

# Field-bus Connection Options

## Capture of measurement data via CAN-Bus, EtherCAT, LIN-Bus, ARINC-Bus, J1587-Bus, FlexRay, XCP and PROFIBUS

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Along with the capture of data with the modular amplifiers, imc measurement devices can also collect data from digital bus systems. At the moment, the bus systems named below are supported. The data acquired using the bus systems are treated in the same way as other data, and can be synchronously stored and displayed along with these, and jointly subjected along with them to calculations. Depending on the software- and hardware configurations, targeted output of data on specific bus systems may also be possible.

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## CAN-Bus Interface

Order code:	Article number	Remarks
<b>CRFX/CAN2</b>	1190028	for installation ex-factory in a CRONOS <i>flex</i> housing
<b>CRFX/CAN2-ET</b>	1191019	version in extended temperature range
<b>CRC/CAN2</b>	1170010	for installation in a CRONOS <i>compact</i> housing
<b>CRC/CAN2-ET</b>	1171011	version in extended temperature range
<b>CRC/CAN2-R</b>	1170133	for installation in a CRONOS <i>compact</i> RACK
<b>CRC/CAN2-R-ET</b>	1171092	version in extended temperature range
<b>CRSL/CAN2</b>	1180009	for installation in a CRONOS-SL
<b>CRPL/CAN2</b>	1080147	for installation in a CRONOS-PL
<b>CRPL/CAN2-ET</b>	1081104	version in extended temperature range
<b>CRPL/CAN</b>	1080016	for installation in a CRONOS-PL housing
<b>CRPL/CAN-ET</b>	1081014	version in extended temperature range
<b>busDAQ/CAN-ET</b>	1041013	for installation in a busDAQ in extended temperature (ET) range
<b>SPAR/CAN2</b>	1130095	for installation in a SPARTAN

### Structure:

- Plug-in module for imc CRONOS*compact*, imc CRONOS-PL and for imc SPARTAN, occupying one slot, maximum of four per device
- Configuration module for imc CRONOS-SL and imc busDAQ, occupying one slot
- Configuration module for imc CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum of two per base unit

### Terminal connection:

- 2x DSUB-9 (1 isolated node per connector)

### Power supply:

- provided by the measurement system

### Operating conditions:

- Depending on the module variety (with/ without extended temperature range), the respective user's instructions are described along with the associated housing type.

### Installed software:

- The module is fully supported by the imcStudio and the imcDevices operating software for the measurement system. The entire functionality with regard to parameterization, data storage, and online computation is available. For configuration of the CAN-bus, a dedicated software assistant is provided.

### Data storage:

- handled by the measurement system

### Transfer protocol:

- **With MCAN Field-bus interface card:**
  - Standard: CAN High Speed (ISO 11898) 1 Mbaud
  - Special version: CAN Low Speed (ISO11519) 125 Kbaud
- **With CAN2 Field-bus interface card:**
  - Standard: CAN High Speed (ISO 11898) 1 Mbaud and CAN Low Speed (ISO11519) 125 Kbaud (software-configurable)

### Remarks:

- Possible combinations with other Field-bus cards: see [table](#) <sup>12)</sup>

#### Only with CAN2 Field-bus interface card:

- Terminator resistor (120 Ω) software-activated for each node.
- Parameterization of CANSAS measurement modules via the CAN-Bus interface.
- CAN High Speed (ISO 11898) 1 Mbaud and CAN Low Speed (ISO11519) 125 Kbaud (software-configurable)

## J1587 Bus-Interface

### Order code:

	Article number	Remarks
<b>CRFX/J1587-2</b>	1190033	for installation ex-factory in a CRONOS <i>flex</i> housing
<b>CRC/J1587-2</b>	1170050	for installation in a CRONOS <i>compact</i> housing
<b>CRC/J1587-2-ET</b>	1171050	version in extended temperature range
<b>CRC/J1587-2-R</b>		for installation in a CRONOS <i>compact</i> RACK
<b>CRSL/J1587-2</b>	1180104	for installation in a CRONOS-SL
<b>CRSL/J1587</b>	1180011	for installation in a CRONOS-SL
<b>CRPL/J1587</b>	1080094	for installation in a CRONOS-PL
<b>CRPL/J1587-ET</b>	1081058	version in extended temperature range

### Structure:

- Plug-in module for imc CRONOS*compact* and for imc CRONOS-PL, occupying one slot, maximum of four per device
- Configuration module for imc CRONOS-SL, occupying one slot
- Configuration module for imc CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum of two per base unit

### Terminal connection:

- 1x DSUB-9

### Power supply:

- provided by the measurement system

### Operating conditions:

- Depending on the module variety (with/ without extended temperature range), the respective user's instructions are described along with the associated housing type.

### Installed software:

- The module is fully supported by the imcStudio and the imcDevices operating software for the measurement system. The entire functionality with regard to parameterization, data storage, and online computation is available. For configuration of the J1587-Bus, a dedicated software assistant is provided.

### Data storage:

- handled by the measurement system

### Transfer protocol:

- J1587 per customer request

### Maximum sustainable overvoltage:

- $\pm 50$  V to system ground (protection ground)

### Remarks:

- Special version with RS485 interface available upon request
- Possible combinations with other Field-bus cards: see [table 12](#)

## LIN Bus-Interface

### Order codes:

	Article number	Remarks
<b>CRFX/LIN</b>	1190029	for installation ex-factory in a CRONOS <i>flex</i> housing
<b>CRC/LIN</b>	1170011	for installation in a CRONOS <i>compact</i>
<b>CRC/LIN-ET</b>	1171012	version in extended temperature range
<b>CRC/LIN-R</b>	1170134	for installation in a CRONOS <i>compact</i> RACK
<b>CRSL/LIN</b>	1180010	for installation in a CRONOS-SL
<b>CRPL/LIN</b>	1080148	for installation in a CRONOS-PL
<b>CRPL/LIN-ET</b>	1081105	version in extended temperature range
<b>busDAQ/LIN-ET</b>	1041014	for installation in a busDAQ in extended temperature (ET) range

### Structure:

- Plug-in module for imc CRONOS*compact* and for imc CRONOS-PL, occupying one slot, maximum of four per device
- Configuration module for imc CRONOS-SL and imc busDAQ, occupying one module slot
- Configuration module for imc CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum of two per base unit

### Terminal connection:

- 2x DSUB-9 (1 isolated LIN-node per connector)

### Power supply:

- provided by the measurement system

### Operating conditions:

- Depending on the module variety (with/ without extended temperature range), the respective user's instructions are described along with the associated housing type.

### Installed software:

- The module is fully supported by the imcStudio and the imcDevices operating software for the measurement system. The entire functionality with regard to parameterization, data storage, and online computation is available. For configuration of the LIN-Bus, a dedicated software assistant is provided.

### Data storage:

- handled by the measurement system

### Transfer protocols:

- LIN 2.0 ; LIN 1.3

### Maximum sustainable overvoltage:

- $\pm 50$  V to system ground (protection ground)

### Remarks:

- "Master Node" 1 k $\Omega$  resistor connectable by software for each node.
- Possible combinations with other Field-bus cards: see [table](#) <sup>12)</sup>

## ARINC Bus-Interface

### Order codes:

	Article number	Remarks
<b>CRFX/ARINC-8Rx</b>	1190030	for installation ex-factory in a CRONOS <i>flex</i> housing
<b>CRC/ARINC-8Rx</b>	1170012	for installation in a CRONOS <i>compact</i>
<b>CRC/ARINC-8RX-ET</b>	1171013	version in extended temperature range
<b>CRC/ARINC-8RX-R</b>		for installation in a CRONOS <i>compact</i> RACK
<b>CRSL/ARINC-8Rx</b>	1180012	for installation in a CRONOS-SL
<b>CRPL/ARINC-8Rx</b>	1080171	for installation in a CRONOS-PL
<b>CRPL/ARINC-8Rx-ET</b>	1081117	version in extended temperature range
<b>busDAQ/ARINC-ET</b>	1041015	for installation in a busDAQ in extended temperature (ET) range

### Structure:

- Plug-in module for imc CRONOS*compact* and for imc CRONOS-PL, the slot occupation depends on the terminal connector type selected, maximum 4 per device
- Configuration module for imc CRONOS-SL and imc busDAQ, occupying one module slot
- Configuration module for imc CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum of two per base unit

### Terminal connection:

- Customer's choice

### Power supply:

- provided by the measurement system

### Operating conditions:

- Depending on the module variety (with/ without extended temperature range), the respective user's instructions are described along with the associated housing type.

### Installed software:

- The module is fully supported by the imcStudio and the imcDevices operating software for the measurement system. The entire functionality with regard to parameterization, data storage, and online computation is available. For configuration of the ARINC-Bus, a dedicated software assistant is provided.

### Data storage:

- handled by the measurement system

### Transfer protocol:

- ARINC 429

### Remarks:

- The maximum voltage to apply to each Rx terminal is  $\pm 29$  V to system ground (protection ground)
- Possible combinations with other Field-bus cards: see [table <sup>12</sup>](#)

### FlexRay Interface

The FlexRay protocol enables sampling of control unit values / variables / channels having bandwidths of up to 2x10 MBit.

- A FlexRay2 Interface is able to transfer up to 60 kSamples/S per card. The predecessor interface (the FlexRay Interface) is able to transfer up to 30 kSamples/s per card.
- A FlexRay cluster is measured. A cluster consists of two FlexRay channels run either in parallel or separately. Import of Fibex files, with the description of the data transmitted on the bus, is supported.
- The system is used both in test stations and in mobile test drives. The integration of imc measurement devices in customer environments with Vector or ETAS or other makes which can read XCP. FlexRay enables the setup of gateways from CCP or KW2000 for instance, to Raw CAN.

#### Order code:

	Article number	Remarks
<b>CRFX/FLEXRAY2</b>	1190031	for installation ex-factory in a CRONOS <i>flex</i> housing
<b>CRFX/FLEXRAY2-ET</b>	1191022	version in extended temperature range
<b>CRC/FLEXRAY2</b>	1170048	for installation in a CRONOS <i>compact</i>
<b>CRC/FLEXRAY2-ET</b>	1171048	version in extended temperature range
<b>CRC/FLEXRAY2-R</b>	1170135	for installation in a CRONOS <i>compact</i> RACK
<b>CRC/FLEXRAY2-R-ET</b>	1171094	version in extended temperature range
<b>CRSL/FLEXRAY</b>	1180068	for installation in a CRONOS-SL
<b>CRPL/FLEXRAY</b>	1080199	for installation in a CRONOS-PL
<b>CRPL/FLEXRAY-ET</b>	1081132	with an extended temperature range
<b>busDAQ/FLEXRAY-ET</b>	1041017	for installation in a busDAQ in extended temperature (ET) range

#### Structure:

- Plug-in module for imc CRONOS*compact* and for imc CRONOS-PL, the slot occupation depends on the terminal connector type selected, maximum 4 per device
- Configuration module for imc CRONOS-SL and imc busDAQ, occupying one module slot
- Configuration module for imc CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum of two per base unit

#### Terminal connection:

- 1x DSUB-9 (channel A & B together)

#### Power supply:

- provided by the measurement system

#### Prerequisite:

- FlexRay Interface: imcDevices as of Version 2.6 R3 SP6

#### Operating conditions:

- Depending on the module variety (with/ without extended temperature range), the respective user's instructions are described along with the associated housing type.

#### Included software:

- The module is completely supported by the imcStudio and the imcDevices operating software for the measurement system. The entire functionality with regard to parameterization, data storage, and online computation is available. Settings for the Flexray connection are made with the help of a dedicated software assistant.
- Fibex files containing the description of FlexRay clusters parameterization can be imported. The settings can be changed by means of the Assistant. The data on the FlexRay cluster can be captured.
- The card is also able to send frames. The frame contents are determined by the process vector, virtual bits and display variables. This mode is possible particularly in conjunction with Online Famos or preferably with Online Famos Professional.

**Data storage:**

- handled by the measurement system

**Transfer protocol:**

FlexRay protocol specification v3.0

**Remarks:**

- Possible combinations with other Field-bus cards: see [table](#) <sup>12</sup>

### **XCP over Ethernet (XCPoE) Interface (Extended Calibration Protocol over Ethernet)**

- Data measured with a imc measurement device can be made available to other applications via Ethernet. The protocol XCP, familiar in control unit settings, is used. The imc device acts as a control unit.
- The data from the imc device can thus be read directly by the standard software packages of various manufacturers, such as Canape by Vector or INCA by ETAS. This makes integration of the imc device into outside environments possible.

### **Supplemental info:**

- The Ethernet enables high speed data transfer at up to 10 kHz per channel. The imc measurement device uses the process vector and is thus able to output the data independently of the triggers.
- An A2L-file is created when preparing the measurement, with which the XCPoE-receiver can be configured. Up to 32 virtual channels can be transferred by means of Display variables. Online Famos Professional is not required to operate XCP.

### **Order code:**

	Article number	Remarks
<b>CRFX/XCPoE</b>	1190032	for installation ex-factory in a CRONOS <i>flex</i> base unit
<b>CRC/XCPoE</b>	1170049	for installation in a CRONOS <i>compact</i>
<b>CRC/XCPoE-ET</b>		version in extended temperature range
<b>CRC/XCPoE-R</b>		for installation in a CRONOS <i>compact</i> RACK
<b>CRSL/XCPoE</b>	1180069	for installation in a CRONOS-SL
<b>CRPL/XCPoE</b>	1080200	for installation in a CRONOS-PL
<b>CRPL/XCPoE-ET</b>		version in extended temperature range
<b>busDAQ/XCPoE-ET</b>		for installation in a busDAQ in extended temperature (ET) range

### **Structure:**

- Plug-in module for imc CRONOS*compact* and for imc CRONOS-PL, the slot occupation depends on the terminal connector type selected, maximum 4 per device
- Configuration module for imc CRONOS-SL and busDAQ, occupying one slot
- Configuration module for imc CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum of two per base unit

### **Terminal connection:**

- 1x RJ45 -Ethernet 100 MBit

### **Power supply:**

- provided by the measurement system

### **Operating conditions:**

- Depending on the module variety (with/ without extended temperature range), the respective user's instructions are described along with the associated housing type.

### **Included software:**

- The module is completely supported by the imcStudio and the imcDevices operating software for the measurement system. The entire functionality with regard to parameterization, data storage, and online computation is available. Settings for the XCPoE connection are made with the help of a dedicated software assistant.
- The process vector serves as the signal source.
- An A2L-file is generated upon preparation of the measurement, with which the XCPoE receiver can be configured.

**Data storage:**

- handled by the measurement system

**Data source:**

- The XCPoE Client requests the measured data once the device has been configured.

**Transfer protocols:**

“XCP -Part 1- Overview”; Ver. 1.0; ASAM e.V.

“XCP -Part 2- Protocol Layer Specification” Ver. 1.0; ASAM e.V.

“XCP -Part 3- Transport Layer Specification XCP on Ethernet (TCP\_IP and UDP\_IP)”;  
Ver. 1.0; ASAM e.V.

“XCP -Part 4- Interface Specification”; Ver. 1.0; ASAM e.V.

**Remarks:**

- Possible combinations with other Field-bus cards: see [table](#) <sup>12</sup>

## Profibus Interface

### Order code:

**CRFX/PROFIBUS**  
**CRC/PROFIBUS**  
**CRC/PROFIBUS-R**  
**CRPL/PROFIBUS**  
**busDAQ/PROFIBUS**

### Remarks

for installation ex-factory in a CRONOS*flex* base unit  
 for installation in a CRONOS*compact*  
 for installation in a CRONOS*compact* RACK  
 for installation in a CRONOS-PL  
 for installation in a busDAQ

### Structure:

- Plug-in module for imc CRONOS*compact* and for imc CRONOS-PL, the slot occupation depends on the terminal connector type selected, maximum 4 per device
- Configuration module for imc busDAQ, occupying one slot
- Configuration module for imc CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum of two per base unit

### Terminal connection:

- 1x DSUB-9

### Power supply:

- provided by the measurement system

### Prerequisite:

- imcDevices as of Version 2.6 R3 SP7

### Operating conditions:

- Depending on the module variety (with/ without extended temperature range), the respective user's instructions are described along with the associated housing type.

### Included software:

- The module is completely supported by the imcStudio and the imcDevices operating software for the measurement system. The entire functionality with regard to parameterization, data storage, and online computation is available. Settings for the PROFIBUS connection are made with the help of a dedicated software assistant.

### Data storage:

- handled by the measurement system

### Transfer protocols:

- DPV0, DPV1

### Remarks:

- Possible combinations with other Field-bus cards: see [table](#) <sup>12)</sup>

### **imcECAT-IF Interface**

The Field bus module imcECAT-Slave-IF (imcECAT-Slave-Interface) enables the use of the imc CRONOS *compact*, CRONOS*flex* and CRONOS-PL devices in an automation system with an EtherCAT Field bus. The interface subscribes to the EtherCAT-Field bus as a Slave module. By means of the interface, process vector variables (PVVs) can be read and written. The reading and writing can be carried out either cyclically or acyclically. For acyclical reading/writing, the EtherCAT-Master must support the protocol CoE(CANopen over EtherCAT). The EtherCAT Interface's transfer properties are presented in an *EtherCAT-Slave-Information* document (ESI), whose structure is defined in the EtherCAT standard.

#### **Order code:**

	Article number	Remarks
<b>CRFX/ECAT-Slave</b>	1190040	for installation ex-factory in a CRONOS <i>flex</i> base unit
<b>CRFX/ECAT-Slave-ET</b>	1191038	version in extended temperature range
<b>CRC/ECAT-Slave</b>	1170026	for installation in a CRONOS <i>compact</i>
<b>CRC/ECAT-Slave-ET</b>	1171023	version in extended temperature range
<b>CRC/ECAT-Master</b>	1170025	for installation in a CRONOS <i>compact</i>
<b>CRC/ECAT-Master-ET</b>	1171022	version in extended temperature range

#### **Physical structure:**

- The ECAT-Slave interface (imcECAT-IF) is a plug-in module for imc CRONOS*compact* and for imc CRONOS-PL, occupying one slot, maximum one per device.
- imcECAT-IF: configuration module for the imc CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum one per base unit.
- The ECAT-Master Interface (imcECAT-DA) is configured ex-factory in a CRONOS*flex* base unit (CRFX-400 / CRFX-2000) occupying one slot, maximum of one per base unit

#### **Terminal connection:**

- 2x RJ45 -EtherCAT 100 MBit

#### **Power supply:**

- Provided by the measurement device.

#### **Operating conditions:**

- For each module option (either with or without the extended temperature range), see the respective housing type's documentation for the operating conditions.
- Along with the XML configuration file, the protocol CANopen<sup>®</sup> over EtherCAT (CoE) help make additional settings.
- As the signal source, the same process vector is used which can also be used for data capture.

#### **Included software:**

- The module is completely supported by the measurement device's operating software imcStudio and imcDevices.
- The Configuration and parameterization of the interface is made with the help of a dedicated imcECAT-IF assistant.

#### **Data storage:**

- Provided by the measurement device

#### **Data source:**

- The cyclical data adjusted via CoE are transferred cyclically following the start of the Field bus and of the measurement system. Additionally, data can be retrieved acyclically via CoE.

#### **Transfer protocol:**

- EtherCAT Specification – Part 4 - Data Link Layer protocols specification
- EtherCAT Specification – Part 6 - Application Layer protocol specification

#### **Remarks:**

- Possible combinations with other Field bus cards: see [table](#) <sup>12)</sup>

## Field-bus

Table for possible combinations of Field-bus and Synthesizer Cards

	CAN	CAN2	LIN	J1587	J1587-2	ARINC	XCPoE	FlexRay	PROFI BUS	SYNTH1..3	SYNTH4	EtherCAT
CAN	ok	X	X	ok	X	X	X	X	X	ok	X	X
CAN2	X	ok	ok	X	ok	ok	ok	ok	ok	ok	ok	ok
LIN	X	ok	ok	X	ok	ok	ok	ok	ok	ok	ok	ok
J1587	ok	X	X	ok	X	X	X	X	X	ok	X	X
J1587-2	X	ok	ok	X	ok	ok	ok	ok	ok	ok	ok	ok
ARINC	X	ok	ok	X	ok	ok	ok	ok	ok	ok	ok	ok
XCPoE	X	ok	ok	X	ok	ok	ok	ok	ok	ok	ok	ok
PROFIBUS	X	ok	ok	X	ok	ok	ok	ok	ok	ok	ok	ok
SYNTH1..3 (alt)	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
SYNTH4 (neu)	X	ok	ok	X	ok	ok	ok	ok	ok	ok	ok	ok
EtherCAT	X	ok	ok	X	ok	ok	ok	ok	ok	ok	ok	ok

### CAN-BUS Interface

#### Technical Datasheet version 3.1

Parameter	Value (min / max)	Remarks
Number of CAN-nodes	2	
Connector	2x DSUB-9 per card	for each of CAN_IN / CAN_OUT
Transfer protocol	CAN High Speed 1 MBaud (ISO 11898) CAN Low Speed 125 Kbaud (ISO 11519)	default switchable per software With <b>CAN2</b> , each node can be configured by software as CAN High Speed or CAN Low Speed.
Max. cable length at transfer rate: CAN CAN2	15 m at 1000 kBit/s 80 m at 500 kBit/s  25 m at 1000 kBit/s 90 m at 500 kBit/s	CAN High Speed cable delay 5.7 ns/m  as of imcDevices Version 2.6 R1
Terminator resistor	124 Ω	switchable by software for each node
Parameterize per CANSAS	CAN2	imcDevices 2.6 R3 necessary or higher and optional CANSAS Software
Max. sustainable overvoltage	±50 V	to System ground (protection ground)

Note the possible combinations with [other modules](#) <sup>[12]</sup>.

**LIN-BUS Interface****Technical Datasheet version 3.1**

Parameter	Value (min / max)	Remarks
Number of LIN-nodes	2	
Connector	2x DSUB-9 per card	LIN_IN / LIN_OUT respectively
Transfer protocol	LIN 2.0, LIN 1.3 1-20 kBaud adjustable as desired	Both LIN-specifications can run on a bus simultaneously.
Max. sustainable overvoltage	±50 V	to System ground (protection ground)

Note the possible combinations with [other modules](#) <sup>12</sup>.

**J1587-BUS Interface****Technical Datasheet version 3.1**

Parameter	Value (min / max)	Remarks
Number of J1587 connections	1	
Connector	1x DSUB-9	
Transfer protocol	J1587 with RS485 interface	custom version special order
Max. sustainable overvoltage	±50 V	to System ground (protection ground)

Note the possible combinations with [other modules](#) <sup>12</sup>.

**imcECAT-IF****Technical Datasheet version 3.1**

Parameter	Value (min / max)	Remarks
Sendable channel types	Prozess vector	
Receivable channel types	Prozess vector	
Connection terminal	2x RJ45	
Transfer protocol	EtherCAT Specification – Part 4 Data Link Layer protocols specification EtherCAT Specification – Part 6 Application Layer protocol specification	along with cyclical data transfer on the basis of EtherCAT, the interface is parameterized using CANopen <sup>®</sup> over EtherCAT (CoE)
Data rate	up to 100 kHz	per channel
Highest possible bus rate	200 µs (5 kHz)	
Highest possible cyclical transferable channel count	Bus cycle/4.5 µs - 10	(max. 34 channels at 200 µs bus rate)

Note the possible combinations with [other modules](#) <sup>12</sup>.

## FlexRay Interface

### Technical Datasheet version 3.2

Parameter	Value (min / max)	Remarks
Number of clusters	1	1x channel A+B
Connector	1x DSUB-9 per card	optionally with two connectors
Transfer protocol	FlexRay protocol specification v2.1	
Baud rate	2.5 / 5.0 or 10.0 MBit	
Data throughput		per card
FlexRay	Max. 30 kSamples/s	
<b>FlexRay2</b>	Max. 60 kSamples/s	
Max. sustainable overvoltage	±50 V	to System ground (protection ground)

Note the possible combinations with [other modules](#) <sup>12</sup>.

## PROFIBUS Interface

### Technical Datasheet version 3.1

Parameter	Value (min / max)	Remarks
Transfer protocol	DPV0, DPV1	
Connector	1x DSUB-9 per card	
Sendable channel types		not supported
Baudrate	max. 12 MBit	per connector
Max. sustainable overvoltage	±50 V	to System ground (protection ground)

Note the possible combinations with [other modules](#) <sup>12</sup>.

## XCPoE Interface

### Technical Datasheet version 3.1

Parameter	Value (min / max)	Remarks
Transmittable channel type	Process vector	
Connector	1x RJ45	
Amount of modules	max. 4	per device
Transfer protocol	„XCP -Part 1- Overview“; Ver. 1.0; ASAM e.V. „XCP -Part 2- Protocol Layer Specification“ Ver. 1.0; ASAM e.V. „XCP -Part 3- Transport Layer Specification XCP on Ethernet (TCP_IP and UDP_IP)“; Ver. 1.0; ASAM e.V. „XCP -Part 4- Interface Specification“; Ver. 1.0; ASAM e.V.	While preparatin of measurement a A2L-file is created and with this file the XCPoE-receiver can be configured.
Ethernet	100 Mbit	
Data rate	max. 10 kHz	per channel
Max. sustainable overvoltage	±50 V	to System ground (protection ground)

Note the possible combinations with [other modules](#) <sup>12</sup>.

**ARINC-Bus Interface****Technical Datasheet version 3.1**

Parameter	Value (min / max)	Remarks
Number of Rx-channels	8	
Connector	freely selectable	by means of adapter connector
Transfer protocol	ARINC 429 Low (12.5 kbit/s) High (100 kbit/s)	
Max. voltage for each Rx connection	$\pm 29$ V	to System ground (protection ground)
Max. sustainable overvoltage	$\pm 50$ V	to System ground (protection ground)

Note the possible combinations with [other modules](#) <sup>12</sup>.

