Technical information

PCD4 PLC based controllers

Controls Division

The process control device for tasks with a broad requirement profile

Powerful functions – already integrated in base unit

- **Up to 510/2048 inputs/outputs**: Modular structure with up to 32 sockets for digital, analogue, counting, measuring and/or motion control modules
  - up to 510 central inputs/outputs
  - up to 2048 local inputs/outputs (e. g. PROFIBUS DP)
- **Up to 1 MByte user memory**: For programs, text and data blocks. 1 MByte flash memory as option for ease of down/uploading program modifications and backups.
- **Up to 6 serial data ports**: Can be fitted with a choice of RS232, RS422, RS485 or TTY/current loop 20mA.
- **Field bus connections**: Can be fitted with a choice of PROFIBUS FMS, PROFIBUS DP as master or slave and Ethernet-TCP/IP.
- **Standard inputs**: Fast counters and interrupt inputs directly on CPU of controller (only PCD4.M170).

High performance operating system and efficient programming tools

- **Efficient programming with PG5** due to its many programming languages, such as IL, FUPLA, GRAFTEC etc. and its diagnostic and other add-on tools. An efficient instruction set, comprehensive FBox libraries and a structure that complies with IEC 1131-3 simplify the editing of transparent programs.
- **Portability of user programs** due to harmonized system resources and the integral Saia®S-Bus, user programs are transferable across the entire PCD family (PCD1 up to PCD6) and capable of running.
- **Short reaction times** due to direct accessing of I/O signals, without the passing through a process map (image).
- **Flexible network integration** due to through communications and programming via Ethernet-TCP/ IP to the connected field bus stations PROFIBUS DP or FMS.

The adaptive controller platform

The PCD4 series is an extremely flexible system. From the minimum system with the simplest processor, one serial interface, a low-cost power supply module and 2 I/O modules, through to the fully equipped system with up to 32 I/O and function modules, processor module ..M170, up to 6 independent serial interfaces or Saia®S-Bus, PROFIBUS FMS/DP or Ethernet-TCP/IP network connections. The system can be assembled in one go, or expanded in stages.

All modules are in the form of equal sized cassettes. Cassette modules are plugged into the appropriate bus modules. The bus modules are in turn snapped onto mounting rails and connected together to form the system bus. Connections to the external process are wired to the bus modules, which means that cassette modules can be inserted or removed without affecting the wiring.
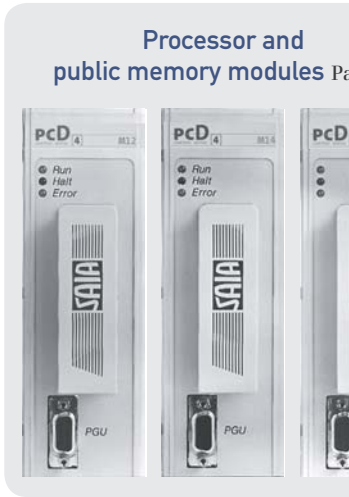
Saia®S-Bus (RS 485)

The efficient protocol for this master-slave network is supported by every PCD both as master and as slave. Economical design across a serial RS 485 data port.

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Combined bus module PCD4.C340

with sockets for processor module, power supply module, 4 I/O modules and 3 sockets for serial data ports.
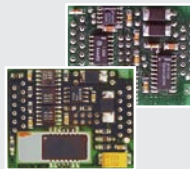
Page 7

Serial data ports
sockets A1, A2, A3 on PCD4.C340

up to 3 serial data ports as RS 422/RS 485, RS 485 electrically isolated, RS 232 for modem or TTY/current loop 20 mA.
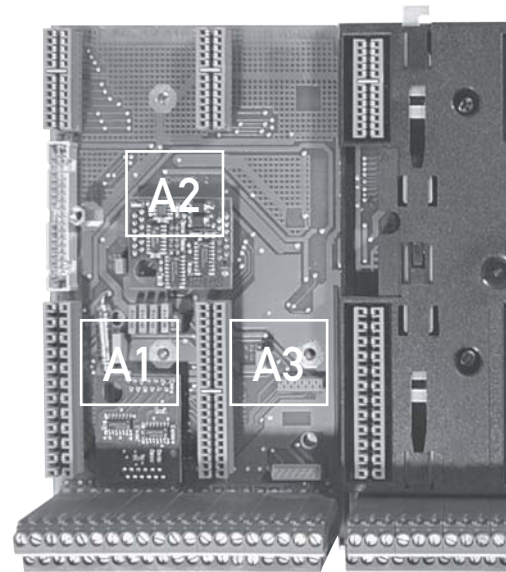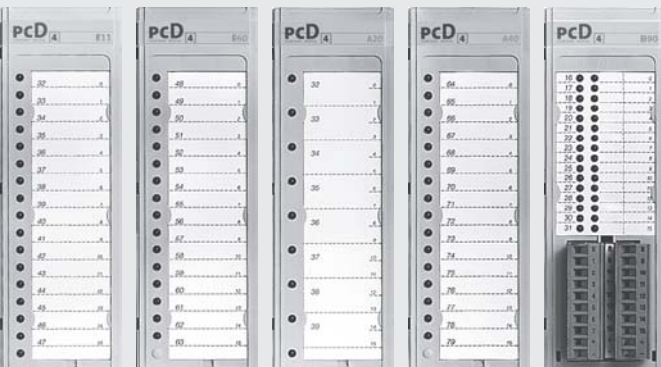
Pages 8/9

Flexible and modular I/O level using bus modules

The I/O bus modules with 2 or 6 module sockets allow expansion up to 510 inputs/outputs or 32 I/O modules.
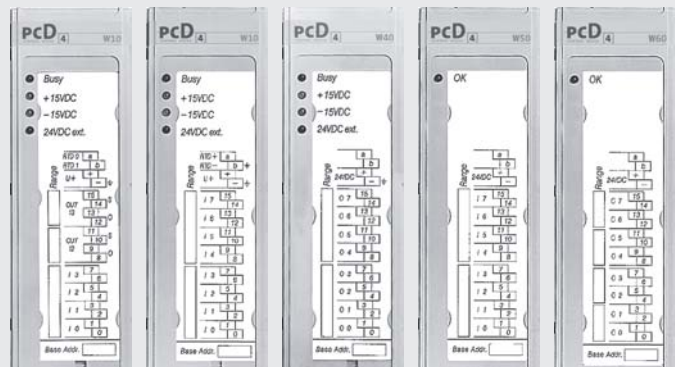
Page 7

Power supply modules Page 10

Processor and public memory modules Page

Digital input/output modules Pages 11–13

Analogue input/output modules Pages 14–16

System overview: Hardware

age 6

up to 428 KBytes user memory as RAM or EPROM

Page 5

Processor module
PCD4.M170 Page 6

User memory

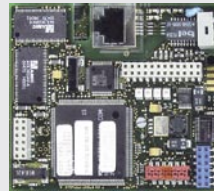1 MByte RAM and plug-on flash card for saving user memory.

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Field bus connections
sockets B1 and/or B2

PROFIBUS FMS/DP: For both networks various modules are available as master or slave, also with additional RS 485 serial data port.

Pages 8/9
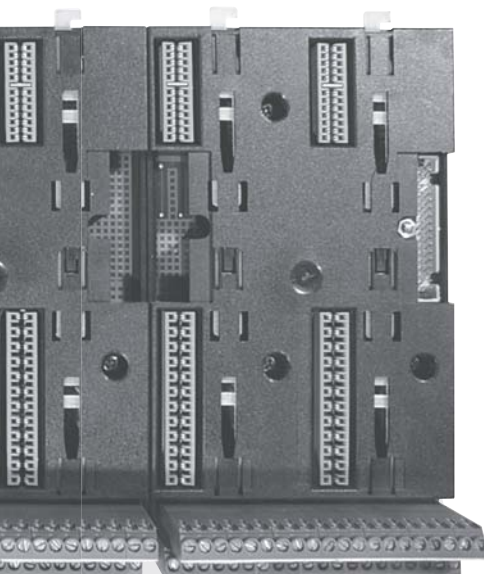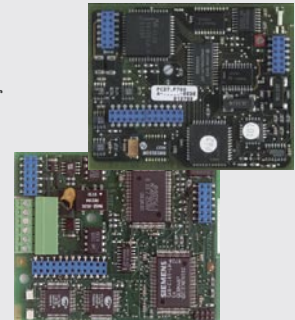
Ethernet-TCP/IP socket B2

Intelligent co-processor module with fast dual-port RAM interface to the CPU, Ethernet 10 Base-T/100 Base-TX. Saia®S-Bus with UDP/IP for PG5⇔PCD communication and PCD⇔PCD multi-master communication. Transmission and receipt of TCP and UDP data packages for communication with any choice of system.

Pages 8/9

Serial data ports
socket B2

2 × RS 232 or RS 232 for modem, RS 232 and RS 422/RS 485

Pages 8/9

Counting, measuring and motion control modules Pages 18–20

Manual operation modules Page 17

Diverse system resources

Block diagram of resources, using PCD4.M170 as example


```
          SUPPLY          SERIAL INTERFACES via        I/Os
                          COMBINED BUS MODULE PCD4.    ADDR 0…510
                          C340

                    ═══════ CPU and I/O BUS ═══════►  ═══ I/O BUS ═══►

RUN / HALT
INTERRUPT INPUTS
FAST COUNTERS          CPU        R    T    F   E    MEMORY   DB      BACKUP
EXTERNAL RESET                    nvol vol  vol E    MAP      TX      USER
                                       C    F   P            P       MEMORY
                                       nvol nvol R
                                      USER MEDIA    USER
                                                   MEMORY

                              ..F.-MODULE BUS

  DATE-TIME   WATCH-DOG    ..F. MODULE      ..F. MODULE
  nvol                     COMMUNICATIONS   COMMUNICATIONS

  PCD4.N..     PGU 1)      FIELD BUS CONNECTIONS / ETHERNET-TCP/IP
               RS 232      SERIAL DATA PORTS
```
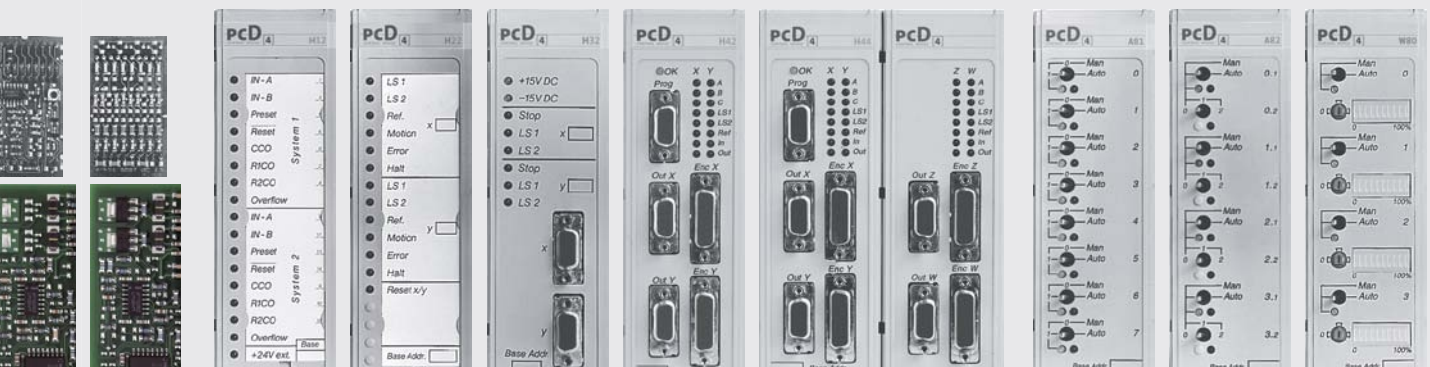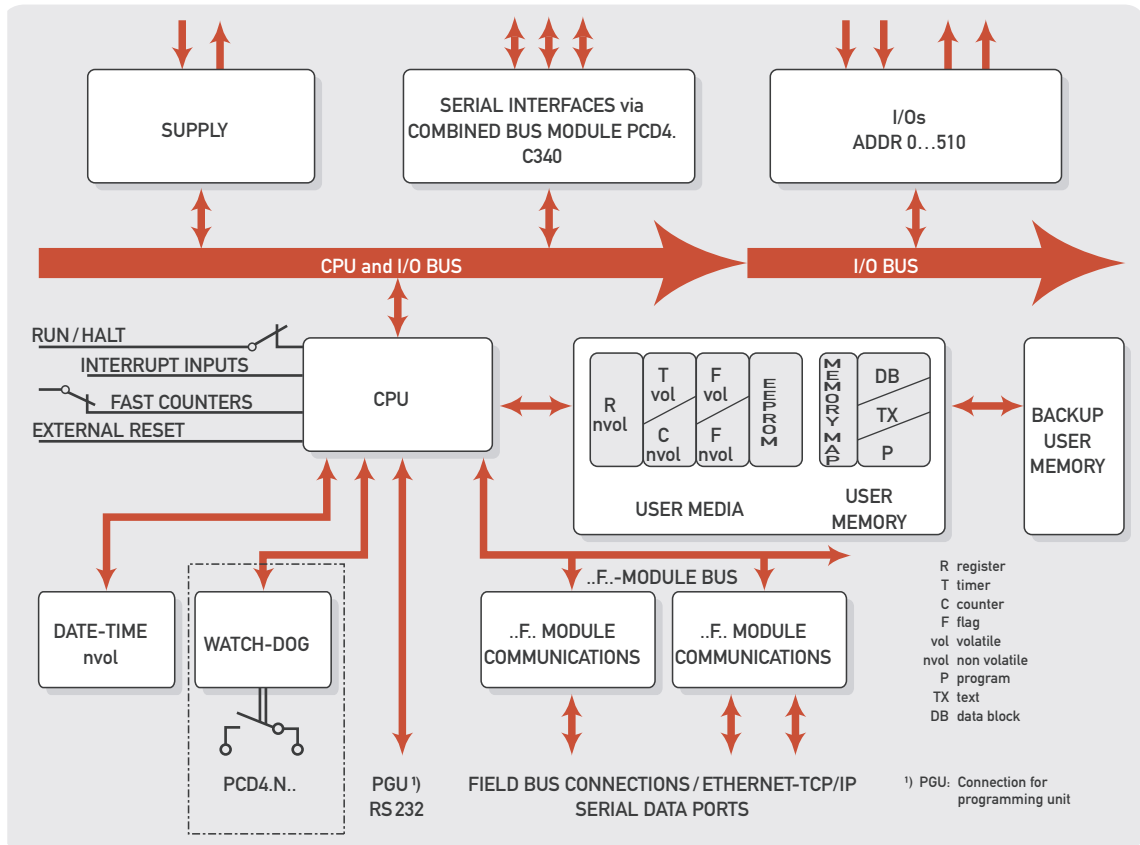
R register
T timer
C counter
F flag
vol volatile
nvol non volatile
P program
TX text
DB data block

1) PGU: Connection for programming unit

Identical system resources for the entire PCD family

Registers	4096×32 bit, non-volatile
Computational ranges	Integers: $-2\,147\,483\,648\ldots$ $+2\,147\,483\,647$ $(-2^{31}\ldots+2^{31}-1)$ Floating-point numbers: $\pm 9.22337 \times 10^{18}\ldots\pm 5.42101 \times 10^{-20}$ Formats: decimal, binary, BCD, hexadecimal or floating point
Index registers	17×13 bit (1 each per COB and XOB)
Timers/counters	1600 volatile timers or non-volatile counters, division programmable Counting range: 31 bit, unsigned $(0\ldots 2\,147\,483\,647)$ Timing range: 31 bit, unsigned $(0\ldots 2\,147\,483\,647$ timing signals, selectable from 10 ms up to 10 s)
Flags	8192×1 bit, volatile or non-volatile, division programmable
Date-time	Time values: s/min/h, week/day of week, month/day of month, year Accuracy: better than 60 s/month Power reserve: 1 to 3 years

Advantages of 1 MByte flash card for the PCD4.M170


The PCD7.R400 flash card offers the following capabilities:

– Backup for user program
– Automatic loading if no user program is present in RAM on start-up
– Simple, convenient program change
– Prompt loading of diagnostic program

For some of these functions the programming unit is not required: activating the load switch transmits the contents of the flash-card to RAM memory.

Operating system and user memory

Structure of program, operating system and hardware
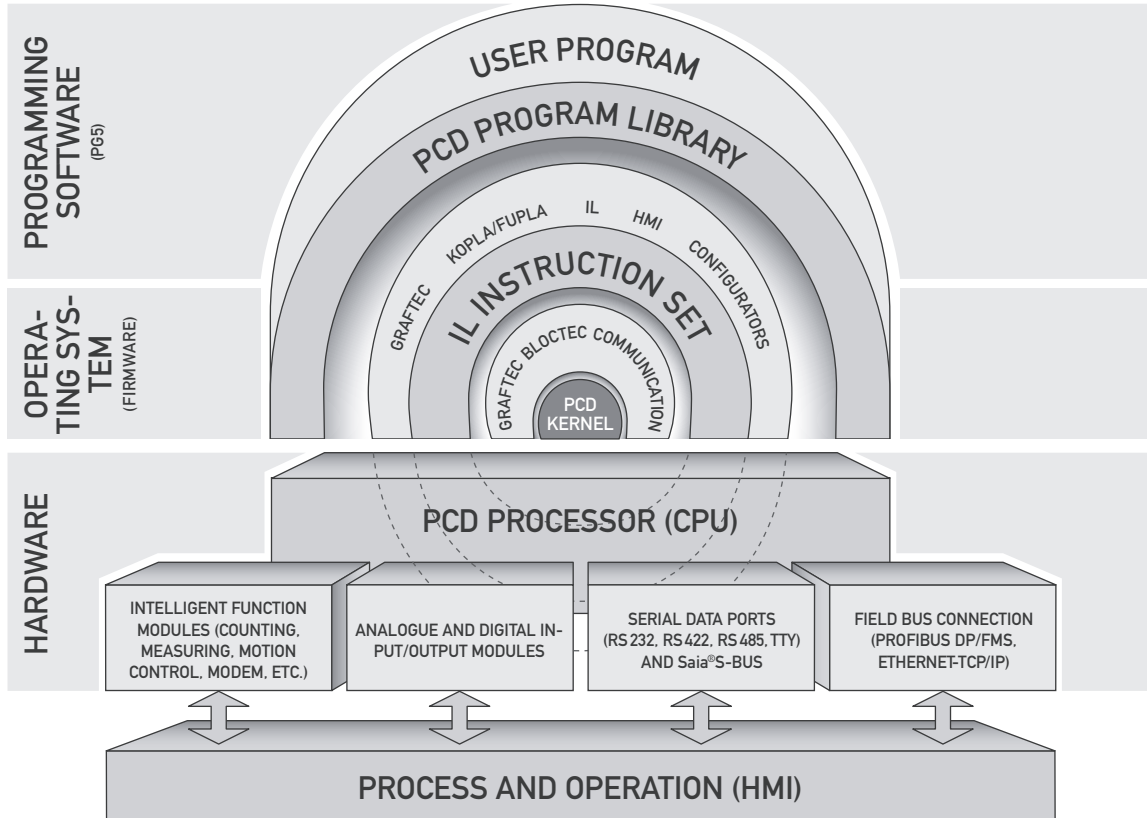
Excellent customer benefit arising from ideally matched components and subsystems, due to full in-house development of operating systems, hardware, firmware and programming software. The following documentation provides detailed information: for PG5 programming tool see 26/362; for operating system see 26/354.

Expandable and flexible user memory

The PCD4.M170 processor module already includes 1 MByte of buffered RAM user memory in its standard equipment.

With the other processor modules, user memory is located in one of the plug-on central memory modules. The PCD7.R110 public memory module with 2 sockets can be fitted with either RAM or EPROM up to a maximum of 256 KBytes of user memory. The universal PCD7.R310 public memory module allows flexibility in equipping the user memory up to 428 KBytes with RAM or a combination of RAM and EPROM. It has standard provision for 172 KBytes of RAM memory, and can be expanded with RAM or EPROM components up to an additional 256 KBytes.

Total available user memory can practically be divided at will into sectors for program, text and data blocks. This enables the requirements of any particular application to be met in the best possible way. With the instructions available, data can be transferred under the other user media, such as flags, registers, timers and counters. The following values are valid:

– 1 register content (32 bit) occupies 4 bytes in the data block range and 8 bytes in the text range

– 1 text character occupies 1 byte

– 1 program line occupies 4 bytes

Processor modules PCD4.M..

Processor modules differ as follows

	PCD4.M110	PCD4.M125	PCD4.M145	PCD4.M445	PCD4.M170
Number of inputs/outputs or I/O module sockets	510 [1] 32	510 [1] 32	510 [1] 32	510 [1] 32	510 [1] 32
Number of CPUs	1	1	1	2	1
Processing time — bit command — word command	6 µs 35 µs	4 µs 20 µs	4 µs 20 µs	4 µs 20 µs	2 µs 10 µs
Serial data ports PGU, sockets on bus or processor modules	1 (PGU) RS 232	1 + 1 RS 232, RS 422, RS 485, TTY/ current loop 20 mA	1 + 3 RS 232, RS 422, RS 485, TTY/ current loop 20 mA	1 + 3 RS 232, RS 422, RS 485, TTY/ current loop 20 mA	1 + 3 + 2 RS 232, RS 422, RS 485, TTY/ current loop 20 mA
Field bus connections	Saia®S-Bus	Saia®S-Bus	Saia®S-Bus	Saia®S-Bus PROFIBUS FMS	Saia®S-Bus PROFIBUS FMS PROFIBUS DP
Network connections	no	no	no	no	Ethernet-TCP/IP
User memory RAM standard equipment Expansion with RAM or EPROM	0…172 KBytes [2] up to 428 KBytes [2]	0…172 KBytes [2] up to 428 KBytes [2]	0…172 KBytes [2] up to 428 KBytes [2]	0…172 KBytes [2] up to 428 KBytes [2]	1024 KBytes 1024 KBytes (..R400)
Date-time	yes	yes	yes	yes	yes
Data protection and power reserve for real-time clock	>2 month (battery)	>2 month (battery)	>2 month (battery)	>2 month (battery)	1–3 years with lithium battery
Interrupt inputs or fast counter inputs	no –	no –	no –	no –	2 1 kHz

[1] With 32 × PCD4.B900 modules an I/O capacity of 512 I plus 512 O is achieved.
[2] Via central memory module with memory modules plugged on.

General technical data

Supply voltage	24 VDC ±20% smoothed or 19 VAC ±15% full-wave rectified
Power consumption	max. 48 W for 256 I/Os
Noise emission Noise immunity	CE mark according to EN 50 081-1 CE mark according to EN 50 082-2
Ambient temperature	Operation 0…+55 °C or 0…+40 °C (depending on mounting position) Storage –20…+85 °C
Atmospheric humidity	95% r.H. without dew formation (DIN 40 040, class F)
Mech. strength	according to EN/IEC 61 131-2
Standards/ approvals	EN/IEC 61 131-2, Germanischer Lloyd, Lloyd's Register of Shipping, Det Norske Veritas, Polski Rejestr Statków, UL-USA, American Bureau of Shipping, UL-CDN

Bus modules PCD4.C..

From a mechanical point of view, the bus modules form the backbone of the PCD4. There is a choice of different types of bus module onto which the cassette-style function modules are plugged, locked mechanically and electrically connected to the I/O or CPU bus.

The power supply modules PCD4.N.. and the processor modules PCD4.M.. are fitted to either the CPU bus module ..C100 or the combined bus module ..C340.

On the combined bus module three sockets are available that can be equipped, as required, with PCD7.F1.. communications modules. See next page for details.

Mounting is by a 35 mm dual mounting rail complying with DIN/EN 50 022. The required number of bus modules is snapped onto this rail and connected together electrically and mechanically.

Wiring to the external process can (and should) be done next. The clearly arranged screw terminals, 20 per module, accept wires of up to 1.5 mm² (including cable sleeve).

The I/O and function modules are plugged in immediately before commissioning the controller, and are protected against vibration with the locking slider (tested in accordance with IEC 1131).

The insertion of key tabs into the bus module connectors prevents any confusion of the modules, since each connector provides a unique code for each module type.

CPU bus module PCD4.C100 without serial data port
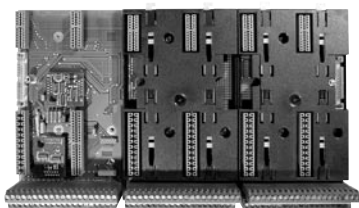
Combined bus module PCD4.C340 with 3 serial data ports and 4 I/O module sockets
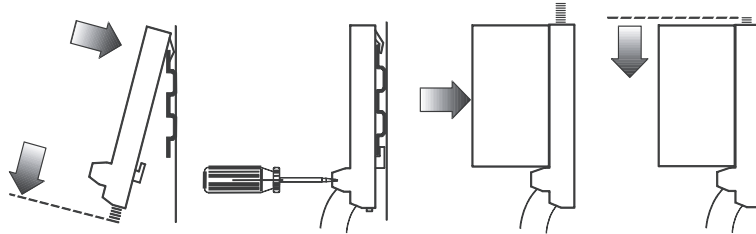
Mounting on 35 mm double top-hat rail

The combination of I/O bus modules with spaces for 2 (PCD4.C220) or 6 modules (PCD4.C260) permits up to 32 I/O modules to be arranged in any order with up to 5 connection plugs or up to a maximum length of 2.5 m.

I/O bus module PCD4.C260 with 6 module sockets

Mounting in a single row
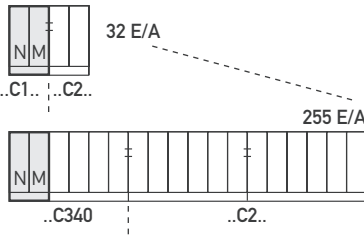
If the width of the controller's cabinet is not sufficient for a single row configuration, expansion to a maximum of four rows is possible using bus connecting cables.

Mounting in two rows with ..K200/..K210

ADDR 0…254
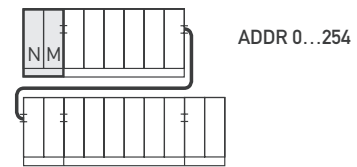
Mounting in three rows with ..K250 and ..K200/..K210

ADDR 256…510

ADDR 0…254
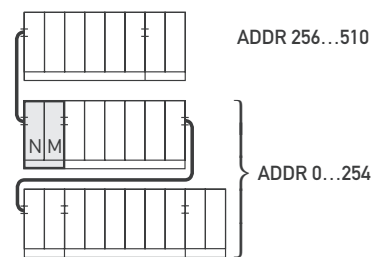
Mounting in four rows with ..K260 and ..K200/..K210

ADDR 256…510

ADDR 0…254
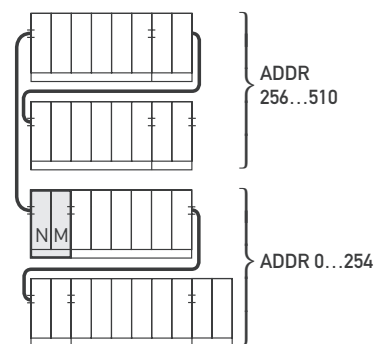
Bus extension cables

PCD4.K200: 100 cm length
PCD4.K210: 80 cm length
PCD4.K250: 32 cm length
PCD4.K260: 72 cm length

Communications possibilities with PCD4

Combined bus module PCD4.C340

3 sockets for serial data ports (socket A1 for modem connection)

Processor module PCD4.M170

Flash card PCD7. R400

Terminals 40…49

PGU connector

B2 connector

B1 connector

TCP/IP plug

Terminals 0…9 (interrupt/counter)

Socket B1 for PROFIBUS DP or FMS connection modules and socket B2 for PROFIBUS DP, Ethernet-TCP/IP connection modules or serial data port

Serial data ports

The PCD supports a large number of protocols for connecting very diverse peripheral devices, such as printers, weighing machines, barcode readers, terminals or other controllers.

Technical data

Baud rate	up to 38.4 kBit/s (TTY/current loop 20 mA up to 9600 Bit/s)
Protocols	– MC mode for single character
	– MD mode for full-duplex exchange of data
	– S-Bus mode for half-duplex, software library available
	– user definable ASCII driver

Field bus connections

Saia®S-Bus

Saia®S-Bus, with its safe and easy protocol, is already available in the standard equipment (without additional modules) of all PCDs as master or slave. For details see Technical Information 26/370.

Technical data

Master connection	38.4 kBit/s (high net data rates due to low protocol overhead), up to 4 masters via gateway function
Slave connection	up to 254 slaves in segments of 32 stations each

PROFIBUS DP and PROFIBUS FMS

For the field level in industrial automation, PROFIBUS DP and FMS are provided as standardized, open network protocols for data transfer. See documentation 26/951 for details.

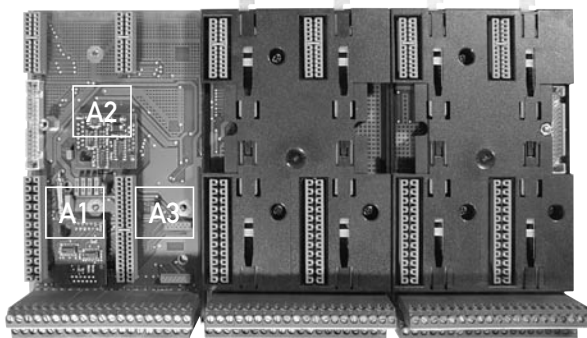Technical data PROFIBUS DP

Master connection	12 MBit/s, up to 4 masters
Slave connection	up to 124 slaves in segments of 32 stations each

Technical data PROFIBUS FMS

Connection	up to 500 kBit/s, up to 126 parties in segments of 32 stations each

Network connections

Ethernet–TCP/IP

The intelligent co-processor module provides the PCD with access to the Ethernet. For details see Technical Information 26/356.

Technical data

Connection	10 Base-T/100 Base TX (RJ 45)
Speed	10/100 MBit/s (autosensing)
Protocols and services	TCP/IP or UDP/IP Saia®S-Bus with UDP/IP for PG5⇔PCD communication, PCD⇔PCD multimaster communication and SCADA⇔PCD communication

Telecommunication via modem

Digital and analogue modem modules, combined with the appropriate modem software library, enable telecommunication with the PCD. Great distances can therefore be overcome quickly and easily, and costs can be saved.

■ SMS messages can be transmitted directly from the PCD.
■ Data exchange across great distances via modem.

Other connections

Depending on the application, the following hardware and/or software solutions are available: EIB, MP-Bus for BELIMO, M-Bus, Modbus RTU and ASCII, Siemens 3964R, Cerberus, GENIbus for Grundfos, STX-Bus for NeoVac, TwiLine, JCI-N2-Bus, BACnet.

Communications capabilities

Overview of communications modules

Serial data ports at sockets A1, A2 or A3

PCD7.F110: RS 422 with RTS/CTS or RS 485 electrically connected, with line termination resistors capable of activation, suitable for S-Bus

PCD7.F120: RS 232 with RTS/CTS, DTR/DSR, DCD, suitable for modem connection

PCD7.F130: TTY/current loop 20 mA (active or passive)

PCD7.F150: RS 485 electrically isolated, with line termination resistors capable of activation, suitable for S-Bus

Serial data ports at socket B2

PCD2.F520: RS 232 with RTS/CTS and RS 422 without RTS/CTS, or RS 485 electrically connected

PCD2.F522: choice possible between 2 × RS 232 with RTS/CTS or 1 × RS 232 full with RTS/CTS, DTR/DSR, DCD, suitable for modem connection

Without add-on module (PGU connector): RS 232 with RTS/CTS, electrically connected

PROFIBUS connection modules at socket B1 and/or B2

PCD7.F700: for connection of PROFIBUS FMS

PCD7.F750: for connection of PROFIBUS DP as master

PCD7.F770: for connection of PROFIBUS DP as slave

PCD7.F772: for connection of PROFIBUS DP as slave and with electrically isolated RS 485 port

Ethernet-TCP/IP connection module at socket B2

PCD7.F65x: intelligent interface module for connection to Ethernet-TCP/IP

Processor module and sockets for communications modules		Socket	Plug-on communications modules										
			PCD4.C340				PCD4.M170						
			PCD7.F110	PCD7.F120 [1]	PCD7.F130	PCD7.F150	PCD2.F520	PCD2.F522 [1]	PCD7.F700	PCD7.F750	PCD7.F770	PCD7.F772	PCD7.F65x
PCD4.M110	..M110 ..C100 / Port 0 (PGU), RS 232	A1	–	–	–	–	–	–	–	–	–	–	–
		A2	–	–	–	–	–	–	–	–	–	–	–
		A3	–	–	–	–	–	–	–	–	–	–	–
PCD4.M125	..M125 ..C340 / Port 0 (PGU), RS 232 / A1 → Port 1	A1	■	■	■	■	–	–	–	–	–	–	–
		A2	–	–	–	–	–	–	–	–	–	–	–
		A3	–	–	–	–	–	–	–	–	–	–	–
PCD4.M145	..M145 ..C340 / A2 → Port 2 / A1 A3 → Port 3 Port 1 / Port 0 (PGU), RS 232	A1	■	■	■	■	–	–	–	–	–	–	–
		A2	■	■	■	■	–	–	–	–	–	–	–
		A3	■	■	■	■	–	–	–	–	–	–	–
PCD4.M170	..M170 ..C340 / Port 0 (PGU), RS 232 / B1 A2 → Port 2 / B2 A1 A3 → Port 3 Port 1 / Port 4 / Port 5	A1	■	■	■	■	–	–	–	–	–	–	–
		A2	■	■	■	■	–	–	–	–	–	–	–
		A3	■	■	■	■	–	–	–	–	–	–	–
		B1	–	–	–	–	–	–	■	■	■ [3]	–	–
		B2	–	–	–	–	■	■	–	■	■ [3]	■	■
PCD4.M445	..M445 ..C340 / PROFIBUS FMS [2] / A2 → Port 2 / A1 A3 → Port 3 Port 1 / Port 0 (PGU), RS 232	A1	■	■	■	■	–	–	–	–	–	–	–
		A2	■	■	■	■	–	–	–	–	–	–	–
		A3	■	■	■	■	–	–	–	–	–	–	–

[1]) Suitable for modem connection due to provision of 6 control lines (PCD7.F120 always plugs onto socket A1).
[2]) The PCD4.M170 is recommended for PROFIBUS FMS.
[3]) The following combinations are not possible: 2 × PROFIBUS DP Slave

Power supply modules PCD4.N..
Dimensions

Power supply modules

PCD4.N200	Basic version, for digital I/O modules only	
	Supply voltage	24 VDC ±20% smoothed or 19 VAC ±15% full-wave rectified
	Current consumption	max. 2.5 A at 24 VDC
	Output current	4.0 A at +5 VDC
PCD4.N210	With Run/Halt and Clear switches, for all digital and analogue I/O modules and the ..H.. function modules	
	Supply voltage	24 VDC ±20% smoothed or 19 VAC ±15% full-wave rectified
	Current consumption	max. 2.5 A at 24 VDC
	Output current	4.0 A at +5 VDC 0.5 A at +15 VDC 0.45 A at –15 VDC

The power supply module is fitted on the left, next to the processor module on the PCD4.C100 or ..C340 bus module. Its output is sufficient to cover the internal power requirements of 512 I/Os or 32 digital I/O modules. If several ..W.. or ..H.. modules are used, consult the power requirements table in the hardware manual.

– Monitoring of 24 VDC input voltage, with reset circuit.

– Monitoring of +5 VDC and ±15 VDC output voltage and the charge level of the back-up battery.

– Watchdog monitoring circuit checks the regular processing of the user program and enables effective safety measures to be taken if errors occur. A potential-free relay contact has been provided for this, with a switching capacity of 0.5 A at 48 VAC/VDC.

– LED display of the processor's operating state.

– Some analogue ..W.. modules and the complex PCD4.H.. modules require stabilized voltages of ±15 V. These are provided by the PCD4.N210 power supply module.

– There are two manual switches Run/Halt (CPU status) and Clear (reset elements) on the PCD4.N210 power supply module. Switch functions are enabled with a jumper.

Dimensions

Digital input/output modules

Overview of digital input/output modules

Type	Total I/Os	Input voltage	Breaking capacity DC	AC	Input filter	Electrical isolation	Current draw [1]
PCD4.E110	16 I	15…30 VDC [2]			8 ms	no	typ. 25 mA
PCD4.E111	16 I	15…30 VDC [2]			0.1 ms	no	typ. 25 mA
PCD4.E600	16 I	15…30 VDC [3]			8 ms	yes	typ. 25 mA
PCD4.E601	16 I	15…30 VDC [3]			0.3 ms	yes	typ. 25 mA
PCD4.B900	16 I +	18…35 VDC			9 ms	no	typ. 50 mA
	16 O, transistor		0.5 A/5…32 VDC			no	
PCD4.A400	16 O, transistor		0.5 A/5…32 VDC			no	typ. 25 mA
PCD4.A410	16 O, transistor		0.5 A/5…32 VDC			yes	typ. 25 mA
PCD4.A350	8 O, transistor		2 A/8…32 VDC			yes [4]	typ. 15 mA
PCD4.A200	8 O, relay (make)		2 A/50 VDC	2 A/250 VAC		yes [5]	typ. 15 mA
PCD4.A250	16 O, relay (make)		2 A/50 VDC	2 A/250 VAC		yes	typ. 25 mA

[1] Current draw from internal 5 V bus (depending on number of active input or output channels), loading capacity max. 4000 mA
[2] Special: 5 VDC, 12 VDC, 48 VDC
[3] Special: 5 VDC, 48 VDC
[4] with short-circuit protection
[5] with contact protection

In order to ensure the highest level of interference immunity, all digital I/O modules have passed the stringent 4 kV interference tests in accordance with IEC 1000-l4-4.

These modules can be installed in any I/O bus module position. Key tabs can be fitted to each bus module to prevent modules being inserted in the wrong locations.

LEDs on the front panel of each I/O module indicate the process state. Absolute I/O addresses are shown on slide-in front panel labels, on which individual descriptions can be written.

Input modules with 16 inputs, 24 VDC

Number of inputs	16, electrically connected
Input voltage	24 VDC (special: 5 VDC, 12 VDC, 48 VDC)
Input signal	low –30…+5 V high 15…30 V
Input current	8 mA at 24 VDC
Current draw internally from 5 V bus	typ. 25 mA (max. 45 mA)

Connection diagram (terminals on bus module)

Source operation: switch open = signal state low, LED off
Sink operation: switch open = signal state high, LED on
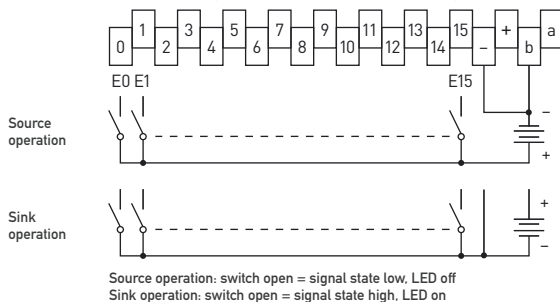
PCD4.E110   Input delay typ. 8 ms (unsmoothed voltage possible)
PCD4.E111   Input delay typ. 0.1 ms (smoothed voltage required)

Input modules with 16 inputs, 24 VDC, electrically isolated

Number of inputs	16, electrically isolated, source operation
Input voltage	24 VDC (special: 5 VDC, 48 VDC)
Input signal	low –30…+5 V High 15…30 V
Input current	7 mA at 24 VDC
Current draw internally from 5 V bus	typ. 25 mA (max. 45 mA)

Connection diagram (terminals on bus module)

Source operation: switch open = signal state low, LED off
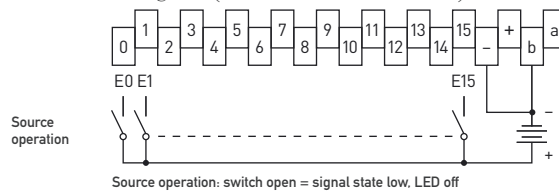
PCD4.E600   Input delay typ. 8 ms (unsmoothed voltage possible)
PCD4.E601   Input delay typ. 0.3 ms (smoothed voltage required)

Digital input/output modules

Relay output module with 8 "make" contacts, 2 A/250 VAC or 2 A/50 VDC

Number of outputs	8, electrically isolated "make" contacts, protected
Breaking capacity	2 A, 250 VAC AC1 1 A, 250 VAC AC11 2 A, 50 VDC DC1 1 A, 24 VDC DC11
Contact protection	VDR and RC
Supply voltage	24 VDC, smoothed or pulsed
Output delay	typ. 5 ms at 24 VDC
Current draw internally from 5 V bus	typ. 15 mA (max. 25 mA)
externally	8 mA per relay [1]

Connection diagram (terminals on bus module)

Relay excited (contact closed) = LED on

PCD4.A200 Relay output module with 8 "make" contacts, 2 A/250 VAC or 2 A/50 VDC

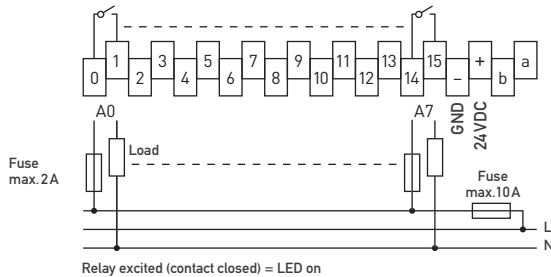[1] Notes: If the relay contact is open, the current leakage through the contact protector is 0.7 mA (at 230 V/50 Hz). This should be taken into account for the smaller AC loads.

Relay output module with 16 "make" contacts, 2 A/250 VAC or 2 A/50 VDC

Number of outputs	16 "make" contacts in 4 groups
Breaking capacity	2 A, 250 VAC AC1 1 A, 250 VAC AC11 2 A, 50 VDC DC1 1 A, 24 VDC DC11
Supply voltage	24 VDC, smoothed or pulsed
Output delay	typ. 5 ms at 24 VDC
Current draw internally from 5 V bus	typ. 25 mA (max. 45 mA)
externally	8 mA per relay

Connection diagram (terminals on bus module)

Relay excited (contact closed) = LED on
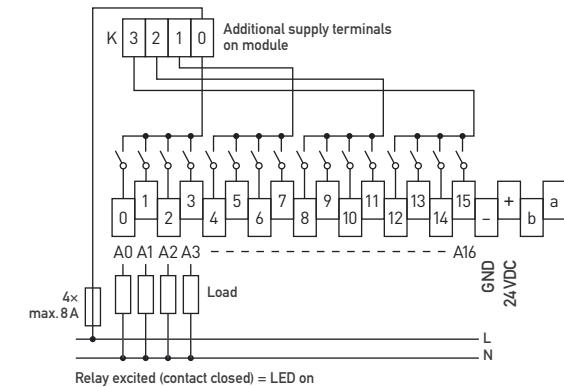
PCD4.A250 Relay output module with 16 "make" contacts, 2 A/250 VAC or 2 A/50 VDC

Transistor output module with 8 outputs, 2 A/24 VDC, electrically isolated, with short–circuit protection

Number of outputs	8, electrically isolated, source operation
Breaking capacity	max. 2 A in range 8...32 VDC smoothed
Voltage drop	max. 2 V at 2 A
Output delay	typ. 10 μs (on) typ. 100 μs (off)
Current draw internally from 5 V bus	typ. 15 mA (max. 25 mA)

Connection diagram (terminals on bus module)

Output transmitting (set) = LED on
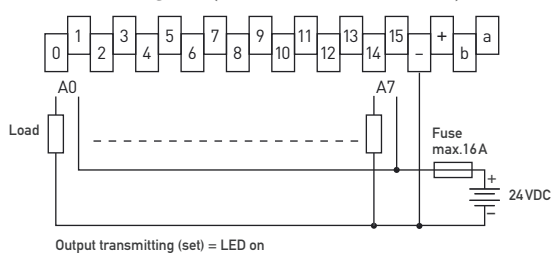
PCD4.A350 Transistor output module with 8 outputs, 24 VDC/2 A

Transistor output module with 16 outputs, 0.5 A/24 VDC

Number of outputs	16, electrically connected, source operation
Output current	5...500 mA
Overall power	8 A at continuous duty (per module)
Voltage range	5...32 VDC smoothed 10...27 VDC pulsed
Voltage drop	max. 0.3 V at 0.5 A
Output delay	typ. 10 μs (on) typ. 50 μs (off)
Current draw internally from 5 V bus	typ. 25 mA (max. 45 mA)

Connection diagram (terminals on bus module)

Output transmitting (set) = LED on
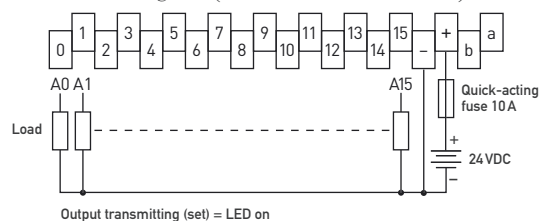
PCD4.A400 Transistor output module with 16 outputs, 24 VDC/0.5 A

Digital input/output modules

Transistor output module with 16 outputs, 0.5 A/24 VDC, electrically isolated

Number of outputs	16, electrically isolated, source operation
Output current	1…500 mA
Overall power	8 A at continuous duty (per module)
Voltage range	5…32 VDC smoothed 10…27 VDC pulsed
Voltage drop	max. 0.3 V at 0.5 A
Output delay	max. 5 µs (on) max. 500 µs (off)
Current draw	
internally from 5 V bus	typ. 25 mA (max. 45 mA)

Connection diagram (terminals on bus module)

Output transmitting (set) = LED on
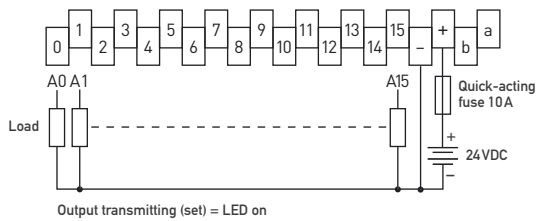
PCD4.A410   Transistor output module with 16 outputs, 24 VDC/0.5 A, electrically isolated

Combined input/output module

with 16 inputs 24 VDC/9 ms and 16 transistor outputs 0.5 A/ 5…32 VDC, enabling the maximum input/output capacity of 510 I plus 510 O to be achieved.

Number of inputs	16, electrically connected, source operation
Input voltage	24 VDC, smoothed or pulsed
Input signal	low −32…+4.8 V high 18…35 V
Input current	8 mA at 24 VDC
Input delay	typ. 9 ms
Number of outputs	16, electrically connected, source operation
Output current	5…500 mA
Overall power	6 A at continuous duty (per module)
Voltage range	5…32 VDC smoothed 10…27 VDC pulsed
Voltage drop	1 V at 0.5 A
Output delay	10 µs
Current draw	
internally from 5 V bus	typ. 50 mA (max. 95 mA)

Connection diagram (terminals on bus module)
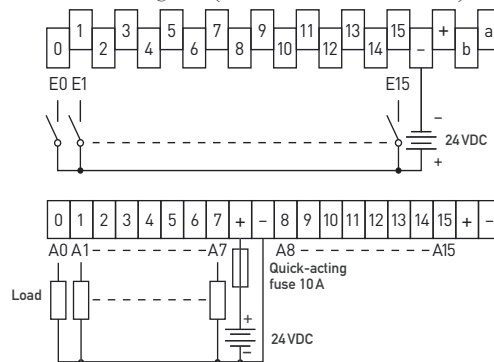
Regarding inputs:
switch open = signal state low, LED off

Regarding outputs:
Output transmitting (set) = LED on

PCD4.B900   Combined input/output module with 16 inputs and 16 transistor outputs

Analogue input/output modules

Overview of analogue input/output modules

Type	Total channels	Signal ranges	Resolution (conversion time)	Current draw 5 V bus [1]	15 V bus [2]
PCD4.W300	8 I (2 × 4)	−10 V…+10 V / −1 V…+1 V / −100 mV…+100 mV −20 mA…+20 mA [7] / +4 mA…+20 mA [3] Pt/Ni 1000, −50…+150 °C [4]	12 bit + sign bit (≤120 ms)	30 mA	16 mA
	4 I (1 × 4)	Pt/Ni 1000 / Pt/Ni 100 [5]			
PCD4.W500 ei [6]	8 I (2 × 4)	0 V…+10 V / −10 V…+10 V / 0 V…+1 V / −1 V…+1 V 0 mA…+20 mA [7] / +4 mA…+20 mA [3] Pt/Ni 1000, −50…+150 °C [4]	12 up to 15 bit (≤100 µs)	150 mA	3 mA
	4 I (1 × 4)	Pt/Ni 1000 / Pt/Ni 100 [5]			
PCD4.W100	4 I (1 × 4)	0 V…+10 V / −10 V…+10 V / −5 V…+5 V 0 mA…+20 mA [7] / −20 mA…+20 mA / −10 mA…+10 mA 2 × Pt/Ni 1000 [5] + 2 × 0…+10 V	12 bit (≤30 µs)	50 mA	35 mA
	+2 O (2 × 1)	0 V…+10 V / 0 V…+1 V / −10 V…+10 V / −1 V…+1 V / −10 V…0 V 0 mA…+20 mA / +4 mA…+20 mA	(≤20 µs)		
PCD4.W400	8 O (2 × 4)	0 V…+10 V 0 mA…+20 mA / +4 mA…+20 mA	8 bit (≤5 µs)	10 mA	30 mA
PCD2.W600 ei [6]	8 O (2 × 4)	0 V….+10 V / −10 V…+10 V 0 mA…+20 mA / +4 mA…+20 mA	12 bit (0.1…0.8 ms)	200 mA	3 mA

[1] Current draw from internal 5 V bus, loading capacity max. 4000 mA
[2] Current draw from internal 15 V bus, loading capacity max. 500 mA
[3] for two-wire transducers
[4] two wires
[5] four wires
[6] electrically isolated
[7] +4…+20 mA via user program

PCD4 analogue modules have a modular structure and can be specifically adapted to the requirements of the application with plug-in and/or switchable signal ranges. The powerful Saia®PCD instruction set can be used not only to monitor limit values, but also to easily create unlimited two-point, three-point and PID control loops. Simple routines for signal handling can be found in the relevant manuals. In addition, the PG5 programming tools support the user by providing function blocks with easy-to-set parameters.

For analogue modules that do not have electrical isolation, the KFD1 series of external isolating amplifiers is available if needed. For details see Technical Information 26/328.
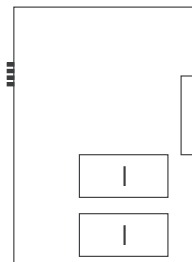
PCD4.W300

4 inputs or 4 outputs 2 mA for Pt/Ni

4 inputs or 4 Pt/Ni 100 or Pt/Ni 1000
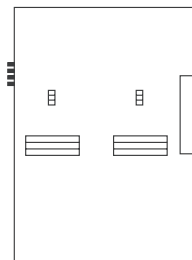
PCD4.W400

Jumpers for selection of the 8 output signals (individually selectable in groups of 4)
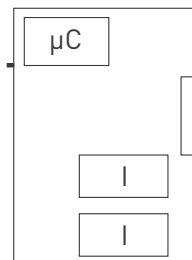
PCD4.W500

4 inputs or 4 outputs 2 mA for Pt/Ni

4 inputs or 4 Pt/Ni 100 or Pt/Ni 1000

Overview of base modules and sockets for range modules

PCD4.W100

2 × 1 output

4 inputs or 2 Pt/Ni 1000 each at 2 mA plus 2 × 0…10 V
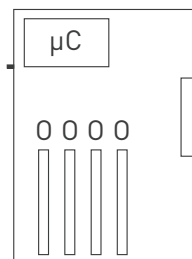
PCD4.W600

Spaces for inserting 4 × 2 outputs

Manual operation modules

Analogue module with 4 input channels and max. 2 output channels, resolution 12 bit

Input channels	4 (1×4) or
	2 Pt/Ni 1000 (four wires)
	plus 2×0…10 V
Input filter	1 ms
Accuracy	±0.5 % unipolar
	±0.6 % bipolar
Output channels	max. 2 (2×1),
	short-circuit proof
D/A conversion time	max. 20 µs
Accuracy	max. ±1.5 % voltage
	max. ±1.65 % current
Resolution	12 bit (0…4095)
Potential isolation	no
Current draw	
internally from 5 V bus	50 mA

Connection diagram (terminals on bus module)

| 0 | 1 | | 3 | | 5 | | 7 | | 9 | | 11 | | 13 | | 15 | | + | | a |
| | 2 | | 4 | | 6 | | 8 | | 10 | | 12 | | 14 | | – | | b |

– + – + – + – + OUT– OUT– SENSE– SENSE+ OUT+ OUT+ SENSE– SENSE+ GND U+ RTD1+ RTD1–
E0 E1 E2 E3
                    A12   A13
Inputs 0…4   Outputs 1 and 2

PCD4.W100	**Basic module**
	Plug-in range modules,
	signal ranges (load impedance):
PCD7.W101 [1]	4 input channels for 0…10 V, ±10 V, ±5 V
	or 2 Pt/Ni 1000 (four-wire connection)
	plus 2×0…10 V
PCD7.W105	4 input channels for 0…20 mA, ±20 mA,
	±10 mA (4…20 mA via user program)
PCD7.W200	1 output channel 0…10 V (≥3 kΩ)
PCD7.W201	1 output channel 0…1 V (≥500 Ω)
PCD7.W202	1 output channel ±10 V (≥3 kΩ)
PCD7.W203	1 output channel ±1 V (≥500 Ω)
PCD7.W204	1 output channel 0…20 mA (≤500 Ω)
PCD7.W205	1 output channel 4…20 mA (≤500 Ω)
PCD7.W206	1 output channel –10…0 V (≥3 kΩ)

[1] Other signal ranges on request

Analogue module with up to 8 input channels, resolution 12 bit + sign bit

Input channels	max. 8 (2×4) voltage
	current inputs
	max. 8 (2×4) Pt/Ni 1000
	with ..W110/..W111
	(two wires)
	max. 4 (1×4) Pt/Ni 100
	or 1000 (four wires)
Resolution	12 bit plus sign bit
	(±4095)
A/D conversion time	max. 120 ms
Environment	50 Hz environment
Accuracy	±0.35 %
Potential isolation	no
Current draw	
internally from 5 V bus	30 mA

Connection diagram (terminals on bus module)

| 0 | 1 | | 3 | | 5 | | 7 | | 9 | | 11 | | 13 | | 15 | | + | | a |
| | 2 | | 4 | | 6 | | 8 | | 10 | | 12 | | 14 | | – | | b |

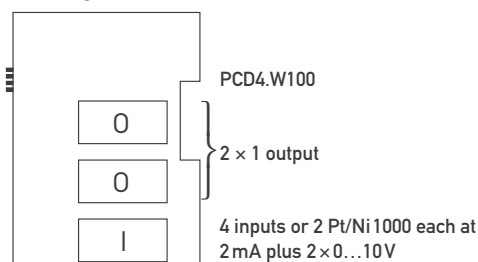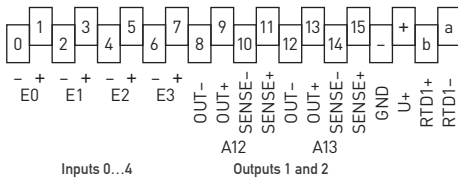– + – + – + – + – + – + – + – +
E0 E1 E2 E3 E4 E5 E6 E7 GND +24 VDC GND RTD+
Range module 1   Range module 2

PCD4.W300	**Basic module**
	1 or 2 plug-in range modules,
	signal ranges (load impedance):
PCD7.W100 [1]	Range module for 4 channels ±10 V or
	4 Pt/Ni 1000 (four-wire connection)
PCD7.W101 [1]	Range module for 4 channels ±1 V or
	4 Pt/Ni 100 (four-wire connection)
PCD7.W102	Range module for 4 channels ±100 mV
PCD7.W103	Range module for 4 channels ±20 mA
	or 4…20 mA
PCD7.W104	Range module for 4 channels 4…20 mA
	for two-wire transducers
PCD7.W110	Range module for 4 channels Pt 1000 with a
	temperature range of –50…+150 °C and a
	resolution of 0.1 °C (two-wire connection)
PCD7.W111	Range module for 4 channels Ni 1000 with a
	temperature range of –50…+150 °C and a
	resolution of 0.1 °C (two-wire connection)
PCD7.W120	4 stabilized current outputs of 2 mA for
	4 Pt/Ni 100 and Pt/Ni 1000 resistance thermo-
	meter (four-wire connection)

[1] Other signal ranges on request

Analogue module with 8 output channels, resolution 8 bit

Output channels	8 (2×4),
	short-circuit proof
Resolution	8 bit (0…255)
D/A conversion time	max. 5 µs
Accuracy	±1.5 % voltage
	±2.0 % current
Potential isolation	no
Current draw	
internally from 5 V bus	10 mA
Signal ranges	individually selectable
(load impedance)	in groups of 4:
	0…10 V (≥3 kΩ)
	0…20 mA (≤500 Ω)
	4…20 mA (≤500 Ω)

Connection diagram (terminals on bus module)

| 0 | 1 | | 3 | | 5 | | 7 | | 9 | | 11 | | 13 | | 15 | | – | | a |
| | 2 | | 4 | | 6 | | 8 | | 10 | | 12 | | 14 | | + | | b |

– + – + – + – + – + – + – + – +
A0 A1 A2 A3 A4 A5 A6 A7 GND +24 VDC

PCD4.W400	Analogue module with 8 output channels

Analogue input/output modules, electrically isolated

Analogue module with up to 8 input channels, electrical isolated, resolution 12 up to 15 bit

A microcontroller enables intelligent functions to be executed without placing any load on the central processor module:

- Single-shot or continuous measurement
- Comparison functions with 2 limiting values per input and adjustable hysteresis
- User-definable scaling for range and offset
- Linearization and conversion to °C if standard temperature sensors are used
- Status information, e.g. wire break, short circuit or error

Input channels	max. 8 (2×4) voltage or current inputs
	max. 8 (2×4) Pt/Ni 1000 with ..W110/..W111 (two wires)
	max. 4 (1×4) Pt/Ni 100 or 1000 (four wires)
Resolution	12 bit (0…4095) up to max. 15 bit (0…32 767)
Input filter	1 ms
Accuracy	±0.3 %
Potential isolation	500 VDC between PCD-GND and module-GND
Current draw internally from 5 V bus	150 mA

Connection diagram (terminals on bus module)

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | – | + | a | b |

```
 –  +  –  +  –  +  –  +  –  +  –  +  –  +  –  +
 E0    E1    E2    E3    E4    E5    E6    E7   GND  +24 VDC
   Range module 1          Range module 2
```

PCD4.W500 Basic module

1 or 2 plug-in range modules, signal ranges (load impedance):

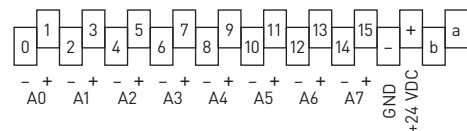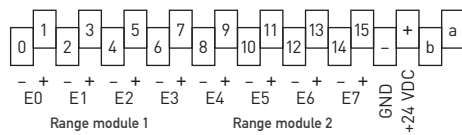|	
PCD7.W100	Range module for 4 channels 0…10 V or ±10 V
PCD7.W101	Range module for 4 channels 0…1 V, ±1 V or 4 Pt/Ni 100 or Pt/Ni 1000 (four-wire connection)
PCD7.W103	Range module for 4 channels 0…20 mA or 4…20 mA
PCD7.W104	Range module for 4 channels 4…20 mA for two-wire transducers
PCD7.W110	Range module for 4 channels Pt 1000 with a temperature range of –50…+150 °C and a resolution of 0.1 °C (two-wire connection)
PCD7.W111	Range module for 4 channels Ni 1000 with a temperature range of –50…+150 °C and a resolution of 0.1 °C (two-wire connection)
PCD7.W120	4 stabilized current outputs of 2 mA for 4 Pt/Ni 100 or Pt/Ni 1000 resistance thermometer (four-wire connection)

Analogue module with up to 8 output channels, electrical isolated, resolution 12 bit

A microcontroller enables intelligent functions to be executed without placing any load on the central processor module:

- Single-shot or synchronous updating
- User-definable scaling for range and offset

Output channels	8 (4×2), short-circuit proof
Resolution	12 bit (0…4095)
D/A conversion time	0.1 ms with voltage (ohmic load)
	0.8 ms with voltage (capacitive load)
	0.3 ms with current
Accuracy	±0.3 % voltage
	±0.3 % current
Potential isolation	500 VDC between PCD-GND and module-GND
Current draw internally from 5 V bus	200 mA

Connection diagram (terminals on bus module)

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | – | + | a | b |

```
 –  +  –  +  –  +  –  +  –  +  –  +  –  +  –  +
 A0    A1    A2    A3    A4    A5    A6    A7   GND  +24 VDC
 Range        Range        Range        Range
 module 1     module 2     module 3     module 4
```
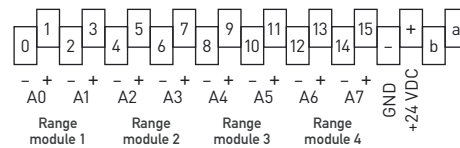
PCD4.W600 Basic module

1…4 plug-in range modules, signal ranges (load impedance):

PCD7.W300	2 output channels 0…10 V (≥3 kΩ)
PCD7.W302	2 output channels ±10 V (≥3 kΩ)
PCD7.W304	2 output channels 0…20 mA (≤500 Ω)
PCD7.W305	2 output channels 4…20 mA (≤500 Ω)

Manual operation modules with manual override

In order to guarantee the necessary trouble-free manual override, specific manual operation modules have been developed for the PCD4 series. These modules are based on digital and analogue output modules, which are activated either via the user program or via manual switches. Like all I/O modules, the manual operation modules are plugged onto the PCD4.C2.. I/O bus modules.

The manual operation modules offer the following advantages:

– The independent 24 VDC supply ensures manual operation of the installation under emergency override in case of controller failure.

– Additional wiring between standard output modules and a separate manual/emergency override level is not necessary, since all these functions are combined in the same module.

– Jumpers make it possible to determine the action (passive - on - off) of individual output channels if an alarm signal should arise (1 alarm input per module).

– The function states are indicated by LEDs on the front panel. Space on the label field allows individual information to be written. The manual switch positions and the status of outputs can be read at any time by the CPU via the I/O bus.

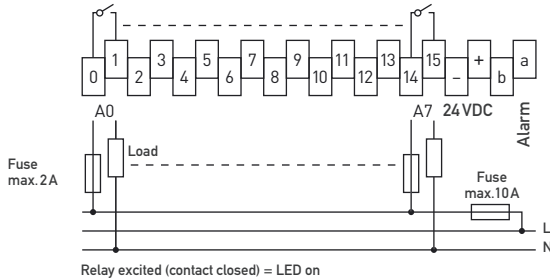## Digital, single-stage manual operation module with 8 "make" contacts, 2 A/250 VAC or 2 A/50 VDC

Switch positions	Auto / Man 0 - Man 1
Number of outputs	8, electrically isolated "make" contacts, protected
Breaking capacity	2 A, 250 VAC AC1
	1 A, 250 VAC AC11
	2 A, 50 VDC DC1
	1 A, 24 VDC DC11
Contact protection	VDR and RC
Supply voltage	24 VDC, smoothed or pulsed
Output delay	4…12 ms at 24 VDC
Current draw	
internally from 5 V bus	typ. 45 mA (max. 45 mA)
externally	8 mA per relay

Connection diagram (terminals on bus module)

Relay excited (contact closed) = LED on

PCD4.A810 Digital, single-stage manual operation module

Digital, dual-stage manual operation module with 8 "make" contacts, 2 A/250 VAC or 2 A/50 VDC

Switch positions	Auto / Man 1 - Man 0 - Man 2
Number of outputs	4 × 2 relays, electrically isolated "make" contacts, protected
Breaking capacity	2 A, 250 VAC AC1
	1 A, 250 VAC AC11
	2 A, 50 VDC DC1
	1 A, 24 VDC DC11
Contact protection	VDR and RC
Supply voltage	24 VDC, smoothed or pulsed
Output delay	4…12 ms at 24 VDC
Current draw	
internally from 5 V bus	typ. 45 mA (max. 45 mA)
externally	8 mA per relay

Connection diagram (terminals on bus module)

Relay excited (contact closed) = LED on
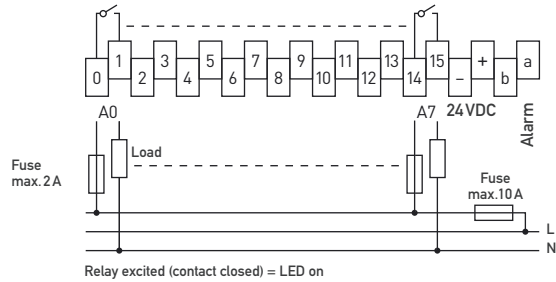
PCD4.A820 Digital, dual-stage manual operation module

Analogue manual operation module with 8 output channels, resolution 8 bit

Switch positions	Auto / Man
Potentiometer	0…100%
Display	10-LED array
Output channels	4, short-circuit proof
Resolution	8 bit (0…255)
D/A conversion time	max. 5 µs
Accuracy	±1.5 % voltage
	±2.0 % current
Potential isolation	no
Current draw	
internally from 5 V bus	10 mA
Signal ranges	individually selectable
(load impedance)	in groups of 4:
	0…10 V (≥3 kΩ)
	0…20 mA (≤500 Ω)
	4…20 mA (≤500 Ω)
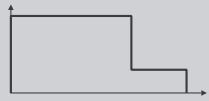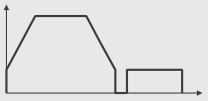
Connection diagram (terminals on bus module)

PCD4.W800 Analogue manual operation module

Modules for industrial axis control for stepper motors and servo drives

Overview of axis control with the PCD4

Modules	PCD4.H120	PCD4.H225	PCD4.H3..	PCD4.H4..
Velocity profile				
Drive	miscellaneous drives	stepper motor	servo motor	servo motor
Encoder or step frequency	max. 166 kHz	max. 20 kHz	max. 100 kHz	max. 150 kHz
Output	digital	square pulses	analogue, ±10 V, 12 bit	analogue, ±10 V, 16 bit
Counting range	±999 999	24 bit (16 777 215)	±30 bit (±1 073 741 823)	±31 bit (±2 147 483 647)
Max. number of axes	40	32	20	12

Wide range of functions

Within the Saia®PCD family, the PCD4 series offers the widest range of functions for general process and axis control. A variety of processor modules not only provide the user with a choice of communications mode, but also a complete selection of powerful axis control modules, plus digital and analogue I/Os. The PCD4 encompasses everything to do with industrial axis control: from asynchronous motors for simple, unregulated motion control, to stepper motors for precise step control, and ultimately servomotors for multi-axis control with linear and circular interpolation.

Highly adaptable

The control modules PCD4.H1.. to ..H4.. represent Saia's many years of experience in the axis control field. Every circuit has been developed from practice and can therefore be connected in series with practically every commonly used power stage or motor type.

Resources and detailed documentation

For programming, commissioning and documentation, Saia provides powerful, practical software tools, function blocks and comprehensive manuals.

Introduction and technical support

To get started more easily, you can join our workshops or make use of the technical support provided by our support engineers.

For more detailed information on these intelligent counting, measuring and motion control modules, please request brochure 26/309.

With this software package the user has access to all the functions of the powerful ..H4.. module, i.e. writing and testing motion programs and optimizing the control parameters.
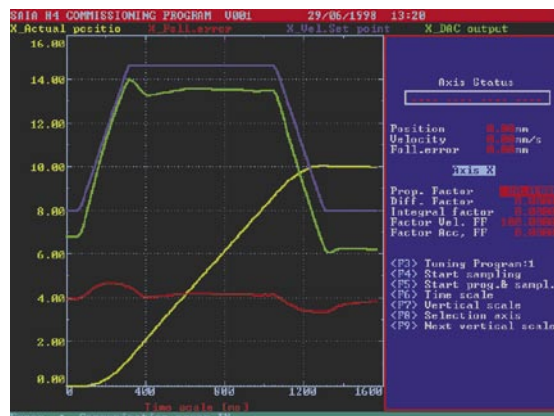
Axis control

PCD4.H120
Unregulated axis control up to 166 kHz, with digital outputs

– specification of encoder pulses up to 166 kHz, with detection of the sense of rotation
– for any choice of servo motor (without velocity regulation)
– output of pulses up to 30 kHz for synchronous motors with high start/stop frequency
– counting range ±999 999 with 3 direct process output
– up to 20×2 axes per PCD4 system
– module for measuring frequency, period length or pulse length (see next page for details)
– 4×100 mA/24 VDC digital outputs (can also be used for PCD7.D120 display module)

PCD4.H3.. (1 or 2 axes)
PID regulated axis control up to 100 kHz, with analogue output
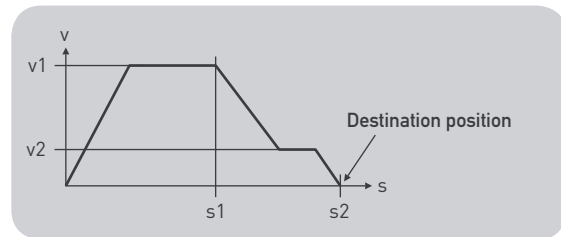
– self-contained motion control operation, independent of PLC CPU
– specification of trapezoid velocity profile (PID regulated) or of regulated constant speed
– encoder inputs for 24 V or 5 V/RS 422 up to 100 kHz
– analogue output to power stage ±10 V, resolution 12 bit
– standard for position range ±30 bit (±1 073 741 824)
– co-ordinated quasi-synchronous operation of several axes
– up to 10×2 axes per PCD4 system

PCD4.H225 (2 axes)
Low-cost motion control module for stepper motors, up to 20 kHz
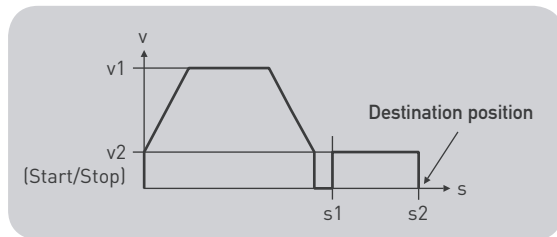
– 2 self-contained motion control functions, independent of the PLC CPU; acceleration and pulse number are controlled with quartz precision
– specification of trapezoid frequency ramps to destination position
– run-up frequency to 20 kHz
– acceleration 1…1000 kHz/s
– positioning distance 24 bit (16 777 215)
– output to power stage 5…32 VDC
– 6 digital inputs for limit and reference switches
– 4×100 mA/24 VDC digital outputs (can also be used for PCD7.D120 display module)
– memory for 4 velocity profiles
– up to 16×2 axes per PCD4 system

PCD4.H4.. (2 or 4 axes)
PID regulated axis control up to 150 kHz, with linear or circular interpolation and analogue output
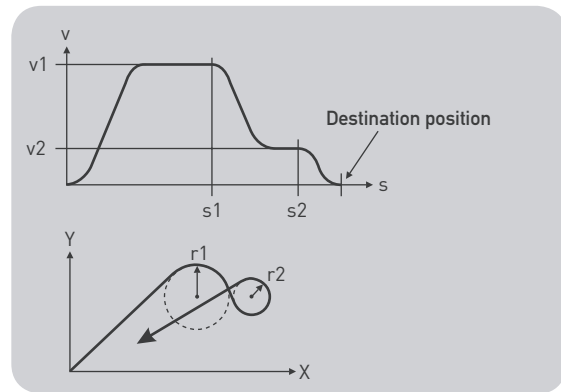
– self-contained motion control operation, independent of PLC CPU
– specification of trapezoid or S-shaped velocity profile (PID regulated)
– several axes with linear or circular interpolation
– encoder inputs for 24 V or 5 V/RS 422 up to 150 kHz
– analogue output to power stage ±10 V, resolution 16 bit
– standard for position range ±31 bit (±2 147 483 647)
– up to 4×2 or 3×4 axes per PCD4 system

Universal counting and measuring module PCD4.H120

This function module with 2 independent counting and measuring systems can perform many tasks:

– Processing fast pulse sequences with frequencies up to 166 kHz (e. g. counting rotations or distances and reacting to one or two preset values).

– Counting with recognition of count direction via incremental shaft encoder (e. g. for simple, unregulated motion control).

– Outputting pulse strings with frequency preselection (e. g. for simple driving of stepper motors below the start/stop frequency via suitable power stages).

– Measuring pulse lengths, frequencies or the duration of periods (e. g. for quartz accuracy in determining velocity, rotational speed, flow rate, etc.).

A software library of standard routines is available for programming the many possible functions.

Characteristics in brief

– 2 separate systems
– 2 digital inputs per system (24, 12 or 5 V), also suitable for the connection of incremental shaft encoders
– Fast counting up to 166 kHz
– Counting range ±999 999
– 2 preset values, 6 digits per system
– Up and down counting, with recognition of count direction
– 3 direct process outputs per system 24 V/0.5 A
– Time measurements with 0.1 μs resolution
– Frequency measurement up to 166 kHz
– Output of programmable frequencies up to 30 kHz
– Possible connection of two PCD7.D120 display modules

Economical remote display of data

PCD7.D120

■ Particularly bright, 6-digit LED display with decimal point. Very clear to read, even in conditions of poor visibility.

■ Does not take up one of the PCD's serial ports; only needs 3 transistor outputs from the following standard modules: PCD4.A400 (inc.version Z10), PCD4.A410 or ..B900.

■ Convenient commissioning with FBox in the FUPLA editor. At the same time the refresh rate of the display is also defined.

■ Parallel driving of up to 14 remote displays. The same value (up to 6 digits) is shown on all displays.

■ Serial driving of 2 (or more) remote displays: useful if more than 6 digits have to be displayed.

■ Standard housing dimensions of 24 × 48 mm, front panel IP 65 system of protection.

■ For details see Technical Information 26/361.

Connection diagram
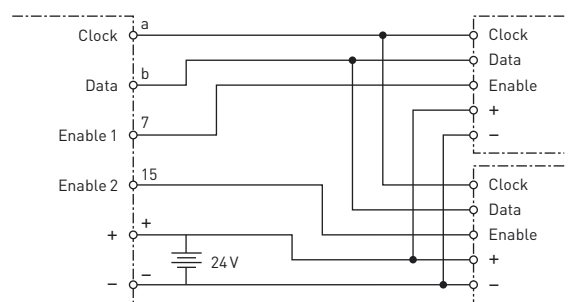
Measering module	2 × display module
PCD4.H120	PCD7.D120

Pin Configuration

Supply and watch-dog
Terminals on bus module
PCD4.C100 and PCD4.C340
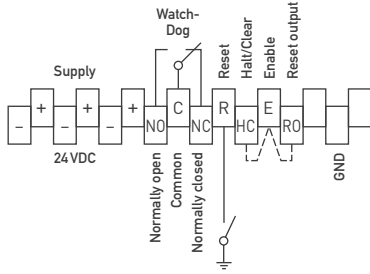
Serial data ports via sockets A1…3 on bus module PCD4.C340 Port #1…3					
Terminal	RS 422 PCD7.F110	RS 485 PCD7.F110	RS 232 PCD7.F120	TTY/20 mA PCD7.F130	RS485 (galv.) PCD7.F150
x0	Tx	D	Tx	TS	D
x1	/Tx	/D	Rx	RS	/D
x2	Rx		RTS	TA	
x3	/Rx		CTS	RA	
x4	RTS		DTR[1]	TC	
x5	/RTS		DSR[1]	RC	
x6	CTS		RSV[1]	TG	SGND
x7	/CTS		DCD[1]	RG	
GND		GND			

[1] These signals can only be used if the interface module PCD7.F120 is plugged onto socket no. 1

Terminals for the sockets A1…3 on bus module PCD4.C340
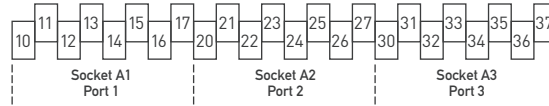
PGU/RS 232 Port #0	
PGU RS 232	
1	PGND
2	RXD
3	TXD
4	–
5	GND
6	DSR
7	RTS
8	CTS
9	+5 V

Serial data ports, socket B2: screw terminal blocks on PCD4.M170 Port #4 and Port #5						
Port #	Terminal 40…49	RS 485/RS 232 PCD2.F520	RS 485 PCD7.F772	RS 422 and RS 232 PCD2.F520	2× RS 232 PCD2.F522	RS 232 full PCD2.F522
4	40	PGND	PGND	PGND	PGND	PGND
	41	TXD	RX – TX	TXD	TXD	TXD
	42	RXD	/RX – /TX	RXD	RXD	RXD
	43	RTS	–	RTS	RTS	RTS
	44	CTS	–	CTS	CTS	CTS
5	45	PGND	–	PGND	PGND	PGND
	46	RX – TX	–	TX	TXD	DTR
	47	/RX – /TX	–	/TX	RXD	DSR
	48	–	–	RX	RTS	–
	49	–	–	/RX	CTS	DCD

Serial data ports, sockets B1 and B2: 9-pole, D-type connector, on PCD4.M170, Port #4 and Port #5				
D-Sub B1 and B2	RS 422 PCD2.F520[1]	RS 485 PCD2.F520[1]	RS 232 PCD2.F522[1]	PROFIBUS Port #8/#9
1	PGND	PGND	PGND	PGND
2	–	–	–	–
3	/TX	/RX – /TX	RxD	RxD/TxD-P
4	–	–	–	CNTR-P/RTS
5	RX	–	RTS	GND
6	/RX	–	CTS	+5 V
7	–	–	–	–
8	TX	RX – TX	TxD	RxD/TxD-N
9	–	–	–	–

[1] Only on socket B2 and Port #5

Interrupt and/or counter	
Terminal 0…9	
0	IN A1
1	IN B1
2	IN A2
3	IN B2
4	OUT 1
5	OUT 2
6	+
7	L
8	PGND
9	PGND

Terminals 40…49
PGU connector

B2 connector
B2 connector
TCP/IP plug
Terminals 0…9 (interrupt/counter)
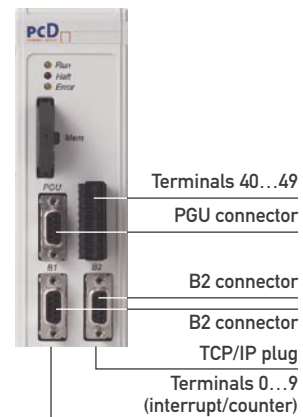
PROFIBUS FMS on PCD4.M445
Connection via 9-pole front panel connector on the processor module. Details should be obtained from the hardware manual PCD4, edition 26/734.

PROFIBUS DP/FMS on PCD4.M170
Connection of socket B2 can be achieved either via screw terminal block or via the 9-pole, D-type connector. Details should be obtained from the relevant documentation.

Ethernet-TCP/IP on PCD4.M170
Connection via RJ 45 plug, category 5.

Ordering information

Type	Description	Weight
PCD4.M170 F..	**The PCD4.M170 Fnx processor module is supplied ready configured:**	
	"n" defines the ..F.. module at socket B1 and "x" defines the ..F.. module at socket B2	380 g

n (socket B1)	x (socket B2)
0 = not equipped	0 = not equipped
1 = PCD7.F700 (PROFIBUS FMS)	2 = PCD7.F750 (PROFIBUS DP master)
2 = PCD7.F750 (PROFIBUS DP master)	3 = PCD7.F770 (PROFIBUS DP slave)
3 = PCD7.F770 (PROFIBUS DP slave)	4 = PCD7.F772 (PROFIBUS DP slave, RS 485)
	7 = PCD2.F520 (RS 232/422, RS 485)
	8 = PCD2.F522 (RS 232)
	9 = PCD7.F65x (Ethernet-TCP/IP)

Type	Description	Weight
PCD7.R400	**Flash card** with 1 MByte for backup of the user program	6 g
4'507'4817'0	Lithium battery (replacement)	10 g
	Processor modules	
PCD4.M110	with PGU/RS 232 interface	250 g
PCD4.M125	supports 1 additional serial data port	250 g
PCD4.M145	supports 3 additional serial data ports	310 g
PCD4.M445	with dual processor, co-processor PROFIBUS FMS, 3 additional serial data ports	390 g
4'507'1360'0	NiCd battery (replacement)	10 g
	Public memory modules (for preceding processor modules)	
PCD7.R110	with 2 sockets for EPROM or RAM memory components up to 256 KBytes	70 g
PCD7.R310	for up to 428 KBytes, equipped with 172 KBytes RAM (for DB/TX) and 2 sockets for additional EPROM or RAM memory components up to 256 KByte	80 g
	Memory components (2 chips required for each module)	
4'502'5414'0 [1]	2 × RAM chip, 64 KBytes user memory	8 g
4'502'7013'0 [1]	2 × RAM chip, 256 KBytes user memory	8 g
4'502'5327'0	2 × EPROM chip, 64 KBytes user memory	12 g
4'502'3958'0	2 × EPROM chip, 128 KBytes user memory	12 g
4'502'7126'0	2 × EPROM chip, 256 KBytes user memory	12 g
26/734 E	**PCD4 series hardware manual**	
PCD4.C100	**CPU bus module** with 2 sockets for the power supply and the processor module, without additional serial data port	380 g
PCD4.C340	**Combined bus module** with sockets for processor module, power supply module, 4 I/O modules and 3 sockets for communications modules PCD7.F1..	1100 g
	Communications modules for plugging onto PCD4.C340	
PCD7.F110	RS 422/RS 485 interface, electrically connected	8 g
PCD7.F120	RS 232 interface (suitable for modem connection)	8 g
PCD7.F130	20 mA current loop interface	8 g
PCD7.F150	RS 485 interface, electrically isolated	8 g
	I/O bus modules, connector to the preceding bus module is supplied with each I/O module	
PCD4.C220	with 2 I/O module sockets	375 g
PCD4.C260	with 6 I/O module sockets	1100 g
	Bus extension cables, shielded, with screw-mounted connectors	
PCD4.K200	for 2-row mounting, up to max. 256 I/Os, length 100 cm	160 g
PCD4.K210	for 2-row mounting, up to max. 256 I/Os, length 80 cm	140 g
PCD4.K250	for 2-row mounting, more than 256 I/Os, length 36 cm	105 g
PCD4.K260	for 3 and 4-row mounting, more than 256 I/Os, length 72 cm	140 g
4'421'8698'0	Bus connector set (supplementary)	20 g
	Power supply modules	
PCD4.N200	for digital I/O modules only	340 g
PCD4.N210	for all digital and analogue I/O modules and the ..H.. function modules	380 g
4'104'5195'0	**Empty module housing** to cover an unused socket on the bus module	110 g

[1] Risk of data loss if non-Saia RAM components are used.

Type	Description	Weight
	Digital input modules	
PCD4.E110	16 inputs 24 VDC, input delay typ. 8 ms	160 g
PCD4.E111	16 inputs 24 VDC, input delay typ. 0.1 ms	160 g
PCD4.E600	16 inputs 24 VDC, input delay typ. 8 ms, electrically isolated	160 g
PCD4.E601	16 inputs 24 VDC, input delay typ. 0.3 ms, electrically isolated	160 g
	Relay output modules	
PCD4.A200	8 "make" contacts 2 A/250 VAC or 2 A/50 VDC	270 g
PCD4.A250	16 "make" contacts 2 A/250 VAC or 2 A/50 VDC	250 g
	Transistor output modules	
PCD4.A350	8 outputs 24 VDC/2 A	330 g
PCD4.A400	16 outputs 24 VDC/0.5 A	170 g
PCD4.A410	16 outputs 24 VDC/0.5 A, electrically isolated	170 g
	Combined input/output module	
PCD4.B900	with 16 inputs 24 VDC/9 ms and 16 transistor outputs 0.5 A/5...32 VDC	250 g
	Additional set of front tags for digital I/O modules	
4'310'8567'0	for address range 0...127	
4'310'8568'0	for address range 128...254	
4'310'8569'0	for address range 255...510	
4'310'8570'0	for ..W.. and ..H.. modules	
	Analogue input/output modules, electrically connected	
PCD4.W100	**Basic module** for 4 input channels and up to 2 output channels, resolution 12 bit	190 g
	Plug-in range modules, signal ranges (load impedance):	
PCD7.W101 [1]	4 input channels for 0...10 V, ±10 V, ±5 V or 2 Pt/Ni 1000 (four wires) plus 2 × 0...10 V	15 g
PCD7.W105	4 input channels for 0...20 mA, ±20 mA, ±10 mA (4...20 mA via user program)	15 g
PCD7.W200	1 output channel 0...10 V (≥3 kΩ)	15 g
PCD7.W201	1 output channel 0...1 V (≥300 Ω)	15 g
PCD7.W202	1 output channel ±10 V (≥3 kΩ)	15 g
PCD7.W203	1 output channel ±1 V (≥300 Ω)	15 g
PCD7.W204	1 output channel 0...20 mA (≤500 Ω)	15 g
PCD7.W205	1 output channel 4...20 mA (≤500 Ω)	15 g
PCD7.W206	1 output channel –10...0 V (≥3 kΩ)	15 g
	Analogue input module, electrically connected	
PCD4.W300	**Basic module** for 8 input channels, resolution 12 bit + sign bit	190 g
	1 or 2 plug-in range modules, signal ranges (load impedance):	
PCD7.W100 [1]	Range module for 4 channels ±10 V or 4 Pt/Ni 1000 (four wires)	15 g
PCD7.W101 [1]	Range module for 4 channels ±1 V or 4 Pt/Ni 100 (four wires)	15 g
PCD7.W102	Range module for 4 channels ±100 mV	15 g
PCD7.W103	Range module for 4 channels ±20 mA or 4...20 mA	15 g
PCD7.W104	Range module for 4 channels 4...20 mA for two-wire transducers	15 g
PCD7.W110	Range module for 4 channels Pt 1000 with a temperature range of –50...+150 °C and a resolution of 0.1 °C (two-wire connection)	15 g
PCD7.W111	Range module for 4 channels Ni 1000 with a temperature range of –50...+150 °C and a resolution of 0.1 °C (two-wire connection)	15 g
PCD7.W120	4 stabilized current outputs of 2 mA for 4 Pt/Ni 100 or Pt/Ni 1000 resistance thermometer (four-wire connection)	15 g
	Analogue output module, electrically connected	
PCD4.W400	**Analogue module** with 8 output channels (2 × 4), resolution 8 bit, can be allocated by jumper to different output signals in groups of 4: 0...10 V (≥3 kΩ), 0...20 mA (≤500 Ω) and/or 4...20 mA (≤500 Ω)	170 g
	Analogue input module, electrically isolated	
PCD4.W500	**Basic module** for up to 8 input channels, resolution 12 up to 15 bit	190 g
	1 or 2 plug-in range modules, signal ranges (load impedance):	
PCD7.W100	Range module for 4 channels 0...10 V or ±10 V	15 g
PCD7.W101	Range module for 4 channels 0...1 V, ±1 V or 4 Pt/Ni 1000 and Pt/Ni 1000 (four wires)	15 g
PCD7.W103	Range module for 4 channels 0...20 mA or 4...20 mA	15 g
PCD7.W104	Range module for 4 channels 4...20 mA for two-wire transducers	15 g
PCD7.W110	Range module for 4 channels Pt 1000 with a temperature range of –50...+150 °C and a resolution of 0.1 °C (two-wire connection)	15 g
PCD7.W111	Range module for 4 channels Ni 1000 with a temperature range of –50...+150 °C and a resolution of 0.1 °C (two-wire connection)	15 g
PCD7.W120	4 stabilized current outputs of 2 mA for 4 Pt/Ni 100 or Pt/Ni 1000 resistance thermometer (four-wire connection)	15 g

[1] Other signal ranges on request

Ordering information

Type	Description	Weight
	Analogue output module, electrically isolated	
PCD4.W600	**Basic module** for up to 8 output channels, resolution 12 bit	190 g
	1…4 plug-in range modules, signal ranges (load impedance):	
PCD7.W300	2 output channels 0…10 V (≥3 kΩ)	15 g
PCD7.W302	2 output channels ±10 V (≥3 kΩ)	15 g
PCD7.W304	2 output channels 0…20 mA (≤500 Ω)	15 g
PCD7.W305	2 output channels 4…20 mA (≤500 Ω)	15 g
	Manual operation modules	
PCD4.A810	Digital, single-stage manual operation module with	
	8 "make" contacts 2 A/250 VAC or 2 A/50 VDC	240 g
PCD4.A820	Digital, dual-stage manual operation module with	
	2 × 4 "make" contacts 2 A/250 VAC or 2 A/50 VDC	240 g
PCD4.W800	Analogue manual operation module with 8 output channels,	
	resolution 8 bit	225 g
PCD4.H120	**Counting and measuring module**, up to 166 kHz, with 2 independent	
	systems	180 g
26/731 E	PCD4.H120 manual	
PCD4.H225	**Motion control module for stepper motors**, up to 20 kHz, for 2 axes	200 g
26/730 E	PCD4.H2.. manual supplement	
	Motion control modules for servo drives, up to 100 kHz	
PCD4.H310	for 1 axis, encoder signals 24 VDC	195 g
PCD4.H320	for 2 axes, encoder signals 24 VDC	225 g
PCD4.H311	for 1 axis, encoder signals 5 V/RS 422	300 g
PCD4.H321	for 2 axes, encoder signals 5 V/RS 422	330 g
PCD8.H340 30E	Commissioning software to the modules ..H3..	
26/729 D	PCD4.H3.. manual	
	Motion control modules for servo drives, up to 150 kHz	
PCD4.H420	for 2 axes, encoder signals 24 VDC or 5 V/RS 422	380 g
PCD4.H440	for 4 axes, encoder signals 24 VDC or 5 V/RS 422	700 g
PCD8.H340 40E	Programming and commissioning tool	
26/752 E	PCD4.H4.. manual	
PCD7.D120	**Display module** for control panel installation with 6-digit display	
	(7-segment LED)	175 g

Addresses

Switzerland and international

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F +41 26 / 672 74 99
pcd@saia-burgess.com
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Product support,
Technical reference website: www.sbc-support.ch

Other addresses: www.saia-burgess.com - Contact

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