |                   |
| User software                     | Download firmware and configuration to the device | Device Explorer                                                                                                           |                   |
|                                   | Configuration and diagnostics                     | Communication Studio                                                                                                      |                   |

Table 92: Technical Data CIFX 50E-CCIES, CIFX 70E-CCIES

### 9.1.4 CIFX 50-DP

| CIFX 50-DP               | Parameter                                                                      | Value                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50-DP                                                                                                                                                         |
|                          | Part No.                                                                       | 1250.410                                                                                                                                                           |
|                          | Description                                                                    | PC Card cifX PCI PROFIBUS DP Master or Slave                                                                                                                       |
|                          | Function                                                                       | Communication interface with PCI and PROFIBUS interface                                                                                                            |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                                                 |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                                                         |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                                            |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                                                           |
| System Interface         | Bus Type                                                                       | PCI, according to [bus spec 1], refer to section <i>Overview</i> , page 117.                                                                                       |
|                          | Transmission Rate                                                              | 33 MHz                                                                                                                                                             |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                                                                  |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                                             |
| PROFIBUS Communication   | Supported communication standard/ protocol (determined by the loaded firmware) | PROFIBUS DP Master, PROFIBUS DP Slave                                                                                                                              |
| PROFIBUS Interface       | Transmission rate                                                              | 9,6 kBit/s, 19,2 kBit/s, 31,25 kBit/s, 45,45 kBit/s, 93,75 kBit/s, 187,5 kBit/s, 500 kBit/s, 1,5 MBit/s, 3 MBit/s, 6 MBit/s, 12 MBit/s                             |
|                          | Interface Type                                                                 | RS 485, according EN 50170, refer to section <i>PROFIBUS Interface</i> page 111.                                                                                   |
|                          | Galvanic Isolation                                                             | isolated                                                                                                                                                           |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                                                     |
|                          | Connector                                                                      | DSub female Connector, 9 pin                                                                                                                                       |
| Display                  | LED Display                                                                    | <b>SYS</b> System Status LED                                                                                                                                       |
|                          |                                                                                | <b>COM</b> LED Communication Status (duo LED)<br>The meaning of the COM LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79. |
| Power supply             | Supply Voltage                                                                 | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                           |
|                          | Current consumption at 3.3 V                                                   | 700 mA (maximum)                                                                                                                                                   |
|                          | Connector                                                                      | Via PCI Bus                                                                                                                                                        |
| Operation                | Rotary Switch Slot Number (Card ID)                                            | To set the Slot Number (Card ID)                                                                                                                                   |
| Environmental Conditions | Operating temperature range*                                                   | -20 °C ... +70 °C (acc. to UL: 0 °C ... +55 °C)                                                                                                                    |
|                          | *Air flow during measurment                                                    | 0,5m/s                                                                                                                                                             |
|                          | Storage temperature range                                                      | -40 °C ... +85 °C                                                                                                                                                  |
|                          | Humidity                                                                       | 10 ... 95% relative humidity, no condensation permitted                                                                                                            |
|                          | Environment                                                                    | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                            |
| Device                   | Dimensions (L x W x H)                                                         | 120,0 x 86 x 18,5 mm (from hardware revision 5)                                                                                                                    |
|                          | Mounting/Installation                                                          | PCI slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                     |
|                          | RoHS                                                                           | Yes                                                                                                                                                                |
| Compliance with EMC      | CE Sign                                                                        | Yes                                                                                                                                                                |

| CIFX 50-DP       | Parameter                                               | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | UKCA Sign                                               | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                  | Emission                                                | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Immunity                                                | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| UL Certification | The device CIFX 50-DP is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| User software    | Download firmware and configuration to the device       | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Configuration and diagnostics                           | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 93: Technical Data CIFX 50-DP

### 9.1.5 CIFX 50E-DP

| CIFX 50E-DP              | Parameter                                                                      | Value                                                                                                                                  |
|--------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50E-DP                                                                                                                            |
|                          | Part No.                                                                       | 1251.410                                                                                                                               |
|                          | Description                                                                    | PC Card cifX PCI Express PROFIBUS DP Master or Slave                                                                                   |
|                          | Function                                                                       | Communication interface with PCI Express and PROFIBUS interface                                                                        |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                     |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                             |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                               |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117.         |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                               |
|                          | Data Access                                                                    | DPM or DMA* (Direct Memory Access);<br>*beginning from Hardware Revision 5                                                             |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                 |
| PROFIBUS Communication   | Supported communication standard/ protocol (determined by the loaded firmware) | PROFIBUS DP Master, PROFIBUS DP Slave                                                                                                  |
| PROFIBUS Interface       | Transmission rate                                                              | 9,6 kBit/s, 19,2 kBit/s, 31,25 kBit/s, 45,45 kBit/s, 93,75 kBit/s, 187,5 kBit/s, 500 kBit/s, 1,5 MBit/s, 3 MBit/s, 6 MBit/s, 12 MBit/s |
|                          | Interface Type                                                                 | RS 485, refer to section <i>PROFIBUS Interface</i> page 111.                                                                           |
|                          | Galvanic Isolation                                                             | isolated                                                                                                                               |

| CIFX 50E-DP              | Parameter                                                | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Isolation Voltage                                        | 1000 VDC (tested for 1 minute)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                          | Connector                                                | DSub female Connector, 9 pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Display                  | LED Display                                              | <b>SYS</b> System Status LED<br><b>COM</b> LED Communication Status (duo LED)<br>The meaning of the COM LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79.                                                                                                                                                                                                                                                                                                                                                                       |
| Power supply             | Supply Voltage                                           | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | Current consumption at 3.3 V                             | 800 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Connector                                                | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)                      | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Environmental Conditions | Operating temperature range*                             | -20 °C ... +70 °C (acc. to UL: 0 °C ... +55 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | *Air flow during measurment                              | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                          | Storage temperature range                                | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Humidity                                                 | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Environment                                              | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Device                   | Dimensions (L x W x H)                                   | 120,0 x 86 x 18,5 mm (from hardware revision 5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Mounting/Installation                                    | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          | RoHS                                                     | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Compliance with EMC      | CE Sign                                                  | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | UKCA Sign                                                | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Emission                                                 | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Immunity                                                 | EN 61000-4-2 / BS EN 61000-4-2 (Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2 (Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1 (Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8 (power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1 (for industrial environments) |
| UL Certification         | The device CIFX 50E-DP is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| User software            | Download firmware and configuration to the device        | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Configuration and diagnostics                            | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 94: Technical Data CIFX 50E-DP

### 9.1.6 CIFX 50-CO

| CIFX 50-CO               | Parameter                                                                      | Value                                                                                                                                                    |
|--------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50-CO                                                                                                                                               |
|                          | Part No.                                                                       | 1250.500                                                                                                                                                 |
|                          | Description                                                                    | PC Card cifX PCI CANopen Master or Slave                                                                                                                 |
|                          | Function                                                                       | Communication interface with PCI and CANopen interface                                                                                                   |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                                       |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                                               |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                                  |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                                                 |
| System Interface         | Bus Type                                                                       | PCI, according to [bus spec 1], refer to section <i>Overview</i> , page 117.                                                                             |
|                          | Transmission Rate                                                              | 33 MHz                                                                                                                                                   |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                                                        |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                                   |
| CANopen Communication    | Supported communication standard/ protocol (determined by the loaded firmware) | CANopen Master, CANopen Slave                                                                                                                            |
| CANopen Interface        | Transmission rate                                                              | 10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 MBit/s                                                    |
|                          | Interface Type                                                                 | ISO-11898, refer to section <i>CANopen Interface</i> , page 111.                                                                                         |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                                                       |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                                           |
|                          | Connector                                                                      | DSub male Connector, 9 pin                                                                                                                               |
| Display                  | LED Display                                                                    | <b>SYS</b> System Status LED                                                                                                                             |
|                          |                                                                                | <b>CAN</b> CANopen Status (duo LED)<br>The meaning of the CAN LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79. |
| Power supply             | Supply Voltage                                                                 | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                 |
|                          | Current consumption at 3.3 V                                                   | 650 mA (maximum)                                                                                                                                         |
|                          | Connector                                                                      | Via PCI Bus                                                                                                                                              |
| Operation                | Rotary Switch Slot Number (Card ID)                                            | To set the Slot Number (Card ID)                                                                                                                         |
| Environmental Conditions | Operating temperature range*                                                   | -20 °C ... +70 °C (acc. to UL: 0 °C ... +55 °C)                                                                                                          |
|                          | *Air flow during measurment                                                    | 0,5m/s                                                                                                                                                   |
|                          | Storage temperature range                                                      | -40 °C ... +85 °C                                                                                                                                        |
|                          | Humidity                                                                       | 10 ... 95% relative humidity, no condensation permitted                                                                                                  |
|                          | Environment                                                                    | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                  |
| Device                   | Dimensions (L x W x H)                                                         | 120,0 x 86 x 18,5 mm (from hardware revision 5)                                                                                                          |
|                          | Mounting/Installation                                                          | PCI slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                           |
|                          | RoHS                                                                           | Yes                                                                                                                                                      |
| Compliance with EMC      | CE Sign                                                                        | Yes                                                                                                                                                      |
|                          | UKCA Sign                                                                      | Yes                                                                                                                                                      |



| CIFX 50-CO       | Parameter                                               | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Emission                                                | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Immunity                                                | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| UL Certification | The device CIFX 50-CO is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| User software    | Download firmware and configuration to the device       | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Configuration and diagnostics                           | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 95: Technical Data CIFX 50-CO

### 9.1.7 CIFX 50E-CO

| CIFX 50E-CO              | Parameter                                                                      | Value                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50E-CO                                                                                                                    |
|                          | Part No.                                                                       | 1251.500                                                                                                                       |
|                          | Description                                                                    | PC Card cifX PCI ExpressCANopen Master or Slave                                                                                |
|                          | Function                                                                       | Communication interface with PCI Express and CANopen interface                                                                 |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                             |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                     |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                        |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                       |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117. |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                       |
|                          | Data Access                                                                    | DPM or DMA* (Direct Memory Access);<br>*beginning from Hardware Revision 4                                                     |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                         |
| CANopen Communication    | Supported communication standard/ protocol (determined by the loaded firmware) | CANopen Master, CANopen Slave                                                                                                  |
| CANopen Interface        | Transmission rate                                                              | 10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 MBit/s                          |
|                          | Interface Type                                                                 | ISO-11898, refer to section <i>CANopen Interface</i> , page 111.                                                               |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                             |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                 |
|                          | Connector                                                                      | DSub male Connector, 9 pin                                                                                                     |

| CIFX 50E-CO              | Parameter                                                | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display                  | LED Display                                              | <b>SYS</b> System Status LED<br><b>CAN</b> CANopen Status (duo LED)<br>The meaning of the CAN LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79.                                                                                                                                                                                                                                                                                                                                                                                 |
| Power supply             | Supply Voltage                                           | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | Current consumption at 3.3 V                             | 800 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Connector                                                | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)                      | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Environmental Conditions | Operating temperature range*                             | -20 °C ... +70 °C (acc. to UL: 0 °C ... +55 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | *Air flow during measurment                              | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                          | Storage temperature range                                | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Humidity                                                 | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Environment                                              | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Device                   | Dimensions (L x W x H)                                   | 120,0 x 86 x 18,5 mm (from hardware revision 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Mounting/Installation                                    | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          | RoHS                                                     | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Compliance with EMC      | CE Sign                                                  | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | UKCA Sign                                                | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Emission                                                 | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Immunity                                                 | EN 61000-4-2 / BS EN 61000-4-2 (Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2 (Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1 (Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8 (power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1 (for industrial environments) |
| UL Certification         | The device CIFX 50E-CO is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| User software            | Download firmware and configuration to the device        | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Configuration and diagnostics                            | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 96: Technical Data CIFX 50E-CO

### 9.1.8 CIFX 50-DN

| CIFX 50-DN               | Parameter                                                                      | Value                                                                                                                                                                                           |
|--------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50-DN                                                                                                                                                                                      |
|                          | Part No.                                                                       | 1250.510                                                                                                                                                                                        |
|                          | Description                                                                    | PC Card cifX PCI DeviceNet Master or Slave                                                                                                                                                      |
|                          | Function                                                                       | Communication interface with PCI and DeviceNet interface                                                                                                                                        |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                                                                              |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                                                                                      |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                                                                         |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                                                                                        |
| System Interface         | Bus Type                                                                       | PCI, according to [bus spec 1], refer to section <i>Overview</i> , page 117.                                                                                                                    |
|                          | Transmission Rate                                                              | 33 MHz                                                                                                                                                                                          |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                                                                                               |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                                                                          |
| DeviceNet Communication  | Supported communication standard/ protocol (determined by the loaded firmware) | DeviceNet Master, DeviceNet Slave                                                                                                                                                               |
| DeviceNet Interface      | Transmission rate                                                              | 125 kBit/s, 250 kBit/s, 500 kBit/s                                                                                                                                                              |
|                          | Interface Type                                                                 | ISO-11898 according to DeviceNet specification, refer to section <i>DeviceNet Interface</i> , page 112.                                                                                         |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                                                                                              |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                                                                                  |
|                          | Connector                                                                      | CombiCon male Connector, 5 pin                                                                                                                                                                  |
| Display                  | LED Display                                                                    | <b>SYS</b> System Status LED<br><b>MNS</b> Module Network Status (duo LED)<br>The meaning of the MNS LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79. |
| Power supply             | Supply Voltage                                                                 | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                        |
|                          | Current consumption at 3.3 V                                                   | 650 mA (maximum)                                                                                                                                                                                |
|                          | Connector                                                                      | Via PCI Bus                                                                                                                                                                                     |
| Operation                | Rotary Switch Slot Number (Card ID)                                            | To set the Slot Number (Card ID)                                                                                                                                                                |
| Environmental Conditions | Operating temperature range*                                                   | -20 °C ... +70 °C (acc. to UL: 0 °C ... +55 °C)                                                                                                                                                 |
|                          | *Air flow during measurment                                                    | 0,5m/s                                                                                                                                                                                          |
|                          | Storage temperature range                                                      | -40 °C ... +85 °C                                                                                                                                                                               |
|                          | Humidity                                                                       | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                         |
|                          | Environment                                                                    | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                         |
| Device                   | Dimensions (L x W x H)                                                         | 120,0 x 86 x 18,5 mm (from hardware revision 5)                                                                                                                                                 |
|                          | Mounting/Installation                                                          | PCI slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                  |
|                          | RoHS                                                                           | Yes                                                                                                                                                                                             |
| Compliance with EMC      | CE Sign                                                                        | Yes                                                                                                                                                                                             |
|                          | UKCA Sign                                                                      | Yes                                                                                                                                                                                             |

| CIFX 50-DN       | Parameter                                               | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Emission                                                | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Immunity                                                | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| UL Certification | The device CIFX 50-DN is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| User software    | Download firmware and configuration to the device       | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Configuration and diagnostics                           | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 97: Technical Data CIFX 50-DN

### 9.1.9 CIFX 50E-DN

| CIFX 50E-DN              | Parameter                                                                      | Value                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50E-DN                                                                                                                    |
|                          | Part No.                                                                       | 1251.510                                                                                                                       |
|                          | Description                                                                    | PC Card cifX PCI ExpressDeviceNet Master or Slave                                                                              |
|                          | Function                                                                       | Communication interface with PCI Express and DeviceNet interface                                                               |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                             |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                     |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                        |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                       |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117. |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                       |
|                          | Data Access                                                                    | DPM or DMA* (Direct Memory Access);<br>*beginning from Hardware Revision 4                                                     |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                         |
| DeviceNet Communication  | Supported communication standard/ protocol (determined by the loaded firmware) | DeviceNet Master, DeviceNet Slave                                                                                              |
| DeviceNet Interface      | Transmission rate                                                              | 125 kBit/s, 250 kBit/s, 500 kBit/s                                                                                             |
|                          | Interface Type                                                                 | ISO-11898 according to DeviceNet specification, refer to section <i>DeviceNet Interface</i> , page 112.                        |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                             |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                 |
|                          | Connector                                                                      | CombiCon male Connector, 5 pin                                                                                                 |

| CIFX 50E-DN              | Parameter                                                | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display                  | LED Display                                              | <b>SYS</b> System Status LED<br><b>MNS</b> Module Network Status (duo LED)<br>The meaning of the MNS LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79..                                                                                                                                                                                                                                                                                                                                                                         |
| Power supply             | Supply Voltage                                           | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | Current consumption at 3.3 V                             | 800 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Connector                                                | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)                      | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Environmental Conditions | Operating temperature range*                             | -20 °C ... +70 °C (acc. to UL: 0 °C ... +55 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | *Air flow during measurment                              | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                          | Storage temperature range                                | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Humidity                                                 | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Environment                                              | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Device                   | Dimensions (L x W x H)                                   | 120,0 x 86 x 18,5 mm (from hardware revision 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Mounting/Installation                                    | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          | RoHS                                                     | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Compliance with EMC      | CE Sign                                                  | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | UKCA Sign                                                | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Emission                                                 | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Immunity                                                 | EN 61000-4-2 / BS EN 61000-4-2 (Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2 (Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1 (Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8 (power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1 (for industrial environments) |
| UL Certification         | The device CIFX 50E-DN is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| User software            | Download firmware and configuration to the device        | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Configuration and diagnostics                            | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 98: Technical Data CIFX 50E-DN

### 9.1.10 CIFX 50-CC

| CIFX 50-CC               | Parameter                                                                      | Value                                                                                                                                                            |
|--------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50-CC                                                                                                                                                       |
|                          | Part No.                                                                       | 1250.740                                                                                                                                                         |
|                          | Description                                                                    | PC Card cifX PCI CC-Link Slave                                                                                                                                   |
|                          | Function                                                                       | Communication interface with PCI and CC-Link interface                                                                                                           |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                                               |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                                                       |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                                          |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                                                         |
| System Interface         | Bus Type                                                                       | PCI, according to [bus spec 1], refer to section <i>Overview</i> , page 117.                                                                                     |
|                          | Transmission Rate                                                              | 33 MHz                                                                                                                                                           |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                                                                |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                                           |
| CC-Link Communication    | Supported communication standard/ protocol (determined by the loaded firmware) | CC-Link Slave                                                                                                                                                    |
| CC-Link Interface        | Transmission rate                                                              | 156 kBit/s, 625 kBit/s, 2500 kBit/s, 5 MBit/s, 10 MBit/s                                                                                                         |
|                          | Interface Type                                                                 | RS-485, refer to section <i>CC-Link Interface</i> , page 112.                                                                                                    |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                                                               |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                                                   |
|                          | Connector                                                                      | CombiCon male Connector, 5 pin                                                                                                                                   |
| Display                  | LED Display                                                                    | <b>SYS</b> System Status LED<br><b>L RUN</b> LED L Run (Duo LED)<br><b>L ERR</b> LED L Error (Duo LED)<br>Refer to chapter <i>Diagnosis with LEDs</i> , page 79. |
| Power supply             | Supply Voltage                                                                 | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                         |
|                          | Current consumption at 3.3 V                                                   | 650 mA (maximum)                                                                                                                                                 |
|                          | Connector                                                                      | Via PCI Bus                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)                                            | To set the Slot Number (Card ID)                                                                                                                                 |
| Environmental Conditions | Operating temperature range*                                                   | -20 °C ... +60 °C                                                                                                                                                |
|                          | *Air flow during measurment                                                    | 0,5m/s                                                                                                                                                           |
|                          | Storage temperature range                                                      | -40 °C ... +85 °C                                                                                                                                                |
|                          | Humidity                                                                       | 10 ... 95% relative humidity, no condensation permitted                                                                                                          |
|                          | Environment                                                                    | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                          |
| Device                   | Dimensions (L x W x H)                                                         | 120 x 85,4 x 18,5 mm (from hardware revision 2)                                                                                                                  |
|                          | Mounting/Installation                                                          | PCI slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                   |
|                          | RoHS                                                                           | Yes                                                                                                                                                              |
| Compliance with EMC      | CE Sign                                                                        | Yes                                                                                                                                                              |
|                          | UKCA Sign                                                                      | Yes                                                                                                                                                              |

| CIFX 50-CC       | Parameter                                               | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Emission                                                | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Immunity                                                | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| UL Certification | The device CIFX 50-CC is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| User software    | Download firmware and configuration to the device       | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                  | Configuration and diagnostics                           | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 99: Technical Data CIFX 50-CC

### 9.1.11 CIFX 50E-CC

| CIFX 50E-CC              | Parameter                                                                      | Value                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50E-CC                                                                                                                    |
|                          | Part No.                                                                       | 1251.740                                                                                                                       |
|                          | Description                                                                    | PC Card cifX PCI ExpressCC-Link Slave                                                                                          |
|                          | Function                                                                       | Communication interface with PCI Express and CC-Link interface                                                                 |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                             |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                     |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                        |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                       |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117. |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                       |
|                          | Data Access                                                                    | DPM or DMA* (Direct Memory Access);<br>*beginning from Hardware Revision 3                                                     |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                         |
| CC-Link Communication    | Supported communication standard/ protocol (determined by the loaded firmware) | CC-Link Slave                                                                                                                  |
| CC-Link Interface        | Transmission rate                                                              | 156 kBit/s, 625 kBit/s, 2500 kBit/s, 5 MBit/s, 10 MBit/s                                                                       |
|                          | Interface Type                                                                 | RS-485, refer to section <i>CC-Link Interface</i> , page 112.                                                                  |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                             |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                 |
|                          | Connector                                                                      | CombiCon male Connector, 5 pin                                                                                                 |

| CIFX 50E-CC              | Parameter                                                | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display                  | LED Display                                              | <b>SYS</b> System Status LED<br><b>L RUN</b> LED L Run (Duo LED)<br><b>L ERR</b> LED L Error (Duo LED)<br>Refer to chapter <i>Diagnosis with LEDs</i> , page 79.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Power supply             | Supply Voltage                                           | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          | Current consumption at 3.3 V                             | 800 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Connector                                                | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Operation                | Rotary Switch Slot Number (Card ID)                      | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Environmental Conditions | Operating temperature range*                             | 0 °C ... +60 °C (acc. to UL: 0 °C ... +55 °C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                          | *Air flow during measurment                              | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Storage temperature range                                | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                          | Humidity                                                 | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | Environment                                              | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Device                   | Dimensions (L x W x H)                                   | 120 x 89,9 x 18,5 mm (from hardware revision 3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Mounting/Installation                                    | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                          | RoHS                                                     | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Compliance with EMC      | CE Sign                                                  | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | UKCA Sign                                                | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | Emission                                                 | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Immunity                                                 | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| UL Certification         | The device CIFX 50E-CC is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| User software            | Download firmware and configuration to the device        | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Configuration and diagnostics                            | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 100: Technical Data CIFX 50E-CC



### 9.1.12 CIFX 50-2DP

| CIFX 50-2DP              | Parameter                                                                      | Value                                                                                                                                                                                                                                                                                                            |
|--------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50-2DP                                                                                                                                                                                                                                                                                                      |
|                          | Part No.                                                                       | 1252.410                                                                                                                                                                                                                                                                                                         |
|                          | Description                                                                    | PC Card cifX PCI 2 channel PROFIBUS DP Master or Slave                                                                                                                                                                                                                                                           |
|                          | Function                                                                       | Communication interface with PCI and 2 x PROFIBUS interface                                                                                                                                                                                                                                                      |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                                                                                                                                                                                               |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                                                                                                                                                                                                       |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                                                                                                                                                                                          |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                                                                                                                                                                                                         |
| System Interface         | Bus Type                                                                       | PCI, according to [bus spec 1], refer to section <i>Overview</i> , page 117.                                                                                                                                                                                                                                     |
|                          | Transmission Rate                                                              | 33 MHz                                                                                                                                                                                                                                                                                                           |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                                                                                                                                                                                                                |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                                                                                                                                                                                           |
| PROFIBUS Communication   | Supported communication standard/ protocol (determined by the loaded firmware) | PROFIBUS DP Master, PROFIBUS DP Slave                                                                                                                                                                                                                                                                            |
| PROFIBUS Interface       | Transmission rate                                                              | 9,6 kBit/s, 19,2 kBit/s, 31,25 kBit/s, 45,45 kBit/s, 93,75 kBit/s, 187,5 kBit/s, 500 kBit/s, 1,5 MBit/s, 3 MBit/s, 6 MBit/s, 12 MBit/s                                                                                                                                                                           |
|                          | Interface Type                                                                 | 2 * RS 485, refer to section <i>PROFIBUS Interface</i> p. 111.                                                                                                                                                                                                                                                   |
|                          | Galvanic Isolation                                                             | isolated                                                                                                                                                                                                                                                                                                         |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                                                                                                                                                                                                   |
|                          | Connector                                                                      | DSub female Connector, 9 pin                                                                                                                                                                                                                                                                                     |
| Display                  | LED Display                                                                    | <p><b>SYS</b> System Status LED</p> <p><b>COM 0</b> LED Communication Status 0 (duo LED) for channel X1</p> <p><b>COM 1</b> LED Communication Status 1 (duo LED) for channel X2</p> <p>The meaning of the LEDs COM0 and COM1 depends on the loaded firmware. Refer to ch. <i>Diagnosis with LEDs</i>, p. 79.</p> |
| Power supply             | Supply Voltage                                                                 | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                         |
|                          | Current consumption at 3.3 V                                                   | 700 mA (maximum)                                                                                                                                                                                                                                                                                                 |
|                          | Connector                                                                      | Via PCI Bus                                                                                                                                                                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)                                            | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                 |
| Environmental Conditions | Operating temperature range*                                                   | -20 °C ... +70 °C (acc. to UL: 0 °C ... +55 °C)                                                                                                                                                                                                                                                                  |
|                          | *Air flow during measurment                                                    | 0,5m/s                                                                                                                                                                                                                                                                                                           |
|                          | Storage temperature range                                                      | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                |
|                          | Humidity                                                                       | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                          |
|                          | Environment                                                                    | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                          |
| Device                   | Dimensions (L x W x H)                                                         | 120 x 94,5 x 18,5 mm                                                                                                                                                                                                                                                                                             |

| CIFX 50-2DP         | Parameter                                                | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Mounting/Installation                                    | PCI slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                     | RoHS                                                     | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Compliance with EMC | CE Sign                                                  | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                     | UKCA Sign                                                | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Emission                                                 | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                     | Immunity                                                 | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| UL Certification    | The device CIFX 50-2DP is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| User software       | Download firmware and configuration to the device        | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                     | Configuration and diagnostics                            | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 101: Technical Data CIFX 50-2DP

### 9.1.13 CIFX 50E-2DP

| CIFX 50E-2DP             | Parameter                                                                      | Value                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50E-2DP                                                                                                                   |
|                          | Part No.                                                                       | 1253.410                                                                                                                       |
|                          | Description                                                                    | PC Card cifX PCI Express 2 channel PROFIBUS DP Master or Slave                                                                 |
|                          | Function                                                                       | Communication interface with PCI Express and 2 x PROFIBUS interface                                                            |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                             |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                     |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                        |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                       |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117. |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                       |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                              |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                         |
| PROFIBUS Communication   | Supported communication standard/ protocol (determined by the loaded firmware) | PROFIBUS DP Master, PROFIBUS DP Slave                                                                                          |
| PROFIBUS Interface       | Transmission rate                                                              | 9,6 kBit/s, 19,2 kBit/s, 31,25 kBit/s, 45,45 kBit/s, 93,75 kBit/s, 187,5 kBit/s, 500 kBit/s, 1,5 MBit/s,                       |

| CIFX 50E-2DP             | Parameter                                         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |                                                   | 3 MBit/s, 6 MBit/s, 12 MBit/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                          | Interface Type                                    | RS 485, refer to section <i>PROFIBUS Interface</i> page 111.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                          | Galvanic Isolation                                | isolated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | Isolation Voltage                                 | 1000 VDC (tested for 1 minute)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                          | Connector                                         | DSub female Connector, 9 pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Display                  | LED Display                                       | <p><b>SYS</b> System Status LED</p> <p><b>COM 0</b> LED Communication Status 0 (duo LED) for channel X1</p> <p><b>COM 1</b> LED Communication Status 1 (duo LED) for channel X2</p> <p>The meaning of the LEDs COM0 and COM1 depends on the loaded firmware. Refer to ch. <i>Diagnosis with LEDs</i>, p. 79.</p>                                                                                                                                                                                                                                                         |
| Power supply             | Supply Voltage                                    | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | Current consumption at 3.3 V                      | 840 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Connector                                         | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)               | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Environmental Conditions | Operating temperature range*                      | -20 °C ... +70 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | *Air flow during measurment                       | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                          | Storage temperature range                         | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Humidity                                          | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Environment                                       | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Device                   | Dimensions (L x W x H)                            | 120,0 x 95 x 21,5 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | Mounting/Installation                             | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          | RoHS                                              | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Compliance with EMC      | CE Sign                                           | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | UKCA Sign                                         | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Emission                                          | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Immunity                                          | EN 61000-4-2 / BS EN 61000-4-2 (Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2 (Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1 (Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8 (power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1 (for industrial environments) |
| User software            | Download firmware and configuration to the device | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Configuration and diagnostics                     | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 102: Technical Data CIFX 50E-DP

### 9.1.14 CIFX 50-2DN

| CIFX 50-2DN              | Parameter                                                                      | Value                                                                                                                                                                                                                                                                                            |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50-2DN                                                                                                                                                                                                                                                                                      |
|                          | Part No.                                                                       | 1252.510                                                                                                                                                                                                                                                                                         |
|                          | Description                                                                    | PC Card cifX PCI 2 channel DeviceNet Master or Slave                                                                                                                                                                                                                                             |
|                          | Function                                                                       | Communication interface with PCI and 2 x DeviceNet interface                                                                                                                                                                                                                                     |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                                                                                                                                                                               |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                                                                                                                                                                                       |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                                                                                                                                                                          |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                                                                                                                                                                                         |
| System Interface         | Bus Type                                                                       | PCI, according to [bus spec 1], refer to section <i>Overview</i> , page 117.                                                                                                                                                                                                                     |
|                          | Transmission Rate                                                              | 33 MHz                                                                                                                                                                                                                                                                                           |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                                                                                                                                                                                                |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                                                                                                                                                                           |
| DeviceNet Communication  | Supported communication standard/ protocol (determined by the loaded firmware) | DeviceNet Master, DeviceNet Slave                                                                                                                                                                                                                                                                |
| DeviceNet Interface      | Transmission rate                                                              | 125 kBit/s, 250 kBit/s, 500 kBit/s                                                                                                                                                                                                                                                               |
|                          | Interface Type                                                                 | ISO-11898 according to DeviceNet specification, refer to section <i>DeviceNet Interface</i> , page 112.                                                                                                                                                                                          |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                                                                                                                                                                                               |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                                                                                                                                                                                   |
|                          | Connector                                                                      | CombiCon male Connector, 5 pin                                                                                                                                                                                                                                                                   |
| Display                  | LED Display                                                                    | <b>SYS</b> System Status LED<br><b>MNS 0</b> Module Network Status 0 (duo LED) for channel X1<br><b>MNS 1</b> Module Network Status 1 (duo LED) for channel X2<br>The meaning of the LEDs MNS 0 and MNS 1 depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79. |
| Power supply             | Supply Voltage                                                                 | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                         |
|                          | Current consumption at 3.3 V                                                   | 700 mA (maximum)                                                                                                                                                                                                                                                                                 |
|                          | Connector                                                                      | Via PCI Bus                                                                                                                                                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)                                            | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                 |
| Environmental Conditions | Operating temperature range*                                                   | -20 °C ... +70 °C                                                                                                                                                                                                                                                                                |
|                          | *Air flow during measurment                                                    | 0,5m/s                                                                                                                                                                                                                                                                                           |
|                          | Storage temperature range                                                      | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                |
|                          | Humidity                                                                       | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                          |
|                          | Environment                                                                    | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                          |
| Device                   | Dimensions (L x W x H)                                                         | 120 x 94,5 x 18,5 mm                                                                                                                                                                                                                                                                             |
|                          | Mounting/Installation                                                          | PCI slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                   |

| CIFX 50-2DN         | Parameter                                         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | RoHS                                              | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Compliance with EMC | CE Sign                                           | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                     | UKCA Sign                                         | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                     | Emission                                          | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                     | Immunity                                          | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| User software       | Download firmware and configuration to the device | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                     | Configuration and diagnostics                     | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 103: Technical Data CIFX 50-2DN

### 9.1.15 CIFX 50E-2DN

| CIFX 50E-2DN             | Parameter                                                                      | Value                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 50E-2DN                                                                                                                   |
|                          | Part No.                                                                       | 1253.510                                                                                                                       |
|                          | Description                                                                    | PC Card cifX PCI 2 channel ExpressDeviceNet Master or Slave                                                                    |
|                          | Function                                                                       | Communication interface with PCI Express and 2x DeviceNet interface                                                            |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                             |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                     |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                        |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                       |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117. |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                       |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                              |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                         |
| DeviceNet Communication  | Supported communication standard/ protocol (determined by the loaded firmware) | DeviceNet Master, DeviceNet Slave                                                                                              |
| DeviceNet Interface      | Transmission rate                                                              | 125 kBit/s, 250 kBit/s, 500 kBit/s                                                                                             |
|                          | Interface Type                                                                 | ISO-11898 according to DeviceNet specification, refer to section <i>DeviceNet Interface</i> , page 112.                        |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                             |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                 |

| CIFX 50E-2DN             | Parameter                                         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Connector                                         | CombiCon male Connector, 5 pin                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Display                  | LED Display                                       | <b>SYS</b> System Status LED<br><b>MNS 0</b> Module Network Status 0 (duo LED) for channel X1<br><b>MNS 1</b> Module Network Status 1 (duo LED) for channel X2<br>The meaning of the LEDs MNS 0 and MNS 1 depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79.                                                                                                                                                                                                                                                                         |
| Power supply             | Supply Voltage                                    | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | Current consumption at 3.3 V                      | 880 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Connector                                         | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)               | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Environmental Conditions | Operating temperature range*                      | -20 °C ... +70 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | *Air flow during measurment                       | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                          | Storage temperature range                         | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Humidity                                          | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Environment                                       | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Device                   | Dimensions (L x W x H)                            | 120,0 x 95 x 21,5 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | Mounting/Installation                             | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          | RoHS                                              | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Compliance with EMC      | CE Sign                                           | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | UKCA Sign                                         | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Emission                                          | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Immunity                                          | EN 61000-4-2 / BS EN 61000-4-2 (Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2 (Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1 (Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8 (power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1 (for industrial environments) |
| User software            | Download firmware and configuration to the device | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Configuration and diagnostics                     | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 104: Technical Data CIFX 50E-2DN

### 9.1.16 CIFX 70E-RE

| CIFX 70E-RE              | Parameter                                                                              | Value                                                                                                                          |
|--------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                                   | CIFX 70E-RE                                                                                                                    |
|                          | Part No.                                                                               | 1.259.100                                                                                                                      |
|                          | Description                                                                            | PC Card cifX Low Profile PCI Express Real-Time-Ethernet Master or Slave (Low Profile PCIe with RTE)                            |
|                          | Function                                                                               | Communication interface with PCI Express and Ethernet interface                                                                |
| Communication Controller | Type                                                                                   | netX 100 processor                                                                                                             |
| Integrated Memory        | RAM                                                                                    | 8 MB SDRAM                                                                                                                     |
|                          | FLASH                                                                                  | 4 MB serial Flash EPROM                                                                                                        |
|                          | Size of the Dual-Port Memory                                                           | 64 KByte                                                                                                                       |
| System Interface         | Bus Type                                                                               | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117. |
|                          | Transmission Rate                                                                      | 2 GBit/s                                                                                                                       |
|                          | Data Access                                                                            | DPM or DMA (Direct Memory Access)                                                                                              |
|                          | Width for the data access to the Dual-Port Memory (DPM)                                | 32-Bit                                                                                                                         |
| Ethernet Communication   | Supported Real-Time Ethernet communication systems (determined by the loaded firmware) | CC-Link IE Field Basic Slave                                                                                                   |
|                          |                                                                                        | EtherCAT Master, EtherCAT Slave                                                                                                |
|                          |                                                                                        | EtherNet/IP Scanner (Master), EtherNet/IP Adapter (Slave),                                                                     |
|                          |                                                                                        | Open Modbus/TCP                                                                                                                |
|                          |                                                                                        | POWERLINK Controlled Node/Slave                                                                                                |
|                          |                                                                                        | PROFINET IO-Controller (Master), PROFINET IO-Device (Slave)                                                                    |
|                          |                                                                                        | Sercos Master, Sercos Slave                                                                                                    |
|                          |                                                                                        | VARAN Client (Slave)                                                                                                           |
|                          | Ethernet Frame Types                                                                   | Ethernet II                                                                                                                    |
| Ethernet Interface       | Transmission rate                                                                      | 100 MBit/s,<br>10 MBit/s (depending on loaded firmware)                                                                        |
|                          | Interface Type                                                                         | 100 BASE-TX,<br>10 BASE-T (depending on loaded firmware),<br>refer to section <i>Ethernet Interface</i> , page 108.            |
|                          | Galvanic Isolation                                                                     | isolated                                                                                                                       |
|                          | Isolation Voltage                                                                      | 1000 VDC (tested for 1 minute)                                                                                                 |
|                          | Half duplex/Full duplex                                                                | depending on loaded firmware,<br>supported (at 100 MBit/s)                                                                     |
|                          | Auto-Negotiation                                                                       | depending on loaded firmware                                                                                                   |
|                          | Auto-Crossover                                                                         | depending on loaded firmware                                                                                                   |
|                          | Connector                                                                              | 2* RJ45 Socket                                                                                                                 |

| CIFX 70E-RE              | Parameter                                         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Display                  | LED Display                                       | <p><b>SYS</b> System Status LED</p> <p>The meaning of the following LEDs depends on the loaded firmware:</p> <p><b>COM 0</b> LED Communication Status 0 (duo LED)</p> <p><b>COM 1</b> LED Communication Status 1 (duo LED)</p> <p><b>LED yellow</b> at RJ45Ch0 and RJ45Ch1, for Ethernet Link status, Ethernet Activity status and additional status</p> <p><b>LED green</b></p> <p>Refer to chapter <i>Diagnosis with LEDs</i>, page 79.</p>                                                                                                                                                           |
| Power supply             | Supply Voltage                                    | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          | Current consumption at 3.3 V                      | 800 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Connector                                         | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Operation                | Rotary Switch Slot Number (Card ID)               | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Environmental Conditions | Operating temperature range*                      | 0 °C ... +65 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | *Air flow during measurment                       | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Storage temperature range                         | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                          | Humidity                                          | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Device                   | Dimensions (L x W x H)                            | 119,0 x 69,0 x 18,5 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Mounting/Installation                             | PCI Express x4 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                          | RoHS                                              | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Compliance with EMC      | CE Sign                                           | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | UKCA Sign                                         | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | Emission                                          | EN 55011+ A1, CISPR 11, Class A / BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                          | Immunity                                          | <p>EN 61000-4-2 / BS EN 61000-4-2 (Electrostatic discharge test)</p> <p>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2 (Radiated, radio-frequency, electromagnetic field test)</p> <p>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1 (Burst Electrical fast transients/burst test)</p> <p>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)</p> <p>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)</p> <p>EN 61000-4-8 / BS EN 61000-4-8 (power frequency magnetic field test)</p> <p>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1 (for industrial environments)</p> |
| User software            | Download firmware and configuration to the device | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Configuration and diagnostics                     | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 105: Technical Data CIFX 70E-RE



### 9.1.17 CIFS 100EH-RE\CUBE

| CIFS 100EH-RE            | Parameter                                                                              | Value                                                                                                                                                                                                                                                                                                                      |
|--------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                                   | CIFS 100EH-RE                                                                                                                                                                                                                                                                                                              |
|                          | Part No.                                                                               | 9016.090                                                                                                                                                                                                                                                                                                                   |
|                          | Description                                                                            | PC Card cifs PCI Express for Real-Time Ethernet Master or Slave, (low-profile card) exclusively for the installing in KEBA KeControl industry PCs series CP 3XX (Cube).                                                                                                                                                    |
|                          | Function                                                                               | Communication interface with PCI Express and Ethernet interface                                                                                                                                                                                                                                                            |
| Communication Controller | Type                                                                                   | netX 100 processor                                                                                                                                                                                                                                                                                                         |
| Integrated Memory        | RAM                                                                                    | 8 MB SDRAM                                                                                                                                                                                                                                                                                                                 |
|                          | FLASH                                                                                  | 4 MB serial Flash EPROM                                                                                                                                                                                                                                                                                                    |
|                          | Size of the Dual-Port Memory                                                           | 64 KByte                                                                                                                                                                                                                                                                                                                   |
| System Interface         | Bus Type                                                                               | PCI Express, One Lane Port*, refer to section <i>Overview</i> , page 117 and <i>Pin Assignment for PCI Express Bus CIFS 100EH-RE\CUBE</i> , page 118.<br><br>*The PC card CIFS 100EH-RE\CUBE can be used for x4 connectors, but not a real x4 connection (mechanical deviation from the standard, it is used only 1 lane). |
|                          | Transmission Rate                                                                      | 2 GBit/s                                                                                                                                                                                                                                                                                                                   |
|                          | Data Access                                                                            | DPM or DMA (Direct Memory Access)                                                                                                                                                                                                                                                                                          |
|                          | Width for the data access to the Dual-Port Memory (DPM)                                | 32-Bit                                                                                                                                                                                                                                                                                                                     |
| Ethernet Communication   | Supported Real-Time Ethernet communication systems (determined by the loaded firmware) | EtherCAT Master, EtherCAT Slave                                                                                                                                                                                                                                                                                            |
|                          |                                                                                        | EtherNet/IP Scanner (Master), EtherNet/IP Adapter (Slave),                                                                                                                                                                                                                                                                 |
|                          |                                                                                        | Open Modbus/TCP                                                                                                                                                                                                                                                                                                            |
|                          |                                                                                        | POWERLINK Controlled Node/Slave                                                                                                                                                                                                                                                                                            |
|                          |                                                                                        | PROFINET IO-Controller (Master), PROFINET IO-Device (Slave)                                                                                                                                                                                                                                                                |
|                          |                                                                                        | Sercos Master, Sercos Slave                                                                                                                                                                                                                                                                                                |
|                          |                                                                                        | VARAN Client (Slave)                                                                                                                                                                                                                                                                                                       |
|                          | Ethernet Frame Types                                                                   | Ethernet II                                                                                                                                                                                                                                                                                                                |
| Ethernet Interface       | Transmission rate                                                                      | 100 MBit/s,<br>10 MBit/s (depending on loaded firmware)                                                                                                                                                                                                                                                                    |
|                          | Interface Type                                                                         | 100 BASE-TX,<br>10 BASE-T (depending on loaded firmware), refer to section <i>Ethernet Interface</i> , page 108.                                                                                                                                                                                                           |
|                          | Galvanic Isolation                                                                     | isolated                                                                                                                                                                                                                                                                                                                   |
|                          | Isolation Voltage                                                                      | 1000 VDC (tested for 1 minute)                                                                                                                                                                                                                                                                                             |
|                          | Half duplex/Full duplex                                                                | depending on loaded firmware, supported (at 100 MBit/s)                                                                                                                                                                                                                                                                    |
|                          | Auto-Negotiation                                                                       | depending on loaded firmware                                                                                                                                                                                                                                                                                               |
|                          | Auto-Crossover                                                                         | depending on loaded firmware                                                                                                                                                                                                                                                                                               |
|                          | Connector                                                                              | 2* RJ45 Socket                                                                                                                                                                                                                                                                                                             |
| Display                  | LED Display                                                                            | <b>SYS</b> System Status LED<br><br>The meaning of the following LEDs depends on the loaded firmware:                                                                                                                                                                                                                      |
|                          |                                                                                        | <b>COM 0</b> LED Communication Status 0 (duo LED)                                                                                                                                                                                                                                                                          |
|                          |                                                                                        | <b>COM 1</b> LED Communication Status 1 (duo LED)                                                                                                                                                                                                                                                                          |
|                          |                                                                                        | <b>LED yellow</b> at RJ45Ch0 and RJ45Ch1,                                                                                                                                                                                                                                                                                  |

| CIFX 100EH-RE            | Parameter                                                       | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |                                                                 | <b>LED green</b> for Ethernet Link status, Ethernet Activity status and additional status<br>Refer to chapter <i>Diagnosis with LEDs</i> , page 79.                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Power supply             | Supply Voltage                                                  | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | Current consumption at 3.3 V                                    | 800 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Connector                                                       | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operation                | Rotary Switch Slot Number (Card ID)                             | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Environmental Conditions | Operating temperature range*                                    | 0 °C ... +65 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | *Air flow during measurment                                     | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                          | Storage temperature range                                       | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Humidity                                                        | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Environment                                                     | For UL compliant usage:<br>The device must be used in a pollution degree 2 environment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Device                   | Dimensions (L x W x H)                                          | 110,0 x 69,0 x 18,5 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                          | Mounting/Installation                                           | PCI Express x4 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.<br><br>x4 <sup>5</sup> = Four Lane; In the PCI Express x4 slot only lane 0 is used.<br>For further details refer to section <i>Pin Assignment for PCI Express Bus CIFX 100EH-RE\CUBE</i> on page 118.                                                                                                                                                                                                                                          |
|                          | Master License                                                  | NXLIC Master (Part No 8211.000)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | RoHS                                                            | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          |                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Compliance with EMC      | CE Sign                                                         | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | UKCA Sign                                                       | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                          | Emission                                                        | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Immunity                                                        | EN 61000-4-2 / BS EN 61000-4-2 (Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2 (Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1 (Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8 (power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1 (for industrial environments) |
| UL Certification         | The device CIFX 100EH-RE\CUBE is certified according to UL 508. | UL-File-Nr. E221530                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| User software            | Download firmware and configuration to the device               | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                          | Configuration and diagnostics                                   | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table 106: Technical Data CIFX 100EH-RE\CUBE

<sup>5</sup> The term "x4" refers to the convention of the PCI Express specifications [bus spec 3] to the number of lanes in the slot.

### 9.1.18 CIFX 70E-DP

| CIFX 70E-DP              | Parameter                                                                      | Value                                                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 70E-DP                                                                                                                                                                                        |
|                          | Part No.                                                                       | 1259.410                                                                                                                                                                                           |
|                          | Description                                                                    | PC Card cifX Low Profile PCI Express PROFIBUS DP Master or Slave (Low Profile PCIe with PROFIBUS)                                                                                                  |
|                          | Function                                                                       | Communication interface with PCI Express and PROFIBUS interface                                                                                                                                    |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                                                                                 |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                                                                                         |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                                                                            |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                                                                                           |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117.                                                                     |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                                                                                           |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                                                                                                  |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                                                                             |
| PROFIBUS Communication   | Supported communication standard/ protocol (determined by the loaded firmware) | PROFIBUS DP Master, PROFIBUS DP Slave                                                                                                                                                              |
| PROFIBUS Interface       | Transmission rate                                                              | 9,6 kBit/s, 19,2 kBit/s, 31,25 kBit/s, 45,45 kBit/s, 93,75 kBit/s, 187,5 kBit/s, 500 kBit/s, 1,5 MBit/s, 3 MBit/s, 6 MBit/s, 12 MBit/s                                                             |
|                          | Interface Type                                                                 | RS 485, refer to section <i>PROFIBUS Interface</i> , page 111.                                                                                                                                     |
|                          | Galvanic Isolation                                                             | isolated                                                                                                                                                                                           |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                                                                                     |
|                          | Connector                                                                      | DSub female Connector, 9 pin                                                                                                                                                                       |
| Display                  | LED Display                                                                    | <b>SYS</b> System Status LED<br><b>COM</b> LED Communication Status (duo LED)<br>The meaning of the COM LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79. |
| Power supply             | Supply Voltage                                                                 | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                           |
|                          | Current consumption at 3.3 V                                                   | 800 mA (maximum)                                                                                                                                                                                   |
|                          | Connector                                                                      | Via PCI Express Bus                                                                                                                                                                                |
| Operation                | Rotary Switch Slot Number (Card ID)                                            | To set the Slot Number (Card ID)                                                                                                                                                                   |
| Environmental Conditions | Operating temperature range*                                                   | 0 °C ... +65 °C                                                                                                                                                                                    |
|                          | *Air flow during measurment                                                    | 0,5m/s                                                                                                                                                                                             |
|                          | Storage temperature range                                                      | -40 °C ... +85 °C                                                                                                                                                                                  |
|                          | Humidity                                                                       | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                            |
| Device                   | Dimensions (L x W x H)                                                         | 119,0 x 69,0 x 18,5 mm                                                                                                                                                                             |
|                          | Mounting/Installation                                                          | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                          |
|                          | RoHS                                                                           | Yes                                                                                                                                                                                                |
| Compliance with EMC      | CE Sign                                                                        | Yes                                                                                                                                                                                                |
|                          | UKCA Sign                                                                      | Yes                                                                                                                                                                                                |

| CIFX 70E-DP   | Parameter                                         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | Emission                                          | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|               | Immunity                                          | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| User software | Download firmware and configuration to the device | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|               | Configuration and diagnostics                     | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 107: Technical Data CIFX 70E-DP

### 9.1.19 CIFX 70E-CO

| CIFX 70E-CO              | Parameter                                                                      | Value                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFX 70E-CO                                                                                                                    |
|                          | Part No.                                                                       | 1259.500                                                                                                                       |
|                          | Description                                                                    | PC-Karte cifX Low Profile PCI Express CANopen Master or Slave (Low Profile PCIe mit CANopen)                                   |
|                          | Function                                                                       | Communication interface with PCI Express and CANopen interface                                                                 |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                             |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                     |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                        |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                       |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117. |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                       |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                              |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                         |
| CANopen Communication    | Supported communication standard/ protocol (determined by the loaded firmware) | CANopen Master, CANopen Slave                                                                                                  |
| CANopen Interface        | Transmission rate                                                              | 10 kBit/s, 20 kBit/s, 50 kBit/s, 100 kBit/s, 125 kBit/s, 250 kBit/s, 500 kBit/s, 800 kBit/s, 1 MBit/s                          |
|                          | Interface Type                                                                 | ISO-11898, refer to section <i>CANopen Interface</i> , page 111.                                                               |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                             |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                 |
|                          | Connector                                                                      | DSub male Connector, 9 pin                                                                                                     |
| Display                  | LED Display                                                                    | <b>SYS</b> System Status LED                                                                                                   |

| CIFX 70E-CO              | Parameter                                         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          |                                                   | <b>CAN</b> CANopen Status (duo LED)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          |                                                   | The meaning of the CAN LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                          |                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Power supply             | Supply Voltage                                    | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          | Current consumption at 3.3 V                      | 800 mA (maximum)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                          | Connector                                         | Via PCI Express Bus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Operation                | Rotary Switch Slot Number (Card ID)               | To set the Slot Number (Card ID)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Environmental Conditions | Operating temperature range*                      | 0 °C ... +65 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | *Air flow during measurment                       | 0,5m/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Storage temperature range                         | -40 °C ... +85 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                          | Humidity                                          | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Device                   | Dimensions (L x W x H)                            | 119,0 x 69,0 x 18,5 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                          | Mounting/Installation                             | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifX PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                          | RoHS                                              | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Compliance with EMC      | CE Sign                                           | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | UKCA Sign                                         | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                          | Emission                                          | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Immunity                                          | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| User software            | Download firmware and configuration to the device | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                          | Configuration and diagnostics                     | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 108: Technical Data CIFX 70E-CO

### 9.1.20 CIFS 70E-DN

| CIFS 70E-DN              | Parameter                                                                      | Value                                                                                                                                                                                           |
|--------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part                     | Name                                                                           | CIFS 70E-DN                                                                                                                                                                                     |
|                          | Part No.                                                                       | 1259.510                                                                                                                                                                                        |
|                          | Description                                                                    | PC Card cifs Low Profile PCI Express DeviceNet Master or Slave (Low Profile PCIe with DeviceNet)                                                                                                |
|                          | Function                                                                       | Communication interface with PCI Express and DeviceNet interface                                                                                                                                |
| Communication Controller | Type                                                                           | netX 100 processor                                                                                                                                                                              |
| Integrated Memory        | RAM                                                                            | 8 MB SDRAM                                                                                                                                                                                      |
|                          | FLASH                                                                          | 4 MB serial Flash EPROM                                                                                                                                                                         |
|                          | Size of the Dual-Port Memory                                                   | 64 KByte                                                                                                                                                                                        |
| System Interface         | Bus Type                                                                       | PCI Express, One Lane Port, according to [bus spec 2, Rev. 2.0] and [bus spec 3], refer to section <i>Overview</i> , page 117.                                                                  |
|                          | Transmission Rate                                                              | 2 GBit/s                                                                                                                                                                                        |
|                          | Data Access                                                                    | DPM or DMA (Direct Memory Access)                                                                                                                                                               |
|                          | Width for the data access to the Dual-Port Memory (DPM)                        | 32-Bit                                                                                                                                                                                          |
| DeviceNet Communication  | Supported communication standard/ protocol (determined by the loaded firmware) | DeviceNet Master, DeviceNet Slave                                                                                                                                                               |
| DeviceNet Interface      | Transmission rate                                                              | 125 kBit/s, 250 kBit/s, 500 kBit/s                                                                                                                                                              |
|                          | Interface Type                                                                 | ISO-11898 according to DeviceNet specification, refer to section <i>DeviceNet Interface</i> , page 112.                                                                                         |
|                          | Galvanic Isolation                                                             | optically isolated                                                                                                                                                                              |
|                          | Isolation Voltage                                                              | 1000 VDC (tested for 1 minute)                                                                                                                                                                  |
|                          | Connector                                                                      | CombiCon male Connector, 5 pin                                                                                                                                                                  |
| Display                  | LED Display                                                                    | <b>SYS</b> System Status LED<br><b>MNS</b> Module Network Status (duo LED)<br>The meaning of the MNS LED depends on the loaded firmware. Refer to chapter <i>Diagnosis with LEDs</i> , page 79. |
| Power supply             | Supply Voltage                                                                 | +3.3 V dc $\pm 5\%$ , refer to section <i>Power Supply and Host Interface</i> , page 51.                                                                                                        |
|                          | Current consumption at 3.3 V                                                   | 800 mA (maximum)                                                                                                                                                                                |
|                          | Connector                                                                      | Via PCI Express Bus                                                                                                                                                                             |
| Operation                | Rotary Switch Slot Number (Card ID)                                            | To set the Slot Number (Card ID)                                                                                                                                                                |
| Environmental Conditions | Operating temperature range*                                                   | 0 °C ... +65 °C                                                                                                                                                                                 |
|                          | *Air flow during measurment                                                    | 0,5m/s                                                                                                                                                                                          |
|                          | Storage temperature range                                                      | -40 °C ... +85 °C                                                                                                                                                                               |
|                          | Humidity                                                                       | 10 ... 95% relative humidity, no condensation permitted                                                                                                                                         |
| Device                   | Dimensions (L x W x H)                                                         | 119,0 x 69,0 x 18,5 mm                                                                                                                                                                          |
|                          | Mounting/Installation                                                          | PCI Express x1 slot (3.3 V), refer to section <i>Slot for the PC Cards cifs PCI, PCIe and Low Profile PCIe</i> , page 50.                                                                       |
|                          | RoHS                                                                           | Yes                                                                                                                                                                                             |
| Compliance with EMC      | CE Sign                                                                        | Yes                                                                                                                                                                                             |
|                          | UKCA Sign                                                                      | Yes                                                                                                                                                                                             |

| CIFX 70E-DN   | Parameter                                         | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | Emission                                          | EN 55011+ A1, CISPR 11, Class A /<br>BS EN 55011+ A1, CISPR 11, Class A (Radio disturbance characteristics - Limits and methods of measurement)                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|               | Immunity                                          | EN 61000-4-2 / BS EN 61000-4-2<br>(Electrostatic discharge test)<br>EN 61000-4-3 + A1 + A2 / BS EN 61000-4-3 + A1 + A2<br>(Radiated, radio-frequency, electromagnetic field test)<br>EN 61000-4-4 + A1 / BS EN 61000-4-4 + A1<br>(Burst Electrical fast transients/burst test)<br>EN 61000-4-5 / BS EN 61000-4-5 (Surge test)<br>EN 61000-4-6 / BS EN 61000-4-6 (to conducted disturbances, induced by radio- frequency fields)<br>EN 61000-4-8 / BS EN 61000-4-8<br>(power frequency magnetic field test)<br>EN 61000-6-2 + B1 / BS EN 61000-6-2 + B1<br>(for industrial environments) |
| User software | Download firmware and configuration to the device | Device Explorer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|               | Configuration and diagnostics                     | Communication Studio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 109: Technical Data CIFX 70E-DN

## 9.2 PCI IDs PC Cards cifX on the PCI Bus

On the PCI bus the PC Cards cifX have the following PCI IDs:

| PCI IDs             | Value  |
|---------------------|--------|
| VendorID            | 0x15CF |
| DeviceID            | 0x0000 |
| Subsystem Vendor ID | 0x0000 |
| Subsystem Device ID | 0x0000 |

Table 110: PCI IDs PC Cards cifX on the PCI Bus

## 9.3 Supported PCI-Bus Commands

From the following table you can see which PCI bus commands are supported by the Hilscher PC Cards cifX *PCI*, *PCI Express* and *Low Profile PCI Express*.

| C/BE3# | C/BE2# | C/BE1# | C/BE0# | Command Type                | supported |
|--------|--------|--------|--------|-----------------------------|-----------|
| 0      | 0      | 0      | 0      | Interrupt Acknowledge       | no        |
| 0      | 0      | 0      | 1      | Special Cycle               | no        |
| 0      | 0      | 1      | 0      | I/O Read                    | ✓         |
| 0      | 0      | 1      | 1      | I/O Write                   | ✓         |
| 0      | 1      | 0      | 0      | Reserved                    | no        |
| 0      | 1      | 0      | 1      | Reserved                    | no        |
| 0      | 1      | 1      | 0      | Memory Read                 | ✓         |
| 0      | 1      | 1      | 1      | Memory Write                | ✓         |
| 1      | 0      | 0      | 0      | Reserved                    | no        |
| 1      | 0      | 0      | 1      | Reserved                    | no        |
| 1      | 0      | 1      | 0      | Configuration Read          | ✓         |
| 1      | 0      | 1      | 1      | Configuration Write         | ✓         |
| 1      | 1      | 0      | 0      | Memory Read Multiple        | no        |
| 1      | 1      | 0      | 1      | Dual Address Cycle          | no        |
| 1      | 1      | 1      | 0      | Memory Read Line            | no        |
| 1      | 1      | 1      | 1      | Memory Write and Invalidate | no        |

Table 111: Supported / not supported PCI Bus Commands

**C/BE** = Bus Command and Byte Enable Signal of PCI



## 9.4 Technical Data of the Communication Protocols

In the following table you find the URLs to open the descriptions on the technical data of each protocol.

| Communication protocol       | Version | URL                                                                                                                      |
|------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------|
| CC-Link IE Field Basic Slave | 1       | <a href="https://hilscher.atlassian.net/wiki/x/kYHqB">https://hilscher.atlassian.net/wiki/x/kYHqB</a> (Features)         |
| CC-Link IE Field Slave       | 1       | <a href="https://hilscher.atlassian.net/wiki/x/S4DoB">https://hilscher.atlassian.net/wiki/x/S4DoB</a> (Features)         |
| EtherCAT Master              | 4       | <a href="https://hilscher.atlassian.net/wiki/x/zYL8Bg">https://hilscher.atlassian.net/wiki/x/zYL8Bg</a> (Features)       |
| EtherCAT Slave               | 4       | <a href="https://hilscher.atlassian.net/wiki/x/HgJiBw">https://hilscher.atlassian.net/wiki/x/HgJiBw</a> (Features)       |
| EtherNet/IP Scanner          | 3       | <a href="https://hilscher.atlassian.net/wiki/x/KABaBw">https://hilscher.atlassian.net/wiki/x/KABaBw</a> (Technical Data) |
| Ethernet/IP Adapter          | 3       | <a href="https://hilscher.atlassian.net/wiki/x/ghlkBw">https://hilscher.atlassian.net/wiki/x/ghlkBw</a> (Technical Data) |
| Open Modbus/TCP              | 3       | <a href="https://hilscher.atlassian.net/wiki/x/14URBg">https://hilscher.atlassian.net/wiki/x/14URBg</a> (Features)       |
| POWERLINK Controlled Node    | 3       | <a href="https://hilscher.atlassian.net/wiki/x/5YHaBg">https://hilscher.atlassian.net/wiki/x/5YHaBg</a> (Features)       |
| PROFINET IO-Controller       | 3       | <a href="https://hilscher.atlassian.net/wiki/x/hoU5Bw">https://hilscher.atlassian.net/wiki/x/hoU5Bw</a> (Features)       |
| PROFINET IO-Device           | 4       | <a href="https://hilscher.atlassian.net/wiki/x/PA1YBw">https://hilscher.atlassian.net/wiki/x/PA1YBw</a> (Technical Data) |
| Sercos Master                | 2       | <a href="https://hilscher.atlassian.net/wiki/x/1AFWBg">https://hilscher.atlassian.net/wiki/x/1AFWBg</a> (Features)       |
| Sercos Slave                 | 3       | <a href="https://hilscher.atlassian.net/wiki/x/GITMC">https://hilscher.atlassian.net/wiki/x/GITMC</a> (Features)         |
| VARAN Client (Slave)         | 1       | <a href="https://hilscher.atlassian.net/wiki/x/YQANBw">https://hilscher.atlassian.net/wiki/x/YQANBw</a> (Features)       |
| PROFIBUS DP Master           | 2       | <a href="https://hilscher.atlassian.net/wiki/x/vwOeB">https://hilscher.atlassian.net/wiki/x/vwOeB</a> (Features)         |
| PROFIBUS DP Slave            | 2       | <a href="https://hilscher.atlassian.net/wiki/x/HwuaB">https://hilscher.atlassian.net/wiki/x/HwuaB</a> (Features)         |
| DeviceNet Master             | 2       | <a href="https://hilscher.atlassian.net/wiki/x/kIKkB">https://hilscher.atlassian.net/wiki/x/kIKkB</a> (Features)         |
| DeviceNet Slave              | 4       | <a href="https://hilscher.atlassian.net/wiki/x/yAGgB">https://hilscher.atlassian.net/wiki/x/yAGgB</a> (Features)         |
| CANopen Master               | 2       | <a href="https://hilscher.atlassian.net/wiki/x/0IPUB">https://hilscher.atlassian.net/wiki/x/0IPUB</a> (Features)         |
| CANopen Slave                | 3       | <a href="https://hilscher.atlassian.net/wiki/x/0IPQB">https://hilscher.atlassian.net/wiki/x/0IPQB</a> (Features)         |
| CC-Link Slave                | 2       | <a href="https://hilscher.atlassian.net/wiki/x/s4TYB">https://hilscher.atlassian.net/wiki/x/s4TYB</a> (Features)         |

Table 112: Technical data protocols (URLs)

## 10 Dimensions

### 10.1 Tolerances of the shown Card Dimensions

The manufacturing tolerance of the printed circuit boards of the PC card cifX is  $\pm 0.1$  mm per milled PCB edge. For all dimensions of the PCB indicated on the drawings (in the sections *Dimensions PC Cards cifX PCI and PCI Express* from page 155 and *Dimensions PC Cards cifX Low Profile PCI Express* from page 177) thus results for the length L and the width W, a tolerance of  $\pm 0.1$  mm (per milled edge)  $\times 2 = \pm 0.2$  mm.

$W = [\text{width of the board in mm}] \pm 0.2 \text{ mm}$

$L = [\text{length of the board in mm}] \pm 0.2 \text{ mm}$

The depth T of the PCB depends on the highest part used or the circuit board plus the descenders. The thickness of the PCB is  $= 1.6 \text{ mm} \pm 10\%$ .



**Note:** The dimensions (L x W x H) specified in section *Technical Data PC Cards cifX* on page 119 (and also the identical values in the data sheet cifX and on the 'Hilscher Site') are rounded and unified for the respective types of card. Here the depth of the PC cards PCI (CIFX 50), PCI Express (CIFX 50E) or Low Profile PCI Express (CIFX 70E) has been equated to the rounded width of the front panel.

## 10.2 Dimensions PC Cards cifX PCI and PCI Express

### 10.2.1 CIFX 50-RE

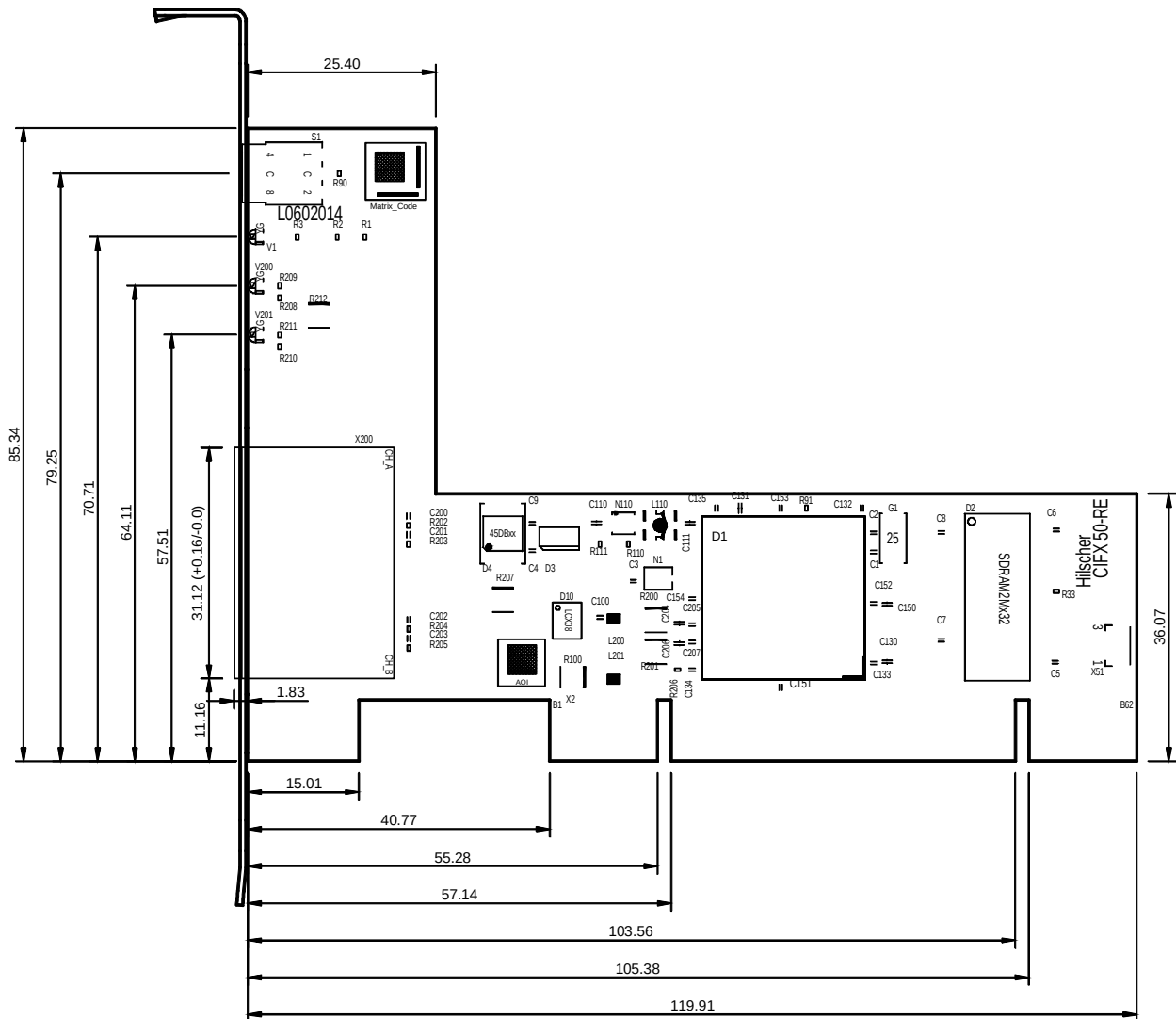


Figure 46: Dimensions CIFX 50-RE (from Hardware Rev.3)

## 10.2.2 CIFX 50E-RE, CIFX 50E-RE\ET

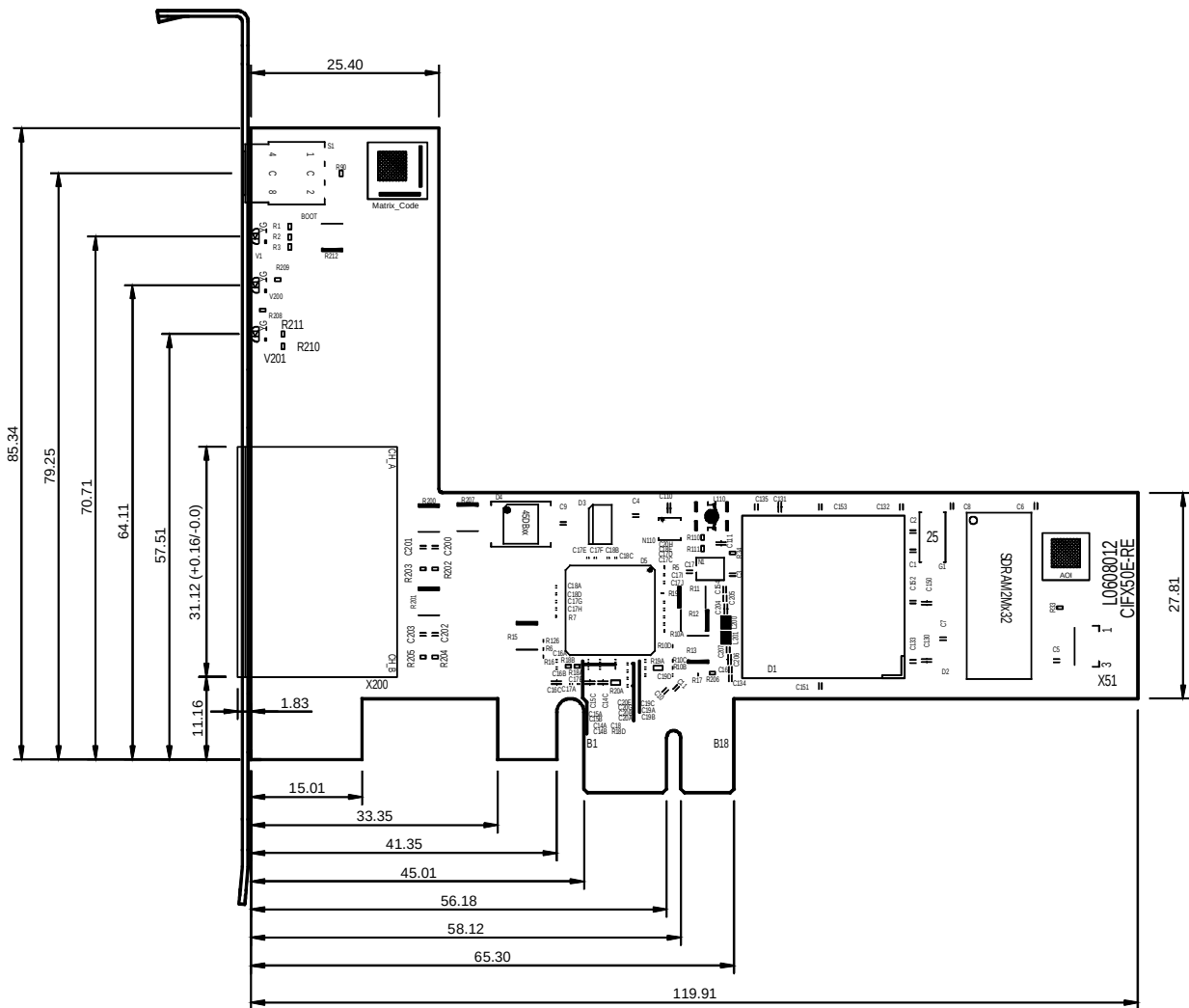


Figure 47: Dimensions CIFX 50E-RE (from Hardware Rev.4), CIFX 50E-RE\ET (from Hardware Rev.1)

### 10.2.3 Front Panel CIFX 50-RE, CIFX 50E-RE or CIFX 50E-RE/ET

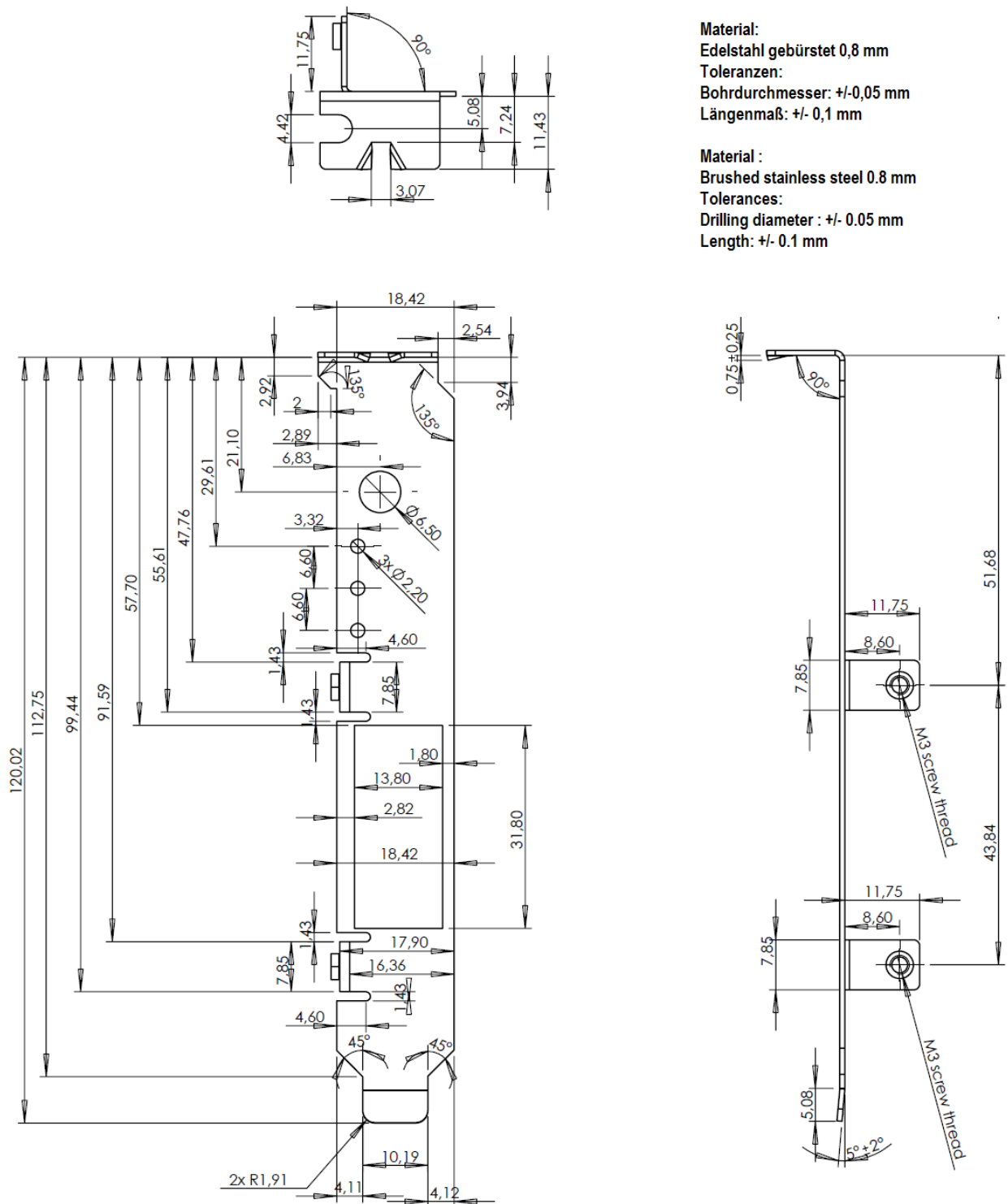


Figure 48: Dimensions Front Panel CIFX 50-RE, CIFX 50E-RE or CIFX 50E-RE/ET

## 10.2.4 CIFX 50E-CCIES

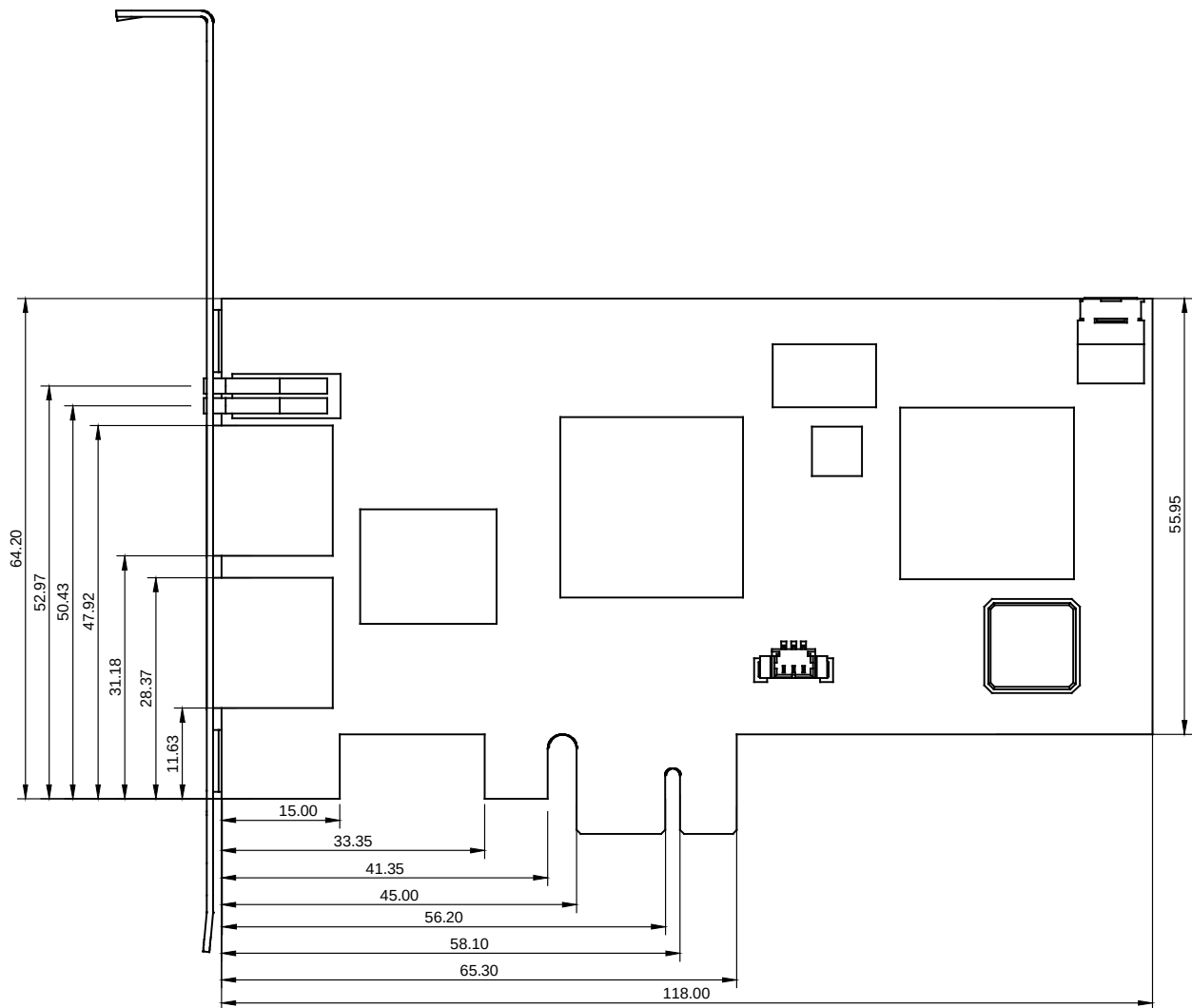
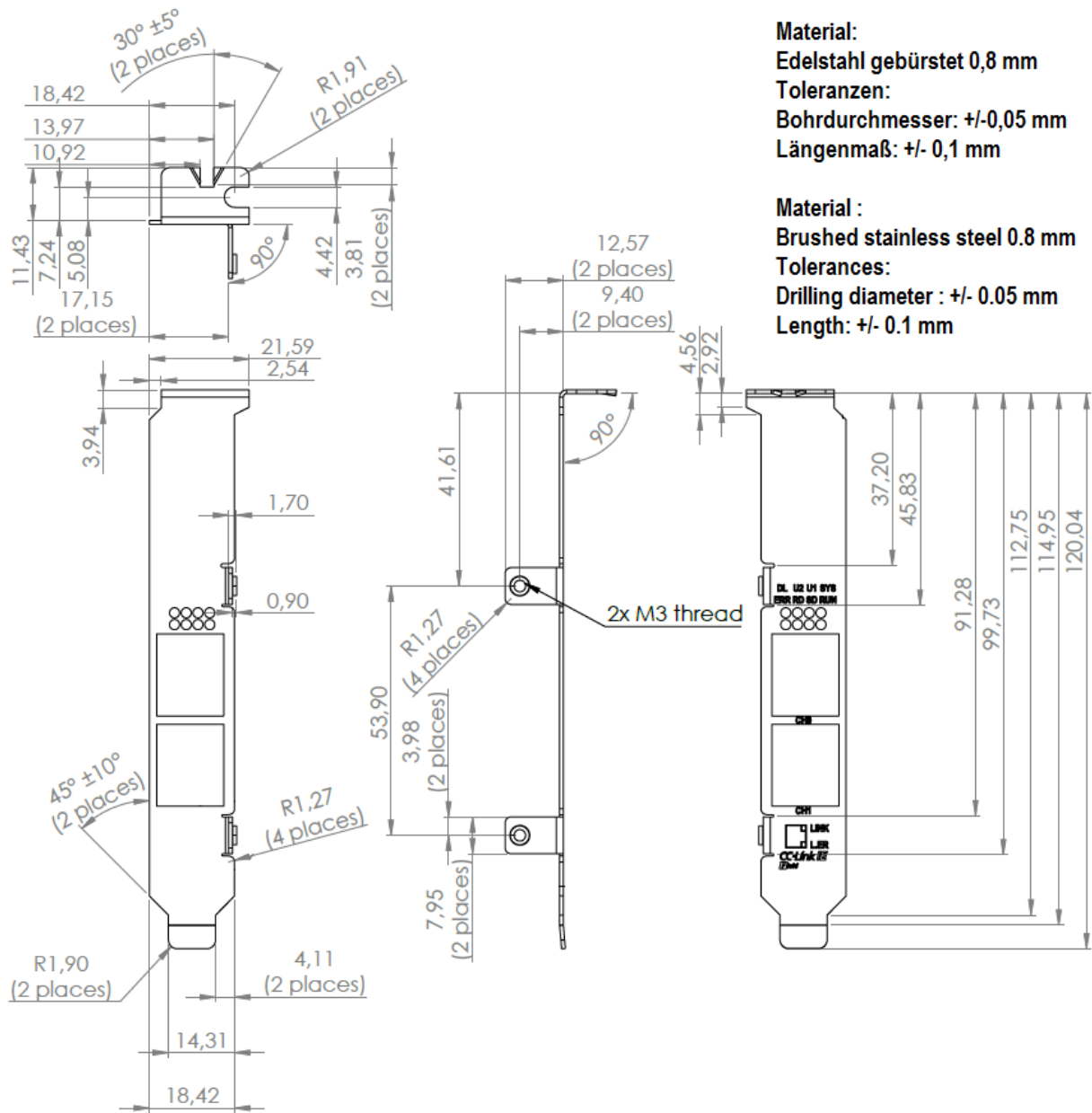


Figure 49: Dimensions CIFX 50E-CCIES (from Hardware Rev.1)

## 10.2.5 Front Panel CIFS 50-CCIES



### Blenden-Ausschnitt

### Panel cutout

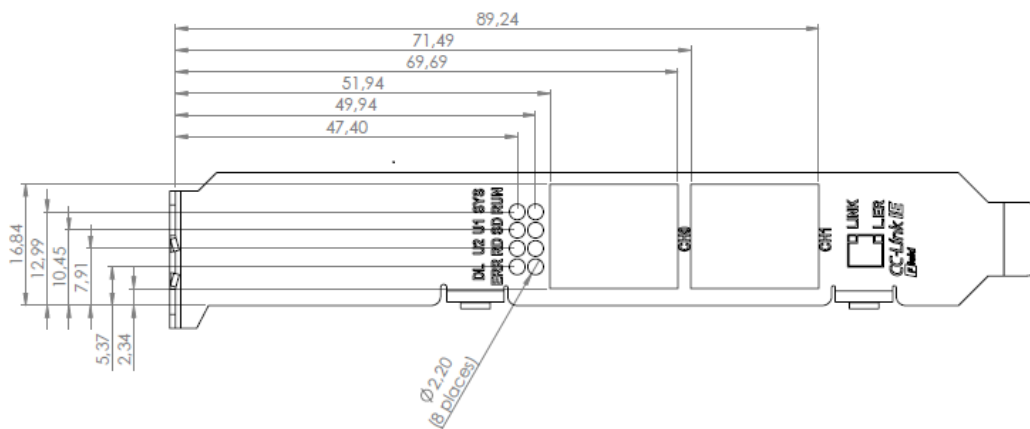


Figure 50: Dimensions Front Panel CIFS 50E-CCIES

## 10.2.6 CIFX 50-DP, CIFX 50E-DP

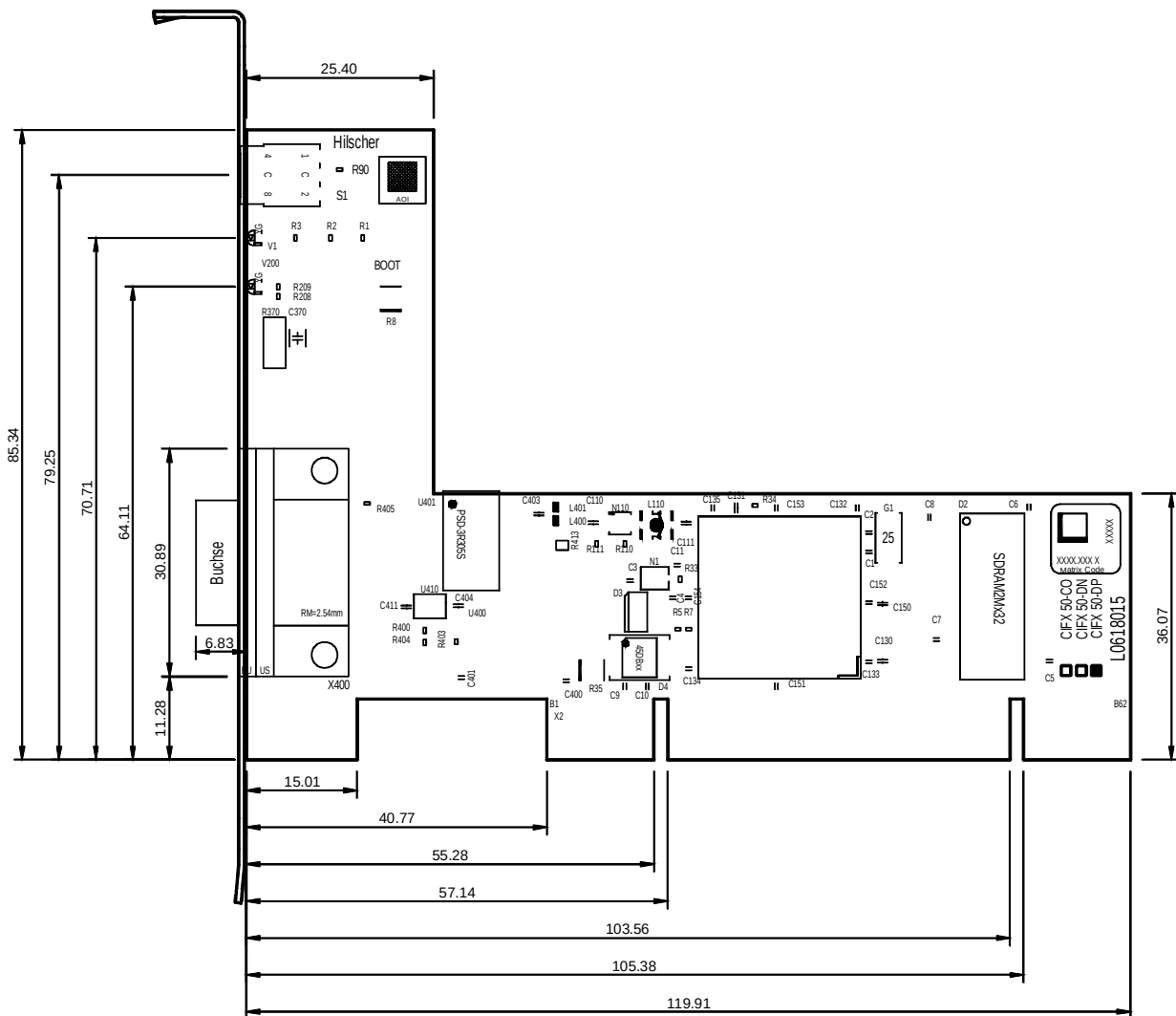


Figure 51: Dimensions CIFX 50-DP (Hardware Rev.5)



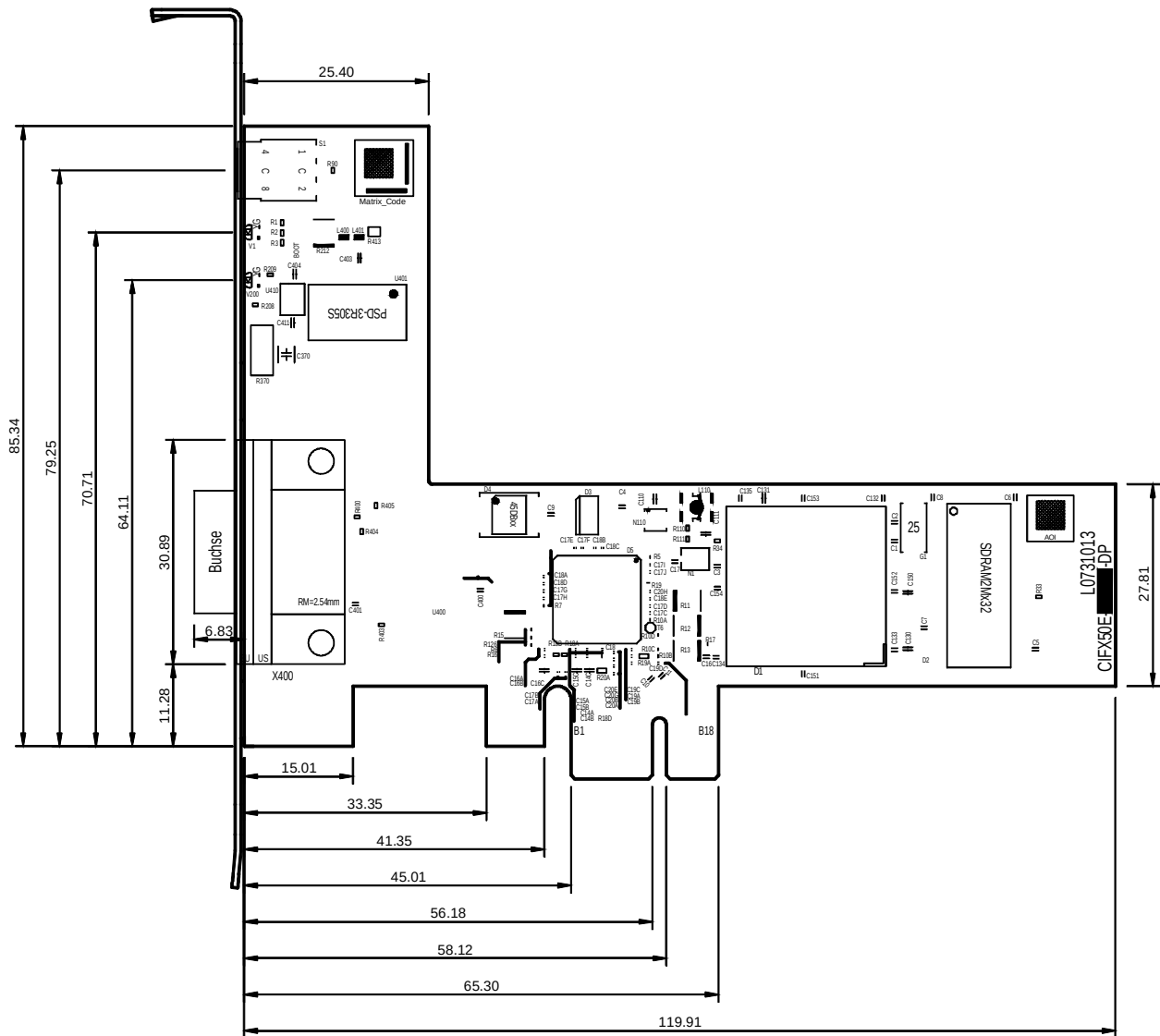


Figure 52: Dimensions CIFX 50E-DP (Hardware Rev.6)

## 10.2.7 Front Panel CIFX 50-DP or CIFX 50E-DP

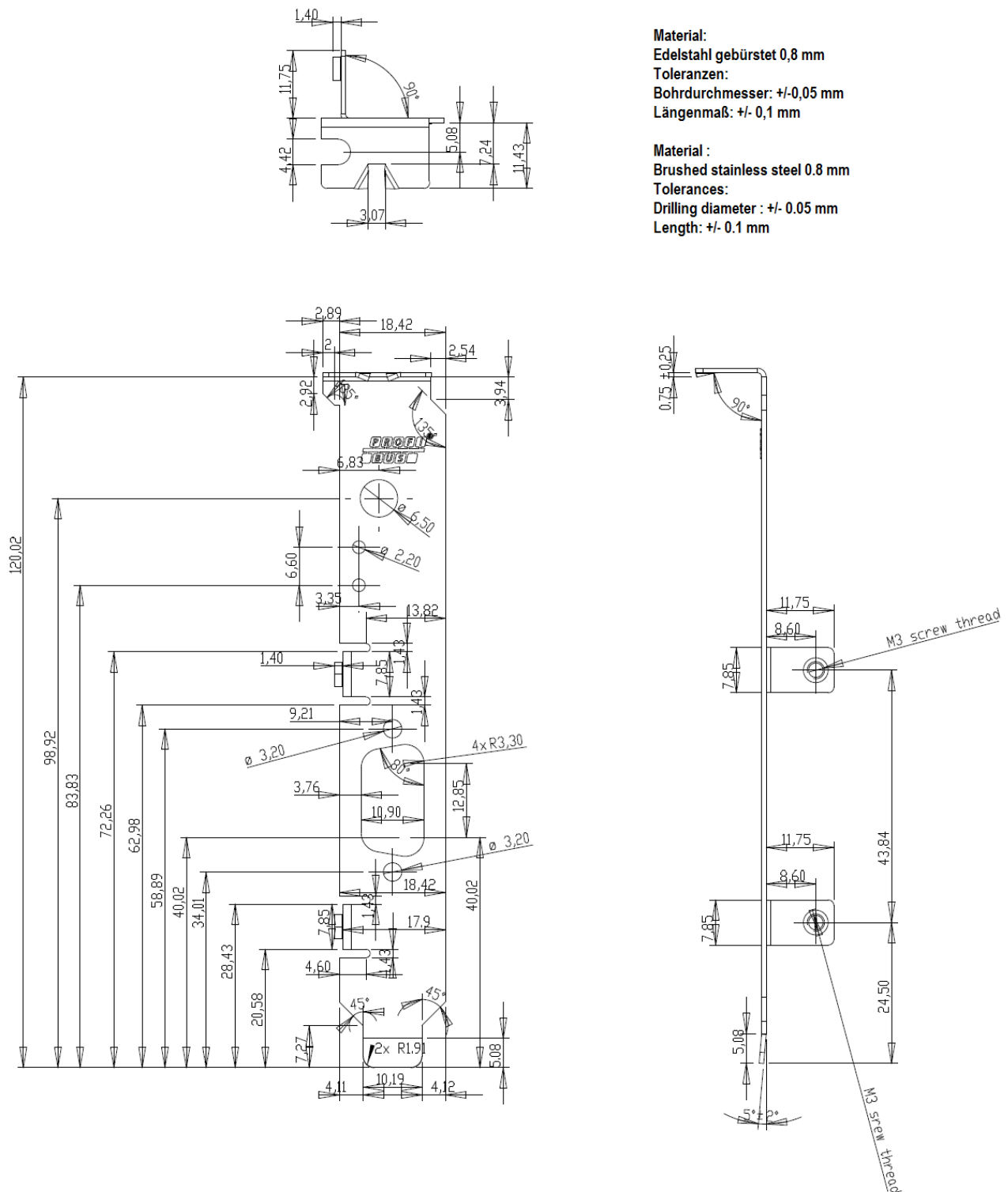


Figure 53: Dimensions Front Panel CIFX 50-DP or CIFX 50E-DP

## 10.2.8 CIFX 50-CO, CIFX 50E-CO

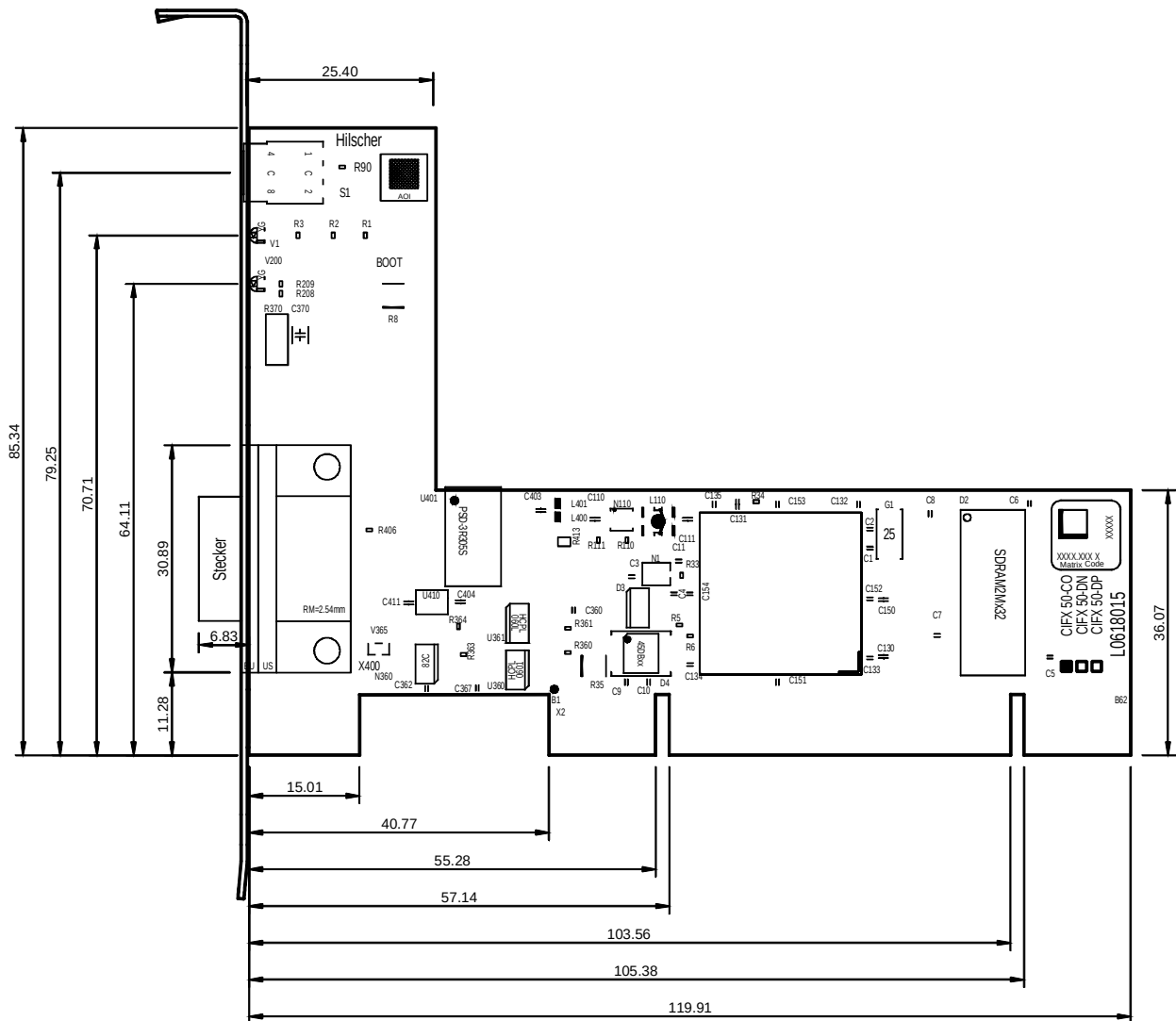


Figure 54: Dimensions CIFX 50-CO (Hardware Rev.5)

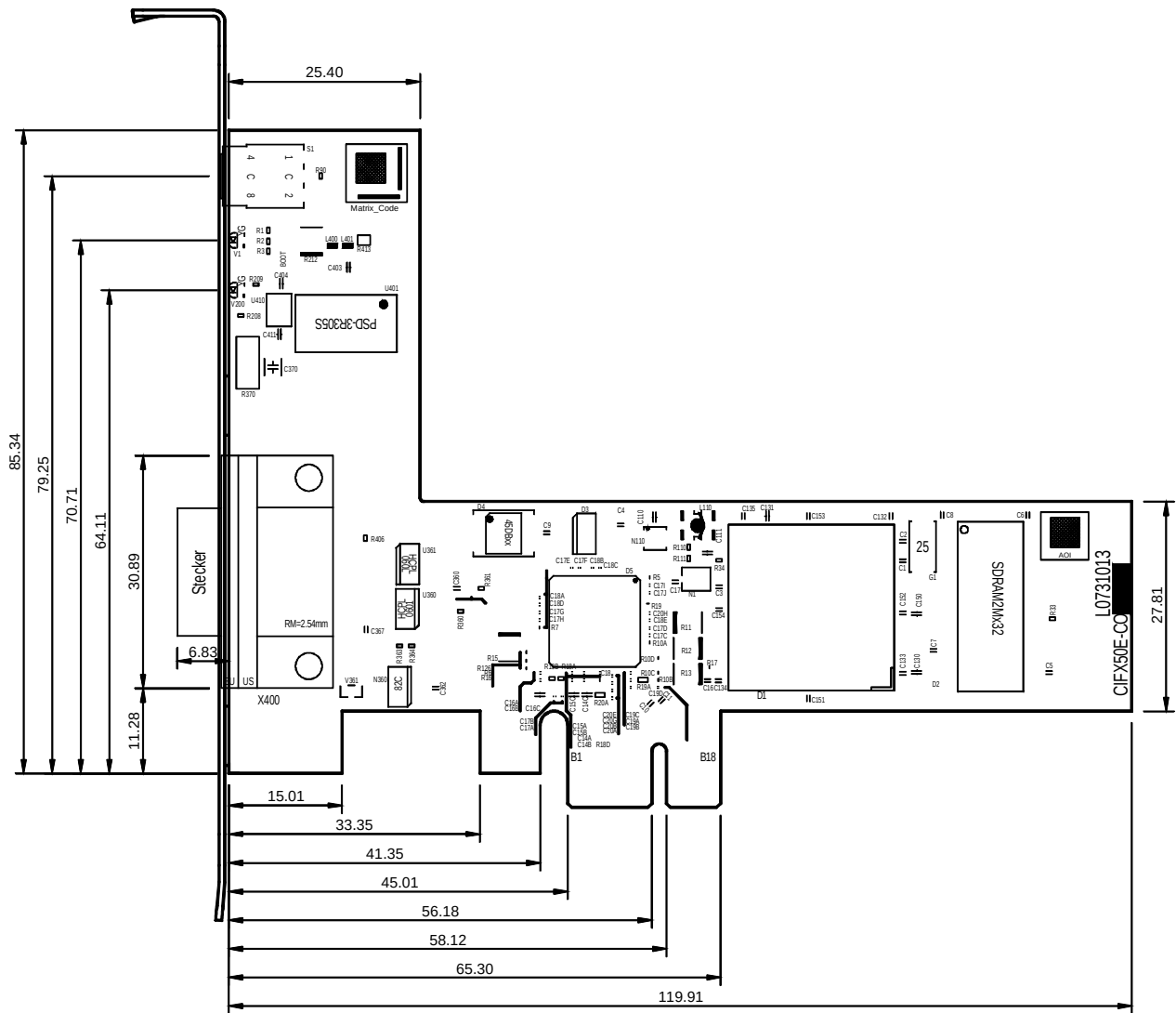


Figure 55: Dimensions CIFX 50E-CO (from Hardware Rev.4)

## 10.2.9 Front Panel CIFS 50-CO or CIFS 50E-CO

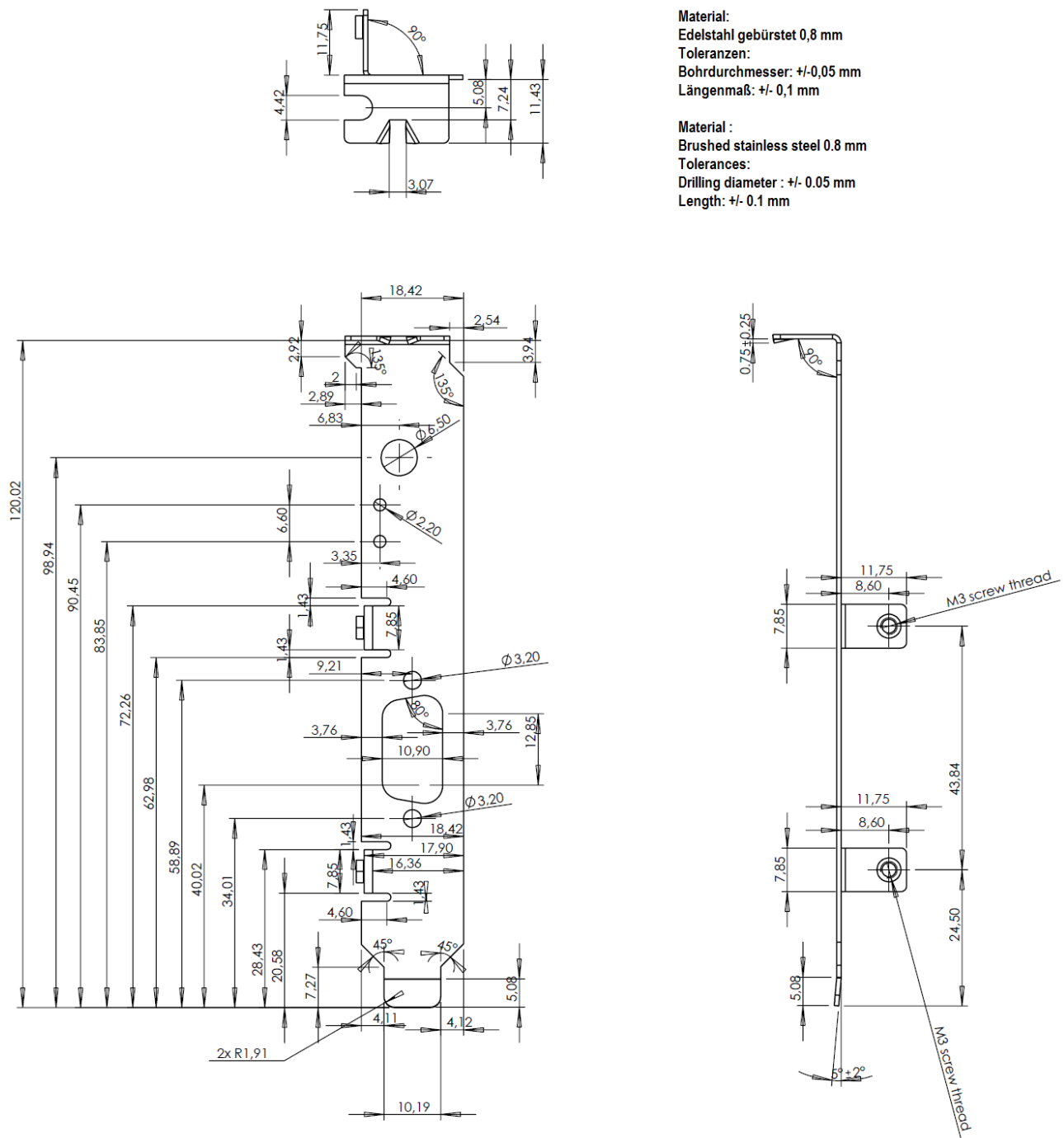


Figure 56: Dimensions Front Panel für CIFS 50-CO or CIFS 50E-CO

### 10.2.10 CIFX 50-DN, CIFX 50E-DN

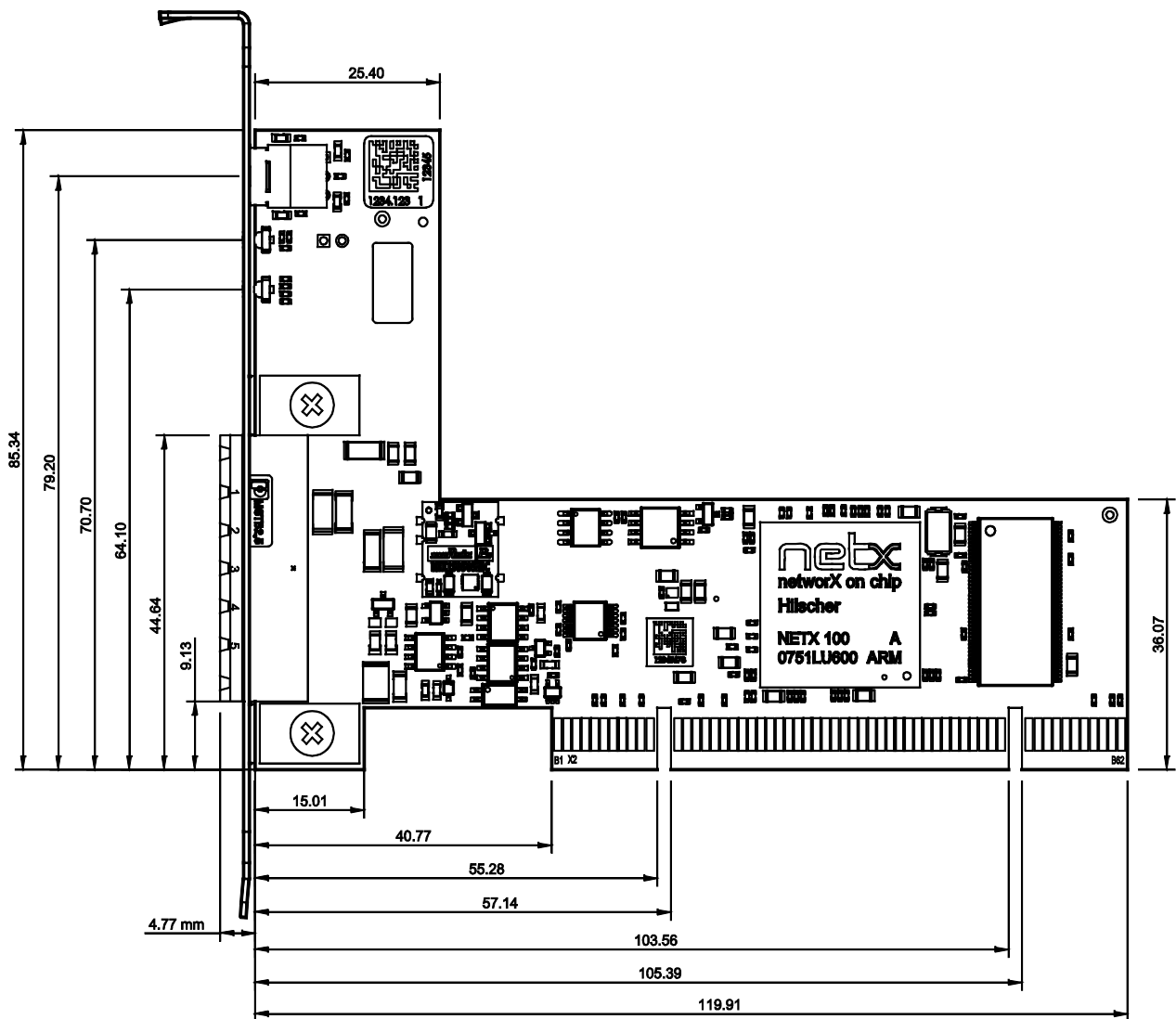


Figure 57: Dimensions CIFX 50-DN (Hardware Rev.9)

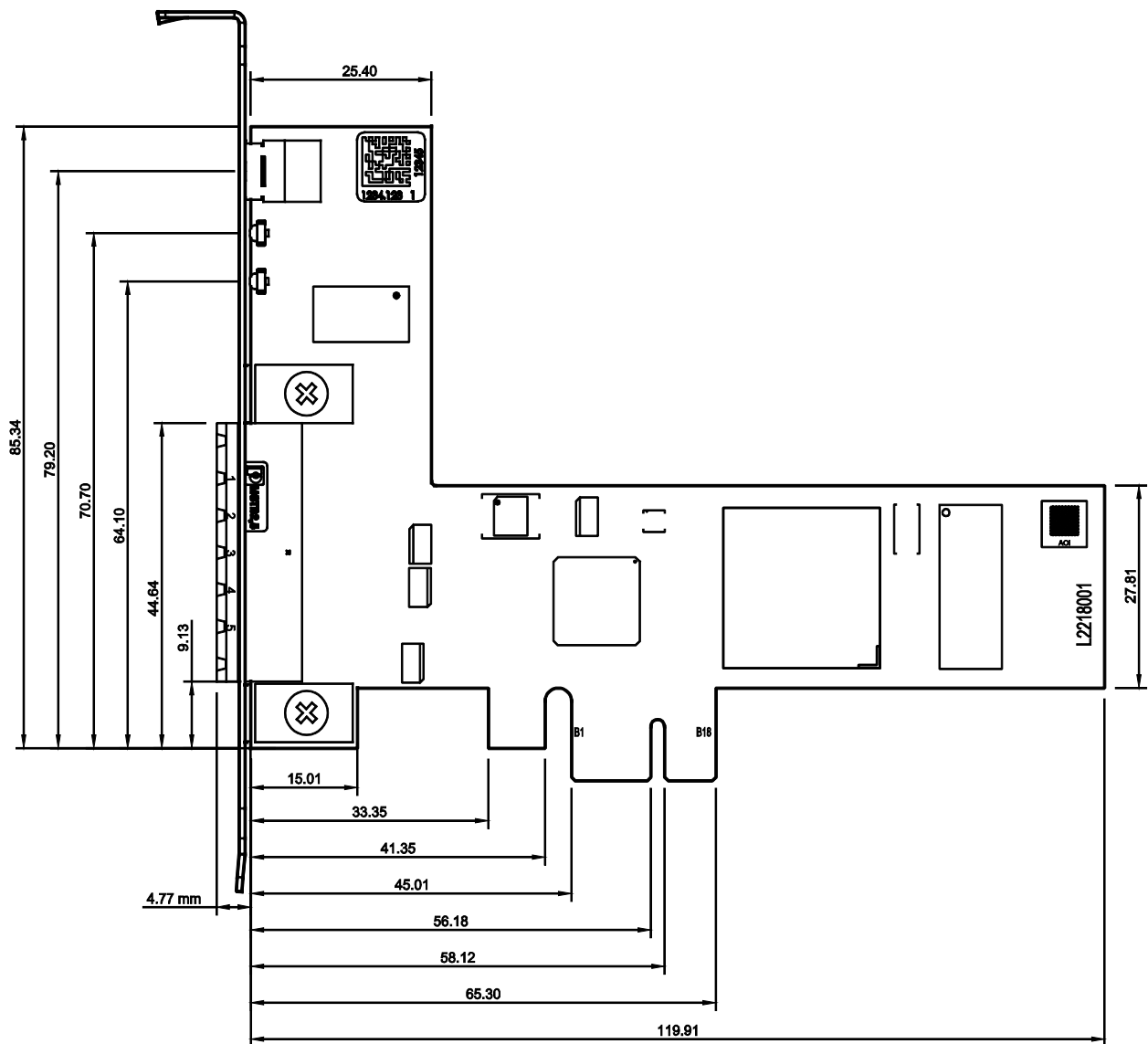


Figure 58: Dimensions CIFX 50E-DN (from Hardware Rev.8)

### 10.2.11 Front Panel CIFX 50-DN or CIFX 50E-DN

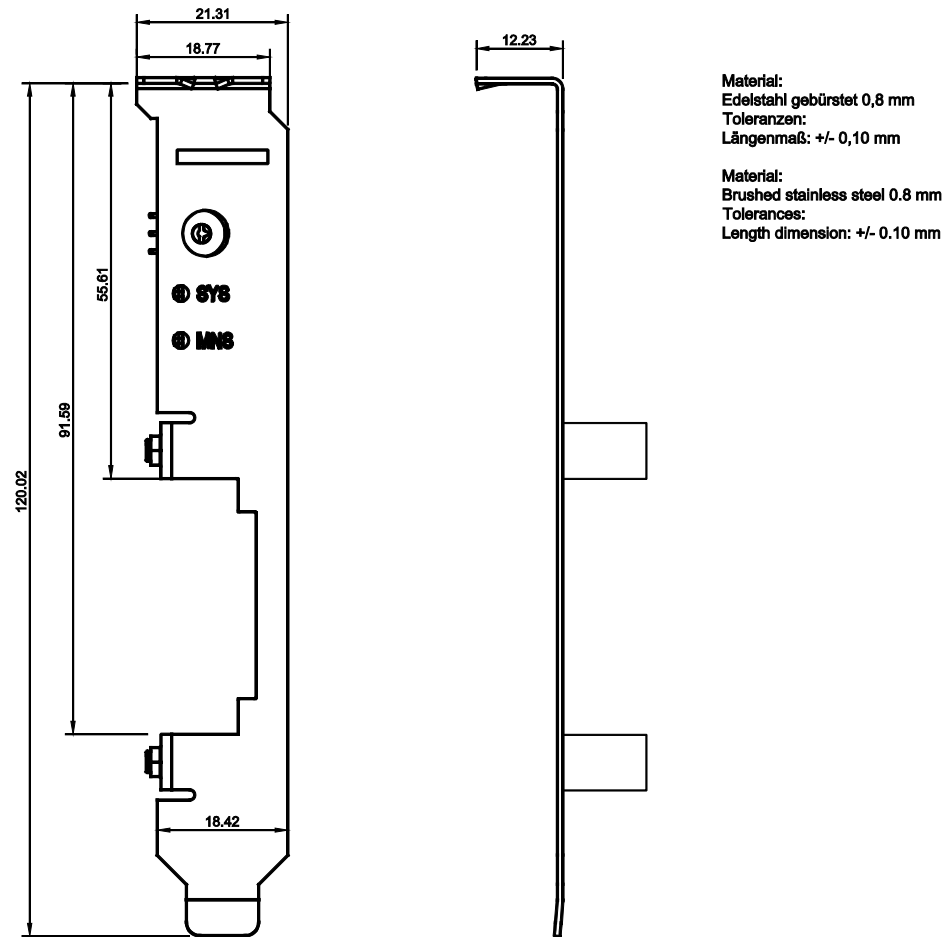


Figure 59: Dimensions Front Panel CIFX 50-DN (Rev. 9) or CIFX 50E-DN (Rev. 8)



## 10.2.12 CIFX 50-CC, CIFX 50E-CC

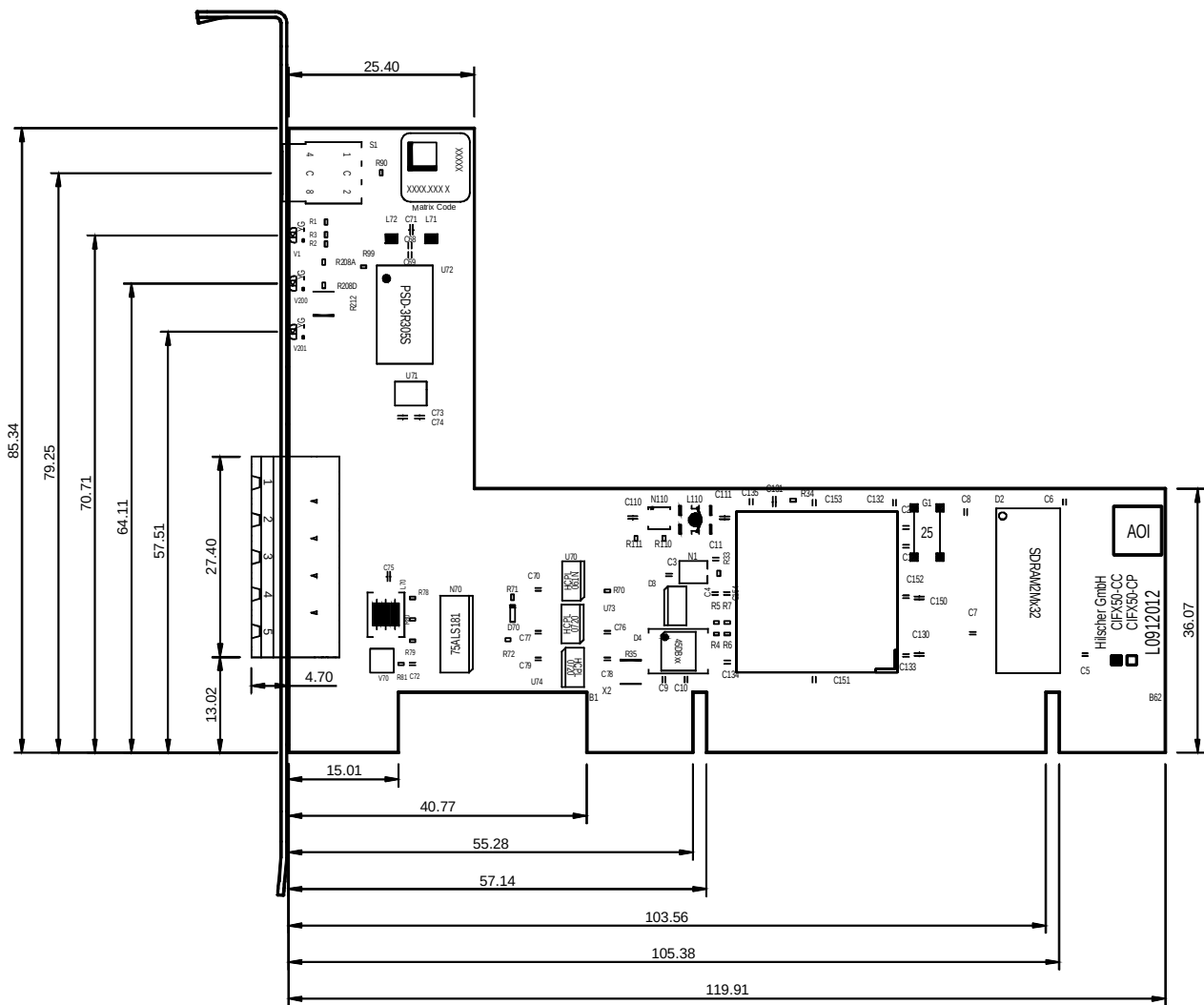
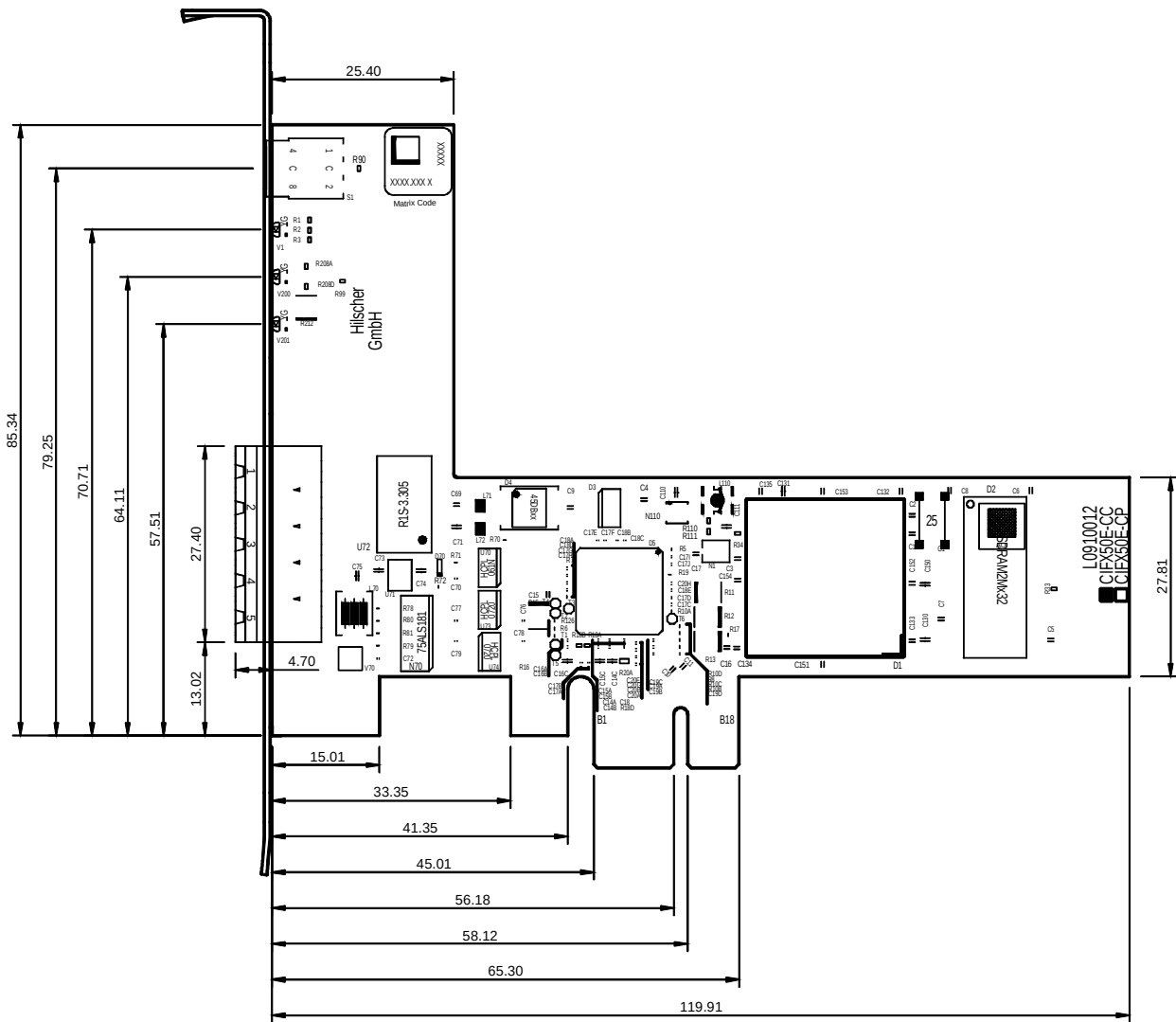
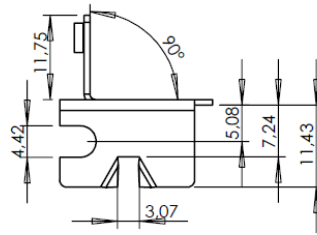


Figure 60: Dimensions CIFX 50-CC (Hardware Rev.2)



### 10.2.13 Front Panel CIFS 50-CC or CIFS 50E-CC



Material:  
Edelstahl gebürstet 0,8 mm  
Toleranzen:  
Bohrdurchmesser:  $\pm 0,05$  mm  
Längenmaß:  $\pm 0,1$  mm

Material :  
Brushed stainless steel 0.8 mm  
Tolerances:  
Drilling diameter :  $\pm 0.05$  mm  
Length:  $\pm 0.1$  mm

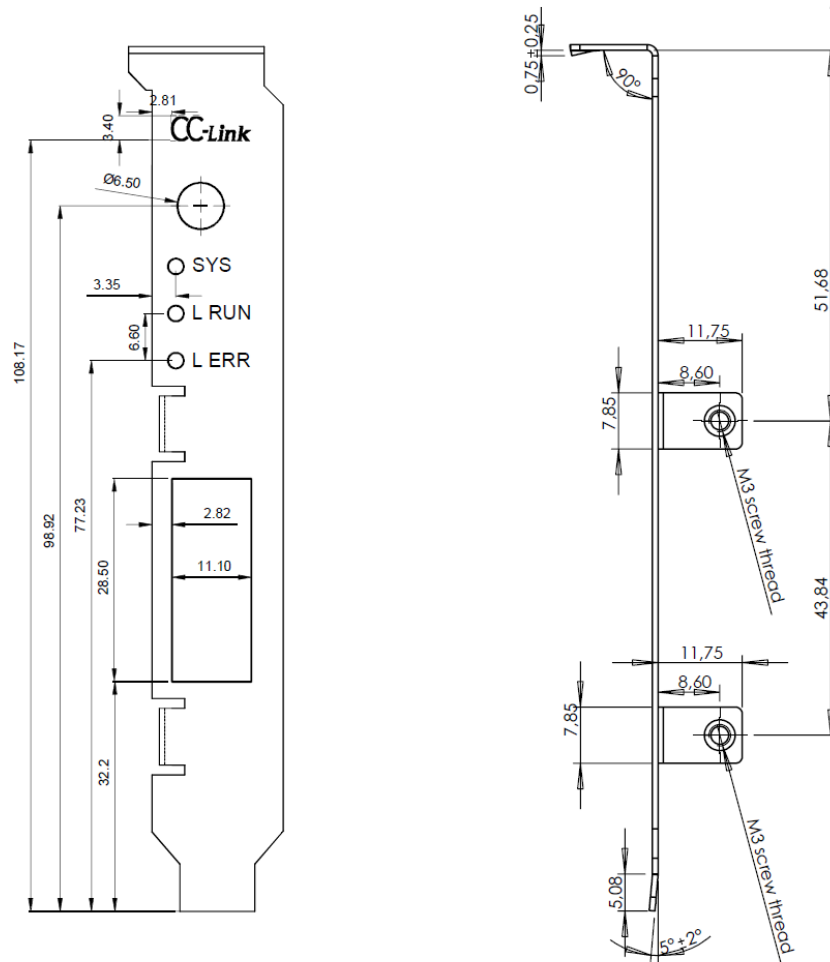


Figure 62: Dimensions Front Panel CIFS 50-CC or CIFS 50E-CC

## 10.2.14 CIFX 50-2DP

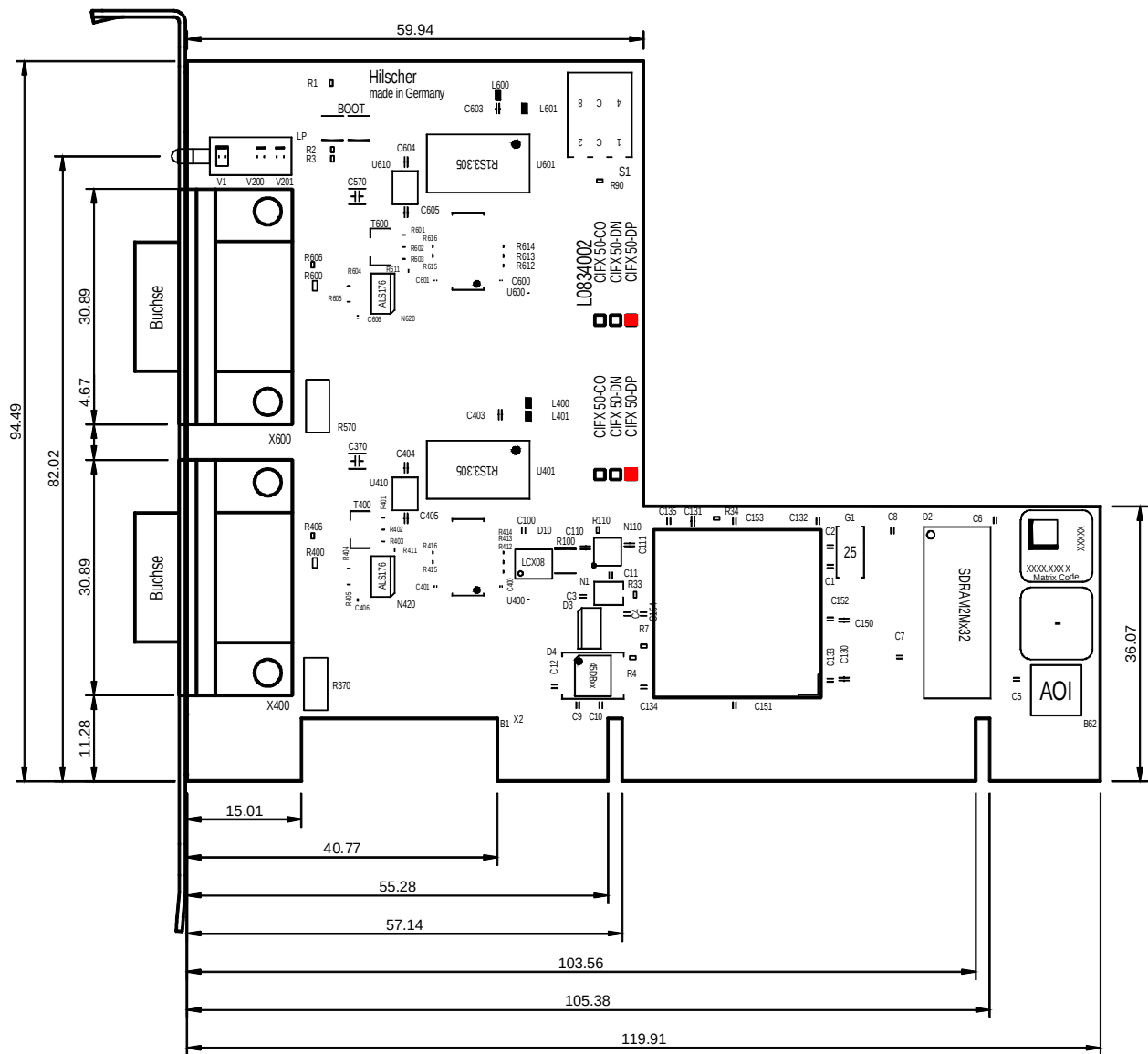


Figure 63: Dimensions CIFX 50-2DP (Hardware Rev.3)

## 10.2.15 CIFX 50E-2DP

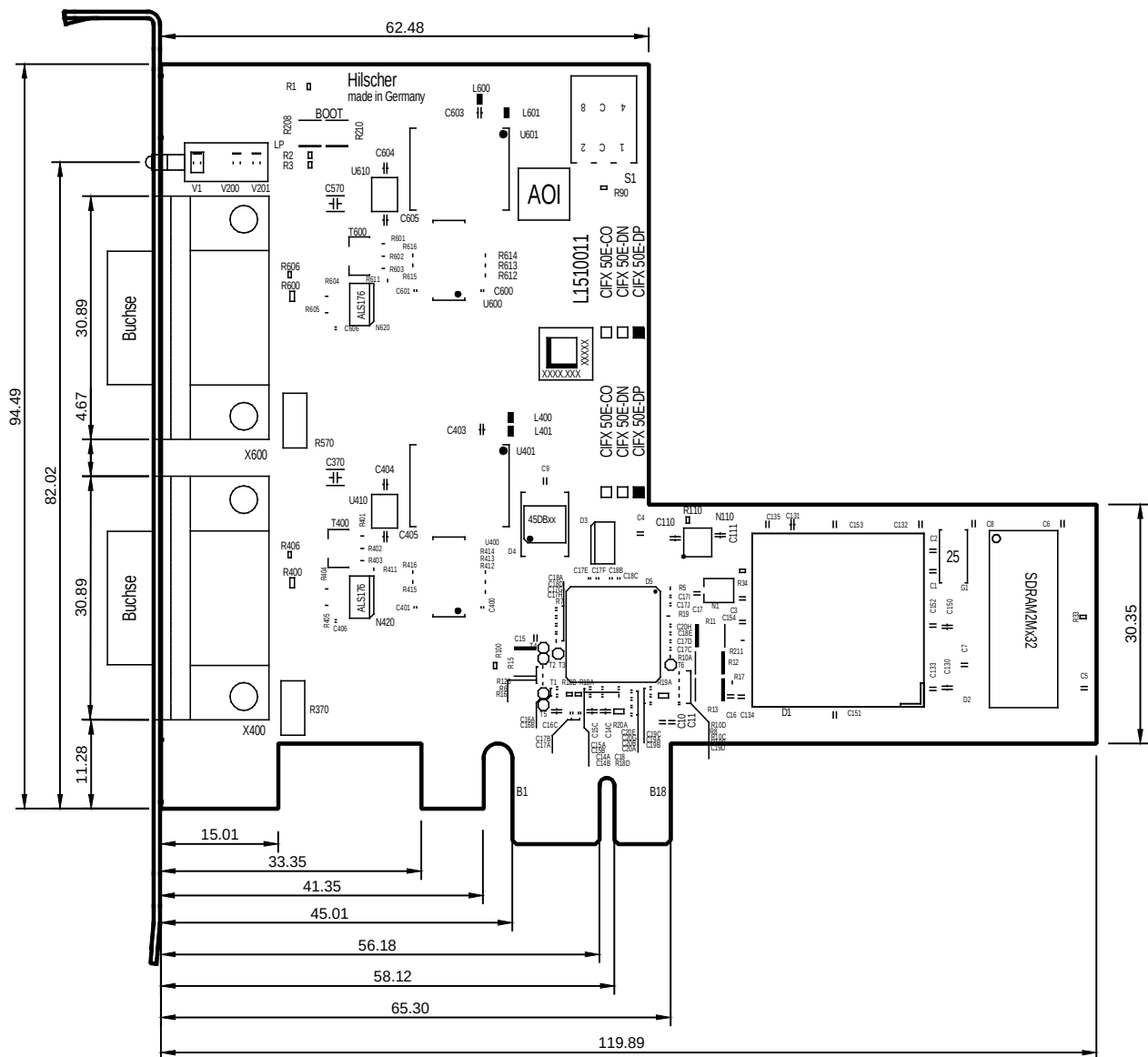


Figure 64: Dimensions CIFX 50E-2DP (Hardware Rev.1)

## 10.2.16 CIFX 50-2DN

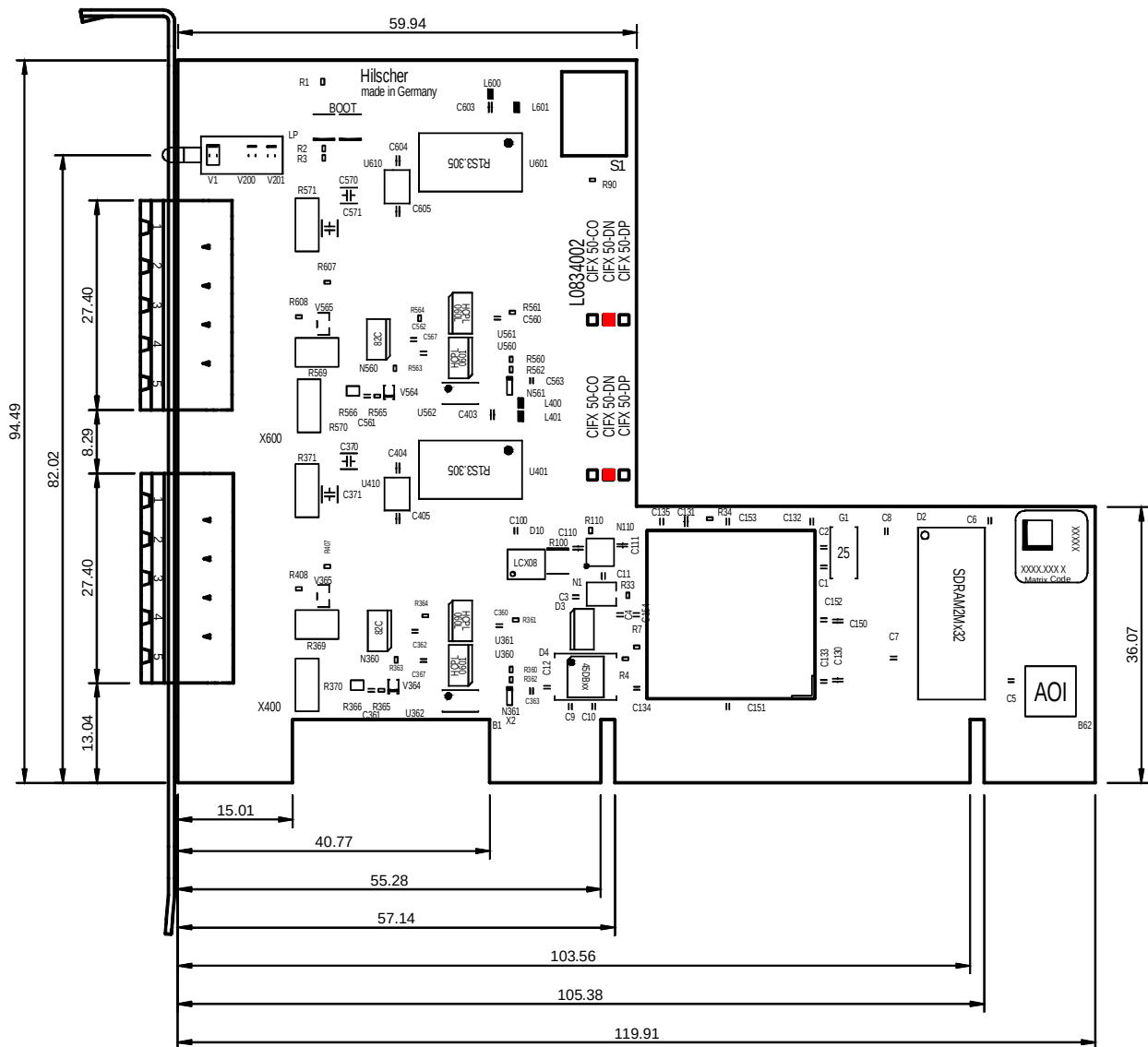


Figure 65: Dimensions CIFX 50-2DN (Hardware Rev.2)

## 10.2.17 CIFX 50E-2DN

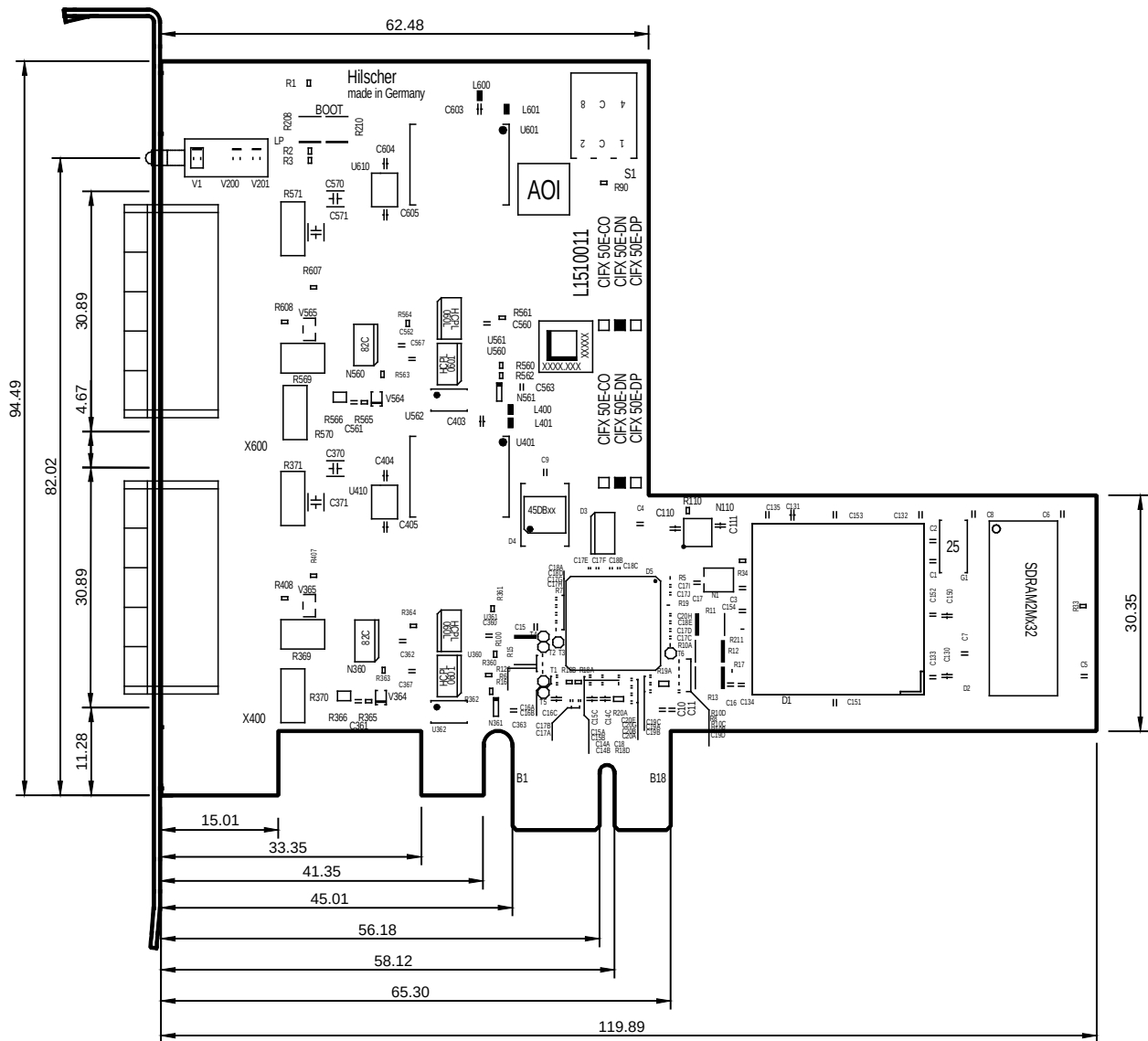


Figure 66: Dimensions CIFX 50E-2DN (Hardware Rev. 1)

Material :  
Brushed stainless steel 0.8 mm  
Tolerances:  
Drilling diameter :  $\pm 0.05$  mm  
Length:  $\pm 0.1$  mm

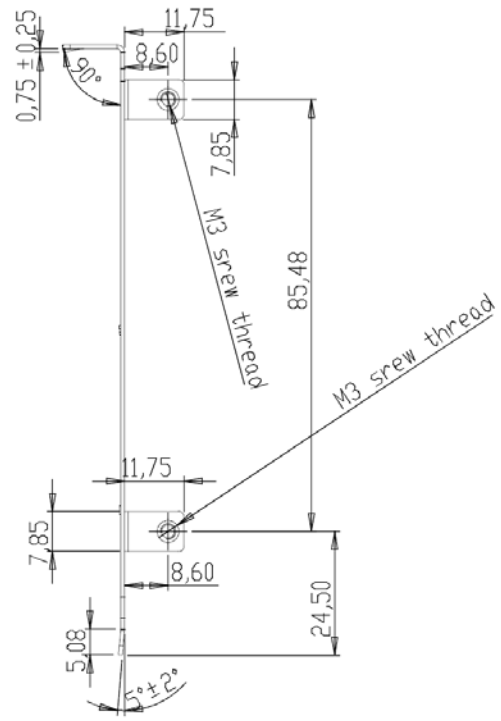


Figure 67: Dimensions Front Panel CIFX 50-2FB



## 10.3 Dimensions PC Cards cifX Low Profile PCI Express

### 10.3.1 CIFX 70E-RE

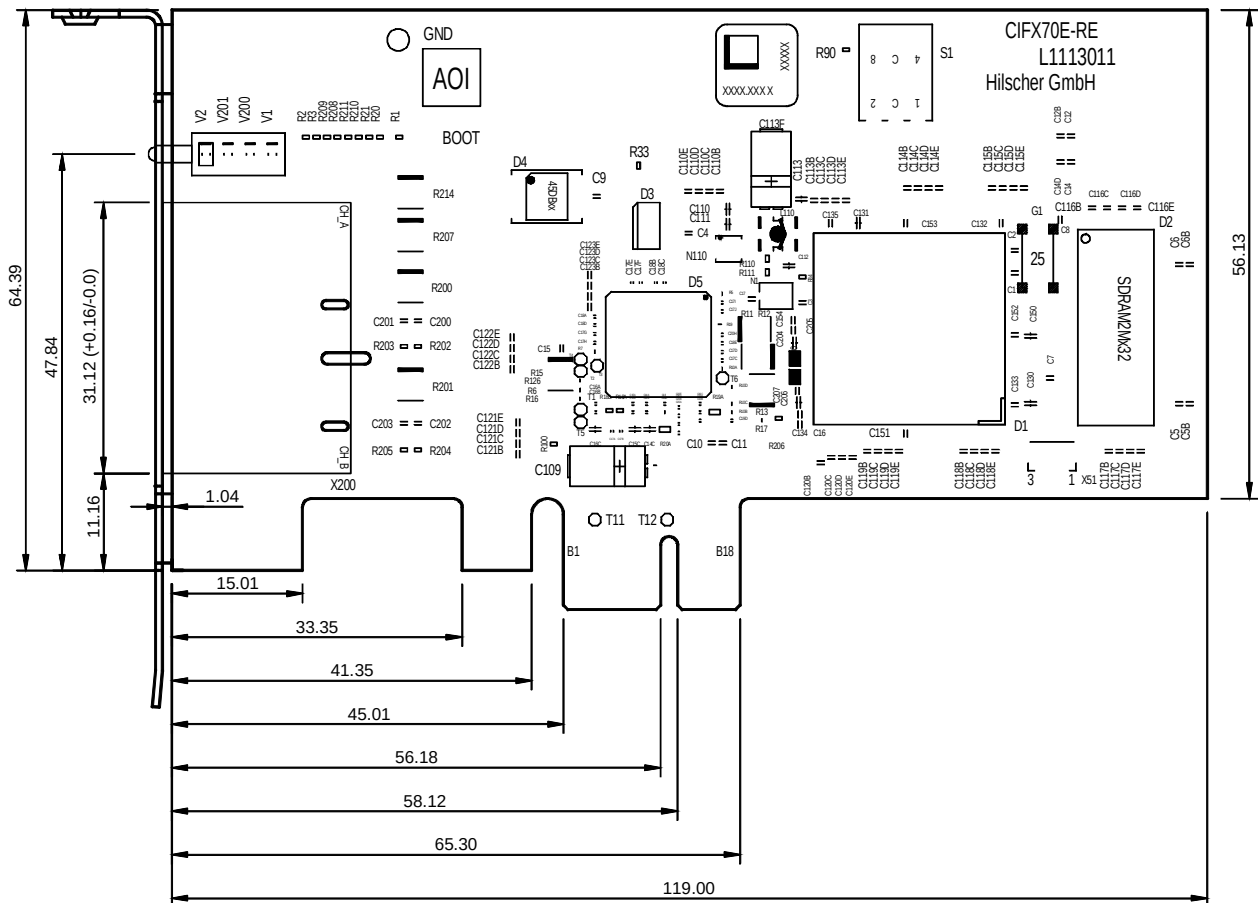


Figure 68: Dimensions CIFX 70E-RE (Hardware Rev.1)

### 10.3.2 Front Panel CIFX 70E-RE

Material:  
Edelstahl gebürstet 0,8 mm  
Toleranzen:  
Bohrdurchmesser: +/- 0,05 mm  
Längenmaß: +/- 0,01 mm

Material:  
Brushed stainless steel 0.8 mm  
Tolerances:  
Drilling diameter: +/- 0.05 mm  
Length: +/- 0.01 mm

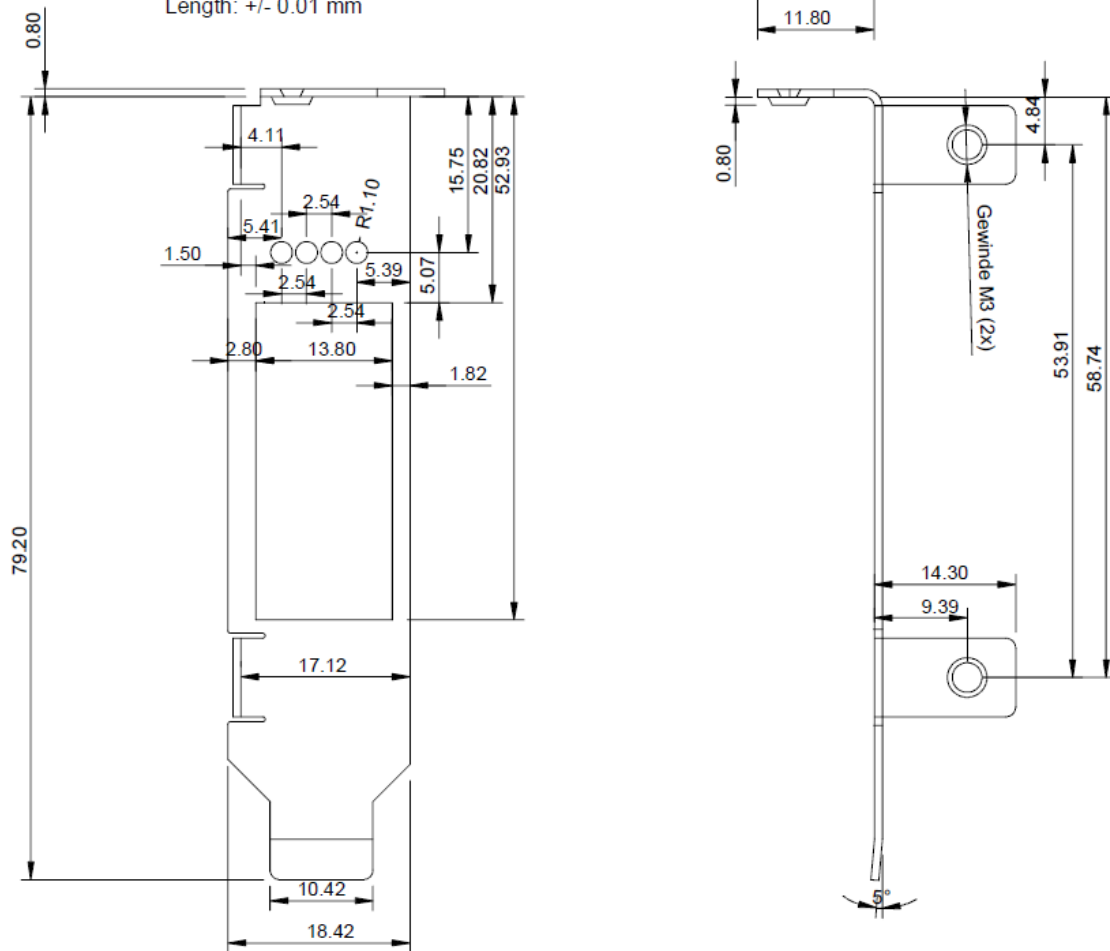


Figure 69: Dimensions Front Panel für CIFX 70E-RE

### 10.3.3 CIFS 70E-CCIES

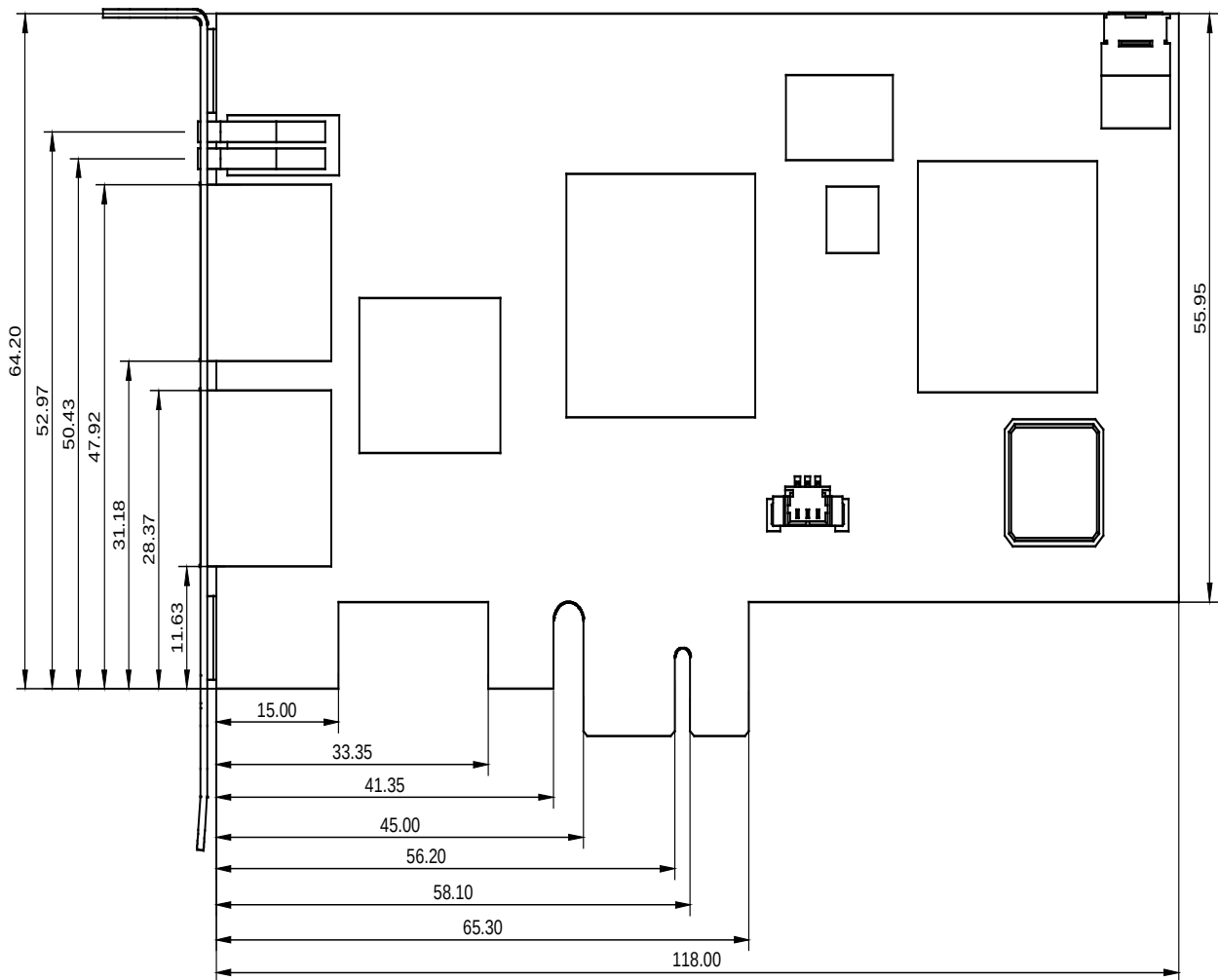
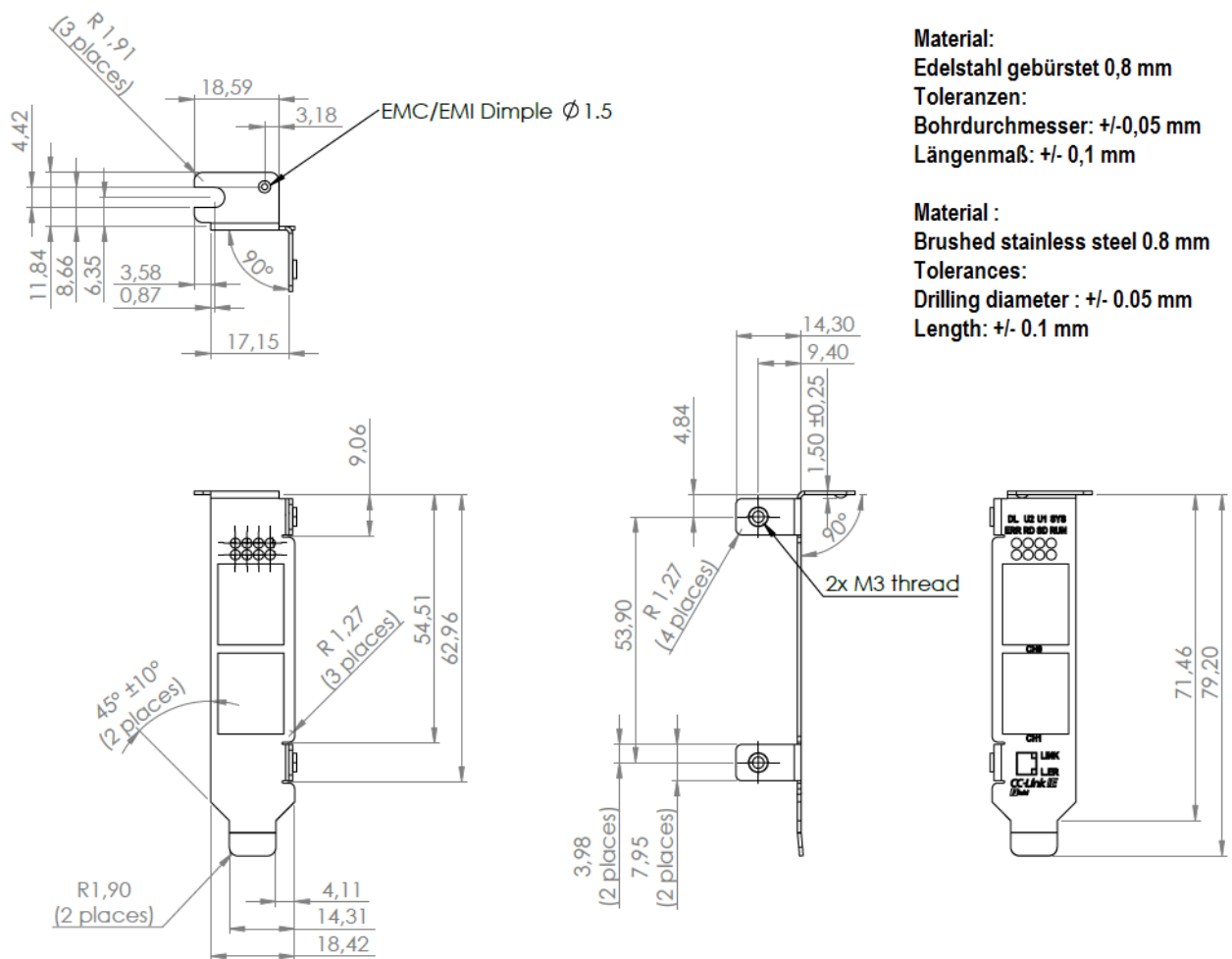


Figure 70: Dimensions CIFS 70E-CCIES (from Hardware Rev. 1)

### 10.3.4 Front Panel CIFS 70-CCIES



#### Blenden-Ausschnitt

#### Panel cutout

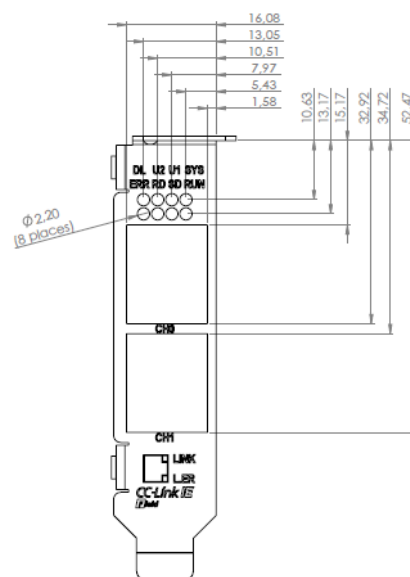


Figure 71: Dimensions Front Panel CIFS 70E-CCIES

### 10.3.5 CIFX 70E-DP

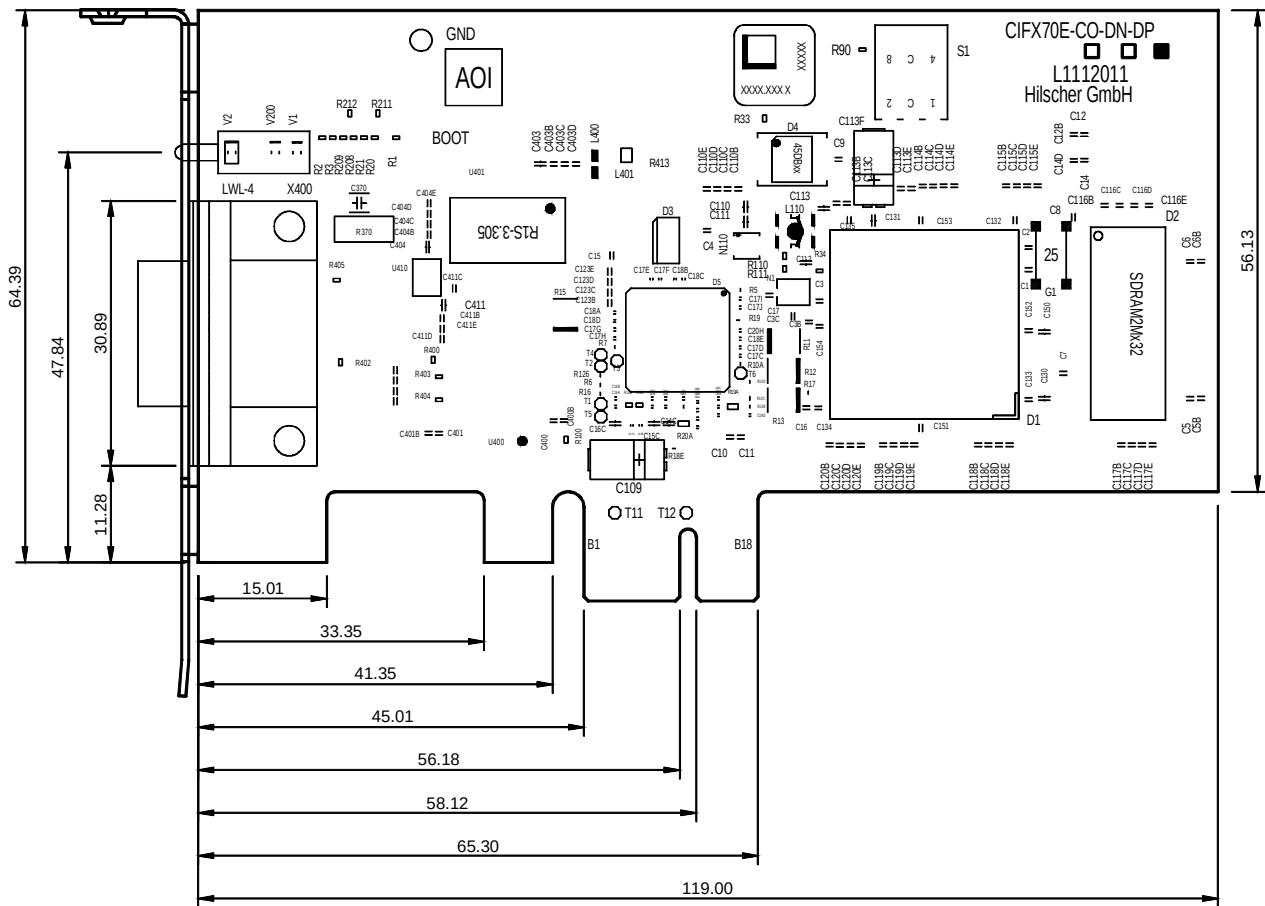


Figure 72: Dimensions CIFX 70E-DP (Hardware Rev.1)

Material:  
Edelstahl gebürstet 0,8 mm  
Toleranzen:  
Bohrdurchmesser: +/- 0,05 mm  
Längenmaß: +/- 0,01 mm

Material:  
Brushed stainless steel 0.8 mm  
Tolerances:  
Drilling diameter:  $\pm 0.05$  mm  
Length:  $\pm 0.01$  mm

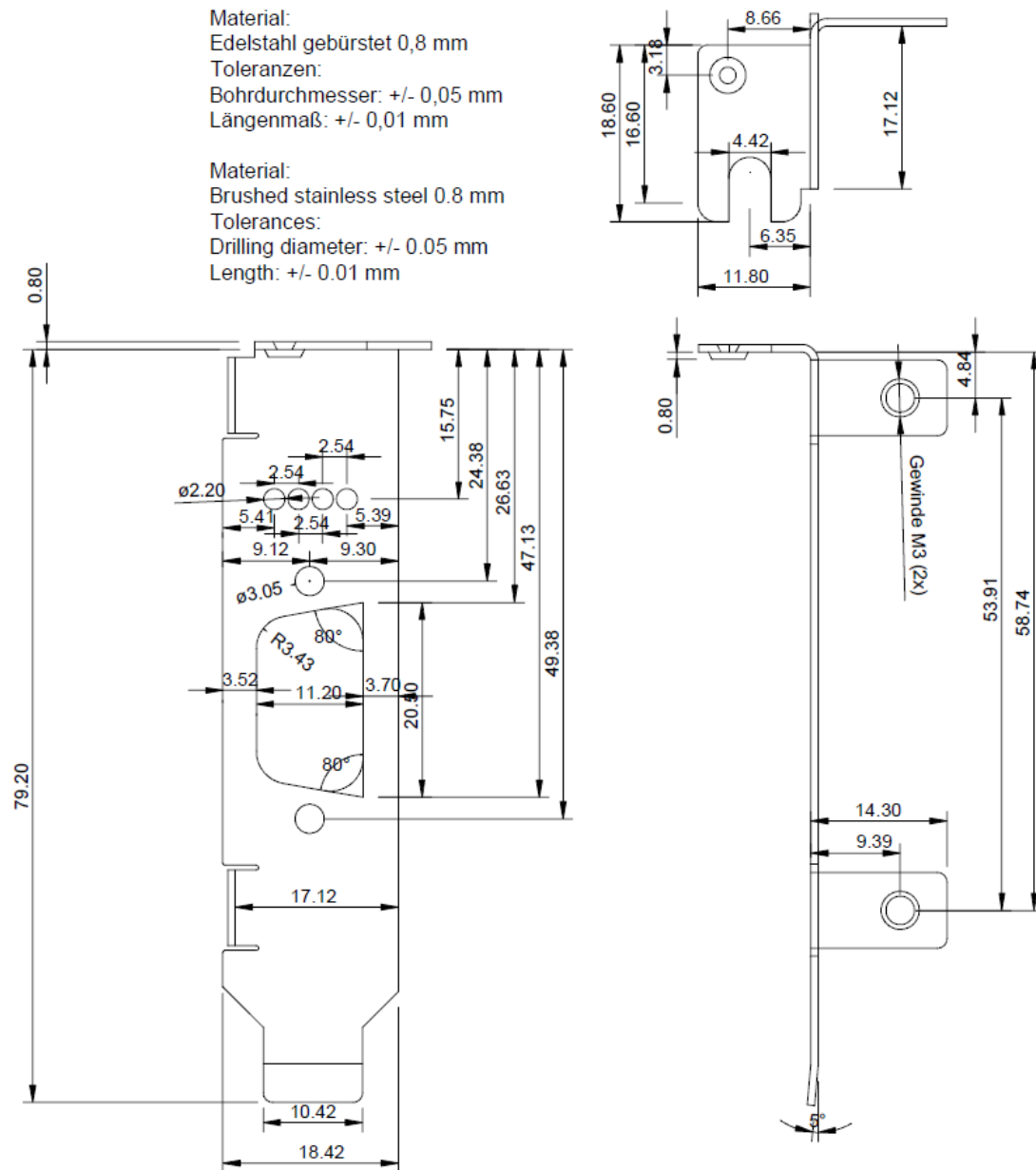


Figure 73: Blende für CIFX 70E-DP

### 10.3.6 CIFX 70E-CO

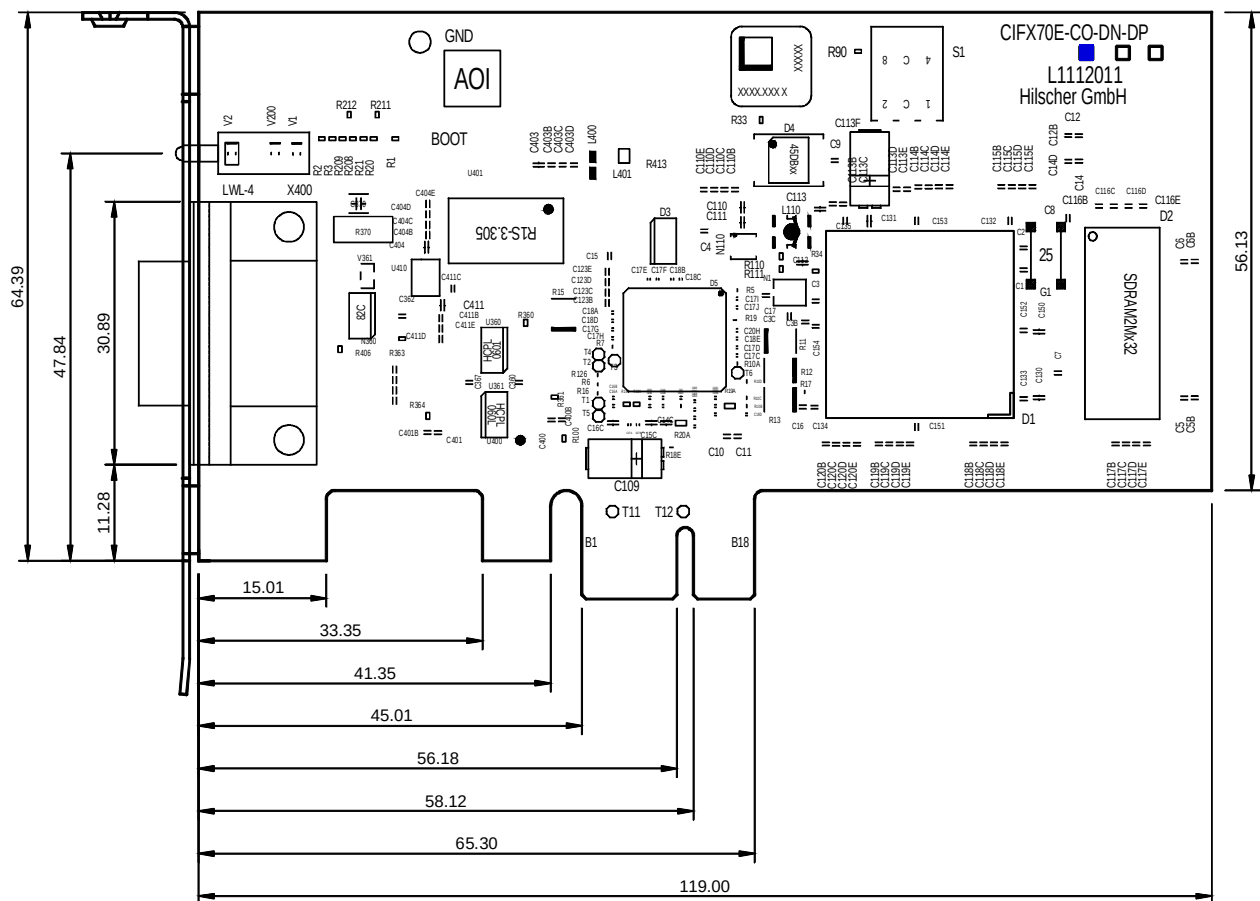


Figure 74: Dimensions CIFX 70E-CO (Hardware Rev.1)

### 10.3.7 Front Panel CIFX 70E-CO

Material:  
Edelstahl gebürstet 0,8 mm  
Toleranzen:  
Bohrdurchmesser: +/- 0,05 mm  
Längenmaß: +/- 0,01 mm

Material:  
Brushed stainless steel 0.8 mm  
Tolerances:  
Drilling diameter: +/- 0.05 mm  
Length: +/- 0.01 mm

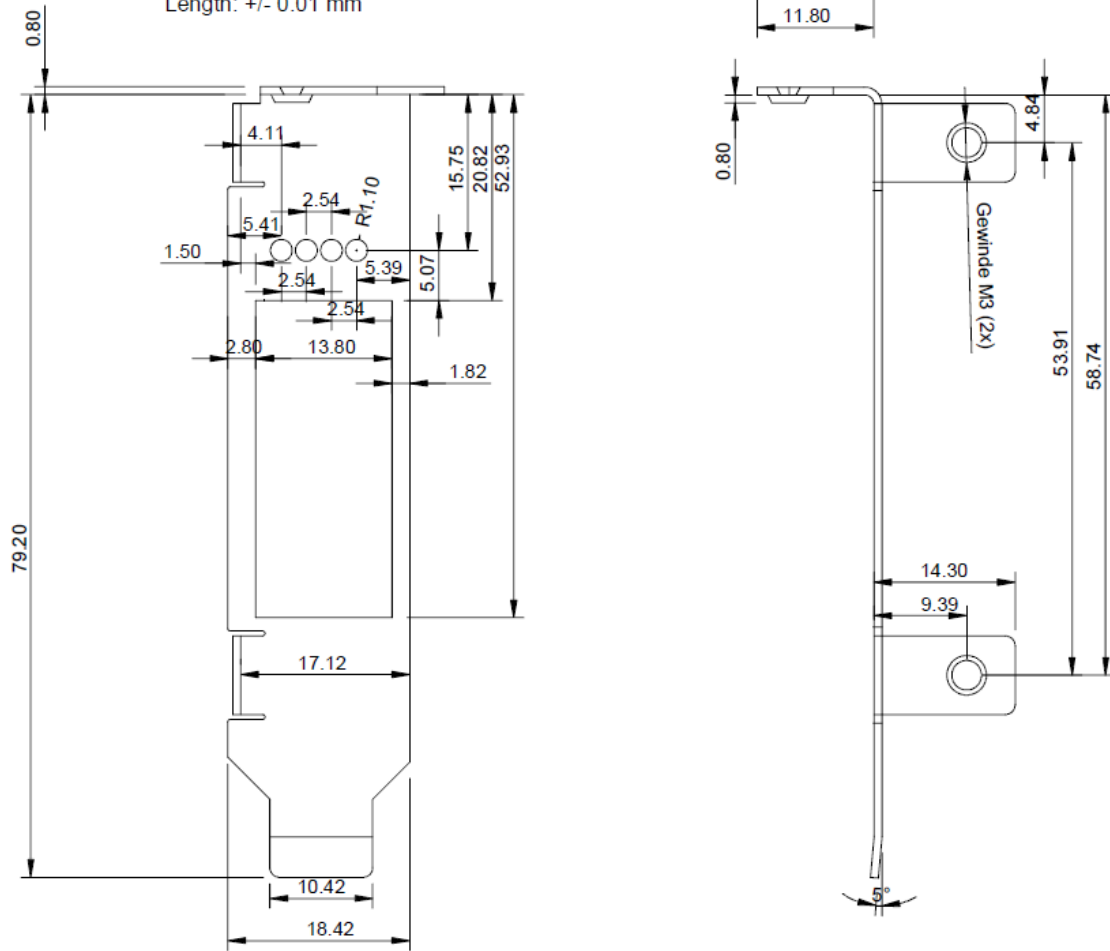


Figure 75: Dimensions Front Panel für CIFX 70E-CO



### 10.3.8 CIFX 70E-DN

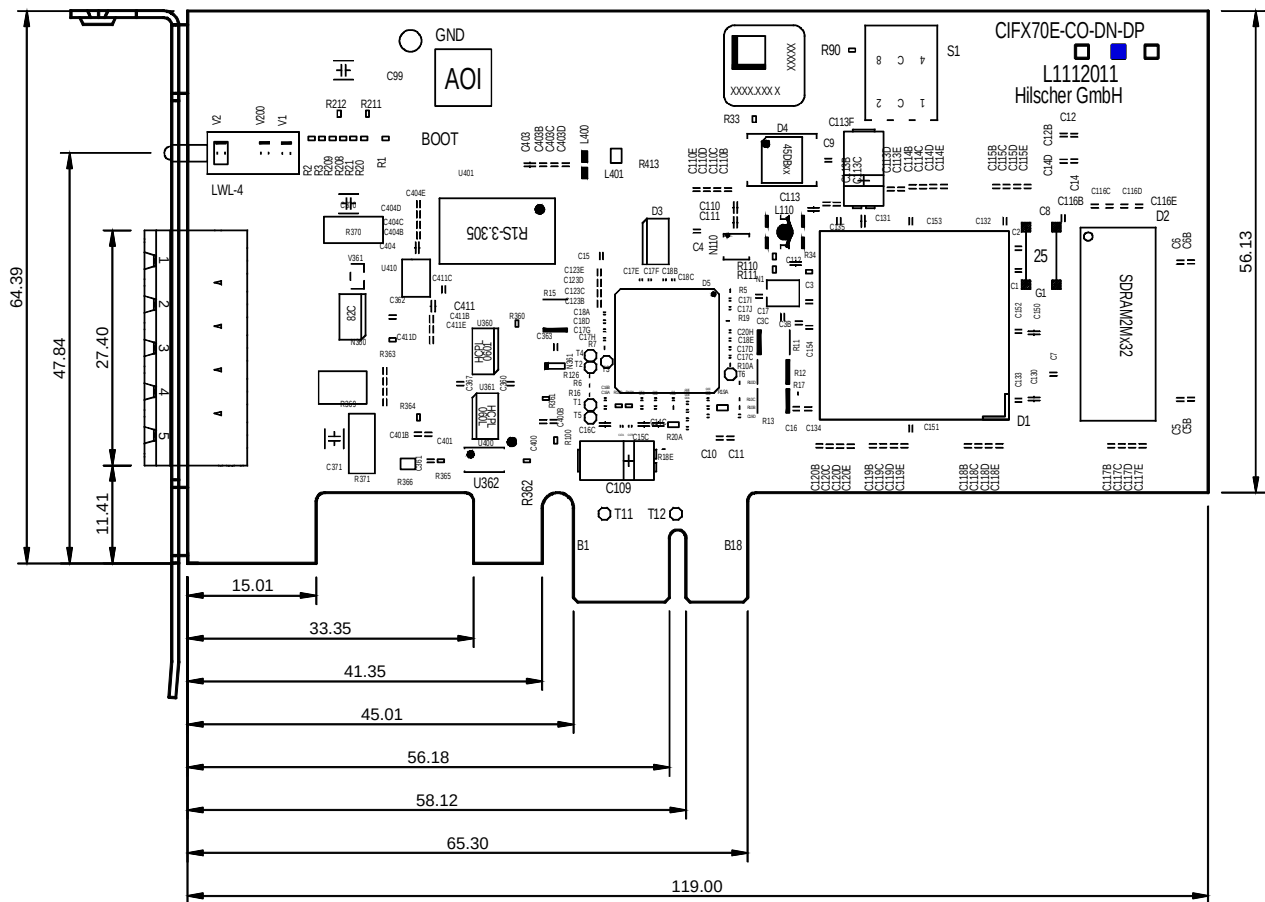


Figure 76: Dimensions CIFX 70E-DN (Hardware Rev.1)

### 10.3.9 Front Panel CIFX 70E-DN

Material:  
Edelstahl gebürstet 0,8 mm  
Toleranzen:  
Bohrdurchmesser: +/- 0,05 mm  
Längenmaß: +/- 0,01 mm

Material:  
Brushed stainless steel 0.8 mm  
Tolerances:  
Drilling diameter: +/- 0.05 mm  
Length: +/- 0.01 mm

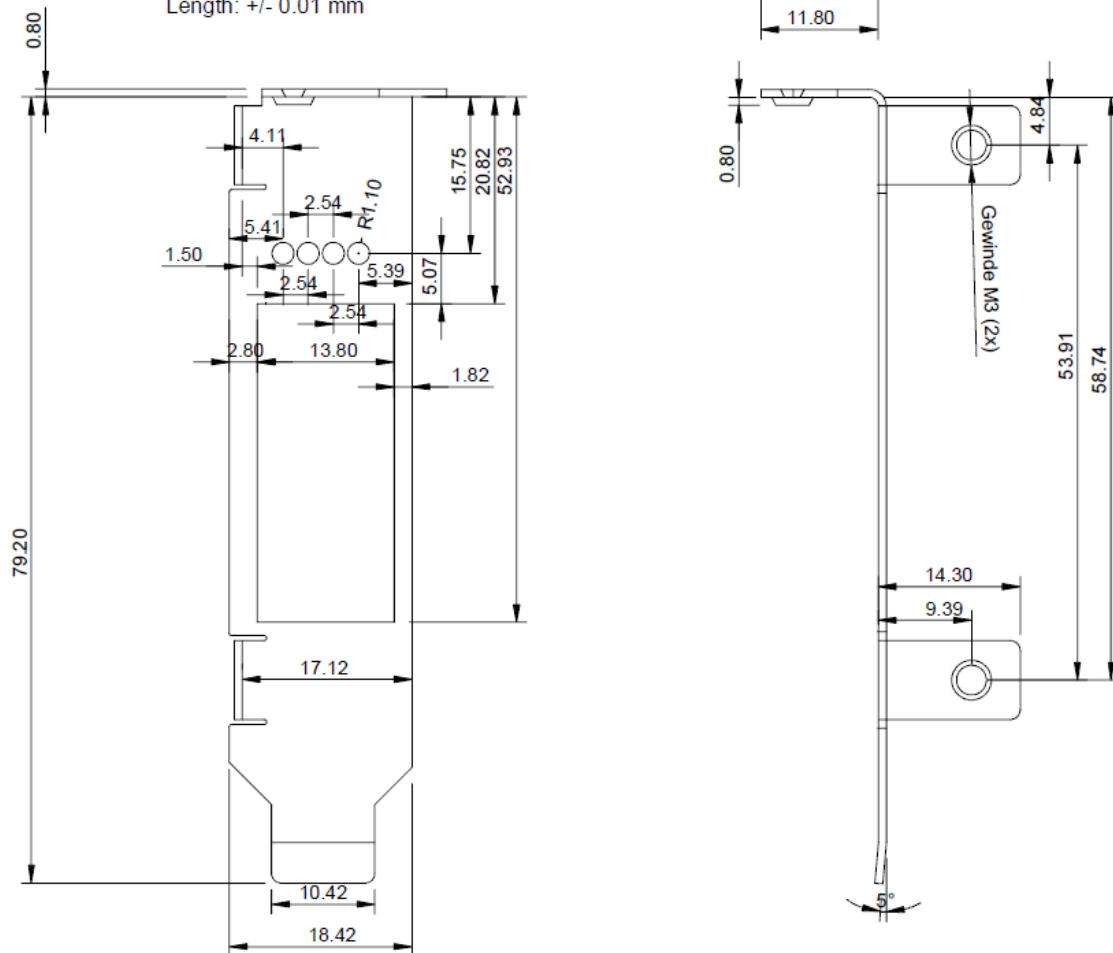


Figure 77: Dimensions Front Panel CIFX 70E-DN

# 11 Annex

## 11.1 References

- [1] THE CIP NETWORKS LIBRARY, Volume 6, CompoNet Adaptation of CIP, Edition 1.4 November 2008
- [2] Data sheet MOD JACK – MJIM:  
<https://www.erni-x-press.com/de/downloads/zeichnungen/203313.pdf>
- [3] Design - Specification for VARAN Rev. 0.76, section 5.1.4 VARAN Splitter

| References Protocol API Manuals                                                            |  |
|--------------------------------------------------------------------------------------------|--|
| • CANopen Master Protocol API Manual, Revision 16, Hilscher GmbH 2016                      |  |
| • CANopen Slave Protocol API Manual (V3), Revision 7, Hilscher GmbH 2016                   |  |
| • CC-Link IE Field Slave Protocol API, Revision 2, Hilscher GmbH 2020                      |  |
| • CC-Link IE Field-Basic Slave Protocol API, Revision 1, Hilscher GmbH 2018                |  |
| • CC-Link Slave Protocol API Manual, Revision 12, Hilscher GmbH 2020                       |  |
| • DeviceNet Master Protocol API Manual, Revision 11, Hilscher GmbH 2016                    |  |
| • DeviceNet Slave Protocol API Manual, Revision 18, Hilscher GmbH 2020                     |  |
| • EtherCAT Master Protocol API Manual (V4), Revision 5, Hilscher GmbH 2017                 |  |
| • EtherCAT Slave Protocol API Manual (V4), Revision 12, Hilscher GmbH 2020                 |  |
| • EtherNet/IP Scanner Protocol API Manual, Revision 15, Hilscher GmbH 2020                 |  |
| • EtherNet/IP Adapter Protocol API Manual, Revision 20, Hilscher GmbH 2017                 |  |
| • Open Modbus/TCP Protocol API Manual, Revision 11, Hilscher GmbH 2018                     |  |
| • POWERLINK-Controlled-Node/Slave Protocol API Manual (V3), Revision 8, Hilscher GmbH 2018 |  |
| • PROFIBUS DP Master Protocol API Manual, Revision 22, Hilscher GmbH 2017                  |  |
| • PROFIBUS DP Slave Protocol API Manual, Revision 20, Hilscher GmbH 2020                   |  |
| • PROFINET IO-Controller Protocol API Manual (V3), Revision 8, Hilscher GmbH 2021          |  |
| • PROFINET IO-Device Protocol API Manual (V4), Revision 4, Hilscher GmbH 2019              |  |
| • Sercos Master Protocol API Manual, Revision 11, Hilscher GmbH 2013                       |  |
| • Sercos Slave Protocol API Manual (V3), Revision 17, Hilscher GmbH 2017                   |  |
| • VARAN Client Protocol API Manual, Revision 4, Hilscher GmbH 2021                         |  |

Table 113: References Protocol API Manuals

### 11.1.1 References PCI Specifications

| No.          | Specification                                     | Revision | Version | Date              | www        |
|--------------|---------------------------------------------------|----------|---------|-------------------|------------|
| [bus spec 1] | PCI Local Bus Specification                       | 2.3      | -       | February 21, 2003 | pcisig.com |
| [bus spec 2] | PCI Express® Base Specification                   | 2.0      | -       | January 15, 2007  |            |
| [bus spec 3] | PCI Express® Card Electromechanical Specification | 2.0      | -       | April 11, 2007    |            |

Table 114: References PCI Specifications

### 11.1.2 References Safety

- [S1] American National Standards Institute, Inc.: American National Standard, Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials, ANSI Z535.6-2016, English, 2016.
- [S2] DIN Deutsches Institut für Normung e. v. and VDE Verband der Elektrotechnik Elektronik Informationstechnik e. V.: German standard, Equipment for audio/video, information and communication technology - Part 1: Safety requirements, (IEC 62368-1:2014, modified + Cor.:2015); English version EN 62368-1:2014 + AC:2015, English, 2016-05.
- [S3] DIN Deutsches Institut für Normung e. v. and VDE Verband der Elektrotechnik Elektronik Informationstechnik e. V.: German standard, Electrostatics - Part 5-1: Protection of electronic components against electrostatic phenomena, General requirements, (IEC 61340-5-1:2016); English version EN 61340-5-1:2016, English, 2017-07.  
  
DIN Deutsches Institut für Normung e. v. und VDE Verband der Elektrotechnik Elektronik Informationstechnik e. V.: German standard, Electrostatics - Part 5-2: Protection of electronic components against electrostatic phenomena, User manual, (IEC TR 61340-5-2:2018), DIN IEC/TR 61340-5-2 (VDE V 0300-5-2), English, 2019-04.

### 11.1.3 Used Terminology

|                     |                                                                                       |
|---------------------|---------------------------------------------------------------------------------------|
| <b>PC Card cifX</b> | Communication Interfaces of the cifX family of Hilscher based on the netX technology. |
| <b>CIFX 50-RE</b>   | Example for the product name for a PC card cifX Real-Time Ethernet.                   |
| <b>CIFX 50-XX</b>   | Example ('XX' replaces 'RE', 'DP', 'CO', 'DN' or 'CC')                                |

For further terminology to the PC cards cifX, its installation, configuration and operation refer to glossary in the annex.

## 11.2 Conventions in this Manual

### Instructions and results

1. Operational purpose

2. Operational purpose

➤ Instruction

⇒ Result

### Signs and Signal Words

| Sign                                                                                | Note                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | General note                                                                                                                                                                                                                                                                                                                   |
|    | Important note that must be followed to prevent malfunctions                                                                                                                                                                                                                                                                   |
|    | Reference on further information (acc. to ISO 7010 M001)                                                                                                                                                                                                                                                                       |
|   | Disconnect the power plug (acc. to ISO 7010 M006)                                                                                                                                                                                                                                                                              |
|  | Warning of Personal Injury and Property Damage Message (acc. to ISO 7010 W001)<br><b>USA:</b> Warning of Personal Injury<br>As in the scope of the ANSI Z535 Standard (for USA) instructions to a property damage message may not contain a warning triangle, this property damage messages are listed separately for the USA. |
|  | Warning of hazardous voltage! (acc. to ISO 7010 W012)<br>Danger to life, risk of injury by electric shock                                                                                                                                                                                                                      |
|  | <b>USA:</b> Warning of hazardous voltage! (acc. to ANSI Z535.4)<br>Danger to life, risk of injury by electric shock                                                                                                                                                                                                            |
|  | Warning of damage due to electrostatic discharge (acc. to IEC 60417-5134)                                                                                                                                                                                                                                                      |

Table 115: General Signs, Principles, Safety signs

| Signal word    | USA                                                                                 | Description                                                                                    |
|----------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>DANGER</b>  |  | Indicates a hazardous situation which if not avoided, will result in death or serious injury.  |
| <b>WARNING</b> |  | Indicates a hazardous situation which if not avoided, could result in death or serious injury. |
| <b>CAUTION</b> |  | Indicates a hazardous situation which if not avoided, may result in minor or moderate Injury.  |
| <b>NOTICE</b>  |  | Indicates a property damage message.                                                           |

Table 116: Signal Words

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The warranty obligation shall not apply if the notification of defect is not asserted promptly, if the purchaser or third party has tampered with the products, if the defect is the result of natural wear, was caused by unfavorable operating conditions or is due to violations against our operating regulations or against rules of good electrical engineering

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## **11.4 Licenses**

If a PC Card cifX is used as a Slave, neither for the firmware nor for the configuration software Communication Studio a license is required.

Licenses will be required if the PC Card cifX is used with

- a firmware with master functionality\*.

\* The master license includes the PC Card cifX operating as master and the license for the configuration software Communication Studio for the respective cifX.

### **11.4.1 License Note about VARAN Client**

In order to use the PC Card cifX with VARAN, you need a license which you can acquire at the VNO (VARAN Bus-Nutzerorganisation, Bürmooser Straße 10, A-5112 Lamprechtshausen, [info@varan-bus.net](mailto:info@varan-bus.net)) after getting a member of VON.

The license as well as the Vendor ID and the Device ID can be adjusted with the Communication Studio configuration software.

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Linux is a registered trademark of Linus Torvalds.

QNX is a registered trademark of QNX Software Systems, Ltd.

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## 11.6 EtherCAT Disclaimer

EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.



To get details and restrictions regarding using the EtherCAT technology refer to the following documents:

- “EtherCAT Marking rules”
- “EtherCAT Conformance Test Policy”
- “EtherCAT Vendor ID Policy”

These documents are available at the ETG homepage [www.ethercat.org](http://www.ethercat.org) or directly over [info@ethercat.org](mailto:info@ethercat.org).

A summary over Vendor ID, Conformance test, Membership and Network Logo can be found hereafter.

## **11.6.1 EtherCAT Summary over Vendor ID, Conformance test, Membership and Network Logo**

### **11.6.1.1 Vendor ID**

The communication interface product is shipped with Hilscher's secondary vendor ID, which has to be replaced by the Vendor ID of the company shipping end products with the integrated communication interface. End Users or Integrators may use the communication interface product without further modification if they re-distribute the interface product (e.g. PCI Interface card products) only as part of a machine or machine line or as spare part for such a machine. In case of questions, contact Hilscher and/or your nearest ETG representative. The ETG Vendor-ID policies apply.

### **11.6.1.2 Conformance**

EtherCAT Devices have to conform to the EtherCAT specifications. The EtherCAT Conformance Test Policies apply, which can be obtained from the EtherCAT Technology Group (ETG, [www.ethercat.org](http://www.ethercat.org)).

Hilscher range of embedded network interface products are conformance tested for network compliance. This simplifies conformance testing of the end product and can be used as a reference for the end product as a statement of network conformance (when used with standard operational settings). It must however be clearly stated in the product documentation that this applies to the network interface and not to the complete product.

Conformance Certificates can be obtained by passing the conformance test in an official EtherCAT Conformance Test lab. Conformance Certificates are not mandatory, but may be required by the end user.

### **11.6.1.3 Certified Product vs. Certified Network Interface**

The EtherCAT implementation may in certain cases allow one to modify the behavior of the EtherCAT network interface device in ways which are not in line with EtherCAT conformance requirements. For example, certain communication parameters are set by a software stack, in which case the actual software implementation in the device application determines whether or not the network interface can pass the EtherCAT conformance test. In such cases, conformance test of the end product must be passed to ensure that the implementation does not affect network compliance.

Generally, implementations of this kind require in-depth knowledge in the operating fundamentals of EtherCAT. To find out whether or not a certain type of implementation can pass conformance testing and requires such testing, contact EtherCAT Technology Group ("ETG", [www.ethercat.org](http://www.ethercat.org)) and/or your nearest EtherCAT conformance test centre. EtherCAT may allow the combination of an untested end product with a conformant network interface. Although this may in some cases make it possible to sell the end product without having to perform network conformance tests, this approach is generally not endorsed by Hilscher. In case of questions, contact Hilscher and/or your nearest ETG representative.

### **11.6.1.4 Membership and Network Logo**

Generally, membership in the network organization and a valid Vendor-ID are prerequisites in order to be able to test the end product for conformance. This also applies to the use of the EtherCAT name and logo, which is covered by the ETG marking rules.

*Vendor ID Policy accepted by ETG Board of Directors, November 5, 2008*

## 11.7 Notes on earlier Hardware Revisions

### 11.7.1 Failure in 10 MBit/s Half Duplex Mode and Workaround

The note is only valid for the PC cards cifX up to serial numbers indicated:

| PC Cars cifX | Part No  | up to Serial Number |
|--------------|----------|---------------------|
| CIFX 50-RE   | 1250.100 | 22414               |
| CIFX 50E-RE  | 1251.100 | 20167               |



**NOTICE**

#### Failure of the Network Communication

- Do not operate hardware with the communication controllers netX 50, netX100 or netX 500 with the protocols Ethernet TCP/UDP/IP, EtherNet/IP or Modbus TCP at 10 MBit/s in half-duplex mode, otherwise failure of the network communication can occur.
- Use only switches or 10/100 MBit/s dual-speed hubs and ensure that the network operates at 100 MBit/s and in full-duplex mode.

**USA:**

**NOTICE**

#### Failure of the Network Communication

- Do not operate hardware with the communication controllers netX 50, netX100 or netX 500 with the protocols Ethernet TCP/UDP/IP, EtherNet/IP or Modbus TCP at 10 MBit/s in half-duplex mode, otherwise failure of the network communication can occur.
- Use only switches or 10/100 MBit/s dual-speed hubs and ensure that the network operates at 100 MBit/s and in full-duplex mode.

#### Affected Hardware

Hardware with the communication controller netX 50, netX 100 or netX 500; netX/Internal PHYs.

#### When can this Failure occur?

When using standard Ethernet communication with 10 MBit/s half duplex mode, the PHY gets stuck in case of network collisions. Then no further network communication is possible. Only device power cycling allows Ethernet communication again.

This problem can only occur with Ethernet TCP/UDP IP, EtherNet/IP or Modbus TCP protocols when using hubs at 10 MBit/s. The issue described above is not applicable for protocols which use 100 MBit/s or full duplex mode.

#### Solution / Workaround:

Do not use 10 MBit/s-only hubs. Use either switches or 10/100 MBit/s Dual Speed hubs, to make sure the netX Ethernet ports are connected with 100 MBit/s or in full duplex mode.

This erratum is fixed with all components of the 'Y' charge (9 digit charge number shows 'Y' at position 5 (nnnnYnnnn)).

#### Reference

"Summary of 10BT problem on EthernetPHY",  
RenesasElectronics Europe, April 27, 2010

## 11.8 List of Figures

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## 11.10 Glossary

### 10-Base T

Standard for communication on Ethernet over twisted pair lines with RJ45 connectors and a [Baud rate](#) of 10 MBit/s (according to the IEEE 802.3 specification).

### 100-Base TX

Standard for communication on Ethernet over unshielded twisted pair lines with RJ45 connectors and a [Baud rate](#) of 100 MBit/s according to the IEEE 802. Specification

### 1000BASE-T

Standard for communication on Ethernet over unshielded twisted pair lines with RJ45 connectors and a [Baud rate](#) of 1 GBit/s according to the IEEE 802.3ab Specification.

### Auto-Crossover

Auto-Crossover is a feature of an interface: An interface with Auto-Crossover capability will automatically detect and correct if the data lines have been exchanged vice versa.

### Auto-Negotiation

Auto-Negotiation is a feature of an interface: An interface with Auto-Negotiation will automatically determine a set of correct communication parameters.

### Baud rate

Data transmission speed of a communication channel or interface.

### Boot loader

Program loading the firmware into the memory of a device in order to be executed.

### CC-Link IE Field

Communication system for industrial Ethernet designed and developed by Mitsubishi Electric Corporation, Tokyo, Japan, for high data throughput based on Gigabit

### CC-Link IE Field Master

Station in the CC-Link IE Field network controlling parameters and managing cyclic communication

### CC-Link IE Field Slave

Station in the CC-Link IE Field network communicating with a master station

### CC-Link IE Field Basic

Communication system for Industrial Ethernet designed and developed by Mitsubishi Electric Corporation, Tokyo, Japan, providing CC-Link IE Field with a speed of 100 Mbit/s based on TCP/IP

**CC-Link IE Field Basic Master**

Station in the CC-Link IE Field Basic network controlling parameters and managing cyclic communication

**CC-Link IE Field Basic Slave**

Station in the CC-Link IE Field Basic network communicating with a master station

**Ch0, Ch1 ...**

Within the configuration software Commuication Studio the communication channels are named ,Ch0', Ch1' ....

For the Real-Time-Ethernet devices cifX, comX and netJACK and the Real-Time Ethernet protocols used with it, the following shall apply:

**'Ch0' in Commuication Studio:** Both ports of the Ethernet RJ45 connector CH0 and CH1 are assigned always to channel 0 in Commuication Studio.

**'Ch1' in Commuication Studio:** Depending on the firmware channel 1 in Commuication Studio can be used as an additional communication channel.

**CH0, CH1 (Ch0, Ch1)**

Names for the ports of an Ethernet RJ45 socket with two Ethernet channels.

CH0 stands for Ethernet channel 0.

CH1 stands for Ethernet channel 1.

**cifX**

Communication InterFace based on netX

**Coil**

A coil is a single bit in the memory that can be accessed using Modbus: read or write access with FC 1, 5, 15. Depending on the used Modbus function code a single coil or several coils lying in succession can be accessed.

**Communication Studio**

FDT-based, multi-protocol capable configuration and diagnosis software for offline configuration, online commissioning and diagnosis of communication-capable fieldbus devices from different manufacturers

**CSP**

electronic device data sheet, required for each CC-Link device

**CSPP**

(CSP+) Control and communication system profile, respectively specification and device description file that contains and provides the necessary data on CC-Link compatible devices for commissioning, operation and maintenance.

---

**Device Description File**

A file containing configuration information about a device being a part of a network that can be read out by masters for system configuration. Device Description Files use various formats which depend on the communication system.

**DHCP**

Dynamic Host Configuration Protocol

This is a protocol simplifying the configuration of IP networks by automatically assigning IP addresses.

**Discrete Input**

A "Discrete Input" (as defined in the Modbus terminology) is a single bit in the memory which can be accessed using Modbus (read with FC 2).

**DP**

Decentral Periphery

**DPM**

Dual-Port Memory

**EDS**

Electronic Data Sheet

**EDS file**

A special kind of Device Description File used for example by EtherNet/IP.

**ET**

Extended Temperature Range (Operating Temperature)

PC cards cifX with the addition of "ET" at the end of the part name can be used in an extended operating temperature range. Details to the operating temperature range are given in the technical data to the respective card.

**EtherCAT**

A communication system for industrial Ethernet designed and developed by Beckhoff Automation GmbH.

**Ethernet**

A networking technology used both for office and industrial communication via electrical or optical connections. It has been developed and specified by the Intel, DEC and XEROX. It provides data transmission with collision control and allows various protocols. As Ethernet is not necessarily capable for real-time application, various real-time extensions have been developed.

**EtherNet/IP**

A communication system for industrial Ethernet designed and developed by Rockwell. It partly uses the CIP (Common Industrial Protocol).

**EtherNet/IP Scanner**

A Scanner exchanges real-time I/O data with Adapters and Scanners. This type of node can respond to connection requests and can also initiate connections on its own.

**EtherNet/IP Adapter**

An Adapter emulates functions provided by traditional rack-adapter products. This type of node exchanges real-time I/O data with a Scanner Class product. It does not initiate connections on its own.

**Ethernet POWERLINK**

A communication system for industrial Ethernet designed and developed by B&R. It partly uses CANopen technologies.

**FDL**

Fieldbus Data Link defines the PROFIBUS communication on layer 2, identical for DP and FMS

**Firmware**

Software running inside a device providing the basic functionality of this device. It can be updated by a firmware download.

**Full duplex**

Full duplex denominates a telecommunication system between two communication partners which allows simultaneous communication in both directions is called a full-duplex telecommunication system. At such a system, it will be possible to transmit data even if currently data are received. Full-duplex is the opposite of Half\_duplex.

**Function code**

A function code (FC) is a standardized method to access, i. e. read or write on coils (Bits) or registers via Modbus.

Modbus function codes are elements of Modbus request/reply telegrams.

**GSD**

Generic Station Description, Device description file

**GSD file**

A special kind of Device Description File used by PROFIBUS (GSD = Generic Station Description).

**GSDML**

Generic Station Description Markup Language  
XML based device description file.

**GSDML file**

A special kind of XML-based Device Description File used by PROFINET.

## Half duplex

Half duplex denominates a telecommunication system between two communication partners which does not allow simultaneous, but alternating, communication in both directions is called a half-duplex telecommunication system. At such a system, receiving data inhibits the transmission of data. Half-duplex is the opposite of `_Full_duplex`.

## Hub

A network component connecting multiple communication partners with each other. A hub does not provide own intelligence, thus it does not analyze the data traffic and sends received data to all connected communication partners. A hub can be used for setting up a star topology.

## Industrial Ethernet

See Real-Time Ethernet

## IP

Internet Protocol.

IP belongs to the TCP/IP family of protocols and is defined in RFC791. It is based on layer 3 of the ISO/OSI 7 layer model of networking.

It is a connectionless protocol, i.e. you do not need to open a connection to a computer before sending an IP data packet to it. Therefore IP is not able to guarantee that the IP data packets really arrive at the recipient. On IP level neither the correctness of data nor the consistence and completeness are checked.

IP defines special addressing mechanisms, see IP Address.

## IP Address

Address within IP (the Internet Protocol, part of TCP/IP).

An IP address is an address identifying a device or a computer within a network using the IP protocol. IP addresses are defined as a 32 bit number. Usually, for ease of notation the IP address is divided into four 8 bit numbers which are represented in decimal notation and separated by points:

a.b.c.d

where a.b.c.d are each integer values between 0 and 255.

Example: 192.168.30.15

However, not all combinations are allowed, some are reserved for special purposes.

The IP address 0.0.0.0 is defined as invalid.

## MAC-ID

MAC = Media Access Control

*Definition for Ethernet:*

A MAC-ID is on delivery a unique (physical) Ethernet address of the device.

MAC-IDs are defined as a 48 bit number. Usually, for ease of notation the MAC-ID address is divided into six 8 bit numbers which are represented in hexadecimal notation and separated by "minus"-signs (-):

A-B-C-D-E-F

where A-B-C-D-E-F are each integer values between 0 and 255.

Example: 00-02-A2-20-91-18

*Definition for DeviceNet:* The MAC-ID is the network address of the device. The network address of a device serves to distinguish itself on a DeviceNet fieldbus system from any other device or Slave on this network. This should be a unique number for each device. A valid MAC-ID address is within a range of 0 to 63 and can be re-entered and changed in the MAC-ID box in the Device Configuration Dialog.

## Master

Type of device that initiates and controls the communication on the bus

## Modbus Data Model

The data model distinguishes four basic types of data areas:

- Discrete Inputs (inputs) = FC 2 (Read)
- coils (outputs) = FC 1, 5, 15 (Write and Read back)
- Input register (input data) = FC 4 (Read)
- Holding register (output data) = FC 3, 6, 16, 23 (Write and Read back).

It should be noted, however, that depending on the device manufacturer and device type:

- the data area in the device may be present or not,
- and two data areas can be combined into one data region. For example, discrete inputs and input registers can be a common data area, which can be accessed with read-FC 2 and FC 4.
- Further FC 1 and FC 3 are used instead of reading back the inputs to read the outputs.

## netX

networX on chip, Hilscher network communication controllers

## Object Dictionary

An object dictionary is a storage area for device parameter data structures. It is accessed in standardized manner.

## Open Modbus/TCP

A communication system for Industrial Ethernet designed and developed by Schneider Automation and maintained by the Modbus-IDA organization based on the Modbus protocols for serial communication.

## PCB

Printed Circuit Board, (printed = machine-made) circuit board

## PCIe

Abbreviation for PCI Express

## PC Card cifX

Communication Interfaces of the cifX product family of Hilscher on the basis of the communication controller netX 100:

for the Real-Time Ethernet systems

- CC-Link IE Field
- CC-Link IE Field Basic
- EtherCAT
- EtherNet/IP
- Open-Modbus/TCP
- POWERLINK
- PROFINET IO
- Sercos
- VARAN

and for the fieldbus systems

- PROFIBUS DP
- CANopen
- DeviceNet
- CompoNet
- CC-Link

as Communication Interface netX with PCI Bus

- PCI (CIFX 50),
- PCI Express (CIFX 50E),
- Low Profile PCI Express (CIFX 70E, CIFX 100EH-RE\CUBE\*),
- Compact PCI (CIFX80),
- Mini PCI (CIFX90),
- Mini PCI Express (CIFX 90E),
- PCI-104 (CIFX 104C)

and as Communication Interface netX with ISA Bus

- PC/104 (CIFX 104).

\*only Real-Time Ethernet

## PROFINET

A communication system for Industrial Ethernet designed and developed by PROFIBUS & PROFINET International (PI). It uses some mechanisms similar to those of the PROFIBUS field bus.

### PROFINET IO Controller

A PROFINET control unit responsible for the defined run-up of an I/O subsystem and the cyclic or acyclic data exchange.

### PROFINET IO Device

A PROFINET field device that cyclically receives output data from its IO-Controller and responds with its input data.

## RE

RE stands for Real-Time Ethernet

## Real-Time Ethernet

Real-Time Ethernet (Industrial Ethernet) is an extension of the Ethernet networking technology for industrial purposes with very good real-time features and performance. There is a variety of different Real-Time Ethernet systems on the market which are incompatible with each other. The most important systems of these are



- CC-Link IE Field
- CC-Link IE Field Basic
- EtherCAT
- EtherNet/IP
- Ethernet POWERLINK
- Open Modbus/TCP
- PROFINET
- Sercos
- VARAN

**Register**

A register is a 16-bit wide storage area for data which can be accessed and addressed as a unit by some of the Modbus Function Codes.

Depending on the used Modbus function code a single register or multiple registers sequentially located can be accessed.

Modbus differs Input Registers (FC 4) and Holding Registers (FC 3, 6, 16, 23).

**Remanent**

Remanent memory holds its data even after power-off, for instance flash memory is remanent. It is also called non-volatile memory.

**RJ45**

A connector type often used for Ethernet connection. It has been standardized by the Federal Communications Commission of the USA (FCC).

**Sercos**

A communication system for industrial Ethernet designed and developed by Bosch-Rexroth and supported by Sercos International.

**Slave**

Type of device that is configured by the Master and which then performs the communication

**Switch**

A network component connecting multiple communication partners (or even entire branches of a network) with each other. A switch is an intelligent network component which analyzes network traffic in order to decide on its own. For the connected communication partners a switch behaves transparently.

**SYNC**

Synchronization cycle of the master

**TCP/IP**

Transport Control Protocol/Internet Protocol connection-orientated, secure transfer protocol as basis for the Internet-protocols

**UCMM**

Unconnected Message Manager

**VARAN**

**V**ersatile **A**utomation **R**andom **A**ccess **N**etwork

A communication system for industrial Ethernet based on the DIAS-BUS developed by Sigmatek. The system is supported by the VARAN-BUS-NUTZERORGANISATION (VNO).

**Watchdog Timer**

A watchdog timer provides an internal supervision mechanism of a communication system. It supervises that an important event happens within a given timeframe (the watchdog time which can be adjusted accordingly, for instance by a parameter in the warmstart message) and causes an alarm otherwise (usually this is accomplished by changing the operational state of the communication system to a more safe state).

**X1, X2, X3, X4 ...**

serve as position names on the circuit board but can also have other or extended meanings

**X1, X2**

(names on the front panel) ... serve for PC cards cifX PCI and PCI Express with 2 channels to identify the respective communication channel:

X1 stands for fieldbus 1 (channel X1; in Communication Studio assigned to *Ch0*).

X2 stands for fieldbus 2 (channel X2; in Communication Studio assigned to *Ch1*).

**XDD file**

A special kind of Device Description file used by Ethernet POWERLINK.

**XML**

XML means Extended Markup Language. It is a symbolic language for structuring data systematically. XML is standard maintained by the W3C (World-wide web consortium). Device Description Files often use XML-based formats for storing the device-related data appropriately.

## 11.11 Contacts

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