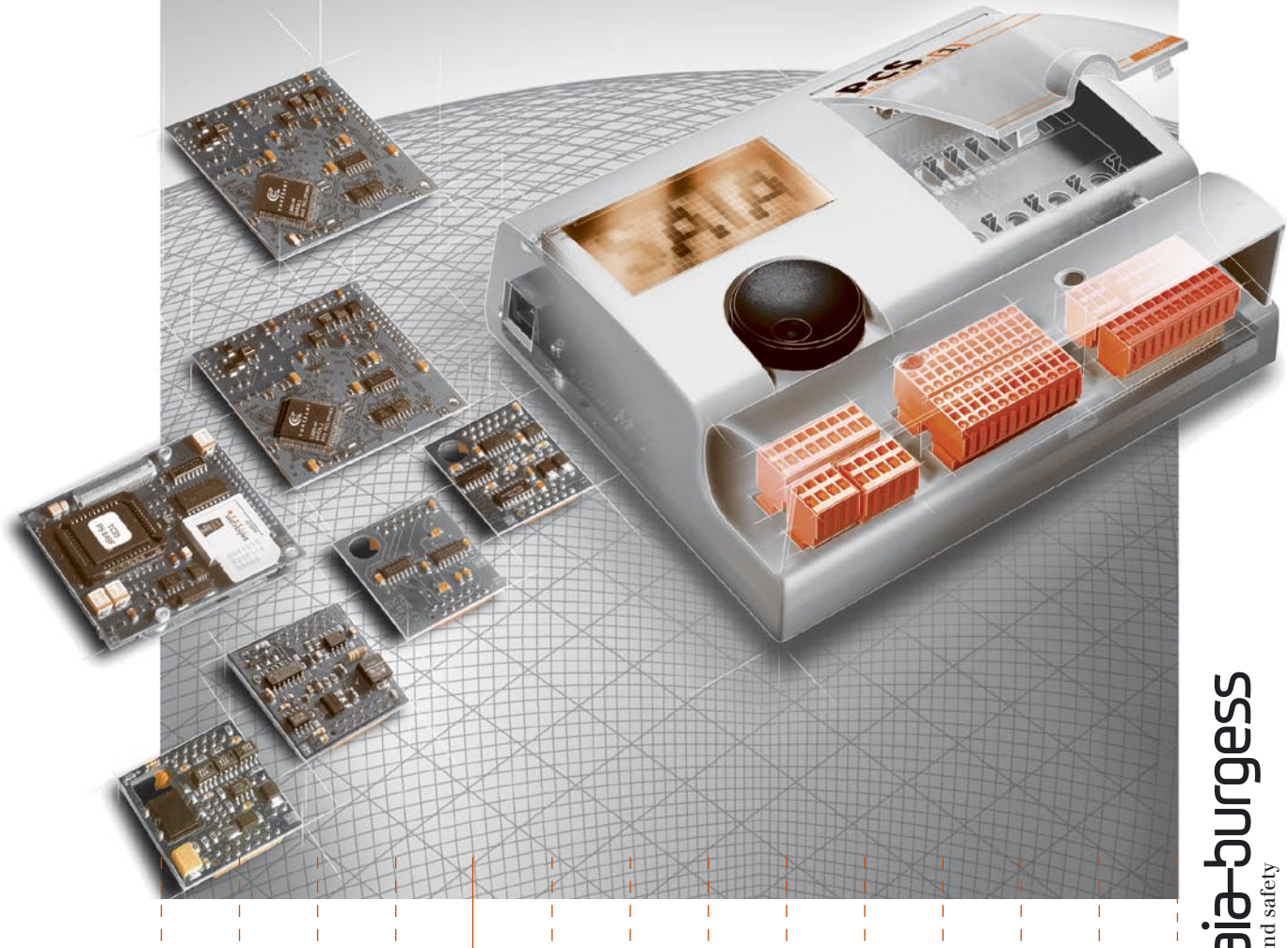


Division Controls

saia-burgess

Smart solutions for comfort and safety

DDC.Compact

The compact style of building automation

Extensive functionality in the minimum space

- integral or remote graphics display with jog dial control
- integral manual/emergency and coupler level
- compact size: 195 × 150 × 60 mm (W × H × D)
- plug-in spring terminals with cover
- large main memory for history data
- 44 data points in the base unit, expandable via networks

Custom solution for all areas of application

Through its distinctive data point structure, the DDC.Compact is ideally suited for use in:

- Ventilation installations
- Heating installations
- Compact air-conditioning equipment
- District heating transfer stations

Interfaces make it a great communicator

- Saia®**S-Bus** (PCD/room control systems or remote data points)
- BACnet via PCD2.M250 BACnet-Server
- LonWorks®
- EIB (European Installation Bus)
- MP-BUS (BELIMO® MFT drives)
- M-Bus (remote counter reading)
- Modbus (RTU and ASCII)
- External graphics display
- Telecommunication via analogue, ISDN or GSM modem. Functions include telemaintenance, remote diagnosis, SMS error messaging and remote programming

Edition 26/345 E3

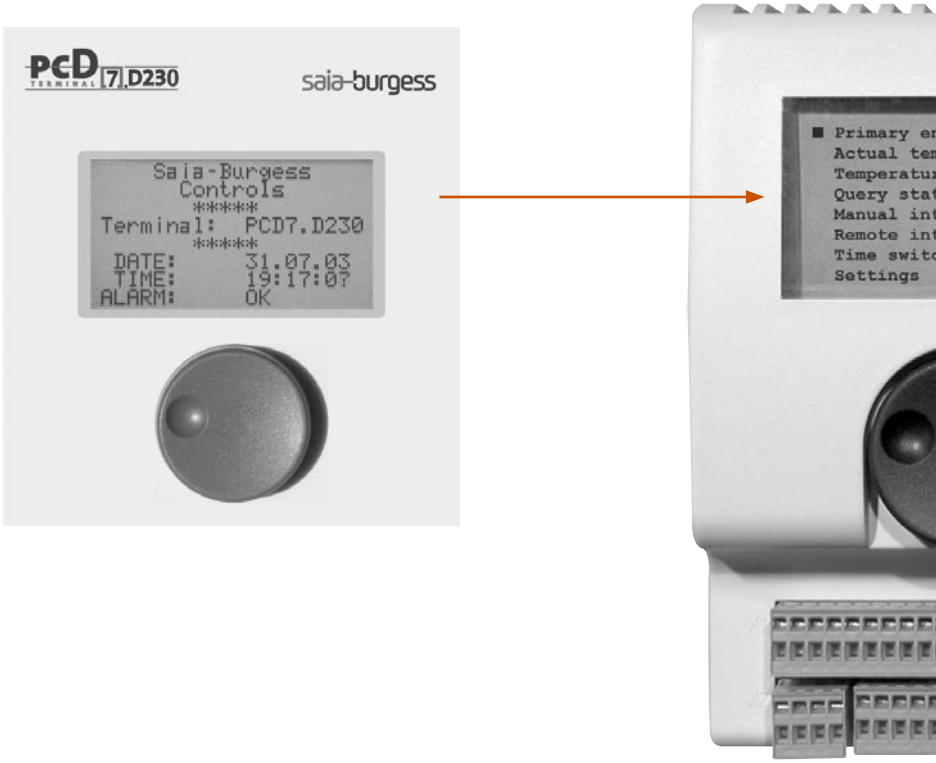
DDC.Compact –
the neatest alternative for intelligent building automation

You can take this statement quite literally. For not only is the controller from Saia-Burgess Controls a design success, it is also unbeatable in functional scope.

Whatever the task, this controller chameleon smoothly adapts to your requirements for heating, ventilation or even district heating technology. Through its distinctive data point level, it is also ideal for control and regulation tasks in compact air-conditioning equipment.

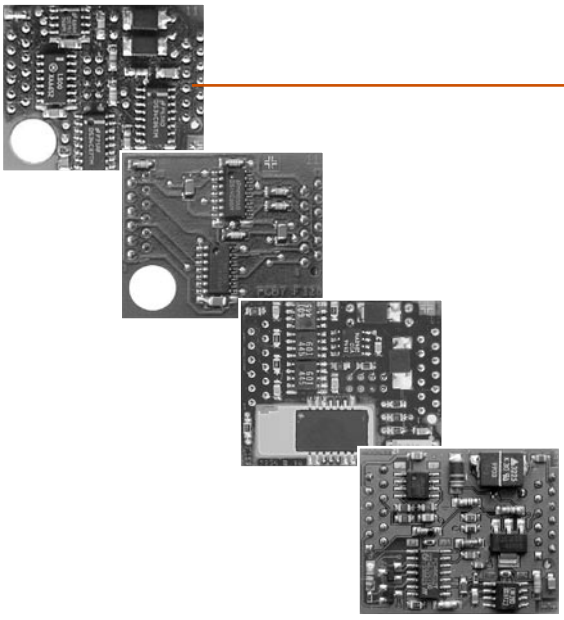
Internal or external graphics display with jog dial control

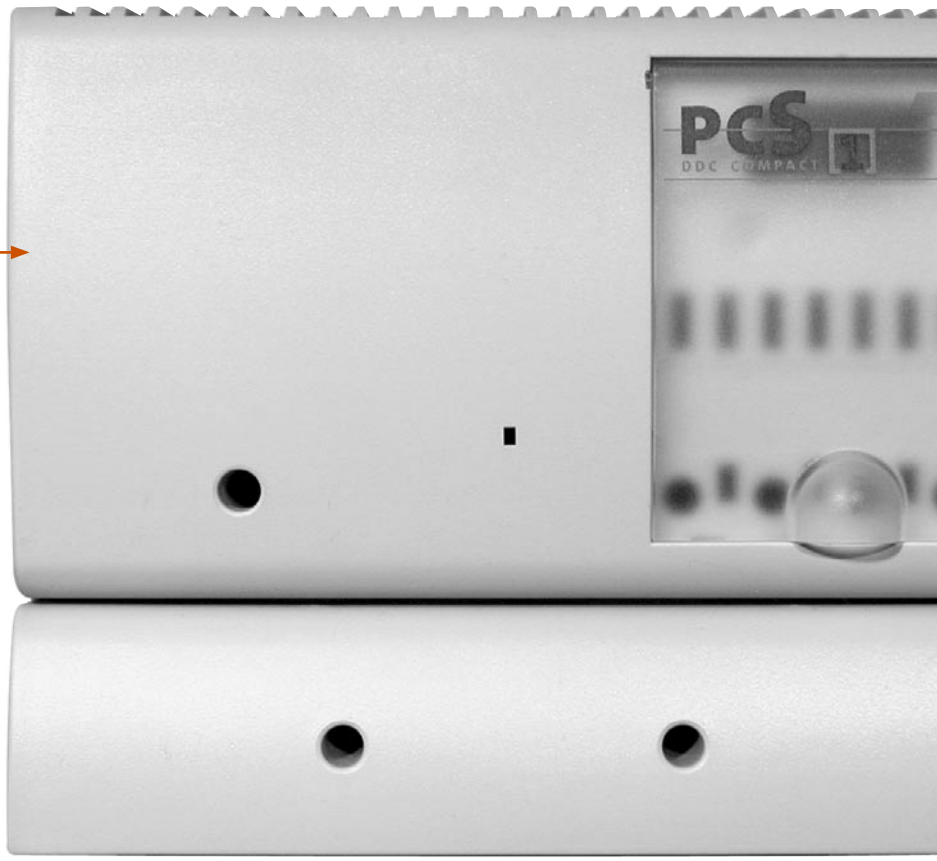
For details, see page 6



Interface modules for a wide diversity of requirements

For details, see pages 4/5

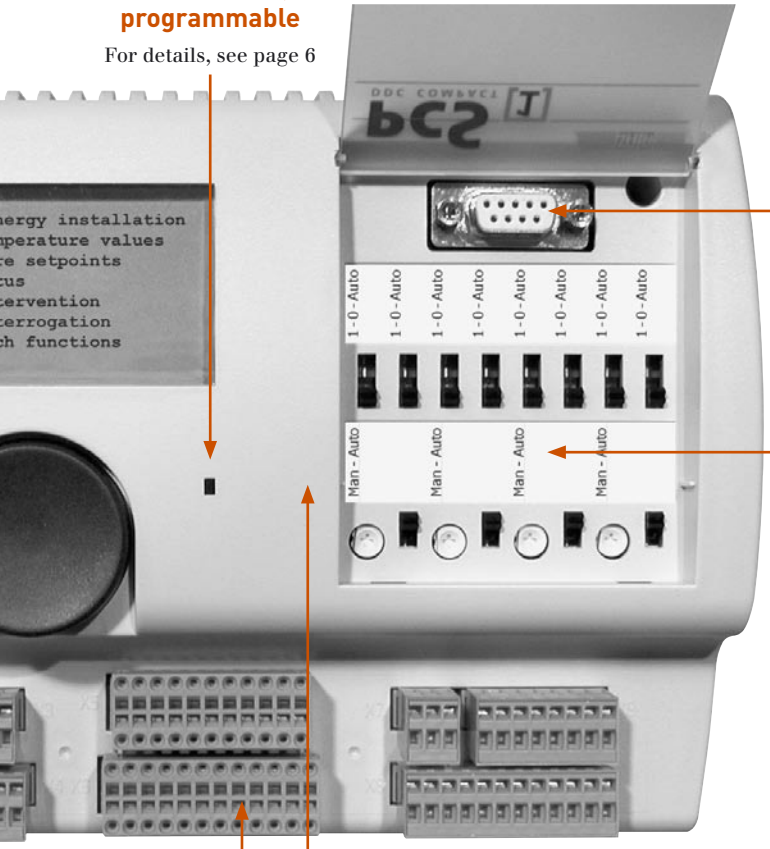




System overview: hardware

Three-colour LED, user programmable

For details, see page 6



PGU programming port

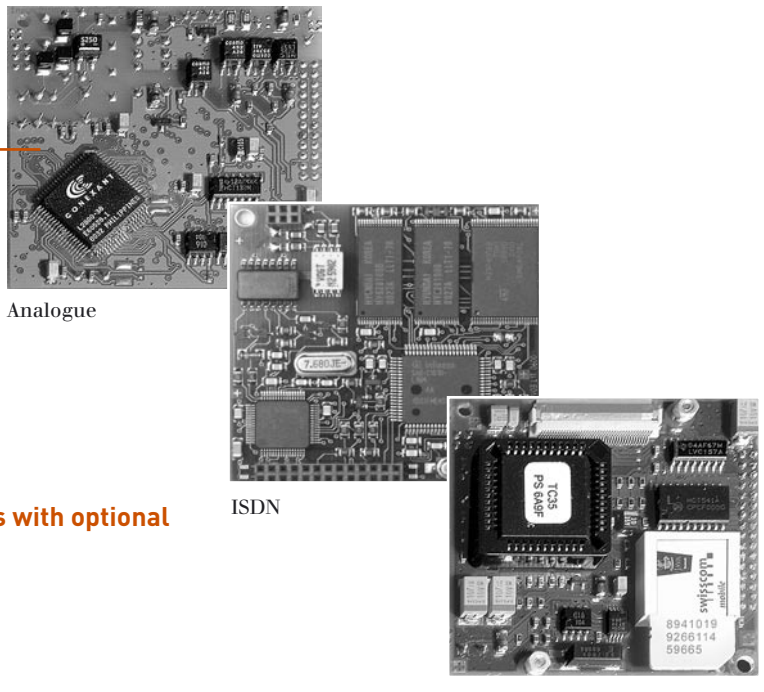
For details, see pages 4 and 12/13

Manual/emergency and coupler level

For details, see pages 6 and 8/9

Modem modules for sophisticated telecommunication

For details, see page 11



Analogue

ISDN

GSM

Terminals for 44 data points with optional terminal cover

For details, see pages 8/9

DDC.Compact – the great communicator with a full range of interface versions

Serial interfaces

DDC.Compact supports many protocols that connect the most diverse peripherals, such as printers, operator terminals and systems for lighting, shade or access control. Connection is via standard interfaces, such as RS232/RS422/RS485 with up to 38.4 kBit/s.

The following modes are supported by PCS1:

- MC mode = character mode for the connection of foreign systems with ASCII protocols (e.g. EIB, M-Bus, Modbus, etc.)
- S-Bus mode = for exchanging data with Saia® systems in a network using half-duplex operation

IMPORTANT:
Port 0 on the PCS1 is used by the modem connection and by the PGU connection, i.e. the modem channel is always active in normal operation. Only when the PGU cable is used to establish a connection with the programming unit will the DSR signal switch the port over to a PGU connection (PGU then has priority and runs by default at 38.4 kBit/s). When the PGU cable is pulled out again, the modem channel is reinitialized.

Network connection / field bus connection

Even when the automation tasks become more complex and comprehensive, there is almost no limit to the expansion of the DDC.Compact, due to its well developed network capabilities. Whether you wish to link remote data points via standard network connections (such as LonWorks®, EIB, Modbus, M-Bus) or use more economical solutions (such as Saia®S-Bus und BELIMO® MP-Bus) the expandability of this controller offers many possibilities.

Saia®S-Bus

Saia®S-Bus – with its simple, reliable protocol – is already provided in the standard equipment of all PCS/PCD systems as master or slave. This protocol is used for the optimised exchange of data between PCS/PCD systems or remote peripherals, such as RIOs or room control systems.

Access with the PG5 tool for programming, debugging and commissioning is also supported, plus connection to the ViSi. Plus building management technology from Saia-Burgess Controls.

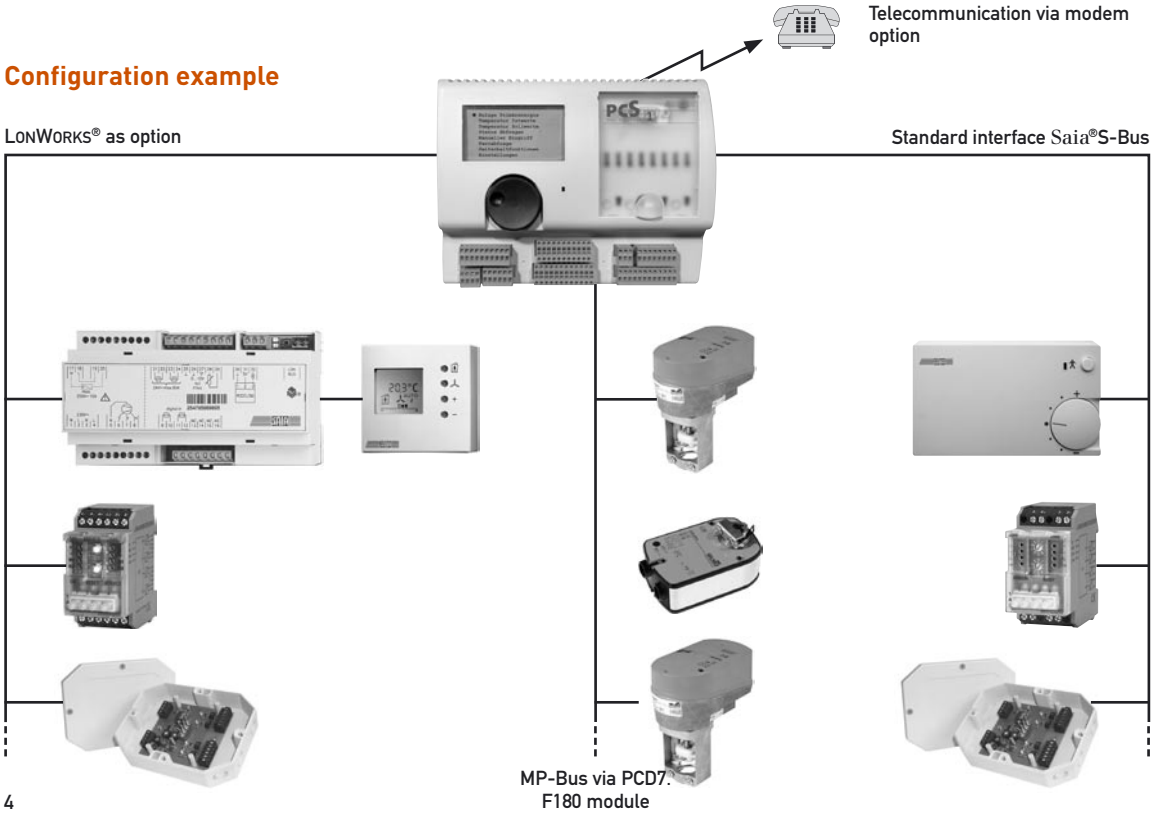
Saia®S-Bus is an economical way of achieving master/slave networks or point-to-point connections with a simple two-wire line based on an RS485 interface. The maximum distance per segment – or between devices/repeaters – is 1200 m.

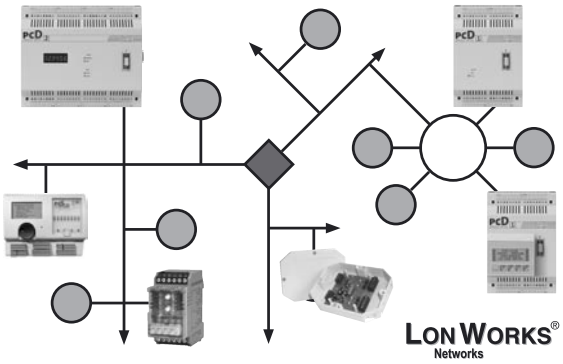
IMPORTANT:
To guarantee perfect connections between stations on an RS485 network, use of Saia®Bus components is required. The bus is terminated through the PCD7.T160 termination box. For details about Saia®S-Bus, see Technical Information 26/370.

Technical data with RS485 interface

Master connection	with up to 38.4 kBit/s PCS/PCD system (high net data rate due to low protocol overhead), up to 4 masters via gateway function
Slave connection	with up to 38.4 kBit/s and up to 254 PCS/PCD slaves in segments of 32 stations each up to 100 slaves with PCD7.L.. modules (see also TI 26/339)

Configuration example





LonWorks® interface

LonWorks® technology is a general-purpose automation concept, which is gaining increasing importance in building and industrial automation. The many advantages of LonWorks® technology, such as remote intelligence, modular construction and its ability to adapt to existing infrastructures, have made it all the more interesting for data transfer in the field area. Individual stations on the network (so-called nodes) can exchange data among themselves on an event-controlled basis. LonWorks® provides the platform for vendor-independent communications in cross-facility building automation.

The modular interface concept and great flexibility of the DDC.Compact enable it to meet different requirements. The LonWorks® host interface in the controller allows the user to define more than 1000 variables for exchanging data with foreign systems. In addition, programming freedom allows the system integrator to adapt the system to the technical demands placed on the building technology.

Transceiver technology: FTT 10a

For the network connection, Saia uses the highly popular FTT10a transceiver technology, patented by Echelon®. It has the following characteristics:

- Cable type: 2×2 wire, twisted
- Transmission rate: 78 kBit/s
- Network structure/cable length: free topology, max. 500 m, bus topology, max. 2700 m
- Number of LonWorks® nodes: max. 64 per segment, over 32 000 in one domain

Standard network variables: SNVT

Implementation of a MIP (microprocessor interface program) enables over 1000 SNVTs (standard network variable types) to be defined in one DDC substation and linked with other PCD or foreign systems. PCD systems support all SNVTs currently specified under LonMark®. For connection to LonWorks® nodes with proprietary information, "explicit messages" can also be transmitted.

IMPORTANT:
When binding of variables is complete, this information must be saved with the «Upload DBx» function in the PG5. If it is not saved, binding information may be lost following program modifications and subsequent download.

MP-Bus interface for BELIMO® drives

The field bus was specially developed by BELIMO® for the MFT and MFT2 drives (MFT = multi-function technology). Saia-Burgess Controls has developed two different connection modules for integration within the overall DDC-PLUS family.

An MP-Bus network (MP = multi-point) comprises a three-pole cable connection between the link to the automation system or control device and the drives. Up to 8 drives can be connected to one communications channel. In addition to the drives connected, further process data can be sent directly to the MP bus via a drive or add-on modules. Passive sensors, active sensors and 2-point on/off signals are supported.

By directly connecting standard sensors for humidity, temperature, etc. to an MFT/MFT2 drive, analogue sensors become bus-compatible. For details, see Technical Information 26/342.

EIB interface

At some point, an EIB user will reach the performance limits of the EIB components currently available on the market. Efficient management of building installations calls for powerful functions that integrate the different facilities. PCS1 devices, with the appropriate EIB driver, offer an ideal solution for complex EIB tasks.

Functional principle

The PCS1 has access to the EIB network via the RS232 serial port on the EIB interface module. The PCS1 issues instructions according to its user program across the EIB network, where it also continuously receives information from EIB peripherals. It is therefore possible to realize logical linkages, timer/counter functions, mathematical operations and sequential processes within the EIB network.

M-Bus and Modbus interface

The M-Bus (EN 1434-3) is an international standard for the remote reading of counters. The M-Bus connection is via a standard RS232 interface and an M-Bus converter. This enables quantities of water, heat or energy to be recorded in a DDC substation. Further processing of measured data takes place via the Saia®-FUPLA function block library.

An RS485 port in the PCS1 provides the interface to the Modbus. The PG5 function block library enables the user to read process data, process it, and transmit control variables to the Modbus network. This very widespread network standard is frequently used by manufacturers of compact clima units as a means of connecting with higher ranking systems.

Detailed information on M-Bus and Modbus interfaces can be found under:
www.engiby.ch and www.ludwig-systemelektronik.de

Other connections

For other connections to foreign systems, such as Siemens 3964R, Cerberus-System, GENIbus for Grundfos pumps, STX-Bus for NeoVac, TwiLine, JCI-N2-Bus or BACnet, please contact your local sales office.

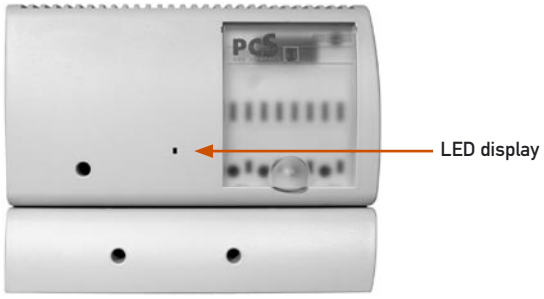
User prompting and LED display
Manual/emergency control level

User prompting

A built-in or external graphics display with jog dial control makes user prompting simple and clear. The graphics display has a resolution or 128×64 pixels and can therefore also be used for high quality representation in plain text or graphics mode. Back-lighting makes user prompting possible, even in poor light.

The jog dial control has “turn” and “press” functions that are used to select submenu structures and different process parameters. The user can also make entries, for example: setpoints or time switch programs.

Turn = Menu selection, parameter selection, value modification
Press = Briefly for edit mode, entry confirmation
Longer for menu return
Hold down to return to the main menu



LED display

The built-in, three-colour LED (red/green/yellow) in the housing cover enables the system integrator to signal controller status to the user at a glance. LED triggering is fully programmable, enabling it to meet the precise needs of the operator (see function block section, page 12: “CPU LED”).

Default LED status

System in boot mode	red LED flashes (no firmware in PCS1)
Download firmware	LED flashes green/red/off
System in RUN mode	yellow LED on
System in Stop/Halt mode	LED off
Hardware error in system	red LED flashes every 500 ms

Manual/emergency control level

The manual/emergency control level, which has been provided with a cover, makes it possible to intervene in the process at any time in case of an emergency or for service.

The DDC.Compact has an integral coupler level with, in total, eight relay outputs. Four of these relays are designed as ’make’ contacts and four as changeover switches, so that the user can latch the outputs mutually if wired for a two-stage fan (see connection diagram, page 9). Switch functions are: auto/off/on. The enclosed labels allow switches to be labelled specifically for each installation.

Four additional switches and potentiometers allow manual/emergency control of the analogue outputs. For example, they can be used to override the control of drives for valves or flaps. Switch functions are auto/manual and potentiometers have a setting range of 0…100 %. The enclosed labels allow manual/emergency control to be labelled specifically for each installation.

Memory ranges
Mounting and terminal connections

PCS1 memory ranges

256 Kbytes flash EPROM as firmware memory

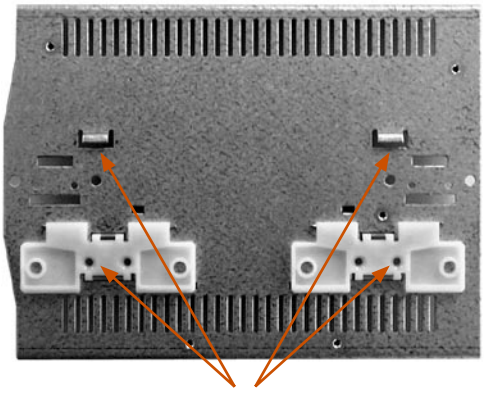
This can be updated by the system integrator, when necessary. Updating is therefore even possible via modem. If the modem connection fails during a download, the system remains accessible via modem and a further attempt can be made to start the update. (After a failed download, the user program can no longer be processed.)

240 Kbytes/1 Mbyte (as of 2004) flash EPROM as user memory

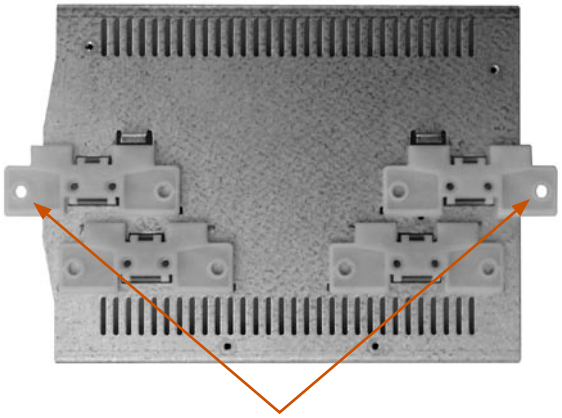
The PG5 programming tool allows the user freedom to divide this between program memory (default 176 Kbytes) and text/data block memory (default 64 Kbytes).

128 Kbytes/896 Kbytes (as of 2004) RAM as history data memory

The user can have this as history data memory (text/data blocks 4000…5999). It enables large volumes of history data to be processed and archived. Since this data can be read via network or telecommunications connections, higher ranking systems are also able to archive the data, evaluate it, represent it graphically and to undertake energy management.



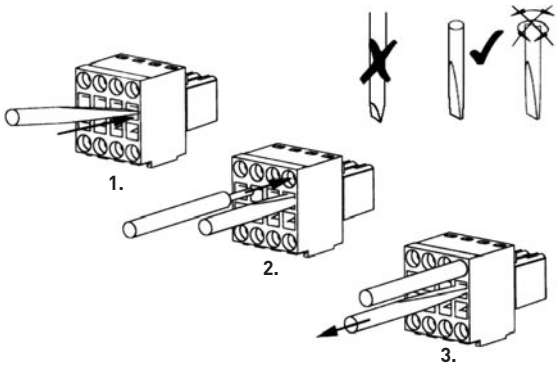
Standard mounting on 35 mm DIN top-hat rail



Wall-mounting as option

Plug-in spring terminals

The plug-in spring terminals make installation child's play. The process input terminals are up to 1.0 mm² and the process output terminals are up to 1.5 mm². Process cable must be bared along 7…8 mm (1.0 mm²) or 10 mm (1.5 mm²) and inserted in the terminals.

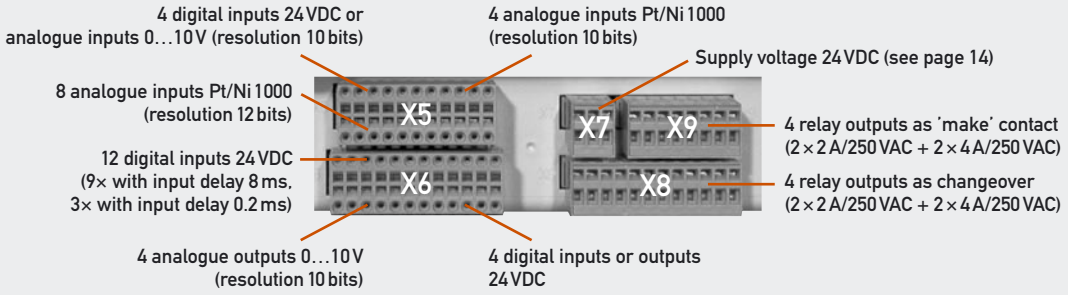


IMPORTANT:
Screwdrivers used should be type SDI 0.4 × 2.5 × 80 (max. width 2.5 mm).

Switch cabinet and field installation

Apart from typical mounting on 35 mm DIN top-hat rail inside a switch cabinet, the DDC.Compact can also be used for field installation. With the optional cover on the plug-in spring terminals and the wall-mounting version, there are no installation problems for the controller.

Digital and analogue data points



Digital inputs 24 VDC, terminal block X6

Number of inputs	9 + 3: 9 with input delay typically 8 ms (pulsed voltage possible) 3 with input delay typically 0.2 ms (smoothed voltage required)
Input voltage	24 VDC
Input signal	Low –30…+5 V High 15…30 V
Input current	6 mA per input at 24 VDC

Digital inputs or outputs 24 VDC, terminal block X6

Digital inputs	max. 4, selectable by wiring
Input voltage	24 VDC
Input signal	Low –0.5…+5 V High 15…32 V
Input current	7 mA per input at 24 VDC
Input delay	typically 8 ms (pulsed voltage possible)
Digital outputs	max. 4, selectable by wiring
Output current I_a	5…500 mA
Total current	3 A for continuous duty
Voltage range U_a	5…32 VDC smoothed
Voltage drop	max. 0.7 V at 0.5 A
Output delay	typically 50 µs or max. 100 µs (off)

Relay outputs as changeover/'make' contact, terminal block X8 and X9

Number of outputs	4 changeover and 4 'make' contacts
Breaking capacity	2 changeover 2 A, 250 VAC/50 VDC 2 changeover 4 A, 250 VAC/50 VDC 2 'make' contacts 2 A, 250 VAC/50 VDC 2 ,make' contacts 4 A, 250 VAC/50 VDC
Output delay	typically 5 ms at 24 VDC
Supply voltage	24 VDC, smoothed or pulsed
Current consumption	9 mA per relay
Manual/emergency control	these outputs can be accesses manually

Important:

Please follow installation instructions according to PCD1/PCD2 manual, edition 26/737.

Digital inputs 24 VDC or analogue inputs 0…10 V and Pt/Ni 1000 (2-wire), terminal block X5

Digital inputs 24 VDC

Number of inputs	max. 4 (selectable by FBox)
Input voltage	24 VDC
Input signal	Low –0.5…+5 V High 15…32 V
Input current	7 mA per input at 24 VDC
Input delay	typically 8 ms (pulsed voltage possible)

Analogue inputs 0…10 V

Number of inputs	max. 4 (selectable by FBox)
Resolution	10 bits (0…1023)
Input filter	5 ms
Accuracy	±0.4 %

Analogue inputs Pt/Ni 1000

Number of inputs	4 × Pt/Ni 1000, 2-wire (selectable by FBox)	
Resolution	10 bits (0…1023) or 0.6 °C	
Input filter	10 ms	
Accuracy	±0.4 %	
Signal ranges	Pt 1000	–50…+400 °C
	Ni 1000	–50…+200 °C
	Ni 1000 L&S	–30…+120 °C

Analogue inputs Pt/Ni 1000 (2-wire), terminal block X5

Number of inputs	8 × Pt/Ni 1000, 2-wire (selectable by FBox)	
Resolution	12 bits (0…4095) or max. 0.15 °C (Pt 1000) or max. 0.08 °C (Ni 1000)	
Input filter	typically 16.9 ms	
Accuracy	±0.3 %	
Signal ranges	Pt 1000	–50…+400 °C
	Ni 1000	–50…+200 °C
	Ni 1000 L&S	–30…+120 °C

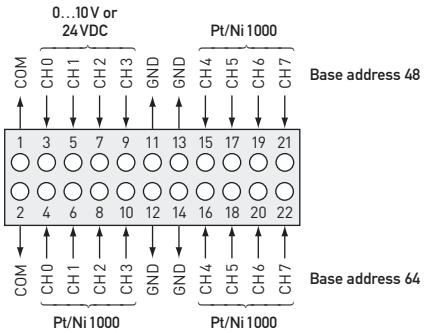
Analogue outputs 0…10 V, terminal block X6

Number of inputs	4, short-circuit proof
Resolution	10 bits (0…1023)
Accuracy	±0.5 %
Signal range	0…10 V
Load impedance	≥3 kΩ
Manual/emergency control	these outputs can be accessed manually via potentiometers

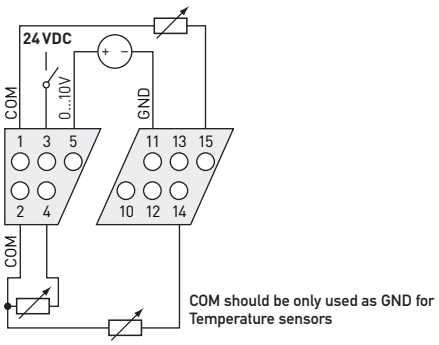
N. B.:

All data points except relay outputs are electrically connected.

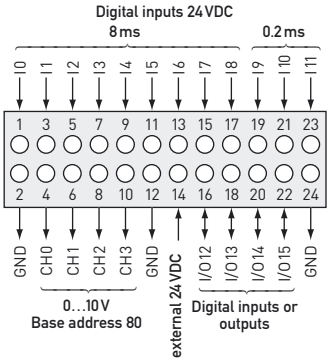
Pin configuration on terminal block X5



Details for wiring

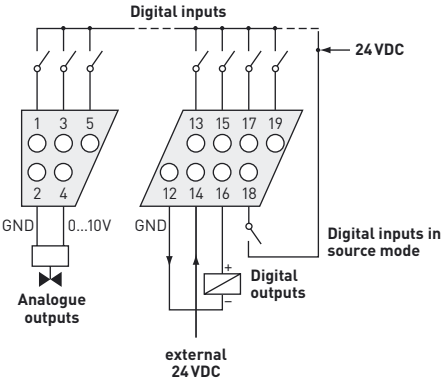


Pin configuration on terminal block X6

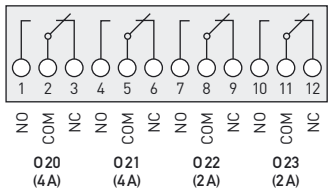


IMPORTANT:
If combined I/Os 12...15 are used as outputs, an external supply is required (24 VDC external). In such cases only source operation will be possible at the inputs

Details for wiring

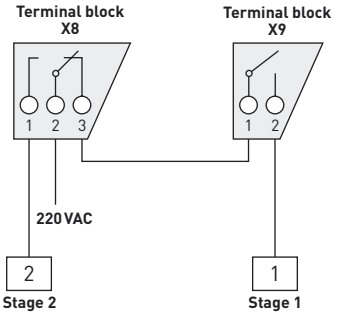


Pin configuration on terminal block X8

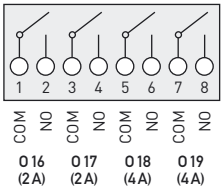


Details for wiring

Example of a 2-stage fan controller with mutual latching



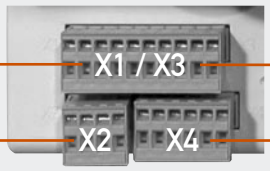
Pin configuration on terminal block X9



Connection of communications interfaces

Terminal block X1:
RS485 interface for Saia®S-Bus or point-to-point in MC mode (port 3)

Terminal block X2:
LonWorks® interface as option



Terminal block X3:
RS232 interface for external display, Saia®S-Bus or point-to-point (port 2)

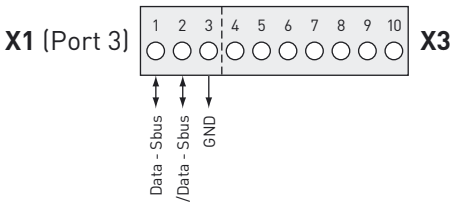
Terminal block X4:
Connection of PCD7.F1.. communications module at space A (port 1)

PGU interface (9-pole, D-type connector):
RS232 programming interface or modem connection via RJ45 connector (port 0), for instructions see page 4: "Serial data interfaces"

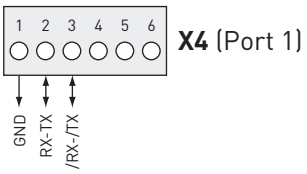
Pins on terminal block X4 for die PCD7.F1.. communications modules at space A

Pin	PCD7.F110 RS485	PCD7.F110 RS422	PCD7.F120 RS232	PCD7.F150 RS485 galv.	PCD7.F180 MP-Bus	
1 (gnd)	GND	GND	GND	—	GND	MP-Bus GND
2 (I1A)	RX-TX	TX	TX	RX-TX	A-COM	MP-Bus signal line
3 (I1B)	/RX-/TX	/TX	RX	/RX-/TX	MST	BELIMO® programming unit
4 (I1C)	—	RX	RTS	—	IN	BELIMO® programming unit detection
5 (I1D)	—	/RX	CTS	—	GND	BELIMO® programming unit GND
6 (I1G)	—	—	—	SGND	—	

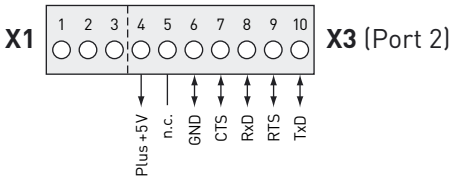
Connection for Saia®S-Bus/RS485



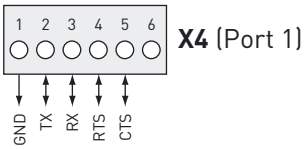
Connection PCD7.F110 for Saia®S-Bus/RS485



Connection external display PCD7.D230/RS232

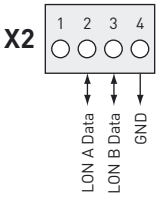


PCD7.F120 connection with RS232



The PCS1 does not support all the handshake signals necessary for modem control with the PCD7.F120 communications module.

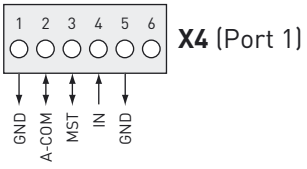
LonWorks® connection as option



The option with LonWorks® connection is a fixed installation. For details, see ordering information on page 16.

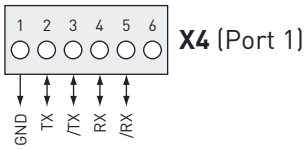
The service pin is located on the left-hand side of the housing, next to the RJ45 connector, and can be actuated through an opening.

PCD7.F180 connection for BELIMO® MP-Bus

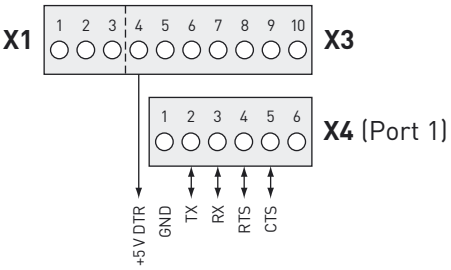


Up to 8 MFT/MFT2 drives from BELIMO® can be connected to the PCD7.F180 connection module for the MP-Bus. For details see Technical Information 26/342.

PCD7.F110 connection with RS422



PCD7.F120 connection for EIB/RS232

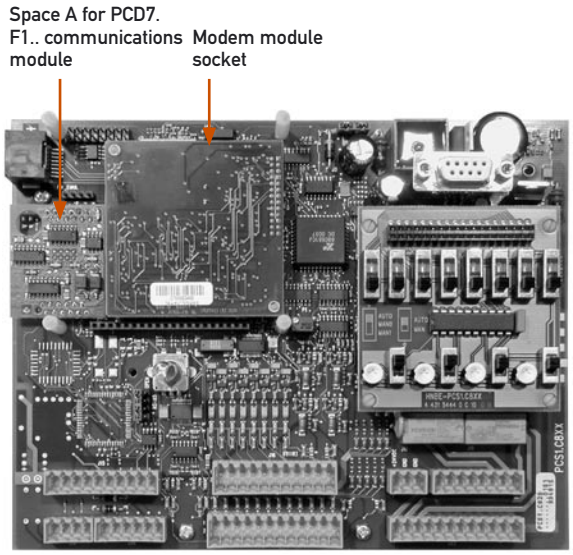


Telecommunication – today's way of overcoming distances and saving costs

Every DDC.Compact can be ordered with the option of an analogue, ISDN or even GSM modem. The telephone cable or GSM aerial must then simply be plugged into the controller itself to gain access to all the important telecommunications services, such as telemaintenance, remote diagnosis, error message transmission via SMS and remote programming.

Modern telecommunications combined with DDC-PLUS systems not only allow savings on commissioning and maintenance costs, but also simultaneously increase the security, availability and financial returns of an installation.

- Event or time-controlled information and requests to operations or service personnel.
- Fault elimination through remote diagnosis.
- Process optimisation through software updates and/or process parameter updates.
- Efficient preventive maintenance by qualified professionals, resulting in reduced maintenance costs.
- Error message transmission via SMS or pager.



Software libraries

Modem-Basic
Initialization and diagnosis, user profiles, list of dial-up numbers, password protection, establishment of connection, event or time-controlled transmission and receipt of data between PCD systems and foreign devices (e.g. building management technology), Saia®-S-Bus network via modem connections.

Modem-Pager
Event or time-controlled transmission of one or more messages by pager. Supports TAP and various protocols specific to different countries.

Modem-SMS
Event or time-controlled transmission of one or more SMS messages. Supports UCP and TAP. Receipt of SMS messages. Control of DDC-PLUS systems by means of SMS.

Modem-DTMF
Supports the receipt of DTMF signals for control commands via telephone = control of DDC-PLUS systems by means of DTMF signals.

For more detailed information, please consult Technical Information 26/368.

Technical data: analogue modem

Data transmission: V.34+, V.34, V.32bis, V.32, V.22, V.21, V.23, BELL standard 102, 212

Data compression: MNP 2-4, V.42, LAPM, MNP 10, MNP 10 EC

Functions: extended AT instruction set, automatic call acceptance, watchdog and reset

Technical data: ISDN modem

Data transmission
B channel: V.110, V.120, x.75, PPP, X.25/X.31, ML-PPP, HDLC (transparent)

D channel: 1TR6, DSS1, National 1,5ESS, JATE (INS64), VN4, TPH1962, X.31

ISDN interface: S0/I.430

Functions: extended AT instruction set

Technical data GSM-Modem

GSM Dualband 900/1800 MHz

FME antenna connector

General data

Power supply: 5 VDC internal (max. 350 mA)

Connection modem telephone network:
Standard RJ45 telephone plug

Approvals: throughout Europe according to CTR21, complies with relevant CE guidelines

Ambient temperature: Operation: 0…+55 °C

PG5 programming tool and function blocks (FBoxes)

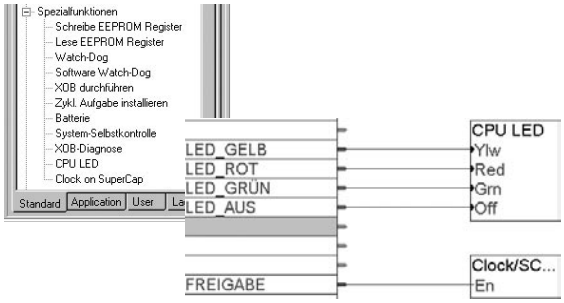
Compatibility throughout the DDC-PLUS family

As a product within the DDC-PLUS family, the DDC.Compact is of course fully compatible with the PG5 programming environment. This means that all 250 function blocks (FBoxes) of the standard library can also be used to their full extent with the DDC.Compact.

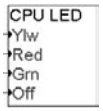
The same applies equally to the additional libraries available, e.g. HEAVAC for building automation applications and the EIB or modem libraries for telecommunications tasks.

Activation of the CPU LED and real-time clock

The appropriate FBoxes are located in the standard library, subdirectory “Special functions”.



FBox CPU LED



Inputs:

Ylw	Enable colour yellow
Red	Enable colour red
Grn	Enable colour green
Off	Enable LED off

Description

A positive edge at the input sets the CPU LED to the corresponding colour. This function is only available with the PCS1. The CPU also controls the LEDs when it goes into STOP or RUN.

Default status of LEDs

System in boot mode	red LED flashes (no firmware in PCS1)
Download firmware	LED flashes green/red/off
System in RUN mode	yellow LED on
System in Stop/Halt mode	LED off
Hardware error in system	red LED flashes every 500 ms

If the user opts for FBox control of the LEDs, the last status is saved after power-off and reactivated after power-up.

FBox Clock/SCap

Real-time clock active or inactive via super-capacitor

Input:

En	Enable for supply of real-time clock

Description

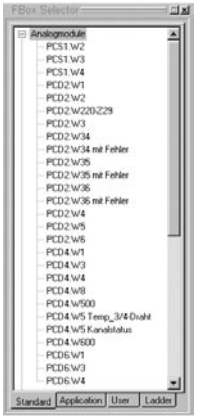
Voltage to the real-time clock is enabled via the “En” input on the FBox. Voltage is supplied by the super-capacitor. This means that when the real-time clock is inactive, data stored in RAM will remain protected approx. 3-times as long.

RAM	approx. 15 days
RAM and real-time clock	approx. 5 days

It can be useful to deactivate the real-time clock in configured systems, for example, to have adequate time for mounting after delivery. When the controller has been commissioned, the real-time clock should be reactivated and set. This function is only available with the PCS1.

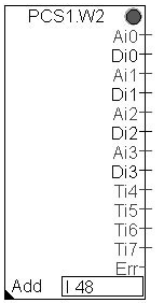
Assignment of analogue data points

The appropriate FBoxes are located in the standard library, subdirectory: “Analogue modules”.



FBox PCS1.W2 for 10-bit analogue inputs

(terminal block X5 above)



Ai0…Ai3	Analogue input signal 0…10 V of input channels 0 to 3
Di0…Di3	Digital input signal 24 VDC of input channels 0 to 3
Ti4…Ti7	Temperature input signal Pt/Ni 1000 of channels 4 to 7
Add	Base address of input channels 0 to 7 (is always I48 with the PCS1)
LED	Red when input value is invalid

The FBox modulates the signals to the input channels of the PCS1. The first 4 inputs can be used either as 0…10 VDC analogue inputs, or as 24 VDC digital inputs. The final 4 inputs are designed for Pt/Ni 1000 temperature values. The type of sensor can be selected in the FBox. The error output indicates which input has an error due to invalid values (bit 0 for input 0, bit 1 for input 1, etc.). A sensor failure,

for example, can therefore be identified. Analogue signal resolution: 10 bits (0.6° C).

The FBox must be used in a COB or PB that is processed cyclically. One input is processed for every CPU cycle.

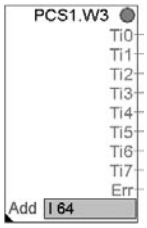
Adjust window

Error/acknowledge	Switch for clearing errors that have been dealt with. It changes the LED from red to green.
Output when in error	Definition of output value when sensor is faulty.
Ch 0…3/mode	Selection of input signal (0…10 V or 24 VDC) for each input channel.
Ch 4…7/sensor type	Choice of sensor type for each input channel.

Sensor types as under FBox PCS1.W3.

FBox PCS1.W3 for 12-bit analogue inputs

(terminal block X5 below)



Ti0…Ti7	Temperature input signal Pt/Ni 1000 of channels 0 to 7
Add	Base address of input channels 0 to 7 (is always I64 with the PCS1)
LED	Red when input value is invalid

The FBox modulates the signals to the input channels of the PCS1 with a resolution of 12 bits (max. 0.15 °C for Pt 1000, max. 0.08 °C for Ni 1000). All 4 inputs are designed for Pt/Ni 1000. The type of sensor can be selected in the FBox. The error output indicates which input has an error due to invalid values (bit 0 for input 0, bit 1 for input 1, etc.). A sensor failure, for example, can therefore be identified.

The FBox must be used in a COB or PB that is processed cyclically. One input is processed for every CPU cycle.

Adjust window

Error/Acknowledge	Switch for clearing errors that have been dealt with. It changes the LED from red to green.
Output when in error	Definition of output value when sensor is faulty.
Ch 0…7/sensor type	Choice of sensor type for each input channel.

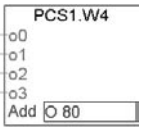
Sensor types of FBoxes PCS1.W2 and PCS1.W3

1:1	No conversion of input signals, setting range 0…1023 or 0…4095
Pt 1000	Temperature sensor Pt 1000, setting range –500…4000 for –50.0 °C to 400.0 °C
Ni 1000	Temperature sensor Ni 1000, setting range –500…2000 for –50.0 °C to 200.0 °C
Ni 1000 L&S	Temperature sensor Ni 1000 Landis & Staefa, setting range –300…1200 for –30.0 °C to 120.0 °C

N.B.:
Effective min/max values and range may differ slightly from the above.

FBox PCS1.W4 for 10-bit analogue outputs

(terminal block X6 below right)

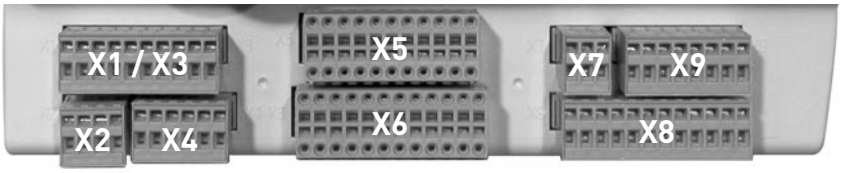


o0…o3	Digital value of analogue output channels 0 to 3
Add	Base address of analogue output channels 0 to 3 (is always O80 with the PCS1)

This FBox transfers the supplied analogue signals to the PCS1's output channels with a resolution of 10 bits. The FBox must be used in a COB or PB that is processed cyclically. One output is processed for every CPU cycle.

N.B.:
Output channels can be overridden through the manual/emergency control level. Overriding can be monitored via addresses I32 to I35.

Overview of terminal block assignment



Block	Pin	Name	I/O address	Notes
X1/X3	1	Data_Sbus		RS485, Port 3 Saia®S-Bus Standard Port on all PCS1
	2	/Data_Sbus		
	3	GND		
	4	+5V		RS232, External display standard port on all PCS1.C822/C823
	5	n.c.		
	6	GND		
	7	CTS2_ext		
	8	RxD2_ext		
	9	RTS2_ext		
	10	TxD2_ext		
X2	1	–		Not used
X4	1	GND		Optional port RS485/RS422/ RS232
	2	I1A		
	3	I1B		
	4	I1C		
	5	I1D		
	6	I1G		
X5	1	COM		GND for Pt/Ni1000
	3	E48	I 48 ch 0	Inputs 0…10V or digital inputs 24VDC Base address = 48, see also FBox PCS1.W2, page 12 Pt/Ni1000
	5	E49	I 48 ch 1	
	7	E50	I 48 ch 2	
	9	E51	I 48 ch 3	
	11	GND		
	13	GND		
	15	E52	I 48 ch 4	
	17	E53	I 48 ch 5	
	19	E54	I 48 ch 6	
	21	E55	I 48 ch 7	
X5	2	COM		GND for Pt/Ni1000
	4	E64	I 64 ch 0	Pt/Ni1000 Base address = 64, see also FBox PCS1.W3, page 13
	6	E65	I 64 ch 1	
	8	E66	I 64 ch 2	
	10	E67	I 64 ch 3	
	12	GND		
	14	GND		
	16	E68	I 64 ch 4	
	18	E69	I 64 ch 5	
	20	E70	I 64 ch 6	
	22	E71	I 64 ch 7	
X6	1	E0	I 0	Digital inputs, 8ms
	3	E1	I 1	
	5	E2	I 2	
	7	E3	I 3	
	9	E4	I 4	
	11	E5	I 5	
	13	E6	I 6	
	15	E7	I 7	
	17	E8	I 8	
	19	E9	I 9	Digital inputs, 0.2ms
	21	E10	I 10	
	23	E11	I 11	
	24	GND		

Block	Pin	Name	I/O address	Notes
X6	2	GND		Outputs 0…10V [1] Base address = 80, see also FBox PCS1.W4, page 13
	4	A80	O 80 ch 0	
	6	A81	O 80 ch 1	
	8	A82	O 80 ch 2	
	10	A83	O 80 ch 3	
	12	GND		Selectable as digital inputs (I12…I15) or outputs (O12…O15)
	14	+24V_EXT		
	16	E/A12	I/O 12	
	18	E/A13	I/O 13	
	20	E/A14	I/O 14	
	22	E/A15	I/O 15	
	(24)	GND		
X7	1	Uin +24VDC		Power supply inc. 24VDC for relays
	2	GND		
	3	GND		
X8	1	NO20	O 20	1st relay [1] / open
	2	COM20		common
	3	NC20	O 20	closed
	4	NO21	O 21	2nd relay [1] / open
	5	COM21		common
	6	NC21	O 21	closed
	7	NO22	O 22	3rd relay [1] / open
	8	COM22		common
	9	NC22	O 22	closed
	10	NO23	O 23	4th relay [1] / open
	11	COM23		common
	12	NC23	O 23	closed
X9	1	COM16		5th relay [1] / common
	2	NO16	O 16	open
	3	COM17		6th relay [1] / common
	4	NO17	O 17	open
	5	COM18		7th relay [1] / common
	6	NO18	O 18	open
	7	COM19		8th relay [1] / common
	8	NO19	O 19	open
Intern		A_M16	I 24	Switch pos.1 (see page 6) Acknowledgement of manual/ emergency control level (Auto/Man = 1/0 [2]) Switch pos.1 (see page 6)
Intern		A_M17	I 25	
Intern		A_M18	I 26	
Intern		A_M19	I 27	
Intern		A_M20	I 28	
Intern		A_M21	I 29	
Intern		A_M22	I 30	
Intern		A_M23	I 31	
Intern		A_M80_0	I 32	
Intern		A_M80_1	I 33	
Intern		A_M80_2	I 34	
Intern		A_M80_3	I 35	

[1] With manual/emergency control level as option
[2] Caution: If the manual/emergency control level is not equipped, the status of inputs I24 to I35 is always logical "1".

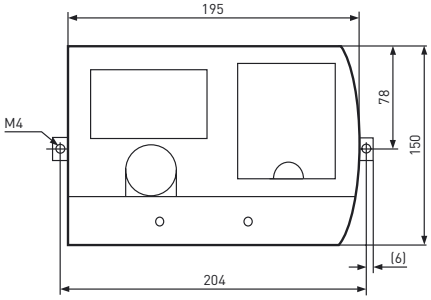
Technical data
Dimension drawing

Technical data

Basic hardware	
Supply voltage	24 VDC ±20 % smoothed or 19 VAC ±15 % full-wave rectified
Power consumption	max. 10 W
User memory	240 Kbytes/1 Mbyte (as of 2004) as flash EPROM and 128 Kbytes/896 Kbytes (as of 2004) as RAM
Processor	CPU with 32-bit µC 68340 (16 MHz)
Processing time	Bit command 5 µs, word command 20 µs
Real-time clock	Time values: s/min/h, week/day of week, month/day of month, year Accuracy: better than 15 s/month
RAM data protection	5…15 days with super-capacitor (user memory, real-time clock)
Digital inputs/outputs	
3 digital inputs, 24 VDC, input delay typically 0.2 ms 9 digital inputs, 24 VDC, input delay typically 8 ms 4 digital inputs/outputs, 24 VDC, input delay typically 8 ms, outputs 0.5 A in range 0…32 V 4 relay outputs as 'make' contact, 2 × 2 A/2 × 4 A/250 VA [1] 4 relay outputs as changeover switch, 2 × 2 A/2 × 4 A/250 VA [1]	
Analogue inputs/outputs	
4 analogue inputs 0…10 V, resolution 10 bits, alternative use as digital inputs possible 4 analogue inputs Pt/Ni 1000, 2-wire, resolution 10 bits (= approx. 0.6 °C) 8 analogue inputs Pt/Ni 1000, 2-wire, resolution 12 bits (= max. 0.15 °C Pt 1000 or max. 0.08 °C Ni 1000) 4 analogue outputs 0…10 V, resolution 10 bits [2]	
Serial data interfaces (space A)	
RS 232, RS 485, RS 485 electrically isolated, RS 422	
Field bus connections via hardware	
Saia®S-Bus as master or slave (RS 485), LonWorks® and MP-Bus from BELIMO® as option	
General data	
Noise emission	CE mark according to EN 61 000-6-3
Noise immunity	CE mark according to EN 61 000-6-2
Ambient temperature	Operation 0…+55 °C or 0…+40 °C (depending on mounting position) Storage –20…+85 °C
Atmospheric humidity	95% relative humidity without condensation
Mech. strength	according to EN/IEC 61 131-2
Standards and approvals	EN/IEC 61 131-2

[1] With manual/emergency control as option
[2] With manual/emergency control and potentiometer as option

Dimension drawing

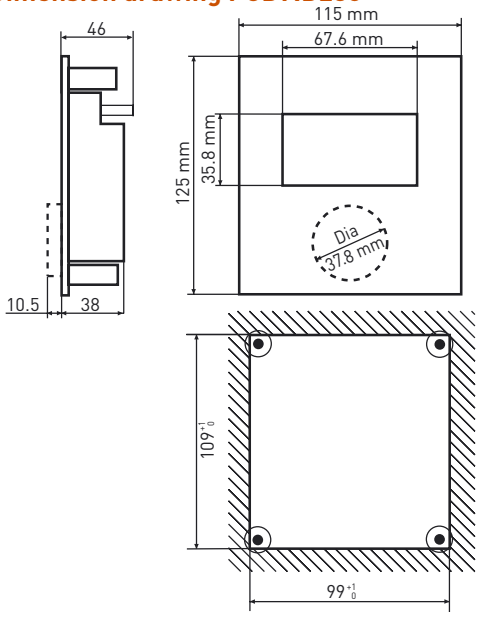


Device depth: 60 mm

Technical data

Typ	PCD7.D230
Display	
Type	Graphics display
Display dimension (W × H)	8 lines x 20 characters 128 x 64 pixels (70 x 40 mm)
Character size (B x H)	5 x 7 pixels + cursor (2.52 x 3.54 mm)
Contrast adjustment	via Software or setup
LED backlighting	on/off
Character sets	ASCII + special characters for German, French, English and Scandinavian
Controls	
Single-knob control	1
Interfaces	
to Saia®PCS1	RS 232 9-pole D-type
General data	
Supply voltage U_n	24 VDC, +30 %/–20 % or 19 VAC, ±15 %, full wave rectified
Power consumption at U_n	200 mA
Noise emission	CE mark according to EN 61 000-6-3
Noise immunity	CE mark according to EN 61 000-6-2
Protection category (front)	IP 54
Operating temperature	0...50 °C
Storage temperature	-25...+70 °C
Permissible humidity	5…95 % r.H. without condensation

Dimension drawing PCD7.D230



Ordering information

Devices are supplied ready-fabricated according to the following order code key:

Base unit	PCD7.F..	Modem	Software	Mechanical options
PCS1.C8..	0 = without	0 = without	0 = PG5	0 = without terminal cover
	A = ..F110	1 = analogue	A = macro	1 = with terminal cover
	B = ..F120	2 = ISDN		2 = without terminal cover, wall mounting
	D = ..F150	3 = GSM		3 = with terminal cover, wall mounting
	E = ..F180			

Example: **PCS1.C820 A200** =
Base unit with graphics display and manual/emergency control,
additional RS422/RS485 interface, ISDN modem, user programmable with PG5,
without terminal cover

Orders placed must specify the complete code.

Base units

PCS1.C820	with graphics display and manual/emergency control
PCS1.C821	with graphics display
PCS1.C822	with manual/emergency control
PCS1.C823	without display or manual/emergency control

Base units with LonWorks® connection

PCS1.C880	with graphics display and manual/emergency control
PCS1.C881	with graphics display
PCS1.C882	with manual/emergency control
PCS1.C883	without display or manual/emergency control

Accessories

4'111'4927'0	Terminal cover
4'109'4849'0	Set for wall-mounting
PCD7.D230	External graphics terminal

PCD7.F.. communications modules (for interchange)

PCD7.F110	interface RS422/RS485, electrically connected
PCD7.F120	interface RS232 (RTS/CTS only supported)
PCD7.F150	interface RS485, electrically isolated
PCD7.F180	MP-Bus connection module for BELIMO® MFT drives

Modem modules (for interchange)

4'636'6683'0	analogue
4'636'6684'0	ISDN-TA
4'636'6749'0	GSM

saia-burgess

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