Saia® PCD3 System
CPU

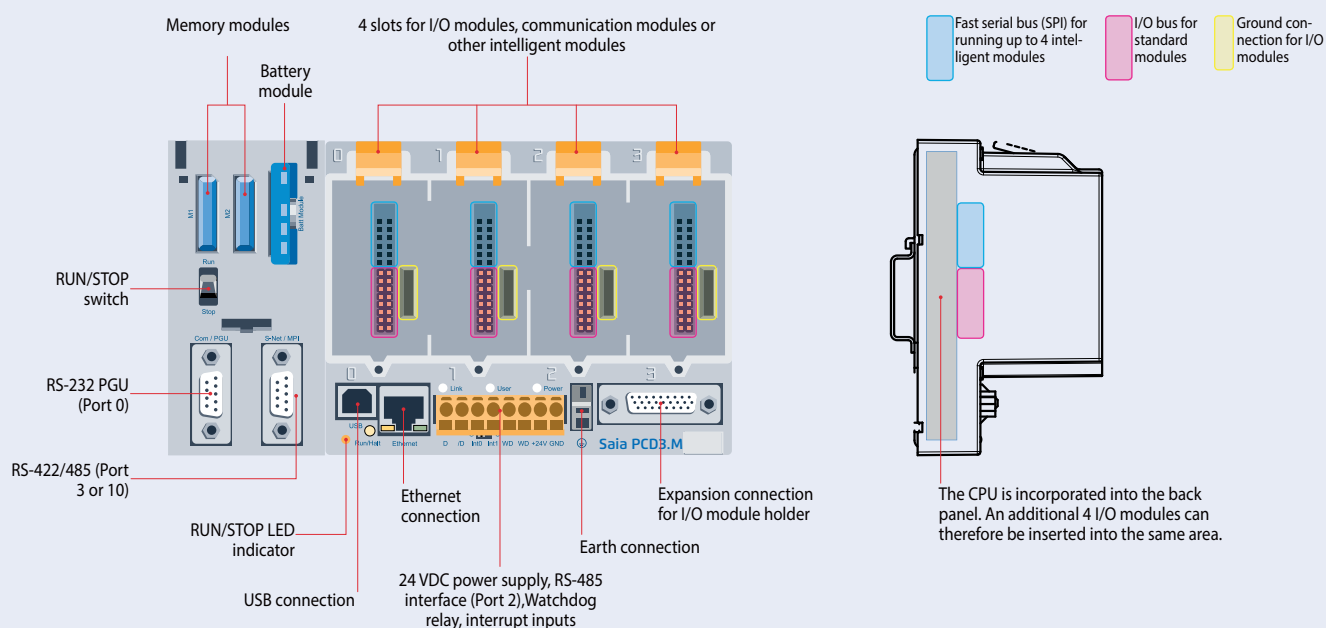# Design of Saia PCD3 controllers

The CPU has been incorporated into the back panel of the device, unlike comparable systems. Its capacity can be increased individually with plug-in communication modules and/or intelligent I/O modules. These have a direct, very fast bus connection to the CPU.

PCD3.Mxxxxx base unit

Base unit with CPU and 4 slots for I/O modules, communication or other specific modules (e.g. PCD3.Hxxx counter modules)

Device design

Memory modules

Battery module

4 slots for I/O modules, communication modules or other intelligent modules

Fast serial bus (SPI) for running up to 4 intelligent modules

I/O bus for standard modules

Ground connection for I/O modules

RUN/STOP switch

RS-232 PGU (Port 0)

RS-422/485 (Port 3 or 10)

RUN/STOP LED indicator

USB connection

Ethernet connection

Earth connection

24 VDC power supply, RS-485 interface (Port 2),Watchdog relay, interrupt inputs

Expansion connection for I/O module holder

The CPU is incorporated into the back panel. An additional 4 I/O modules can therefore be inserted into the same area.

With the left expansion, the Standard (PCD3.M5/M6xxx) and High Power (PCD3.Mxx60) CPU types have slots for a battery holder module with LED indicators, a run/stop switch, two slots for flash memory modules and two additional communication interfaces. The LED indicators on the battery module display the status of the CPU and battery and any errors in the application. The battery also protects the data in the event of an interruption to the power supply. It can be replaced during operation while under power. The configuration, programs and data can be transferred from one controller to another using the plug-in flash memory modules. No programming tool is required for this.

Dimensions

PCD3.M5xx0/M6xx0

180 × 100.5 × 139 mm (W × H × D)
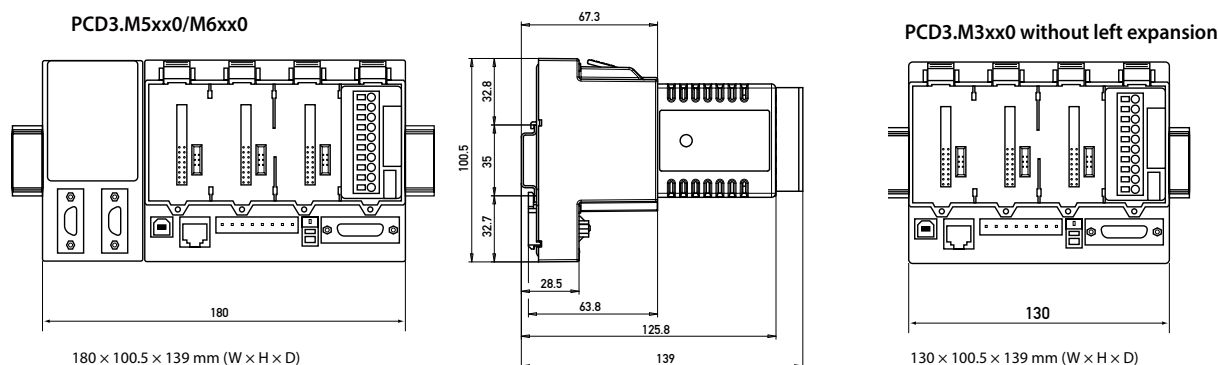
▲ Standard and High Power CPU with slots for battery and memory modules, run/stop switch and additional interfaces

PCD3.M3xx0 without left expansion
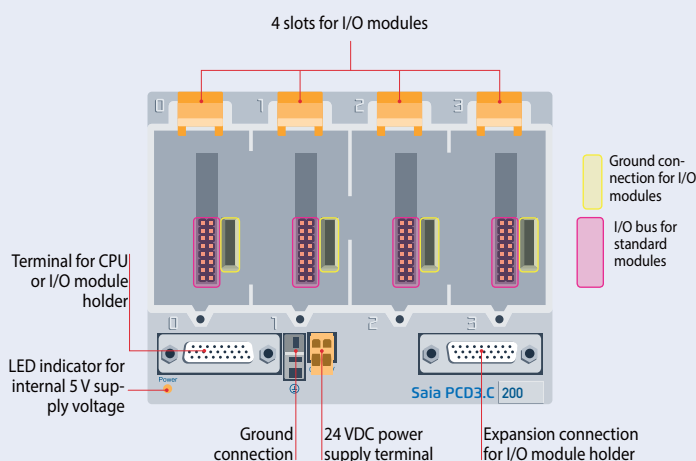
130 × 100.5 × 139 mm (W × H × D)

▲ Minimum Basic CPU without battery module. PCD3.Rxxx memory modules are plugged into an I/O slot.

Saia PCD3.Cxxx module holder

I/O expansion module holders are available in either a 2- or 4-slot version. This enables users to expand the PCD3 controllers to a max. 64 I/O modules or a max. 1023 I/Os.

Device design

4 slots for I/O modules

Ground connection for I/O modules

I/O bus for standard modules

Terminal for CPU or I/O module holder

LED indicator for internal 5 V supply voltage

Power

Saia PCD3.C 200

Ground connection

24 VDC power supply terminal

Expansion connection for I/O module holder

All standard I/O modules can be used in the expansion module holders. Communication modules or other intelligent modules can only be used in the slots of the Basic CPU.
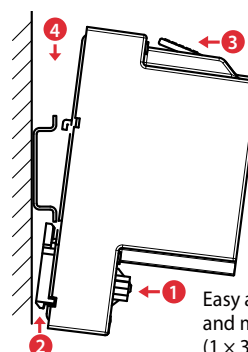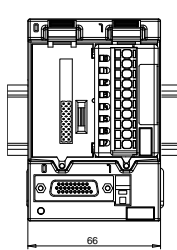
Available types

▸ PCD3.C100 Expansion module holder with 4 I/O slots
▸ PCD3.C110 Expansion module holder with 2 I/O slots
▸ PCD3.C200 Expansion module holder with 4 I/O slots and terminal connectors for 24 VDC power supply for all connected I/O modules, plus any downstream PCD3.C1xx module holders
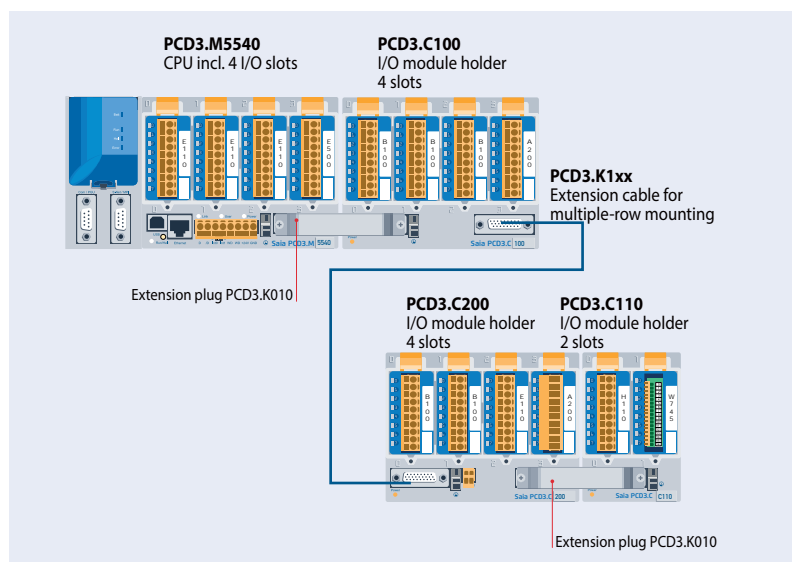
PCD3.C100/200 with 4 I/O slots

130
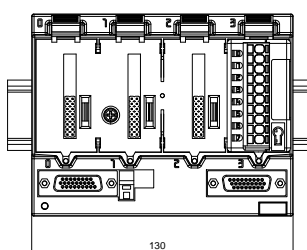
PCD3.C110 with 2 I/O slots

66

Easy assembly of the CPUs and module holders on DIN rail (1 × 35 mm)

System expansion up to 1023 I/O
Single- and multiple-row mounting of the module holders

PCD3.M5540 CPU incl. 4 I/O slots

PCD3.C100 I/O module holder 4 slots

PCD3.K1xx Extension cable for multiple-row mounting

Extension plug PCD3.K010

PCD3.C200 I/O module holder 4 slots

PCD3.C110 I/O module holder 2 slots

Saia PCD3.C 200   Saia PCD3.C C110

Extension plug PCD3.K010

PCD3 in multiple-row mounting in the switch cabinet

Extension plug and cables

▸ PCD3.K010 Extension plug
▸ PCD3.K106 Extension cable 0.7 m
▸ PCD3.K116 Extension cable 1.2 m

1 Automation stations

2 Operation and monitoring

3 Dedicated room controllers

4 Consumer data acquisition

5 Switch cabinet components

Saia PCD3.Mxx60 controllers

High-performance CPU for any requirement

The fast processor and increased system resources provide the High Power CPU with sufficient power reserves to process the most demanding control and communication tasks.

System properties

▸ Up to 1023 inputs/outputs
  Can be expanded remotely with RIO PCD3.T66x or PCD3.T76x
▸ Up to 13 communication interfaces
▸ Onboard USB and Ethernet interface
▸ 2 Ethernet interfaces (PCD3.M6860 only)
▸ Fast program processing (0.1µs for bit operations)
▸ Large onboard memory for programs (2 MB) and data (128 MB file system)
▸ Memory with SD flash cards can be expanded up to 4 GB
▸ Automation Server for integration in Web/IT systems

Automation Server
integrated in the base unit

Types

▸ **PCD3.M5360**   CPU basic module with Ethernet TCP/IP, 2 MB of program memory

▸ **PCD3.M5560**   CPU basic module with Ethernet TCP/IP, 2 MB of program memory, Profibus-DP-Slave

▸ **PCD3.M6560**   CPU basic module with Ethernet TCP/IP and Profibus-DP Master 12 Mbits, 2 MB of program memory

▸ **PCD3.M6860**   CPU basic module with 2 Ethernet TCP/IP, 2 MB of program memory
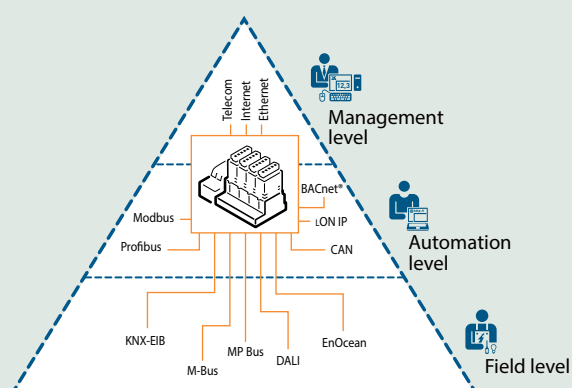
The Saia PCD3 Power CPU has sufficient system resources to operate up to 13 communication interfaces in the same device. Even the most demanding tasks, such as simultaneous communication via BACnet® and Lon IP, are handled reliably.
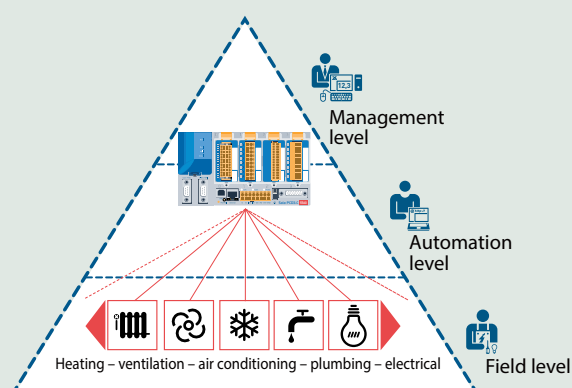
The generous memory resources (4 GB) of the new PCD3 Power CPU enable users to record/monitor, archive and control the data and statuses of all plants in the Saia PCD®, even with no computer equipment and control system software. Applications for the various plants (HVAC) can be created easily using the graphic PG5 engineering tool and application-specific software libraries.

Saia PCD3.Mxx60 controllers
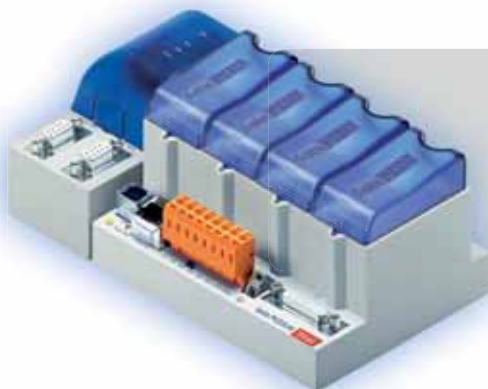
High-performance CPU

1023	I/O
up to 4.2 GB	File system
2 MB	Program
0.1/0.3 µs bit/word	CPU speed

	PCD3.M5360*	PCD3.M5560	PCD3.M6560	PCD3.M6860
Technical Data	Power	Power DP Slave	Power DP Master	Power 2 × Ethernet
Number of inputs/outputs	1023			
or I/O module slots	64			
I/O expansion connection for PCD3.Cxxx module holder	Yes			
Processing time [µs] bit operation	0.1…0.8 µs			
word operation	0.3 µs			
Real-time clock (RTC)	Yes			

Onboard memory

Program memory, DB/text (flash)	2 MB
User memory, DB/text (RAM)	1 MB
Flash memory (S-RIO, configuration and backup)	128 MB
User flash file system (INTFLASH)	128 MB
Data backup	1…3 years with lithium battery

Onboard interfaces

	PCD3.M5360*	PCD3.M5560	PCD3.M6560	PCD3.M6860
USB 1.1	Yes			
Ethernet 10/100 Mbits, full-duplex, auto-sensing/auto-crossing	Yes			2×
RS-232 on D-Sub connector (PGU/Port 0)	up to 115 kbits			No
RS-485 on terminal block (Port 2) or RS-485 Profibus-DP Slave, Profi S-Net on terminal block (Port 2)	up to 115 kbits up to 187.5 kbits	up to 115 kbits No	up to 115 kbits up to 187.5 kbits	
RS-485 on D-Sub connector (Port 3)* or Profibus-DP Slave, Profi S-Net on D-Sub connector (Port 10)* or Profibus-DP Master on D-Sub connector (Port 10)*	Up to 115 kbits [1] No No	Up to 115 kbits [2] Up to 1.5 Mbits [2] No	No No up to 12 Mbits [2]	No No No

*   can be used as an alternative
[1]   electrically connected
[2]   electrically isolated

Options

The data memory can be expanded to 4 GB with flash memory modules (with file system).

Optional data interfaces

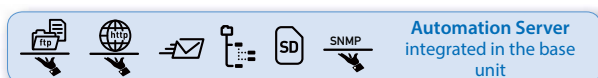|	
I/O slot 0	PCD3.F1xx modules for RS-232, RS-422, RS-485 and Belimo MP-Bus
I/O slot 0…3 up to 4 modules or 8 interfaces:	PCD3.F2xx modules for RS-232, RS-422, RS-485, BACnet® MS/TP, Belimo MP-Bus, DALI and M-Bus

General specifications

Supply voltage (in accordance with EN/IEC 61131-2)	24 VDC, −20/+25% max. incl. 5% ripple or 19 VAC ±15% two-way rectified (18 VDC)
Power consumption	typically 15 W for 64 I/Os
Capacity 5 V/+V (24 V) internal	max. 600 mA/100 mA

*) In preparation, see section C1 Product status

1 Automation stations

2 Operation and monitoring

3 Dedicated room controllers

4 Consumer data acquisition

5 Switch cabinet components

Saia PCD3.M5x40 controllers
The standard CPU for many applications

1023	I/O
up to 4 GB	File system
1 MB	Program
0.3/0.9 μs bit/word	CPU speed

ftp   http   @   SD   SNMP   **Automation Server** integrated in the base unit

Types

▶ PCD3.M5340 CPU basic module with Ethernet TCP/IP, 1 MB program memory

▶ PCD3.M5540 CPU basic module with Ethernet TCP/IP and Profibus-DP Slave 1.5 Mbits, 1 MB program memory

	PCD3.M5340	PCD3.M5540
Technical Data	Standard	Standard
Number of inputs/outputs	1023	
or I/O module slots	64	
I/O expansion connection for PCD3.Cxxx module holder	Yes	
Processing time [μs] bit operation word operation	0.3…1.5 μs	
	0.9 μs	
Real-time clock (RTC)	Yes	

Onboard memory

Main memory (RAM) for program and DB/TEXT	1 MB	
Flash memory (S-RIO, configuration and backup)	2 MB	
User flash file system (INTFLASH)	No	
Data backup	1…3 years with lithium battery	

Onboard interfaces

	PCD3.M5340	PCD3.M5540
USB 1.1	Yes	
Ethernet 10/100 Mbits, full-duplex, auto-sensing/auto-crossing	Yes	
RS-232 on D-Sub connector (PGU/Port 0)	up to 115 kbits	
RS-485 on terminal block (Port 2) or RS-485 Profibus-DP Slave, Profi S-Net on terminal block (Port 2)	up to 115 kbits	
	up to 187.5 kbits	up to 115 kbits No
RS-422/485 (electrically connected) on D-Sub connector (Port 3) *	up to 115 kbits	No
RS-485 (electrically isolated) on D-Sub connector (Port 3) *	No	up to 115 kbits
Profibus-DP Slave, Profi S-Net on D-Sub connector (Port 10) *	No	up to 1.5 Mbits

* can be used as an alternative

Options

The data memory can be expanded to 4 GB with flash memory modules (with file system).

Optional data interfaces

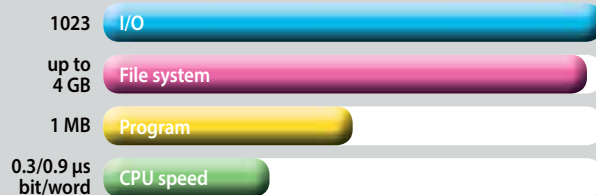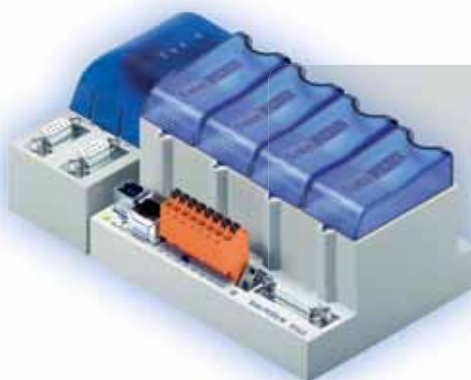|	
I/O slot 0	PCD3.F1xx modules for RS-232, RS-422, RS-485 and Belimo MP-Bus
I/O slot 0…3 up to 4 modules or 8 interfaces:	PCD3.F2xx modules for RS-232, RS-422, RS-485, BACnet® MS/TP, Belimo MP-Bus, DALI and M-Bus

General specifications

Supply voltage (in accordance with EN/IEC 131-2)	24 VDC, −20/+25% max. incl. 5% ripple or 19 VAC ±15% two-way rectified (18 VDC)
Power consumption	typically 15 W for 64 I/Os
Capacity 5 V/+V (24 V) internal	max. 600 mA/100 mA

Saia PCD3.M3xx0 controllers

The base CPU for simple applications
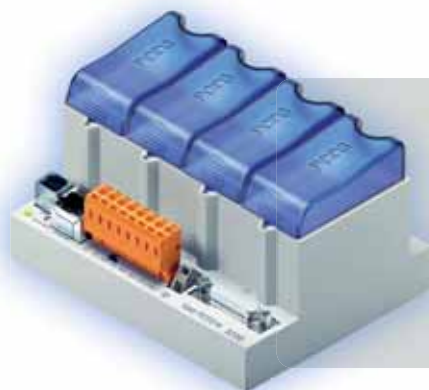
1023	I/O
up to 4 GB	File system
512 kByte	Program
0.3/0.9 µs	CPU speed
0.1/0.3 µs bit/word	CPU speed Basic Power

Automation Server
integrated in the base unit

Types

▸ PCD3.M3120 CPU basic module with Ethernet TCP/IP, 64 I/Os, 128 kByte of program memory

▸ PCD3.M3160 CPU basic module with Ethernet TCP/IP, 64 I/Os, 512 kByte of program memory

▸ PCD3.M3330 CPU basic module with Ethernet TCP/IP, 1023 I/Os, 512 kByte of program memory

▸ PCD3.M3360 CPU basic module with Ethernet TCP/IP, 1023 I/Os, 512 kByte of program memory

Technical Data	PCD3.M3120	PCD3.M3330	PCD3.M3160*	PCD3.M3360*
	Basic	**Basic**	**Basic Power**	**Basic Power**
Number of inputs/outputs	64	1023	64	1023
or I/O module slots	4	64	4	64
I/O expansion connection for PCD3.Cxxx module holder	No	Yes	No	Yes
Processing times [µs] bit operation word operation	0.3…1.5 µs 0.9 µs		0.1…0.8 µs 0.3 µs	
Real-time clock (RTC)	Yes			

Onboard memory

Main memory (RAM) for program and DB/text	128 kByte	512 kByte	No	
Program memory, DB/text (FLASH)	No		512 kByte	
Working memory, DB/text (RAM)	No		128 kByte	512 kByte
Flash memory (S-RIO, configuration and backup)	2 MByte		128 MByte	
User flash file system (INTFLASH)	No		128 MByte	
Data backup	4 hours with SuperCap			

Onboard interfaces

USB 1.1	Yes
Ethernet 10/100 Mbits, full-duplex, auto-sensing/auto-crossing	Yes
RS-485 on terminal block (Port 2) or RS-485 Profibus-DP Slave, Profi-S-Net on terminal block (Port 2)	up to 115 kbits up to 187.5 kbits

Options

The data memory can be expanded to 4 GB with flash memory modules (with file system).

Optional data interfaces

I/O slot 0	PCD3.F1xx modules for RS-232, RS-422, RS-485 and Belimo MP-Bus
I/O slot 0…3 - up to 4 modules or 8 interfaces:	PCD3.F2xx modules for RS-232, RS-422, RS-485, BACnet® MS/TP, Belimo MP-Bus, DALI and M-Bus

General specifications

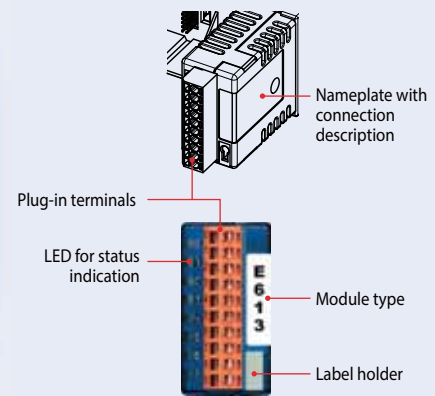|	
Supply voltage (in accordance with EN/IEC 61131-2)	24 VDC, −20/+25% max. incl. 5% ripple or 19 VAC ±15% two-way rectified (18 VDC)
Power consumption	typically 15 W for 64 I/Os
Capacity 5 V/+V (24 V) internal	max. 600 mA/100 mA

*) In preparation, see section C1 Product status

1 Automation stations

2 Operation and monitoring

3 Dedicated room controllers

4 Consumer data acquisition

5 Switch cabinet components

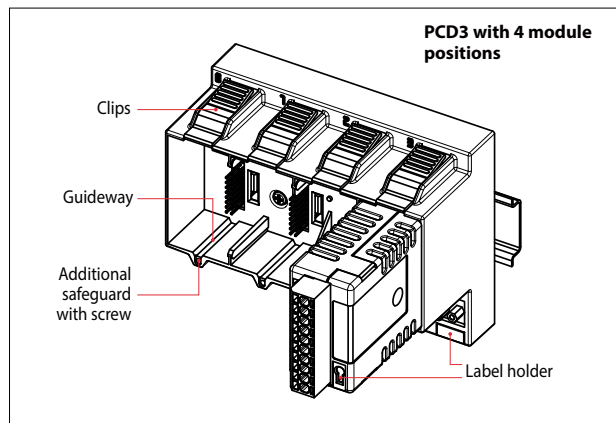# Saia PCD3 input and output modules in cassette design

The functions of the Saia PCD3 can be expanded as required using a wide range of plug-in I/O modules and can be adapted to specific requirements. This not only ensures that a project can be implemented quickly, but also provides the option of expanding or modifying the system at any time.

System properties

▸ Numerous variants available
▸ Slot direct in the Saia PCD3 basic CPU or in the module holder
▸ Full integration in the Saia PCD3 housing
▸ Stable cartridge construction
▸ Connection to the I/O level via plug-in spring terminal blocks or ribbon cables and adapters
▸ I/O terminal blocks are supplied as standard
▸ No tools required for replacing modules

Nameplate with connection description

Plug-in terminals

LED for status indication

Module type

Label holder

Insertion of I/O modules

PCD3 with 4 module positions

Clips

Guideway

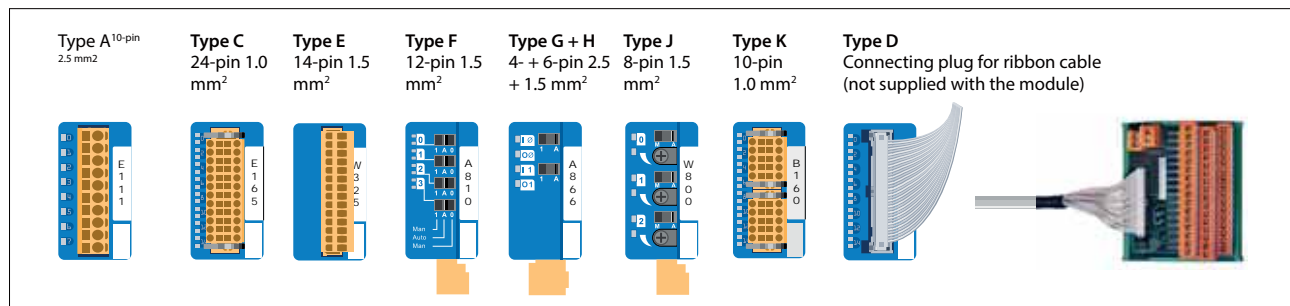Additional safeguard with screw

Label holder

▲ Simple exchange of I/O modules

Over 50 modules available with different functionalities

Types

▸ **PCD3.Axxx**　Digital output modules
▸ **PCD3.Bxxx**　Combined digital input/output modules
▸ **PCD3.Exxx**　Digital input modules
▸ **PCD3.Fxxx**　Communication modules
▸ **PCD3.Hxxx**　Fast counter modules
▸ **PCD3.Rxxx**　Memory modules
▸ **PCD3.Wxxx**　Analogue input/output modules

Connecting plugs/terminals

| Type A 10-pin 2.5 mm2 | Type C 24-pin 1.0 mm² | Type E 14-pin 1.5 mm² | Type F 12-pin 1.5 mm² | Type G + H 4- + 6-pin 2.5 + 1.5 mm² | Type J 8-pin 1.5 mm² | Type K 10-pin 1.0 mm² | Type D Connecting plug for ribbon cable (not supplied with the module) |

⊠ Spare terminals, ribbon connectors with system cables and separate terminals are ordered as accessories.

Saia PCD3 digital input and output modules

The digital I/O modules can be easily plugged into the Saia PCD3 Basis CPU or an appropriate module holder. In addition to inputs for various voltage levels, digital outputs are provided with both transistor construction and as mechanical relays. This means that electrical isolation from the switching electrical circuit can be achieved easily and reliably.

Digital input modules

Type	Number of inputs	Input voltage	Output switching capacity DC AC		Input delay	Electrical isolation	Internal current draw 5 V-Bus [1] + V-Bus [2]		I/O connector type [3]
PCD3.E110	8	15…30 VDC	---	---	8 ms	---	24 mA	---	A
PCD3.E111	8	15…30 VDC	---	---	0.2 ms	---	24 mA	---	A
PCD3.E160	16	15…30 VDC	---	---	8 ms	---	10 mA	---	D
PCD3.E161	16	15…30 VDC	---	---	0.2 ms	---	10 mA	---	D
PCD3.E165	16	15…30 VDC	---	---	8 ms	---	10 mA	---	C
PCD3.E166	16	15…30 VDC	---	---	0.2 ms	---	10 mA	---	C
PCD3.E500	6	80…250 VAC	---	---	20 ms	●	1 mA	---	A
PCD3.E610	8	15…30 VDC	---	---	10 ms	●	24 mA	---	A
PCD3.E613	8	30…60 VDC	---	---	9 ms	●	24 mA	---	A

Digital output modules

Type	Number of outputs	Input voltage	Output switching capacity DC AC		Input delay	Electrical isolation	Internal current draw 5 V-Bus [1] + V-Bus [2]		I/O connector type [3]
PCD3.A200	4, relay (make)*	---	2 A/50 VDC	2 A/250 VAC	---	●	15 mA	---	A
PCD3.A210	4, relay (break)*	---	2 A/50 VDC	2 A/250 VAC	---	●	15 mA	---	A
PCD3.A220	6, relay (make)	---	2 A/50 VDC	2 A/250 VAC	---	●	20 mA	---	A
PCD3.A251	8, relay (6 changeover + 2 make)	---	2 A/50 VDC	2 A/48 VAC	---	●	25 mA	---	C
PCD3.A300	6, transistor	---	2 A/10…32 VDC	---	---	---	20 mA	---	A
PCD3.A400	8, transistor	---	0.5 A/5…32 VDC	---	---	---	25 mA	---	A
PCD3.A410	8, transistor	---	0.5 A/5…32 VDC	---	---	●	24 mA	---	A
PCD3.A460	16, transistor	---	0.5 A/10…32 VDC	---	---	---	10 mA	---	D
PCD3.A465	16, transistor	---	0.5 A/10…32 VDC	---	---	---	10 mA	---	C
PCD3.A810 Manual operation	4, relay (2 changeover + 2 make)	---	2 A/50 VDC 2 A/50 VDC	5 A/250 VAC 6 A/250 VAC	---	● ●	40 mA	---	F

* with contact protection

Digital input/output modules

Type	Number of I/Os	Input voltage	Output switching capacity DC AC		Input delay	Electrical isolation	Internal current draw 5 V-Bus [1] + V-Bus [2]		I/O connector type [3]
PCD3.A860 Light and shade	2 Out, relay (make) 2 In	15…30 VDC	---	12 A/250 VAC	8 ms	●	18 mA	---	G H
PCD3.B100	2 In + 2 Out + 4 selectable In or Out	I: 15…32 VDC	0.5 A/5…32 VDC	---	8 ms	---	25 mA	---	A
PCD3.B160	16 I/O (configurable)	I: 24 VDC	0.25 A/18…30 VDC	---	8 ms or 0.2 ms	---	120 mA	---	2× K

Fast counter modules

Type	Number of counters	Inputs per counter	Outputs per counter	Counting range	Selectable digital filter	Current draw 5 V-Bus [1] + V-Bus [2]		I/O connector type [3]
PCD3.H112	2	2 I n+ 1 configurable In	1 CCO	0…16 777 215 (24 Bit)	10 kHz…150 kHz	50 mA	4 mA	K
PCD3.H114	4	2 In + 1 configurable In	1 CCO	0…16 777 215 (24 Bit)	10 kHz…150 kHz	50 mA	4 mA	2× K

Overview of the internal bus capacity of the module holders

Capacity	PCD3.Mxxx0	PCD3.Txxx	PCD3.C200
[1] Internal 5V	600 mA	600 mA	1500 mA
[2] Internal +V (24 V)	100 mA	100 mA	200 mA

The electrical requirement of the internal +5V and +V bus for the I/O modules is calculated in the PG5 2.0 Device Configurator.

[3] Plug-in terminal blocks are included with I/O modules. Spare terminals, ribbon connectors with system cables and separate terminals are ordered as accessories (see pages 34 and 172).

1 Automation stations

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4 Consumer data acquisition

5 Switch cabinet components

Saia PCD3 analogue input and output modules

The numerous analogue modules allow complex control tasks or measurements to be performed. The resolution is between 8 and 16 bits, depending on the speed of the AD converter. The digitised values can be further processed direct in the project in the Saia PCD3. The large number of different modules means that suitable modules are available for almost any requirement.

Analogue input modules

Type	Total Channels	Signal ranges/description	Resolution	Electrical isolation	Internal current draw 5 V-Bus [1] + V-Bus [2]		I/O connec-tor type [3]
PCD3.W200	8 In	0…+10 V	10 Bit		8 mA	5 mA	A
PCD3.W210	8 In	0…20 mA [4]	10 Bit		8 mA	5 mA	A
PCD3.W220	8 In	Pt1000: −50 °C…400 °C/Ni1000: −50 °C…+200 °C	10 Bit	---	8 mA	16 mA	A
PCD3.W220Z03	8 In	NTC 10 temperature sensor	10 Bit		8 mA	16 mA	A
PCD3.W220Z12	4 In	4 In: 0…10 V	10 Bit		8 mA	11 mA	A
	+4 In	4 In: Pt1000: −50 °C…400 °C/Ni1000: −50 °C…+200 °C					
PCD3.W300	8 In	0…+10 V	12 Bit		8 mA	5 mA	A
PCD3.W310	8 In	0…20 mA [4]	12 Bit		8 mA	5 mA	A
PCD3.W340	8 In	0…+10 V/0…20 mA 4)	12 Bit		8 mA	20 mA	A
		Pt1000: −50 °C…400 °C/Ni1000: −50 °C…+200 °C		---			
PCD3.W350	8 In	Pt100: −50 °C…+600 °C/Ni100: −50 °C…+250 °C	12 Bit		8 mA	30 mA	A
PCD3.W360	8 In	Pt1000: −50 °C…+150 °C	12 Bit		8 mA	20 mA	A
PCD3.W380	8 In	−10 V…+10 V, −20 mA…+20 mA, Pt/Ni1000, Ni1000 L&S, NTC10k/NTC20k (configuration using software)	13 Bit		25 mA	25 mA	2× K
PCD3.W305	7 In	0…+10 V	12 Bit	●	60 mA	0 mA	I
PCD3.W315	7 In	0…20 mA [4]	12 Bit	●	60 mA	0 mA	I
PCD3.W325	7 In	−10 V…+10 V	12 Bit	●	60 mA	0 mA	I
PCD3.W720	2 In	Weighing module with 2 systems for up to 6 weighing cells	≤18 Bit	---	60 mA	100 mA	I
PCD3.W745	4 In	Temperature module for TC type J, K and 4-wire Pt/Ni 100/1000	16 Bit	●	200 mA	0 mA	[6]

Analogue output modules

Type	Number of channels	Signal ranges/description	Resolution	Electrical isolation	Internal current draw 5 V-Bus [1] + V-Bus [2]		I/O connec-tor type [3]
PCD3.W400	4 Out	0…+10 V	8 Bit		1 mA	30 mA	A
PCD3.W410	4 Out	0…+10 V/0…20 mA/4…20 mA jumper-selectable	8 Bit	---	1 mA	30 mA	A
PCD3.W600	4 Out	0…+10 V	12 Bit		4 mA	20 mA	A
PCD3.W610	4 Out	0…+10 V/−10 V…+10 V/0…20 mA/4…20 mA jumper-selectable	12 Bit	---	110 mA	0 mA	A
PCD3.W605	6 Out	0…+10 V	10 Bit	●	110 mA	0 mA	I
PCD3.W615	4 Out	0…20 mA/4…20 mA parameters can be set	10 Bit	●	55 mA	0 mA	I
PCD3.W625	6 Out	−10 V…+10 V	10 Bit	●	110 mA	0 mA	I
PCD3.W800	4 Out, 3 of which are manually operated	0…+10 V, short circuit-proofed	10 Bit	---	45 mA	35 mA [5]	J

Analogue input/output modules

Type	Number of channels	Signal ranges/description	Resolution	Electrical isolation	Internal current draw 5 V-Bus [1] + V-Bus [2]		I/O connec-tor type [3]
PCD3.W525	4 In +	In: 0…10 V, 0(4)…20 mA, Pt1000, Pt500 or Ni1000 (selectable via DIP switch)	In: 14 Bit	●	40 mA	0 mA	I
	2 Out	Out: 0…10 V or 0(4)…20 mA (selectable via software)	Out: 12 Bit				

Manual control modules

PCD3.A810
Relay outputs, 2 change-over and 2 make

PCD3.A860
Light and shade 2 relay outputs and 2 inputs

PCD3.W800
4 analogue outputs (3 of these operable)

Overview of the internal bus capacity of the module holders

Capacity	PCD3.Mxxx0	PCD3.Txxx	PCD3.C200
[1] Internal 5V	600 mA	600 mA	1500 mA
[2] Internal +V (24 V)	100 mA	100 mA	200 mA

The electrical requirement of the internal +5V and +V bus for the I/O modules is calculated in the PG5 Device Configurator.

[3] Plug-in I/O terminal blocks are included with I/O modules.
Spare terminals, ribbon connectors with system cables and separate terminals are ordered as accessories (see pages 34 and 172).
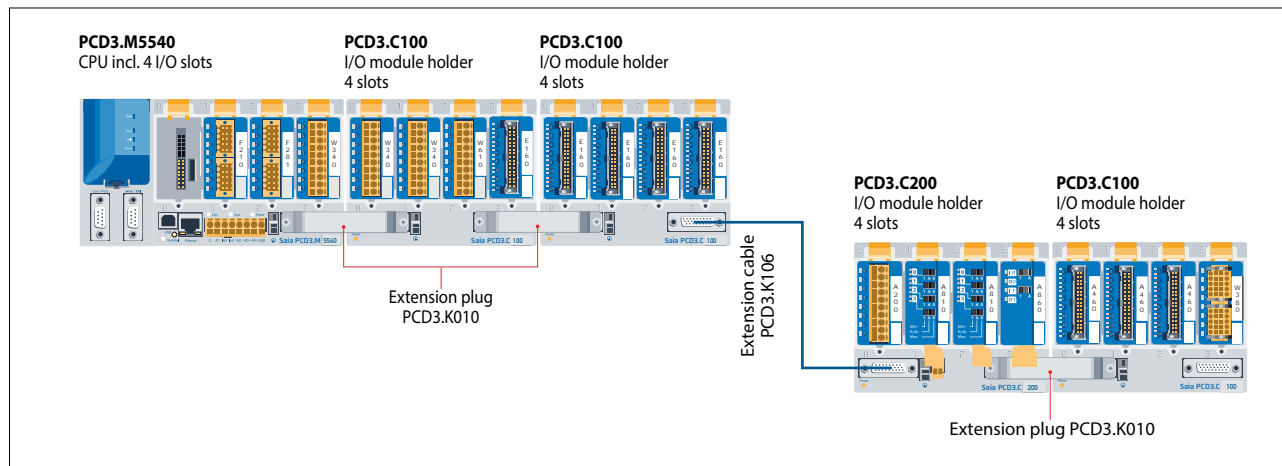
[4] 4…20 mA via user program

[5] At 100% output value and 3 kΩ load

[6] With soldered spring terminal block

Information for project planning with PCD3 module holders

The internal load current taken by the I/O modules from the +5V and +V (24V) supply must not exceed the maximum supply current specified for the CPUs, RIOs or PCD3.C200 module holders.

Example calculation for the current consumption of the internal +5V and +V (24V) bus of the I/O modules

PCD3.M5540
CPU incl. 4 I/O slots

PCD3.C100
I/O module holder
4 slots

PCD3.C100
I/O module holder
4 slots

PCD3.C200
I/O module holder
4 slots

PCD3.C100
I/O module holder
4 slots

Extension plug
PCD3.K010

Extension cable
PCD3.K106

Extension plug PCD3.K010

Consumption M5540 + C100 + C100

Module	Internal 5V	Internal +V (24V)
Not used		
F210	110 mA	
F281	90 mA	15 mA
W340	8 mA	20 mA
Total M5540	**208 mA**	**35 mA**
W340	8 mA	20 mA
W340	8 mA	20 mA
W610	110 mA	0 mA
E160	10 mA	
Total C100	**136 mA**	**40 mA**
E160	10 mA	
E160	10 mA	
E160	10 mA	
E160	10 mA	
Total C100	**40 mA**	**0**
Total M5540	**384 mA**	**75 mA**

Consumption C200 + C100

Module	Internal 5V	Internal +V (24V)
A200	15 mA	
A810	40 mA	
A810	40 mA	
A860	18 mA	
Total C200	**113 mA**	
A460	10 mA	
A460	10 mA	
A460	10 mA	
W380	25 mA	25 mA
Total C100	**55 mA**	**25 mA**
Total C200	**168 mA**	**25 mA**

Capacity	PCD3.M5540	PCD3.C200
Internal 5V	600 mA	1500 mA
Internal +V (24V)	100 mA	200 mA

The calculation example shows that internal capacity is maintained in the CPU basic module PCD3.M5540 and the holder module PCD3.C200. The CPU basic module has a sufficient reserve to receive an additional communication module in the empty slot 0. The holder module PCD3.C200 also has sufficient reserves to connect an additional PCD3.C100 or PCD3.C110 holder module. The power consumption of the internal +5V and +V (24 V) bus for the I/O modules is automatically calculated in the PG5 2.0 Device Configurator.

The following aspects should be considered when planning PCD3 applications:

▶ In keeping with lean automation, it is recommended to leave the first slot in the CPU basic module free for any subsequent expansions. Both single I/O modules and communication modules can be used in this slot.

▶ The total length of the I/O bus is limited by technical factors; the shorter, the better.

The PCD3.C200 is used to extend the I/O bus or for the internal power supply (+5V and +V (24V)) to a module segment. Please note the following rules:

▶ Do not use more than six PCD3.C200s in a single configuration, or the time delay will exceed the I/O access time.

▶ Use a maximum of five PCD3.K106/116 cables.

▶ Insert a PCD3.C200 after each cable (at the start of a row). Exception: In a small configuration with no more than 3 PCD3.C1xxs, these can be supplied from the PCD3.Mxxx. A PCD3.C200 is not required.

▶ If an application is mounted in a single row (max. 15 module holders), then after five PCD3.C100 a PCD3.C200 must be used to amplify the bus signal (unless the configuration ends with the fifth PCD3.C100).

▶ If the application is mounted in multiple rows, the restricted length of cable means that only three module holders (1× PCD3.C200 and 2× PCD3.C100) may be mounted in one row.

Saia PCD3 power supply and connection concept

External power supply

A two-way rectified supply can be used for most modules.
The following modules must be connected to smoothed 24 VDC:
PCD3. H1xx, H2xx, H3xx, PCD7.D2xx

It is generally recommended to use robust
and interference-resistant SBC power supply
units with 24 VDC output. See Chapter 5.1
for available types.
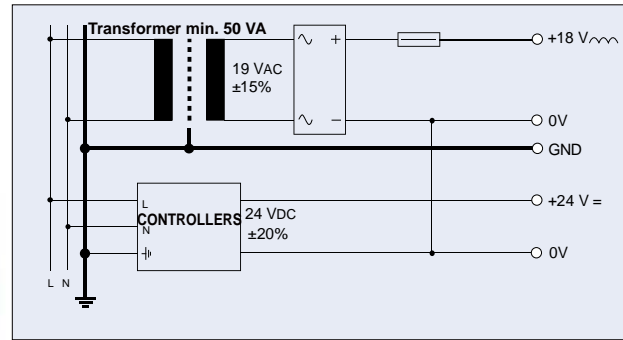
Grounding and connection plan

▶ The zero potential (GND) of the 24 V supply is connected to the
GND and the controller's grounding terminal. If possible, this
should be connected to the ground bar with a short wire (<25 cm)
with a cross section of 1.5 mm^2. The same applies to the negative
connection to the PCD3.F1xx or the interrupt terminal.

▶ Any shielding of analogue signals or communication cables
should also be brought to the same grounding potential,
either via a negative terminal or via the ground bar.

▶ All negative connections are linked internally. For flawless
operation, these connections should be reinforced externally
by short wires with a cross section of 1.5 mm2.
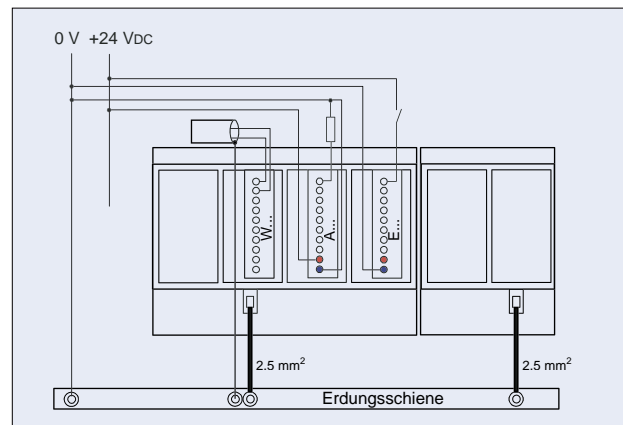
Grounding and connection concept analogue inputs that are not electrically isolated (PCD3.W2x0, PCD3.W3x0)

Signal sources (such as temperature sensors) should be connected direct to the input module wherever possible.

To obtain optimum measurement results, avoid connection to a ground bar. Additional external GND connections to the sensor signals may
result in equalising currents which distort the measurement.

If shielded cables are used, the shielding should be continued to a ground bar.
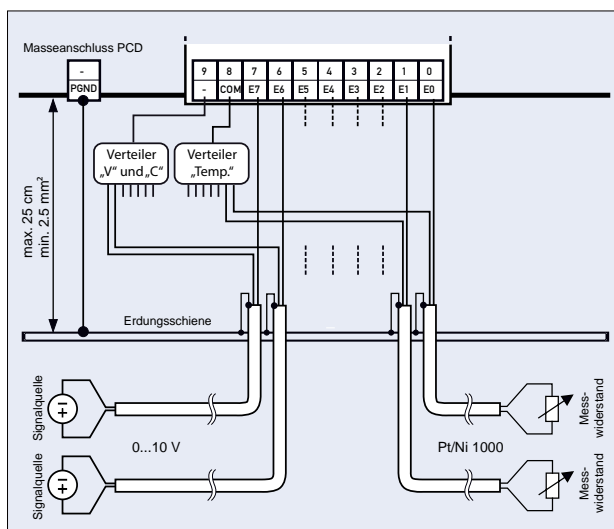
Connection concept for PCD3.W3x0
The reference potential of voltage and current inputs must be
wired to a common GND distributor at the "–" terminal. Tempera-
ture sensors must be wired to a common GND distributor at the
"COM" terminal. The module PCD3.W380 has a 2-wire connection
for the inputs and requires no external GND distributor.
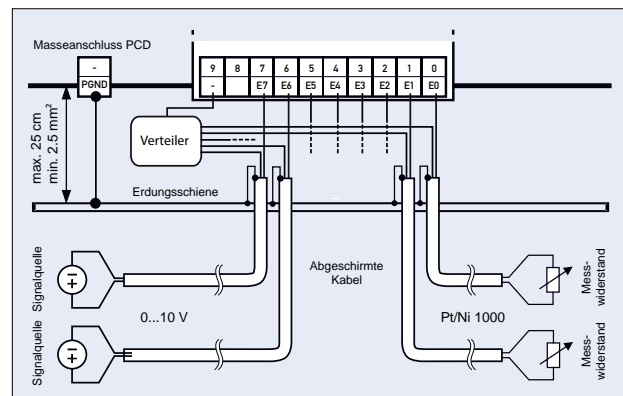
Connection concept for PCD3.W2x0
The reference potential of signal sources must be wired to a
common GND distributor at the "–" terminal

Communication interfaces of Saia PCD3.Mxxxx controllers

In addition to the interfaces that the Saia PCD3 has onboard, the interface functions can also be expanded using various slots. Numerous protocols are therefore supported by the PCD3. For the majority of protocols, the physical bus specifications are offered as a plug-in module. If this is not the case, the bus can be connected via an external converter.

Protocols supported by PCD3.Mxxxx via FBoxes

▸ Modem communication with the PCD
▸ S-Bus
▸ Modbus
▸ JCI N2-Bus
▸ KNX® S-Mode/EIB (with external converter)

▸ DALI
▸ EnOcean (with external converter)
▸ M-Bus
▸ BACnet® MS/TP
▸ HMI editor applications with PCD7.Dxxx text terminals (RS-232 only)

ref:Modbus

Read Int Ind	
—Enable	Error—
—Func	
—RemAdd	
—Number	
Add	R 500

PCD3.F1xx for slot 0
Port 1 RS-232
or   RS-422
or   RS-485
        or MP-Bus
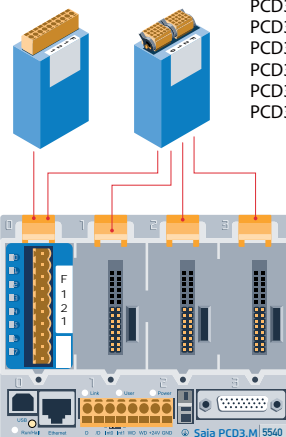
PCD3.F2xx for slot no. 0...3
PCD3.F221 → RS-232
PCD3.F210 → RS-422/RS-485
PCD3.F281 → MP-Bus
PCD3.F215 → BACnet®-MS/TP
PCD3.F261 → DALI
PCD3.F27x → M-Bus

Fully programmable physical interfaces

Module	Specifications	Slot	Electrical isolation	Internal current draw 5V +V (24 V)		I/O connec-tor type [1]
PCD3.F110	RS-422 with RTS/CTS or RS-485, with line termination resistors that can be activated	I/O 0	---	40 mA	---	A
PCD3.F121	RS-232 with RTS/CTS, DTR/DSR, DCD	I/O 0	---	15 mA	---	A
PCD3.F150	RS-485 with termination resistors that can be activated	I/O 0	●	130 mA	---	A
PCD3.F210	RS-422/RS-485 plus PCD7.F1xxS as option	I/O 0...3	---	110 mA	---	2× K
PCD3.F221	RS-232 plus PCD7.F1xxS as option	I/O 0...3	---	90 mA	---	2× K

Physical interfaces for specific protocols

Module	Specifications	Slot	Electrical isolation	Internal current draw 5V +V (24 V)		I/O connec-tor type [1]
PCD3.F180	Belimo MP-Bus, for connecting up to 8 drives on one line	I/O 0	---	15 mA	15 mA	A
PCD3.F215	BACnet® MS/TP or freely programmable	I/O 0...3	---	110 mA	---	2× K
PCD3.F240	LONWORKS® interface module exclusively for PCD3.M5x6x	I/O 0...3	---	90 mA	---	A9
PCD3.F261	DALI	I/O 0...3	---	90 mA	---	A
PCD3.F270	M-Bus 240 nodes	I/O 0...3	---	70 mA	8 mA	A
PCD3.F271	M-Bus 20 nodes	I/O 0...3	---	70 mA	8 mA	A
PCD3.F272	M-Bus 60 nodes	I/O 0...3	---	70 mA	8 mA	A
PCD3.F273	M-Bus 120 nodes	I/O 0...3	---	70 mA	8 mA	A
PCD3.F281	Belimo MP-Bus with slot for PCD7.F1xxS modules	I/O 0...3	---	90 mA	15 mA	2× K

[1] Plug-in I/O terminal blocks are included with I/O modules. Spare terminals, ribbon connectors with system cables and separate terminals are ordered as accessories (see pages 34 and 172).

System properties required for PCD3.Fxxx modules:

The PCD3 system has a processor that serves both the application and the serial ports. To determine the maximum communication capacity for each PCD3.M5xx0 system, consult the information and examples provided in the manual 26-789 for PCD3.M5xx0.

Interface modules for optional insertion in PCD3.F2xx modules

Module	Specifications
PCD7.F110S	RS-422 with RTS/CTS or RS-485 (electrically connected), with terminating resistors that can be activated.
PCD7.F121S	RS-232 with RTS/CTS, DTR/DSR, DCD suitable for modem, EIB connection
PCD7.F150S	RS-485 (electrically isolated), with line termination resistors that can be activated
PCD7.F180S	Belimo® MP-Bus for connecting up to 8 drives on one line

1 Automation stations
2 Operation and monitoring
3 Dedicated room controllers
4 Consumer data acquisition
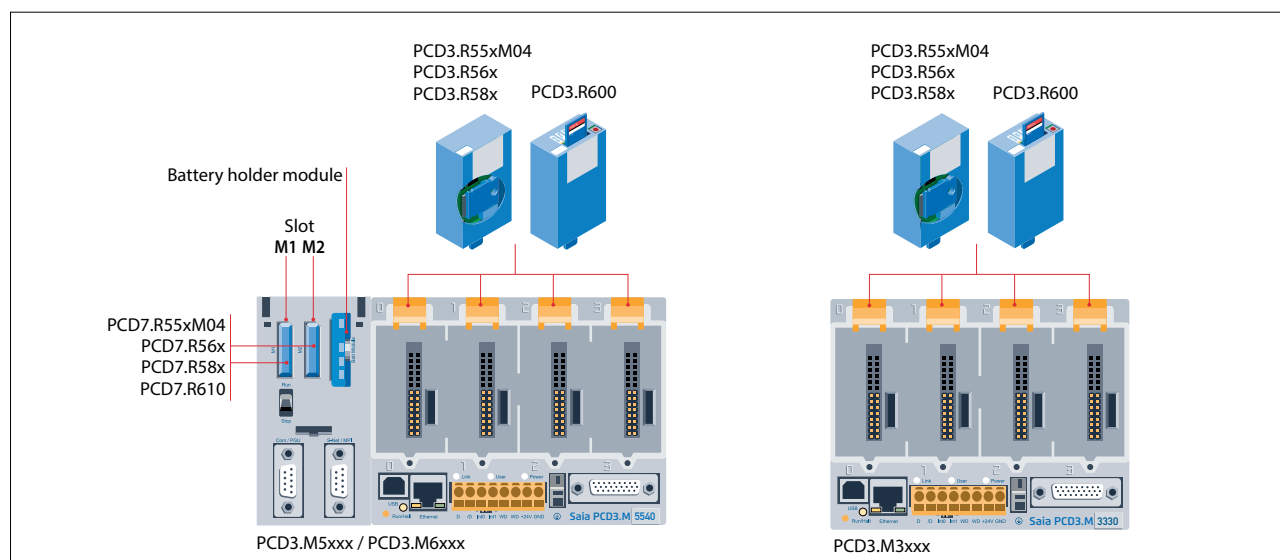5 Switch cabinet components

Memory modules of Saia PCD3.Mxxxx controllers

In addition to the onboard memory contained in the base units, PCD3 controllers can also be expanded in a modular way with various flash memory modules for programs and data. The various communication protocols where the firmware is installed on the flash cards can also be used by simply inserting the relevant card.
More information on memory management and construction can be found in Chapter 1.1 Saia PCD® System description.

System properties
▸ Configuration, programs and data can be transferred from one CPU to another
▸ Two slots (M1 and M2) for memory cards
▸ Additional memory cards can be inserted in the I/O slots using I/O adapters
▸ Memory can be expanded by up to 4 GB

PCD3.M5xxx / PCD3.M6xxx

PCD3.M3xxx

Flash memory with file system, program and data backup, BACnet® for M1/M2 slot

Type	Description	Slot
PCD7.R550M04	4 MB flash card with file system	M1 & M2
PCD7.R560	Flash card with BACnet®	M1 & M2
PCD7.R562	Flash card with BACnet® and 128 MB file system	M1 & M2
PCD7.R580	Flash card with Lon IP	M1 & M2
PCD7.R582	Flash card with Lon IP and 128 MB file system	M1 & M2
PCD7.R610	Basic module for Micro SD flash cards	M1 & M2
PCD7.R-MSD1024	Micro SD flash card 1024 MB, PCD formatted	PCD7.R610

PCD7.R55xM04
PCD7.R56x
PCD7.R58x

PCD7.R610

Plug-in flash modules for I/O module slots for all PCD3.Mxxx0s

Type	Description	Slot
PCD3.R550M04	4 MB flash card with file system	I/O 0…3
PCD3.R560	Flash card with BACnet®	I/O 0…3
PCD3.R562	Flash card with BACnet® and 128 MB file system	I/O 0…3
PCD3.R580	Flash card with Lon IP	I/O 0…3
PCD3.R582	Flash card with Lon IP and 128 MB file system	I/O 0…3

PCD3.R55xM04
PCD3.R56x
PCD3.R58x

Saia PCD3 basic module for SD flash cards with file system

Type	Description	Slot
PCD3.R600	Basic module with slot for SD flash cards (Up to 4 modules in I/O slots 0 to 3 on a CPU)	I/O 0…3
PCD7.R-SD512	SD flash card, 512 MB with file system	---
PCD7.R-SD1024	SD flash card, 1024 MB with file system	---

PCD3.R600

Spare parts (battery and battery holder module) see consumables and accessories

Consumables and accessories for Saia PCD3 controllers

Labelling accessories

1 (4 310 8686 0)   **2** (4 329 4819 1)

### Addressing and labelling of I/O modules and module holders

I/O module slots in the module holder are labelled with numbers:

▫ 0…3 (PCD3.Mxxxx /T66x/C100, C200)
▫ 0…1 (PCD3.C110)

The provided inscription labels **2** can either be used for additional labelling of the module holders or for the I/O modules themselves. They are blank and, depending on requirements, may either be labelled by hand or by using pre-printed adhesive strips **1**.
The circuit diagram **3** printed on the side of each I/O module makes wiring easier and also helps during commissioning. Sufficient space **4** is available on the other side of the cassette for the user to add customised labelling with the self-adhesive labels supplied.

Order type
(4 310 8723 0)

Without clip   With clip
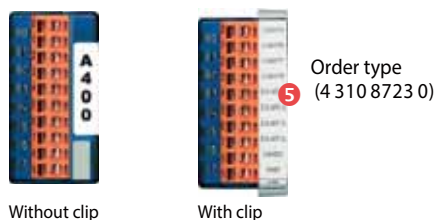
Additional labelling on the front **5**

The PCD3 modules can also be labelled on the front panel.
Neutral labels with a snap-on cover (clip) are available for this purpose.
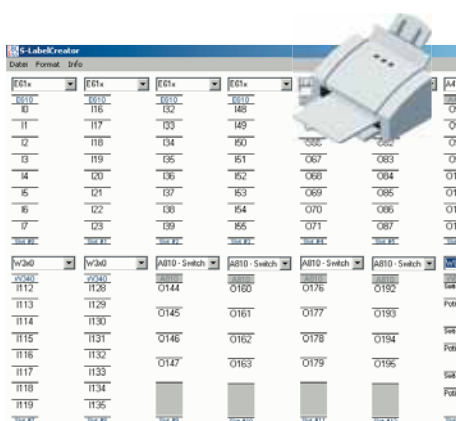
Fast labelling of I/O modules with the LabelEditor

The LabelEditor is included in the PG5 Controls Suite Device Configurator. This software tool is used to label PCD3 label clips efficiently.

EPLAN macros

EPLAN macros are available for project planning and engineering

The EPLAN® electric P8 macros are available on the support site.

The macros and article data are also provided on the EPLAN® data portal.

Download:
www.sbc-support.com

# Consumables and accessories for Saia PCD3.Mxxxx controllers

Saia PCD3 battery and battery holder module

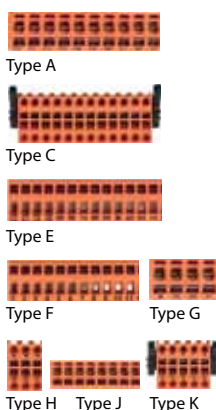| Type	Description
PCD3.R010	Battery kit for PCD3.M3xxx Basic CPU (battery module for slot#3 incl. lithium battery CR2032)
4 639 4898 0	Battery holder module (for PCD3.M5xxx)
4 507 4817 0	Lithium battery for PCD Base CPU

Saia PCD3 housing covers

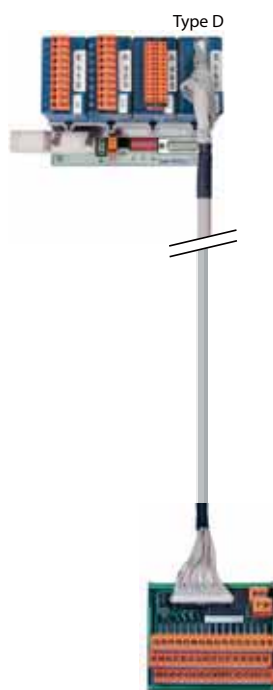| Type	Description
4 104 7493 0	Cover for PCD3.M5xxx and M6xxx
PCD3.E009	Empty module housing for unused PCD3 I/O slots
4 104 7515 0	Slot cover for unused PCD3 I/O slots
4 104 7502 0	Slot cover for unused PCD3 I/O slots without SBC logo
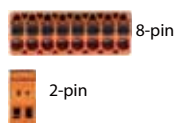
8-pin

2-pin

Saia PCD3 plug-in screw terminal blocks for basic modules and module holders

Type	Description
4 405 4995 0	8-pin spring terminal block for power supply to PCD3.Mxxx0
4 405 4952 0	Screw terminal 2-pin for supply PCD3.C200

Saia PCD3 plug-in terminal blocks and labelling for I/O modules

Type A

Type C

Type E

Type	Description		
4 405 4954 0	Plug-in I/O spring terminal block 10	- pin for wires up to 2.5 mm2	type A
4 405 4956 0	Plug-in I/O spring terminal block 24	- pin for wires up to 1.0 mm2	type C
4 405 4998 0	Plug-in I/O spring terminal block 14	- pin for wires up to 1.5 mm2	type E
4 405 4936 0	Plug-in I/O spring terminal block 12	- pin for PCD3.A810 for wires up to 1.5 mm^2	type F
4 405 5027 0	Plug-in I/O spring terminal block 4	- pin for PCD3.A860 for wires up to 2.5 mm^2	type G
4 405 5028 0	Plug-in I/O spring terminal block 6	- pin for PCD3.A860 for wires up to 1.0 mm^2	type H
4 405 5113 0	Plug-in I/O spring terminal block 9	- pin for PCD3.F240 for wires up to 2.5 mm^2	type A9
4 405 4934 0	Plug-in I/O spring terminal block 8	- pin for PCD3.W800 for wires up to 1.5 mm^2	type J
4 405 5048 0	Plug-in I/O spring terminal block 10	- pin for wires up to 1.0 mm2	type K
4 310 8723 0	Set of 10 units: Transparent snap-on label holder including neutral inscription labels (2× DIN A4)		
4 329 4819 1	Set of 10 units: Snap-on inscription carrier for modules		
4 310 8686 0	Set of 10 units: Pre-printed self-adhesive strips for snap-on label holder		

Type F   Type G

Type H   Type J   Type K

System cables and "ribbon screw terminal" adapters (see Chapter 5.11 for details)

Type D

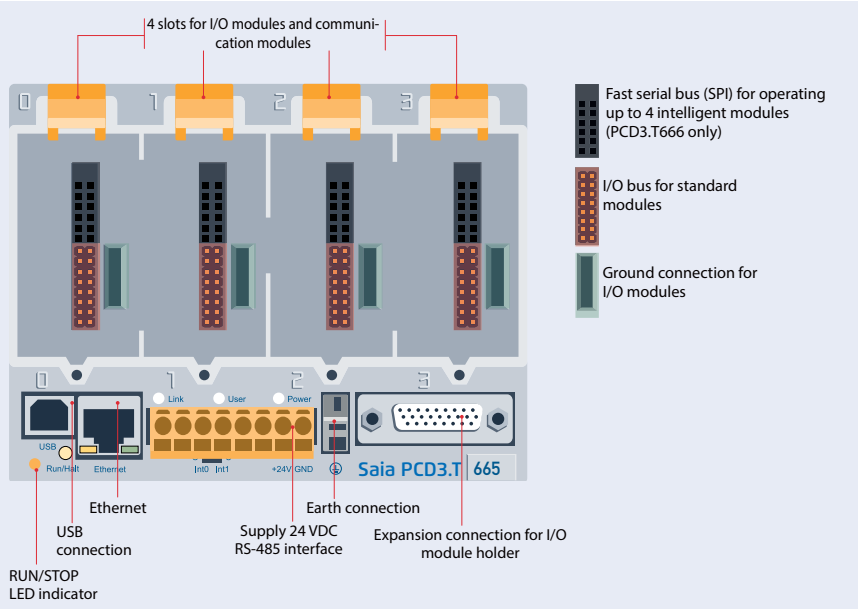| Type	Description
System cables for digital modules with 16 I/Os	
PCD2.K221	Sheathed, round cable with 32 strands of 0.25 mm^2, 1.5 m long, PCD side 34-pin ribbon cable connector type D, process side: strand ends free, colour coded
PCD2.K223	Sheathed, round cable with 32 strands of 0.25 mm^2, 3.0 m long, PCD side 34-pin ribbon cable connector type D, process side: strand ends free, colour coded
System cables for adapters PCD2.K520/..K521/..K525	
PCD2.K231	Sheathed, half-round cable with 34 strands, each 0.09 mm^2, 1.0 m long, 34-pin ribbon connector at both ends type D
PCD2.K232	Sheathed, half-round cable with 34 strands, each 0.09 mm^2, 2.0 m long, 34-pin ribbon connector at both ends type D
System cables for 2 adapters PCD2.K510/..K511 or 1 adapter and relay interface PCD2.K551	
PCD2.K241	Sheathed, half-round cable with 34 strands, each 0.09 mm^2, 1.0 m long, PCD side 34-pin ribbon connector type D, process side two 16-pin ribbon connector
PCD2.K242	Sheathed, half-round cable with 34 strands, each 0.09 mm^2, 2.0 m long, PCD side 34-pin ribbon connector type D, process side two 16-pin ribbon connectors

"Ribbon/screw terminal" adapters

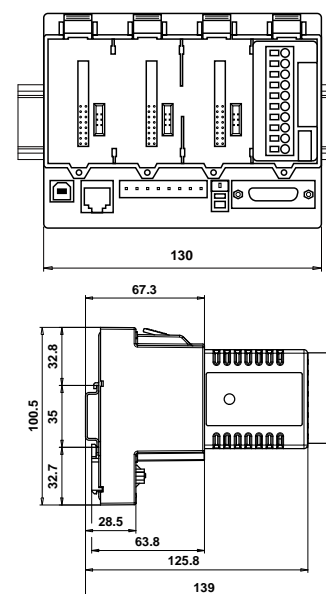| Type	Description
PCD2.K510	for 8 inputs/outputs, with 20 screw terminals without LED
PCD2.K511	for 8 inputs/outputs, with 20 screw terminals and LED (for source operation only)
PCD2.K520	for 16 inputs/outputs, with 20 screw terminals without LED
PCD2.K521	for 16 inputs/outputs, with 20 screw terminals and LED (for source operation only)
PCD2.K525	for 16 inputs/outputs, with 3 × 16 screw terminals and LED (for source operation only)
PCD2.K551	Relay interface for 8 PCD transistor outputs with 24 screw terminals and LED
PCD2.K552	Relay interface for 8 PCD transistor outputs with 24 screw terminals, LED and manual control mode (on-off auto switch) and 1 output as feedback for manual control

1.2.2 **Saia PCD3.T66x remote I/O stations**

The Smart RIOs are more than just another Ethernet remote I/O system. They can be programmed like a PLC and are therefore the ideal solution for distributed automation in line with the lean philosophy. Smart RIOs can be equipped with PCD3 I/O modules and expanded with PCD3 I/O module holders up to 256 I/Os per RIO station.

Design of Saia PCD3.T66x: Smart RIO head station with 4 slots for I/O modules

Dimensions

4 slots for I/O modules and communi-cation modules

Fast serial bus (SPI) for operating up to 4 intelligent modules (PCD3.T666 only)

I/O bus for standard modules

Ground connection for I/O modules

USB
Run/Halt   Ethernet
Int0 Int1   +24V GND
Saia PCD3.T | 665

USB connection
Ethernet
RUN/STOP LED indicator
Supply 24 VDC RS-485 interface
Earth connection
Expansion connection for I/O module holder

130

67.3
32.8
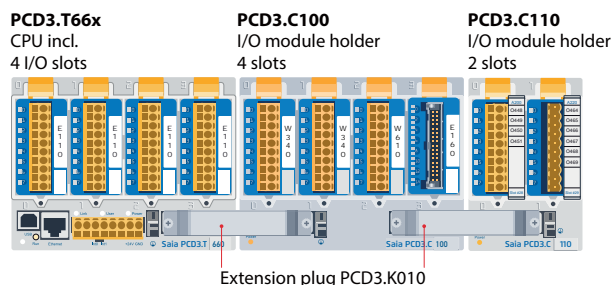100.5   35
32.7
28.5
63.8
125.8
139

System properties

▸ Can be used as a simple remote I/O station or an intelligent programmable I/O station.

▸ Can be programmed with PG5. Important or time-critical tasks can be processed direct in the RIO.

▸ The RIO user programs are managed centrally in the Smart RIO Manager (PCD) and distributed to the RIOs automatically.

▸ Data exchange with efficient Ether S-IO protocol. Simple configuration with the RIO network configurator.

▸ Cross-communication with other PCD systems using Ether S-Bus (FBoxes).

▸ Intelligent communication modules (M-Bus, DALI) are supported with PCD3.T666.

▸ Other communication protocols (e.g. Modbus) via Ethernet TCP/IP and with PCD3.T666, also via the onboard RS-485 interface.

▸ Integrated Automation Server

I/O modules

The standard I/O modules of the PCD3 series can be used. For more information and types, see Chapter "PCD3 input/output modules".
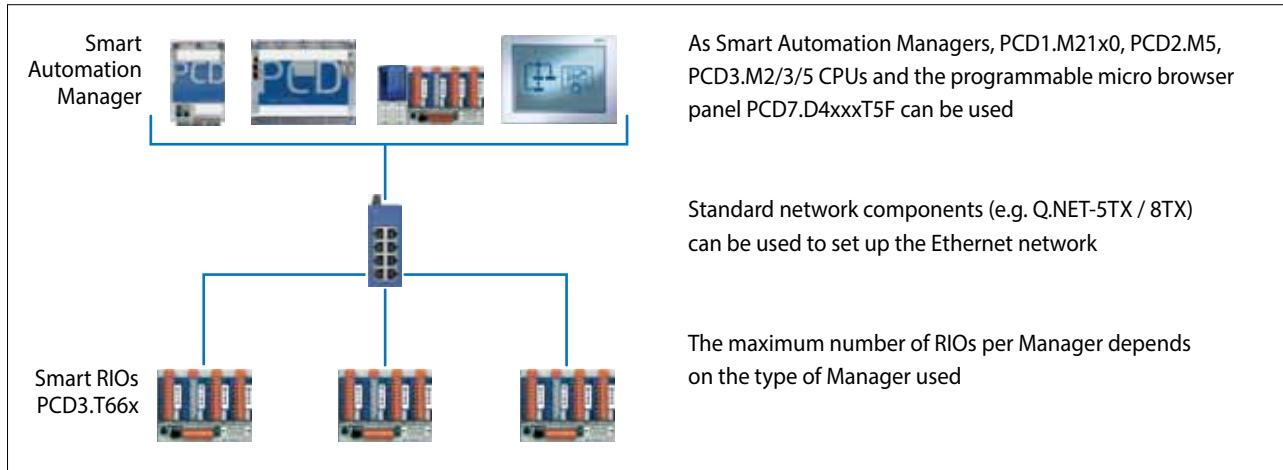
I/O extensions up to 256 I/O per RIO station

PCD3.T66x
CPU incl.
4 I/O slots

PCD3.C100
I/O module holder
4 slots

PCD3.C110
I/O module holder
2 slots

Extension plug PCD3.K010

Order details

Smart RIO

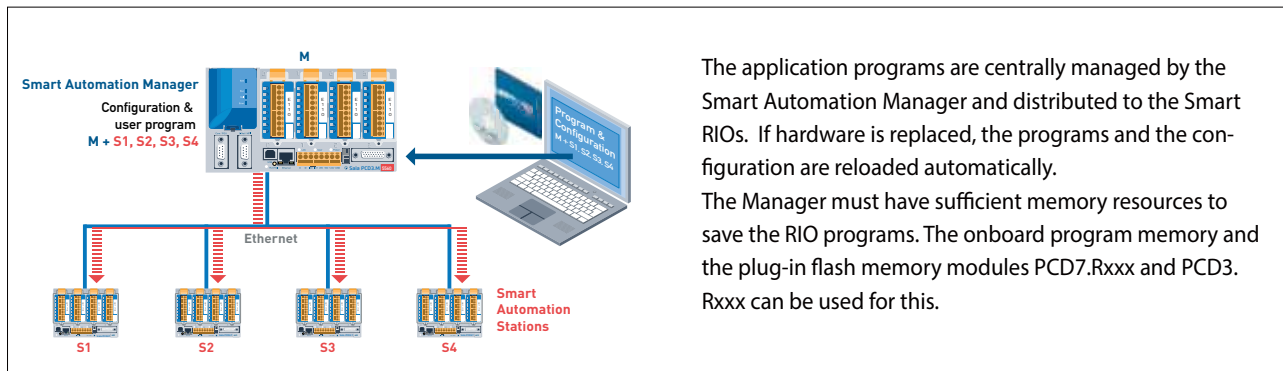| PCD3.T665	Smart-RIO, Ether S-IO data exchange, programmable, 32 kByte program memory
PCD3.T666	Smart RIO, Ether S-IO data exchange, programmable, 128 kByte program memory, serial interfaces

I/O module holder

PCD3.C100	Expansion module holder with 4 I/O slots
PCD3.C110	Expansion module holder with 2 I/O slots
PCD3.C200	Expansion module holder with 4 I/O slots and terminals for 24 VDC power supply

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5 Switch cabinet components

Distributed automation system design with Smart RIO

Smart Automation Manager

Smart RIOs PCD3.T66x

As Smart Automation Managers, PCD1.M21x0, PCD2.M5, PCD3.M2/3/5 CPUs and the programmable micro browser panel PCD7.D4xxxT5F can be used

Standard network components (e.g. Q.NET-5TX / 8TX) can be used to set up the Ethernet network

The maximum number of RIOs per Manager depends on the type of Manager used
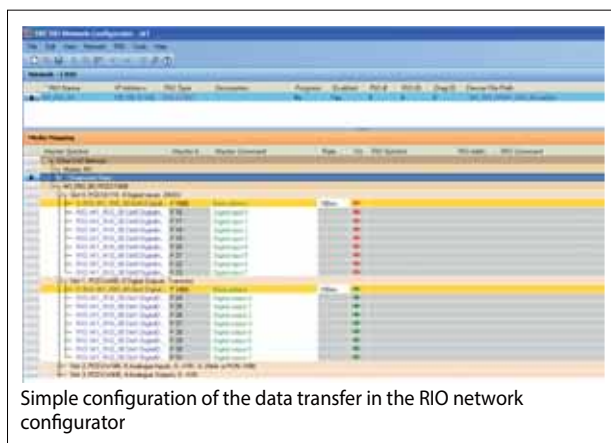
The Smart RIOs can be used both as simple remote I/O stations and as intelligent programmable RIO stations.

Central program management in the Manager

Smart Automation Manager
Configuration & user program
M + S1, S2, S3, S4

M

Ethernet

S1   S2   S3   S4

Smart Automation Stations

Program & Configuration M + S1, S2, S3, S4

The application programs are centrally managed by the Smart Automation Manager and distributed to the Smart RIOs. If hardware is replaced, the programs and the configuration are reloaded automatically.
The Manager must have sufficient memory resources to save the RIO programs. The onboard program memory and the plug-in flash memory modules PCD7.Rxxx and PCD3. Rxxx can be used for this.

Data transfer with Ether S-IO protocol

Simple configuration of the data transfer in the RIO network configurator

Data transfer cycle times

Number of RIOs	Minimum data transfer cycle time
10	50 ms
20	100 ms
40	200 ms
80	400 ms
128	800 ms

2 different transfer cycle times can be set per RIO station:
– Short cycle time for high-priority data
– Normal cycle time for low-priority or slow data

The exchange of data can be easily configured in PG5 with the RIO network configurator. The configured exchange of data between RIO and the Manager is processed automatically by the operating system. No user program is required for this. The Manager sends the data to the Smart RIOs on a cyclical basis with broadcast or unicast telegrams. The RIOs also send their data or statuses of their inputs to the RIO Manager on a cyclical basis.

Technical Data

Property		PCD3.T665	PCD3.T666
Number of inputs/outputs		64 in base unit, expandable to 256	
I/O module slots		4 in base unit, expandable to 16	
I/O modules supported		PCD3.Exxx, PCD3.Axxx, PCD3.Bxxx, PCD3.Wxxx	
max. number of RIO stations		128	
Protocol for data transfer		Ether S-IO	
Ethernet connection		10/100 Mbits, full-duplex, auto-sensing, auto-crossing	
Default IP configuration		IP address: 192.168.10.100 Subnet mask: 255.255.255.0 Default gateway: 0.0.0.0	
USB interface for configuration and diagnostics		Yes	
Program memory		32 kByte	128 kByte
Web server for configuration and diagnostics		Yes	
Web server for user pages		Yes	
Onboard file system for web pages and data		512 kByte	
BACnet® or LonWorks®		No	No
Onboard interrupt inputs		2	
Onboard RS-485 interface		No	Yes
Special modules	for I/O slot 0 only	---	PCD3.F1xx
	for I/O slots 0…3 (up to 4 modules)	PCD3.H1xx --- ---	PCD3.H1xx counter PCD3.F26x DALI PCD3.F27x M-Bus
S-Web alarming/trending		No	No
Watchdog		No	
Real-time clock		No	
Software clock (not battery-powered)		yes, synchronised by the Manager	
Battery		No	

Smart Automation Manager (master station)

max. 16 RIO stations	PCD3.M2130, PCD3.M2330
max. 32 RIO stations	PCD1.M212x, PCD3.M3330,
max. 64 RIO stations	PCD1.M2160, PCD3.M5340, PCD3.M5540, PCD3.M6x40, PCD7.D457VT5F, PCD7.D410VT5F, PCD7.D412DT5F
max. 128 RIO stations	PCD3.M5560, PCD3.M6560, PCD3.M6860

General data

Supply voltage	24 VDC ±20% smoothed or 19 VAC ±15% two-way rectified
Capacity of 5 V bus / +V bus (24 V)	max. 600 mA/100 mA
Ambient temperature	0…+55 °C or 0…+40 °C (depending on mounting position)
Storage temperature	−20…+70 °C
Relative humidity	30…95% RH with no condensation
Mechanical strength	in accordance with EN/IEC 61131-2

System properties/limits and recommendations for lean automation

In the case of lean automation, it is inefficient to exploit the specified limits or max. number of stations per Manager and max. number of I/Os per RIO. The following points should be considered:

▸ The load on the RIO Manager increases with the rising number of RIO stations. This has an impact on the overall application in the RIO Manager.
▸ If there is a large number of RIOs, a sufficiently large volume of PCD media must be reserved on the Manager for the data transfer.
▸ With the increased number of RIO stations, the build and download process in PG5 is extended accordingly. Likewise, the start-up behaviour of the Manager or the entire RIO network is proportionately longer.
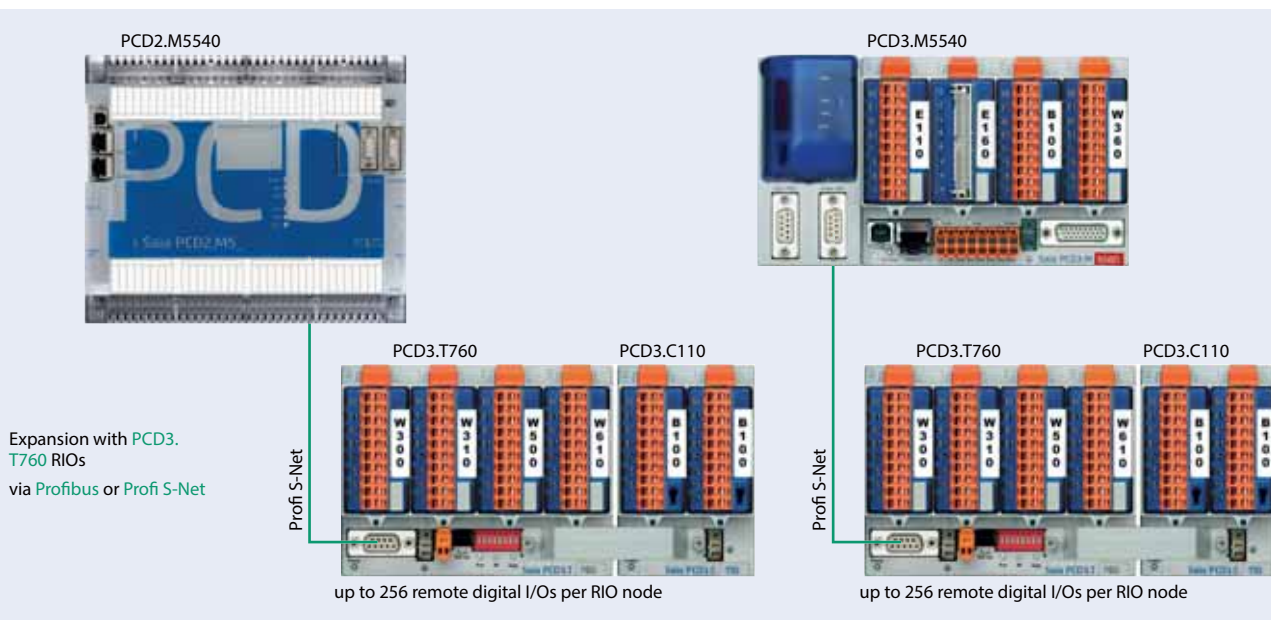
Recommendation: 20 Smart RIOs per Manager is an effective configuration for efficient and flawless operation and easy commissioning and support.
The Smart RIOs do not have a battery. In the event of an interruption to the power supply, all the data in the RAM memory (registers, flags, DBs/text) will be lost. Data and parameters that are remanent must either be transferred by the Manager or stored in the RIO's flash file system. If this is not possible, it is recommended to use a normal controller instead of a Smart RIO.
The user programs are stored in the flash memory of the RIOs and are retained in the event of an interruption to the power supply.

1.2.3 **Saia PCD3.T760 Profibus RIO**

The PCD3.T760 head station serves as a remote peripheral node. These compact PCD3 RIOs snap onto a 35 mm DIN rail and can be equipped with PCD3 I/O modules. Up to 3 PCD3.Cxxx module holders can be connected to the PCD3.T760. Users can therefore connect a maximum of 16 I/O modules or 256 inputs/outputs per RIO node.


PCD2.M5540

PCD3.M5540

Expansion with PCD3.
T760 RIOs
via Profibus or Profi S-Net

Profi S-Net

PCD3.T760   PCD3.C110

up to 256 remote digital I/Os per RIO node

Profi S-Net

PCD3.T760   PCD3.C110

up to 256 remote digital I/Os per RIO node

Dimensions Identical to PCD3.T66x, see 1.2.2 Saia PCD3.T66x remote I/O stations

Web server for commissioning, diagnostics and service
The integrated web server in the PCD3.T760 provides the user with the greatest usage for commissioning, diagnosis and service. Access is via a popular, easy-to-operate standard web browser. Using RS-232 or Profi S-Net, users can access the predefined equipment and specific system HTML pages and all the information data in the RIOs.
This facilitates the checking of the states of all I/O signals (digital/analogue/counters) and specifically input/output states can be modified with a mouse click.
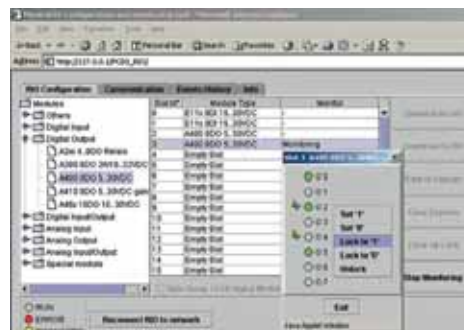
Technical Data	PCD3.T760
Number of inputs/outputs or	256 [1]
I/O module slots	16 [2]
Expansion connection	Yes
Profibus-DP < 1.5 Mbits	DPV0
User web server memory	128 kByte flash
number of RIO stations	128 per master station

General

Supply voltage	24 VDC ±20% smoothed or 19 VAC ±15% two-way rectified
Capacity 5 V/24 V bus	max. 650 mA/100 mA

[1]) When using digital I/O modules with 16 I/Os each.
[2]) With PCD3.Cxxx module holders.

Ordering information for PCD3.T76x accessories

Type	Description
PCD3.K225	Accessories for the configuration of the PCD3 RIO interface cable PCD3.T760 web server to PC (2.5 m); RIO configuration cable

1.2.4 **Saia PCD3.M2130V6 Compact**

The PCD3 Compact combines high functionality in confined spaces. With its compact dimensions, it can fit into the smallest switch cabinets. This makes it ideal for upgrading existing installations. It includes all the features of PCD3 technology and also has I/Os directly onboard.
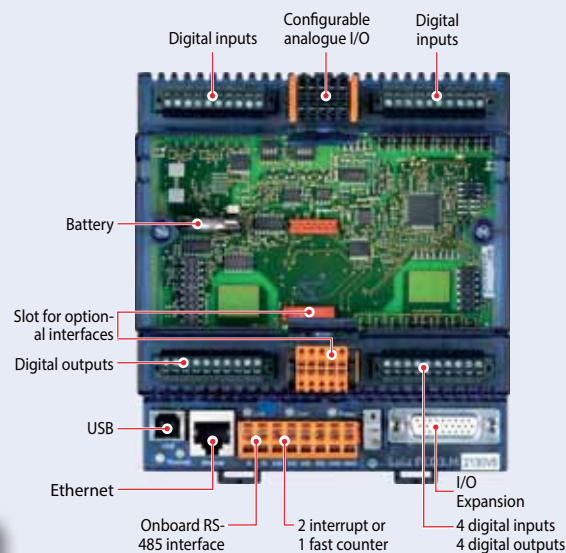
System properties

‣ Fully programmable with PG5
‣ Compact dimensions: 130 × 140 × 74 mm (W × H × D)
‣ Integral interfaces USB, Ethernet and RS-485
‣ Slot A for optional PCD7.F1xxS serial communication modules
‣ 38 inputs/outputs contained in the base unit
‣ Replaceable lithium battery
‣ Configurable analogue inputs for voltage, current and temperature
‣ Expandable with PCD3.C200 or PCD3.C110 I/O module holder
‣ Remote I/O expansion with remote I/O PCD3.T66x (Ethernet) or PCD3.T760 (Profi S-IO)

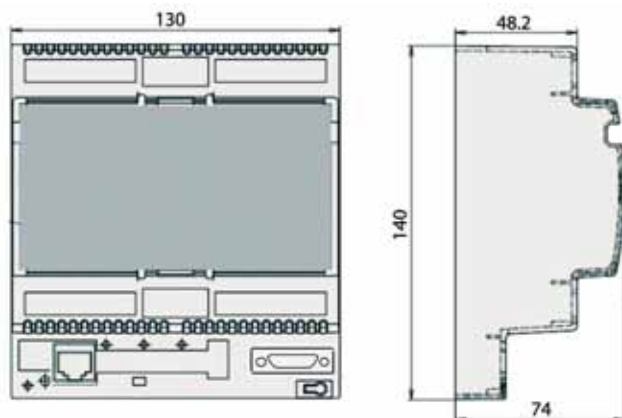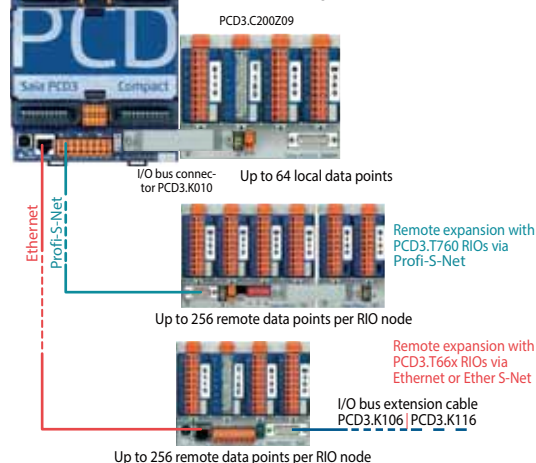**Automation Server** integrated in the base unit

Digital inputs   Configurable analogue I/O   Digital inputs

Battery
Slot for optional interfaces
Digital outputs
USB
Ethernet
Onboard RS-485 interface
2 interrupt or 1 fast counter
I/O Expansion
4 digital inputs 4 digital outputs

Onboard inputs/outputs

Type	Number	Input voltage	Signal ranges	Switching capacity VDC	Resolution	I/O connector type
Digital inputs	20	15…30 VDC	---	---	---	Plug-in screw terminals or push-in terminals with LED (optional)
Digital outputs transistor	12	---	---	0.5 A/ 5…32 VDC	---	Plug-in screw terminals or push-in terminals with LED (optional)
Analogue configurable inputs	4	---	−10 V…+10 V / 0…20 mA, Pt/ Ni1000, Ni1000 L&S, resistance 0…2500 Ω	---	13 bit / 12 bit	Plug-in spring terminals
Analogue outputs	2	---	0…10 V	---	12 Bit	Plug-in spring terminals

Dimensions

130
48.2
140
74

Saia PCD3 Compact Controller

PCD3.C200Z09

I/O bus connector PCD3.K010
Up to 64 local data points

Ethernet
Profi-S-Net

Remote expansion with PCD3.T760 RIOs via Profi-S-Net
Up to 256 remote data points per RIO node

Remote expansion with PCD3.T66x RIOs via Ethernet or Ether S-Net
I/O bus extension cable PCD3.K106 | PCD3.K116
Up to 256 remote data points per RIO node

Performance overview and accessories

Power supply

Type	Description
Supply voltage (in accordance with EN/IEC 61131-2)	24 VDC −20 / +25% incl. 5% ripple
Current draw / input power	Type 175 mA / 4.2 W max. 500 mA / 12 W
Capacity 5 V/+V internal	max. 600 mA / 100 mA
Reclosing (in accordance with EN / IEC 61131-2)	≤ 10 ms for interval ≥ 1 s
Watchdog relay, make contact	48 VAC or VDC, 1 A

Communication interfaces to field level options in slot A

PCD7.F110S	RS-422 with RTS/CTS or RS-485 electrically connected, with line termination resistors that can be activated. Suitable for Modbus, S-Bus, EnOcean, etc.
PCD7.F121S	RS-232 with RTS/CTS, DTR/DSR, DCD, suitable for modem, EIB, DALI connection.
PCD7.F150S	RS-485 (electrically isolated), with line termination resistors that can be activated
PCD7.F180S	Belimo® MP-Bus, for connecting up to 8 drives on one line

I/O expansions

Type	Description	Capacity
PCD3.C110Z09	2 module slots (connection with PCD3.K010 connector or with PCD3.K106/K116 cable)	0 mA
PCD3.C200Z09	4 module slots, with 24 VDC supply (connection with PCD3.K010 connector or with PCD3.K106/K116 cable)	1500 mA / 200 mA (5 V / +V)
PCD3.C110	2 module slots (connection with PCD3.K106/K116 cable only)	0 mA
PCD3.C200	4 module slots, with 24 VDC supply (connection with PCD3.K106/K116 cable only)	1500 mA / 200 mA (5 V / +V)

I/O modules see pages 27 and 28

Order details

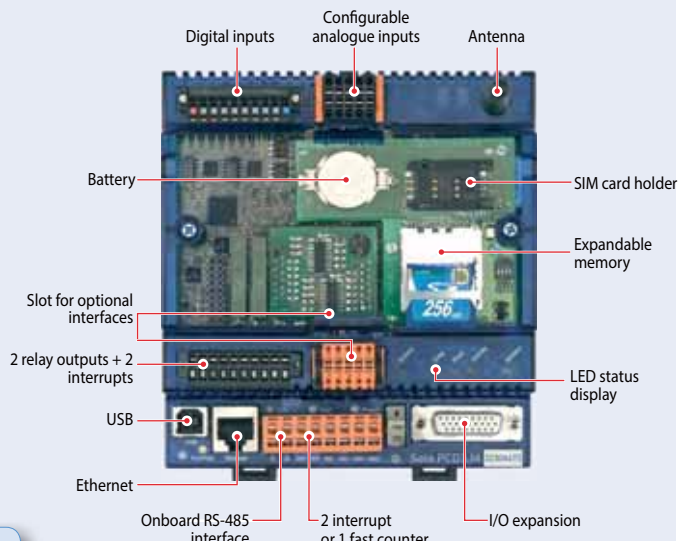| Type	Description
PCD3.M2130V6	Base units with 38 I/Os (supplied with plug-in screw terminals) CPU with 512 kByte user program, backup with onboard flash memory, 1 MB file system, USB port for programming with PG5, RS-485 interface, 2 interrupt inputs, integrated web and FTP server, 1 port (slot A) for PCD7.F1xxS communication modules, lithium battery for data backup for 1…3 years, Ethernet TCP/IP interface
4 405 5066 0	Optional: Pluggable 10-pin "push-in" terminal block with LEDs for digital I/Os

1.2.5 Saia PCD3.M2330A4Tx Wide Area Controller

Saia PCD3 Wide Area Controllers are fully programmable, industrial control and automation devices with web, IT and telecommunications functions. Its potential uses therefore extend much further than those of classic RTU stations, which are normally only suitable for alarm monitoring with remote alarms and data logging. The PCD3 Wide Area Controller is also suitable for sophisticated control tasks.

System properties

▸ Fully programmable with PG5

▸ Compact dimensions: 130 × 140 × 74 mm (W × H × D) (without antenna)

▸ Management of historical data with up to 1 GB flash memory

▸ Integral telecommunications interface (PSTN, GSM/GPRS)

▸ Constantly accessible owing to redundant communication
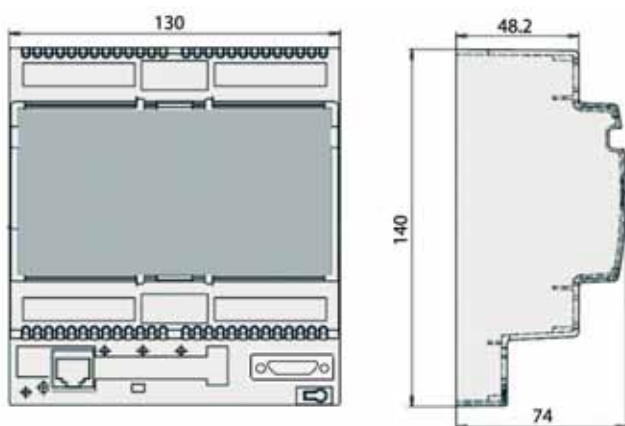
▸ 14 inputs/outputs contained in the base unit

Automation Server integrated in the base unit

Labels: Digital inputs, Configurable analogue inputs, Antenna, Battery, SIM card holder, Expandable memory, Slot for optional interfaces, 2 relay outputs + 2 interrupts, USB, LED status display, Ethernet, Onboard RS-485 interface, 2 interrupt or 1 fast counter, I/O expansion

Onboard inputs/outputs

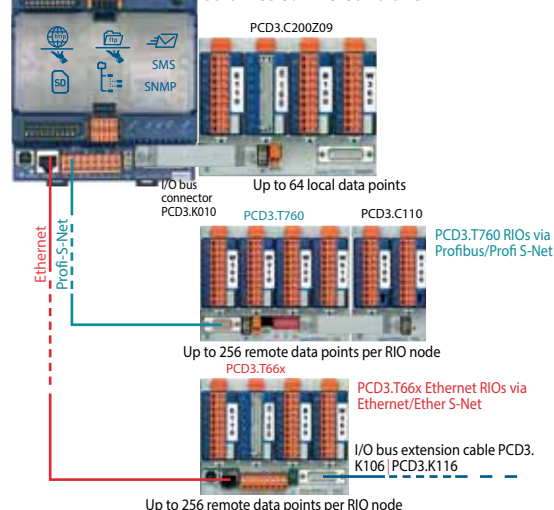| I/O data points	Properties
8 digital inputs + 2 interrupts	15…30 VDC
2 relay outputs	DC 2 A/50 V, AC 6 A/250 V
4 configurable analogue inputs	−10…+10 VDC, 0…±20 mA, Pt/Ni1000, Ni1000 L&S, 0…2500 Ω

Onboard interfaces

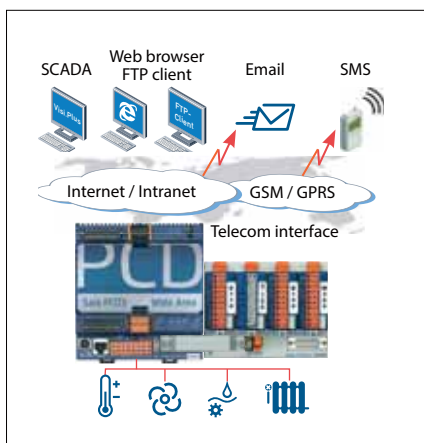| Interface	Transmission rate
RS-485 (serial) on terminal block for free protocols or Profi S-Net / Profibus-DP Slave	≤ 115.2 kbits ≤ 187.5 kbits
Ethernet TCP/IP	10/100 Mbits
USB 1.1 (PGU)	

Dimensions

130, 48.2, 140, 74

Saia PCD3.WAC Controller

PCD3.C200Z09
Up to 64 local data points
I/O bus connector PCD3.K010
PCD3.T760   PCD3.C110
PCD3.T760 RIOs via Profibus/Profi S-Net
Up to 256 remote data points per RIO node
PCD3.T66x
PCD3.T66x Ethernet RIOs via Ethernet/Ether S-Net
I/O bus extension cable PCD3. K106 | PCD3.K116
Up to 256 remote data points per RIO node
FTP client, Web browser, Mail server, SMS, Internet, Telecom GSM / GPRS

1 Automation stations
2 Operation and monitoring
3 Dedicated room controllers
4 Consumer data acquisition
5 Switch cabinet components

Examples of applications

▶ PCD3.WAC as an RTU controller

Send SMS messages and emails through the GSM/GPRS network. Use the PCD3.WAC with local I/Os to send messages, statuses or alarms to the SCADA system or to the end user via email and SMS.
Via integrated web and FTP servers can link external stations easily over Intranet and Internet. The integrated web server also permits access to external stations via standard web browsers.
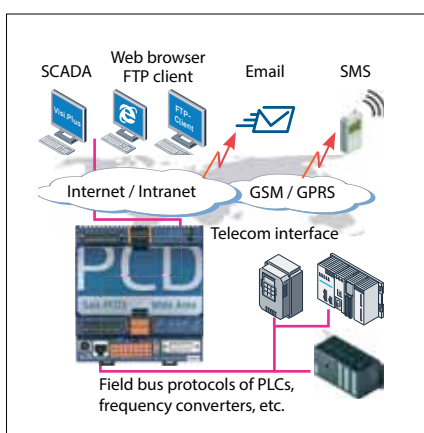
▶ WAC communications gateway

The Saia PCD3.WAC can be used for non-SBC systems as a communications gateway to Internet or Intranet applications with integrated protocols such as FTP, HTTP or using open data modes, Ethernet or a serial interface.
Many field bus protocols are supported at the field level, such as Modbus TCP/RTU/ASCII, EIB, M-Bus, etc.
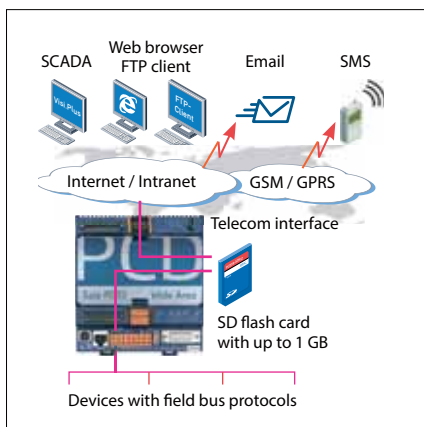
▶ Ready for data management:

With up to 1 GB of memory, the Saia PCD3.WAC has enough memory to store data received from the field level over a long period. These data can be processed directly by the Saia PCD® and then transferred to the management or upstream monitoring systems by email, FTP, HTTP or data communication. This makes the Saia PCD3 Wide Area Controller independent of management stations and therefore suitable as a data concentrator.
Remote operation and control have various applications for taking measurements, monitoring the status of systems and the relevant transfer of data.
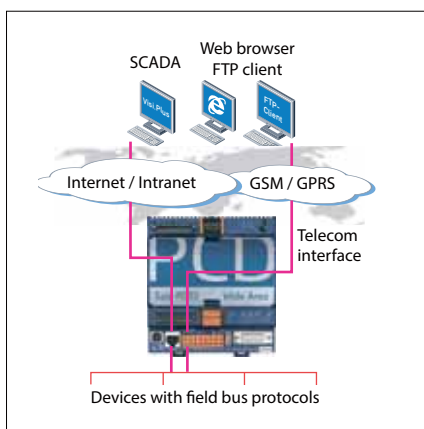
▶ Permanently available owing to redundant communication

Bridging geographical distances is often a requirement for systems with a large number of distributed stations. With integrated telecommunications interfaces (GSM/GPRS, PSTN or ISDN) and an Ethernet interface, the Wide Area Controller is permanently available via its telecommunications interface and Ethernet port. Redundant communication paths (telecommunications or Ethernet interface) increase the reliability and availability of the system.

Performance overview, ordering information and accessories

Processor technology

RAM as program memory	512 kByte
Backup memory (flash)	512 kByte
Memory for file system (flash)	1 MB (onboard)
PCD media	8192 flags, 16,384 × 32-bit register

Telecom communication interface (alternatively integrated interfaces)

GSM / GPRS / PSTN / ISDN / SMS – sending and receiving

Internet and Intranet protocols

HTTP server	Visualisation with web browser and web panel
FTP Server	Easy data exchange
TCP/IP-PPP point-to-point protocol	Efficient communication
SMTP client	Sending emails with files (e.g. log files) as attachments
DHCP and DNS client	Easy integration in IP networks
SNTP client	Synchronisation of the internal clock
SNMP agent	Network management

Field level protocols

Serial S-Bus, Ether S-Bus and Profi S-Bus
MODBUS RTU or TCP EIB M-Bus IEC 870-5-101/103/104
For other protocols please refer to Chapter B2

Order type

PCD3.M2330A4T1	with PSTN modem
PCD3.M2330A4T5	with GSM/GPRS modem (without antenna)

Additional data storage

Slot for SD flash cards	SBC SD card with up to 1 GB file system
Data files up to 900 files with file system	Download and upload via ftp
PCD7.R-SD512	SBC SD flash card, 512 MB with file system
PCD7.R-SD1024	SBC SD flash card, 1024 MB with file system

Communication interfaces for slot A

PCD7.F110S	RS-422 with RTS/CTS or RS-485 electrically connected, with line termination resistors that can be activated. Suitable for Modbus, S-Bus, EnOcean, etc.
PCD7.F121S	RS-232 with RTS/CTS, DTR/DSR, DCD, suitable for modem, EIB, DALI connection.
PCD7.F150S	RS-485 (electrically isolated), with line termination resistors that can be activated
PCD7.F180S	Belimo® MP-Bus, for connecting up to 8 drives on one line

I/O expansions

PCD3.C110Z09	2 module slots (connection with PCD3.K010 connector or with PCD3.K106/K116 cable)	0 mA
PCD3.C200Z09	4 module slots, with 24 VDC supply (connection with PCD3.K010 connector or with PCD3.K106/K116 cable)	1500 mA / 200 mA (5 V / +V)
PCD3.C110	2 module slots (connection with PCD3.K106/K116 cable only)	0 mA
PCD3.C200	4 module slots, with 24 VDC supply (connection with PCD3.K106/K116 cable only)	1500 mA / 200 mA (5 V / +V)

I/O modules see pages 27 and 28

1.3 **Standby System**

With the PCD3.M6880 standby controllers, redundant automation solutions can be achieved. This helps to ensure uninterrupted operation of systems and processes.

Modular PCD3 standby controller with 2 Ethernet TCP/IP ports and a coprocessor for standby operation.

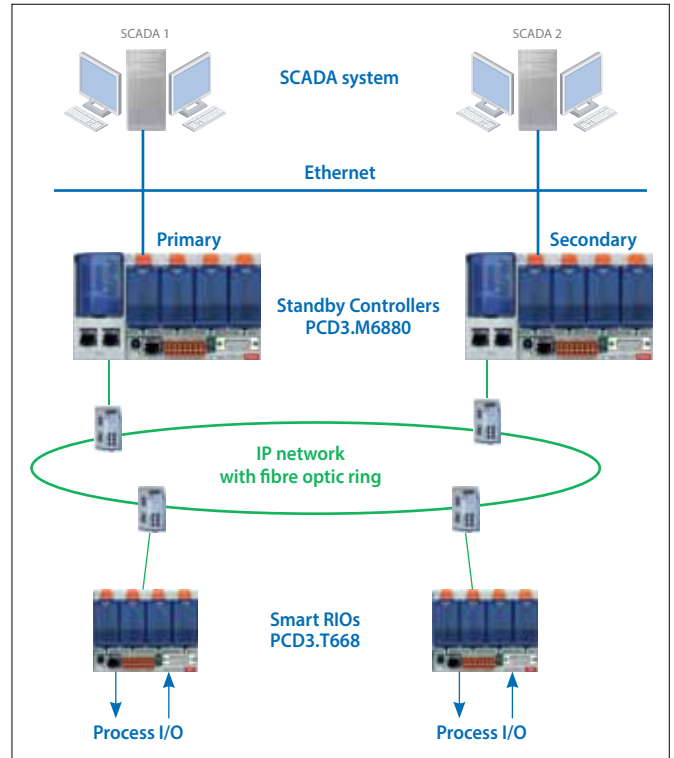Smart RIO for standby system,
for connection to the PCD3.M6880 CPU1.

1 Automation stations

2 Operation and monitoring

3 Dedicated room controllers

4 Consumer data acquisition

5 Switch cabinet components

Standby System Overview

Introduction

The PCD3.M6880 Standby Controllers are for creating redundant automation solutions, to ensure the uninterrupted operation of systems and processes.

Standby (redundant automation) systems from SBC have the following characteristics:

▶ Based on the modular and robust PCD3 family, using standard modules.

▶ Simple system architecture to reduce costs.

▶ Standby processors with shared Ethernet Remote I/Os avoids the duplication of the inputs/outputs and the sensors/actuators.

▶ Programmable remote I/Os create intelligent decentralized nodes to provide additional reliability.

▶ The network uses standard Ethernet components, and can run over a standard Ethernet TCP/IP network along with other services.

▶ Easy engineering and commissioning, using the PG5 Project Manager to automatically generate the project.

▶ Uninterrupted switching from Standby to Active device.

▶ Standby controllers contain two processors. One processor runs the redundant program and monitors the active PCD. The second independent processor runs other non-redundant processes. This significantly increases the performance and flexibility of the system.

▶ Comprehensive diagnostic features to aid commissioning and fault finding.

Typical layout of a redundancy system with two PCD3.M6880 Standby devices and PCD3.T668 Ethernet Smart RIOs.

Terminology

The following definitions will provide a better understanding of the properties and operating principles:

Standby Controller	The PCD3.M6880 controller which supports the standby feature.
Primary PCD	The PCD which becomes the active device by default when the system is powered up, depending on the configuration.
Secondary PCD	The PCD which becomes the standby device on power up, and only takes over active control in the event of a fault on the active device.
Active PCD	The PCD whose CPU1 is in Active Mode, running the redundant program and controlling the inputs/outputs (PCD3.T668 RIOs).
Standby PCD	The PCD whose CPU1 is in Standby mode. It does not run the redundant program and the outputs (PCD3.T668 RIOs) are not controlled by this device.
Main CPU	CPU0 of the Primary or the Secondary PCD, which runs the non-redundant program. This program may be different on the Primary and Secondary devices.
Redundant CPU	CPU1 of the Primary or Secondary PCD, which contains the Redundant program. This program must be the same on the primary and Secondary devices. This CPU is either in Active mode and running the Redundant program, or in Standby mode and monitoring the Active PCD.

Redundant control solutions are created using two PCD3.M6880 Standby Controllers. The input/outputs (process signals) are connected and controlled via PCD3.T668 Ethernet smart RIOs. The RIO stations are connected to both controllers via an Ethernet connection. This means there is no need to have duplicate inputs, outputs, sensors and actuators. The two PCDs (primary and secondary) monitor each other. If the active PCD fails, the standby PCD takes over processing and control of the connected RIO stations. The process image (I/O) and the internal PCD media (F, R, T, C, DB) - the synchronization data - are continuously transferred from the active PCD to the standby PCD via the Ethernet connection. This ensures uninterrupted switching from the active to the standby PCD.

The Redundant CPU1 has two independent Ethernet interfaces. The ETH 2.x interface is reserved exclusively for operating the PCD3.T668 RIO stations. The PCDs also synchronize their process data via the same interface. For security reasons, we recommend setting up this network as a ring structure with specific network components from third-party providers. We have had good experiences with the industrial Ethernet switches from Hirschmann.

Ethernet 2
(2 port switch)

The ETH 1 interface on CPU0 is available for connecting and operating other systems and devices. For example, SCADA systems can be connected via this interface. SBC does not provide its own SCADA system for redundant automation solutions, but almost any system can be used. A single SCADA system, or an additional redundant SCADA system can be used if it supports redundant controllers. The PCD3. M6880 controllers provide detailed status and diagnostic information which can be evaluated by the SCADA systems.


Ethernet 1

Ordering Information

|	
PCD3.M6880	Modular PCD3 standby controller with 2 Ethernet TCP/IP ports and a coprocessor for standby operation.
PCD3.T668	Smart RIO for standby system, for connection to the PCD3.M6880 CPU1.

Designing the System

Redundant automation solutions can be achieved with various network topologies.

Physically separating the management network (SCADA systems) and the network for the remote I/Os is recommended. We also recommend setting up the remote I/O network in a ring structure using fibre-optic network components. This significantly increases the performance, security and, above all, the network availability and thus the system reliability. Standard devices from third-party providers can be used for the network components (switches). We have had good experiences with the switches (RS30) from Hirschmann. However, the networks can also be set up with standard components in a star structure. A shared physical network for the remote I/Os and management systems is also possible, but availability of the system will be reduced accordingly.
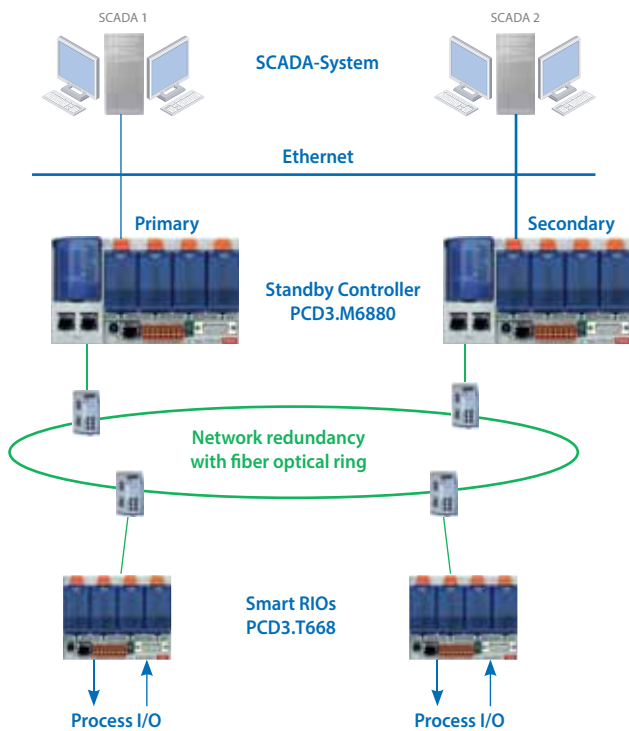
Recommended network topology with physically separate networks and a fibre-optic ring
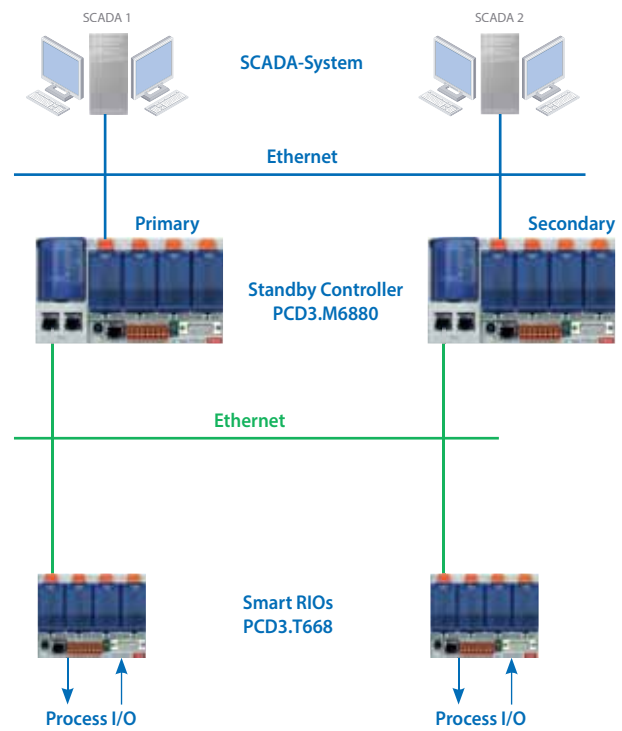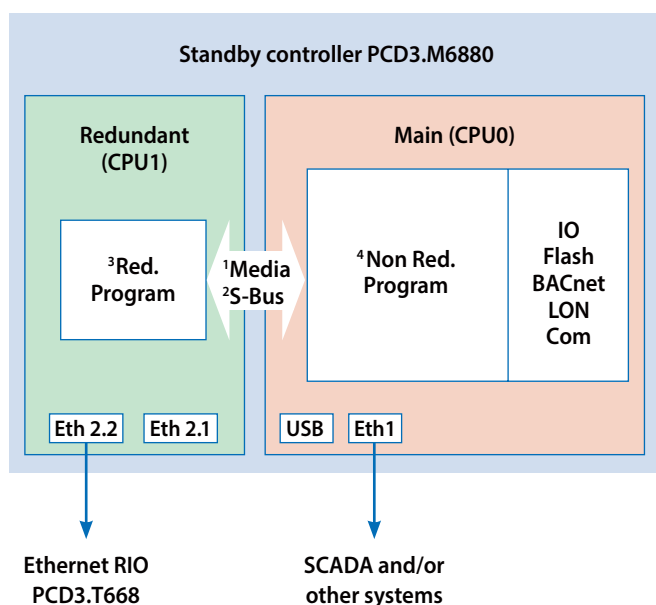

Physically separate networks in a star topology with standard components
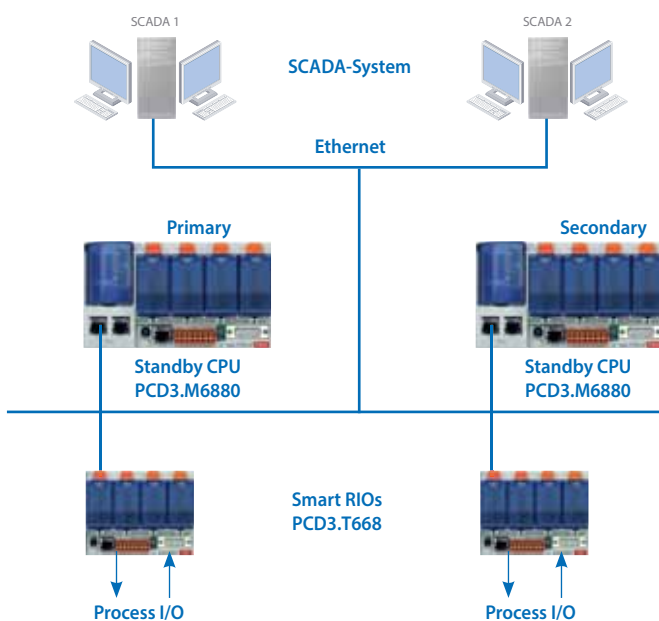
Shared physical network in a star topology with standard components

1.3.1 PCD3.M6880 Standby Controller

Architecture of the PCD3.M6880

PCD3.M6880

Standby controller PCD3.M6880

Redundant (CPU1)

Main (CPU0)

³**Red. Program**

¹**Media** ²**S-Bus**

⁴**Non Red. Program**

IO Flash BACnet LON Com

Eth 2.2 **Eth 2.1**

USB **Eth1**

Ethernet RIO PCD3.T668

SCADA and/or other systems

¹ Data Media Transfer (Exchange Range or/and CSF/FBox)

² S-Bus GWY CPU0 to CPU1 (2 different S-Bus address)

³ Redundant program on CPU1 runs only if active. Same program on both PCDs.

⁴ Non-redundant program can be different in both PCDs.

The PCD3.M6880 standby controller has two independent processors (CPU0 and CPU1). Both processors have their own independent PCD media (F, R, T, C, DB/TX).

The redundant CPU1 runs the redundant user program and controls the shared inputs/outputs of the PCD3.T668 remote I/Os. The redundant programs in the primary and secondary PCD3.M6880s are identical. During normal operation, only the active PCD runs the redundant program. CPU1's internal used PCD media (F, R, T, C, DB/TX) are transferred from the active to the standby PCD via the Ethernet interface 2 (ETH2.x). In the event of a fault, the standby PCD takes over operation without interruption, and runs the redundant program using the last process image from the active PCD.

Depending on requirements, the user programs of the main CPU0 can be different in the primary and secondary PCD3.M6880. CPU0 has the same capabilities as a standard PCD (e.g. PCD3.M5560). Local I/Os in the PCD's slots, and the I/O expansion modules, are controlled by CPU0. External systems and devices (SCADA systems, web browsers and other external devices) communicate only with CPU0. CPU0's internal PCD media (F, R, T, C, DB) are not synchronized between the active and standby PCD.

CPU1's program cannot directly access the local IOs or CPU0's media (and vice versa). Data is exchanged between CPU0 and CPU1 using a data exchange mechanism. The data to be exchanged (PCD media) are define in global symbol files. This data is automatically exchanged between CPU0 and CPU1 on each program cycle.

Saia PCD3.M6880 controllers
High Power Standby Controller

	1.023	I/O
	up to 4.2 GB	File system
	2 MB	Program
	0.1/0.3 µs bit/word	CPU speed

Property/function	PCD3.M6880	
	Main CPU0	Redundant CPU1
Number of inputs/outputs	1023	—
or I/O-module slots	64	—
I/O expansion connection for PCD3.C module holder	Yes	—
Processing time [µs] bit operation	0.1…0.8 µs	
word operation	0.3 µs	
Real time clock (RTC)	Yes	

On-Board memory

Program memory, DB/TEXT (Flash)	2 MByte	
User memory, DB/TEXT (RAM)	1 MByte	128 KByte
Flash memory (Program, S-RIO and configuration)	128 MByte	
User flash file system (INTFLASH)	128 MByte	—
PCD media:		
Register	16384	16384
Flag	16384	16384
DB/TEXT	8192	8192

On-Board interfaces

USB 1.1	Yes	No
Ethernet 10/100 Mbit/s, full-duplex, auto-sensing/auto-crossing	ETH1	ETH2.x (2 port switch)
RS-485 on terminal block (Port 2) or RS-485 Profibus-DP Slave, Profi-S-Net on terminal block (Port 2)	up to 115 kbit/s up to 187.5 kbit/s	—

Optional communication interfaces

I/O slot 0: PCD3.F1xx modules for RS-232, RS-422, RS-485 and Belimo MP-Bus	Yes	No
I/O slot 0…3 up to 4 modules or 8 interfaces: PCD3.F2xx modules for RS-232, RS-422, RS-485, BACnet® MS/TP, Belimo MP-Bus, DALI and M-Bus	Yes	No

### Other features

Communication protocols/systems (BACnet, Modbus, LonWorks®, DALI, M-Bus…)	As PCD3.M6860 without 2nd Ethernet	No
Automation server (web server, FTP server, e-mail, SNMP, flash file system…)	Yes	No
Connection and operation of PCD3.T668 remote I/O Number of supported RIO stations	No —	Yes 64
Connection and operation of PCD3.T665/T666 remote I/O Number of supported RIO stations	Yes 64	No —
Access to the I/O slots in the basic housing as well as to the PCD3.Cxxx I/O terminal bases	Yes	No

Switchover Criteria

Each of the Standby PCDs (CPU1) sends a „Keep Alive" telegram to its partner for supervision.

The STANDBY PCD switches to ACTIVE when:

▶ No Keep Alive telegram has been received within the „Keep alive timeout" period defined with the Redundant CPU's Device Configurator. The "Keep Alive Timeout" can be adjusted between 100…500 ms. By this the max. switchover latency is <100…500 ms.

▶ The ACTIVE PCD's state is not RUN or STOP (stops sending Keep Alive).

▶ A manual Switchover command is executed. This is only possible if the Primary device does not have priority, the „Primary device has priority" option must be „No".

Data Synchronization and Supervision (Keep Alive)
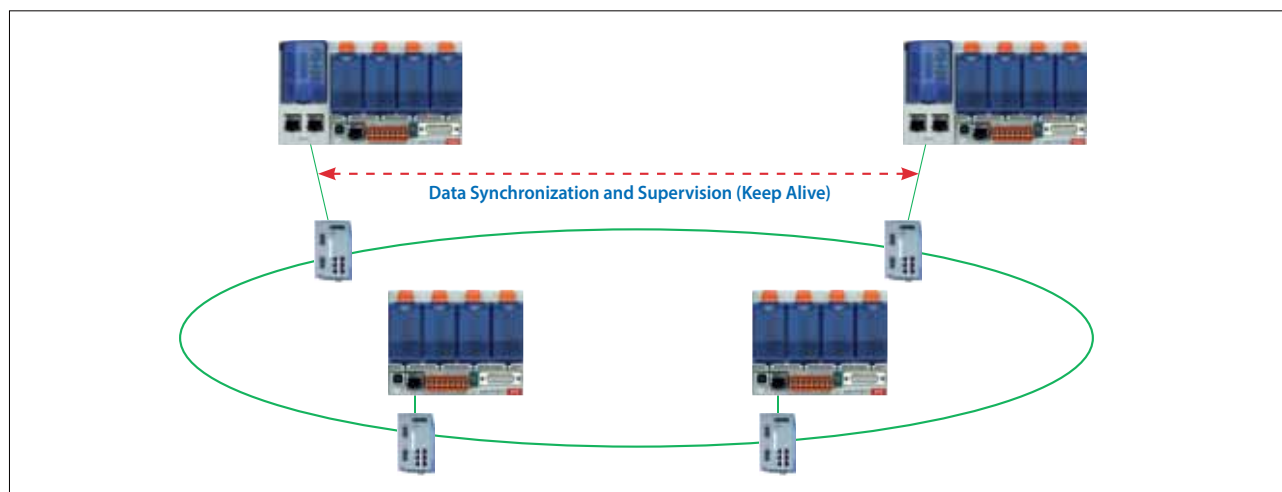
Data Synchronisation and Program Cycle:

The used PCD medias (R, F, T/C, DB/TX) in the redundant CPU1 are cyclically synchronized between the active and the standby PCD. The synchronization time for all PCD media is normally less than 200 ms. This time is reduced accordingly if only a part of the PCD media is used. The total program cycle time is calculated as follows:

Total cycle time = program execution time + data synchronization time

The max. value for a large application can be calculated as follows: 100 ms + 200 ms = 300 ms max.
For smaller applications where less PCD media are used the cycle time is reduced correspondingly.

1.3.2 PCD3.T668 Standby RIO

Architecture of the PCD3.T668

The PCD3.T668 remote I/Os are exclusively for use with the PCD3.M6880 Standby Controllers. With the exception of the redundancy function, they support the same properties/functions as the PCD3.T666 remote I/O station. The PCD.T665 and PCD3.T666 standard remote I/Os cannot be used with Standby Controllers.

▶ Can be used as a simple local I/O station or an intelligent programmable I/O station

▶ Can be programmed with the PG5. Important or timecritical tasks can be processed directly in the RIO

▶ The RIO's user programs are managed centrally by the Smart RIO Manager (PCD) and downloaded to the RIOs automatically

▶ Data exchange uses the efficient Ether-S-IO protocol. Simple configuration with the RIO Network Configurator

▶ Cross-communication with other PCD systems using Ether-S-Bus (FBoxes)

▶ Intelligent communication modules (e.g. M-Bus, DALI) are supported

▶ Other communication protocols (e.g. Modbus) via Ethernet TCP/IP and also by the onboard RS-485 interface

▶ Integrated Web Server

1 Automation stations
2 Operation and monitoring
3 Dedicated room controllers
4 Consumer data acquisition
5 Switch cabinet components

Technical data

Property		PCD3.T668
Number of inputs/outputs		64 in base unit, extensible to 256
I/O-module slots		4 in base unit, extensible to 16
I/O-modules supported		PCD3.Exxx, PCD3.Axxx, PCD3.Bxxx, PCD3.Wxxx
Max. number of RIO stations		128
Protocol for data transfer		Ether-S-IO
Ethernet connection		10/100 Mbit/s, full-duplex, auto-sensing, auto-crossing
Default IP configuration		IP address: 192.168.10.100 Subnet mask: 255.255.255.0 Default gateway: 0.0.0.0
USB port for configuration and diagnostics		yes
Program memory		128 kByte
Web server for configuration and diagnostics		yes
Web server for user pages		yes
On-Board file system for web pages and data		512 kByte
BACnet® or LONWORKS®		no
On-Board interrupt inputs		2
On-Board RS-485 interface		yes
Special modules	for I/O-slot 0 only	PCD3.F1xx
	for I/O-slots 0…3 (up to 4 modules)	PCD3.H1xx counter PCD3.F26x DALI PCD3.F27x M-Bus
S-Web alarming/trending		no
Watchdog		no
Real-time clock		no
Software clock (not battery-powered)		yes, synchronized by the Manager
Battery		no

General data

Supply voltage	24 VDC ±20 % smoothed or 19 VAC ±15 % full-wave rectified
Capacity of 5 V bus / 24 V bus	max. 650 mA/100 mA
Ambient temperature	0…+55 °C or 0…+40 °C (depending on mounting position)
Storage temperature	–20…+70 °C
Relative humidity	30…95 % RH with no condensation
Mechanical strength	according to EN/IEC 61131-2

System properties/limits and recommendations for lean automation

With lean automation, it is not recommended to make full use of the specified limits with regard to the maximum number of stations per Manager and the maximum number of I/Os per RIO. The following points should be taken into account:

▶ The load on the RIO Manager increases with the rising number of RIO stations. This has an impact on the overall application in the RIO Manager.

▶ If there is a large number of RIOs, a sufficiently large amount of PCD media must be reserved on the Manager for the data transfer.

▶ With a rising number of RIO stations, the build and download process in PG5 is lengthened accordingly. Likewise, the start-up behavior of the Manager or the entire RIO network is proportionally longer.

Recommendations: 20 Smart RIOs per Manager is a sensible configuration for efficient and problem-free operation, and simple commissioning and support.
The Smart RIOs do not have a battery. In the event of an interruption to the power supply, all the data in the RAM memory (registers, flags, DBs/text) will be lost. Data and parameters that are to remain must either be transferred by the Manager or stored in the RIO's flash file system. If this is not possible, the use of a normal controller in place of a Smart RIO is recommended. The user programs are stored in the flash memory of the RIOs and are retained in the event of an interruption to the power supply.