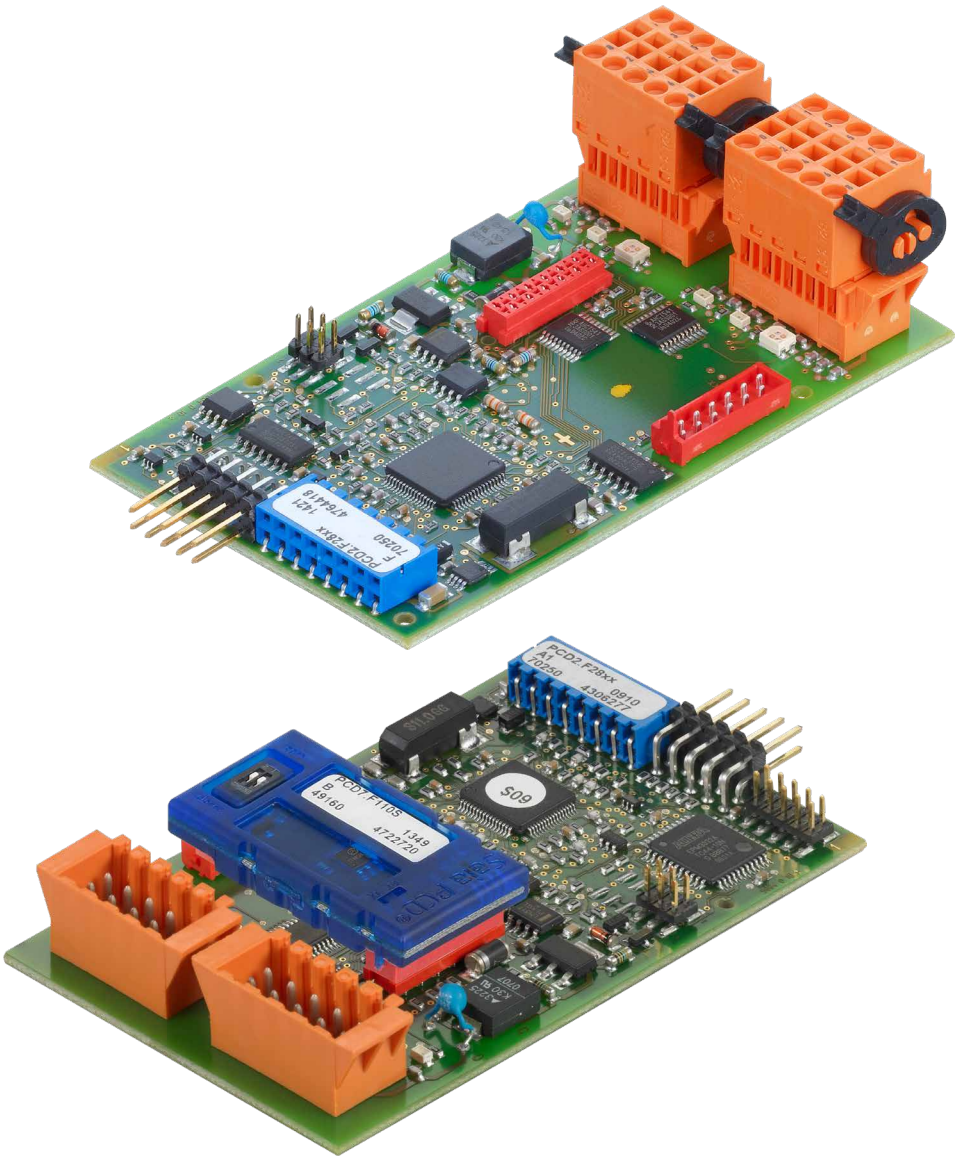
SAIA BURGESS CONTROLS



PCD2.F2xxx
serial interface modules

Document 27-649 | Version ENG02 | 2018-08-15

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0 Contents

0

0.1 Document versions

Version	Date	Updated	Comments
ENG01	2018-02-08	2018-02-08	Translated from the german version
ENG02	2018-08-15	-	Revised, overview improved, Chapter 2

0.2 Brand names and trademarks

Saia PCD® and Saia PG5®
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Technical changes based on the current technical state of the art

Published in Switzerland

1 PCD2.F2xxx serial interface modules

1.1 I/O-Slot Modules overview

Serial communications modules with two serial interface ports

PCD2.F2100
Port x.0: RS-422 / RS-485
Port x.1: slot for PCD7.F1xxS module

PCD2.F2210
Port x.0: RS-232
Port x.1: slot for PCD7.F1xxS module

PCD2.F2810
Port x.0: Belimo MP-Bus
Port x.1: slot for PCD7.F1xxS module

1.1.1 Serial interface modules PCD7.F1xxS

Serial interface modules PCD7.F1xxS to port x.1 insertion of PCD2.F2xxx modules

PCD7.F110S RS-422 / RS-485 with connectable terminating resistors

PCD7.F121S RS-232

PCD7.F150S RS-485 galv. isolation and with connectable terminating resistors

PCD7.F180S Belimo MP-Bus

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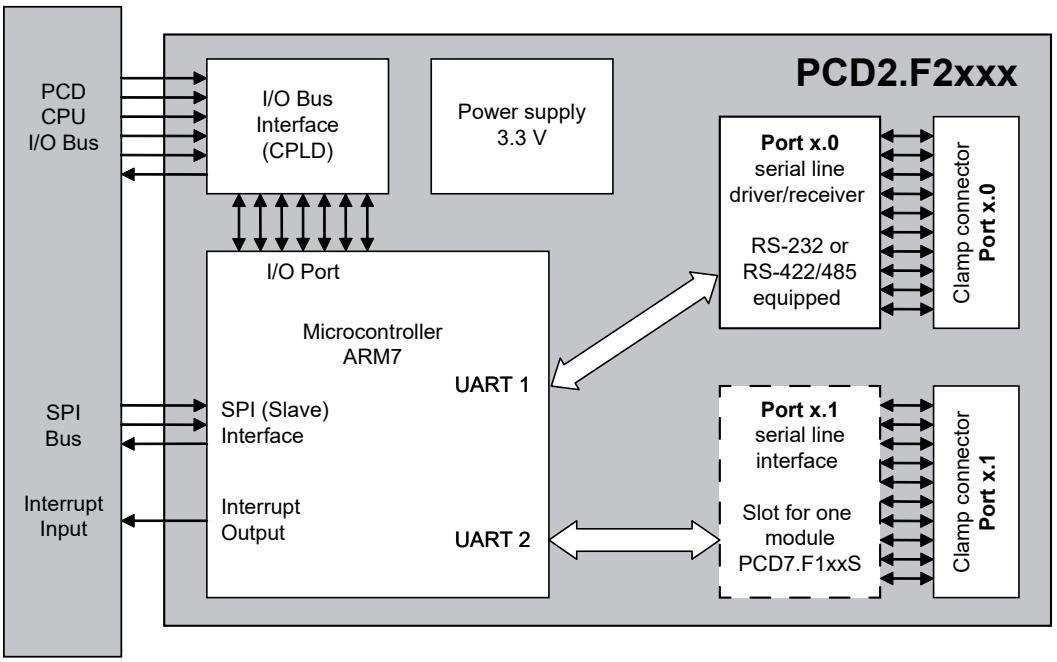
1.1.2 Block diagram



1.2 General info on the PCD2.F2xxx

System properties of the PCD2.F2xxx modules

One plug-in socket (orange) for each interface. The first port named Port # 0 is factory-fitted with a fixed serial port depending on your choice.

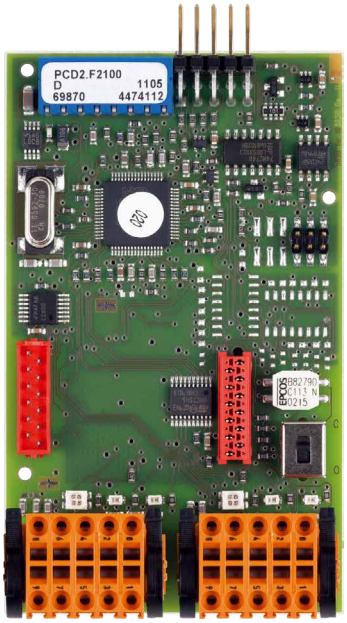
The second interface with the designation Port # 1 allows free loading with a PCD7.F1xxS module of your choice or as a reserve for later assembly.

The following points must be noted when using the PCD2.F2xxx interface modules:

- Each Saia PCD® system has a limitation on the maximum number of PCD2. F2xxx modules. For an overview, see chapter 2 in this manual.
- The PCD systems have a high-performance processor that processes the application and the serial interfaces. The appropriate CPU capacity is required to process the interface modules. Please note the following when defining the maximum communication capacity per PCD2 system:
  - The communication volume is determined by the peripheral devices connected. This may be the case if, for example, a PCD2 is used as an S-Bus slave station. If a PCD2 control unit is bombarded with a heavy telegram transfer at high baud rates, there will be little CPU capacity remaining to process the actual application. The following rules apply here: the use of 8 interfaces with 9.6 kbps requires approx. 50% of the CPU capacity. Two 57.6 kbps interfaces require approx. 50% of the CPU capacity. Two 115 kbps interfaces require approx. 60% of the CPU capacity.
  - If the PCD is the initiator of the communication, the communication volume and therefore the communication capacity is defined by the user program in the PCD (the PCD is used as the master station). Theoretically, all interfaces can be operated with a maximum baud rate of 115 kbps. The effective data throughput will however depend on the user program and the number of interfaces and can be correspondingly low. The essential factor is that the connected peripheral devices can work with the selected configuration and communication capacity.

1.3 Module description

The PCD2.F2xxx communications modules are designed for the PCD2.Mxxxx systems. Each module has two serial ports, a fixed interface and a second which can be equipped with one of the PCD7.F1xxS modules if required.



Port x.1 still without PCD7. F1xxS module

Port x.0 fix, depending on the PCD2.F2xxx module selected

Serial communications modules with two serial interface ports:

PCD2.F2100
Port x.0: RS-422 / RS-485 (equipped)
Port x.1: slot for PCD7.F1xxS module

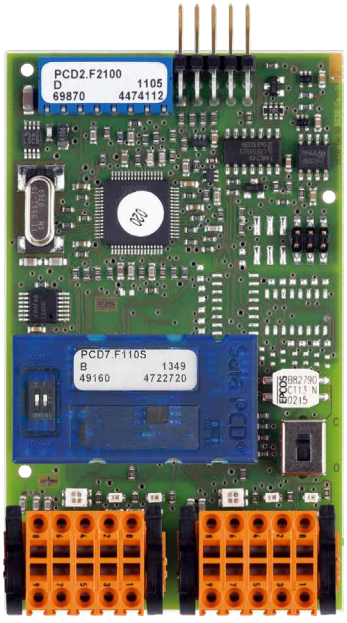
PCD2.F2210
Port x.0: RS-232 (equipped)
Port x.1: slot for PCD7.F1xxS module

PCD2.F2810
Port x.0: Belimo MP-Bus (equipped)
Port x.1: slot for PCD7.F1xxS module

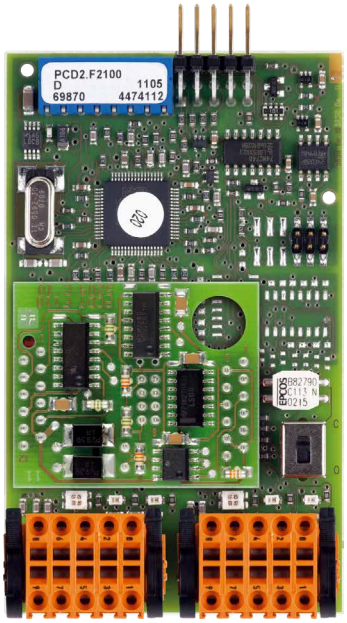
Example of one of the PCD7.F1xxS modules

Examples with attached PCD2.F_ module on Portx.1:

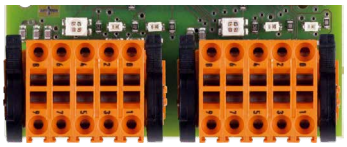
with serie PCD2.FxxS



with old serie PCD2.FxxS



1.3.1 Connection terminals



Terminal to port x.1
10 pin (2x5)

Terminal to port x.0
10 pin (2x5)

RS-232

0	PGND	TxD	1
2	RxD	RTS	3
4	CTS	PGND	5
6	DTR	DSR	7
8	COM	DCD	9

RS-422

0	PGND	Tx	1
2	/Tx	Rx	3
4	/Rx	PGND	5
6	RTS	/RTS	7
8	CTS	/CTS	9

RS-485

0	PGND	Rx-Tx	1
2	/Rx-/Tx		3
4		PGND	5
6			7
8	(SGD)		9

TTY (CL)

0	PGND	TS	1
2	RS	TA	3
4	RA	PGND	5
6	TC	RC	7
8	TG	RG	9

Belimo MP-Bus

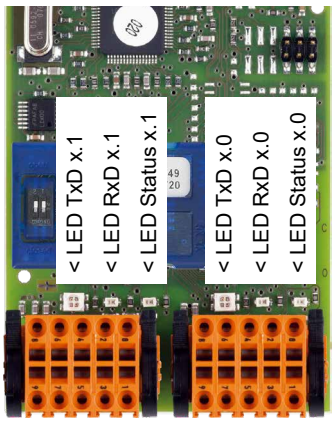
0	PGND	Acom	1
2	MST	IN	3
4		PGND	5
6			7
8			9

Type K terminal block
(2x item no. 4 405 5048 0 are also supplied)

Each serial port has its own individual 10 pin spring-loaded terminal block.
Two type K spring-loaded terminal blocks are fitted on the PCD2.F2xxx module, the right for port x.0 and the left for port x.1.

Maximum wire gauge: 1.0 mm^2 AWG 18

1.3.2 LEDs



LED TxD	Transmission data detection		
LED RxD	Data reception detection		
LED status	The LED status indicates the status of the serial ports. 'green' means that the port is working properly		
	green	**red**	**Status of the serial port**
	-	100%	F2xxx not operating
	25%	75%	F2xxx start procedure
	50%	50%	F2xxx operating, but no communication with CPU
	75%	25%	F2xxx operating, channel closed
	90%	10%	F2xxx operating, channel open with error
	100%	-	F2xxx operating, channel open OK

1.3.3 Technical data

Communication modes supported:

MC0 character mode without automatic handshaking
MC1 character mode with RTS/CTS handshaking
MC2 character mode with Xon/Xoff protocol
MC4 character mode for RS-485 interface
MC5 similar to MC4 with rapid switching between sending and receiving

SM1 S-Bus master, parity mode
SM2 S-Bus master, data mode

SS1 S-Bus slave, parity mode
SS2 S-Bus slave, data mode

GS1 S-Bus gateway slave, parity mode
GS2 S-Bus gateway slave, data mode

GM S-Bus gateway master

→ Gateway always via the PCD2.

Baud rates supported (bit/s):

1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

Current consumption

		+5 V-Bus	V+
Basis module	Port x.1 config.	[I in mA]	[I in mA]
PCD2.F2100	none	110	0
	PCD7.F110S	150	0
	PCD7.F121S	125	0
	PCD7.F130	190	22
	PCD7.F150S	240	0
	PCD7.F180S	125	15
PCD2.F2210	none	90	0
	PCD7.F110S	130	0
	PCD7.F121S	105	0
	PCD7.F130	120	22
	PCD7.F150S	225	0
	PCD7.F180S	105	15
PCD2.F2810	none	90	15
	PCD7.F110S	130	15
	PCD7.F121S	105	15
	PCD7.F130	115	37
	PCD7.F150S	225	15
	PCD7.F180S	105	30

1.3.4 Restrictions

The PCD2.F2xxx modules for the PCD2 systems enable users to create up to 8 additional serial interfaces. Note: every additional interface uses CPU capacity.

The use of these 8 ports depends on the type of communication, the baud rate required and the volume of the data transfer.

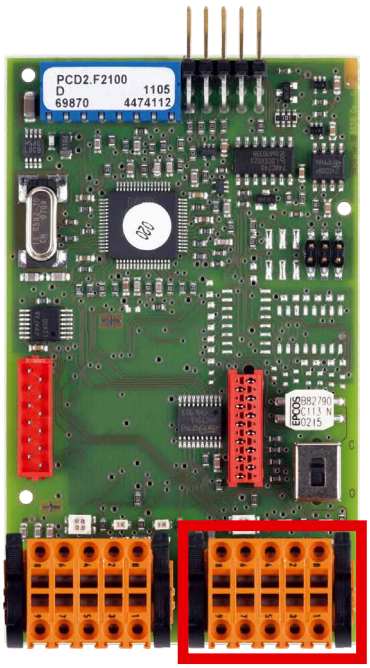
Additional important factors are:

- Communication on the PCD, i.e. Profi-S-Net, Ether-S-Net, USB
- Use of the web server
- Data transfer from the CPU to the memory
- User program in the PCD

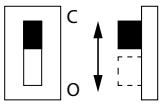
1.4 Module variants

1.4.1 RS-422/485 on module - PCD2.F2100 port x.0

The PCD2.F2100 module contains two different interface types on port x.0, RS-422 with RTS/CTS and RS-485 (electrically connected). The line terminator is integrated into the module and can be connected to the module via a switch.



Switch for network terminator port x.0 (RS-485)



RS-422 connection

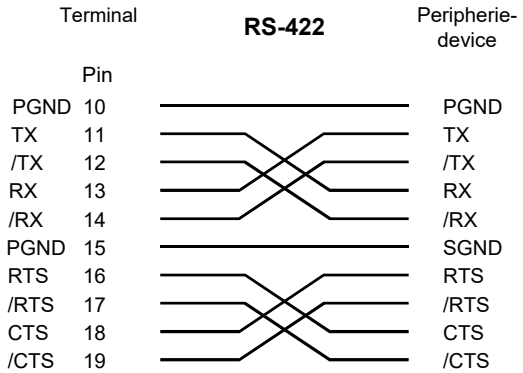
Port x.0

RS-422

0	PGND	Tx	1
2	/Tx	Rx	3
4	/Rx	PGND	5
6	RTS	/RTS	7
8	CTS	/CTS	9

10 pin spring-loaded terminal block

The line terminator in RS-422 mode occurs at 150 Ω in all cases on the PCD2.F2100 module.



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RS 485 connection

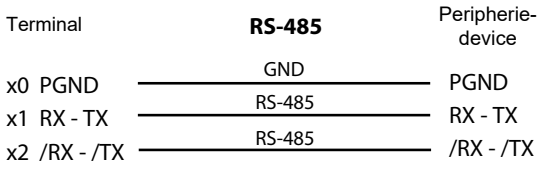
Port x.0

RS-485

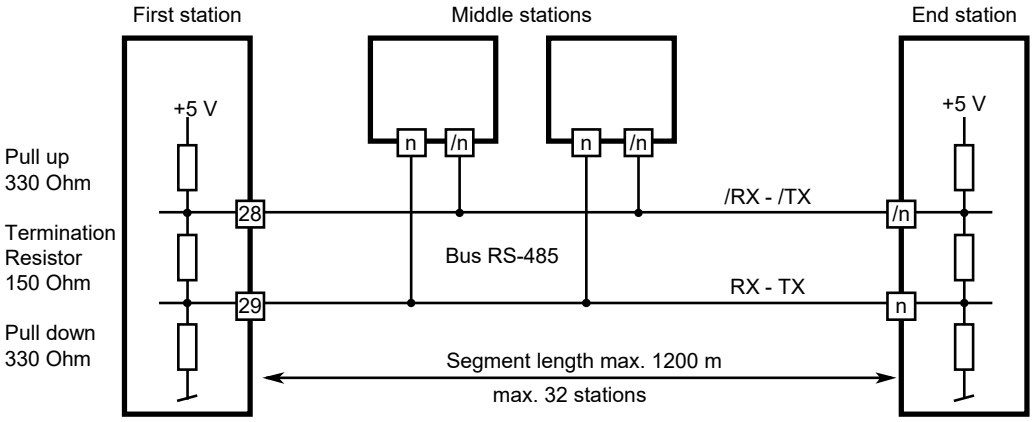
0	PGND	Rx-Tx	1
2	/Rx-/Tx		3
4		PGND	5
6			7
8	(SGD)		9

10 pin spring-loaded terminal block

(Electrically connected RS-485 interface)



Line terminator:

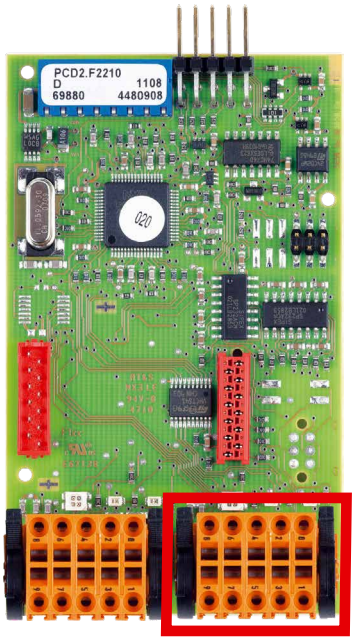


The line terminator for port x.0 is integrated into the module and can be activated using a switch on the module. In addition to the switch, the following indications appear on the LP: ‘O’ for OPEN and ‘C’ for CLOSED.

1.4.2 RS-232 on module - PCD2.F2210 Port x.0 (for modem)

The PCD2.F2210 module has a full RS-232 interface on port x.0 an. This port is designed in particular for all modem connections, including the RTS/CTS, DTR/ DSR and DCD.

RS-232 connection



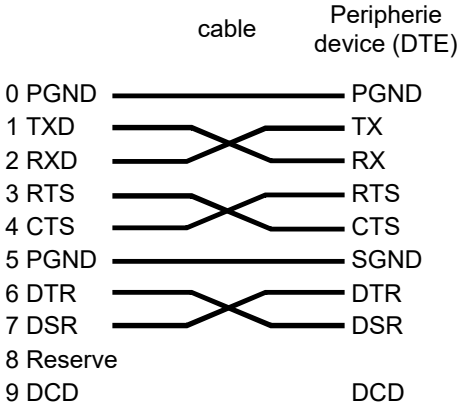
Port x.0

RS-232

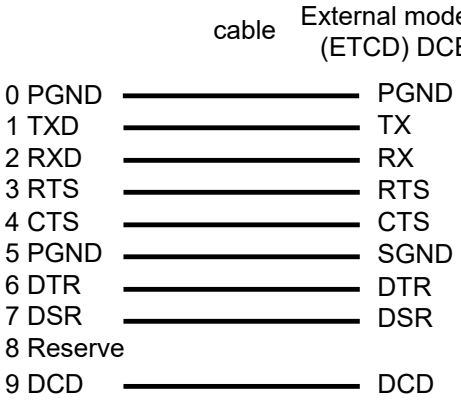
0	PGND	TxD	1
2	RxD	RTS	3
4	CTS	PGND	5
6	DTR	DSR	7
8	COM	DCD	9

10 pin spring-loaded terminal block

RS-232 connection to DTE



RS-232 connection to DCE



1.4.3 Belimo MP-Bus on module - PCD2.F2810 port x.0

The PCD2.F2810 module has a full Belimo MP-Bus interface on port x.0 an. An MP-Bus with up to 8 drives and sensors can therefore be connected to port x.0.

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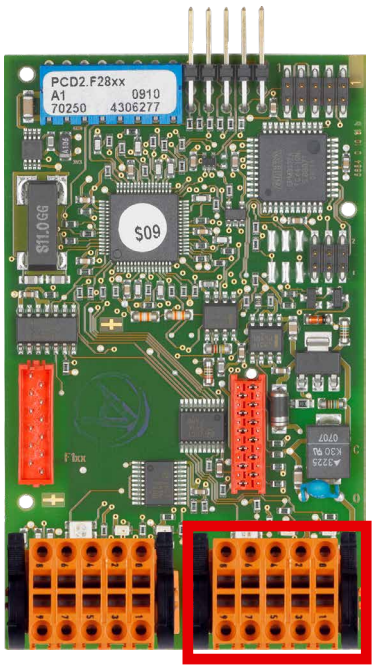
Belimo connection



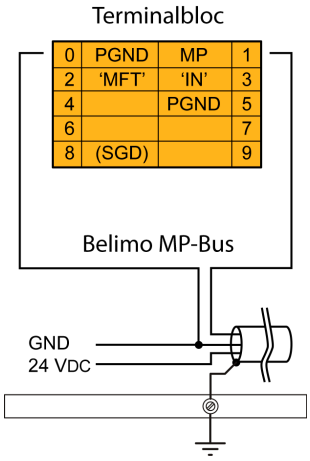
Port x.0

Belimo MP-Bus

0	PGND	Acom	1
2	MST	IN	3
4		PGND	5
6			7
8			9

10 pin
spring-loaded terminal block

MP-Bus cabling



0	PGND	Earth connection, MP line
1	MP	Multi-point The MP-Bus is the Belimo master slave bus. Up to 8 slaves can be connected to a master device. These are: - MFT(2) flap drives - MFT(2) valve drives - MFT fire damper drives - VAV NMV-D2M compact controller
2	'MFT'	MFT programming unit (internal MP-Bus)
3	'IN'	detection of MFT programming unit (input 10 kΩ, Z5V1)
5	PGND	Earth connection, MFT programming unit

1.5 PCD7.F1xxS serial interface modules for port x.1

1.5.1 PCD7.F1xxS modules overview

PCD7.F1xxS serial interface modules will be used, among others, for the insertion of port x.1 of the PCD2.F2xxx modules. A second interface can be mounted on each CD2.F2xxx module depending on the purpose of the application.

PCD7.F110S RS-422 / RS-485 with connectable terminating resistors

PCD7.F121S RS-232

PCD7.F150S RS-485 galv. isolation and with connectable terminating resistors

PCD7.F180S Belimo MP-Bus

PCD7.F1xxS modules for port x.1

Port x.1

0			1
2			3
4			5
6			7
8			9

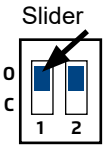
10 pin
spring-loaded terminal block

1.5.2 RS-485/RS-422 - PCD7.F110S serial interface module

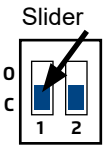
The terminating connectors can be linked using slide switches (CLOSED) or isolated (OPEN).

PCD7.F110S

RS-485 terminator



Open not terminated (factory setting)



Closed terminated

RS-422 connection

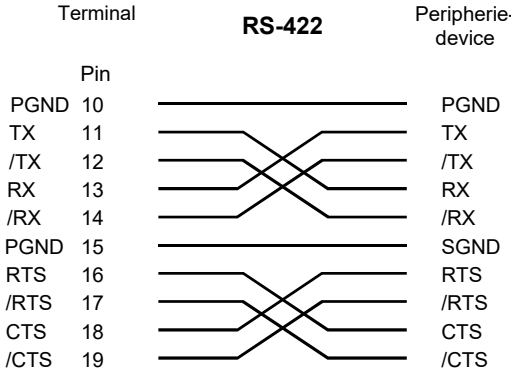
Port x.1

RS-422

0	PGND	Tx	1
2	/Tx	Rx	3
4	/Rx	PGND	5
6	RTS	/RTS	7
8	CTS	/CTS	9

10 pin spring-loaded terminal block

The line terminator in RS-422 mode occurs at 150 Ω in all cases on the PCD2.F2100 module.



RS 485 connection

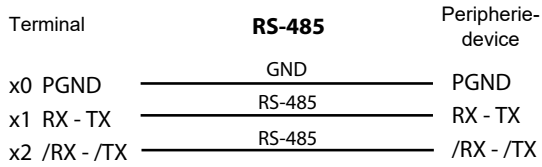
Port x.1

RS-485

0	PGND	Rx-Tx	1
2	/Rx-/Tx		3
4		PGND	5
6			7
8	(SGD)		9

10 pin spring-loaded terminal block

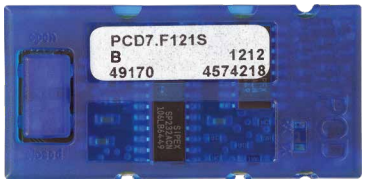
(Electrically connected RS-485 interface)



More details are available in the manual 26-740 “Installation components for RS-485 networks”.

1.5.3 RS-232 up to 115 kbit/s, suitable for modem connection PCD7.F121S serial interface module

PCD7.F121S



RS-232 connection

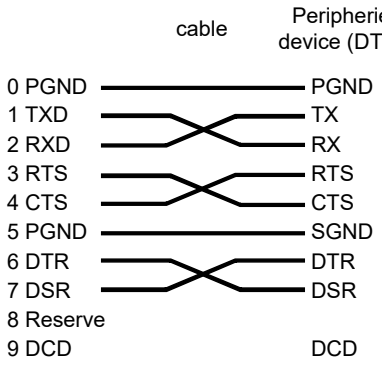
Port x.1

RS-485

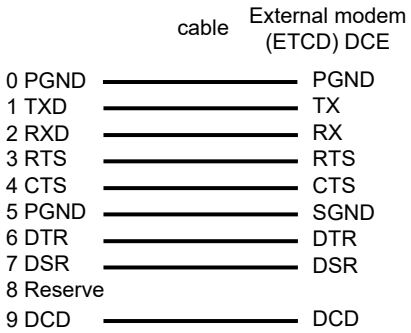
0	PGND	TxD	1
2	RxD	RTS	3
4	CTS	PGND	5
6	DTR	DSR	7
8	COM	DCD	9

10 pin spring-loaded terminal block

RS-232 connection to DTE



RS-232 connection to DCE



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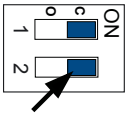
1.5.4 RS-485 galv. isolation - PCD7.F150S serial interface module

Electrical isolation is achieved using three optical couplers and a DC/DC converter. The data signals are protected against excess voltages by a suppressor diode (10 V). The terminating connectors can be linked using slide switches (CLOSED) or isolated (OPEN).

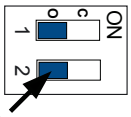
PCD7.F150S

RS-485 terminator



Closed terminated

Slider



Open not terminated
(factory setting)

Slider

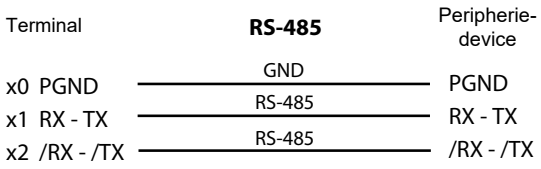
RS 485 connection

Port x.1

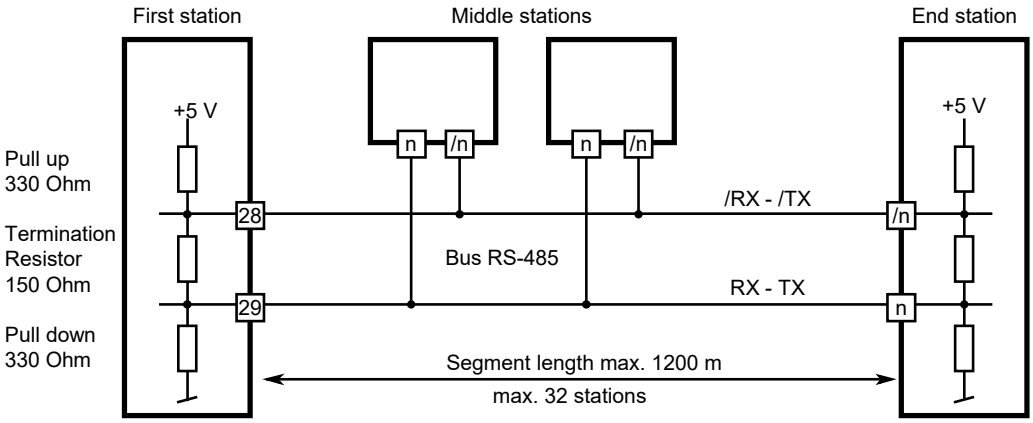
RS-485

0	PGND	Rx-Tx	1
2	/Rx-/Tx		3
4		PGND	5
6			7
8	(SGD)		9

10 pin spring-loaded terminal block



Line terminator:



The line terminator for port x.1 is integrated into the module and can be activated using a switch on the module. In addition to the switch, the following indications appear on the LP: ‘O’ for OPEN and ‘C’ for CLOSED.

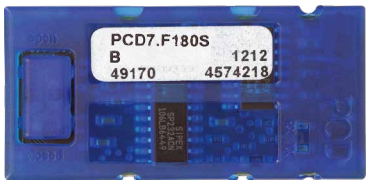
When using this module, the permitted ambient temperature for the control unit is reduced by 5°C.

More details are available in the manual 26-740 “Installation components for RS-485 networks”.

1.5.5 Belimo MP-Bus PCD7.F180S - serial interface module

Up to a maximum of 8 actuating drives and sensors can be connected.

PCD7.F180S



Belimo connection

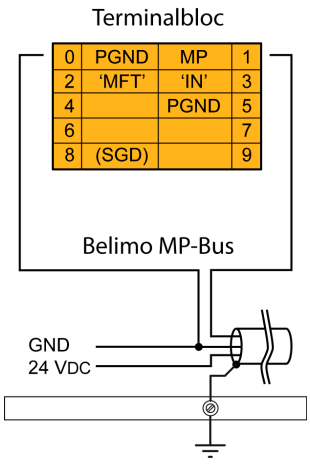
Port x.1

Belimo MP-Bus

0	PGND	MP	1
2	‘MFT’	‘IN’	3
4		PGND	5
6			7
8	(SGD)		9

10 pin spring-loaded terminal block

MP-Bus cabling



0	PGND	Earth connection, MP line
1	MP	Multi-point The MP-Bus is the Belimo master slave bus. Up to 8 slaves can be connected to a master device. These are: - MFT(2) flap drives - MFT(2) valve drives - MFT fire damper drives - VAV NMV-D2M compact controller
2	‘MFT’	MFT programming unit (internal MP-Bus)
3	‘IN’	detection of MFT programming unit (input 10 kΩ, Z5V1)
5	PGND	Earth connection, MFT programming unit

1

1.5.6 PCD7.Fxxx - Overview of older interface modules (no longer available)

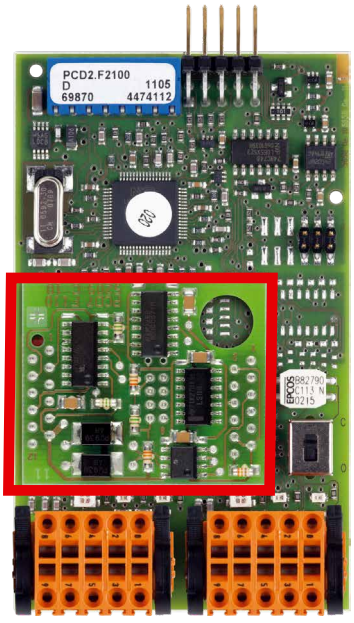
The older serial interface modules PCD7.F1xx (without «S» at the end) are no longer available.
Except PCD7.F130 current loop 20 mA

For completeness they are still listed here.

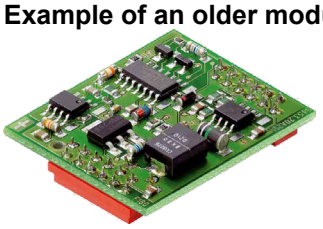
Their functions are the same as with the newer models with the “S” in the article number at the end.

PCD7.F110	Serial interface module RS-422 / RS-485
PCD7.F121	Serial interface module RS-232, for modem connection
PCD7.F130	Serial interface module, current loop 20 mA
PCD7.F150	Serial interface module, RS-485, electrically isolated
PCD7.F180	Serial interface module for Belimo MP bus, for max. 8 actuators and sensors

An equipped PCD2.F2xxx looks like this:



Example of an older module



0			1
2			3
4			5
6			7
8			9

2 PCD2 slots are available on...

This chapter indicates which PCD controllers can be used with which PCD2.F2xxx modules.

2.1 PCD1.M22xx-C15

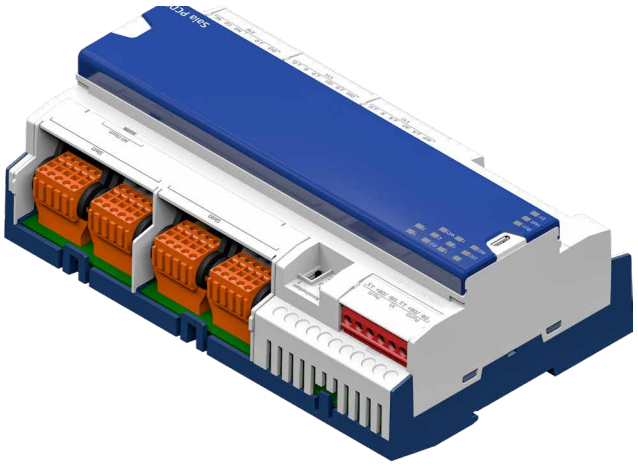
A maximum of two PCD2.F2xxx modules can be used on the two slots. The slots can be accessed with the following port addresses via communication FBoxes:

Slot 0 with the PCD2.F2xxx module

- Port 100 for the 0.0 port
- Port 101 for the 0.1 port (with PCD7.F1xxx)

Slot 1 with the PCD2.F2xxx module

- Port 110 for the 1.0 port
- Port 111 for the 1.1 port (with PCD7.F1xxx)

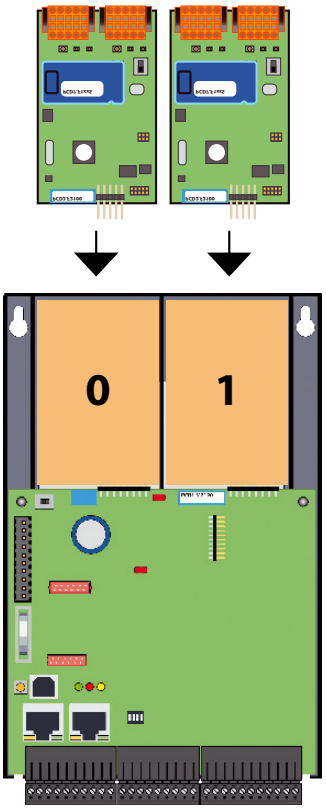


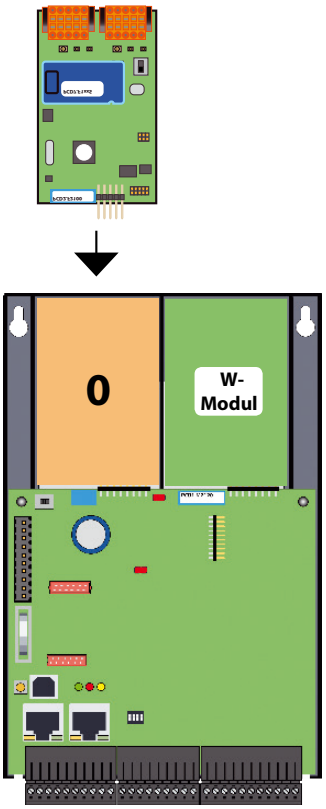
2.2 PCD1.M21xx

Slots IO0 and IO1 on the PCD1.M2_ can also be equipped with the PCD2.F2xxx interface modules. The slots can be accessed with the following port addresses via communication FBoxes (or AWL commands):

PCD1.M2120 /PCD1.M2160		
Module slot	**Module port address**	**Module terminal block**
0	100 101	Port x.0 Port x.1
1	110 111	Port x.0 Port x.1

PCD1.M2110-Room		
Module slot	**Module port address**	**Module terminal block**
0	100 101	Port x.0 Port x.1



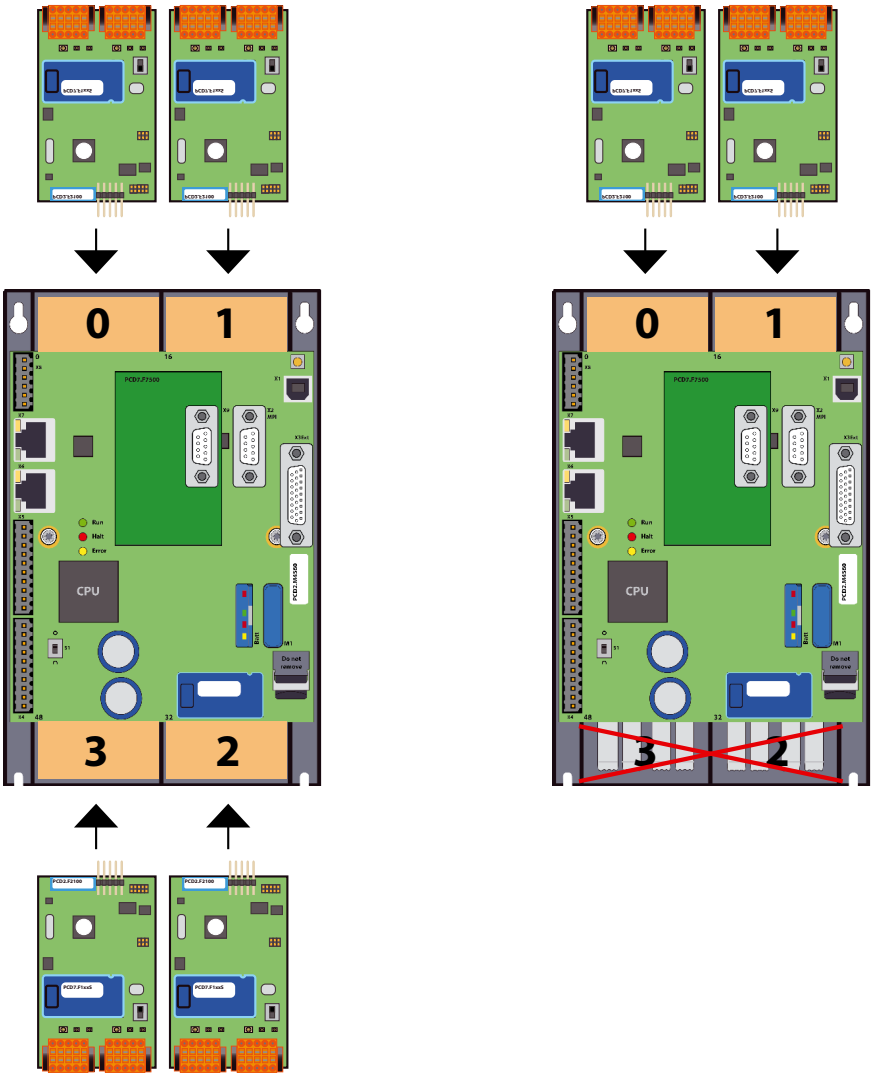


2.3 PCD2.M4xxx

Die PCD2.M4xxx kann die Module PCD2.F2xxx in den E/A-Slots 0…3 bzw. 0 … 1 aufnehmen. Wie in der folgenden Abbildung gezeigt, sind die E/A-Slots folgendermassen bezeichnet:

PCD2.M4560		
Module slot	Module port address	Module terminal block
0	100 101	Port x.0 Port x.1
1	110 111	Port x.0 Port x.1
2	120 121	Port x.0 Port x.1
3	130 131	Port x.0 Port x.1

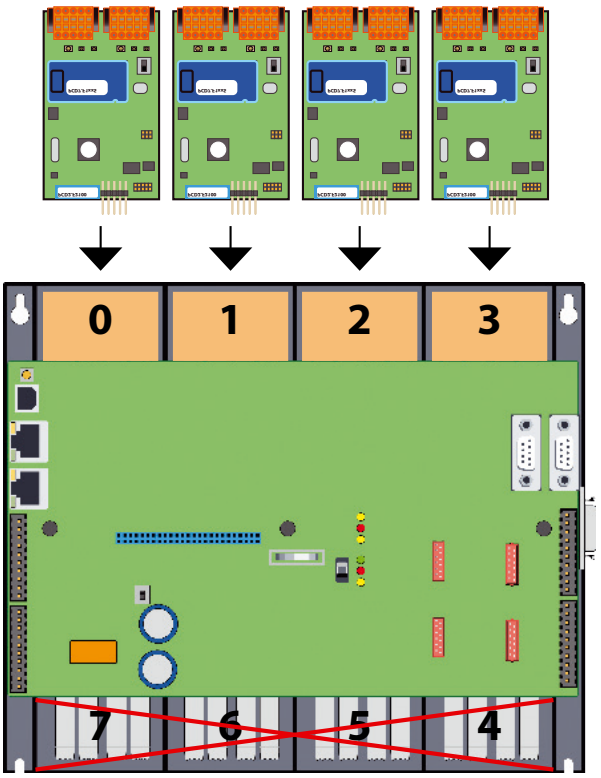
PCD4.M4160		
Module slot	Module port address	Module terminal block
0	100 101	Port x.0 Port x.1
1	110 111	Port x.0 Port x.1



2.4 PCD2.M5xxx

The PCD2.F2xxx modules are intended for inclusion in the I/O slot 0...3 on a PCD2.Mxxxx. As shown in the diagram, the I/O slots are labelled as follows:

Module slot	Module port address	Module terminal block
0	100 101	Port x.0 Port x.1
1	110 111	Port x.0 Port x.1
2	120 121	Port x.0 Port x.1
3	130 131	Port x.0 Port x.1



If a PCD2.F2xxx module is connected to I/O slot 0, port 1 cannot be used. Instead, the PCD2.F2xxx module is connected to the two ports 100 and 101.

A Appendix

A.1 Icons

	This symbol indicates that additional information on this topic exists in this manual, a different manual or technical documentation. There are no direct links to these documents.
	This symbol indicates instructions that require strict compliance.

A.2 Contact details

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