

Saia® System Catalogue 2009/2010

Quality, openness and flexibility
in automation

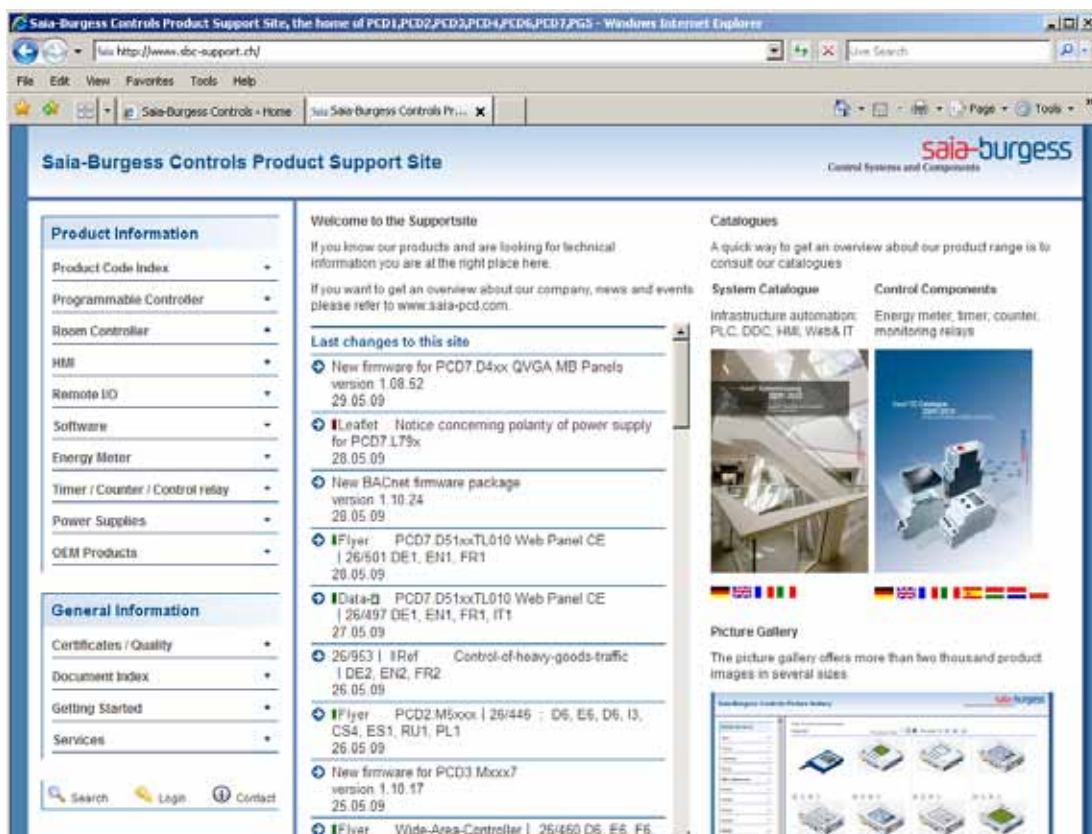
saia-burgess

Control Systems and Components

Saia-Burgess Controls in the Internet



www.saia-pcd.com



www.sbc-support.ch

Technical support

Cover picture: Saia®PCD Reference Project: Westside Bern, Switzerland
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Saia® System Catalogue: Content

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Saia® Partnership concept



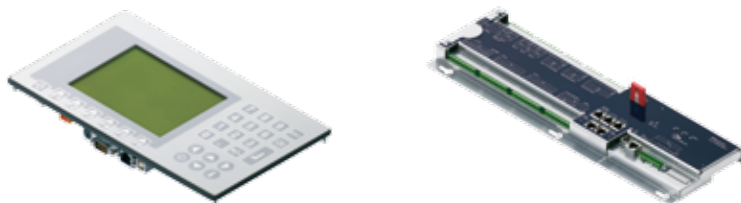
The system integrator as partner

As a control and regulation specialist, Saia-Burgess Controls develops and produces all its own hardware, firmware and software components for the entire product range.

For the technical implementation of all building automation requirements, the company has for many years collaborated with trained system partners, who realize projects on behalf of the builders of houses, commercial properties or industrial facilities. System partners offer system solutions based on the portfolio of products for the entire life

cycle of the building's technical equipment. This goes through all the stages from planning and project processing to complete system integration and operational control, including energy and technical facility management.

To focus its own company resources better, Saia® basically excludes itself from offering complete automation solutions. A situation in which it might compete against its own customers could therefore never arise.



The device manufacturer (OEM) as partner

The characteristics of the Saia® product portfolio make it particularly attractive for cost-optimized volume applications, where industrial grade quality and durability are required. With its high internal added value, it is a strongly competitive, flexible and competent partner for the control technology of mass produced machines, devices and apparatus. The range offered in the OEM segment starts with standard systems that have an OEM label and extends through customized interfaces for standard

PCD/PCS systems to dedicated Smart Controls solutions. Partners can use the programming environment of Saia® PG5 Controls-Suite to encapsulate their own know-how in protected functions and store them in the system where they are processed. A large basic memory not only lets them file web-compatible configuration menus for spare parts lists, but also system documentation. All these characteristics enhance the efficiency of commissioning, service and maintenance for OEMs.

- Hospitals
- Industrial facilities
- Railway stations
- etc. ...

End users

- Ships
- Shopping centers
- Breweries
- Hotels
- Banks

• Museums

GC

Planer

OEM

System integrator

Control systems

Saia®DDC.Plus Saia®SWeb

Control devices

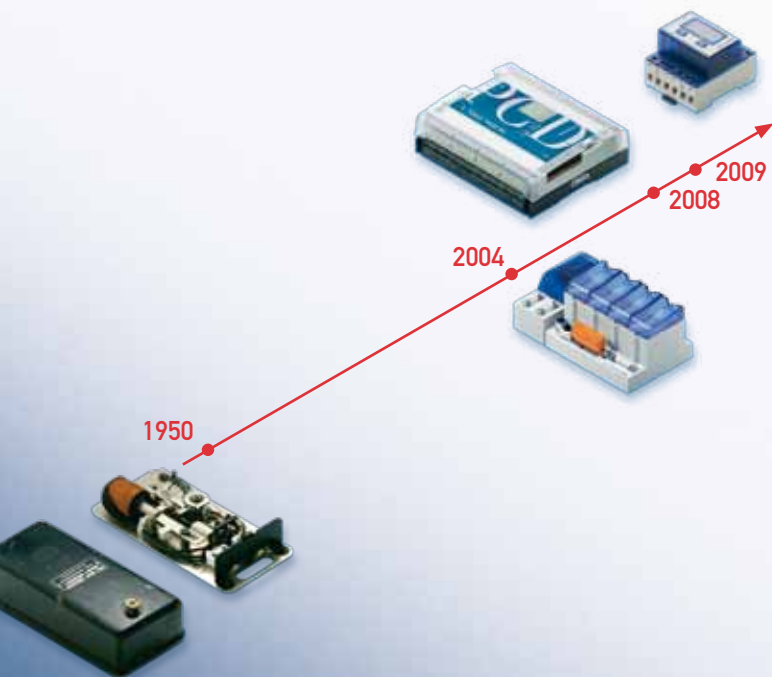
Saia®PCD Saia®PCS

Boards & Software Components

Saia®NT.OS

Saia-Burgess

Saia-Burgess Controls: Continuing tradition



The Saia® system is a continuation of this company's long development history in building technology. Even before 1930, the former SAIA AG set out to develop, produce and market technical components for buildings. In the company's early history, these largely comprised machines for use in the stair and landing areas. From the seventies, they were developed into a modern, highly flexible building automation system based on user programmable control systems.

To continue along this successful path, the company employs a large number of hardware and software development engineers at its main plant in Switzerland.

Every year, Saia-Burgess Controls produces more than 30 000 controller CPUs with over 1.5 million data points for the automation engineering field. Volumes like this can, in suitable quality, only be developed and produced on the basis of a mature quality management system.

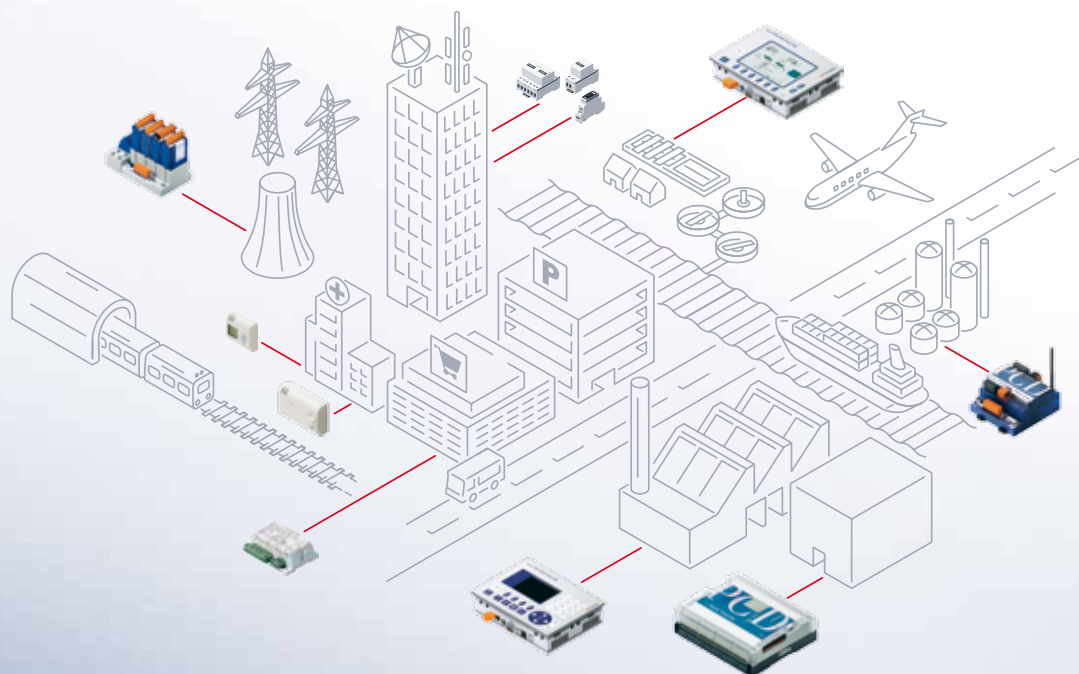
Infrastructure Automation: Our core competency



What lies behind the term: infrastructure automation? Saia-Burgess Controls has focussed the main thrust of its activities and the design concept of its product and service range at the very point where market definitions typically leave a large gap. This area also happens to be a weak point in the automation systems or sales/support organizations even of leading automation suppliers.

We call this area infrastructure automation. It includes the automation of commercial properties, covering all the necessary technical facilities, the wellbeing of people, and the smooth operation of installed machines and equipment. For this field of application, Saia-Burgess Controls develops system solutions based on the latest PLC technology and characterized by high levels of flexibility, openness and quality.

Today our products are used across the spectrum, from the technologies of building, traffic, power and water to data management and logistics systems. To implement such extensive automation tasks, Saia-Burgess Controls works throughout Europe with over 500 elected system partners. Saia system partners are suppliers of solutions for end users and planners. According to individual requirements and problems, our partners put together a suitable system solution based on Saia® components. They carry out its integration and, if necessary, service and maintain the installation.



Automation + web technology + IT technology



Saia® S-Web based user prompting

With Saia-Burgess Controls, web technology means unlimited communication, due to an integral automation server at the automation level. Regardless of whether a web-based control panel gets its system data from the automation level, or whether energy data has to be provided within a building network: one and the same standards-based communications mechanism will always apply. A browser just has to be installed on control units to display in a user-friendly way the information available in the automation server. Through the use of standard interfaces and services, energy data can be accessed or alarm messages sent world-wide.

Management level

A building management system is indispensable for the display, operation, optimization and processing of incoming alarms in the technical installations of any building. The Saia®Visi.Plus system offers a wide range of uses in building technology at the optimum price, due to its scalable, web-based infrastructure automation.

Automation level

At the automation level, Saia-Burgess Controls offers a comprehensive range of freely programmable, compact and modular systems, whose rigorous compatibility sets them apart. With the help of comfortable programming tools in the Saia®PG5 Controls-Suite, it is possible to integrate and commission systems in the installation specifically for an application. Standard interfaces are predominantly used to network the separate plant areas and levels. Interfaces range from simple serial connections or modem segments all the way to Ethernet-TCP/IP communications and networking with Internet.

Field automation level

To adjust for optimum room climate, independently functioning room control units are used for the most diverse requirements. These units can be connected to the higher ranking automation system via network connections, thus ensuring a direct effect on primary power installations.

In order to switch on signals in widely separate parts of a building, decentralized input/output modules or intelligent room control units are used. These can be connected and monitored via a wide variety of standard interfaces, according to requirements.

Saia® S-Web

cgi

ibus

System components: Automation stations

As a company, Saia-Burgess Controls has always stressed the importance of protecting investment through the rigorous compatibility of our products. At the automation level, this company offers an extensive range of compact, modular, freely programmable systems, all of which can be equipped with a manual/emergency control level. With the help of a convenient programming tool – Saia®PG5 Controls-Suite – these systems are programmed for specific applications and then commissioned. The freedom with which automation systems and software components can be combined produces such flexibility that there are almost no limits to the range of uses.

Saia® PCS

Compact range
up to 44 data points

Chapter 6.1



PCS1.C42x



PCS1.C62x



PCS1.C82x

Saia® PCD3

Compact range
up to 102 data points

PCD3.Compact Chapter 6.5



PCD3.M2x30V6

PCD3.WAC Chapter 6.6



PCD3.M2x30A4Tx

Saia® PCD

Modular range
up to 64 data points

up to 128 data points
up to 256 data points
up to 512 data points

up to 1024 data points

Chapter 6.2



PCD1.M110



PCD1.M125



PCD1.M135

Chapter 6.4

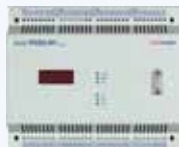


PCD3.M3020



PCD3.M3120

Chapter 6.2



PCD2.M110



PCD2.M150



PCD2.M170

Chapter 6.2



PCD2.M480

Chapter 6.3



PCD2.M5x40

Chapter 6.4



PCD3.M3230



PCD3.M3330

Chapter 6.4

Profi-S-Nets



PCD3.M5340



PCD3.M5440 /
PCD3.M5540

CAN- / Profi-
bus Master



PCD3.M6240 /
PCD3.M6340

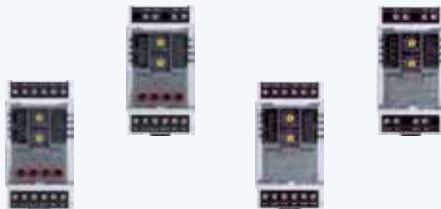
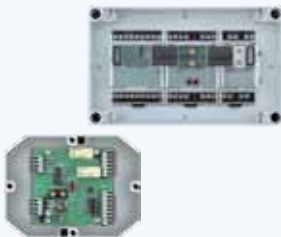




PCD3.M6440 /
PCD3.M6540

System components:






















Remote data points

Remote input/output components overcome great distances quickly, easily and at reasonable cost. Users can select the connection that meets their requirements: either serial, Profibus or Ethernet. As far as mounting is concerned, there are two different types for the various areas of use: switch cabinet and field mounting.

	Switch cabinet mounting	Field mounting
Serial S-Net	<p>Chapter 7.1</p>  <p>PCD7.L100 PCD7.L200 PCD7.L300 PCD7.L400</p>	<p>Chapter 7.1</p>  <p>PCD7.L121 IP66 housing</p>
Profibus DP / Profi-S-Net	<p>Chapter 7.2</p>  <p>PCD3.T760 PCD3.T765</p>	
Ethernet / Ether-S-Net	<p>Chapter 7.3</p>  <p>PCD3.T660</p>	

System components: Operator panel

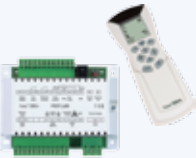


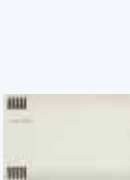





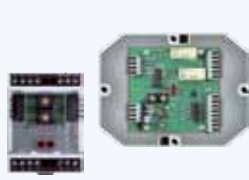


When it comes to displaying system-specific information, or entering parameters like time-switch functions, the spectrum extends from the simple text panel to the powerful web panel. This means that, depending on requirements, individual customer needs can be met in full. Whether these needs call for direct local control or for networked visualization through distributed control nodes, Saia®system components can be used to create open control concepts – without adding to design, implementation or maintenance costs.

Saia® PCD Web-Panel eXP	Web-Editor	<div>Chapter 5.5</div> <div>    </div> <div>10.4 " 12 " 15 "</div>	Windows® eXP
Saia® PCD Web-Panel CE		<div>Chapter 5.5</div> <div>    </div> <div>6.4 " 10.4 " 10.4 "</div>	Windows® CE
Saia® PCD Web-Panel MB		<div>Chapter 5.5</div> <div>     </div> <div>3.5 " 5.7 " 5.7 " 10.4 "</div>	Saia® NT
Saia® PCD Web-Panel nanoB		<div>Chapter 6.3</div> <div>  </div> <div>eDisplay 1.9" for PCD2.M5xxx</div>	Saia® NT
Saia® Graphical Panel	VT-Win	<div>Chapter 5.4</div> <div>     </div> <div>PCD7.D740 PCD7.D763 PCD7.D786 PCD7.D787</div>	
Saia® PCD Text Panel	HMI-Editor	<div>Chapter 5.3</div> <div>       </div> <div>PCD7.D16x PCD7.D170 PCD7.D290 PCD7.D230 PCD7.D231 PCD7.D232</div>	

System components:

Room automation















When regulating for an optimum room climate, autonomous room controllers are used for the most diverse requirements. They can be connected to a higher ranking automation system via network connections, to ensure a direct influence on primary power installations.

		Serial S-Net	BACnet®	LONWORKS®
Fan-coil Radiator Cooling ceiling Variable volume flow	Heating, ventilation, air conditioning (HeaVAC)	Chapter 8.3  PCD7.L60x	Chapter 8.3  PCD7.L60x	Chapter 8.3  PCD7.L61x
		Chapter 8.2  PCD7.L79x	Chapter 8.3  PCD7.L60x	Chapter 8.3  PCD7.L60x
		Chapter 8.2  PCD7.L79x	Chapter 8.3  PCD7.L60x	Chapter 8.3  PCD7.L60x
Light and shade	Electrical	Chapter 7.1  PCD7.L120 PCD7.L121	Chapter 8.3  PCD7.L62x	Chapter 8.3  PCD7.L62x

System components:

Operation and monitoring

The aim is: individual control and monitoring. To achieve it, many system components have been placed at the disposal of building operators. They range from the management station, switch cabinet operation and manual control modules, all the way to room control units. With the help of these components, parts of an installation can be operated, monitored, or overridden.

Operator stations	Chapter 4.1	Chapter 3 + 4	Chapter 5.5		
					
	Management station	Web operation	Web-Panel eXP		
Switch cabinet operation	Chapter 5.3	Chapter 5.4	Chapter 5.5		
					
	Text Panel	Graphical Panel	Web-Panel MB Web-Panel CE		
Manual operation	Chapter 6.1	Chapter 9.4	Chapter 6.4	Chapter 7.1	Chapter 9.5
					
	PCS1.Cxxx	PCD2.K552	PCD3.x	PCD7.Lxxx	PCD7.Lxxx
Room control devices	Chapter 8.2	Chapter 5.3	Chapter 8.3		
					
	PCD7.L793	PCD7.D290	PCD7.L6xx		

System components: Software tools

For programming, configuring, commissioning and monitoring overall automation technology.

- Cost-optimized configuration, visualization and commissioning of standard installations with Compact-Easy
- Fast, comfortable engineering through prefabricated libraries for the automation and management level with DDC-Suite
- Tailor-made engineering with Saia® PG5 Controls-Suite
- Know-how transfer with Saia® FBox-Builder
- Web applications made easy with Saia® S-Web

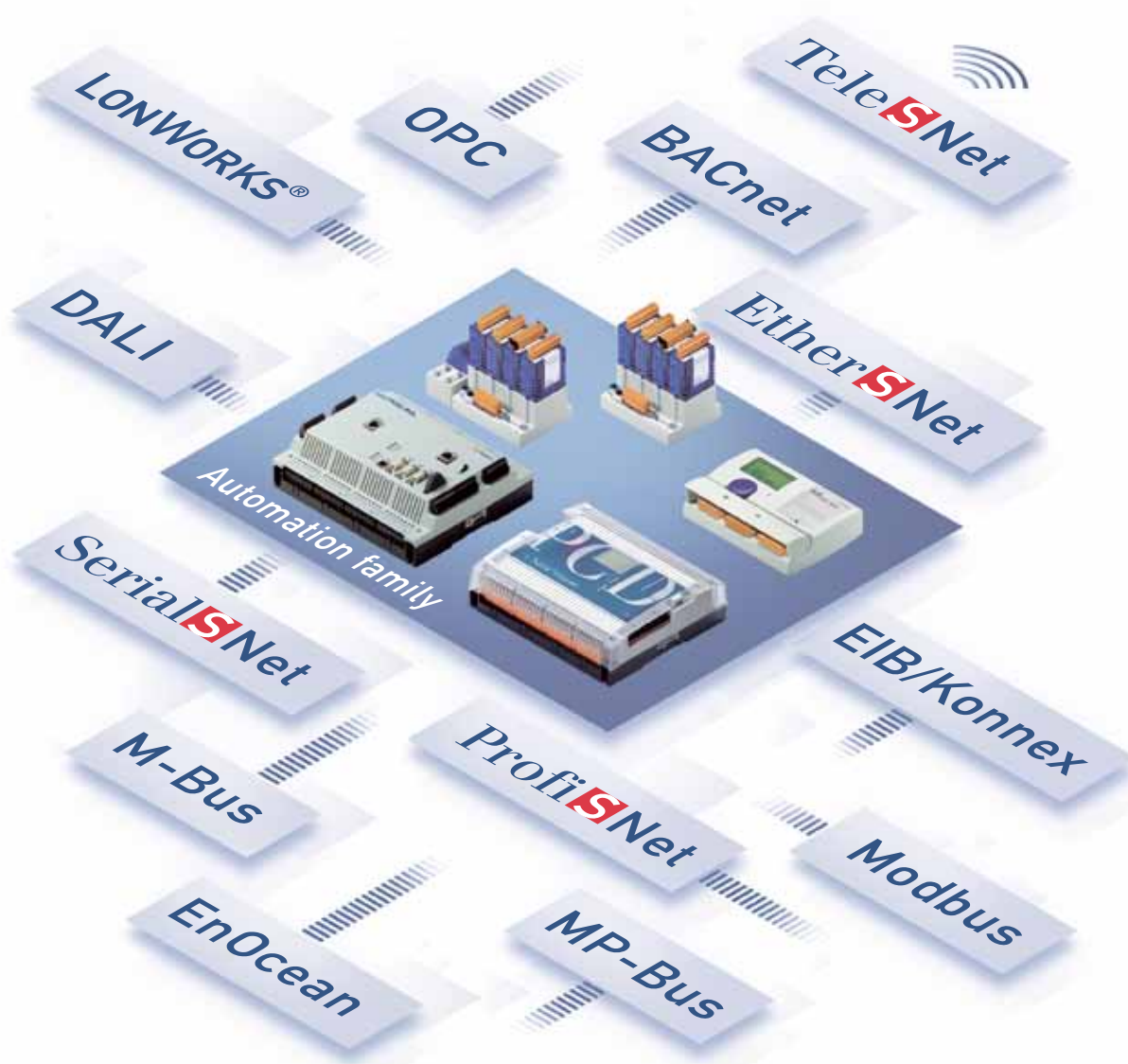
		Configuration	Visualization/ Engineering tools	Automation libraries	Creation of object masters
Modular and compact systems	PCS/PCD		PG5	Standard HeaVAC/ DDC-Suite	FBox- Builder
Management systems	Visi.Plus		Visi.Plus	HeaVAC/ DDC-Suite	
Web operator panel	Web		S-Web- Editor	HD-Log/ DDC-Suite	
Graphical operator panel	Graphics		VT-Win		
Text and semigraphical operator panel	Text		HMI-Editor	HeaVAC / DDC-Suite	
Communication	Com		Network configurator	FBoxes	

■ LonWORKS® ■ S-Net
 ■ KNX/EIB ■ Modem
 ■ EnOcean ■ DALI
 ■ JCI-N2 ■ Modbus

(see Chapter 2)

2 Open, comfortable communication

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2.1 Overview of communications interfaces for all automation stations

	Compact										Modular						
	PCS1				PCD3. Compact		PCD3.WAC				PCD1			PCD2			
	PCS1.C42x	PCS1.C62x	PCS1.C82x	PCS1.C88x	PCD3.M2030V6	PCD3.M2130V6	PCD3.M2330A4T1	PCD3.M2330A4T3	PCD3.M2330A4T5	PCD3.M2330A4T5	PCD1.M110	PCD1.M125	PCD1.M135	PCD2.M110	PCD2.M150	PCD2.M170	PCD2.M480
Up to 19 data points	■																
Up to 30 data points		■															
Up to 44 data points			■	■													
Up to 64 data points											■	■	■				
Up to 78 data points (of which 14 on board)							■	■	■	■							
Up to 102 data points (of which 38 on board)					■	■											
Up to 128 data points														■			
Up to 256 data points (of which 128 on board)															■		
Up to 512 data points (of which 128 on board)																■	
Up to 1024 data points (of which 128 on board)																	■
Maximum number of interfaces incl. PGU	3	3	3	4	3	4	5	5	5	4	2	3	3	4	4	6	9
Interfaces on board																	
PGU RS 232	■	■	■	■							■	■	■	■	■	■	■
PGU USB					■	■	■	■	■	■							■
Serial S-Net up to 38,4 kBit/s	■	■	■	■													
Profi-S-Net 187.5 MBit/s or RS485 up to 115 kBit/s	■	■	■	■	■	■	■	■	■	■	■						■
Profi S-Net 1.5 MBit/s																	■
LONWORKS®																	
PSTN Modem							■										
ISDN Modem								■									
GSM&GPRS Modem									■	■							
Ethernet				■		■	■	■	■								
Pluggable interface options																	
Ethernet-TCP/IP											1	1		1	1	2	
Optional slot PCD7.F1xx	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■
Number of module slots for F5, 6, 7, 8 [module]																	
- F5xx module 2 × serial (as F1xx)																	
- F655 module Ethernet																	
- F7xx module Profibus + RS485											1	1		1	2	2	
- F8xx module LONWORKS® + RS485 (not with M480)																	
It is not possible to use 2 interface modules of the same type (except PCD2.M480 with 2 x Ethernet)																	
Optional integral modem	■	■	■	■							■	■	■	■	■	■	■
Optional external modem											■	■	■	■	■	■	■

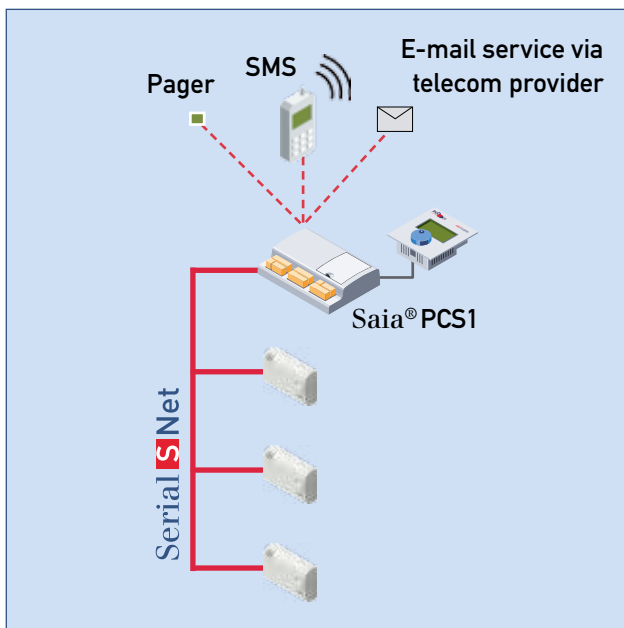
			Modular												
			PCD2.M5		PCD3										
			PCD2.M5440	PCD2.M5540	PCD3.M3020	PCD3.M3120	PCD3.M3230	PCD3.M3330	PCD3.M5340	PCD3.M5440	PCD3.M5540	PCD3.M6240	PCD3.M6340	PCD3.M6440	PCD3.M6540
Up to 64 data points					■	■									
Up to 1024 data points (of which 128 on board)			■	■			■	■	■	■	■	■	■	■	■
Maximum number of interfaces incl. PGU With 4 modules PCD2/PCD3.F2xx (each with 2 interfaces)			11	12	10	11	10	11	13	13	13	13	13	13	13
Interfaces on board															
PGU RS 232			■	■					■	■	■	■	■	■	■
PGU USB			■	■	■	■	■	■	■	■	■	■	■	■	■
Ethernet-TCP/IP				■		■		■	■		■		■		■
Controller Area Network (CAN 2.0B)												■	■		
Profibus DP Master up to 12 MBit/s														■	■
Profi S-Net 1.5 MBit/s			■	■						■	■				
Profi-S-Net 187.5 MBit/s or RS485 up to 115 kBit/s					■/■	■/■	■/■	■/■	■/■	-/■	-/■	■/■	■/■	-/■	-/■
RS422 up to 115 kBit/s									■						
LONWORKS®				■		■		■	■		■		■		■
Pluggable interface options															
Slot C for Controller Area Network (CAN 2.0B)			■	■											
Slot C for Profibus DP Master up to 12 MBit/s			■	■											
BACnet (with PCDx.R56x module)						■		■	■		■		■		■
Slot A1/A2 for PCD7.F1xx			■ ■	■ ■											
I/O-slots 0 for PCD3.F1xx					■	■	■	■	■	■	■	■	■	■	■
- RS 232 for EIB, DALI, external modem, control panel, external system, etc. - RS 485/422 for S-Bus, Modbus, EnOcean etc. - Belimo MP-Bus															
I/O-slots 0...3 for - PCD2.F2100 (RS 422 / RS 485 & optional PCD7.F1xx) - PCD2.F2210 (RS 232 & optional PCD7.F1xx) - PCD7.F2810 (Belimo MP-Bus & optional PCD7.F1xx)			4	4											
Number of module slots for PCD3.F2xx Module 2 × serial (functions as F1xx)					4	4	4	4	4	4	4	4	4	4	4
Slot A1/A2 for integral modem on I/O-slots			■	■											
Optional external modem			■	■	■	■	■	■	■	■	■	■	■	■	■

2.2 Application examples

System structure for small-sized premises

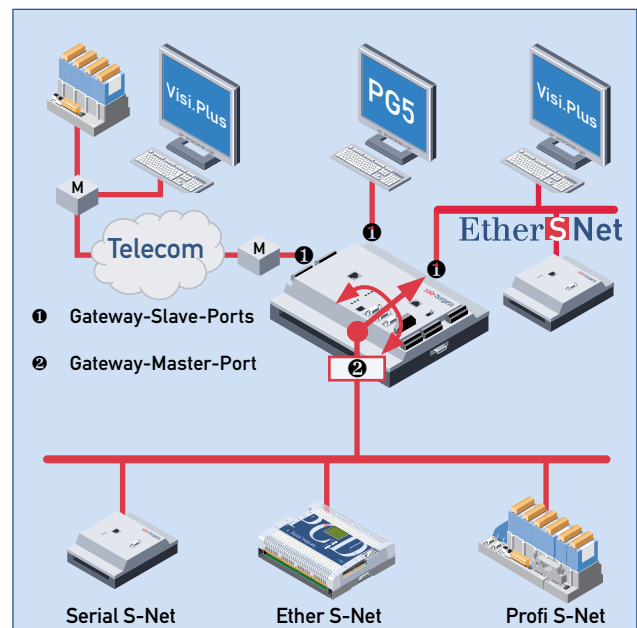
PCS1 compact automation station

Local user prompting and room control systems linked S-Net. The integral modem allows the transmission of alarm messages and execution of telemaintenance functions.



Gateway function in all Saia® automation stations

The gateway function allows network crossovers and inter-face adjustments to be made. This involves consistent support throughout of programming, data and web services for access via the web browser.

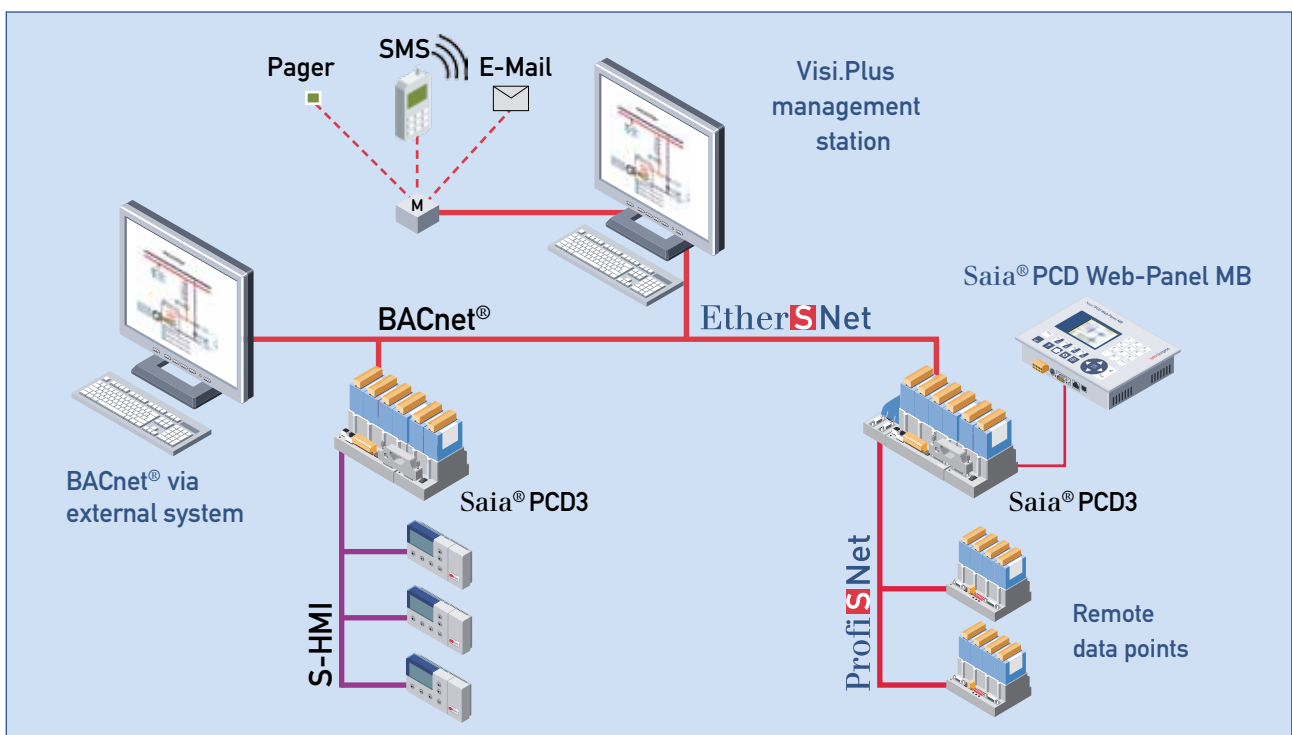


System structure for medium-sized premises

PCD3 distributed automation stations

Linked via Ether S-Net to the Visi.Plus building management system.

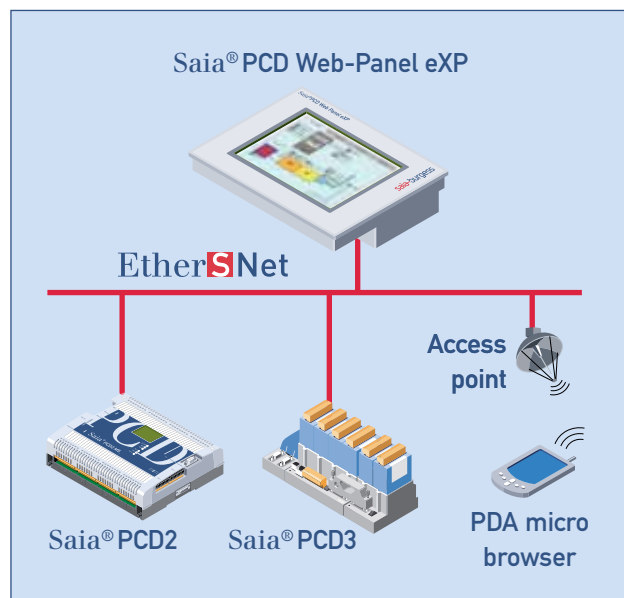
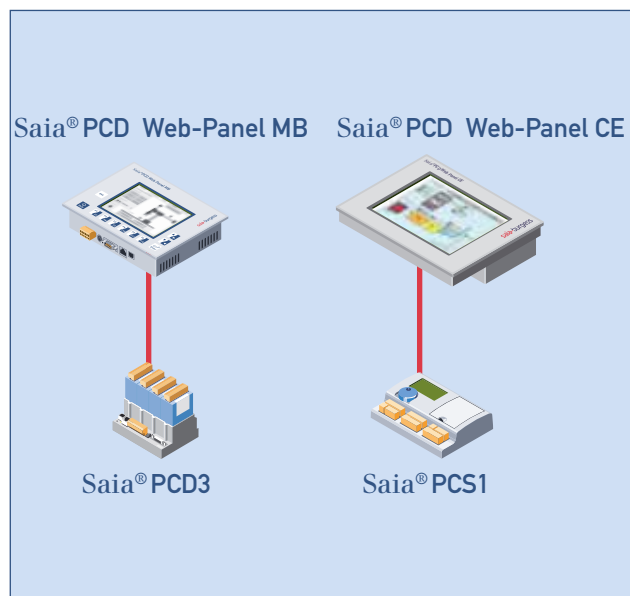
As an option, BACnet® external systems can also be incorporated within combined automation. This allows BACnet® client and server utilities to be executed at the automation level and even, via OPC, at the management level.



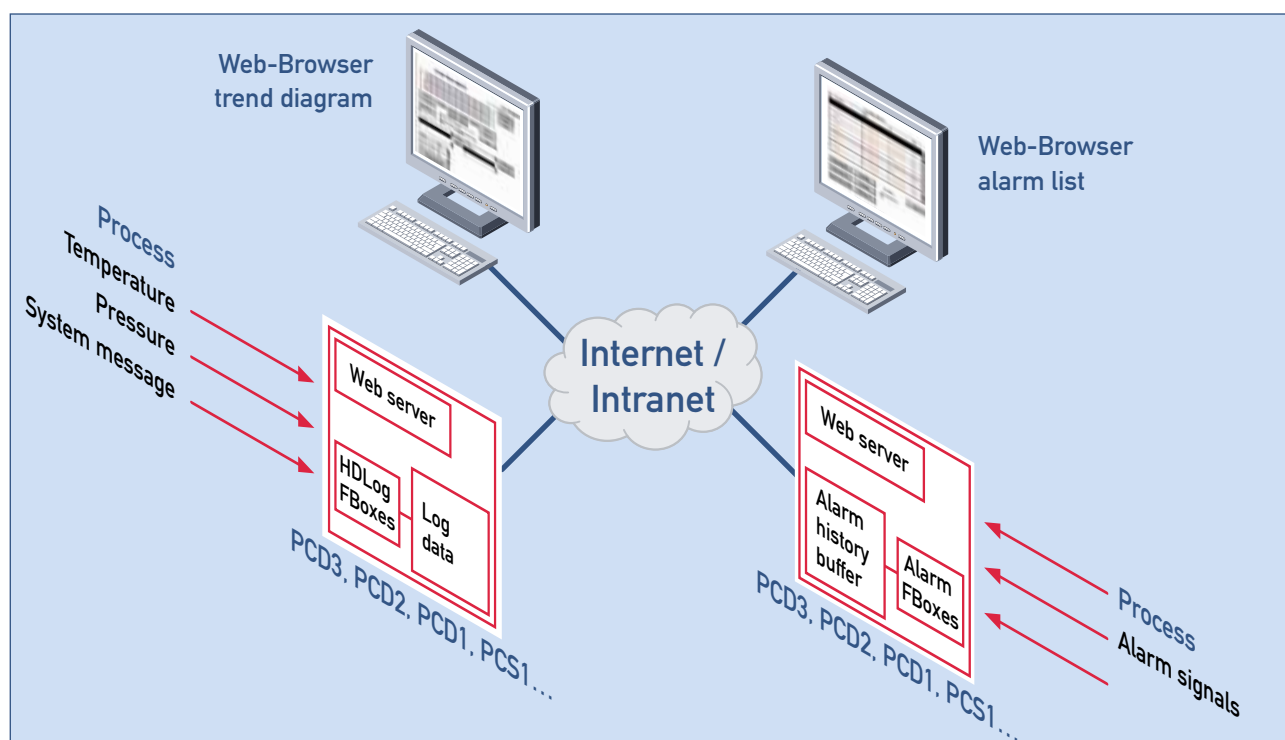
Application examples

Web based application with Saia® S-Web

The automation stations have integral web servers that can be used to create uncomplicated, custom control concepts. Operation may be via Saia® Web-Panels and/or mobile PDAs.



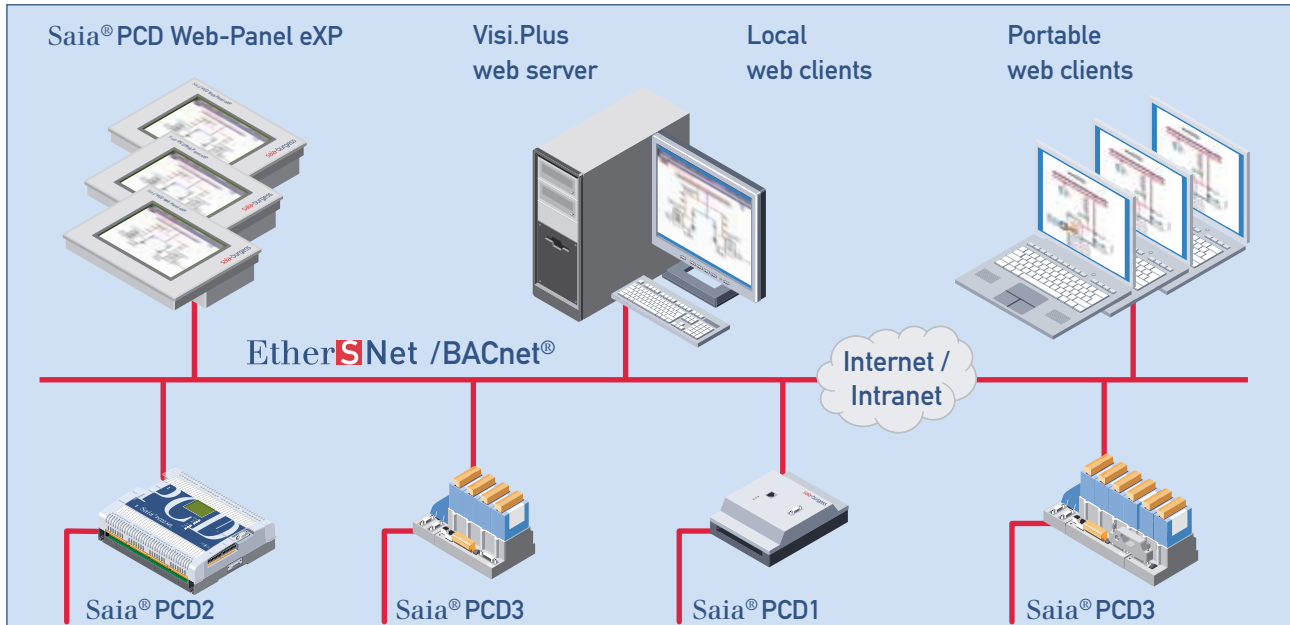
The web server includes integral «Trend» and «Alarm» functions. These may be used, for example, to track temperature sequences and report via the alarm module whenever any limit values are exceeded.



Application examples

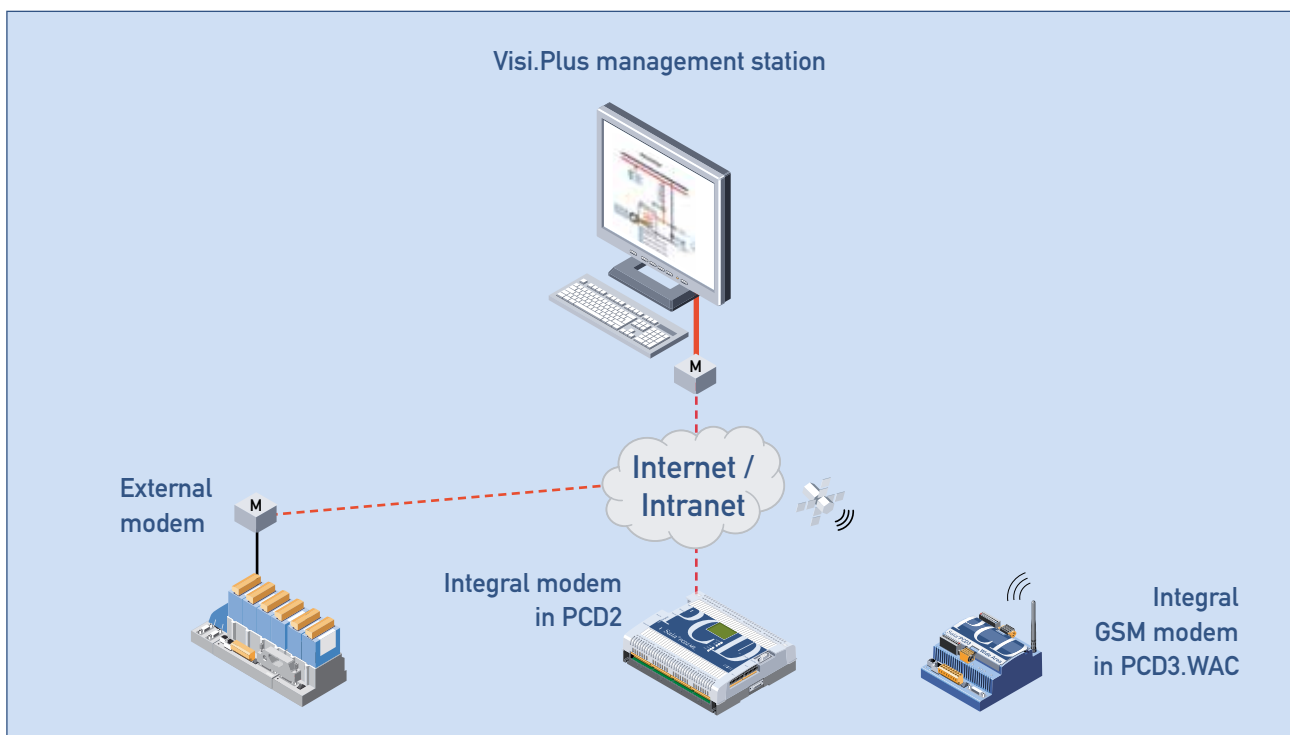
Web management with Visi.Plus

The Visi.Plus building management system has an integral web server that can be used to create PC or even web panel-based control concepts. This can enable every workstation in the building to influence climate, lighting and shade. This takes place without the installation of additional software on the client.



Telecommunication/tele service with Tele-S-Net

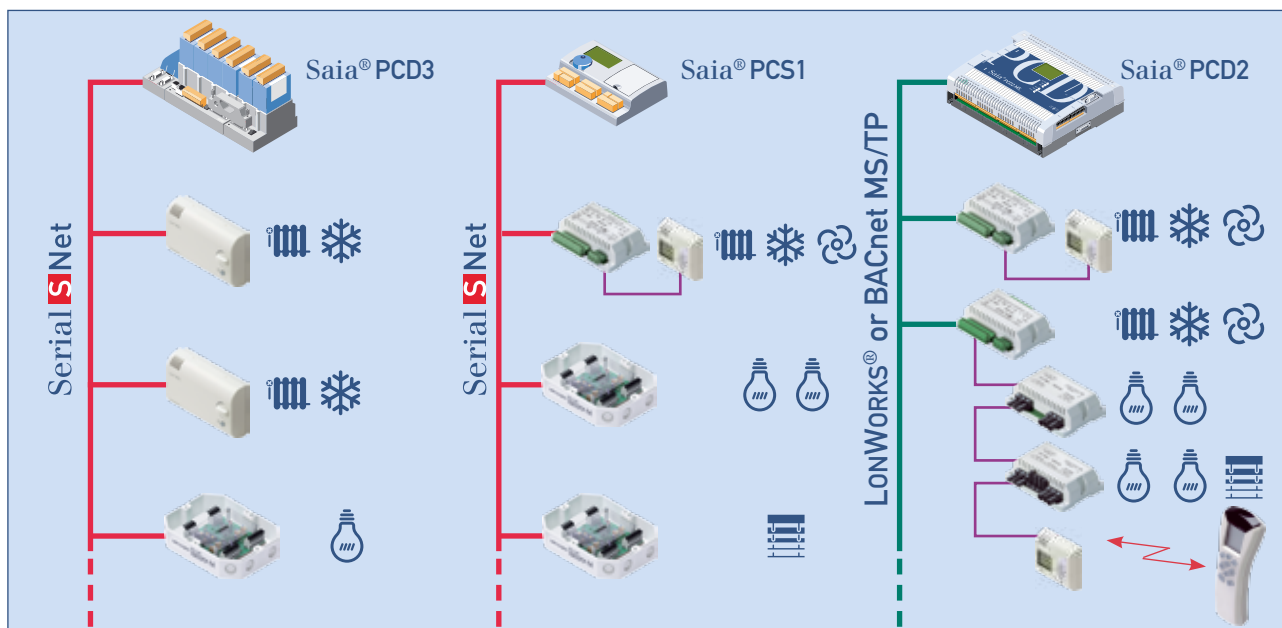
Tele-service functions are particularly indispensable in the building automation field. The Saia® system therefore offers a continuous solution, from analogue modems to ISDN and even GSM modems. The different types of modem can be implemented as external or integral module variants.



Application examples

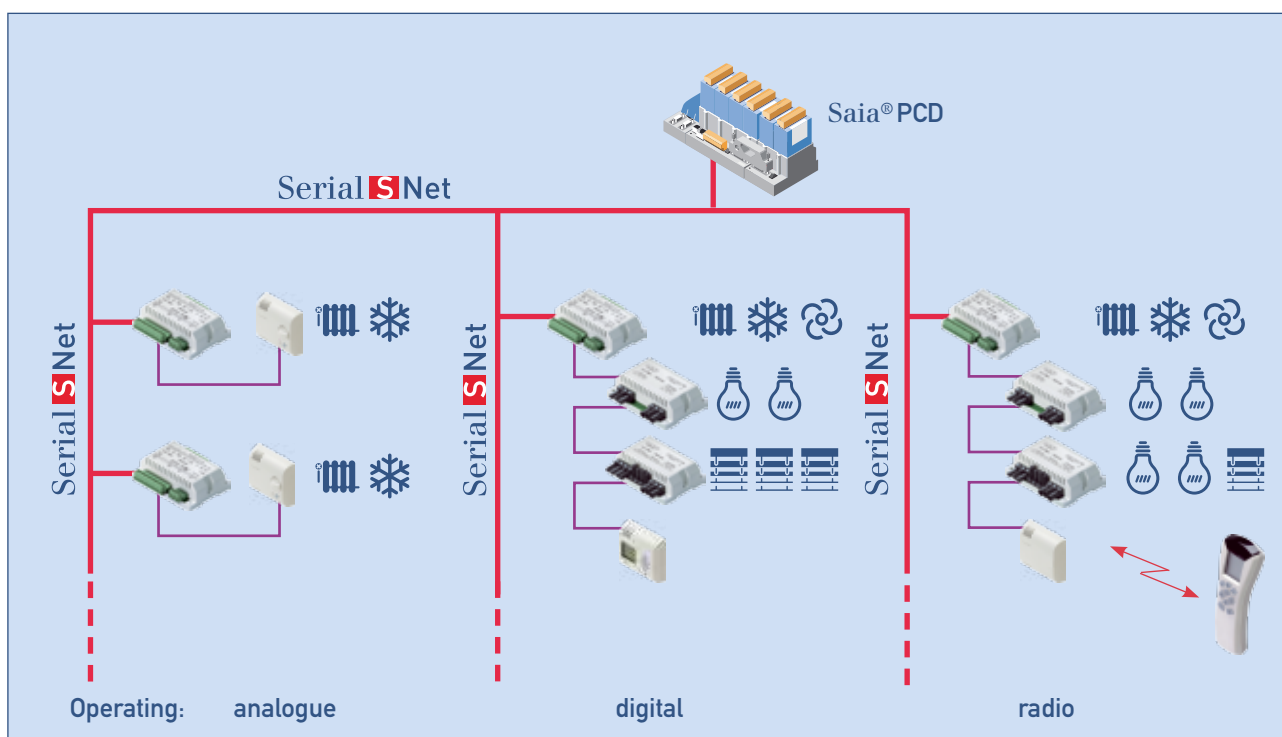
Room automation

A comprehensive range of room controllers is available to users for an individual room climate. These controllers can quickly and easily be linked within S-Net, BACnet or LonWorks® networks. Their range of use extends from the simple radiator control to combinations of radiators and cooling ceilings, even including fan-coil and VVS applications.

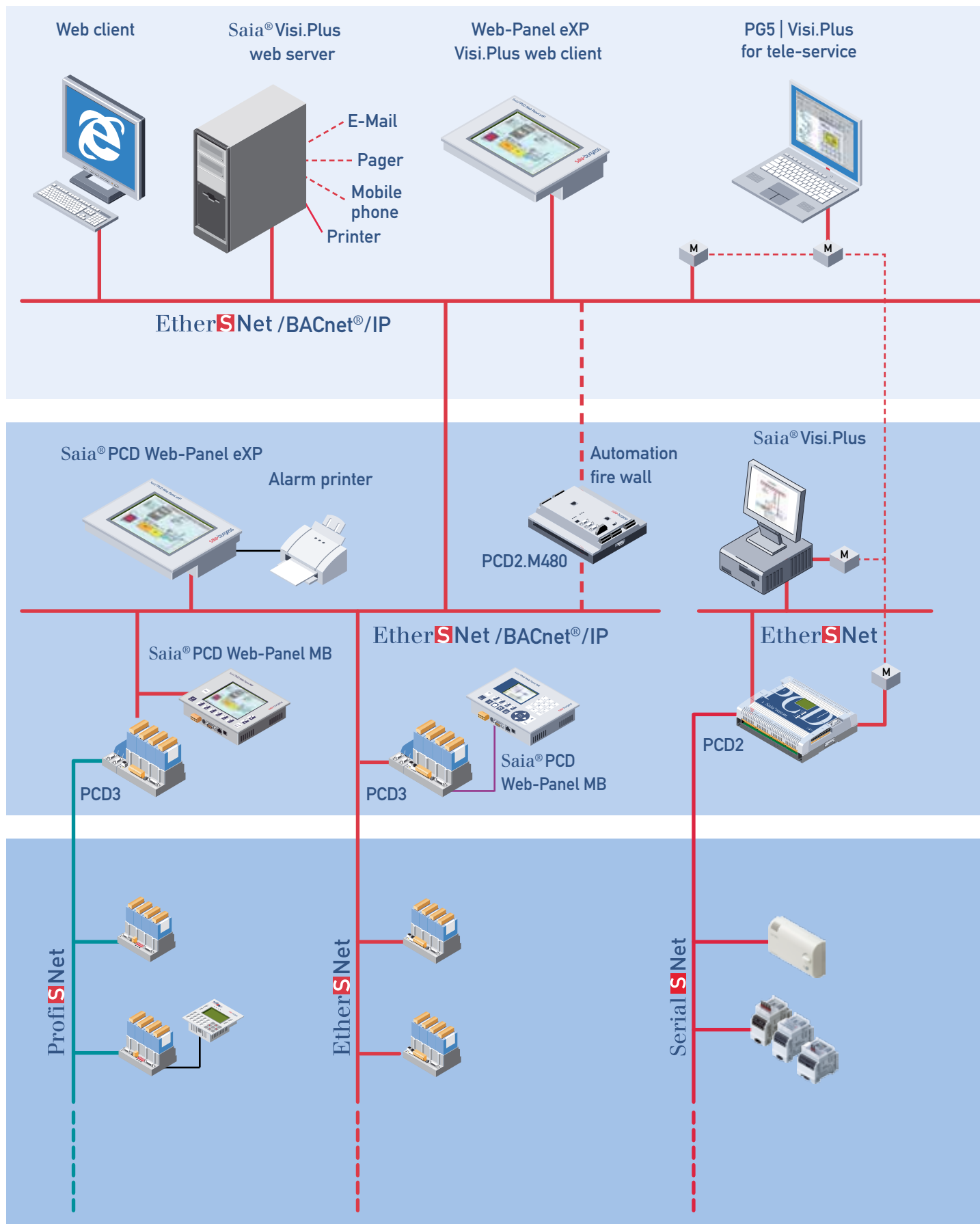


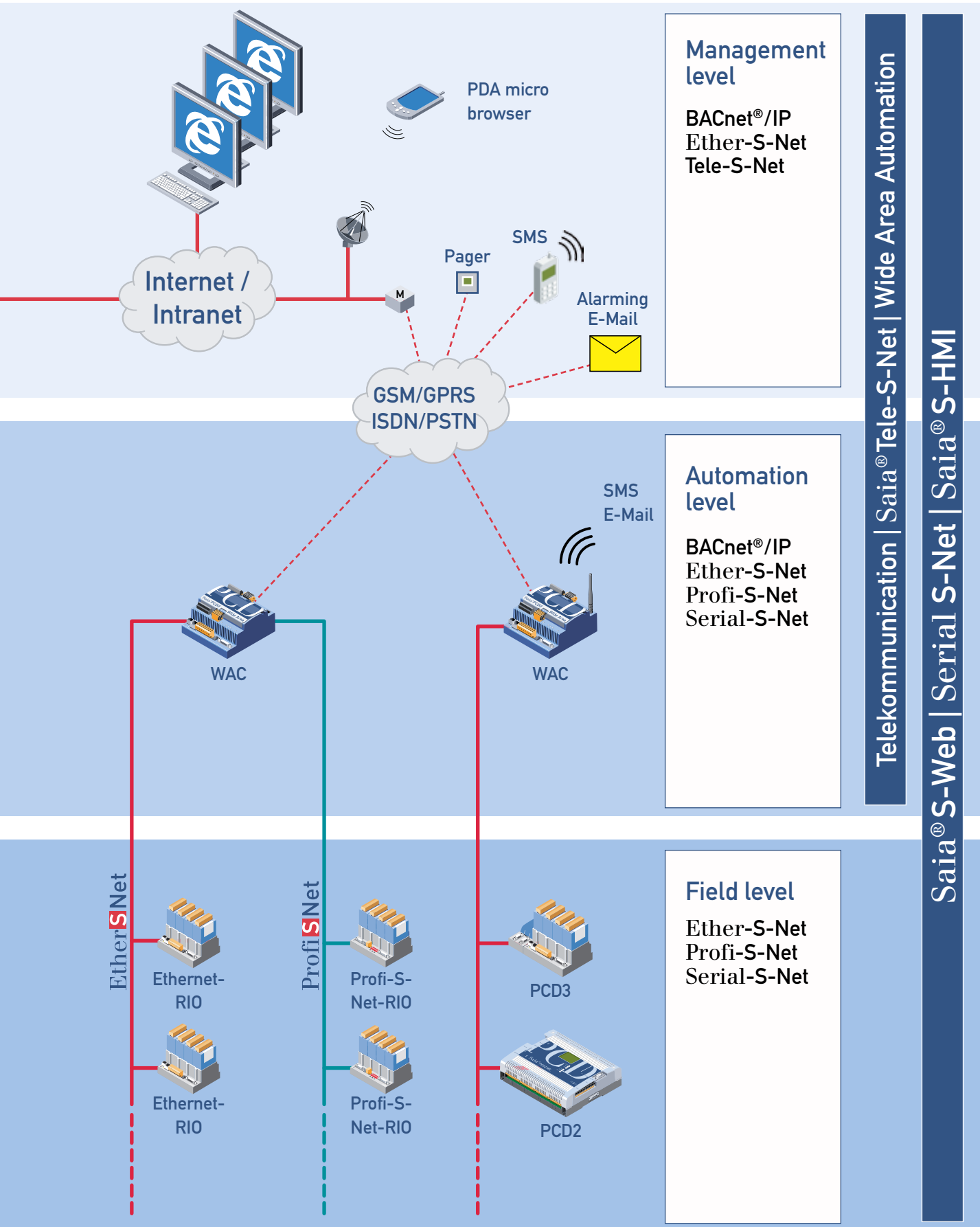
Inter-plant room automation

For uncomplicated inter-plant solutions, the control components of a building's electrical systems can simply be added to its room controllers. Matching software tools ensure speedy and efficient configuration of these components for their diverse application areas, and their integration within the network structure.



2.3 Comfortable communication with Serial S-Net





Comfortable communication with Serial S-Net: Seamless integration

Fully integrated communication

Based on open standards like USB, Ethernet or Profibus, comfortable and continuous integration of communication is possible. Regarding Ethernet, Profibus and serial communications, S-Net comprises all the necessary Saia® protocols for programming, data transfer and web server access.

USB, Ethernet and serial interfaces, such as RS 232 or RS 485, are ready integrated in the base unit and, with the operating system's integral S-Net protocols, form a strong communications platform.

Continuous data transfer

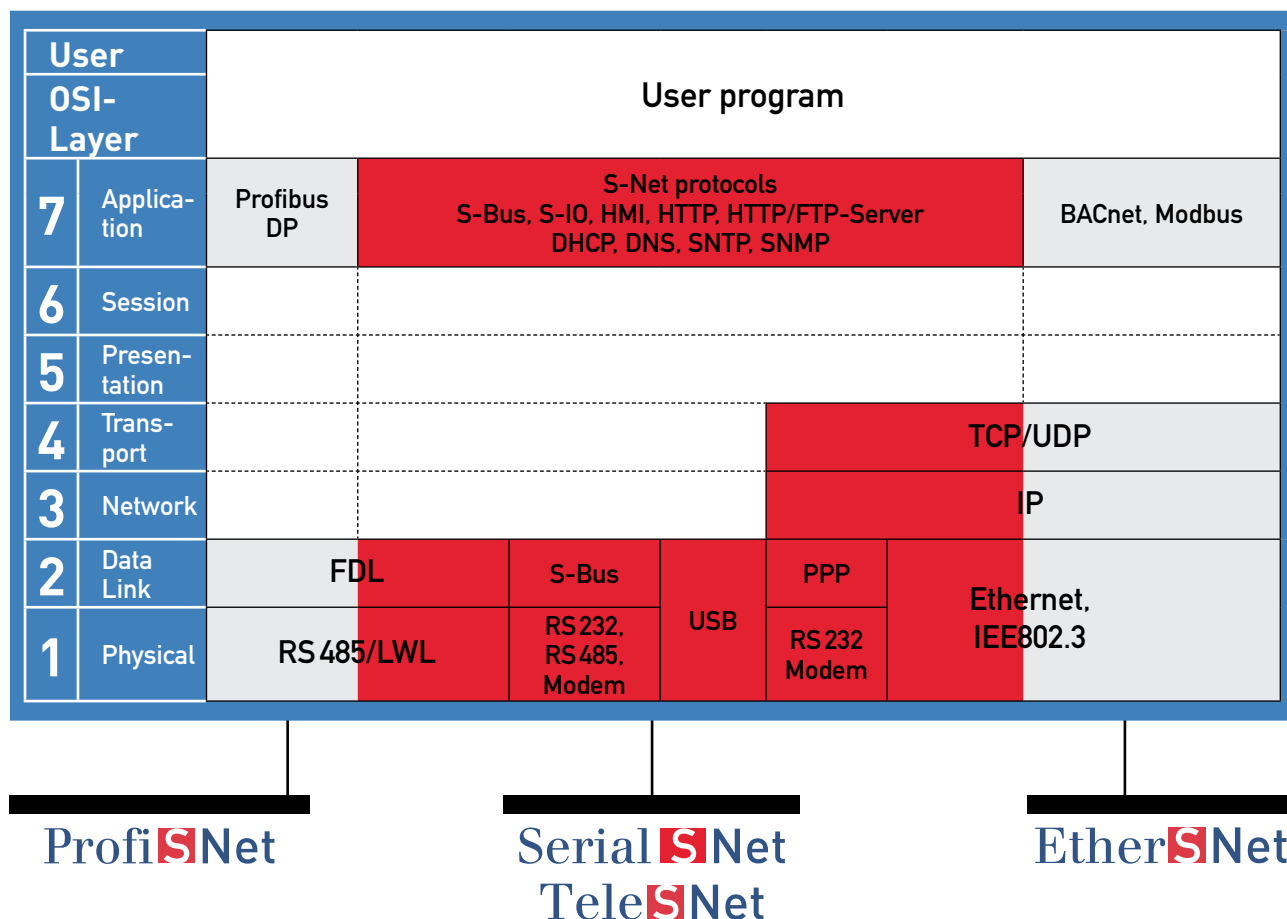
Through Ether-S-Net, Serial-S-Net or Profi-S-Net connections, continuous communication is ensured for data transfer, programming and monitoring of controllers, and for access to the web server.

Integration of TCP/IP protocols like DHCP/DNS, SNMP or e-mail and PPP in the firmware of Saia® PCD controllers also guarantees the best possible interface to the IT world.

Use of web technology

At no extra charge, Saia® PCD controllers can be integrated into different networks (Ether-S-Net, Profi-S-Net or Serial-S-Net) ensuring access to web and FTP servers (only via PPP or Ethernet). This allows optimum expansion and use of existing network infrastructures.

The ISO/OSI communications model

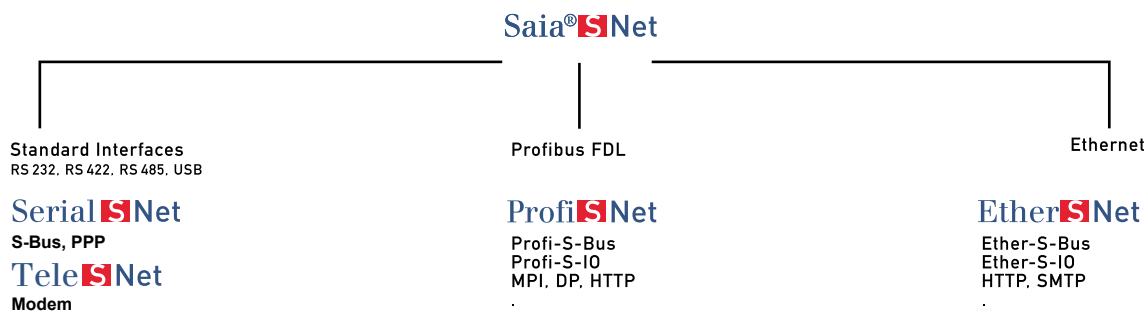


This diagram superimposes S-Net over the ISO/OS communications model, with the relevant system designations.

Topology and protocols

Strong basic system with many forms

Saia®-S-Net	Saia®-S-Net from Saia-Burgess Controls is based on the open standards Profibus and Ethernet. Great importance is attached today to the standards and functionalities of the IT world (internet and web technologies)
Serial-S-Net Tele-S-Net	Supports the S-Bus protocol on serial interfaces (RS 232, RS 485/422, USB, Modem) in master/slave mode
Profi-S-Net	«Private control networks (PCNs)» containing all protocols and services for running Saia® devices (PLCs, RIOfs, HMIs, PGs) on Profibus. They support multi-protocol operation (Profibus: DP/MPI/S-Bus/S-IO/HTTP) on a single connector and cable
Ether-S-Net	«Private control networks (PCNs)» containing all protocols and services for running Saia® devices (PLCs, RIOfs, HMIs, PGs) on Ethernet. They support multi-protocol operation (Ethernet: S-Bus/S-IO/HTTP/SMTP) on a single connector and cable
Ether-S-Bus Profi-S-Bus	For event-controlled exchange of data with multi-master communication between controllers. Alongside the normal data services, they also include services for accessing PCD controllers with the PG5 programming unit, Saia® OPC-Server or web browser
Profi-S-IO	Optimized for running the PCD3.RIO. Alongside normal data services, they also include special services for configuration and diagnosis, and for the management of RIO plug-ins
Profibus DP	Standard protocol for exchanging data with Profibus-DP devices (PLCs, RIOfs, frequency converters...)
MPI	Multi-point protocol for exchanging data with other devices (Saia®-xx7 SIMATIC® STEP® 7 controllers, HMIs, SCADA systems)
HTTP	Hyper-text transfer protocol for accessing the PCD. Web-Server via Ether-S-Net and Profi-S-Net
SMTP	Simple mail transfer protocol for sending e-mail messages via Ether-S-Net
SNTP	Simple Network Time Protocol, to synchronize the internal clocks of different network stations with an SNTP time server
PPP	Point-to-Point Protocol allows IP communications via modem or serial connections
DHCP	Dynamic Host Control Protocol allows the dynamic assignment of an IP network configuration to Saia® PCD systems from a server
DNS	Domain Name Service allows Saia® PCD systems to be reached using a unique name, without knowing the IP address
SNMP	The Simple Network Management Protocol was developed to allow such network elements as routers, servers, switches or Saia® PCDs to be monitored and controlled from a central station.



Detailed information about:

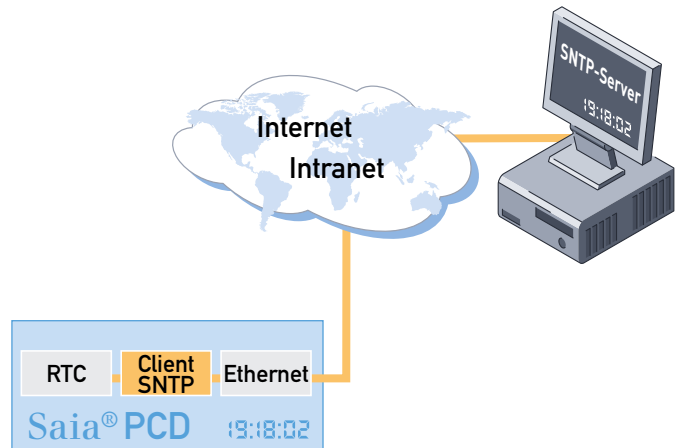
IP protocols

SNTP – Simple Network Time Protokoll

The Simple Network Time Protocol is a standard for the time synchronisation of multiple devices in IP networks. The protocol allows transmission of current time from servers located on the internet or an intranet.

Specially designed algorithms ensure that the different running times are compensated through a network.

The synchronisation of internal system clocks becomes child's play. Events like switching between summer and winter time take place automatically for all network stations simultaneously.



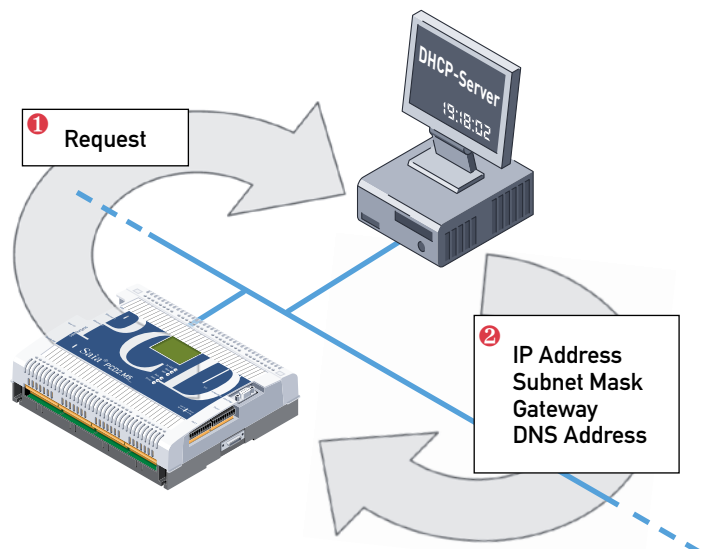
standard	RFC-2030
Port	UDP 123
SNTP Mode	Unicast Point to Point (SNTP client starts a time query) Broadcast Point to Point (time sent by NTP server to all clients simultaneously)
Time format	UTC (Greenwich Mean Time), time zone adjustable
Time precision	500 ms for Unicast Point to Point 1 s for Broadcast Point to Point (Without running time correction)
Polling interval	10 s
Interfaces	Ethernet or serial RS 232 via PPP

DHCP – Dynamic Host Configuration Protokoll

This is a protocol for the automatic configuration of Ethernet communication. Lengthy manual entry of communications parameters is no longer necessary; instead they are assigned directly from a central server.

After a request, a DHCP client receives the parameter IP address, subnet mask, gateway and DNS address automatically.

Without knowing the network parameters, devices can be integrated into existing networks. This also makes it easier to increase the availability of devices and simplify the management of addresses used. Even service personnel with no technical background or knowledge of the precise data can exchange devices.



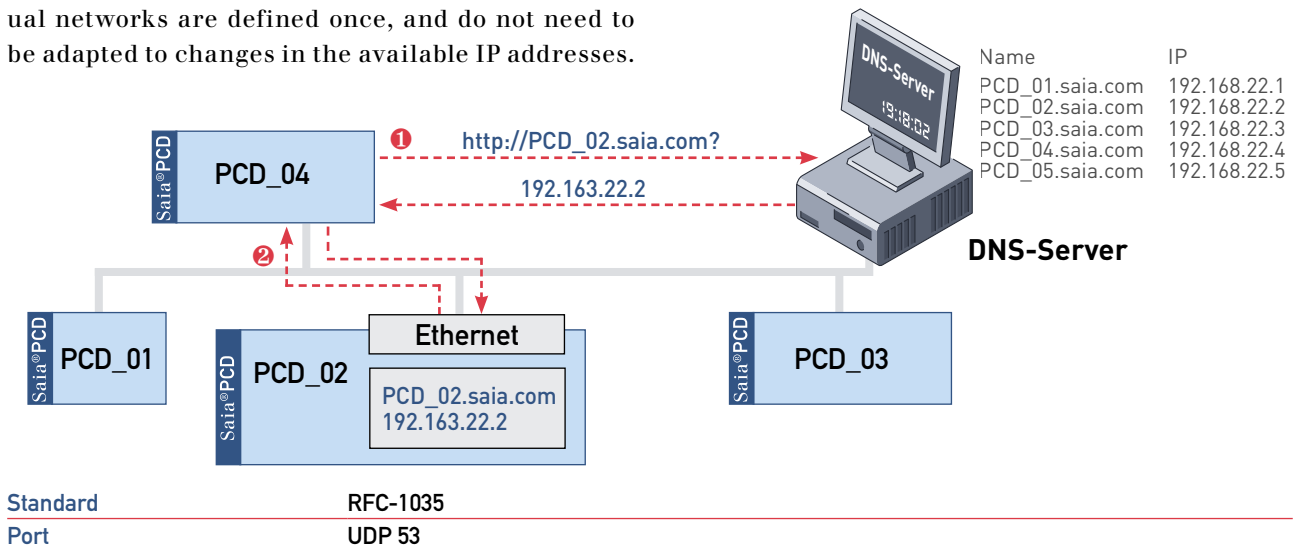
Standard	RFC-2131
Port	UDP 67 for server, UDP 68 for client
Assigned parameters	IP-Address Subnet-Mask Gateway (optional) DNS-Adresse (optional)

IP protocols

DNS – Domain Name System

Access to controllers through the assignment of fixed hostnames. To establish communication between two controllers, it is not necessary to know the IP address of the target controller, only its hostname. Using this name, the IP address can be requested from a DNS server. Devices no longer use anonymous IP addresses that contain little information. The structure and availability of individual networks are defined once, and do not need to be adapted to changes in the available IP addresses.

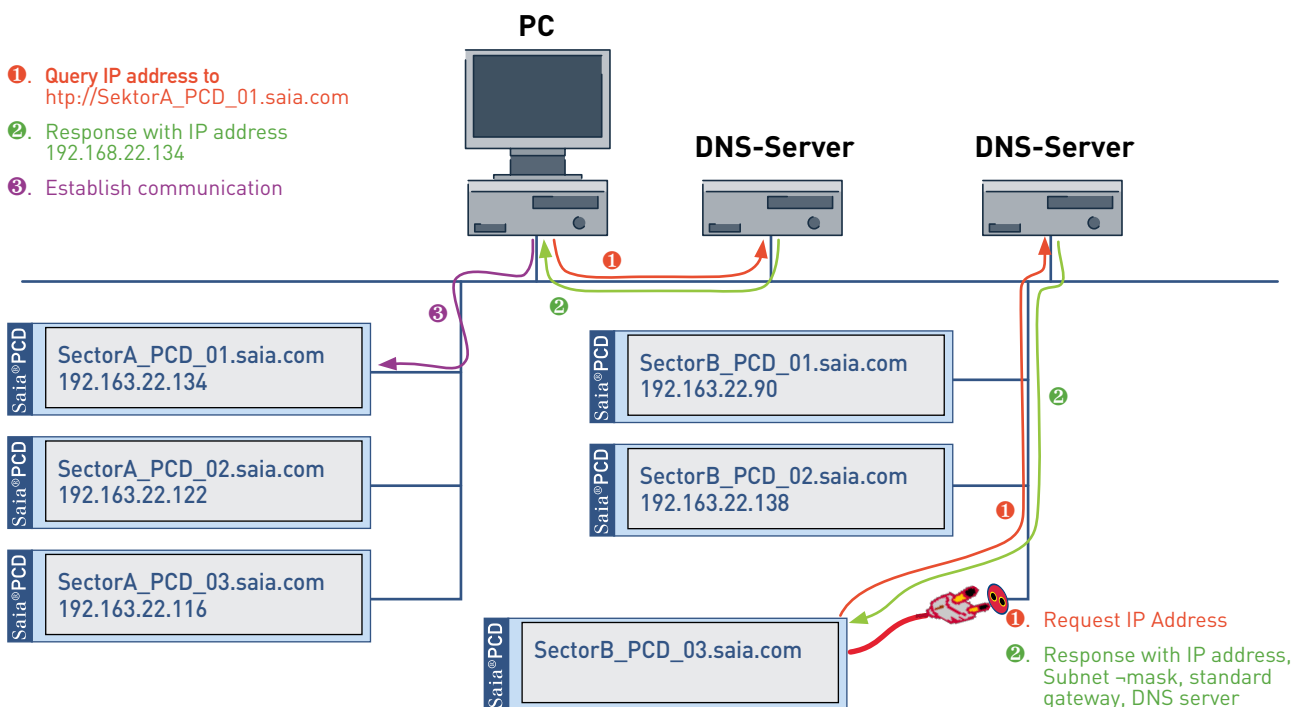
Controllers are supplied pre-configured and programmed. The IP addresses are only transferred on-site and are generally not known. On-site users only need to know the user-friendly device names. Systems therefore become easier and their operation more intuitive. Documentation of networks with multiple stations can be displayed more clearly.



Case study with DHCP and DNS:

The integration of devices in networks is made very easy. A DHCP client automatically obtains network parameters from a DHCP server. This means that,

without knowing the network parameters, controllers in existing networks can be integrated. The controller is conveniently accessed by name.

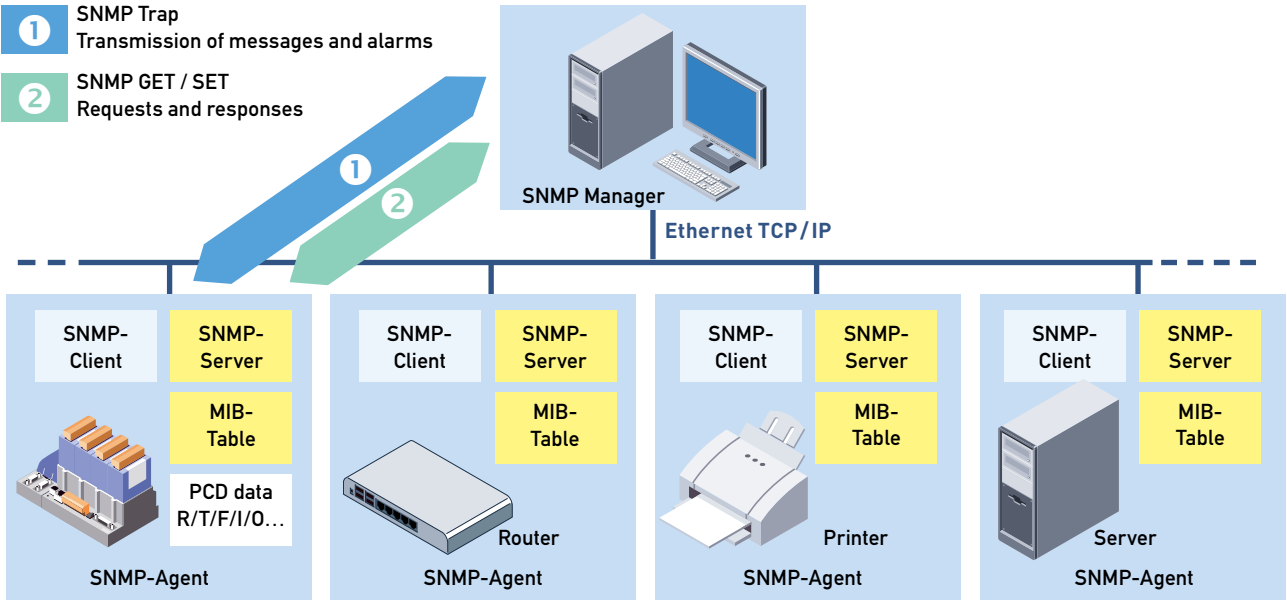


Detailed information about:

SNMP – Simple Network Management Protocol

The SNMP manager software usually runs on a server. It monitors and controls SNMP agents. The SNMP manager reads and sends data from the agent using SET and GET commands. The SNMP agent can also sent unrequested so-called ‘trap’ messages to the SNMP manager. This allows, for example, the direct reporting of faults.

Saia®PCD-MIB has been defined for Saia®PCD with SNMP support. Within it are represented all the resources that can be queried and modified with SNMP. Basically, all PCD media can be accessed (inputs\outputs, registers, flags, DBs, etc.). In the MIB file, the programmer can restrict access to selected areas only.

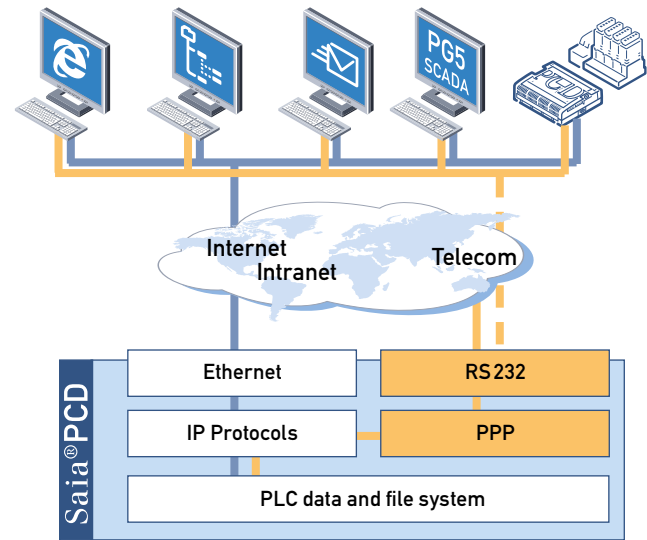


PPP – Point to Point Protocol

In order to satisfy the security requirements of dial-up within company networks or installations with critical tasks, the challenge authentication protocol (CHAP) has been introduced.

Via one of the Saia®PCD controller’s telecommu-
nications interfaces (PSTN, ISDN, GSM/GPRS)
the user has access to the web and FTP server.
The same applies for applications with cheaper
devices that do not have an Ethernet connection.

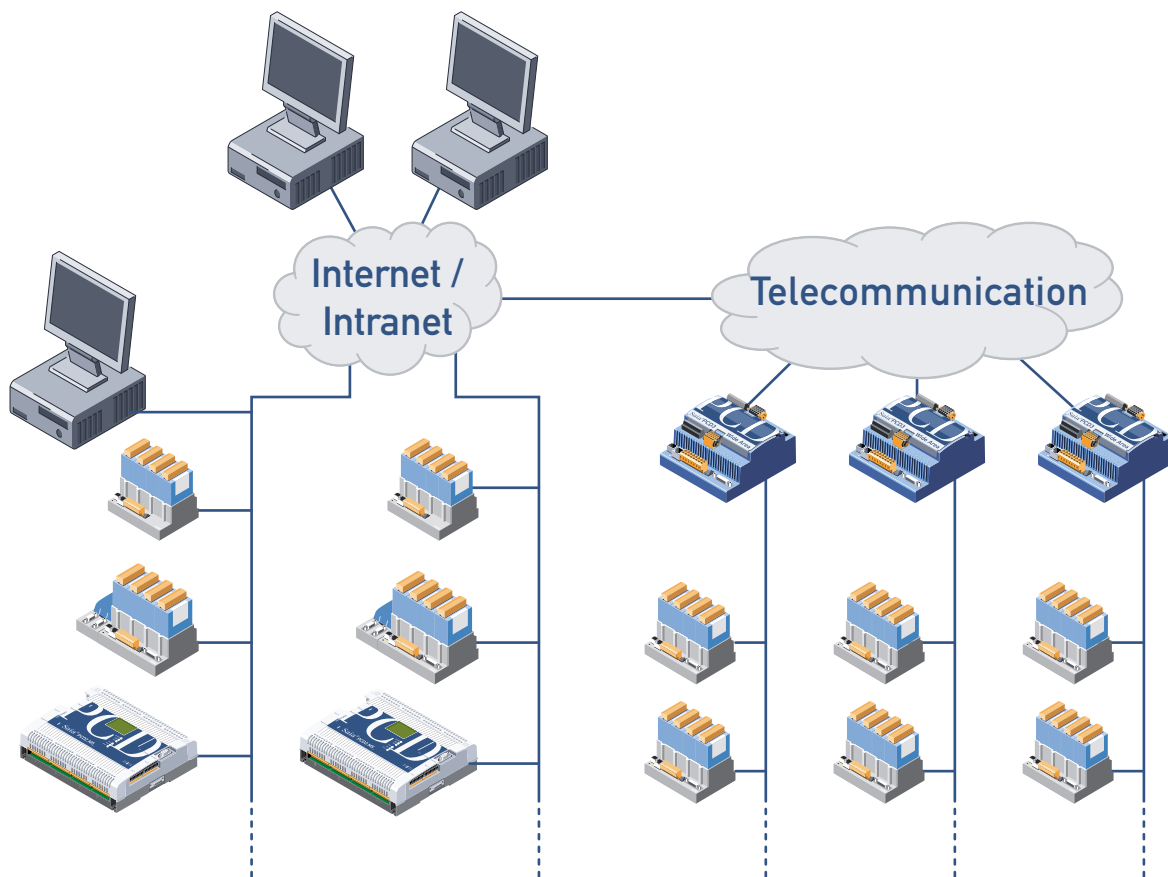
Web browser FTP client P0 box PG5 / SCADA PCD2.M5/PCD3.M



Standard	RFC-1661
Authentication	PAP, CHAP and MS-CHAP
Simultaneous PPP connections	Per Saia®PCD controller, only 1 PPP connection can be active (client or server)
PPP via Ethernet	No

Wide Area Automation

The demands placed on a system are often high when geographical distances are bridged with a relatively large number of substations. Using the integral web and FTP servers, remote stations can be easily coordinated via internet and intranet.



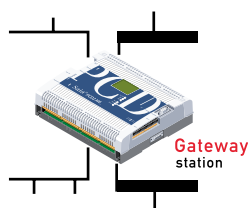
Comfortable Communication with Serial S-Net: Characteristic elements

Properties | Functions | Components | Devices

EtherSNet



ProfiSNet



TeleSNet



Telecommunication

Multi-protocol operation and multi-master communication

Ether-S-Net and Profi-S-Net controllers support multi-protocol operation, i.e. several different application protocols (S-Bus, S-I/O, DP, HTTP...) can be used simultaneously on the same connector and cable. This dispenses with costly parallel wiring for different applications. Ether-S-Net and Profi-S-Net devices are capable of event-controlled data exchange in multi-master communication, which reduces the load on the network and makes for short reaction times.

Gateway function

The gateway function allows network crossovers and inter-face adjustments to be made. This involves continuous support for programming, data and web services that allow access via the web browser.

The gateway function is an integral part of the PCD operating system and does not require an additional hardware module.

(For detailed information, please consult the PCD/PCS manuals)

Powerful software tools for programming, configuration, commissioning and diagnosis

Convenient network configurator that saves time designing S-Net communication projects.

- Easy programming with PG5 IL instructions or convenient FUPLA FBoxes.
 - Continuous access to PCD devices with the PG5 programming tool via the network.
- With the gateway function, this is also possible across several network levels.

Visualization, control and monitoring

- S-Bus OPC server for connection of SCADA systems to Profi-S-Net and Ether-S-Net.
- All new CPUs and RIOs have an integral web server for control, monitoring and diagnosis. The web server includes predefined, device-specific HTML pages for configuration and diagnosis. In addition, application-specific HTML pages can also be created and stored with the convenient S-Web editor, or any standard editor (e.g. Frontpage, etc.).

Remote monitoring, control, alarms, programming and diagnostics via telecommunications networks

The modem connection (analogue, ISDN, GSM) is included in the operating system of all PCD controllers.

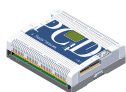
- Economical connection to telecommunications networks with modem modules that can be integrated in the controller.
- Powerful modem libraries simplify the programming of modem communications.

S-Net devices

All controllers with an Ethernet connection (PCD7.F651 or on board for PCD3.Mxxxx CPUs) can be operated on Ether-S-Net. The controllers PCD2.M480, PCD3.Mxxxx and PCD3.T76x RIO all have an integral Profi-S-Net interface (up to 1.5 Mbit/s) in the basic system.

PCD7.D7xx terminals can run on Ether-S-Net. The Profi-S-Link adapter (PCD8.K120) enables programming devices, SCADA equipment, web terminals and web browsers can be connected via Ethernet to Profi-S-Net.

PCD2.M480



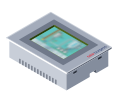
PCD3.Mxxxx



PCD3.Txxx (RIO)



PCD7.Dxxx (HMI)



Profi-S-Link



Typical examples of use

Practical possibilities with S-Net in applications

Multi-protocol operation

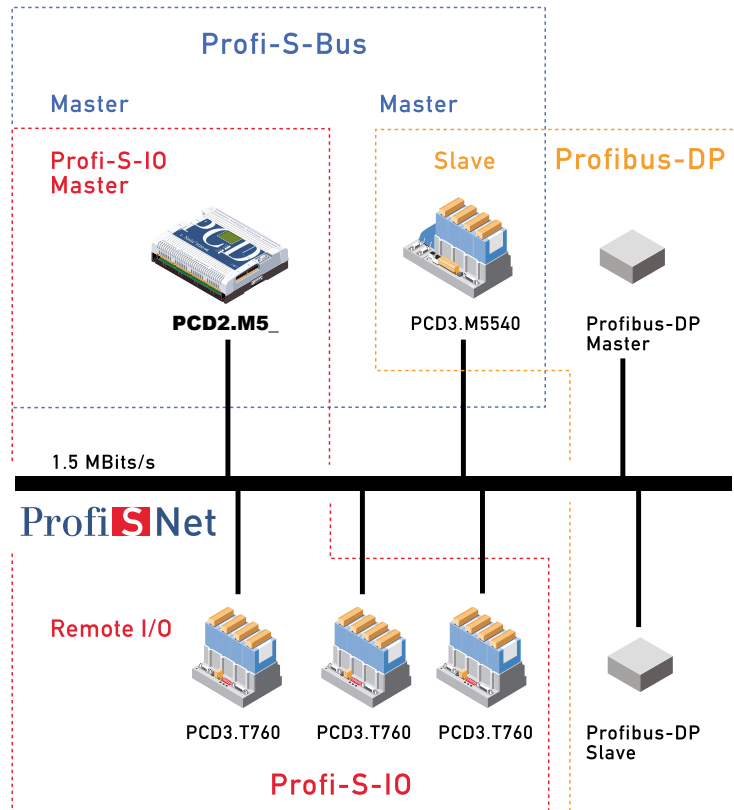
On a single physical network (cable), 3 different logical networks run different tasks simultaneously.

- The PCD2.M5_ forms a logical network with the PCD3 remote I/O, managing and operating it with the Profi-S-I/O protocol.
- In a second logical network, PCD2.M5_ and PCD3.M5540 controllers use the Profi-S-Bus protocol for event-controlled exchange of data in multi-master communication.
- In a third logical network, the PCD3.M5540 controller and one or more foreign slave devices are assigned to a foreign Profibus-DP master. These devices communicate using the Profibus-DP protocol.

Advantage

Different communications tasks are carried out on a single physical network with a single network connection to the PCD controllers. Costs are thereby saved in all areas:

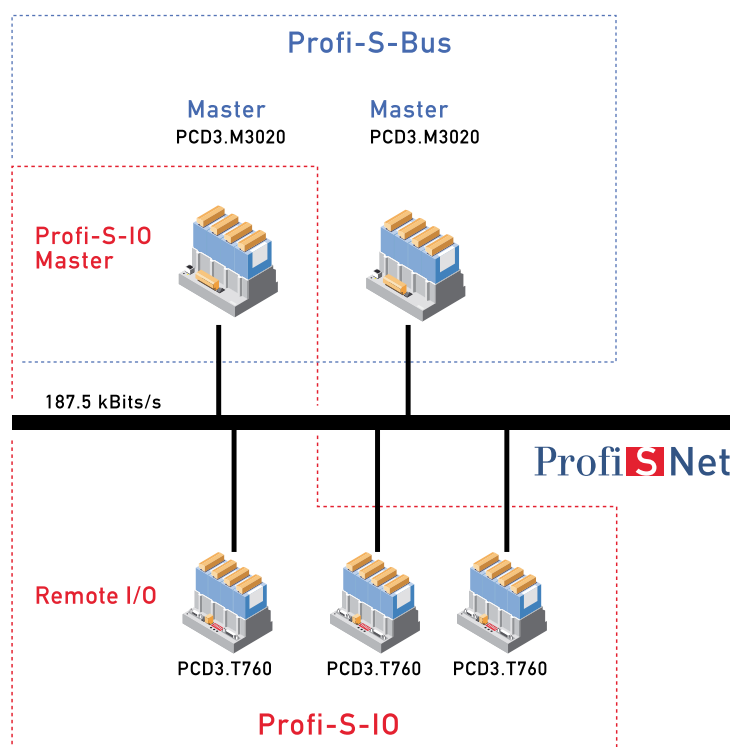
- There is no requirement for separate physical network structures.
- Existing network infrastructures (e.g. Profibus-DP) can be exploited.
- Additional interface cards are not required in the PCD controller.
- The design costs of the communications project (planning, configuration, programming) are therefore reduced.



Economical communications with Profi-S-Net

Low-cost PCD3.M3xxx controllers, PCD.RIOs and PCD7.D7xx terminals can be used to produce efficient, economical networks. These devices all have a built-in Profi-S-Net interface that can run at up to 187.5 kBit/s. At this baud rate, installation requirements are not high and economical cabling and connectors may therefore be used.

These economical Profi-S-Net networks are ideally suited for communications tasks that are not time-critical, such as in building automation. Multi-master functionality still allows the efficient exchange of data between master devices, particularly when there is a large number of network stations. This also gives the terminal access to all controllers.



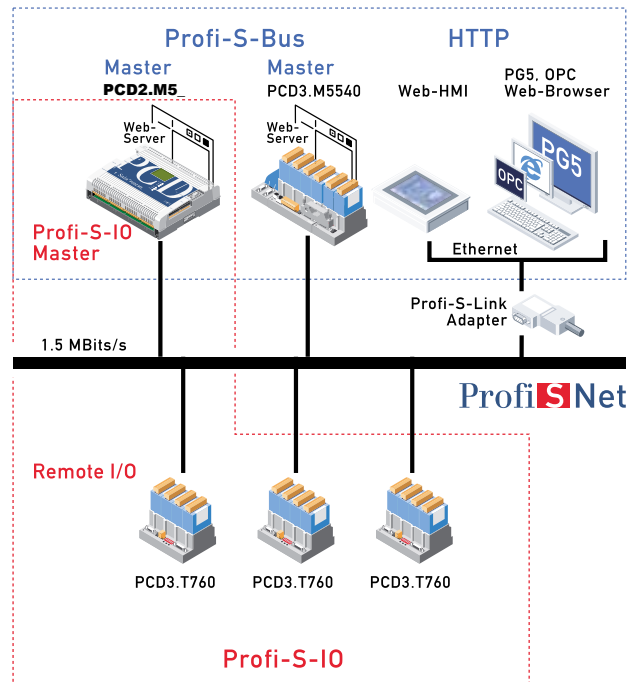
Typical examples of use

Practical possibilities with S-Net in applications

Direct connection of PCs to Profi-S-Net

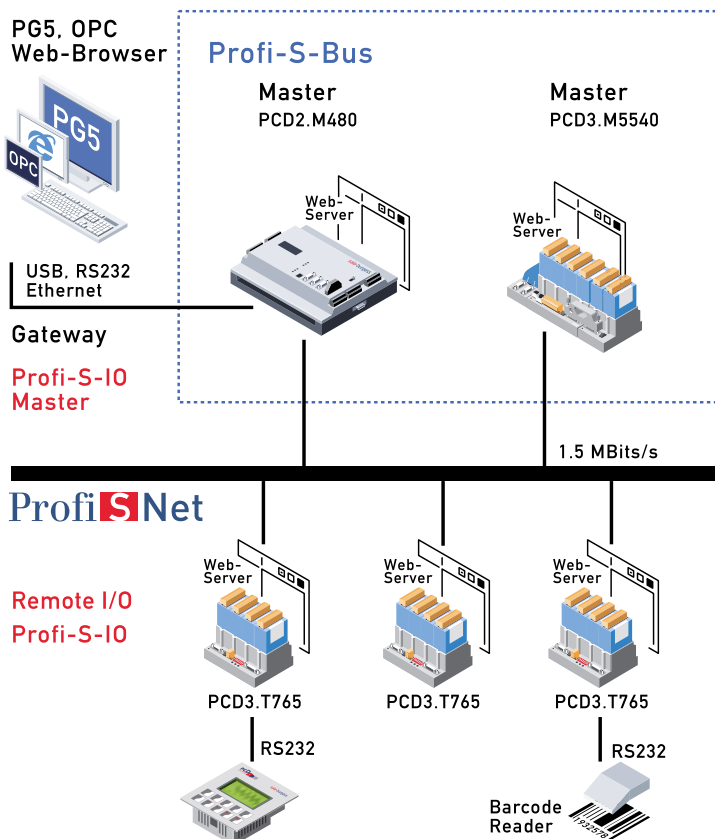
Standard PC systems and/or web terminals can be connected with the Profi-S-Link adapter directly to a Profi-S-Net network. In this way, a PG5 programming unit, web browser or SCADA system with OPC server can access Profi-S-Net devices. The web browser is used to upload HTML pages via Profi-S-Bus and the http protocol from the controllers' built-in web server. The compact size of the Profi-S-Link adapter makes it ideal not only for fixed installation, but also for mobile use with a notebook.

In contrast to a fixed interface card installed in the PC, the Profi-S-Link adapter can also be used with different PCs, simply by connection to the Ethernet interface. This completely avoids the costly and time-consuming installation of hardware and software – with all the associated operating system and driver compatibility problems.



Interconnected communication and programming with gateway function

The integral gateway function in a PCD2.M480 or PCD3.Mxxxx provides interconnected communication via the USB, RS 232, modem or Ethernet interface to devices on Profi-S-Net.



Central management of decentralized functions

Plug-in technology turns even simple PCD3 remote I/O devices into intelligent, decentralized equipment. With functions assigned in the form of plug-in components (C code), PCD3-RIOs are capable of independently carrying out such tasks as:

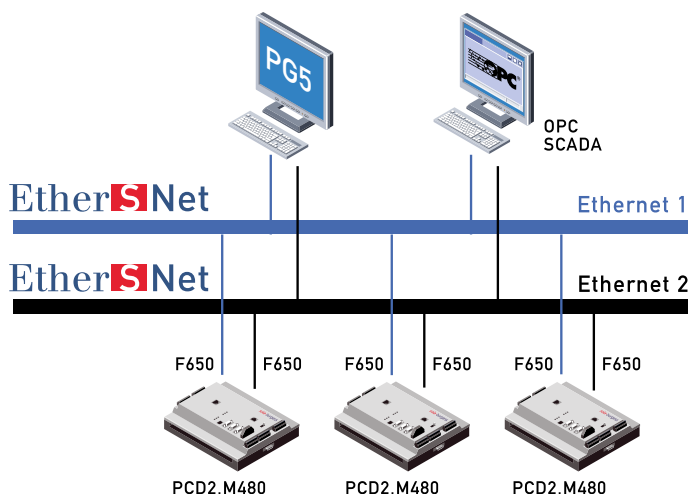
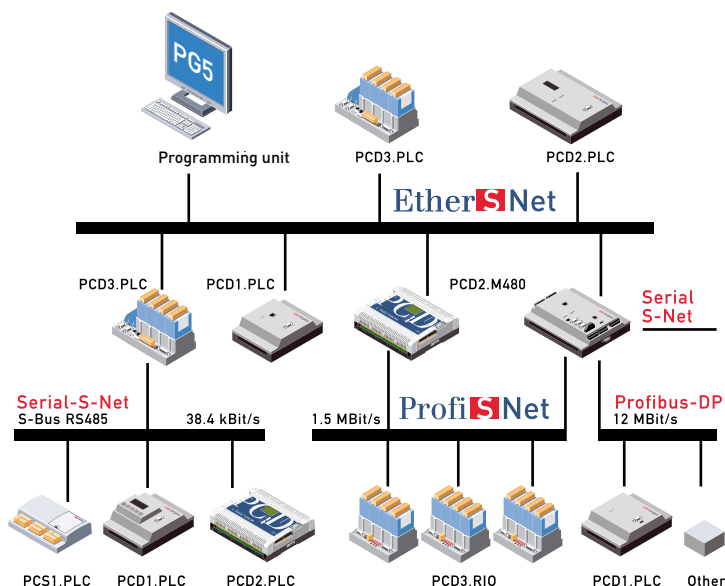
- Pre-processing of I/O signals
- Dealing with equipment (e.g. terminals, bar-code readers, etc.) that is connected to the RS 232 interface included with PCD3.T765 RIOs
- Fast processes can be handled locally in the remote I/O.
- If the master controller fails, decentralized functions safeguard emergency operation or the controlled stopping of the process. This involves management of remote functions by the PCD2.M480 Profi-S-IO master, with automatic distribution to PCD3.T765 RIOs via the HTTP protocol. In such cases, PCD3.RIOs will be active stations on the bus and will also autonomously request plug-in components as required from the Profi-S-IO master device.

These functions, which are supported by S-Net, demonstrably reduce the expense of commissioning and maintenance for devices and systems.

Continuity and investment protection

PCD2.M480, PCD2.M5 and PCD3.Mxxxx controllers all have S-Bus RS485 interfaces. These can be used to extend existing systems (having older generation PCD devices) with Profi-S-Net and/or Ether-S-Net. In addition, the gateway function supports interconnected access across several network levels.

PCD1 or PCD2 controllers with a PCD7.F651 Ethernet module may also be integrated compatibly within an Ether-S-Net. The Profibus-DP master module even allows devices with 12 MBit/s to be connected to a Profi-S-Net controller.



Redundant Ethernet connections

With 2 slots available for Ethernet, upgrades for deployment in redundant networks are economical to do. This is often a requirement for systems where security demands are high, e.g. in traffic engineering for tunnel controllers. Each connection has its own IP address and supports the Ether-S-Net protocols.

The Saia® OPC server also supports operation at two redundant networks, monitoring both communications paths to the PCD controllers, and automatically switching to the other connection in case of error.

2 × Ethernet with «firewall» and as «gateway»

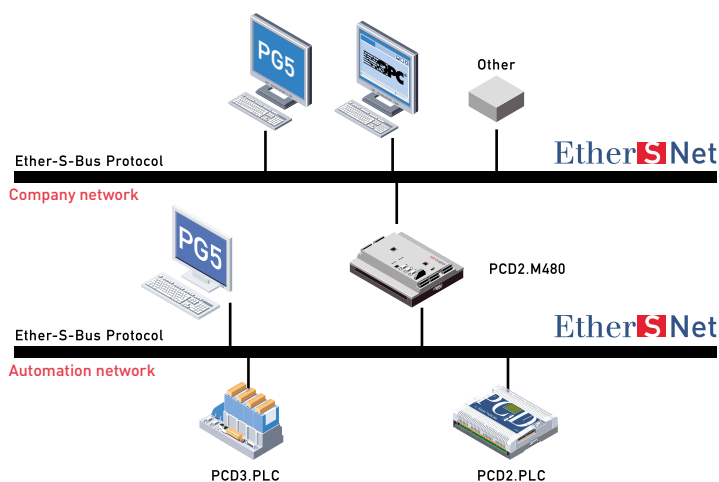
Two Ethernet interfaces enable the PCD2.M480 to be inserted as a gateway with firewall function between two physically separate networks (e.g. a company network and an automation network).

2 × Ethernet with «firewall»

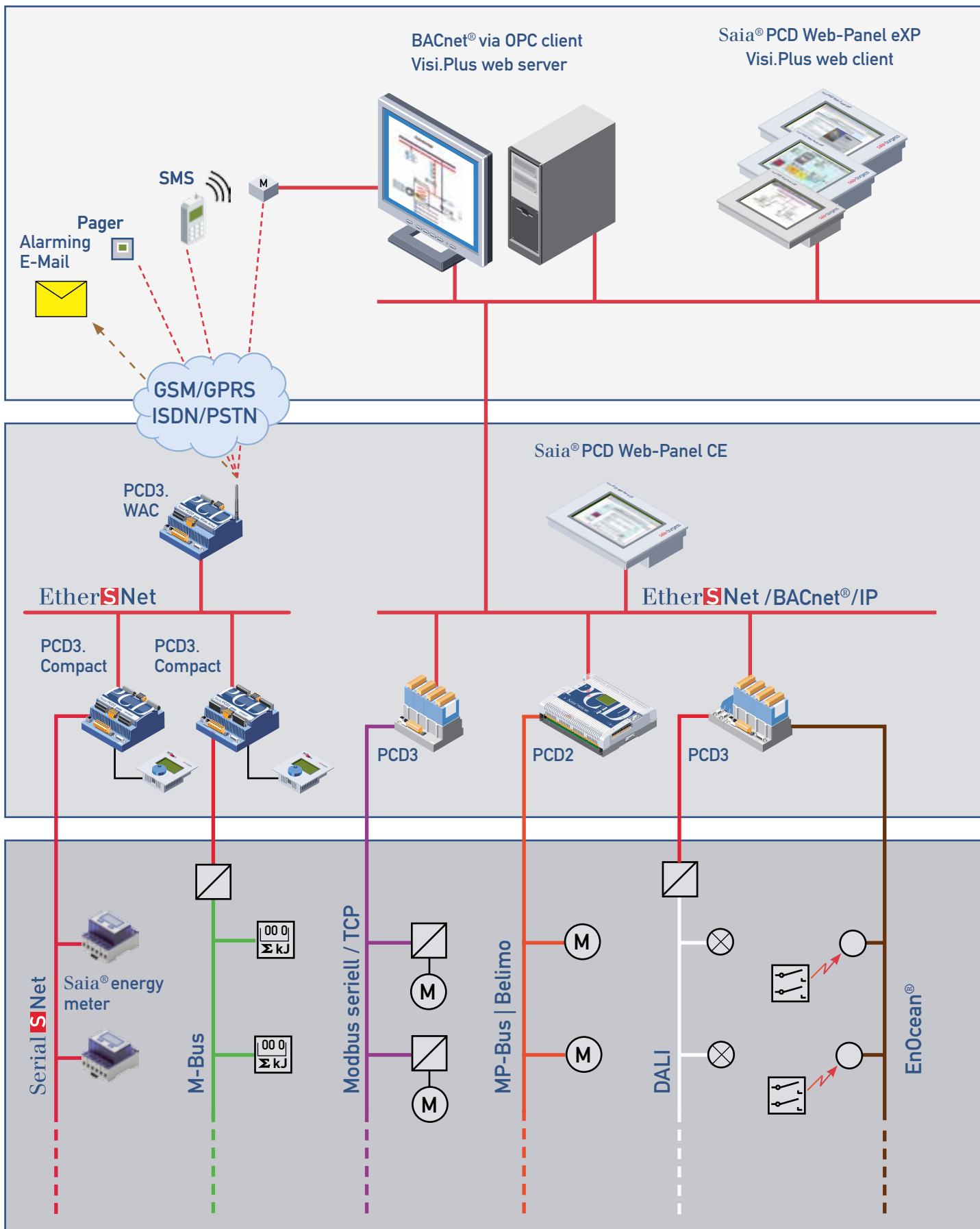
Both Ethernet interfaces have their own IP address and are completely separate at Ethernet and TCP/IP level. Ethernet and IP telegrams are not transferred to the other network. Access to PLC media is only achieved through use of the Ether-S-Net protocol. Hackers using the TCP/IP protocol are excluded from attacking PLC media or the second Ethernet interface.

2 × Ethernet with «gateway» function

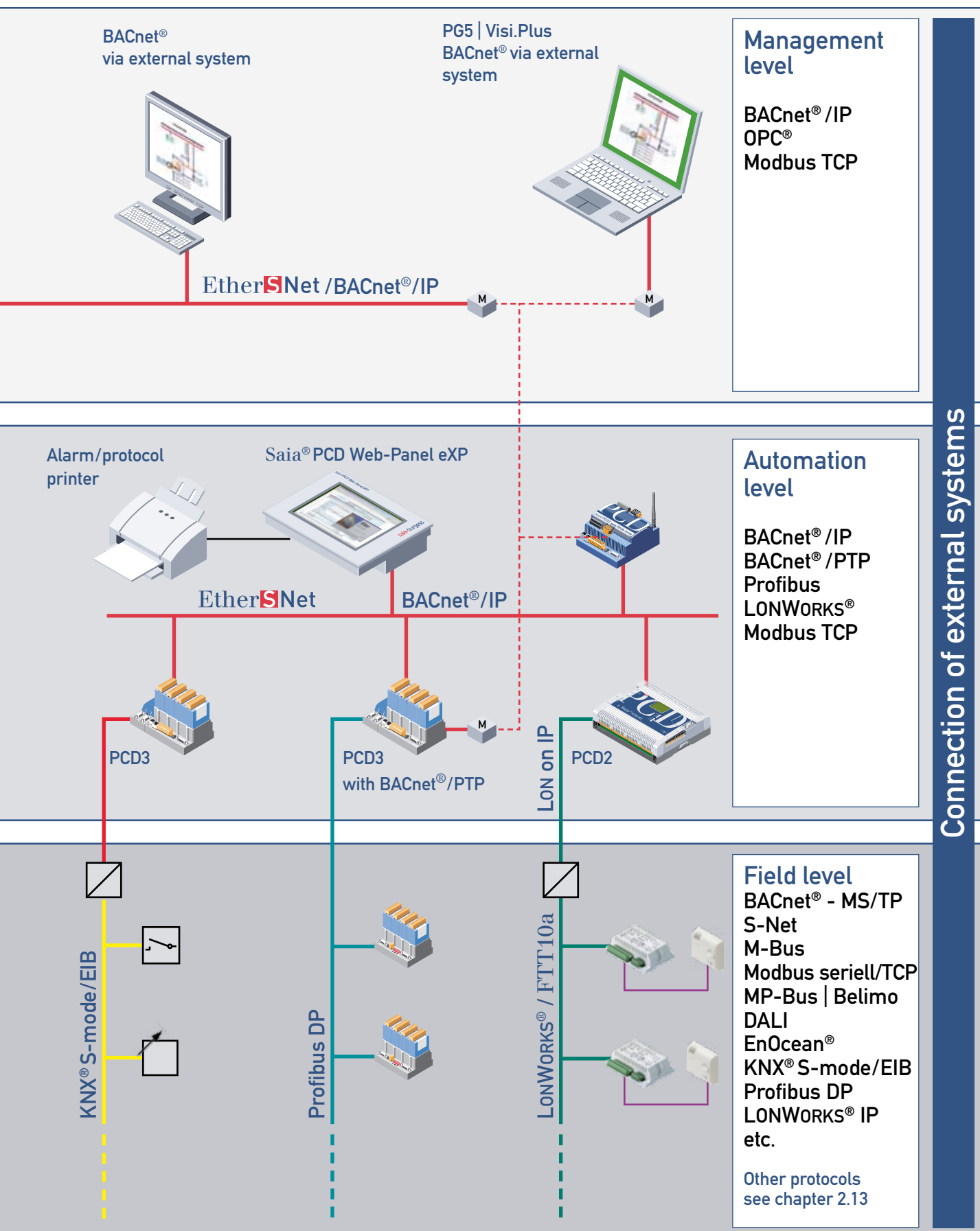
Thanks to the PCD2.M480's integral gateway function, devices that support the Ether-S-Net protocol (PG5, OPC server, PCD controllers) have interconnected access to PCD controllers in the other, physically separate network.



2.4 Open communication at all levels



Connection of external systems

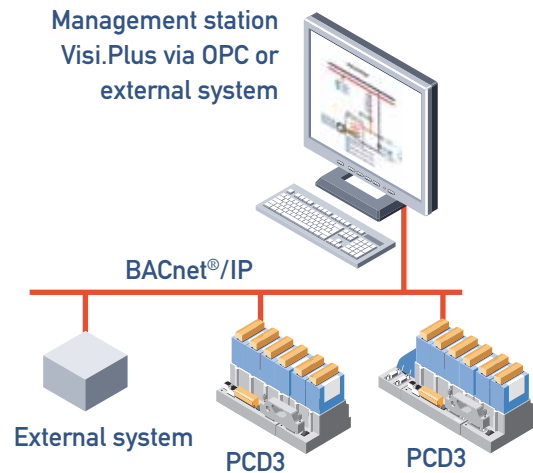


2.5 Open communication | BACnet®: Interface for open, interoperable building automation

Open systems are the prerequisites for integrated building technology. Saia-Burgess Controls wishes to take this fact into account and has therefore developed the new Saia® PCD3 product family as BACnet® Building Controller (B-BC) following ANSI/ASHRAE 135-2001.

Features

- BACnet®/IP server and Client
- BACnet®/PTP on RS232 basis
(inc. half-router function for modem)
- BACnet®/IP broadcast management device (BBMD) supports foreign device registration (FD)
- Up to 1200 BACnet® objects per controller
- Trend logs up to 4 GB
- Scheduler, Calendar, Event enrolment, Alarming, Command and others
- Integration of other open protocols, e.g. KNX/EIBnet, Profibus, MP-Bus, etc.
- Freedom and ease of programming with Saia® PG5 Controls-Suite



PCD as BACnet® Building Controller (B-BC) with complementary functions

The PCD3 supports 23 data objects, according to the standard:

ANSI ASHRAE 135-2004:

- Data exchange:
- Analogue Input, Output and Value with Priority Array
 - Binary Input, Output and Value with Priority Array
 - Multistate Input, Output and Value with Priority Array
- BACnet® program:
- Accumulator, Averaging, Calendar, Command, Device, File, Group, Loop, Program, Pulse Converter, Schedule, Event Enrollment, Notification Class and Trendlog-Object
- BACnet® services:
- Data communication (data sharing) with change-of-value or polling
 - Event oriented alarm and event services
 - Time Synchronisation, UTC Time Synchronisation (as master and slave)
 - Bidirectional connection via modem
 - Backup/restore according to B-BC requirement
 - Flexible definition of write and read access, according to a priority mechanism
 - User-programmable client configuration for exchanging data with other automation stations

Certificates



Efficient engineering

There is even more convenience for system integrators with new applications FBox libraries: DDC Suite V2.0 and Room Controller V2.0. With BACnet® available at the press of a button, a BACnet® configuration will be generated automatically when the user program is written.

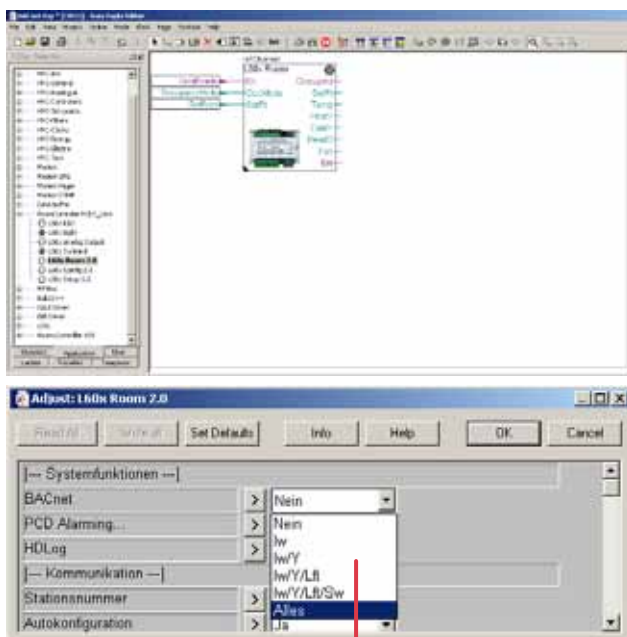
All the necessary settings take place within HeaVAC applications FBoxes.

The application can be written as usual with Saia® PG5 Controls-Suite.

The BACnet® configurator it contains will allow complete freedom in setting the parameters of all BACnet® objects. Any conceivable task can therefore be undertaken.

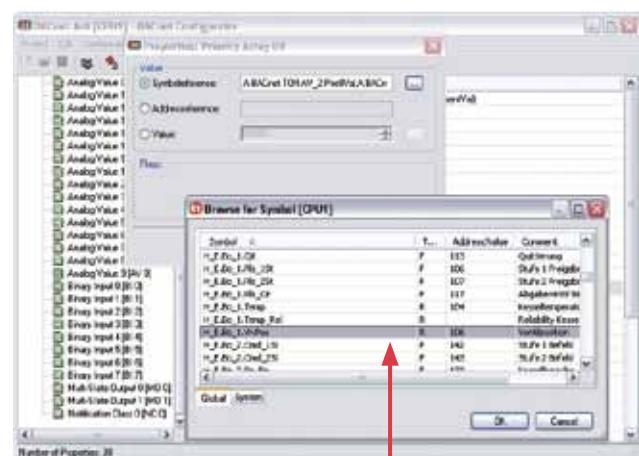
Clearly structured dialogue gives a good overview when setting parameters for the Scheduler, Trending, Alarming, etc.

PG5 Fupla Editor



BACnet® adjust window

BACnet® configurator in Saia® PG5 Controls-Suite



EDE file export for connection of PCD to higher ranking Scada systems.

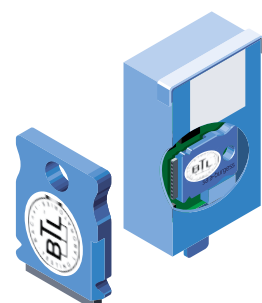
Automatic generation of BACnet® objects and PCD resources via FBoxes and templates.



EDE file import for simple generation of BACnet® clients

Ordering information memory modules

Type	Description
PCD3.R560	BACnet® option module for PCD3.M3 and PCD3.M5, for I/O slot 0...3
PCD3.R561	BACnet® option module for PCD3.M3 and PCD3.M5, for I/O slot 0...3 incl. Backup/file system 1 MB each
PCD7.R560	BACnet® option module for PCD2.M5 and PCD3.M5, for memory slot M1 or M2
PCD7.R561	BACnet® option module for PCD2.M5 and PCD3.M5, for memory slot M1 or M2 incl. Backup/file system 1 MB each



2.6 Open communication | LonWorks® Network: Interface between automation and field levels

The standard for building technology

LONWORKS® technology is a universal communications protocol that has been established in building and factory automation for years. The various advantages of LONWORKS® such as decentralized intelligence, modular structure, interfaces that match requirements and possibilities for adapting to existing infrastructures, all make it an interesting technology for data transfer in the field area and for backbone systems. Individual network stations – so-called nodes – can exchange data together on an event-controlled basis. LONWORKS® forms the platform for vendor-independent communications within inter-plant building automation.

Saia®DDC.Plus systems satisfy the most diverse requirements, thanks to their modular construction and great flexibility. The «DDC.Plus» LON IP host node is based on a modular, freely programmable control and automation system with the latest web-IT technology.

Features

- Variables supported according to LONMARK®
- Platform change and modifications*, extensions* possible without loss of binding
- LON systems supported on IP basis
- Integral LON IP configurator in PG5 for selecting and defining standard network variables (SNVT)

*For LON IP in preparation

Typical applications with LONWORKS®

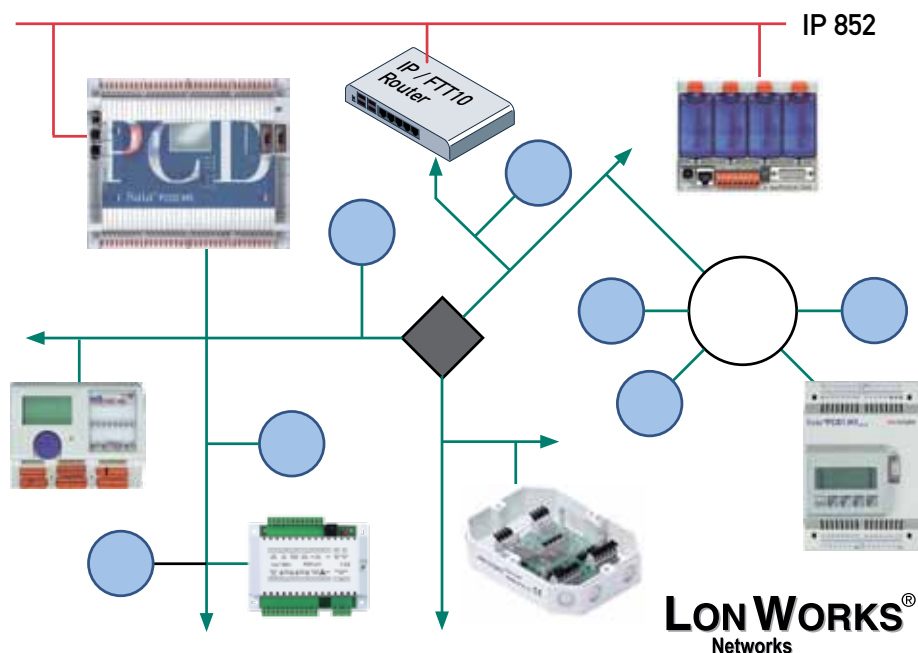
- Heating, air conditioning and ventilation control
- Lighting control
- Controls of sun blinds
- Safety
- Energy management etc.

LON systems on FTT10 basis

- PCS1.C88x
- PCD1.M125, PCD1.M135
- PCD2.M150, PCD2.M170

LON Systems on IP basis

- PCD3.M3xxx
- PCD3.M5xxx
- PCD2.M5540
- LONWORKS® memory module
- Option PCDx.R58x



The LON on IP System

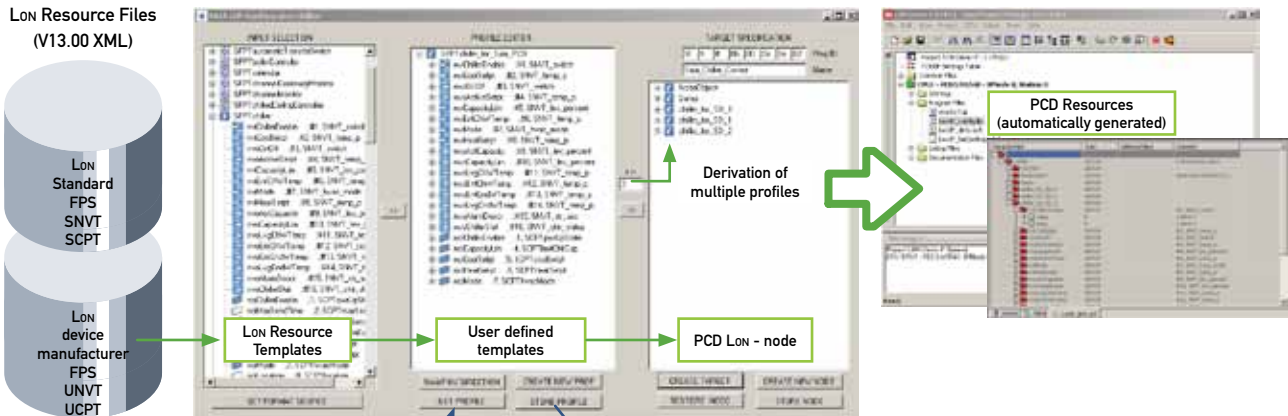
Saia®automation stations can be expanded with a PCD7.R581 memory module option to become a powerful LONWORKS® host. Communication is IP 852-based. For transitions to other interfaces, e.g. FTT 10 or Power Line, the system integrator can use external routers and media couplers.

Note: For each LON IP network, an external LONWORKS® configuration server should be provided (e.g. LIP from the company Loytec as FTT10 router, including configuration server).

LON IP, efficient engineering with templates

LON configurator

PG5 resources

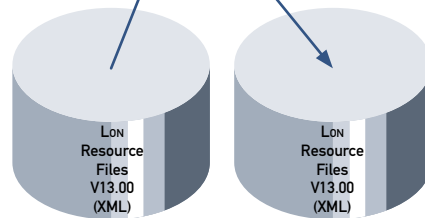


Configurations

Configuring a PCD host node can be quite extensive, depending on project size. Using a newly developed template concept, the system integrator can with a few entries derive many hundreds of the same nodes from one definition and generate PCD resources automatically.

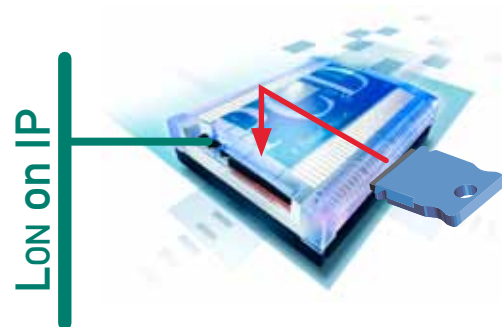
Templates from device manufacturers can be processed as well as XML templates edited in-house. In the LON IP configurator, LONWORKS® standard templates can be extended with additional information, such as resources used, scaling, etc. and saved as in-house templates. Templates edited in this way can be combined at will and reworked further to form the LON node.

Due to the high reusability of templates, engineering becomes a critical advantage over the competition.



Standard network variables SNVT

Through implementation as an IP stack for the Saia® operating system NT-OS, up to 2000 SNVTs (standard network variable types) can be defined in one DDC substation and linked with other PCD or foreign systems. All SNVTs currently specified in LONMARK® are supported by PCD systems.



Ordering information

Type	Description
LON on IP with PCD3.M3xxx PCD3.M5xxx and PCD3.M6xxx	
PCD3.R580	Flash memory module with LON on IP firmware for PCD3.M3120 and ..M3330, plugs onto I/O slots 0...3
PCD3.R581	Flash memory module with LON on IP firmware for PCD3.M3120 and ..M3330, with 1 MByte as backup for user program and 1 MByte with file system, plugs onto I/O slots 0...3
LON on IP with PCD3.M5xxx PCD3.M6xxx and PCD2.M5	
PCD7.R580	Flash memory module with LON on IP firmware for PCD2.M5xxx and PCD3.M5xxx/..M6xxx, plugs onto slot M1 or M2
PCD7.R581	Flash memory module with LON on IP firmware for PCD2.M5xxx and PCD3.M5xxx/..M6xxx, with 1 MByte as backup for user program and 1 MByte with file system, plugs onto slot M1 or M2
LON FTT10 with PCD1 PCD2.M	
PCD7.F800	LONWORKS® interface modul
PCD7.F802	LONWORKS® interface modul with additional RS485 interface
LON FTT10 with PCS1	
PCS1.C88x	Configured compact controllers with integral LONWORKS® interface module

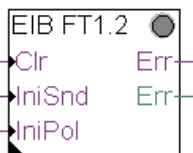
2.7 Open communication | KNX® S-Mode/EIB: Communications driver for the KNX® network

Efficient networking of building technology requires powerful inter-plant functions and components to communicate with foreign devices. Freely programmable Saia® automation stations offer a wide variety of possibilities for integrating communication in the KNX/EIB field. Depending on which interfaces (RS 232 or Ethernet) are available for accessing the KNX/EIB network, a comprehensive software library allows the necessary components to be linked with Saia® PCD or Saia® PCS systems.

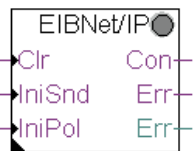
Direct connection via Ethernet communications makes accessing KNX/EIB data significantly faster and more powerful.

Features

- Use of driver for all Saia® automation stations
- Easy communications pick-up with Fupla modules
- Comprehensive support for EIS data formats in EIB S-Mode
- The driver supports the new serial KNX BCU 2 interface
- The driver supports easy upgrading of existing systems with KNX-BCU1 to the KNX-BCU 2 interface
- The driver also supports KNXnet/IP (EIBnet/IP) communication for high-performance systems



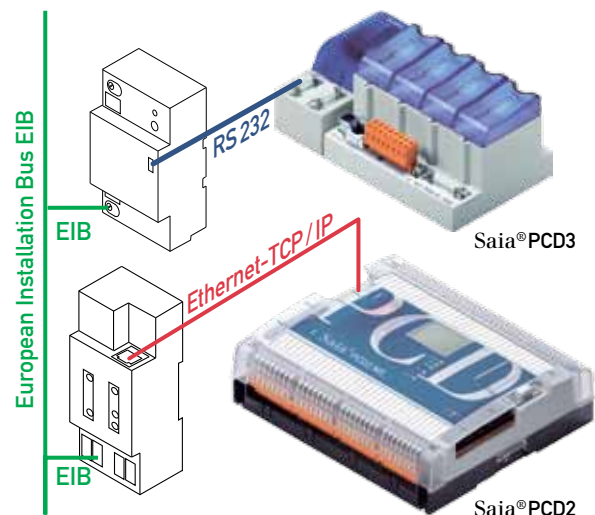
Function box RS 232 / BCU 2



Function box KNX / IP

Communications features

- BCU 1 mode with single-character acknowledgement (not recommended for new installations)
- BCU 2 mode with telegram acknowledgement
- KNX® S-Mode standard communication
- RS 232 connection (BCU 1 or BCU 2)
- Ethernet connection via KNXnet/IP router



Various solutions for different tasks

Installations with an existing KNX/BCU 1 connection can be upgraded at little cost to KNX/BCU 2 mode.

The new Ethernet-based connection is recommended for medium to large installations and for new construction. This interface makes full use of speed advantages and therefore reduces the load on the Saia® PCS or Saia® PCD automation stations.

The following external EIB RS 232/ Ethernet converters are recommended

SIEMENS Gamma Instabus interface	5WG1 148-1AB21	KNXnet/IP
SIEMENS Gamma Instabus router	5WG1 146	KNXnet/IP inc. router use
SIEMENS Gamma Instabus interface	5WG1 148-1AB04	RS 232 BCU 2 use

Ordering information

Hardware:	Purchase of converters via the electrical installation market
Software PG5 EIB:	EIB function box library for building automation

2.8 Open communication | Profibus DP: Interface for decentralized peripheral devices

Profibus in building automation

Profibus is the international standard bus for industry and building automation, according to EN 50170. With Profibus, the whole world of standardized network communication becomes accessible to the most varied applications, even ones involving devices from different manufacturers.

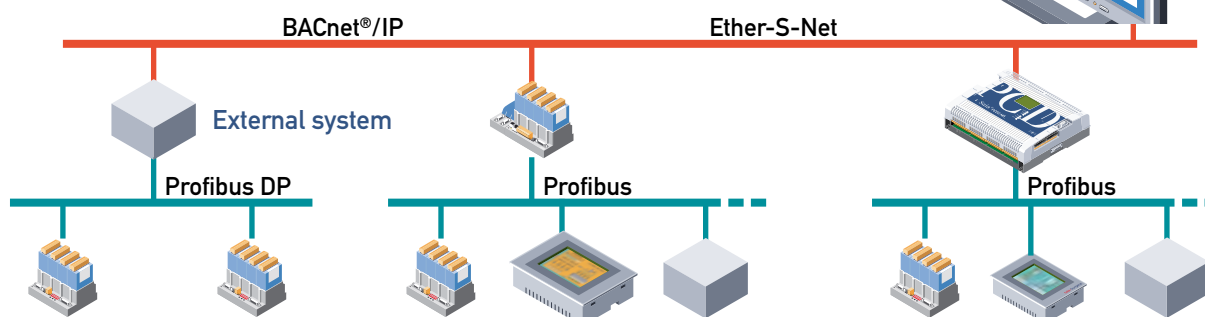
- Profibus is completely open and producer-independent
- More than 3 million different Profibus devices (such as PCs, controllers, control terminals, drives, valves, remote data points, etc. from more than 600 suppliers) are in use today worldwide. That results in a high degree of safety and investment protection for the user.
- The Profibus user organisation (PNO) maintains a qualified system of certification and checks that Profibus products comply with standards and in -operability requirements. Saia-Burgess Controls has PNO representation across Europe.

- Profibus DP is the fast network protocol (up to 12 Mbit/s) for the field level in production automation. Increasingly, it is also used in building automation, because of its large range of accessories.

Profibus with Saia[®]PCD

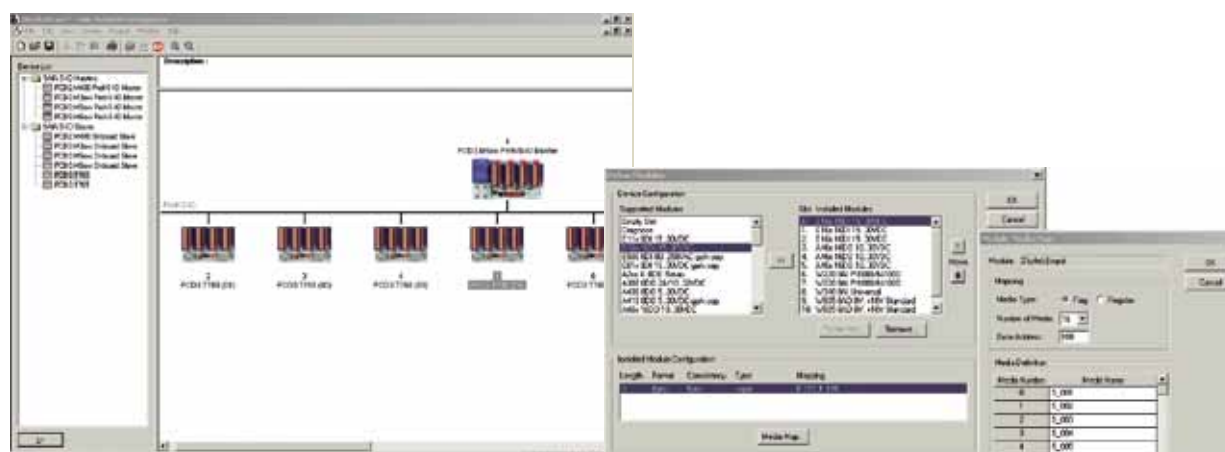
In the broad Saia[®]PCD-range, users will find all the control components they need for building decentralized controllers. The Profibus connections to DDC sub-stations are modular and can therefore be used specifically where they are needed. Remote data points - called PCD3.T7xx - and intelligent control terminals supplement the broad Profibus range of automation systems.

Profibus network



Profibus network configurators

The PG5 programming tool provides comfortable network configuration tools for all network versions. With these tools, users define variables, objects and network parameters.



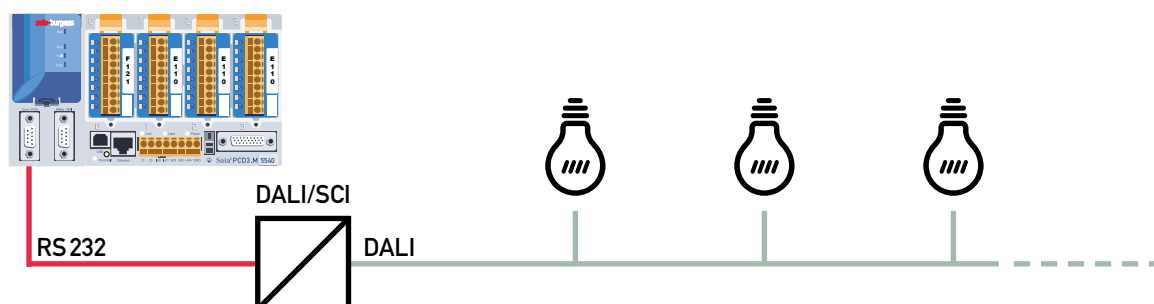
2.9 Open communication | DALI: Communications driver for the DALI lighting control network

DALI® (Digital Addressable Lighting Interface) is a system for the comfortable, synchronous control of lighting units. With its origins in the lighting technology of theatres and the film industry, this system has now become established in building technology for simple lighting tasks as well as complex ones.

The Saia®PCD communications driver forms a bridge between the DALI® lighting control network and the HeaVAC automation system. With demand-oriented control concepts and intelligent management of lighting based on Saia®PCD automation systems, lighting concepts can be implemented with optimized use of energy.

Features

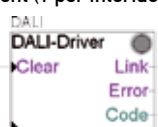
- Programmable via the Saia® PG5 Controls-Suite
- Easy configuration with convenient software function blocks (FBoxes)
- Communication via RS 232 using the DALI® SCI interface from TRIDONIC.ATCO
- Control of individual lamps or groups of lamps
- Control of on/off settings and dimming factors
- Control of staging (requires setting of appropriate DALI® scene parameters)



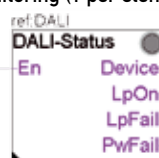
The range of function blocks allows individual lamps or lighting groups to be switched on or off or dimmed directly.

Elements of the library:

Driver element (1 per interface)



Status monitoring (1 per element to be monitored)



Lighting control - on/off (1 per lamp/group)



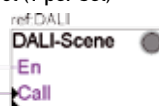
Lighting control - dimmer (1 per lamp/group)



Lighting control direct (1 per lamp/group)



Stage control (1 per set)



Recommended hardware

Type	Description	Manufacturer
DALI-SCI	DALI/RS 232 converter Item number 24033463	TRIDONIC.ATCO

Software ordering information

Type	Description
PG5 DALI	PG5 library to connect DALI network components to
Communication Library	Saia®PCD PCS automation systems

2.10 Open communication | EnOcean®: Communications driver for the EnOcean® wireless network

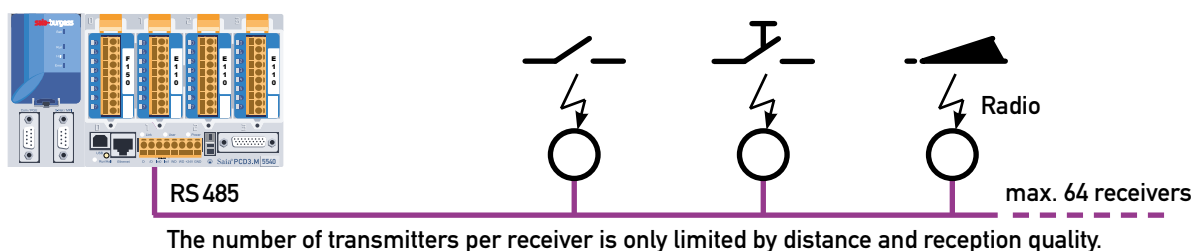
In building refurbishment projects, rewiring sensors and switches can be a tedious and expensive undertaking. The wireless-based EnOcean® network offers a flexible and cost-effective alternative.

This technology can be easily and efficiently integrated with Saia® automation systems. With one coupler from EnOcean® to RS485 installed locally within the building, EnOcean® sensors can be connected to the automation systems without any problem.

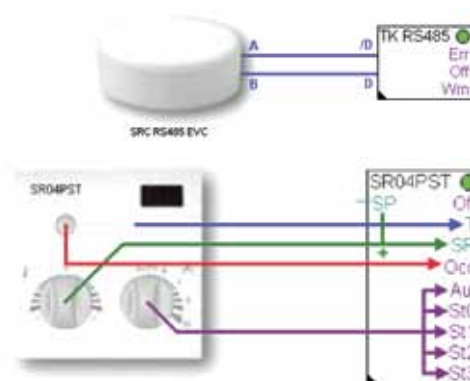
Features

- Communication via RS485 and connection of up to 64 couplers
- Many standard EnOcean® components supported
- Programmable via the Saia® PG5 Controls-Suite
- Matching FBoxes for the various EnOcean® components
- Intuitive engineering and simple commissioning
- Event-driven communication, no network load from polling

Connection diagram of the wireless receiver via RS485:



Example of driver circuit in FUPLA editor



Example of a logical connection between the FBox and a room control device

Ordering information

Type	Description
EnOcean network components	
Q.SRC65-RS485E	EnOcean wireless receiver with RS485 interface, IP65 housing with external aerial
Q.STC65-RS485E	EnOcean wireless receiver/transmitter with RS485 interface (bidirectional), IP65 housing with external aerial
Q.APG03U-RS485	EnOcean wireless receiver with RS485 interface, White plastic - housing IP20 for interiors
Q.APG03B-RS485	EnOcean wireless receiver/transmitter with RS485 interface (bidirectional), White plastic - housing IP20 for interiors

Software

PG5 EnOcean®	PG5 - EnOcean Library Bidirectional EnOcean library for connection of EnOcean technology
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2.11 Open communication | Modbus Interface to a quasi standard

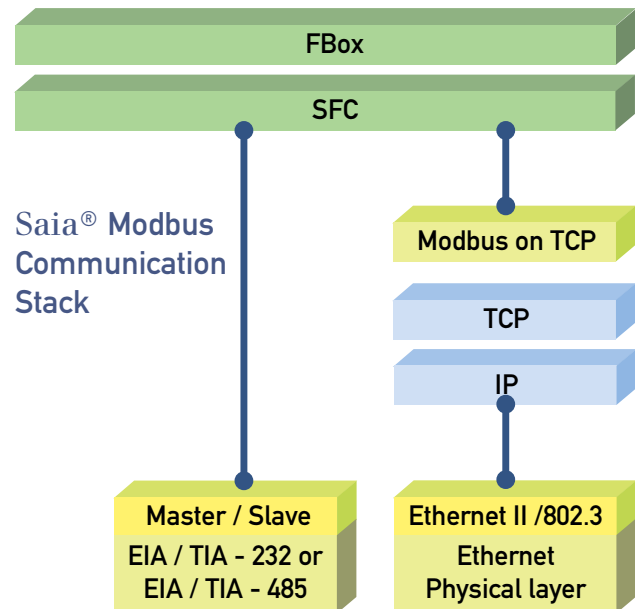
Modbus is communications protocol based on a master/slave or client/server architecture. It is widely used and supported by many manufacturers and devices. In many cases, therefore, Modbus is the common denominator for exchanging data between different devices and systems.

Modbus with Saia® PCD

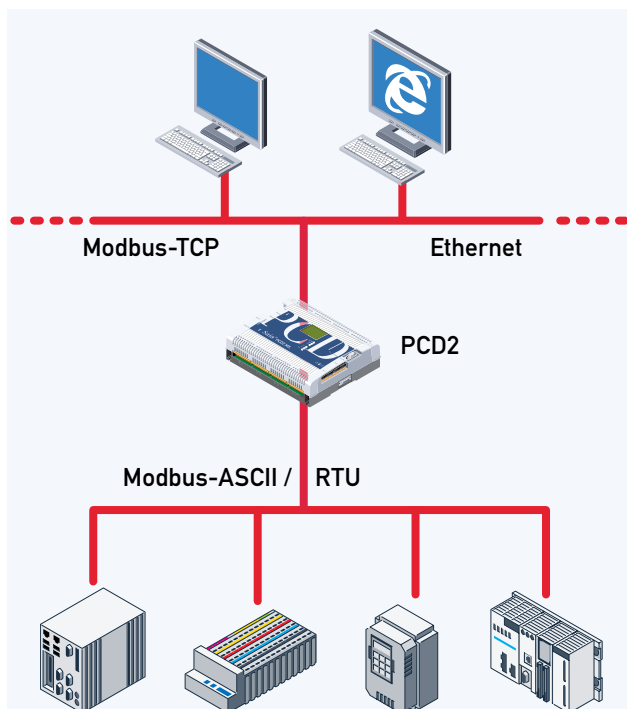
Modbus exists in three versions:

- **Modbus-ASCII**
Data is transferred in ASCII format across serial interfaces (RS232, RS485).
- **Modbus-RTU**
Data is transferred in binary format across serial interfaces (RS232, RS485).
- **Modbus-TCP**
Data is transferred in TCP/IP or UDP/IP packages via Ethernet.

The Modbus protocol is supported in the firmware of all Saia®PCD3 and Saia®PCD2.M5 CPUs. Client and server functionality is available for all types of protocol.



Application examples:



In connection with the integral AutomationServer, third-party systems can also be easily incorporated via Modbus into higher ranking web/IT automation environments.

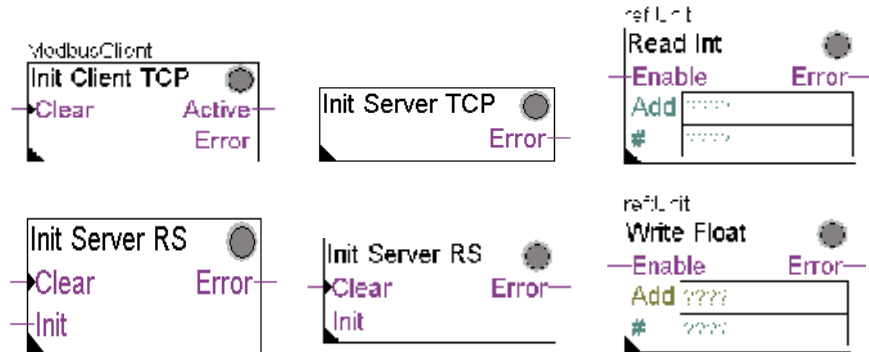
Modbus with Saia® PCD

For the configuration and programming of data communications, CSF commands or convenient Fupla FBoxen are available.

Technical data Saia® Modbus

Function codes supported:

- 1 Read Coils
- 2 Read Discrete Inputs
- 3 Read Holding Registers
- 4 Read Input Registers
- 5 Write Single Coil
- 6 Write Multiple Coils
- 7 Write Single Holding Register
- 8 Write Multiple Holding Registers



Media mapping:	user adjustable
Mapping areas:	max. 10 per UID
Number of servers:	max. 4 per PCD System
Number of unit IDs:	max. 10 per PCD System
Number of channels:	max. 10 per PCD System

Number of connections:

A maximum of 26 connections can be established per PCD system. Of these, a maximum of 10 may be used as client connections on the PCD controller. The remaining connections can be used as server connections to the same PCD controller.

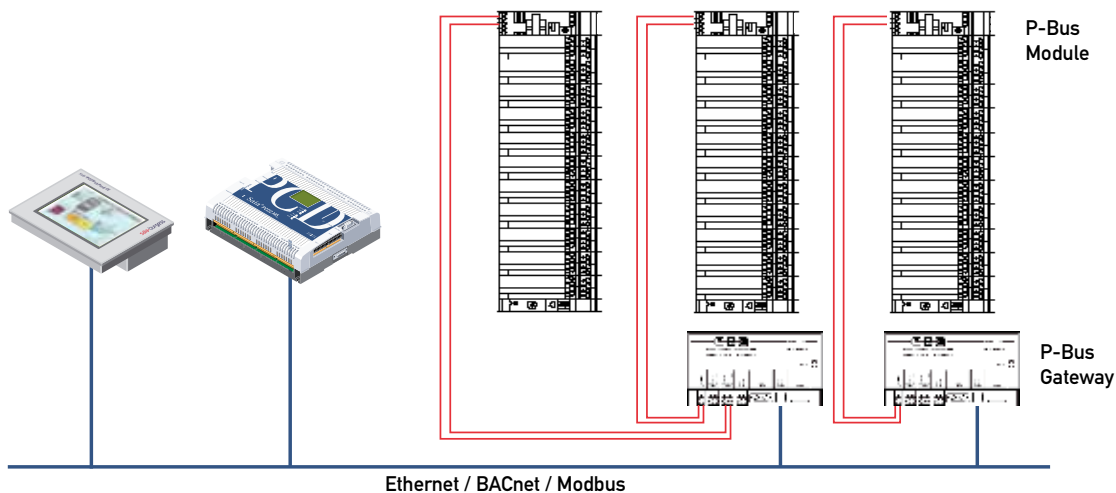
2.12 Open communication | P-Bus

Gateway module for Siemens® P-Bus

To modernize or extend the functionality of old systems that were fitted with PRU or PRV controllers, all you need is a gateway produced by the Persy Company. This gateway can be used to address up to 2 P-Bus branches, each with 64 data point modules, directly across a Saia® PCD controller. Direct connection is possible via the Ethernet, RS 232 or RS 485 interface. With an FBox family, P-Bus data point modules can be driven directly from the PCD application program.

Features

- 2 P-Bus branches each with 64 modules can be addressed using the gateway
- Parameters are set via a convenient web interface
- The interface can be connected to the PCD system via Ethernet, RS 232 or RS 485
- P-Bus modules are addressed via an FBox family



i The communication to the gateway bases on the Modbus TCP (Modbus Library of SBC (previous page) is required!). These gateways are available from the Persy Company: www.persy.nl

2.13 Open communication | MP-Bus: Interface for direct connection to BELIMO[®] damper actuators

Networking of field devices

The networking of field devices gives high functionality and economical operation. This is achieved with PCD2.T500 or PCD7.T180 MP-Bus modules, which exchange data between BELIMO[®] damper actuators and the automation level.

- Software support for setting parameters and triggering the damper actuators.
- Information calling on current damper position, actuator status, number of movements, etc.
- Higher order networking via Saia[®] S-Bus (RS 485), EIB, Profibus DP/FMS, LonWorks[®], Ethernet-TCP/IP or BACnet[®].

Characteristics of the MP-Bus protocols

- No special cable or line termination resistors
- Costs saved due to reduced expenditure on cabling and easy handling
- Simple commissioning and maintenance

MP-Bus design

The field bus was specially developed by BELIMO[®] for MFT and MFT2 actuators (MFT = multi-functional technology). Saia-Burgess Controls has developed two different connection modules to integrate it within the overall control architecture. An MP-Bus network (MP = multi-point) consists of a 3-wire cable linking the connection at the automation system or controller to the damper actuators. Up to 8 actuators can be connected to one communications channel. The overall length of each branch of the network depends crucially

PCD2.T500 / PCD3.F2xx / PCD3.F2xx / PCD7.F180 connection modules

- Interface for a variety of Saia[®]-devices and requirements
- Integration of up to 16 MP-Bus participants and sensors per PCD2.T500 connection module
- Comprehensive software library for a wide variety of damper actuator families

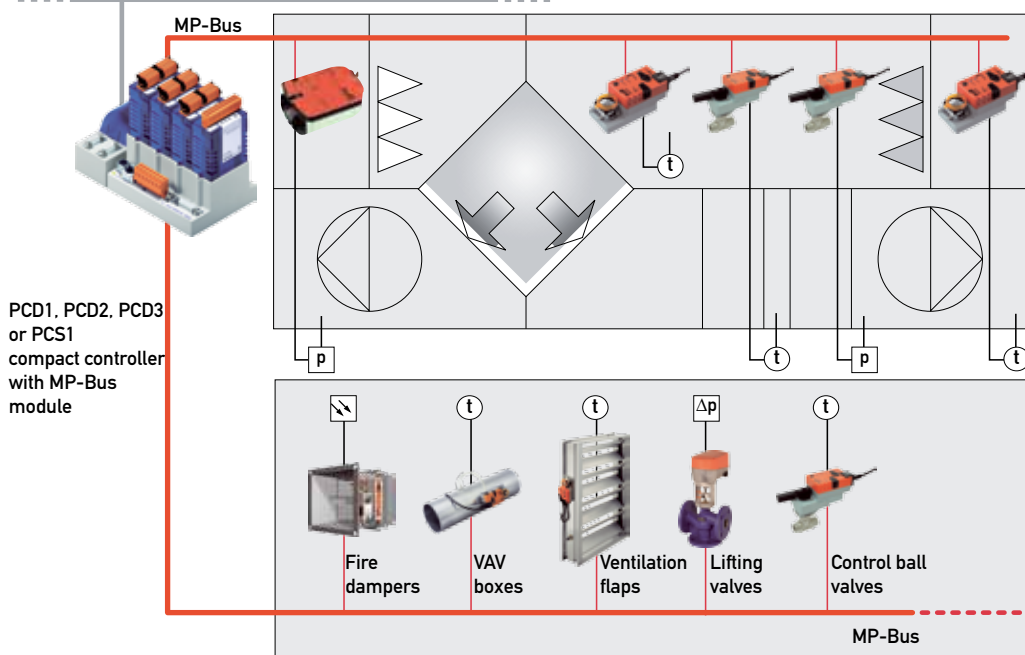
on the choice of cable cross section and on the number and type of actuators connected. Generally, an overall length of approx. 100 m is attained. Since the length of connection and number of drives are limited, no other requirements (e.g. line termination resistors or screened cable) are placed on bus topology.

Direct sensor connection

In addition, further process information can be switched directly to any connected drives through add-on modules for the drive or MP-Bus.



LonWorks[®], Ethernet-TCP/IP, Profibus etc.



The direct connection to an MFT/MFT2 actuator of conventional sensors for humidity, temperature, etc., and of automatic contactors and switches, gives analogue sensors bus capabilities. This simple solution saves the use of expensive, bus-compatible sensors and significantly reduces cabling.

The following are supported:

- passive sensors
- active sensors
- Switching contacts

Overview

Automation station	Nmbr.	MP-Bus module	Nmbr. of MP-Bus-branches actuators		Anzahl	MP-Bus Modul	Anzahl MP-Bus-branches actuators	
PCS1.C4xx / .C6xx / .C8xx 	1	PCD7.F180 	1	8				
PCD3.Compact 	1	PCD7.F180 	1	8				
PCD3.WAC 	1	PCD7.F180 	1	8				
PCD1 	1	PCD7.F180 	1	8	1	PCD2.T500 	2	16
PCD2.M1xx/.M480 	1	PCD7.F180 	1	8	M110 : 1	PCD2.T500 	2	16
					M120/M150 : 3	PCD2.T500 	6	48
					M170/M480 : 5	PCD2.T500 	10	80
PCD2.M5xxx 	2	PCD7.F180 	2	16	4	PCD2.F2100 * PCD2.F2210 * 	4	32
					4	PCD2.F2810 * 	8	64
PCD2.M3xxx / M5xxx 					4	PCD3.F210 * PCD3.F221 * 	4	32
					4	PCD3.F281 * 	8	64

* with additional PCD7.F180 modules

Info PCD2.T500

The module can control up to two branches (bus connections) each having eight connected actuators. Each branch can be run asynchronously, independently of each other. To run both branches independently, the automation system will also require two logical communications channels (RS232). However, if required, both branches can also be run on only one logical communications channel.

Open communication | MP-Bus:

Function blocks for BELIMO® MP-Bus

Saia-Burgess Controls provides an appropriate function box (FBox) for all actuator types available from BELIMO®. To enable the actuator to be correctly initialized and addressed by the master, the FBox necessary for that actuator family must be used.

Types/rating classes	Sensors		MP-Bus FBox
Ventilation applications			
Damper actuators without safety function: LM24A-MP (5 Nm), NM24A-MP (10 Nm) SM24A-MP (20 Nm), GM24A-MP (40 Nm)			
Damper actuators with safety function: TF24-MFT ¹⁾ (2 Nm), LF24-MFT2 (4 Nm) AF24-MFT2 (10 Nm)			
Damper actuators linear: LH24A-MP100 / 200 / 300 (150 N) SH24A-MP100 / 200 / 300 (450 N)			
Damper actuators rotating: LU24A-MP (3 Nm)			
Security applications			
Actuators for fire dampers: BF24TL-T-ST (18 Nm) BFG24TL-T-ST (11 Nm)			
Room and system applications			
VAV compact controller: LMV-D2-MP (5 Nm), NMV-D2-MP (10 Nm) SMV-D2-MP (20 Nm)			
VAV compact controller linear: LHV-D2-MP (150 N)			
VAV universal controller: VRP-M			
Water applications			
Lifting drives without failsafe function: NV24-MFT2 (1000 N), NVG24-MFT2 (1600 N) AV24-MFT2 (2000 N)			
Lifting drives with failsafe function: NVF24-MFT2 (800 N), NVF24-MFT2-E (800 N)			
Drives for control ball valves without failsafe function: LR24A-MP (5 Nm), SR24A-MP (20 Nm)			
Drives for control ball valves with failsafe function: TRF24-MFT ¹⁾ (2 Nm), LF24-MFT2 (4 Nm) ARF24-MP (15 Nm)			
Drives for butterfly valves without failsafe function: SR24A-MP-5 (20 Nm), GR24A-MP-5/-7 (40 Nm)			

1) Only active sensors and switches can be connected.

1) Only active sensors and switches can be connected.

Belimo MP-Bus

In addition, FBoxes are available for the following devices

■ PHT Multifunction Sensor	Temperature, pressure and humidity capture in one device
■ THC24	For connection of up to 4 fire dampers
■ UST3	I/O device for wiring of ventilation stages and for integration of 0...10 V signals
■ FLS2000 Automatic	Window ventilation system
■ Air Qualitizer	MP-Bus room controller from the company AL-KO



2.14 Open communication | N2-Bus: Communications driver for Johnson Controls N2-Bus

Communications driver JCI-N2 bus

JCI modules with an N2 bus interface can easily be linked to a PCD controller. The N2 bus connection is established via a standard RS 485 interface. No converter is needed.

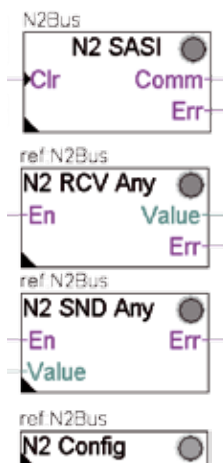
Communication with the JCI modules takes place with an FBox library. The PCD is then either the master or slave, and can access or reply via write and read commands. Supported formats are: 1 byte, 8 bits, 2 bytes, 16 bits, 4 bytes and floating point. Floating point format is immediately converted into the HeaVAC format.

The Send/Receive FBoxes use data for station numbers/Item address/format definition. This means they can be used Independently of the module.



PCD1/PCD1...3

RS 485
N2-Bus



Ordering information:

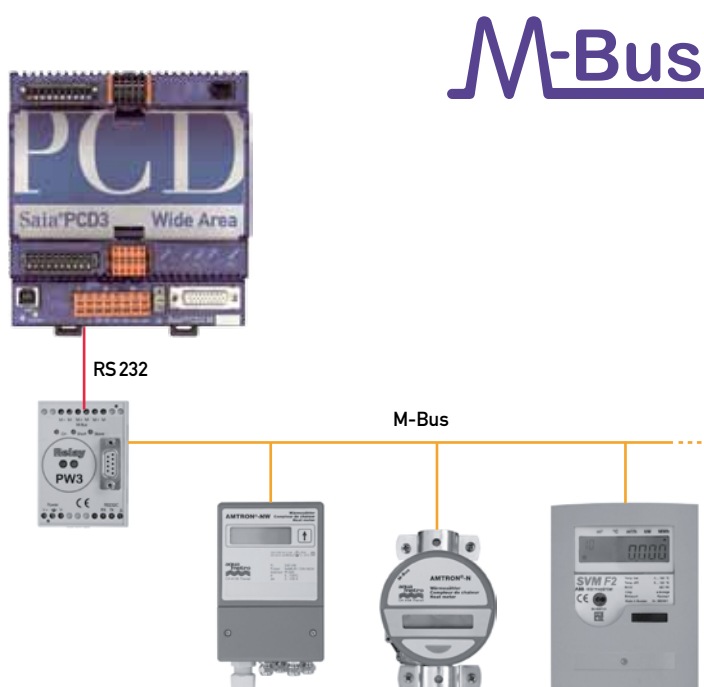
Type	Description
PG5 - JCI N2-Bus Library	Library to connect JCI installations

2.15 Other communications drivers of Saia® CVP system partners for connecting external systems

Communications driver for M-Bus-protocol drivers of Saia® CVP system partners

The M-Bus (EN 1434-3) is an international standard for the distant reading of energy counting devices. The M-Bus connection is made through a RS232 standard interface and an M-Bus converter. This enables quantities of water, heat or electrical energy to be registered in a DDC sub-station. Further evaluation of measured data is done with a function box library in the Saia® FUPLA.

This driver is available from: www.engiby.ch.



Alongside the communications possibilities set out here, other special drivers are available for PCD systems. Please contact your local Saia® representative for detailed information.

Modbus Schneider	Modicon, Telemecanique and many other devices point to point - modem - RS 232 - RS 485 - RS 422
Modbus / TCP Schneider	Modicon, Telemecanique and many other devices via TCP/IP - UDP/IP
3964(R)/RK512	Siemens: point-to-point communication
M-Bus	Heating meters Water meters Pulse counters Electricity meters
IEC 870-5-101	Power plant/energy management
IEC 870-5-103	Switchgear control
IEC 870-5-104	Power plant/energy management
ExControl	Light and blind functions with remote control via RS 232 or Ethernet
Luxmate	Lightning control BMS ZUMTOBEL
C-Bus	Lightning control from Clipsal
Menerga	Menerga controllers
COMSAB/York	SABROE compressor control units : - PROSAB II - UNISAB S/R/RT/RTH - UNISAB II
Cerberus	Siemens-Cerberus alarm systems (extended driver)
DMS 7000	Siemens-Cerberus alarm systems (reduced driver)
Tyco MX	Tyco MX 1000 and 4000 alarm system
Securiton, BMA, EMA	Fire and intruder alarm systems

ESPA 444	Message Transmission Message Reception Message Forward and Routing over SMS, Pager or TAP
SNMP Trap	Alarming / Messaging
TechTalk	Access control
Ernitec	Video Matrix Control
Panasonic	Video Recorder Control
Commend	Interphone system
ebmBUS	Motor control ebmPapst
Grundfos Pump control	Genibus on RS485 G100 gateway via RS232 and Profibus DP
Clock and GPS	Reception of time data for DCF77 Reception of time and position data via GPS Reception of time and weather station data from Elsner Station
Marksman	Road Traffic Recorder
APC	Unswitched Power Supply
Fidelio	Hotel management system

Available with www.engiby.ch

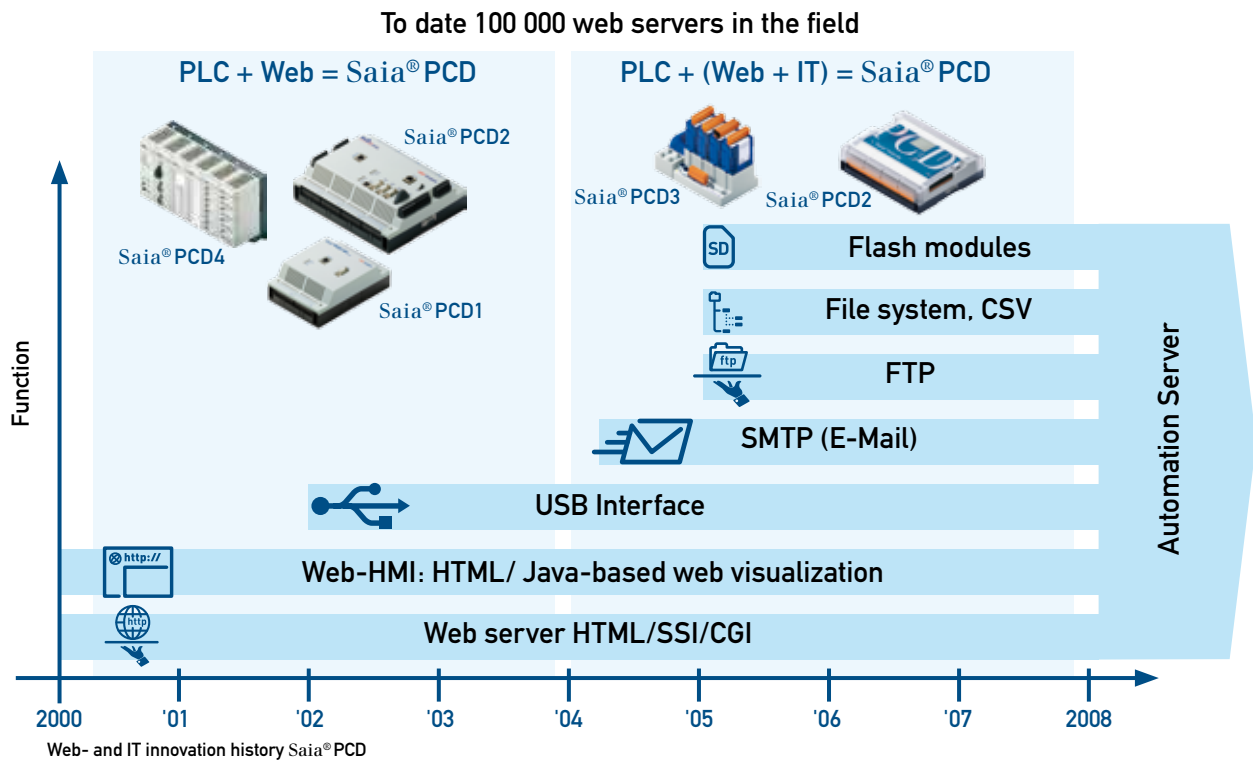
3 Web-based automation with Saia® S-Web

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3.2 AutomationServer Saia® S-Web	57
3.3 Web based automation Typical examples	60



3.1 Automation Server

Decisive added value for the user from an advanced automation device



Culture of innovation and technology

In the first 20 years of the company, Saia-Burgess built up a good reputation for its PLCs and established a corporate culture marked by open and closed loop industrial control technology.

Saia® has begun steadily combining the «old» with the «new». The «new» comprises technologies from the web and IT worlds, as well as from the fields of consumer electronics (e.g. SD-Flash, haptic) and telecommunications (e.g. GPRS).

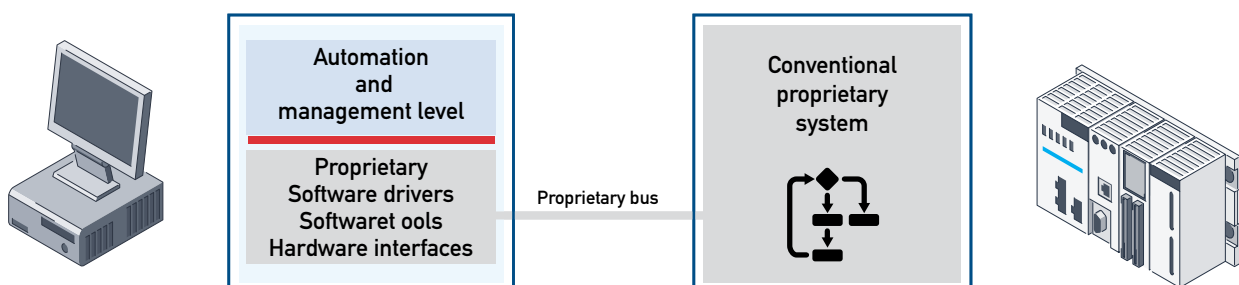
In themselves, the individual technologies are nothing new and their use is very widespread. However, it is something new to have all these technologies united in a freely programmable automation device with industrial design and a correspondingly long life cycle.

Saia® has developed its longstanding PLC culture into a new, PLC-based innovation and technology culture, creating in the process extremely attractive products.

Automation-Server – the missing link

The great advantage of the AutomationServer is apparent when integrating proprietary automation equipment into the automation and management level of a system operator.

Any facility operator who wishes to integrate automation devices from different manufacturers into his automation and management level will be confronted with complex and costly tasks.

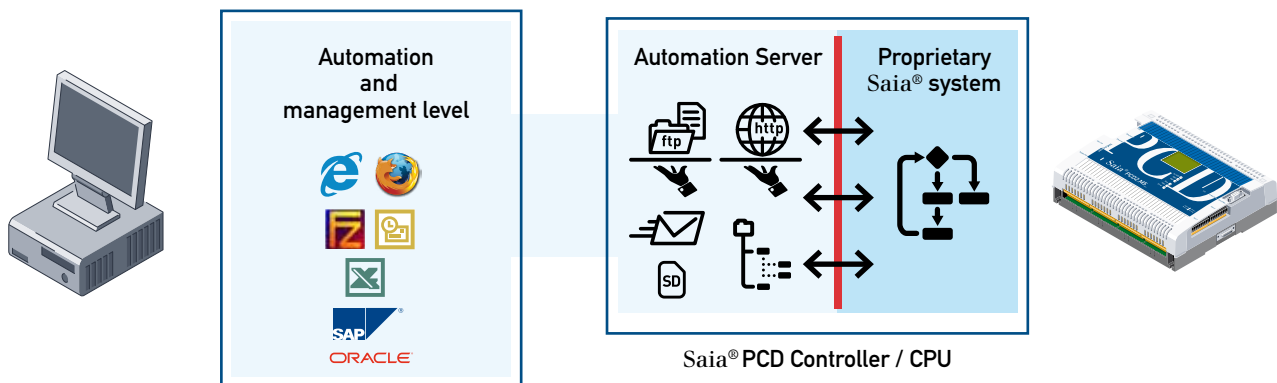


For the management/ERP system etc. to access the automation devices of various manufacturers, the facility operator usually needs specific, proprietary software drivers and/or hardware interfaces.

The facility operator's desire for openness leads to higher costs and additional complexity.

The manufacturers bear no responsibility for interoperability during the operational lifetime of the overall system.

Integration of a Saia®PCD with AutomationServer



It is ideal for the facility operator if he can use communications interfaces and software tools that are available in-house for the integration of automation equipment.

For this purpose, the following conditions must be met:

- No more proprietary protocols
- No more proprietary data formats
- No more proprietary drivers and plug-in cards
- No more proprietary software tools

Starting with software, they have to be able to rely on something that is available everywhere and therefore costs little or nothing extra. The solution is any choice of browser or FTP and e-mail client.

For management systems, whether large ERP systems like SAP or small ones based on EXCEL, it must be possible to exchange information simply and se-

curely with any choice of automation device. This is achieved with CGI bin instructions (supported by all operating systems) and the CSV data format (also universally understood).

In order for all these ideal wishes to be realized, a functional counterpart is required at both the field and automation levels to serve the operator's (client's) applications. This counterpart is the **AutomationServer**.

The AutomationServer comprises a web server, FTP server, SMTP client (e-mail) and its own file system with ample data memory.

The AutomationServer is therefore a bridge from the open, standardized automation environment (based on universal web/IT technology) to the internal, proprietary resource and process model of the automation device.

In all new Saia®PCD control devices, the AutomationServer has been integrated as standard, at no extra cost.

AutomationServer

Flash memory with file system, e-mail service plus FTP and web server

Flash memory



The large memory capacities of Saia®PCD2.M5 and PCD3 controllers give them independence from any higher ranking PC system, even for long periods. Any choice of process points (temperature, pressure, energy consumption, switch states, system messages, etc.) can be recorded in the flash memory modules. With SD flash cards, the data memory of Saia®PCD2 and PCD3 controllers can be extended by up to 4 GBytes. Additional, external memory systems (e.g. data loggers or even PC systems) can therefore be saved.

File system



In the flash memory modules, data is managed with a file system like that of a familiar Windows PC.

Unlike an office PC, however, machine controllers operate in tough, industrial environments. Loss or corruption of data resulting from power cuts or other faults will not be accepted. Accordingly, the file system of Saia®PCD controllers has been implemented in a robust, secure way.

Up to 1000 files can be stored in a Saia®PCD system. Files and directories can be assigned individually to different user groups, protecting them from unauthorized access. Since very diverse file formats are supported, data can be exchanged with overlying systems, e.g. CSV files for EXCEL applications.

For the simple integration of file system functions within PCD programs, FBox and IL libraries are available.

FTP and web server



The Saia®PCD operating system contains an integral FTP and web server that allows data to be exchanged with a higher ranking system, without any additional, specific software driver. Machines or systems equipped with Saia®PCD controllers can therefore always be integrated at no extra cost into existing IT systems (e.g. an ERP system). With a standard FTP client (included in, e.g. Internet Explorer, Filezilla, etc.) files are exchanged with the FTP server via the Ethernet TCP/IP interface. Access can be protected by assigning user names and passwords. With the web server, a web browser can be used to load stored files onto a PC for further processing. If necessary, stored data can also be sent via e-mail to a higher ranking system or to the persons concerned. For example, if a fault occurs, the system will be able to supply service personnel not only with the actual error message, but also with more detailed information about the problem at hand. Or else the system can independently transmit log data for long-term archiving by a higher ranking system.

E-mail



With the e-mail function and integral SMTP client (simple mail transfer protocol) PCD controllers can forward process and system information via the Ethernet interface to a mail server. In this way, alarms, service messages, error messages or any selected process information can be sent via e-mail to a control centre and/or service personnel. For the simple integration of e-mail functions within PCD programs, FBox and IL libraries are available.

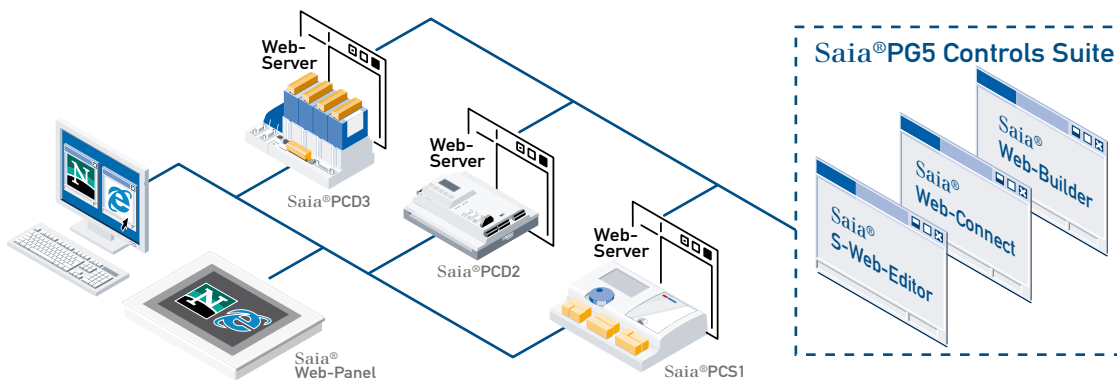
3.2 Automation Server | Saia® S-Web

Saia® PCD.Web technology, seamlessly integrated and applied, transforms the automation environment in all areas of commissioning, service, control and monitoring.

Highlights

- Web browser as tool for commissioning, service and visualization. No proprietary software tools or runtime licences necessary
- Continuous access via any interface or network: from Ethernet TCP/IP to Profibus
- Saia®PCD.Web-Server integrated within all products, from the most powerful controller to the simple remote I/O – at no extra cost
- Saia®S-Web-Editor – easy, convenient editing of Java-based web pages (knowledge of Java or HTML programming not required)
- Saia®Web-Panels – economical touch-screen panels with built in web browser for control and monitoring

A professional toolbox for the Saia® PCD.Web-Server



Operation, visualization, commissioning and maintenance

Saia® S-Web an complete system approach

All the more recent Saia®PCD control devices (PLCs and RIOS) include a built-in web server in the basic unit at no extra cost. Saia® S-Web is an integral system approach that not only includes the web server and browser, but also all the necessary tools (e.g. Saia®S-Web-Editor) for creating web applications with ease and convenience. Economical, industrial, web-based

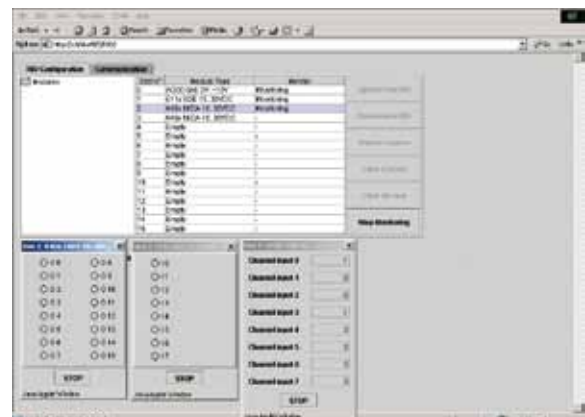
control stations are also available, in the form of embedded Windows touch-screen panels. The consistent system employed by Saia-Burgess to integrate web technology has not only led to a cost differentiation, but also to a positive functional differentiation from the general market level.

Saia® S-Web

Web-based device and installation management

At present, most commissioning and service of systems and installations still takes place with specific, proprietary software tools. Thanks to the use of web technologies, these can now be replaced with standard tools, such as Internet Explorer. No specialist know-how is required to operate a browser, and it has a high level of user acceptance. Predefined HTML pages allow optimized device and system management during commissioning and service. All device or installation-specific documents and information (user guides, spare parts lists, other links, telephone contacts, etc.) can be stored directly in the PCD controller's web server, where they can be called online at any time with the browser from a service PC or any other connected Saia® S-Web-Panel. Moreover, with user group-specific HTML pages, com-

fort and security are significantly increased while at the same time costs are cut considerably.



Automation-Server | Saia® S-Web

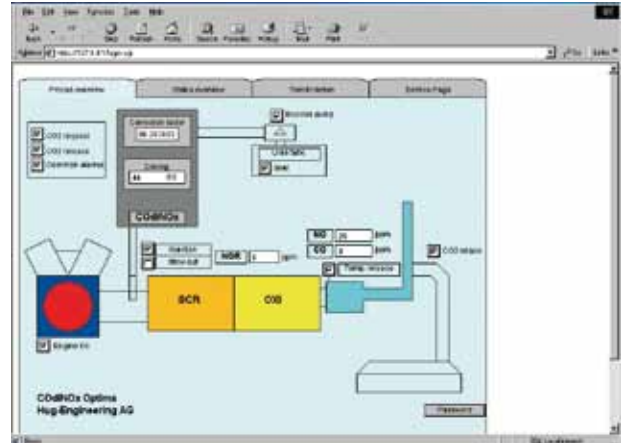
Web-based control and visualization without runtime licences

Expensive and often complex Scada systems or proprietary control panels have also been used for simple control and monitoring functions.

A web server with browser is ideally suited for such tasks. The costs involved with expensive development tools and runtime licences will be avoided.

Information is located at the site of the action (in the controller) and is therefore always up-to-date.

All control devices, whether local (e.g. a touch-screen Saia®Web-Panel) or remote (e.g. a browser PC on intranet or internet) access the same data source (web server) and therefore have the same user interface. By decentralizing data and functions, the cost of application editing, administration and support is considerably reduced.



Another advantage of web technology is the vendor-independent, standardized interface between the controller system and the management level.

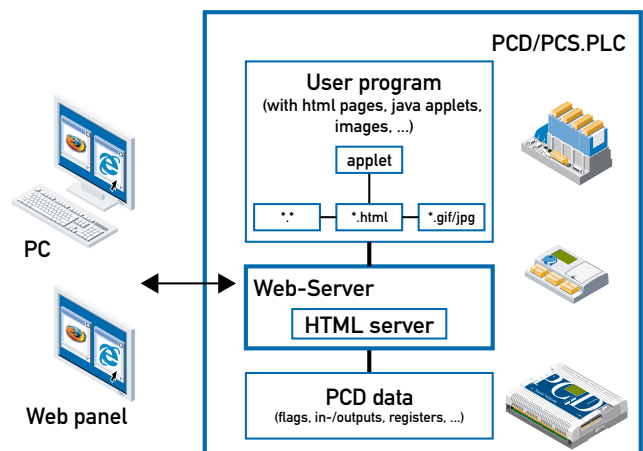
Web technology seamlessly integrated within all devices and systems

Web-Server integrated in Saia®PCD operating system

The web server is integrated within the operating system of all new PCD controllers and forms the heart of the S-Web concept. No additional module is required.

Building it into the operating system has made accessing PCD data very efficient and direct.

HTML files, Java applets, pictures and any files can be stored in the web server. The web server processes queries from the browser according to HTML standard 1.1 and delivers the required pages with data. PCD data is accessed within an HTML page with special text commands, or within Java applets or scripts using special CGI calls. It is possible to protect access to HTML pages and PLC data with a password. Four protection levels are available, each with a freely definable password.



Web project management forms part of the PG5 programming tool. Web pages are generated simply and efficiently with the Saia®S-Web-Editor, or with a standard HTML editor (e.g. Frontpage).

Seamless access via any choice of interface or network

Access to the Saia®PCD.Web-Server is possible not only via Ethernet TCP/IP, but also via economical standard serial ports (RS232, RS485, modem ...) or Profibus networks. It also takes place seamlessly across the various network levels.

This makes web technology feasible even for simple, low-cost devices without any Ethernet TCP/IP

connection. Web browsers on Intranet/Internet have, via the frontend PC and Saia®Web-Connect, transparent access to all connected PCD.Web-Servers.

Saia®Web-Connect software lets connections be established to the PCD.Web-Server, even without an IP address.

AutomationServer | Open data access with Saia®.Net



Saia®.Net components

The CGI interface of a PCD web server can be used in web applications for the efficient exchange of data with Saia®PCD controllers. The CGI interface can also be used in Windows applications for problem-free data exchange via port 80. At the same time, Windows applications can also have direct read and write access to the controller's integral file system.

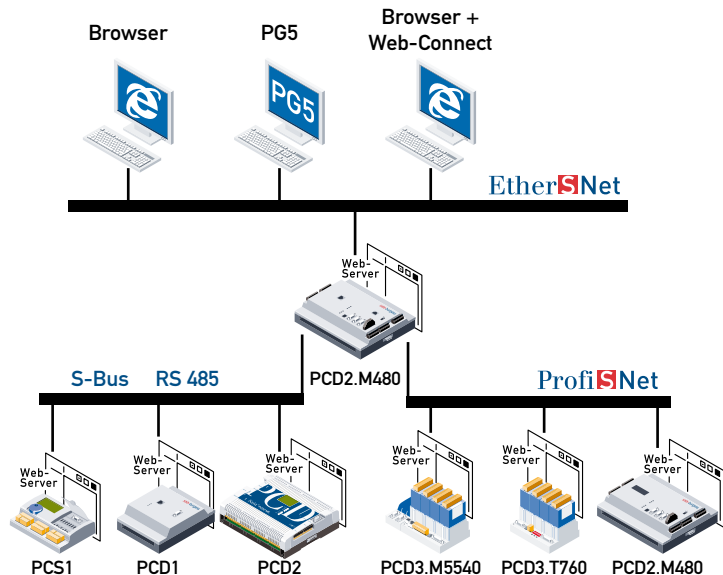
Standard .Net technology from Microsoft® and Saia®.Net communications components provide software developers with easy ways of integrating Saia® automation components into their Windows® applications, without having to worry about communications drivers or complex CGI syntax. The Saia®.Net Suite includes components and class libraries for communication via S-Bus (master and slave) or across the CGI interface.

3.3 Web-based automation | Typical examples

Practical possibilities applying S-Web

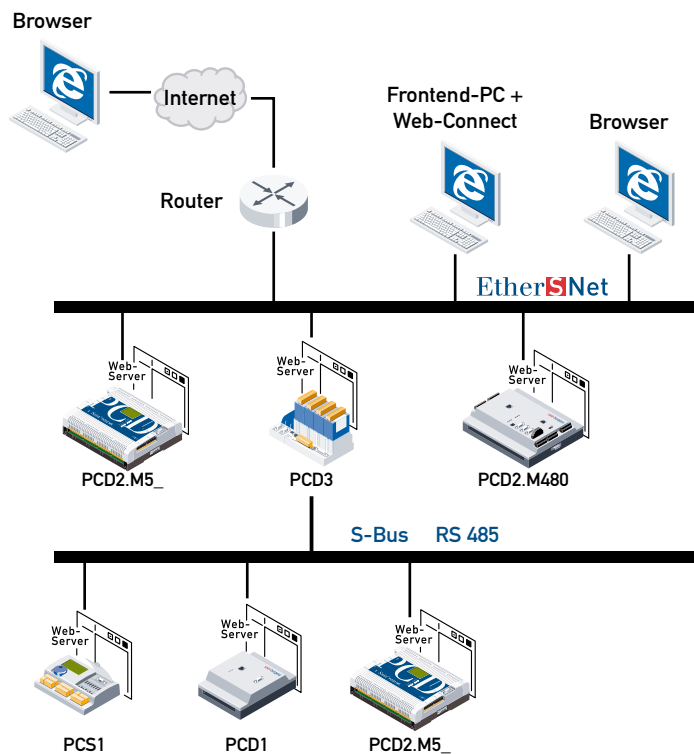
Seamless access by Ethernet via Profibus

Saia®Web-Connect software, combined with the gateway function in PCD controllers, provides continuous access to all Saia®PCD.Web-Server on Ether-S-Net, Profi-S-Net and even on simple, serial S-Bus (RS485) networks. This enables the seamless implementation of decentralized web-based control and monitoring concepts. Even simple, low-cost devices without an Ethernet-TCP/IP connection have a web server, and so can be integrated into the concept. The PG5 programming tool also has consistent access to PCD controllers via the same interfaces and networks. Therefore, no duplicate wiring is needed for file and programming services.



Internet access without IP addresses

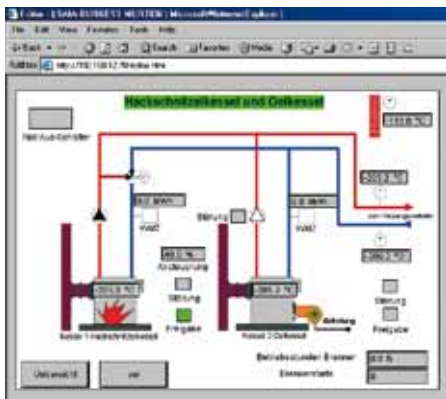
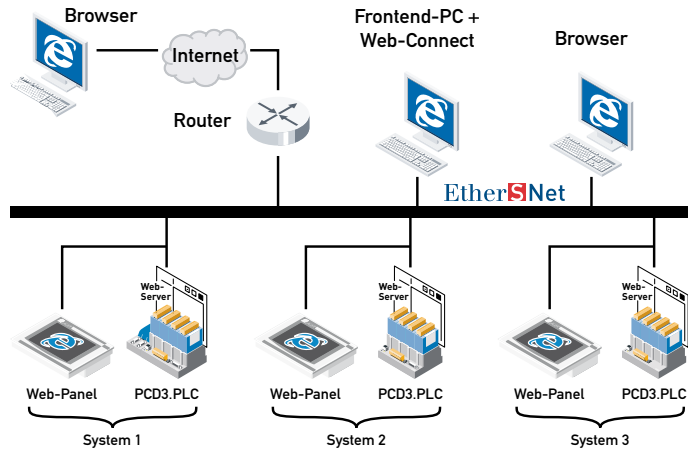
To access a web server via Internet, it is normally necessary to have a registered, public IP address for that web server. Such IP addresses still cost money. The S-Web concept with Saia®Web-Connect software allows access to all web servers, even those without an IP address. This is achieved by installing Saia®Web-Connect software on the frontend PC, after which a registered IP address is only required for the frontend PC. All browser PCs will then have Intranet and Internet access, without additional software, to web servers in all PCD devices. Moreover, thanks to the gateway function, this access takes place seamlessly, across several network levels, with Saia®Web-Connect software remaining fully transparent to the user. The connection in the browser is established in the usual way by entering the URL (e.g. www.frontend-PC.com/PCD-controller/web-page.html). It is also possible to store large files, such as pictures or even overview pages from the frontend PC, as a way of reducing the load on PCD controller memory and of optimizing download times. If necessary, an OPC server or Scada system can also be operated on the frontend PC to complement the web application.



Practical possibilities applying S-Web

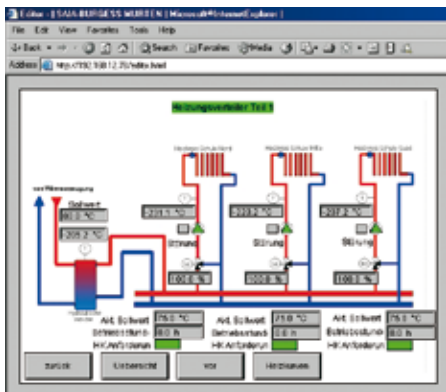
Web-based control and service concept for a warehouse stocking system using Saia® S-Web

The S-Web concept is ideally suited to the implementation of a low-cost, web-based control concept for commissioning, operating and servicing machines and equipment. The diverse capabilities are represented with the help of a stocking system. The example shows a stocking system comprising three individual systems, each controlled by a PCD3 controller with integral PCD.Web-Server. Operation is either local, using Saia® Web-Panels, or remote, using a standard Intranet or Internet browser.



Local or remote control

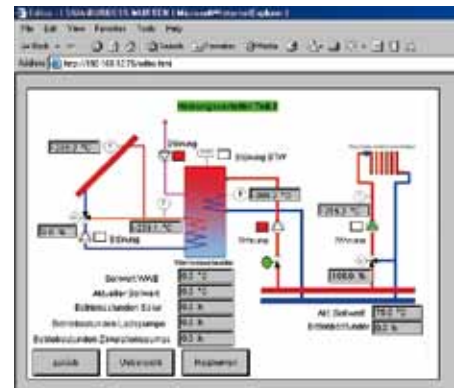
Regardless of whether control is local or remote, the user always encounters the same user interface with the same current data from decentralized PCD.Web-Servers. Decentralizing data and functions reduces the costs of application creation, administration and support.



Save costs by creation web pages simply and efficiently with Saia® S-Web-Editor

The web pages shown here are Java-based and can be produced with the Saia® S-Web-Editor. The objects displayed can be drawn and ani-

mated very easily in this editor. Parameters for equipment and systems are animated and displayed with the help of Java applets in the browser in auto-refresh mode. The equipment parameters necessary for animation are transferred directly from the PLC user program by the PG5 resource manager. Duplicate entries are thereby avoided and costly project planning time is saved. If the Saia® S-Web-Editor's available functions are not enough, specific, personal Java applets can be programmed and employed by the user.



In the same way, personal HTML pages constructed with a standard HTML editor (e.g. Frontpage) can also be used in combination with Saia® S-Web-Editor projects. Help pages, equipment/system descriptions and spare parts lists are mainly generated as standard HTML pages and then called from the Saia® S-Web-Editor. In the Saia® S-Web-Editor, system images and photographs that already exist in GIF format can be used and animated. It is also possible to produce user interfaces in many languages. Links to other web servers (e.g. information and support servers on Internet) can be called directly from the Saia® S-Web-Editor application. Via the browser PC, e-mails can be sent to the relevant service department. Service personnel have direct access via the Internet connection to the web server, enabling them to analyse problems quickly and take action. These capabilities reduce downtime and increase system availability.

4 Management system

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Profile and application range of Saia® Visi.Plus

The Visi.Plus management system is successfully used in a very wide range of areas:



Building technology

The comfort and satisfaction of building users are achieved with reliable regulation of room climate and lighting or shade control systems. Nowadays, building management systems have become indispensable for display, operation, fine-tuning and alarm identification within building systems.

All facilities controlled and regulated with Saia automation components can easily be locked onto the Saia®Visi.Plus management system. Regardless of whether they are typical heating, ventilation, air-conditioning, sanitary or electrical applications or access control systems, connection is possible either via standard RS485 ports or even across direct Ethernet network links.

Typical application areas include:

- Building control
- Monitoring and security systems
- Monitoring of production halls
- Integration of access control systems
- Monitoring, protocoling and optimisation
- etc.

Power engineering

Liberalization and deregulation of energy markets and the definition of targets for climate protection have resulted in a clear trend towards decentralized power supply systems. This tendency includes small, economically competitive units that are highly efficient as local energy providers for residential properties and commercial or industrial buildings.

The broad market requirements of control engineering to the management level are covered with flexibility, innovation and speed. This is exemplified by commitment in the area of fuel cell heaters.

Other application areas include:

- Water turbines
- Wind power generators
- Combined heat and power plants

in the infrastructure automation field



Traffic engineering

Rising personal mobility and constantly increasing freight transport call for high capacity traffic infrastructure. Whether road, rail or waterway, the emphasis everywhere is on the requirement for high levels of system availability and security. For years, automation systems from Saia-Burgess have been used in road and rail tunnels. At the same time, Saia®Visi.Plus, as an efficient management tool, has decisively ensured reliable, economic operation.

Typical application areas include:

- tunnel ventilation
- lighting
- traffic regulation
- fire prevention
- energy optimization
- integration of tunnel systems
- escape route control

Water engineering

There are a variety of ways to optimize water systems with state-of-the-art control and regulation technology. For years, Saia-Burgess Controls has supplied products for this field of application and has, with its innovative products and concepts, ensured the integration of individual processes within overall supply engineering. In water engineering as in other areas, global solutions require intelligent management systems with a modular structure.

Typical application areas include:

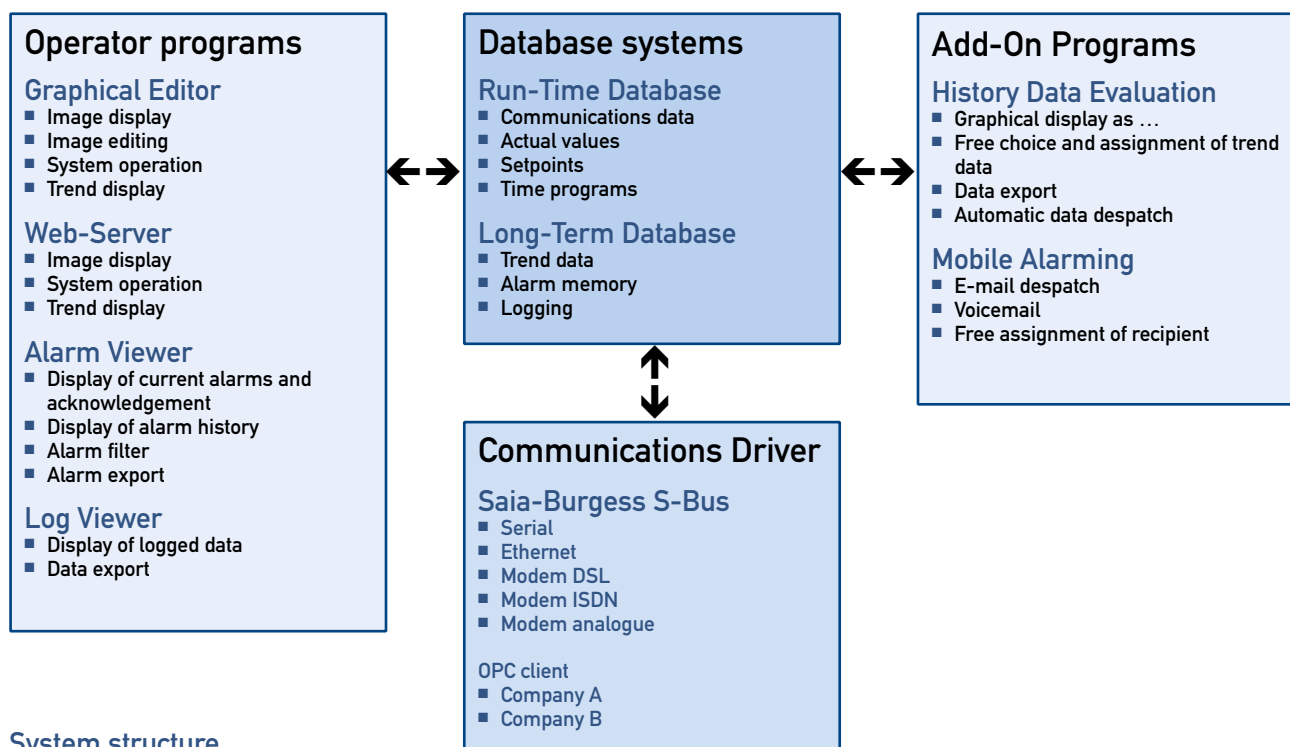
- Supply of drinking and service water
- Sewage engineering
- Industrial water systems
- General water regulation
- Water power

4.1 Management system | Saia®Visi.Plus

Software package for the visualization and solution of management system tasks

Main characteristics of Saia®Visi.Plus

- Flexible application range, from building technology to process engineering
- Scalable architecture, for price optimization across a broad spectrum of use
- High integration of the automation level, with matching engineering tool
- Prefabricated system objects to optimize engineering times
- Well developed alarm management, including remote alarms
- Reduced commissioning and maintenance costs, due to clear handling
- The integral web server allows all process data to be displayed with a web browser via intranet or internet connections
- No development environment required, therefore entry-level costs are low



System structure

The modular system structure allows systems of any size to be implemented, including distributed systems that associate many individual installations.

Visi.Plus offers complete, interactive visual display, operation and monitoring at an extremely attractive price. The system is expandable and open for different applications. It is also networkable with full data transparency. Visi.Plus makes full use of the operating system's networkability.

By coupling several systems together, computing power can be multiplied. Additional operator stations can be integrated into the overall system at any time.

The architecture used offers clear interfaces. Thus, projects can be implemented reliably and economically.

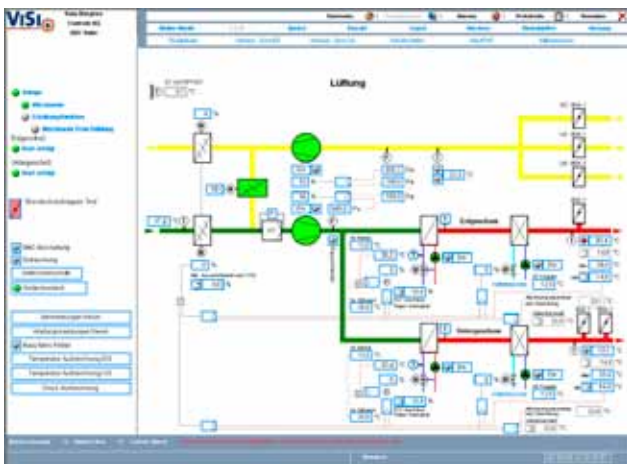
Visi.Plus is based on recognized standards and its main characteristics are the following:

- Distributed client/server processing
- Interface to other Windows applications
- Online help forum
- Scalable, modular architecture
- Multitasking capability within system
- WINDOWS® 2000 / XP / Vista operating system
- Efficient database access
- Object-oriented, graphical user interface
- Network-oriented architecture
- Innovative system function
- Object-oriented data structures
- Integration in PG5 (Saia-Burgess Controls Ltd)
- Efficient project creation

Operating programs

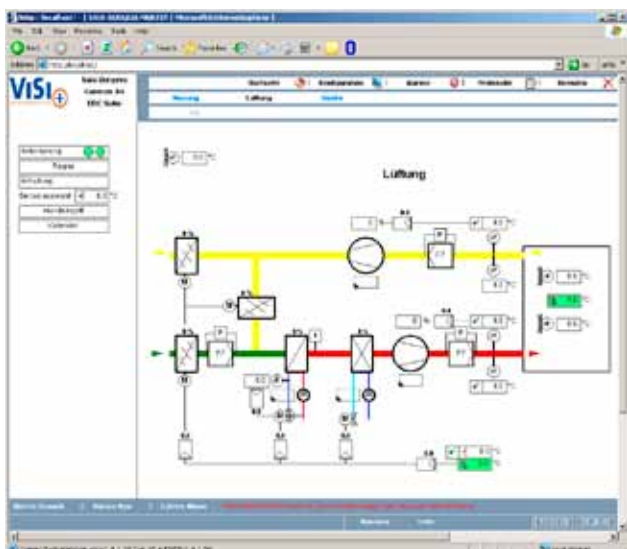
Visual display and graphical editor

All relevant parts of the facility can be suitably represented for the user with the powerful graphical editor. The use of vector and bitmap graphics allows both overviews and detailed information to be displayed. The graphical editor also provides the visual display in runtime mode, this means that it is possible to switch to edit mode at any time to make adjustments or modifications (password protected).



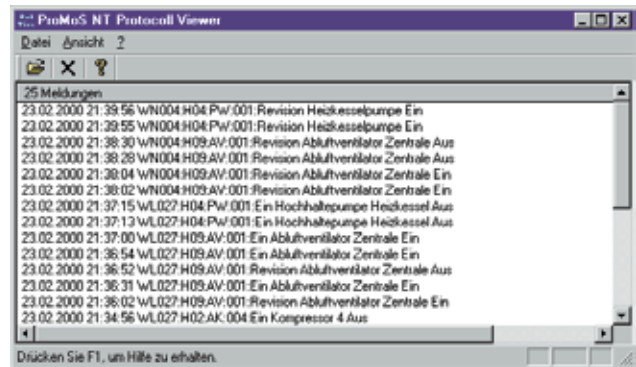
Web server

All created diagram pages are stored automatically as web pages. All generated pages can be displayed and operated using a browser, by activating the Visi.Plus web server.



Logging

This module logs and stores all events. The log viewer, with its integral filter functions, allows all important occurrences to be represented as required in a way that suits the user.



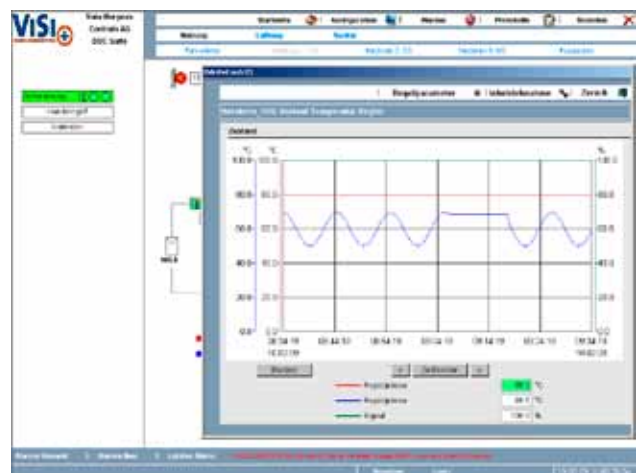
Alarm management

Alarm management is an essential constituent of any building management system. With Saia® Visi.Plus it is possible, by observing threshold values, to display all relevant points of information for the user in a plain-text alarm window. Two separate alarm lists ensure a better overview. The first one gives an overview of all alarms; the second enables all current alarms to be examined.



Trend projection

With this module you can, for example, receive every month a summary energy balance sheet for all consumers in a building. Regardless of whether you have to monitor the consumption of water, electricity or heat, this trend evaluation provides you with the necessary overview to enable suitable measures to be initiated.



Management system | Saia® Visi.Plus:

Data base systems

Data management system (DMS)

The data management system is the central database of the entire Saia® Visi.Plus system. All process data is managed in the DMS and is available at all times. Communication with the individual program parts (e.g. the graphical editor) is event-oriented, via active connections called pipes (inter-task communication).



Number of DMS data points	RAM memory required	PLC/DDC data points
50'000	256 MB	500
100'000	512 MB	1'000
300'000	1 GB	3'000
3'000'000	2 GB	10'000

Historic database system (PDBS)

The Saia® Visi.Plus database system stores and manages history data, alarms and logs. In addition, this module permits data to be exported to other databases, enabling process data to be collected in real time and stored in various databases.

Process engineering tool (PET)

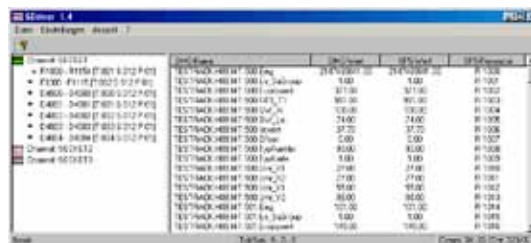
The PET provides a convenient, clear representation of all data from the data management system in tabular form. All data (including communication, alarms, logs, functions, etc.) belonging to a Saia® Visi.Plus project can therefore be recorded and managed in the process engineering tool.



Communication driver

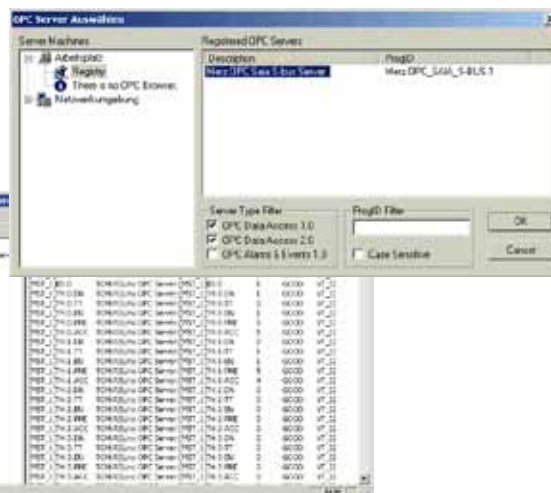
Saia® SDriver

The SDriver is used for communication with Saia automation stations based on the SBus protocol. The driver supports all types of communication, e.g. serial interface, modem, USB and TCP/IP. Since the SDriver is based on Saia's own SCOMM-DLL, all PG5 tools can be used in parallel with the SDriver. The SDriver has a mechanism to optimize data communications via automatically generated telegram packages. Another optimization is achieved by prioritizing telegrams according to categories, such as alarms, actual values, or setpoints.



Visi.Plus as OPC client

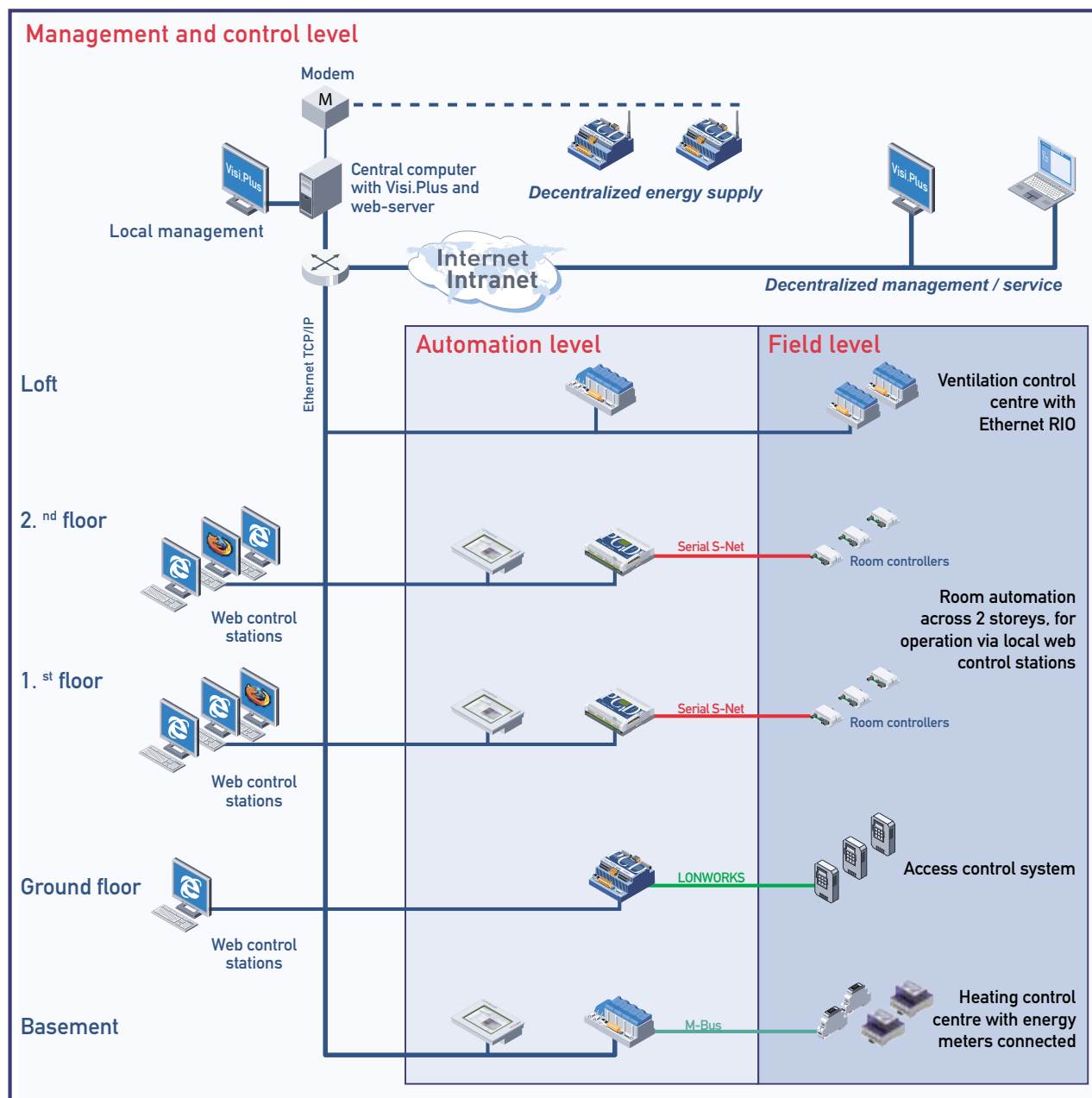
To enable the neutral integration of automation systems even from other manufacturers, Visi.Plus offers an OPC client that reads data from the OPC server of a third-party supplier and automatically enters it in the Visi.Plus DMS database. The user can access it there for further processing in the Graphical Editor, Alarm Manager or for storage in the history database.



Management system | typical example

Management system with Web-Server and local web control stations

The example shows a building automation structure with automation stations for the primary energy and ventilation control centres, including a room automation system. With the Saia®Visi.Plus web server, all users can adjust their own workstations to their personal temperature and lighting needs via a local PC and standard browser. Service and data management are implemented through remote access via standard routers or modems. Alarm management can be local or decentralized and can use email, SMS or a voice module.



Due to the modular structure of Saia®Visi.Plus, the management system can be perfectly adapted to the relevant requirements.

Saia® Visi.Plus | Template library (DDC-Suite)

Visi.Plus library to control and manage a building's technical installations

For speed and comfort in engineering the technical systems of buildings, consistency is required in the automation objects used at the functional, control and management levels.

The two automation libraries «HeaVAC» and «DDC-Suite» form the basis of object structure. These libraries are made up of ready-made function objects called FBoxes (e.g. representing a fan motor or reheater) so that user programs can be created and their parameters set individually.

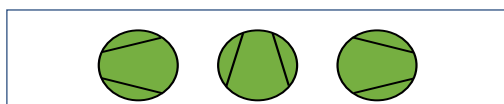
Control objects for the Saia® management system coordinate with the function library and can be used to create control concepts that meet customer requirements.

Consistency among all available objects ensures program quality in installations and minimizes the costs of program writing and service.

To ensure consistency, all graphics and control objects have also been created for the Saia®Visi.Plus building management system. A built-in mechanism allows all objects used in a automation project to be ported to this management system. It dispenses with the laborious assigning of individual resources, a process in which errors can occur. As with the Web-Panel library, here too objects consist of graphical symbols and the appropriate parameter windows

System integrators can use the ready-made automation templates (e.g. for the heating circuit, water heater, boiler and ventilation systems) to build complete installations and adapt them to the customer's wishes very speedily.

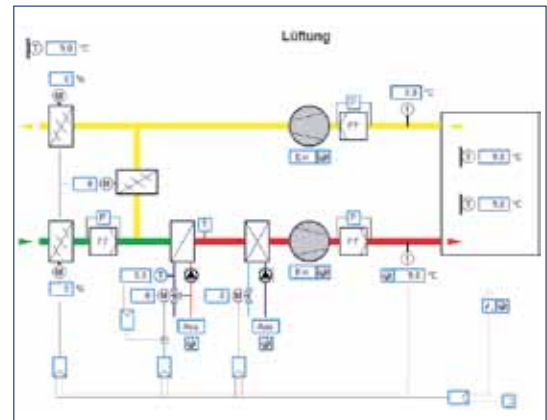
System template



Graphical object: fan



Object control window



Control template Object library

For uniform structuring of the complete project, navigation pages are available that can be used to configure project navigation as a whole at the click of a mouse.



Navigation page

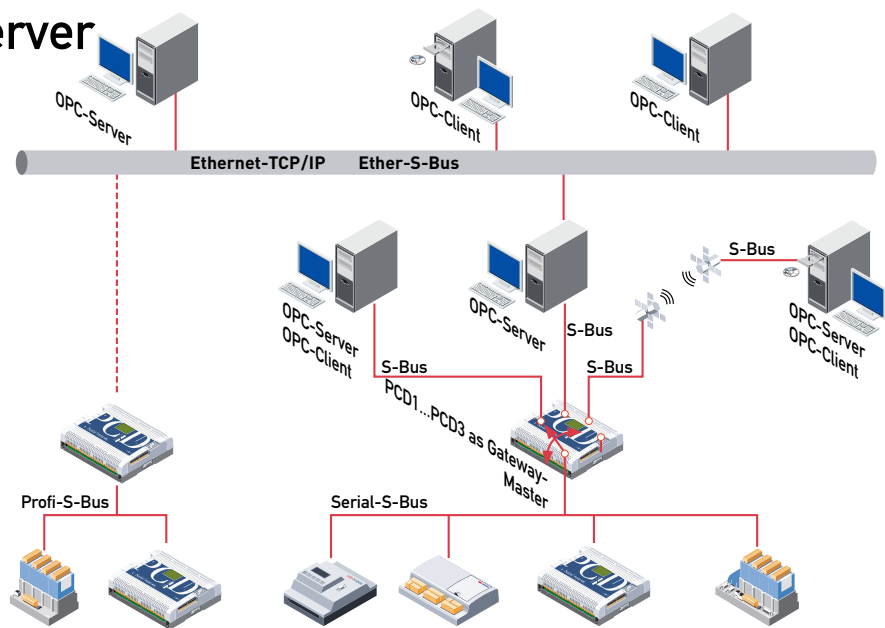
Ordering information Saia® Visi.Plus

Three basic Visi.Plus versions are available to system integrators. Depending on job requirements and the complexity of installations, the appropriate package for the client can be used and extended with add-on modules.

Type	Description
	Visi.Plus – basic package (one licence per project), x = D (German), E (English)
PCD8.S89V00M1	Visi.Plus – demo package (can be downloaded free of charge from www.visiplus.org)
PCD8.S89V04x9	Visi.Plus Light – basic package Data management system, database system, graphical editor, Saia® S-Driver 250 data points, trend and alarm capture, scheduler, ASCII export program and engineering tool
PCD8.S89V05x9	Visi.Plus Medium – basic package Data management system, database system, graphical editor, Saia® S-Driver 1000 data points, trend and alarm capture, scheduler, ASCII export program and engineering tool
PCD8.S89V06x9	Visi.Plus Large – basic package Data management system, database system, graphical editor, Saia® S-Driver 10.000 data points, trend and alarm capture, logging, scheduler, ASCII export program, remote alarms by pager/SMS and engineering tool
PCD8.S89V39M5	Version update (basic package)
	S-Driver options for basic package
PCD8.S89V09M5	Visi.Plus – option for basic package Saia® S-Driver for 10.000 additional data points
PCD8.S89V10M5	Visi.Plus – option for basic package Saia® S-Driver for 25.000 additional data points
PCD8.S89V11M5	Visi.Plus – option for basic package Saia® S-Driver for 50.000 additional data points
PCD8.S89V12M5	Visi.Plus – option for basic package Saia® S-Driver for unlimited data points
	Module options for basic package
PCD8.S89V21M5	GE2 graphical editor runtime system, two additional consoles
PCD8.S89V50M5	GE5 graphical editor runtime system, five additional consoles
PCD8.S89V51M5	GE10 graphical editor runtime system, ten additional consoles
PCD8.S89V52M5	GEUL graphical editor runtime system, unlimited consoles
PCD8.S89V24M5	PRT logging (add-on module for Visi.Plus Light/Medium package)
PCD8.S89V53M5	PChart - trend display tool
PCD8.S89V27M5	MALM remote alarms via pager/SMS/e-mail (add-on module for Visi.Plus Light/Medium package)
PCD8.S89V70M5	MALM Voice – Transmission of voice mail with acknowledgement via DTMF
PCD8.S89V71M5	MALM ESPA 4.4.4 - Remote alarms using the ESPA protocol within TelKo systems (send only)
PCD8.S89V72M5	ESPA 4.4.4 (RCV) - Alarms/messages via ESPA protocol from TelKo systems to Visi.Plus (receive only)
PCD8.S89V73M5	pSMS - Receive and evaluate SMS via GSM modem (software module only)
PCD8.S89V74M5	SNMP driver to monitor network components
PCD8.S89V56M5	Web server 2, for 2 simultaneous connections
PCD8.S89V57M5	Web server 5, for 5 simultaneous connections
PCD8.S89V55M5	Web server 20, for 20 simultaneous connections
	Other drivers
PCD8.S89V46M5	OPC1 client for 250 data points
PCD8.S89V47M5	OPC2 client for 1000 data points
PCD8.S89V48M5	OPC3 client for 10.000 data points

4.2 Saia®OPC-Server

Network topology with Saia® S-Bus



The efficient way of integrating Saia® PCD controllers into any visual display and management system.

OPC-Server ...

- **Standardized OPC interface:** Expertise in vendor-specific protocols is no longer required. This results in significantly lower costs for development, commissioning and maintenance
- **OPC project:** All the OPC data of networked controllers is united in a single project. This produces a clear data structure and simplifies the proper definition of data points
- **Import of PLC variables:** Symbols and data points previously defined for the PLC program with the PG3/PG4 or PG5 programming tools can be carried over and used unmodified by the OPC-Server
- **Communication through all routes:** Communication between the OPC-Server and the Saia®PCD can take place via RS232, RS485, modem, TCP/IP, Profibus, USB or dual-port RAM (PC/104). Several OPC clients can access the OPC-Server simultaneously across several PC ports

... in combination with the Saia® S-Bus

- **OPC-Server/Saia®PCD:** Visual display and management systems with OPC client interfaces can be connected to any Saia®PCD controller. This enables every OPC client, via the OPC-Server, to read data from the PCD or write data to the PCD
- **S-Bus protocol:** This is built into every Saia®PCD. The simple, safe and efficient protocol supports point-to-point, master-slave and master-master communication between the OPC-Server and the controller. The OPC-Server supports all S-Bus protocols, including the new protocols via UDP/IP or Profibus
- **Master-slave network:** Up to 3 external OPC-Servers can simultaneously access all Saia®PCD controllers present in the network and their data
- **PG5 programming tool:** Efficient programming and diagnosis of all Saia®PCD controllers present in the network via the Serial S-Net

Technical data

OPC data access standards supported	1.01a, 2.05a
PC operating systems supported	MS Windows NT 4.0 SP4, MS Windows 95/98 Windows 2000, Windows XP
Protocols supported	S-Bus Data, Parity and Break Mode, S-Bus via UDP/IP (Ether-S-Bus), S-Bus via Profibus (Profi-S-Bus), PGU-Mode, PC104
Controller types supported	All PCD controller types (excluding xx7 Series)
Possible connection types between OPC-Server (PC) and PLC	RS 232/422/485, USB, Modem, Dual-Port-RAM (PCD2.M250), Profi-S-Link Adapter, Ethernet 10/100 Base-T (PCD7.F65..)
PLC data that can be displayed in OPC-Server	Inputs, outputs, flags, registers, data blocks, texts, timers, counters, date-time, display register, firmware version
Data formats for import functions	*.src (PG3, PG4), *.pcd (PG4, PG5), *.sy5 (PG5), *.csv (coma separated values; e. g. from Excel)
Special features	Redundant communication of different channels Internal data for data exchange between OPC Clients

Ordering information

Type	Description
	OPC-Server for the Saia® S-Bus
PCD8.C59001M9	Complete version, for one PC and one application
PCD8.C59001M93	Complete version, for 3 PCs of the same application
PCD8.C59001M95	Complete version, for 5 PCs of the same application
PCD8.C59001M9A	Complete version, for 10 PCs of the same application
PCD8.C59001M9S	Complete version, for an unlimited number of PCs of the same application
PCD8.C59001M9U	Complete version, unlimited number of licences for OEM
PCD8.C59001E1	Demo version, limited to one hour run time

5 Control Panels

Chapter	Page
5.1 Saia® PCD Text-Panels Graphic-Panels	76
5.2 Saia® PCD Web-Panels	77
5.3 Overview tables Saia® PCD Text-Panels	78
5.4 Overview tables Saia® PCD Graphic-Panels	79
5.5 Overview table Saia® PCD MB-Web-Panels	80
5.6 Control and monitoring of foreign systems with Saia® MB-Web-Panel	81
5.7 Overview table Saia® PCD Web-Panels CE/eXP	82
5.8 Drywall installation set for MB-Web-Panels	84
5.9 Drywall installation set for Web-Panels CE/eXP	85



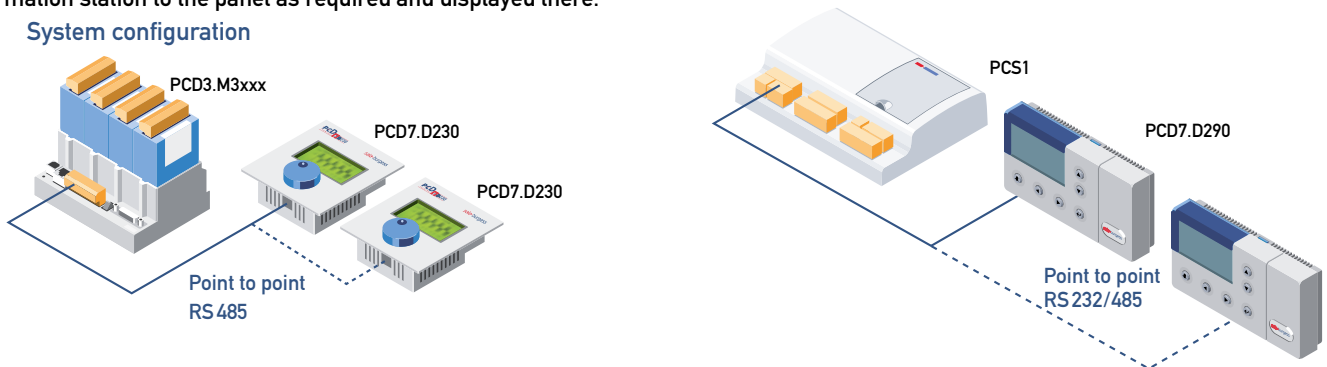
5.1 Control panels

Saia® PCD Text-Panels | Graphic-Panels

Text-Panels

Text information can be displayed on Saia® Text-Panels and, depending on the model, graphical elements may also be displayed. Since these Text-Panels do not have their own memory available, all information to be displayed is transferred from the automation station to the panel as required and displayed there.

System configuration



Properties of the Saia® HMI-Editor*

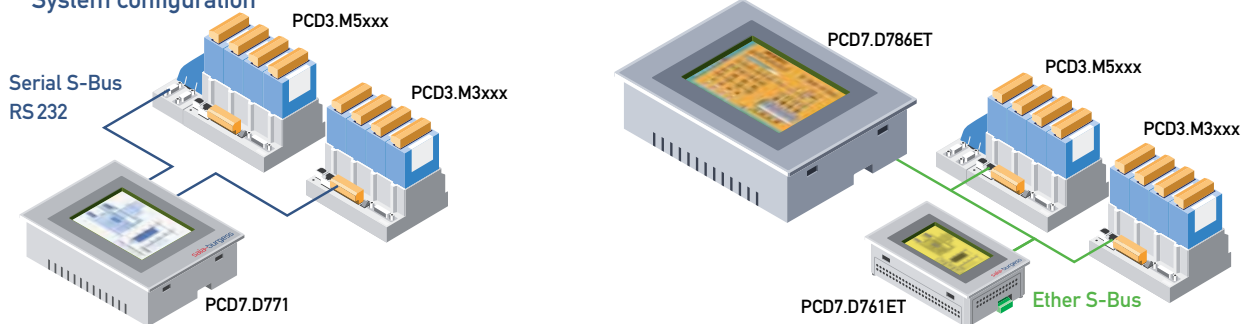
- The Saia® HMI editor is an integral part of the Saia® PG5 Controls-Suite
- Optimum integration within HMI-Editor projects in PG5. Automatic access to PG5 symbols for using PCD variables
- The HMI-Editor is used to build menu structure, define password hierarchy, display and edit variables, call internal FBox parameters and generate an alarm list
- Text-Panel configuration: terminal type, topology, access, serial connection type, Baud rate, handshaking...
- Graphics: easy creation of icons using the ICON-Editor. Icons and trends can be displayed on screen (according to type and topology)
- Project preview with «Play» function
- Administration of 10 password hierarchies
- In bus topology: maximum 6 terminals

* For more details on the HMI-Editor, see Chapter 10.7

Graphics-Panels

The HMI functionality of Graphics-Panels is configured and programmed using an independent software tool. A wide selection of text, graphics and touchscreen terminals is available with ample working memory. The following communications protocols are supported: Serial S-Bus, Ether-S-Bus and MPI.

System configuration



Features of PCD8.D81W programming software*

PCD8.D81WLT includes cable, adapter and manuals. It can be installed in 5 languages, including an online help function.

- Projects can work with up to 8 languages at a time
- Graphics: extremely realistic representation of machine/building/no adjustment of images necessary
- MS®Windows® fonts are supported in the graphics panels
- Images can be compressed before downloading onto the PCD7.D7xx
- The colour (or tone of either grey or blue) of displayed objects can be selected via a PCD variable
- Symbol libraries: predefined symbols simplify programming and save time
- The position of graphical objects can be defined through PLC/field variables. This lets users simulate the movements of machine parts with just one dynamic image
- Trends: real-time and buffered
- Ethernet: it is possible to transfer a project, its firmware, recipes, etc. across the Ethernet 10/100 interface (automatic download mode)
- Import of variables (global symbols) from the PCD programming tool «PG5»

* For more details on the programming software PCD8.D81W, see Technical Information TI P+P26/421

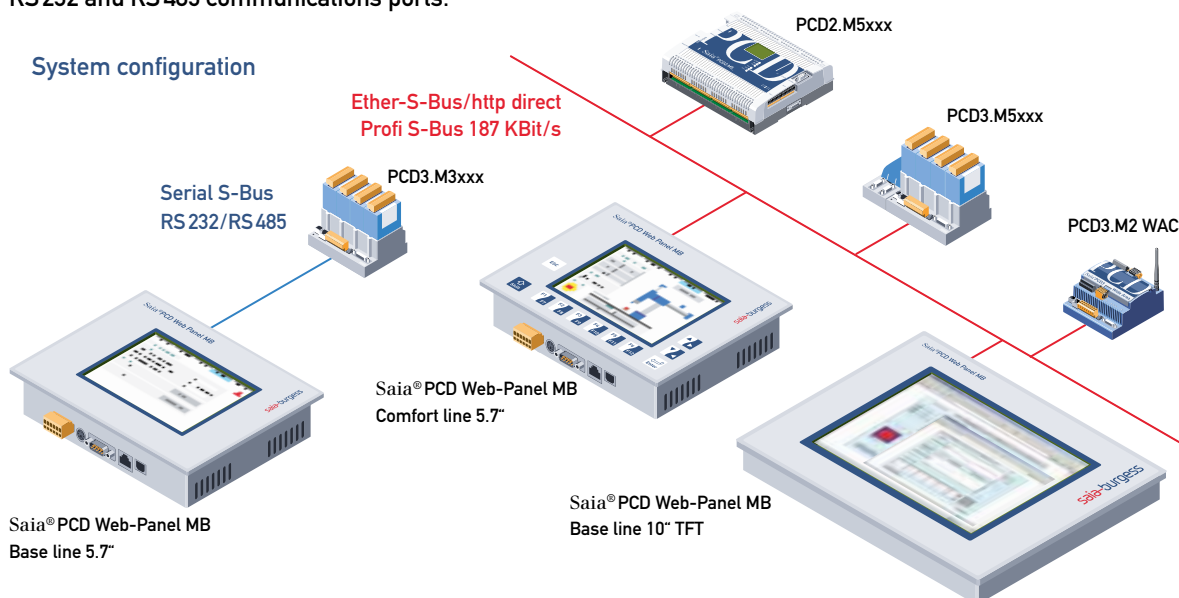
5.2 Control panels

Saia®PCD Web-Panels

Web-Panels MB

The Saia®PCD Web-Panel MB family with micro-browser and touchscreen technology comprises control panels for the display of installation-specific web pages. Web-Panel MB devices have at least one Ethernet port and one USB port, plus RS 232 and RS 485 communications ports.

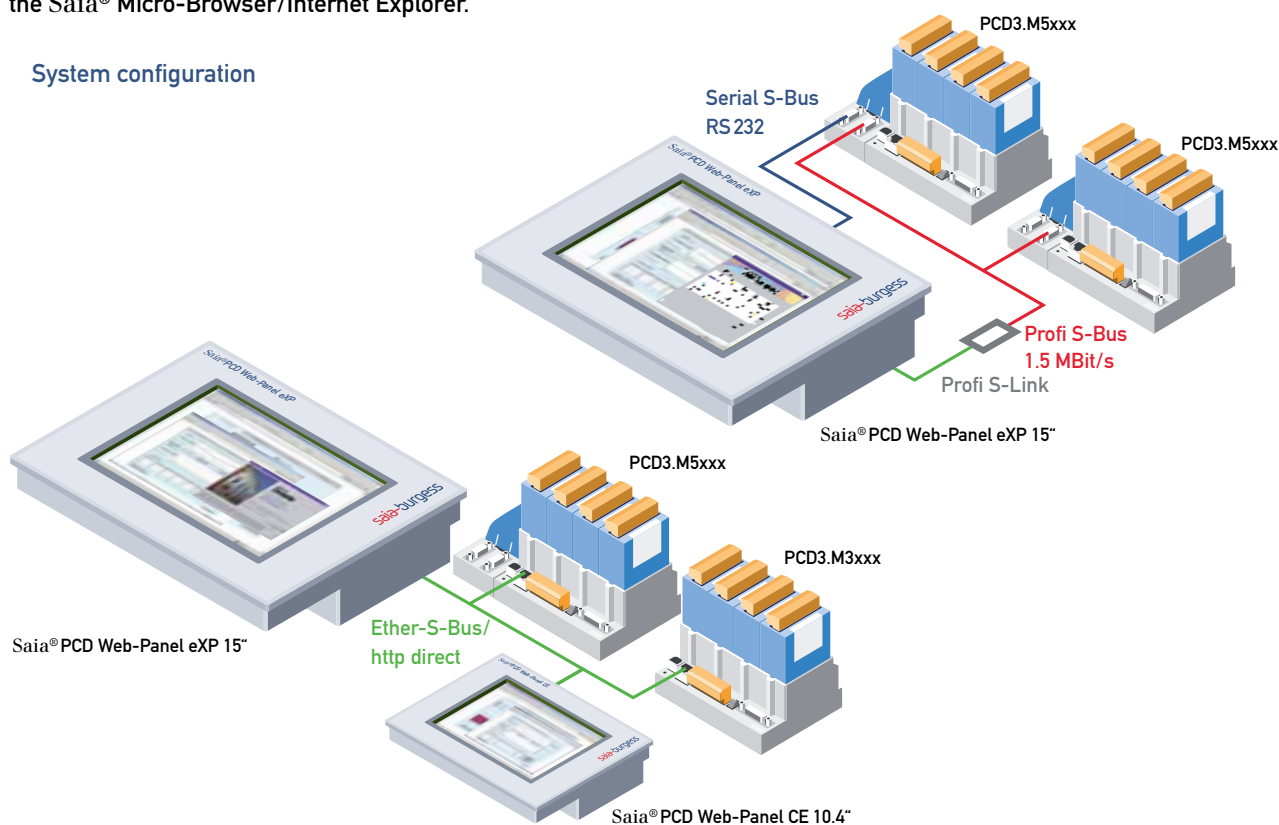
System configuration



Web-Panels CE & eXP

Saia®PCD Web-Panel CE and eXP devices are touchscreen panels for use with micro-browser and standard web-browser technologies. These Web-Panels have at least one Ethernet-TCP/IP port and two USB ports, and require neither fan nor hard disk. In addition, these panels have been preconfigured with the embedded operating system Windows® CE or XP, plus the Saia® Micro-Browser/Internet Explorer.

System configuration



Installation-specific web pages for PCD Web-Panels are programmed via the Saia®Web-Editor. For details see Chapter 10.8

5.3 PLC based terminals



4 lines x 16 charac.



8 lines x 20 characters with graphics capability



	PCD7.D170/ PCD7.D16x	PCD7.D290	PCD7.D230	PCD7.D231	PCD7.D232
Display					
Colours	mono	mono	mono	mono	mono
Display	Text	Graphic	Graphic	Graphic	Graphic
Lines x Characters	4 ZL x 16 c.	8 ZL x 20 c.	8 ZL x 20 c.	8 ZL x 20 c.	8 ZL x 20 c.
Resolution	–	128 x 63 pixel	128 x 63 pixel	128 x 63 pixel	128 x 63 pixel
Backlight	LED on/off	LED on/off	LED on/off	LED on/off	LED on/off
Character size (W x H)	3 x 4,7 mm	2,5 x 3,5 mm	2,5 x 3,5 mm	2,5 x 3,5 mm	2,5 x 3,5 mm
Character set	ASCII + spec. E. G. F. Sca	ASCII (West European)	ASCII (West European)		
Keyboard					
Total Keys	5	6	1 dial knob	10	25
Function keys and keys	5 F-keys ⁴⁾ or 5 keys	-	-	10 F-keys + 5 keys	8 F-keys + num.keypad
Key autorepeat	yes	yes	no	yes	yes
Buzzer	no	yes	yes	yes	yes
LED	no	6 (as key backlight)	no	no	8
Memory (PCD/PCS1)	depending on PLC	depending on PLC	depending on PLC	depending on PLC	depending on PLC
Clock	on PLC	on PLC	on PLC	on PLC	on PLC
Communication-Interface	RS 232	RS 232/485*	RS 232/422/485	RS 232/422/485	RS 232/422/485
Pt-to-pt	yes	yes	yes	yes	yes
		*maximally 6 terminals			
On board interfaces					
NTC temperature sensor	-	0° ... 45° C	-	-	-
Capacity humidity sensor	-	5...95% RH.	-	-	-
Software tool	HMI-Editor ²⁾	HMI-Editor	HMI-Editor	HMI-Editor	HMI-Editor
Using PG5 resources	yes	yes	yes	yes	yes
Graphical display capabilities	no	yes ⁵⁾	yes ¹⁾	yes ¹⁾	yes ¹⁾
Autorepeat function	yes	yes	-	yes ³⁾	yes ³⁾
Function keys commands	yes ⁴⁾	-	-	yes ³⁾	yes ³⁾
LED controls	-	yes	-	-	yes ³⁾
Buzzer controls	-	yes ³⁾	yes ³⁾	yes ³⁾	yes ³⁾
Technical data					
Power supply	19...32 VDC	19...30 VDC/VAC	19...32 VDC	19...32 VDC	19...32 VDC
Front protection	IP 65	IP 40	IP 54	IP 65	IP 65
Dimensions (W x H x D) [mm]	120 x 110 x 45	141.4 x 77 x 28.5	115 x 125 x 45	115 x 125 x 45	115 x 125 x 45
Cut-out (W x H) [mm]	109 x 99	wall mounting	99 x 109	99 x 109	99 x 109

¹⁾ with RS 232 RTS/CTS, XON/XOFF reduced, RS 422 XON/XOFF reduced

²⁾ only with "shift key" setup mode»

³⁾ not with FTP mode (RS 485)

⁴⁾ function keys are not supported by the HMI-Editor

⁵⁾ icon with RS 232

Display

Colours

Display

Lines x Characters

Resolution

Contrast adjustment

Backlight

Character set

Keyboards

Total Keys

Function keys, customizable

LED

Buzzer

User memory

Project (text+graphic) [bytes]

Recipes/Alarm buffer [bytes]

Memory card for backup

Interfaces

Multi Serial Port
RS 232/422/485/TTY20 mA

Auxiliary Serial Port

LPT Parallel port

Ethernet port

Protocol

Saia® S-Bus 38,4 Kbits/s

Ether-S-Bus 10/100 Mbits/s

MPI

Software tool

Using PG5 resources

Languages on line

Trends

Alarm

Hardware clock

Technical data

Power supply

Front protection)

Dimensions (W x H x D) [mm]

Cut-out (W x H) [mm]

5.4 Proprietary Panels

1 System Solutions

2 Communication

3 Web-based automation

4 Management system

5 Control panels

6 Automation systems

7 Remote data points

8 Room automation

9 Switch cabinet components

10 Software



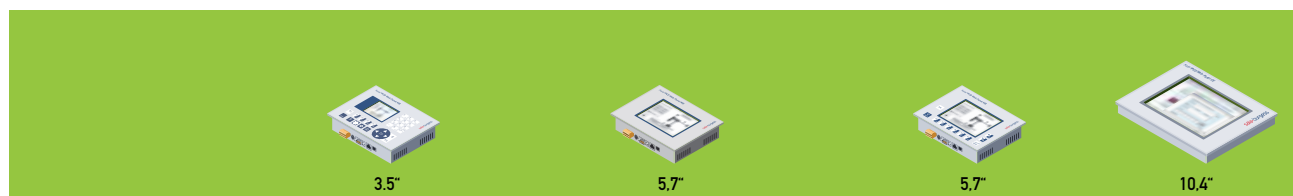
PCD7.D700/D710	PCD7.D740	PCD7. D761/D761ET	PCD7. D771/D771ET	PCD7. D763/D763ET	PCD7. D786/D786ET	PCD7. D787/D787ET
mono	mono	4 tons grey	4 tons blue	16 colours	256 colours	256 colours
Text	5.5" STN	4" STN	5.7" STN	5.7" STN	10.4" TFT	12.1" TFT
4 Zl. x 20 Zch.	–	–	–	–	–	–
–	240 x 128	240 x 128	QVGA 320 x 240	QVGA 320 x 240	VGA 640 x 480	SVGA 800 x 600
Trimmer	Software	Software	Software	Software	Software	Software
LED on/off	CCFL on/off	LED on/off	CCFL on/off	CCFL on/off	CCFL on/off	CCFL on/off
ASCII, Katakana	Prog fonts/TTF Wind.	Prog fonts/TTF Wind.	Prog fonts/TTF Wind.	Prog fonts/TTF Wind.	Prog fonts/TTF Wind.	Prog fonts/TTF Wind..
25/36	46	Touch screen	Touch screen	Touch screen	Touch screen	Touch screen
10/12	21	–	–	–	–	–
7/30	30	–	–	–	–	–
yes	yes	yes	yes	yes	yes	yes
256/320 K	192 K + 384 K	640 K	640 K	960 K	2432 K	960 K + 6 M
–/32 K/8 K RAM ¹⁾	128 K/8 K RAM	16 K/8 K Flash	16 K/- Flash	32 K/8 K Flash	128 K/8 K Flash	128 K/8 K Flash
–	4 M	–	–	–	8 M	8 M
ja	ja	ja/–	ja/–	ja/–	ja	ja
–/RS 232 (9 pin)	–/RS 232/RS 485 (15 pin)	–/RS 232 (8 pin)	–/RS 232 (8 pin)	RS 232 (8 pin)	RS 232/RS 485 (15 pin)	RS 232/RS 485 (15 pin)
–	–	–	–	–	Centronics	Centronics
–	–	–/1 x RJ 45 (ET)	–/1 x RJ 45 (ET)	–/1 x RJ 45 (ET)	–/1 x RJ 45 (ET)	–/1 x RJ 45 (ET)
yes	yes	yes	yes	yes	yes	yes
no	no	–/yes	–/yes	–/yes	–/yes	–/yes
yes	yes	yes	yes	yes	yes	yes
PCD8.D81W	PCD8.D81W	PCD8.D81W	PCD8.D81W	PCD8.D81W	PCD8.D81W	PCD8.D81W
yes	yes	yes	yes	yes	yes	yes
6–8	8	4	4	8	8	8
no	yes	no	no	no	yes	yes
no/yes	yes	yes	no	yes	yes	yes
no/yes battery	yes battery	yes supercap	no	yes supercap	yes supercap	yes supercap
18...32 VDC	18...32 VDC	18...32 VDC	18...32 VDC	18...32 VDC	18...32 VDC	18...32 VDC
IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65
accord. to models	252 x 196 x 60	166 x 100 x 39.6	210 x 158 x 54	210 x 158 x 54	336.3 x 256 x 44	336.3 x 256 x 44
accord. to models	232 x 178	157 x 91	198 x 148	198 x 148	314 x 240	314 x 240

¹⁾ with battery

Ordering information | Accessories

Type	Description
4 507 481 50	Buffer battery for PCD7.D71 to ..D72 terminals (lithium 3.6 V for RAM and clock)
4 507 481 70	Lithium battery for PCD processor unit and PCD7.D73 to ..D78 terminals (RENATA button battery, type CR 2032)

5.5 Web-Panels MB



	PCD7.D435 TLCF	PCD7.D457			PCD7.D457		PCD7.D410 VTCF
		BTCF ⁵⁾	STCF ⁵⁾	VTCF ^{5) 6)}	SMCF ⁵⁾	VMCF ^{5) 6)}	
Display							
Screen: colours	256 colours	16 levels of grey	256	65 536	256	65 536	65 536
Display	3.5" TFT	5.7" STN		5.7" TFT	5.7" STN	5.7" TFT	10.4" TFT
Resolution/Pixel	QVGA 320 × 240	QVGA 320 × 240		VGA 640 × 480	QVGA 320 × 240	VGA 640 × 480	VGA 640 × 480
Touch screen	—	Resistive touch screen			Resistive touch screen		Resistive touch screen
Contrast adjustment	yes	yes			yes		yes
Backlight	LED	LED	CCFL	LED	CCFL	LED	CCFL
Fkeys, keyboard	12 Fkeys + keyboard	—			2 × 6 Fkeys		—
Processor	Coldfire	Coldfire			Coldfire		Coldfire
RAM	—	—			—		—
CFC card slot internal	—	—			—		—
CFC card slot external	—	—			—		—
Memory for local web server	4 MB Flash	4 MB Flash			4 MB Flash		4 MB Flash
SD card interface	Option	Option			Option		Option
Interfaces							
Ethernet 10/100 M	× 1 RJ45 ¹⁾	× 1 RJ45 ¹⁾			× 1 RJ45 ¹⁾		× 1 RJ45 ¹⁾
USB 12 M	× 1 client	× 1 client			× 1 client		× 1 client
Serial (D-Sub9)	× 1 RS232 ³⁾	× 1 RS232 ²⁾			× 1 RS232 ³⁾		× 1 RS232 ³⁾
Serial	× 1 RS485 ⁴⁾	× 1 RS485 ⁴⁾			× 1 RS485 ⁴⁾		× 1 RS485 ⁴⁾
Keyboard/barcode	× 1 PS/2	—			× 1 PS/2		× 1 PS/2
Connector to external monitor	—	—			—		—
Operating System	Saia® NT	Saia® NT			Saia® NT		Saia® NT
Browser	Saia® Micro-Browser	Saia® Micro-Browser			Saia® Micro-Browser		Saia® Micro-Browser
Software tools							
.Net	—	—			—		—
Java Virtual Engine	—	—			—		—
Server							
	Web-Server (HTTP D) FTP-Server	Web-Server (HTTP D) FTP-Server			Web-Server (HTTP D) FTP-Server		Web-Server (HTTP D) FTP-Server
Software tool							
Saia® Net	—	—			—		—
Graphic editor	Saia® Web-Editor*	Saia® Web-Editor*			Saia® Web-Editor*		Saia® Web-Editor*
* using PG5 resources	yes	yes			yes		yes
Technical data							
Supply voltage	18...32 Vdc	18...32 Vdc			18...32 Vdc		18...32 Vdc
Protection class (front)	IP 65	IP 65			IP 65		IP 65
Dimensions (W × H × D) mm	202 × 156 × 42	202 × 156 × 42			202 × 156 × 42		280 × 220 × 56
Cut-out (W × H) mm	189 × 142	189 × 142			189 × 142		262 × 202
Accessories							
Kits for In-Wall mounting		PCD7.D457-IWS					PCD7.D410-IWS ⁴⁾
Kits for On-Wall mounting		PCD7.D457-OWS ⁴⁾					PCD7.D410-OWS ⁴⁾

¹⁾ http direct/Ether-S-Bus

²⁾ Serial-S-Bus

³⁾ Serial-S-Bus and printer

⁴⁾ Serial-S-Bus, Profi-S-Bus (187.5 KB) in preparation

⁵⁾ available without Saia® Logo

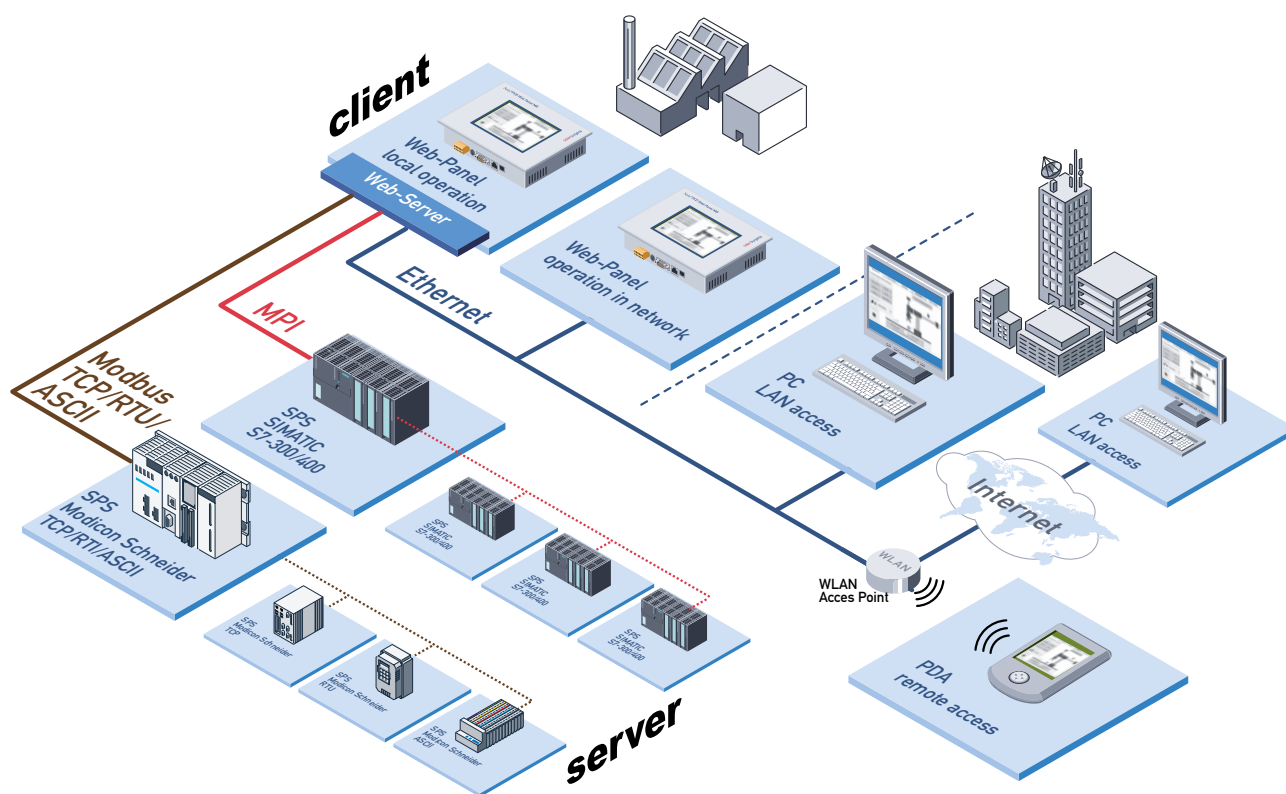
⁶⁾ in preparation

Ordering information | Accessories

Type	Description
4 109 4881 0	Mounting set (4 pieces) for Web-Panel with embedded Micro-Browser
4 405 4933 0	Plug-in I/O spring terminal block, 6-pole to 2.5 mm ² , labelled 1 to 6, for Web-Panel with embedded Micro-Browser or for PCS1 (X4 connector)

5.6 Control and monitoring of foreign systems with Saia® MB-Web-Panel

MPI and Modbus DataProxy with Microbrowser Web Panels



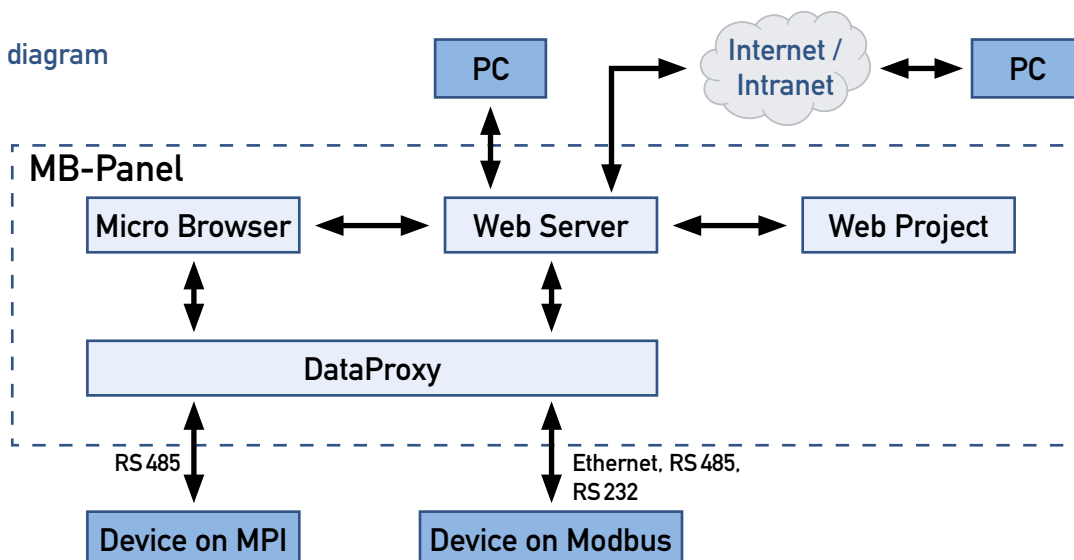
More than just a control panel: Saia®PCD MB Web-Panels for integrating programmable logic controllers from foreign manufacturers within web environments.

PCD7.D457Vxxx and PCD7.D410Vxxx MB Panels build bridges between conventional SIMATIC-S7 300/400 controllers from Siemens or conventional Modicon controllers from Schneider and web technology. Connection to the controller is via the MPI protocol (187.5 kBytes/s) or Modbus protocol (TCP (UDP)/ RTU or ASCII).

Customer benefit:

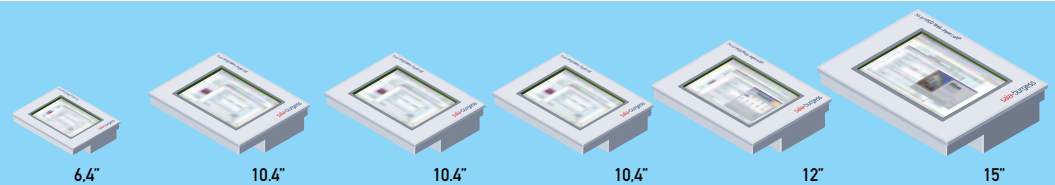
- Easy upgrading of existing foreign systems with Saia® web technology
- Collection and forwarding of data from existing plant
- Remote access to existing plant via Saia® web technology
- Easy engineering due to support for MPI and Modbus in the Saia® Web-Editor

Block diagram



5.7 Web-Panels

CE



	PCD7.D5064TX010	PCD7.D5100TX010	PCD7.D5100TM010	PCD7.D5100TL010	PCD7.D5120TL010	PCD7.D5150TL010
Display						
Screen: colours	65 K	65 K	16,7 Mio	16,7 Mio	16,7 Mio	16,7 Mio
Display	6.4" TFT	10.4" TFT	10.4" TFT	10.4" TFT	12" TFT	15" TFT
Resolution/Pixel	VGA 640 × 480	VGA 640 × 480	VGA 640 × 480	SVGA 800 × 600	SVGA 800 × 600	XGA 1024 × 768
Touch screen	Resistive touch screen	Resistive touch screen	Resistive touch screen	Resistive touch screen	Resistive touch screen	Resistive touch screen
Contrast adjustment	yes	yes	yes	yes	yes	yes
Backlight	CCFL	CCFL	CCFL	CCFL	CCFL	CCFL
Fkeys, keyboard	—	—	—	—	—	—
Processor	Xscale 400 MHz	Xscale 400 MHz	Intel CELERON-M 1.3 GHz	AMD Geode LX 800 533 MHz	AMD Geode LX 800 533 MHz	AMD Geode LX 800 533 MHz
RAM	64 MB	64 MB	256 MB	256 MB	256 MB	256 MB
CFC card slot internal	—	—	—	× 1	× 1	× 1
CFC card slot external	× 1 with 128 MB Flash	× 1 with 128 MB Flash	× 1 with 128 MB Flash	× 1 with 128 MB Flash	× 1 with 128 MB Flash	× 1 with 128 MB Flash
Interfaces						
Ethernet 10/100 M	× 1 RJ45	× 1 RJ45	× 1 RJ45	× 2 RJ45	× 2 RJ45	× 2 RJ45
USB 12 M	× 2 Host 1.1	× 2 Host 1.1	× 4 Host 2.0	× 2 host 2.0	× 2 host 2.0	× 2 host 2.0
Serial (D-Sub9)	× 1 RS232	× 1 RS232	× 3 RS232	× 1 RS232	× 1 RS232	× 1 RS232
Serial	—	—	—	—	—	—
Keyboard/barcode	—	—	—	× 1 Mini DIN PS/2	× 1 Mini DIN PS/2	× 1 Mini DIN PS/2
Connector to external monitor	—	—	—	× 1 VGA	× 1 VGA	× 1 VGA
Operating System	Windows® CE.NET 5.0	Windows® CE.NET 5.0	Windows® CE.NET 5.0	Windows® CE 6.0	Windows® CE 6.0	Windows® CE 6.0
Browser	Internet Explorer/ Saia® Micro-Browser	Internet Explorer/ Saia® Micro-Browser	Internet Explorer/ Saia® Micro-Browser	Internet Explorer / Saia® Micro-Browser / Applett Viewer	Internet Explorer / Saia® Micro-Browser / Applett Viewer	Internet Explorer / Saia® Micro-Browser / Applett Viewer
Software tools						
.Net	Microsoft.NET Compact Framework	Microsoft.NET Compact Framework	Microsoft.NET Compact Framework	Microsoft.NET Compact Framework	Microsoft.NET Compact Framework	Microsoft.NET Compact Framework
Java Virtual Engine	yes	yes	yes	yes	yes	yes
Server						
	Web-Server (HTTP D/Microsoft) FTP-Server File-Server	Web-Server (HTTP D/Microsoft) FTP-Server File-Server	Web-Server (HTTP D/Microsoft) FTP-Server File-Server	Web-Server FTP-Server File-Server VNC-Server	Web-Server FTP-Server File-Server VNC-Server	Web-Server FTP-Server File-Server VNC-Server
Software tool						
Communication driver	Saia® Web-Connect	Saia® Web-Connect	Saia® Web-Connect	Saia® Web-Connect Saia® Web-HMI	Saia® Web-Connect Saia® Web-HMI	Saia® Web-Connect Saia® Web-HMI
Graphic editor	Saia® Web-Editor	Saia® Web-Editor	Saia® Web-Editor	Saia® Web-Editor	Saia® Web-Editor	Saia® Web-Editor
Technical data						
Supply voltage	19...30 VDC	19...30 VDC	19...30 VDC	19...30 VDC	19...30 VDC	19...30 VDC
Protection class (front)	IP 65/ IP 20	IP 65/ IP 20	IP 65/ IP 20	IP 65/ IP 20	IP 65/ IP 20	IP 65/ IP 20
Dimensions (W × H × D) mm	215 × 160 × 68	318 × 244 × 68	318 × 244 × 95.6	318 × 244 × 81	364 × 296 × 74	452 × 357 × 86
Cut-out (W × H) mm	197 × 142	303 × 229	303 × 229	303 × 229	344 × 276	429 × 334
Accessories						
Kits for In-Wall mounting				see page 85	see page 85	see page 85
Technical Information						
Flyer				P+P26/497	P+P26/497	P+P26/497

eXP



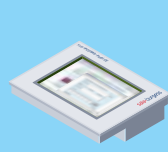
10.4"



12"



15"



10.4"



12"



15"

PCD7.D6100TM010 PCD7.D6100TM020	PCD7.D6120TM010 PCD7.D6120TM020	PCD7.D6150TM010 PCD7.D6150TM020	PCD7.D6100TL010	PCD7.D6120TL010	PCD7.D6150TL010
16.7 Mio	16.7 Mio	16.7 Mio	16.7 Mio	16.7 Mio	16.7 Mio
10.4" TFT	12" TFT	15" TFT	10.4" TFT	12" TFT	15" TFT
SVGA 800 × 600	SVGA 800 × 600	XGA 1024 × 768	SVGA 800 × 600	SVGA 800 × 600	XGA 1024 × 768
Resistive touch screen	Resistive touch screen	Resistive touch screen	Resistive touch screen	Resistive touch screen	Resistive touch screen
yes	yes	yes	yes	yes	yes
CCFL	CCFL	CCFL	CCFL	CCFL	CCFL
—	—	—	—	—	—
Intel CELERON-M 1.3 GHz	Intel CELERON-M 1.3 GHz	Intel CELERON-M 1.3 GHz	AMD Geode LX 800 533 MHz	AMD Geode LX 800 533 MHz	AMD Geode LX 800 533 MHz
512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
× 1	× 1	× 1	× 1	× 1	× 1
× 1 with 1 GB Flash (at ...M010) × 1 with 2 GB Flash (at ...M020)	× 1 with 1 GB Flash (at ...M010) × 1 with 2 GB Flash (at ...M020)	× 1 with 1 GB Flash (at ...M010) × 1 with 2 GB Flash (at ...M020)	× 1 with 2 GB Flash	× 1 with 2 GB Flash	× 1 with 2 GB Flash
—	—	—	—	—	—
× 2 RJ45	× 2 RJ45	× 1 RJ45	× 2 RJ45	× 2 RJ45	× 2 RJ45
× 4 Host 2.0	× 4 Host 2.0	× 4 Host 2.0	× 2 host 2.0	× 2 host 2.0	× 2 host 2.0
× 3 RS232	× 3 RS232	× 3 RS232	× 1 RS232	× 1 RS232	× 1 RS232
—	—	—	—	—	—
× 2 PS/2	× 2 PS/2	—	× 1 Mini DIN PS/2	× 1 Mini DIN PS/2	× 1 Mini DIN PS/2
× 1 VGA	× 1 VGA	—	× 1 VGA	× 1 VGA	× 1 VGA
Windows®XP embedded	Windows®XP embedded	Windows®CE.NET 5.0	Windows®XP embedded	Windows®XP embedded	Windows®XP embedded
Internet Explorer	Internet Explorer	Internet Explorer	Internet Explorer	Internet Explorer	Internet Explorer
Microsoft.NET Framework	Microsoft.NET Framework	Microsoft.NET Framework	Microsoft.NET Framework	Microsoft.NET Framework	Microsoft.NET Framework
Sun Java 2 Platform Standard Edition	Sun Java 2 Platform Standard Edition	Sun Java 2 Platform Standard Edition	Sun Microsystems	Sun Microsystems	Sun Microsystems
Web-Server (IIS/Microsoft) FTP-Server File-Server	Web-Server (IIS/Microsoft) FTP-Server File-Server	Web-Server (IIS/Microsoft) FTP-Server File-Server	Web-Server (IIS/Microsoft) FTP-Server File-Server VNC-Server	Web-Server (IIS/Microsoft) FTP-Server File-Server VNC-Server	Web-Server (IIS/Microsoft) FTP-Server File-Server VNC-Server
Saia®Web-Connect Saia®Web-HMI Saia®Web-Editor	Saia®Web-Connect Saia®Web-HMI Saia®Web-Editor	Saia®Web-Connect Saia®Web-HMI Saia®Web-Editor	Saia®Web-Connect Saia®Web-HMI Saia®Web-Editor	Saia®Web-Connect Saia®Web-HMI Saia®Web-Editor	Saia®Web-Connect Saia®Web-HMI Saia®Web-Editor
19...30 Vdc	19...30 Vdc	19...30 Vdc	19...30 Vdc	19...30 Vdc	19...30 Vdc
IP 65/ IP 20	IP 65/ IP 20	IP 65/ IP 20	IP 65/ IP 20	IP 65/ IP 20	IP 65/ IP 20
318 × 224 × 95.6	364 × 296 × 88.5	452 × 357 × 86	318 × 244 × 81	364 × 296 × 74	452 × 357 × 86
303 × 229	344 × 276	429 × 334	303 × 229	344 × 276	429 × 334
—	—	—	see page 85	see page 85	see page 85
—	—	—	P+P26/505	P+P26/505	P+P26/505

5.8 Drywall installation set



Drywall installation set

Our micro-browsers are not just for mounting in the control cabinet: they also look very good in the office or living-room, or mounted on a wall.

Mounting sets for both flush and on-wall installation are now available as an accessory for the 5.7" panel (in preparation for the 10.4"). As a result, this innovative technology is not just reserved to the control cabinet for the machine operator, but will also make a contribution to more comfort in the office or at home too.

Dimensions

Front (W × H)	275 × 230 mm
Opening: (W × H)	235 × 210 mm (for cavity wall)

Ordering code

Type	Description	Weight
PCD7.D457-IWS	in-wall mounting kit (solid wall) for Saia® MB Panels 5.7"	1250 gr
4 121 49100	Additional fixing set for Cavity (hollow) walls	100 gr

26/863	Manual in-wall kit for 5.7 MB panels
--------	--------------------------------------



Flush mounting frame



Front cover

5.9 Wall mounting set | for Windows CE and eXP based Web-Panels



Web-Panels from the LX800 family with Windows CE and eXP (series PCD7.D51xxTL010 and PCD7.D61xxTL010) may also be obtained in the form of a practical wall mounting set. A total of 6 types are therefore available in display sizes from 10" to 15" – optionally with Windows CE or eXP – for easy mounting within buildings. The set is equally suitable for use with either drywall or solid wall construction. The Web-Panels' technical specification matches that of standard versions PCD7.D51xxTL010 and PCD7.D61xxTL010; only the internal slot for an added CFC compact-flash card has been omitted. Mechanical dimensions have been adapted to enable optimum installation within buildings.

A wall mounting set consists of three components:

■ Wall mounting box

- Metal box with cable entries
- For drywall and solid wall construction
- For 10", 12" and 15" Web-Panels

10" Q.LIWBox-100M

12" Q.LIWBox-120M

15" Q.LIWBox-150M



■ Open-frame Saia® PCD Web-Panel

- 10", 12" and 15" Web-Panels
- Windows CE and Windows Exp

WinCE 10" PCD7.D5100TLW10

WinCE 12" PCD7.D5120TLW10

WinCE 15" PCD7.D5150TLW10

Win eXP 10" PCD7.D6100TLW10

Win eXP 12" PCD7.D6120TLW10

Win eXP 15" PCD7.D6150TLW10



■ Face frame

- Standard aluminium face frame
- Support for individually designed face frames

Support 10" Q.LIWFrm-100-01

Support 12" Q.LIWFrm-120-01

Support 15" Q.LIWFrm-150-01

Aluminium 10" Q.LIWFrm-100-02

Aluminium 12" Q.LIWFrm-120-02

Aluminium 15" Q.LIWFrm-150-02



Alongside the standard aluminium frame, a basic support is also available with the necessary spring bolts. A wide variety of materials (wood, metal, glass or stone) can be fitted onto it individually to match the building interior.

6 Automation systems: From compact to modular systems

Chapter	Page
6.1 Compact automation system Saia® PCS1	88
6.2 Modular automation systems Saia® PCD1 PCD2	96
6.3 Modular automation systems Saia® PCD2.M5	106
6.4 Modular automation systems Saia® PCD3	116
6.5 Modular automation systems Saia® PCD3.Compact	126
6.6 Modular automation systems Saia® PCD3.WAC	128
6.7 Adapterboard Staefa Integral NRUF/A – NRUE/A	132



6.1 Automation system | PCS1 Compact device series

This compact, freely programmable automation system excels precisely where other compact controllers find their limits. It has a mix of data points designed for the HeaVAC market and outstanding communications capabilities, allowing an almost limitless spectrum of uses.

Extensive functionality in the minimum space

- integral or remote graphics display with jog dial control
- integral manual and coupler level
- compact size: 195 × 150 × 60 mm (W × H × D)
- plug-in spring terminals with cover
- large main memory for history data
- 19, 30 or 44 data points in the base unit, expandable via networks

Custom solution for all areas of application

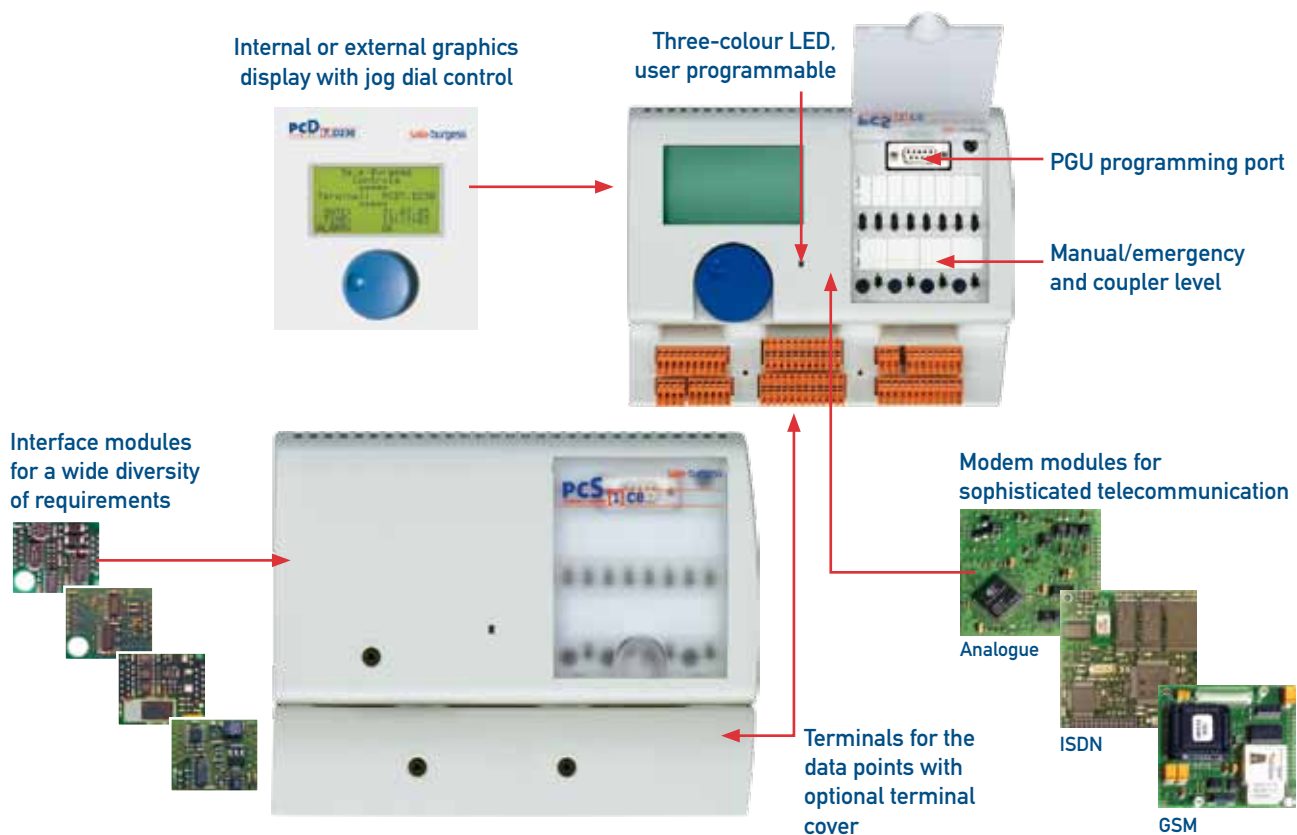
Through its distinctive data point structure, the DDC.Compact is ideally suited for use in:

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

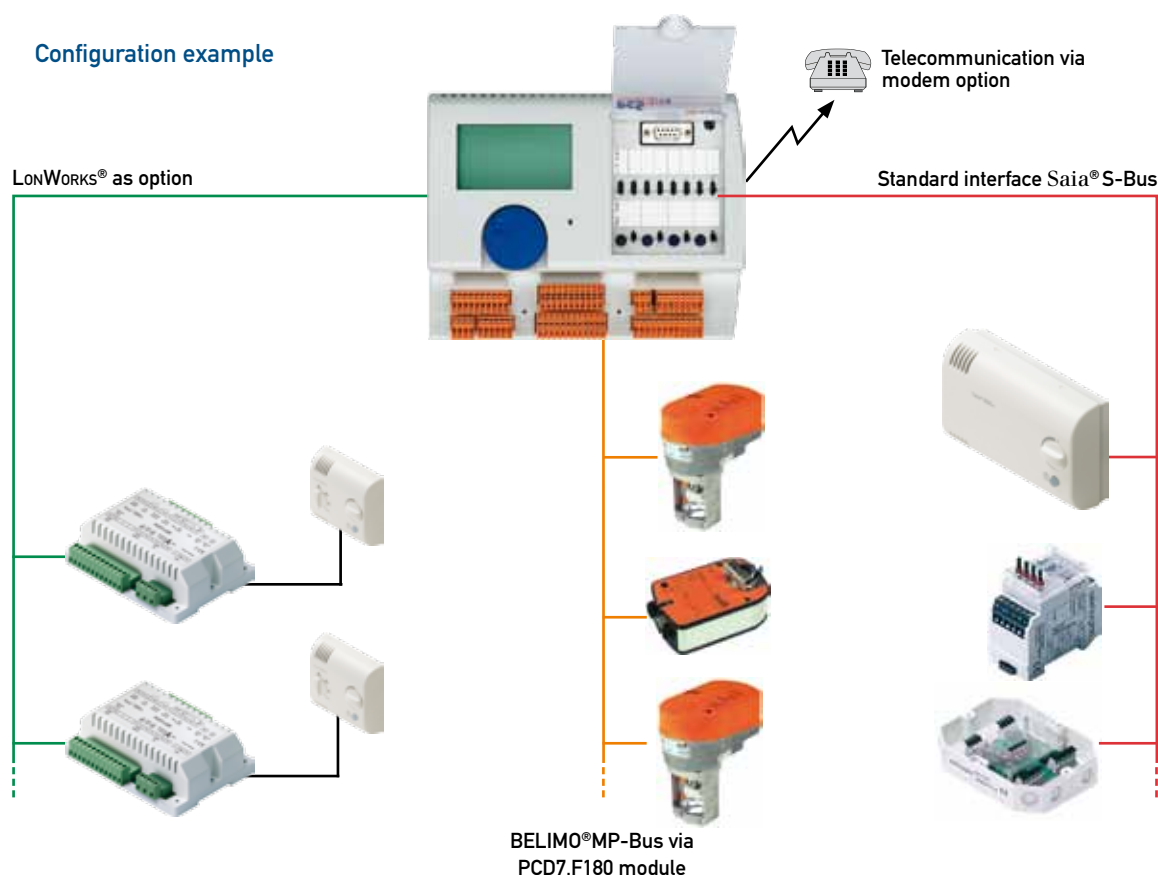
Interfaces make it a great communicator

- Saia® S-Bus (PCD/room control systems or remote data points)
- LONWORKS®
- EIB (European Installation Bus) /Konnex
- MP-BUS (BELIMO® MFT drives)
- M-Bus (remote counter reading)
- Modbus (RTU and ASCII) etc.
- Different networks
- Telecommunication via integrated analogue, ISDN or GSM modem. Functions include telemaintenance, remote diagnosis, SMS error messaging and remote programming

N.B.: The connection of external modems is not possible!



Configuration example



Technical data PCS1

Basic hardware

User memory	1 MByte as flash EPROM and 896 KByte as RAM
Processor	CPU with 32 Bit, μ C 68340 (16 MHz)
Processing time	Bit command 5 μ s, word command 20 μ s
Real-time clock	Time values: s/min/h, week/day of week, month/day of month, year Accuracy: better than 60 s/month
Data protection	Flash RAM > 10years 5...15 days with super-capacitor protection (user memory, real-time clock)
Supply voltage	24 VDC -20/+25% incl. 5% ripples according to EN/IEC 61 131-2
Power consumption	max. 10 W

Number of digital inputs/outputs

	PCS1.C4xx	PCS1.C6xx	PCS1.C8xx
digital inputs, I, 24 VDC, input delay typically 0.2 ms	0	2	3
digital inputs, I, 24 VDC, input delay typically 8 ms	4	4	9
digital inputs/outputs I/O, 24 VDC, input delay typically 8 ms, outputs 0.5 A in range 0...32 V	2	4	4
relay outputs as 'make' contact, 2×2 A/2 \times 4 A/250 VA ¹⁾	4	4	4
relay outputs as changeover switch, 2×2 A/2 \times 4 A/250 VA ¹⁾	0	4	4

¹⁾ With manual control as option

Number of analogue inputs/outputs

analogue inputs Pt/Ni 1000, 2-wire, resolution 10 bitst (= approx. 0.6 °C)	0	0	4
analogue inputs Pt/Ni 1000, 2-wire, resolution 12 bits (= max. 0.15 °C Pt 1000 or max. 0.08 °C Ni 10000)	4	6	8
analogue outputs 0...10 V, resolution 10 bits ²⁾	3	4	4

²⁾ With manual control and potentiometer as option

relay outputs as changeover switch, 2×2 A/2 \times 4 A/250 VA ¹⁾

Number of universal inputs

analogue inputs 0...10 V, resolution 10 bits, alternatively usable as digital inputs	2	2	4
---	---	---	---

Performance overview PCS1



Technical data

PCS1.C42x

PCS1.C62x

PCS1.C82x

PCS1.C88x

	PCS1.C420	PCS1.C421	PCS1.C422	PCS1.C423	PCS1.C620	PCS1.C621	PCS1.C622	PCS1.C623	PCS1.C820	PCS1.C821	PCS1.C822	PCS1.C823	PCS1.C880	PCS1.C881	PCS1.C882	PCS1.C883
Internal graphics display	■	■	-	-	■	■	-	-	■	■	-	-	■	■	-	-
Manual/emergency control	■	-	■	-	■	-	■	-	■	-	■	-	■	-	■	-

Data points

Digital inputs 0.2 ms	0				2				3				3			
Digital inputs 8 ms	4				4				9				9			
Digital inputs/outputs	2				4				4				4			
Relay outputs as 'make' contact	4				4				4				4			
Relay outputs as changeover switch	0				4				4				4			
Universal inputs (0...10 V; 24 V on/off)	2				2				4				4			
Analogue inputs (Pt/Ni 1000, 0.6 °C)	0				0				4				4			
Analogue inputs (Pt/Ni 1000, 0.15 °C)	4				6				8				8			
Analogue outputs (0...10 V)	3				4				4				4			
Total	19				30				44				44			

Data Interfaces

PGU RS 232	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
S-Bus RS 485 M/S	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
RS 232 for EIB/DALI/M-Bus etc.																
RS 422 remote control terminal																
RS 485 S-Bus, EnOcean etc.																
MP-Bus, Belimo																
LONWORKS®	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■	■

Optional via modules PCD7.F1xx

General data

Supply voltage	24 Vdc -20/+25 %															
User memory	1 MByte Flash and 896 KByte RAM															
Real-time clock	yes															
Data protection	Flash	> 10 years														
	RAM	5...15 days														

Ordering information freely programmable PCS1 (not Compact-Easy)

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

Data points	Base unit	PCD7.F1xx	Modem	Software	Mechanical options
19	PCS1.C42x	0 = without	0 = without	0 = PG5	0 = without terminal cover
30	PCS1.C62x	A = ..F110	1 = analogue		1 = with terminal cover
44	PCS1.C8xx	B = ..F120	2 = ISDN-TA		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 RS 422/RS 485 interface, ISDN modem, user programmable with PG5, without terminal cover.

Orders placed must specify the complete code.

Base units with 19 data points

PCS1.C420	with graphics display and manual/emergency control
PCS1.C421	with graphics display
PCS1.C422	with manual/emergency control
PCS1.C423	without display, without manual/emergency control



Base units with 30 data points

PCS1.C620	with graphics display and manual/emergency control
PCS1.C621	with graphics display
PCS1.C622	with manual/emergency control
PCS1.C623	without display, without manual/emergency control



Base units with 44 data points

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

LON base units with 44 data points

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

Accessories (spare parts requirement)

440549410	Set of spring terminals, 8 parts
411149270	Terminal cover
410948490	Set for wall mounting
PCD7.D230	External graphics terminal
PCD7.K423	Screened interface connection cable, length 2.5 m: between terminal (D-type, 9 pole) and RS 232 interface with RTS/CTS of PCS1 or PCD (wire ends free)
PCD8.K111	Programming cable configuration-/programming tool



PCD7.F1x0 communications modules (for interchange)

PCD7.F110	interface RS 422/RS 485, electrically connected
PCD7.F120	interface RS 232 (RTS/CTS only supported)
PCD7.F150	interface RS 485, electrically isolated
PCD7.F180	MP-Bus connection module for BELIMO® MFT drives



Modem modules (for exchange)

PCS1.T814	analogue
PCS1.T851	ISDN-TA
PCS1.T830	GSM



Automation system | PCS1: The spectrum of use

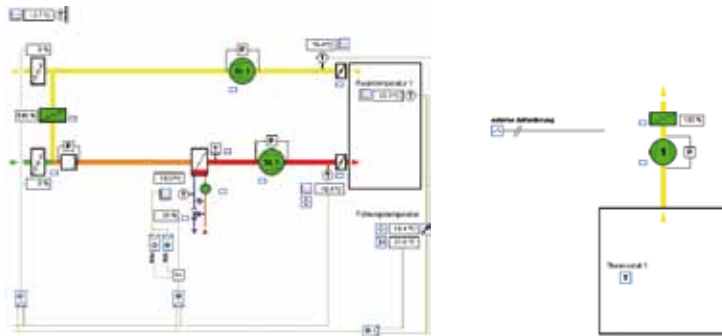
The application spectrum for PCS1 compact controllers is very diverse. The following examples are intended to show users typical HeaVAC applications, where DDC-Compact has been used.

Application examples PCS1.C62x

Application example 1

- Ventilation system with 2 control sequences
- 2-stage ventilation
- Pre-heated return monitoring
- Room temperature/air extraction control
- Single-stage air extraction with valve function, thermostat and external requesting

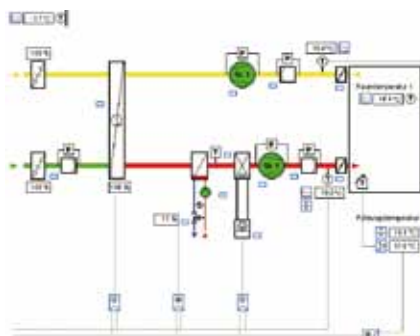
Application example 1



Application example 2

- Ventilation system with 3 control sequences
- Pressure control with remote monitoring, 2-stage
- Rotational heat recovery
- Process monitoring of media
- Remote setpoint transmitter
- Room temperature/air extraction control
- 2-stage direct vaporizer control

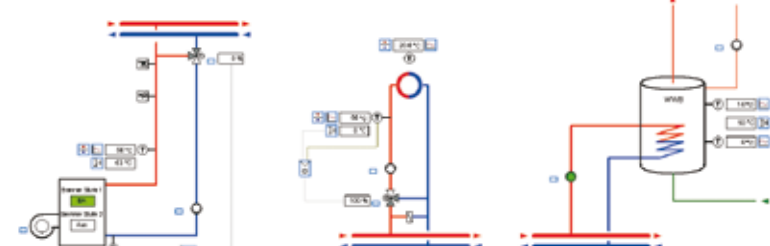
Application example 2



Application example 3

- 2-stage boiler controller
- Boiler return upkeep
- Emergency OFF function
- Pressure/water level monitoring
- Process/fault monitoring
- Heating group with room temperature monitoring
- Service water tank with 2 detectors
- Loading and circulation pumps

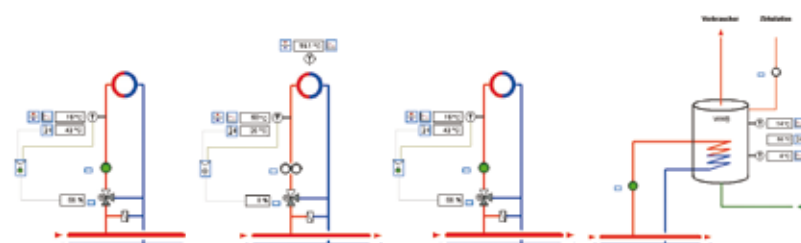
Application example 3



Application example 4

- 3 independent heating groups
- Extension of working hours
- Double pump (heating circuit 2)
- 3-point valve drive triggering
- Service water tank with 2 detectors
- Loading and circulation pumps

Application example 4

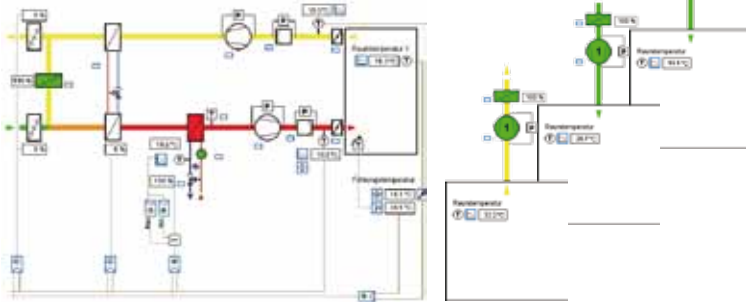


Special functions:

- Single or double pumps
- Individual time-switch program
- Display operation
- Integral manual switch function
- Modem-remote access
- Networkable

Application examples PCS1.C8xx

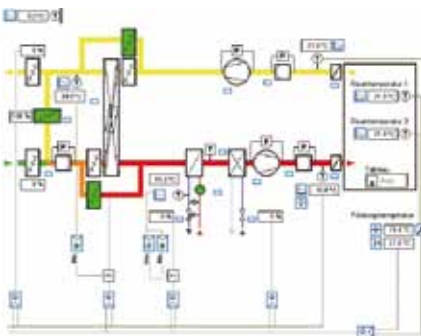
Application example 1



Application example 1

- Ventilation system with 4 control sequences
- 2-stage ventilation
- Remote setpoint transmitter
- Room temperature/air extraction control
- Single-stage air extraction with valve function
- Single-stage aeration with valve function
- Single-stage aeration

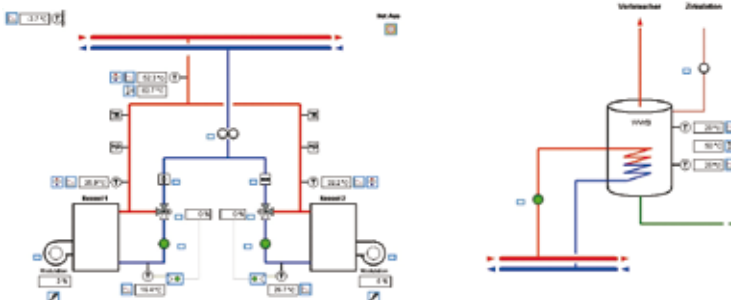
Application example 2



Application example 2

- Ventilation system with 4 control sequences
- Pressure control with remote monitoring, 2-stage
- Heat recovery function with disk changer
- Process monitoring of media
- Remote setpoint transmitter
- Room temperature/air extraction control
- Board switch: Auto-0-1

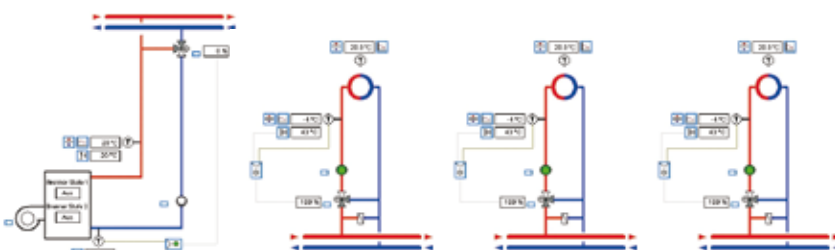
Application example 3



Application example 3

- Double boiler system with sequential control
- Double pump in main flow pipe
- Independent return upkeep
- Modulated burner control
- Emergency OFF function
- Service water tank with 2 detectors
- Loading and circulation pumps

Application example 4



Application example 4

- 2-stage boiler controller
- Flow-pipe temperature control
- Boiler return upkeep
- 3 independent heating groups
- Room temperature turn-on for heating groups

Special functions:

- Single or double pumps
- Individual time-switch program
- Display operation
- Integral manual switch function
- Modem – remote access
- Networkable



Raumtemperatur 1
21.0 °C

Raumtemperatur 2
21.0 °C

Tableau
L Add

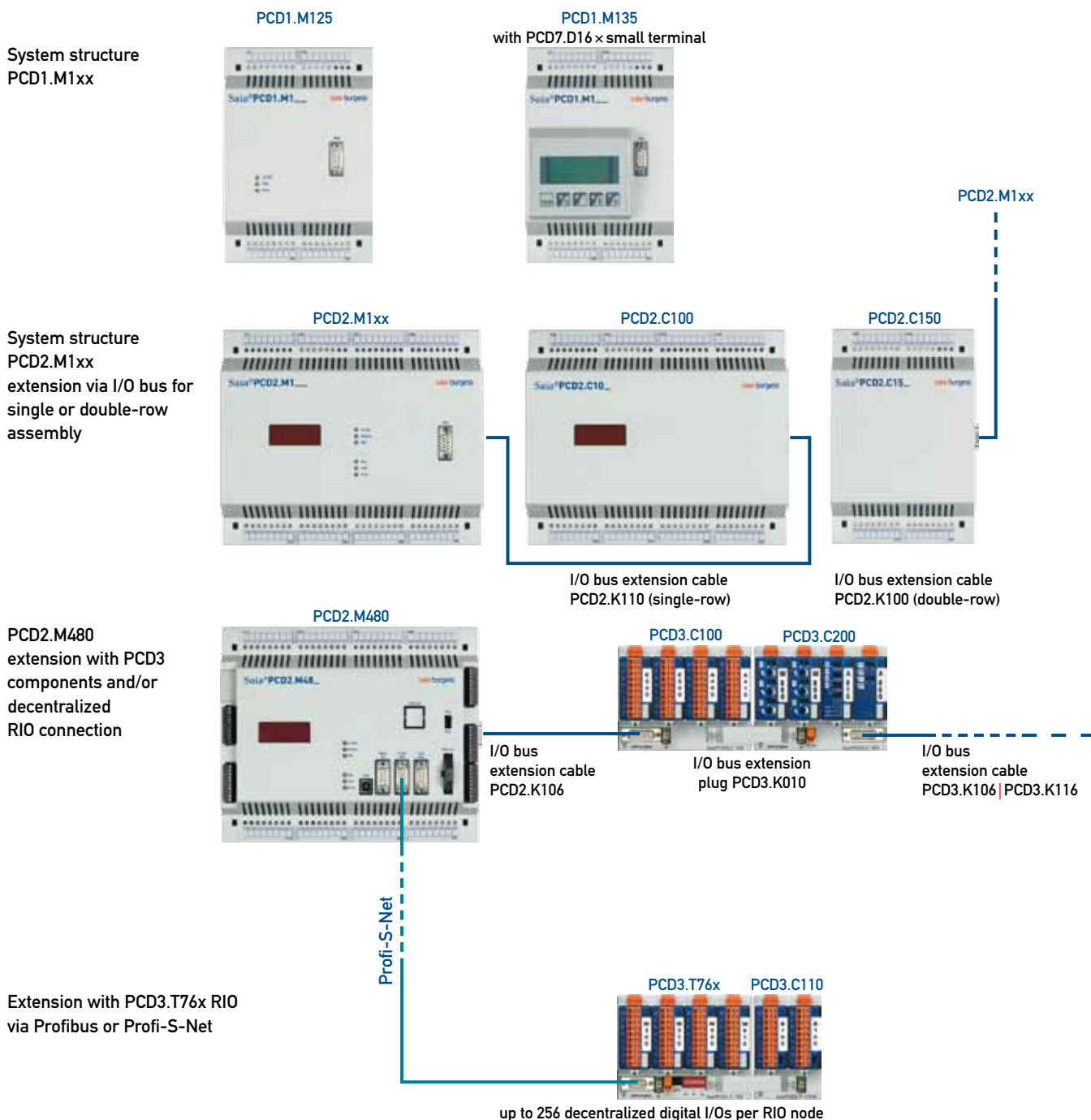
Führungstemperatur
18.4 °C
21.0 °C

6.2 Automation systems | PCD1/PCD2 Modular device series, flat design

Powerful functions – already integrated in base unit

- Up to 1023 local inputs/outputs: all I/O sockets can be equipped with any choice of digital, analogue, counting, measuring and/or weighing:
 - up to 1023 I/Os with PCD2.M480 and PCD3.LIO (up to 255 with PCD2.C100)
 - up to 23'536 remote I/Os in PCD3.RIO/LIO (via Profibus DP or Profi-S-I/O)
- 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 9 serial ports can be fitted with choice of RS 232, RS 422, RS 485, Belimo® MP-Bus or TTY current loop/20 mA, fieldbus connections like Profibus FMS/DP, LonWorks® or Ethernet-TCP/IP, integrable modems, USB and Profi-S-Net/MPI (PCD2.M480)
- Web server at no extra cost and without additional TCP/IP communication modules, already included in the base unit
- Up to 4 standard inputs for interrupts or fast counters, on the CPU

Configuration examples:



Overview of system components

PCD1/PCD2.Mxx0 for centralized and remote automation tasks

The large choice of CPUs in different performance classes forms the backbone of the system. The 4|8 I/O module slots of the PCD1|PCD2 and the additional 4|8 slots in the PCD2.C150/C100 extension housings can be freely equipped and offer space for up to 255 data points. Extending a PCD2 with a PCD3.C100/110 and PCD3.C200 will allow up to 1023 local data points. CPUs can drive several interfaces at one time (up to nine with the PCD2.M480).

PCD1.M110 and PCD1.M1x5

- The PCD1 system range takes up to 4 data point modules (max. 64. data points). Three different types of CPU are available for diverse requirements.

PCD2.M1x0

- The PCD2.M1x0 system range takes up to 32 data point modules (max. 512 data points). Its diversity of configuration makes it suitable for almost any field of application.

PCD2.M480

- The flagship of the PCD2 system range can process up to 64 data point modules (max. 1024 data points). With its maximum 9 interfaces (two Ethernet) and powerful CPU, there are almost no limits on communications tasks.

Extension of I/O capacity

PCD3.T760 and PCD3.T765 RIO head stations

- PCD3.T76x head stations are used as remote peripheral nodes. Up to 3 PCD3.Cxxx module holders can be connected to the PCD3.T76x → 16 data point modules.

PCD2.C100 and PCD2.C150

- Local data point extension with PCD2 components is achieved via a PCD2.C100 extension for 8 additional module slots, or via a PCD2.C150 extension for 4 additional module slots.

PCD3.C100, PCD3.C110 and PCD3.C200 module holder

- 4 PCD3 module slots (2 with PCD3.C110)
- Extension module holder for PCD3.Mxxxx /Txxx/Cxxx and PCD2.Mxxx
- Additional PCD3.Cxxx connectable via plug or cable
- LED indicator for internal 5V supply voltage
- PCD3.C200 has connecting terminals for 24 VDC feed to internal supply of connected PCD3 I/O modules and any superposed PCD3.Cxxx module holders.

User memory

PCD2.M170/M480 has 1 MByte RAM and an optional flash card for backup. Other types have up to 128/640 KBytes RAM, EPROM or Flash EPROM.

Connection technology: plug-in spring/screw terminal blocks, or system cable

Connection to the I/O level is via plug-in spring/screw terminal blocks, plug-in system cables, or ribbon ↔ screw terminal adapters.

I/O bus extension plug and cables

- PCD2.K110: Extension cable 0.7 m
 - PCD2.K110: Extension cable 0.5 m
 - PCD2.K106: Extension cable 0.7 m
 - PCD3.K010: Extension plug
 - PCD3.K106: Extension cable 0.7 m
 - PCD3.K116: Extension cable 1.2 m
- PCD2.Mxxx ↔ PCD2.C1x0 (side-by-side)
 PCD2.Mxxx ↔ PCD2.C1x0 (below base unit)
 PCD2.Mxxx ↔ PCD3.Cxxx
 PCD3.Mxxxx /T76x/Cxxx ↔ PCD3.Cxxx
 PCD3.Mxxxx /T76x/Cxxx ↔ PCD3.Cxxx
 PCD3.Mxxxx /T76x/Cxxx ↔ PCD3.Cxxx

Performance overview PCD1 | PCD2 series



Technical data PCD1	PCD1.M110	PCD1.M125	PCD1.M135
Number of inputs/outputs or PCD2 I/O module sockets	64 ⁵⁾ 4	64 ⁵⁾ 4	64 ⁵⁾ 4
Connector for extension housing	no	no	no
Processing time ³⁾	bit command 5 µs word command 20 µs	5 µs 20 µs	5 µs 20 µs
User memory			
RAM standard equipment	17 Kbytes	128 Kbytes	128 Kbytes
Extension with RAM	128 Kbytes	128...512 Kbytes	128...512 Kbytes
EPROM or Flash-EPROM	128 Kbytes 112 Kbytes	128 Kbytes 112...448 Kbytes	128 Kbytes 112...448 Kbytes
Data protection	30 days with Super Cap	7 days with Super Cap	1...3 years ²⁾ with lithium battery
Date-time (RTC)	no	yes	yes
Integrated Web-Server	no	yes	yes
Interrupt inputs or fast counter inputs	no no	2 1 kHz	2 1 kHz
FW downloadable	no	yes	yes
Serial data ports	2	1...2	1...2
On-board serial data interfaces			
PGU	PGU RS 232	PGU RS 232	PGU RS 232
Transmission rates: up to 38.4 kbit/s			
RS 422/485	RS 422/485		
Transmission rates: up to 38.4 kbit/s			
Optional serial data interfaces			
Socket A		RS 232, RS 422, RS 485, TTY/current loop 20 mA Belimo® MP-Bus	RS 232, RS 422, RS 485, TTY/current loop 20 mA Belimo® MP-Bus
Transmission rates: up to 38.4 kbit/s, TTY/20 mA = 9.6 kbit/s			
Socket B	no ⁴⁾	yes	yes
for network or data ports, LED display, small terminal			
Programmable starting from	PG3	PG5 version 1.3.120	PG5 version 1.3.120

¹⁾ When using digital I/O modules PCD2.E16x or PCD2.A46x with 16 I/Os each.

²⁾ Depends on ambient temperature.

³⁾ Ethernet-TCP/IP as configured system with type no. PCD1.M135F655.

⁴⁾ Small terminal PCD7.D162 possible.

⁵⁾ Processing time is dependent on the load placed on communication ports.

System resources PCD1 | PCD2

Flags	8192 × 1 bit, volatile or non-volatile, division programmable
Registers	4096 × 32 bits, non-volatile
PCD2.M48x	16384 × 32 Bit, non-volatile
PCD2.M5xx0	16384 × 32 Bit, non-volatile
Computational ranges	Integers: -2 147 483 648...+2 147 483 647 ($-2^{31} \dots +2^{31}-1$) Floating-point numbers: $\pm 9.22337 \times 10^{18} \dots \pm 5.42101 \times 10^{-20}$ Formats: decimal, binary, BCD, hexadecimal or floating point
Index registers	17 × 13 bits (1 each per COB and XOB)
Timers/counters	1600 volatile timers or non-volatile counters, division programmable
Counting range	31 bits, unsigned (0...2 147 483 647)
Timing range	31 bits, unsigned (0...2 147 483 647) timing signals, selectable (10 ms to 10s)
Texts and DBs	8192
Date-time	Time values: s/min/h, week/day of week, month/day of month, year
Accuracy	
PCD1, PCD2	< 15 seconds per month
PCD2.M5xx0	< 1 minute per month
Power reserve	7 days up to 3 years

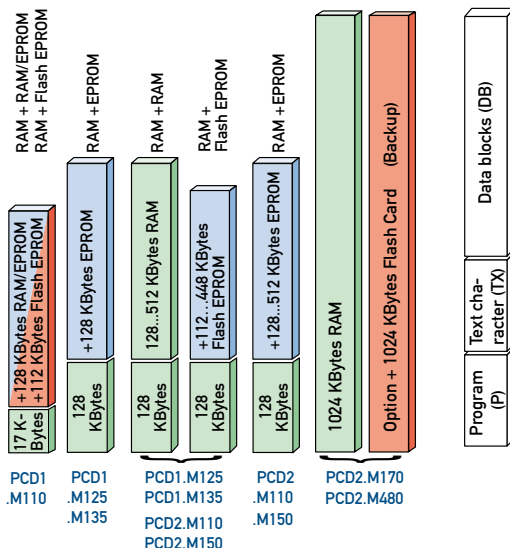


Technical data PCD2	PCD2.M110	PCD2.M150	PCD2.M170	PCD2.M480
Number of inputs/outputs or PCD2 PCD3 I/O module sockets	128 ¹⁾ 8	255 ¹⁾³⁾ 16 ⁴⁾	510 ¹⁾³⁾ 32 ⁴⁾	1023 ¹⁾³⁾ 64 ⁴⁾
Connector for extension housing	no	yes	yes	yes
Processing time ⁹⁾				
bit command	4 µs	4 µs/2 µs	2 µs	0.1...0.8 µs ⁹⁾
word command	20 µs	20 µs/10 µs	10 µs	0.3 µs ¹⁰⁾
User memory				
RAM standard equipment	128 KBytes	128 KBytes	1024 KBytes	1024 KBytes
Extension with RAM	128...512 KBytes	128...512 KBytes		
EPROM or	128...512 KBytes	128...512 KBytes		
Flash-EPROM	112...448 KBytes	112...448 KBytes		
Flash Card PCD7.R400 (Backup)			1024 KBytes	1024 KBytes
Data protection	1...3 years ²⁾ with lithium battery	1...3 years ²⁾ with lithium battery	1...3 years ²⁾ with lithium battery	1...3 years ²⁾ with lithium battery
Date-time (RTC)	yes	yes	yes	yes
Integrated Web-Server	no	yes	yes	yes
Interrupt inputs or fast counter inputs	no no	2 1 kHz	2 1 kHz	4 + 2 outputs 1 kHz
FW downloadable	no	no	yes	yes
Serial data ports	1...2	1...4	1...6	2...9
On-board serial data interfaces				
PGU	PGU RS 232, 38.4 kBit/s	PGU RS 232, 38.4 kBit/s	PGU RS 232, 38.4 kBit/s	PGU RS 232, 38.4 kBit/s
USB 1.1 Slave ³⁾	no	no	no	yes, 12 MBit/s
Optional serial data interfaces				
Socket A, B/B1 or B2 Transmission rates: up to 38.4 kbit/s, TTY/20 mA = 9.6 kbit/s PCD2.M480: up to 115 kbit/s (Ports #0, #1 and #6)	RS 232, RS 422, RS 485, TTY/20 mA, Belimo® MP-Bus	RS 232, RS 422, RS 485, TTY/20 mA, Belimo® MP-Bus	RS 232, RS 422, RS 485, TTY/20 mA, Belimo® MP-Bus	RS 232, RS 422, RS 485, TTY/20 mA, Belimo® MP-Bus
Network connections	Saia® S-Bus, 38.4 kBit/s	Saia® S-Bus, 38.4 kBit/s	Saia® S-Bus, 38.4 kBit/s	Saia® S-Bus, 115 kBit/s
Transmission rates: Profibus FMS bis zu 500 kbit/s * Profibus DP-Master/Slave 12 Mbit/s ** Profibus DP-Master 12 Mbit/s, DP-Slave 1.5 Mbit/s Ethernet-TCP/IP 10/100 Mbit/s (autosensing)		Profibus FMS, 500 kBit/s Profibus DP * Ethernet-TCP/IP ⁴⁾ LonWORKS®	Profibus FMS, 500 kbit/s Profibus DP * Ethernet-TCP/IP LonWORKS®	S-Net/MPI, 1.5 Mbit/s Profibus DP ** Ethernet-TCP/IP
Socket B/B1 for network and/or data ports, LED display, small terminal	no ⁷⁾	yes	yes	yes
Socket B2 for network or data ports	no	no	yes	yes
Programmable starting from	PG3	PG3	PG5 version 1.1	PG5 version 1.3

¹⁾ When using digital I/O modules PCD2/3.E16x or PCD2/3.A46x with 16 I/Os each.
²⁾ Depends on ambient temperature.
³⁾ Address 255 (and 511 with PCD2.M170) are reserved for the watch-dog.
⁴⁾ Combined with PCD2.C100 or PCD3.Cx00.
⁵⁾ For programming or as S-Bus Slave with WebConnect, ViSi.Plus etc.

⁶⁾ Ethernet-TCP/IP as configured system with type no. PCD2.M150F655.
⁷⁾ Small terminal PCD7.D162 possible.
⁸⁾ Processing time is dependent on the load placed on communication ports.
⁹⁾ With direct access to peripheral unit.
¹⁰⁾ Only for double words.

Developable and flexible user memory



General technical data

Supply voltage ¹⁾	24 VDC -20/+25% incl. 5% ripples
Power consumption	15 W for 64 I/Os, 20 W for 128 I/Os
Max. load capacity 5 V bus ³⁾	PCD1 750 mA PCD2 1600 mA PCD2.M480 = 2000 mA PCD2.M5xx0 = 1400 mA
Load capacity internal +V bus (16...24 V) ³⁾	PCD1 100 mA PCD2 200 mA PCD2.M5xx0 = 800 mA
Short interruptions ¹⁾	≤10 ms with an interval ≥1 s
Watchdog relay	make contact = 48 VAC or VDC ²⁾ = 1 A

¹⁾ According to EN/IEC 61131-2

²⁾ With VDC a free-wheeling diode should be connected in parallel to the load

³⁾ Extension housings PCD2.C100/C150 and PCD3.C100/C110 module holders receive their power supply via the extension cable from the base unit. The overall electrical requirement depends on the choice of modules equipped. Extension module holders PCD3.C200 possesses connections for an external 24 VDC supply and forms a separate supply segment.

Overview of digital I/O modules

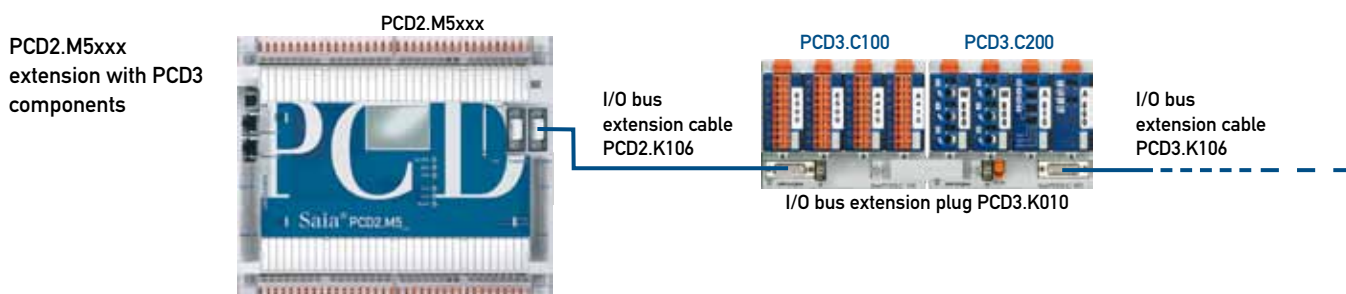
Type	Total I/Os	Input voltage	Breaking capacity DC	AC	Input filter	Electrical isolation	Current draw 5 V-Bus ¹⁾ + V-Bus ²⁾	I/O type PCD2 PCD3 ³⁾
PCD2/3.E110	8 I	15...30 VDC			8 ms		12 mA	A
PCD2/3.E111	8 I	15...30 VDC			0.2 ms		12 mA	A
PCD2/3.E112	8 I	7.5...15 VDC			9 ms		12 mA	A
PCD2/3.E116	8 I	3.5...7 VDC			0.2 ms		12 mA	A
PCD2.E160	16 I	15...30 VDC			8 ms		50 mA	
PCD3.E160	16 I	15...30 VDC			8 ms		8 mA	D
PCD2/3.E161	16 I	15...30 VDC			0.2 ms		50 mA	D
PCD2.E165	16 I	15...30 VDC			8 ms		50 mA	
PCD3.E165	16 I	15...30 VDC			8 ms		8 mA	C
PCD2/3.E166	16 I	15...30 VDC			0.2 ms		50 mA	C
PCD2/3.E500	6 I	80...250 VAC			20 ms	■	1 mA	A
PCD2/3.E610	8 I	15...30 VDC			10 ms	■	12 mA	A
PCD2.E611	8 I	15...30 VDC			0.2 ms	■	12 mA	
PCD2/3.E613	8 I	30...60 VDC			9 ms	■	12 mA	A
PCD2.E616	8 I	3.5...7 VDC			0.2 ms	■	12 mA	
PCD2/3.A200	4 O, relay (make)		2 A/50 VDC	2 A/250 VAC		■	10 mA	A
PCD2.A210	4 O, relay (break) ⁴⁾		2 A/50 VDC	2 A/250 VAC		■	10 mA	
PCD2/3.A220	6 O, relay (make) ⁴⁾		2 A/50 VDC	2 A/250 VAC		■	10 mA	A
PCD2.A250	8 O, relay (make)		2 A/50 VDC	2 A/48 VAC		■	15 mA	
PCD3.A251	8 O, relay (6 changeover + 2 make)		2 A/50 VDC	2 A/48 VAC		■	15 mA	C
PCD2/3.A300	6 O, transistor		2 A/10...32 VDC				12 mA	A
PCD2/3.A400	8 O, transistor		0.5 A/5...32 VDC				15 mA	A
PCD2/3.A410	8 O, transistor		0.5 A/5...32 VDC			■	15 mA	A
PCD2.A460	16 O, transistor ⁵⁾		0.5 A/10...32 VDC				50 mA	
PCD3.A460	16 O, transistor ⁵⁾		0.5 A/10...32 VDC				8 mA	D
PCD2.A465	16 O, transistor ⁵⁾		0.5 A/10...32 VDC				50 mA	
PCD3.A465	16 O, transistor ⁵⁾		0.5 A/10...32 VDC				8 mA	C
PCD3.A810	4 O, relay (2 changeover + 2 make)		2 A/50 VDC	5 A/250 VAC		■	40 mA	F
Manual operation			2 A/50 VDC	6 A/250 VAC		■		
PCD3.A860	2 O, relay (make)		-	12 A/250 VAC		■	18 mA	G
Manual operation	2 I	15...30 VDC			8 ms			H
PCD2/3.B100	2 I + 2 O + 4 I or O selectable I or O	I: 15...32 VDC O: 0.5 A/5...32 VDC			8 ms		15 mA	A

³⁾ Pluggable I/O terminal connectors for PCD3 modules and cables are not included in the I/O module delivery pack and must be ordered separately

⁴⁾ With contact protection ⁵⁾ With short-circuit protection

Capacity	PCD1	PCD2	PCD2.M48x	PCD2.M5xx0	PCD2.C2000	PCD3.Mxxx0	PCD3.C200	PCD3.Txxx
¹⁾ Internal 5 V bus	750 mA	1600 mA	2000 mA	1400 mA	1400 mA	600 mA	1500 mA	650 mA
²⁾ Internal + V bus	100 mA	200 mA	200 mA	800 mA	800 mA	100 mA	630 mA	100 mA

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



A manual control level can only be implemented on the PCD2 system series if the PCD3.C200 is used with PCD3.A810 and PCD3.W800 modules.

PCD3.A810
Relay outputs,
2 changeover/co and
2 make/no contacts



PCD3.A860
Light and shade
Relay outputs
2 make/no contacts
and 2 inputs



PCD3.W800
4 analogue output
channels
(3 channels with
manual control)



Overview of analogue I/O modules

Customized multifunctional I/O modules

Type	Total channels	Signal ranges	Resolution	Electrical isolation	Current draw		I/O type	
					5 V ¹⁾	24 V ²⁾	PCD2	PCD3 ³⁾
PCD2/3.W200	8 I	0...+10 V	10 bits		8 mA	5 mA		A
PCD2/3.W210	8 I	0...20 mA ⁴⁾	10 bits		8 mA	5 mA		A
PCD2/3.W220	8 I	Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	10 bits		8 mA	16 mA		A
PCD2.W220Z02	8 I	NTC 10 temperature sensors	10 bits		8 mA	16 mA		A
PCD3.W220Z03	8 I	NTC 10 temperature sensors	10 bits		8 mA	16 mA		A
PCD2/3.W220Z12	4 I + 4 I	4 I: 0...10 V and 4 I: Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	10 bits		8 mA	11 mA		A
PCD2/3.W300	8 I	0...+10 V	12 bits		8 mA	5 mA		A
PCD2/3.W310	8 I	0...20 mA ⁴⁾	12 bits		8 mA	5 mA		A
PCD2/3.W340	8 I	0...+10 V/0...20 mA ⁴⁾ Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	12 bits		8 mA	20 mA		A
PCD2/3.W350	8 I	Pt 100: -50 °C...+600 °C/Ni 100: -50 °C...+250 °C	12 bits		8 mA	30 mA		A
PCD2/3.W360	8 I	Pt 1000: -50 °C...+150 °C	12 bits		8 mA	20 mA		A
PCD2/3.W305	7 I	0...+10 V	12 bits	■	60 mA	0 mA		E
PCD2/3.W315	7 I	0...20 mA/4...20 mA, parameters can be set	12 bits	■	60 mA	0 mA		E
PCD2/3.W325	7 I	-10 V...+10 V	12 bits	■	60 mA	0 mA		E
PCD2/3.W400	4 O	0...+10 V	8 bits		1 mA	30 mA		A
PCD2/3.W410	4 O	0...+10 V/0...20 mA/4...20 mA jumper selectable	8 bits		1 mA	30 mA		A
PCD2/3.W600	4 O	0...+10 V	12 bits		4 mA	20 mA		A
PCD2/3.W610	4 O	0...+10 V/-10 V...+10 V/0...20 mA/4...20 mA jumper selectable	12 bits		110 mA	0 mA		A
PCD2/3.W605	6 O	0...+10 V	10 bits	■	110 mA	0 mA		E
PCD2/3.W615	4 O	0...20 mA/4...20 mA, parameters can be set	10 bits	■	55 mA	0 mA		E
PCD2/3.W625	6 O	-10 V...+10 V	10 bits	■	110 mA	0 mA		E
PCD2/3.W525	4 I + 2 O	I: 0...10 V, 0(4)...20 mA, Pt 1000, Pt 500 or Ni 1000 (selectable by DIP switch) O: 0...10 V or 0(4)...20 mA (selectable by software (FBox, FB))	I: 14 bits O: 12 bits	■	40 mA	0 mA		E
PCD3.W745	4 I	Temperature module for TC and 4-wire Pt/Ni	16 bits	■	200 mA	0 mA		⁶⁾
PCD3.W800	4 O	0...+10 V, short circuit proofed 3 of them manually operated	10 bits		45 mA	35 mA ⁵⁾		J

The terminal connectors are provided with the modules

³⁾ Pluggable I/O terminal connectors for PCD3 modules and cables are not included in the I/O module delivery pack and must be ordered separately (see P+P26/388)

⁴⁾ +4...+20 mA via user program ⁵⁾ With 100 % output and 3 kΩ load ⁶⁾ With soldered I/O spring terminal block

Capacity	PCD1	PCD2	PCD2.M48x	PCD2.M5xx0	PCD2.C2000	PCD3.Mxxx0	PCD3.C200	PCD3.Txxx
¹⁾ Internal 5 V bus	750 mA	1600 mA	2000 mA	1400 mA	1400 mA	600 mA	1500 mA	650 mA
²⁾ Internal + V bus	100 mA	200 mA	200 mA	800 mA	800 mA	100 mA	630 mA	100 mA

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

Customized multifunctional I/O modules

The modules **PCD2.G400** and **PCD2.G410** are representative examples of the development and manufacture of customized versions.



PCD2.G400 10 digital inputs 24 VDC similar to the PCD2.E110 module, but without the sink mode option
8 digital transistor outputs 24 VDC/0.5 A, similar to PCD2.A400
2 analogue inputs 0...10 VDC, 10 bit resolution, similar to PCD2.W200
6 analogue inputs Pt/Ni 1000, 10 bit resolution similar to PCD2.W220
6 analogue outputs 0...10 VDC, 8 bit resolution similar to PCD2.W400
Current draw from 5V bus: 10...65 mA.

PCD2.G410 16 digital inputs 24 VDC, electrically isolated, for source or sink operation, similar to PCD2.E610
4 relay outputs, electrically isolated changeover contacts, each for 2 A, 250 VAC or 2 A, 50 VDC (ohmic), varistors as contact protection, similar to PCD2.A200
4 analogue inputs, 10 bit resolution, jumper selectable for 0...10 V, 0...20 mA or resistance thermometer Pt/Ni 1000 for -20...+100 °C, no electrical isolation, input filter 5...10 ms, similar to PCD2.W2xx
4 analogue outputs, 8 bit resolution, jumper selectable for 0...10 V or 0...20 mA, also as short-circuit proofed voltage output, D/A conversion time <5 µs, similar to PCD2.W410
Current draw from 5V bus: 10...50 mA.

Overview of communication modules

The PCD supports a large number of protocols for connecting peripherals, such as sensors, actuators, printers, weighing machines, barcode readers, terminals or other controllers.

Without add-on module the following interfaces are available: RS232 with RTS/CTS or RS485 electrically connected (separate for PCD2.M480), with line termination resistors capable of activation, suitable for S-Bus.

Communication possibilities

Serial data ports or MP bus at socket A



- PCD7.F110:** RS422 with RTS/CTS or RS485 electrically connected, with line termination resistors capable of activation. Suitable for Modbus, SBus, EnOcean etc.
- PCD7.F121:** RS232 with RTS/CTS, DTR/DSR, DCD. Suitable for modem, EIB, DALI connection
- PCD7.F130:** TTY/20 mA (active or passive)
- PCD7.F150:** RS485 electrically isolated, with line termination resistors capable of activation
- PCD7.F180:** Belimo® MP bus (RS 232), for connection of up to 8 drives.

Profibus connection modules at sockets B, B1 and/or B2



- 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 RS485 electrically isolated

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

Serial data ports at socket B, B1 and/or 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
- PCD2.F530 with display:** (not on PCD2.M170/M480) RS 232 with RTS/CTS and RS 422 without RTS/CTS or RS 485 electrically connected and 6-digit display.

Network connections (Serial S-Net, see chapter 2.3)

Ethernet-TCP/IP module at socket B, B2



(PCD2.M480: second module on B1 plugged at pre-configured version PCD2.M480F650-2)

- PCD7.F655:**
Intelligent interface module for connection to Ethernet-TCP/IP.

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

Field bus connections

Saia® S-Bus (without additional module)

Saia® S-Bus, with its safe and easy protocol, is already available in the standard equipment of all PCDs as master or slave.

See TI P+P26/370

Technical data

Master connection	38.4 kBit/s (115 with PCD2.M480). 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

Profi-S-IO on the PCD2.M480 (without additional module)

Without additional Profibus interface, the user can connect a maximum of 126 RIO head stations PCD3.T76x.



Interface Options

LonWorks® module

at sockets B, B1 and/or B2
(not possible with PCD2.M480)

PCD7.F800: for connection to the LonWorks®-network.

PCD7.F802: for connection to the LonWorks® network, with additional RS485 serial port, electrically connected.

Transceiver type	FTT-10A



MP-Bus interface for BELIMO®-damper actuators at I/O socket

PCD2.T500: Belimo MP bus (RS232), for connection of up to 16 drives.

The module can actuate two branches with eight actuators each. To run both branches independently 2 communications channels (RS232/TTL) are required..

Data exchange is asynchronous and runs at 1200 pulses/second.



Modem Options

Telecommunication via integral modem at I/O socket

PCD2.T814, analogue

PCD2.T851, ISDN

- Integral modem in base unit saves expenditure on external installation.
- SMS messages can be transmitted directly from the PCD.
- Data exchange across great distances via modem



Telecommunication via external modems

See chapter 9



Base units and sockets for plug-on communications modules

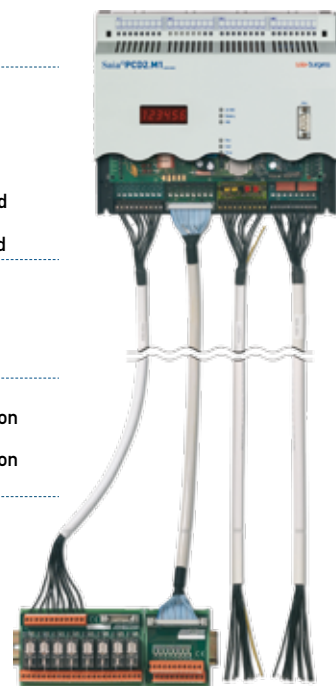
- 1) Suitable for modern connection due to provision of 6 control lines.
- 2) Display of si x 7-segment LED digits (as **PCD2.F530** but without communications port)
- 3) For **PCD2.M135** at socket B with special housing cover 410474090 or as configured system with type number **PCD1.M135F655**.
- 4) Can be fitted, but the extra port is not available.
- 5) For **PCD2.M150** at socket B with special housing cover 410474100 or as configured system with type number **PCD2.M150F655**.
- 6) The following combinations are not possible: 2 x Profibus DP Slave or 2 x LonWorks®
- 7) For **PCD2.M480** Ethernet (2 x **PCD7.F655**) at sockets B1 and B2 with special housing cover 410475030 or as configured system with type number **PCD2.M480F655-2**
- 8) **PCD7.F750** on **PCD2.M480** socket B2 not recommended

Saia® small terminals use the intelligence and large memory of Saia®PCD. For this reason the terminal communicates with the CPU via a communication module, which occupies socket B or B1. Depending on the terminal set, the following communication capabilities are available:

See TI [P+P26/430](#) and manual [26/737](#)

Ordering information for PCD1 | PCD2 accessories

Type	Description
Accessories	
450748170	Lithium battery
Extension cables and ribbon ↔ screw terminals adapters	
Extension cables, programming cable	
PCD2.K100	Extension cable, length 0.5 m (PCD2.C1x0 below of the base unit, max. gap 150 mm)
PCD2.K110	Extension cable, length 0.7 m (PCD2.C1x0 and base unit mounted side-by-side)
PCD2.K120	Extension cable, length 2 m (for coupling bus module)
PCD2.K106	Extension cable, length 0.7 m (PCD2.Mxx0 ↔ PCD3.LI0)
PCD8.K111	Programming cable with 9-pole D-type connector for the connection to a PC
Plug-in system cables (see chapter 9.4)	
for digital modules with 16 I/Os	
PCD2.K221	Sheathed, round cable with 32 strands, each 0.25 mm ² , 1.5 m long. PCD side: 34-pole ribbon cable connector type D; process side: strand ends free, colour coded
PCD2.K223	Sheathed, round cable with 32 strands, each 0.25 mm ² , 3.0 m long. PCD-side 34-pole ribbon cable connector type D; process side: strand ends free, colour coded
for adapters PCD2.K520/..K521/..K525	
PCD2.K231	Sheathed, half-round cable with 34 strands, each 0.09 mm ² , 1.0 m long, both ends with 34-pole ribbon cable connector type D
PCD2.K232	Sheathed, half-round cable with 34 strands, each 0.09 mm ² , 2.0 m long, both ends with 34-pole ribbon cable connector type D
for 2 adapters PCD2.K510/..K511 or 1 adapter and relay interface PCD2.K551	
PCD2.K241	Sheathed, half-round cable with 34 strands, each 0.09 mm ² , 1.0 m long, PCD side: 34-pole ribbon cable connector type D; process side: two 16 pole ribbon cable connectors
PCD2.K242	Sheathed, half-round cable with 34 strands, each 0.09 mm ² , 2.0 m long, PCD side: 34-pole ribbon cable connector type D; process side: two 16 pole ribbon cable connectors
Ribbon ↔ screw terminals adapters	
PCD2.K510	for 8 inputs or 8 outputs, with 20 screw terminals, without LEDs
PCD2.K511	for 8 inputs or 8 outputs, with 20 screw terminals and with LEDs (source operation only)
PCD2.K520	for 16 inputs or 16 outputs, with 20 screw terminals, without LEDs
PCD2.K521	for 16 inputs or 16 outputs, with 20 screw terminals and with LEDs (source operation only)
PCD2.K525	for 16 inputs or 16 outputs, with 3 × 16 screw terminals and with LEDs (source operation only)
PCD2.K551	for 8 transistor outputs, relay interface with 24 screw terminals and with LEDs
PCD2.K552	for 8 transistor outputs, relay interface with 24 screw terminals, LEDs, manual control mode (switch on-off-auto) and 1 output for acknowledgement of manual control mode



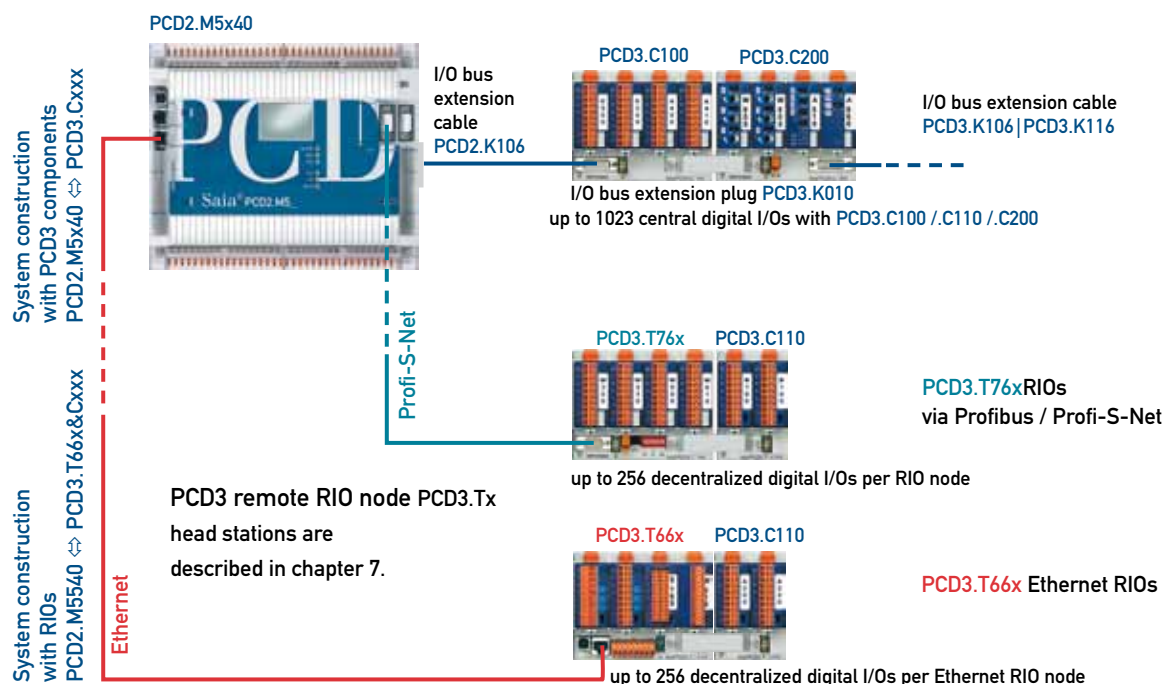
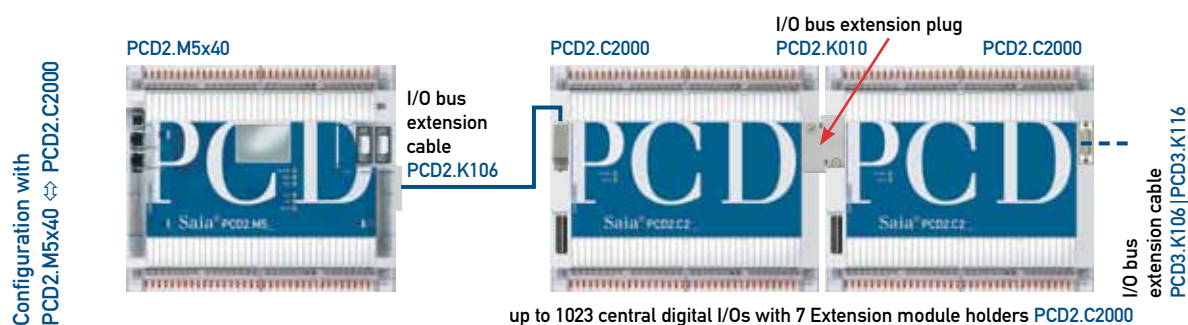
6.3 Automation systems | PCD2.M5: modular device series, flat construction

The Saia® PCD2 success story continues in a new housing. The PCD2.M5xxx is compatible with the existing PCD2 system in size, functions and technology. CPU versions correspond functionally to the PCD3.M series, with features including USB, Ethernet, an on-board web server and flash modules that have a file system.

Strong functions – already integrated in the base unit

- Up to 1023 digital inputs/output, all I/O slots can be freely equipped with digital, analogue, counting, measuring and/or weighing modules
- up to 1023 central data points with PCD3.C100 / .C110 / .C200 or with PCD2.C2000
- up to 23'536 remote data points in PCD3.T76x (via Profibus DP or Profi-S-I/O) with PCD3.C100 / .C110 / .C200
- 1 MByte user memory for programs, text and data blocks
- Up to 4 GByte flash memory - large selection, for convenient up/downloading of program modifications and backups
- Up to 12 serial interfaces for optional equipping with RS 232, RS 422, RS 485, Belimo® MP-Bus or TTY/20 mA, field-bus connections like ProfibusDP, Ethernet-TCP/IP, integral modems, USB and Profi S-Net/MPI
- Web server at no extra price already included in base unit (without additional TCP/IP communications modules)
- 6 standard inputs for interrupts or fast counters, plus 2 PWM outputs directly on the CPU
- All existing PCD2 data point modules can be used

PCD2.M5x40 system structure:



Overview of system components

PCD2.M5x40 for centralized and decentralized automation tasks

Up to 7 PCD2.C2000 extension housings can be connected to the PCD2.M5_. Users can connect up to 64 I/O modules or 1023 digital inputs/outputs. A base unit has room for 8 data point modules.



Input/output capacity

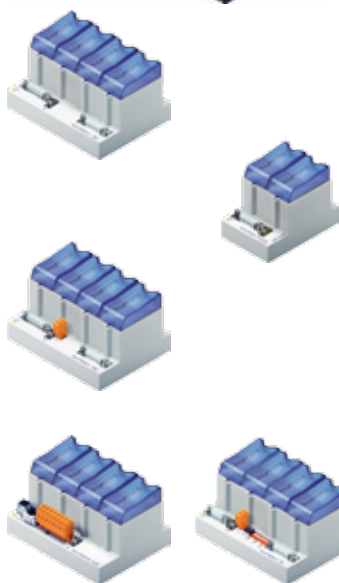
On board I/Os (on X6 terminal block)

- 6 digital inputs 24 VDC (4x interrupts)
- 2 digital outputs (2x pulse width modulation PWM)

Extension of input/output capacity with PCD2.C2000

- Local data point extension is achieved with up to 7 expansion housings, each with 8 freely equippable I/O module slots for up to 1023 digital I/Os.

No space is lost if housings are connected with the PCD2.K010 I/O bus connector.



Extension with PCD3.C100 module holders with 4 PCD3 module slots

- Extension module holder for PCD3.Mxxxx/Txxx/Cxxx and PCD2.Mxxx
- Additional PCD3.Cxxx connectable via extension cable/plug
- Indication of internal 5V supply voltage by LED

Extension with PCD3.C110 module holders with 2 PCD3 module slots

- Extension module holder for PCD3.Mxxxx/Txxx/Cxxx and PCD2.Mxxx
- Indication of internal 5V supply voltage by LED

Extension with PCD3.C200 module holders with connection for 24 VDC supply

- 4 PCD3 module slots
- Extension module holder for PCD3.Mxxxx /Txxx/Cxxx and PCD2.Mxxx
- Additional PCD3.Cxxx devices connectable via extension cable/plug
- Indication of internal 5 V supply voltage by LED
- Connecting terminals for 24 VDC power supply for all connected PCD3 I/O modules, plus any downstream PCD3.Cxxx module holders

Remote extension with RIO head stations PCD3.T66x / PCD3.T76x

- Up to 3 PCD3.Cxxx module holders can be connected to PCD3.T66x / PCD3.T76x devices. This corresponds to 16 data point modules with up to 256 digital I/Os (see chapter 6.4)

Communications interfaces integrated within base units

- RS 232 (serial) on D-type X2 (PGU) or RS 485 (serial) on terminal block X5 up to 115.2 kBit/s
- RS 485 (serial) on D-type X1 with 2 ports for free protocols up to 115.2 kBit/s or Profi-S-Net / Profibus DP slave up to 1.5 MBit/s
- USB 1.1 (slave device) interface, for use as programming interface up to 12 MBit/s
- Ethernet-TCP/IP (1 port with 2 plugs and switch) up to 10/100 MBit/s (PCD2.M5540 only)



Integral e-display

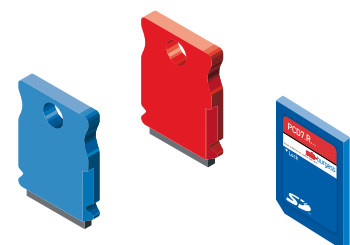
Integral on-site configuration and control unit

Ample memory possibilities

On board 1 MByte RAM basic equipment and 1 MByte backup flash memory

Optional flash memory cards for program and data backup

- 1 MByte flash card in slot for user program backup
- 4 MByte flash card with file system on slot
- 2 MByte flash card with BACnet option
- Base module (PCD2.R6000) for SD flash cards for I/O slots # 0...3, up to 4 GBytes



Performance overview PCD2.M5xxx series



PCD2.M5440

PCD2.M5540

Technical data, CPUs

	Basic	Extended (Ethernet on board)
Number of digital inputs/outputs on board	6 digital inputs 24 Vdc (4× interrupt) 2 digital outputs (2× pulse width modulation PWM)	
Number of digital inputs/outputs as option or I/O module slots in base unit	≤ 128	≤ 128
Number of digital inputs/outputs in ≤ 7 × PCD2.C2000 Or I/O module slots	≤ 8 ≤ 896 ≤ 56	≤ 8 ≤ 896 ≤ 56
Processing time [μs]	0.3...1.5 μs 0.9 μs	0.3...1.5 μs 0.9 μs
■ bit command ■ word command		
User memory on board	1024 Kbyte RAM + 1024 Kbyte Flash	1024 Kbyte RAM + 1024 Kbyte Flash
User memory optional		
Backup Flash-Karte PCD7.R500	1 Mbyte	1 Mbyte
Flash card with file system PCD7.R550M04	4 Mbyte	4 Mbyte
Flash card with file system PCD7.R551M04	3 + 1 Mbyte Backup	3 + 1 Mbyte Backup
Flash-Karte mit BACnet Firmware PCD7.R560	2 Mbyte	2 Mbyte
Flash-Karte mit BACnet Firmware PCD7.R561	1 + 1 Mbyte Backup	1 + 1 Mbyte Backup
SD-Karte card with file system PCD7.R-SDxxx in PCD2.R6000	≤ 4 GByte	≤ 4 GByte
Data protection	1...3 years with lithium battery	1...3 years with lithium battery
Integrated Web server + USB + Date-time (RTC)	Yes, HTTP direct, S-Bus	Yes, HTTP direct, S-Bus
Communications interfaces on board		
RS 232, RS 485 / PGU	≤ 115 kbit/s	≤ 115 kbit/s
RS 485 Profibus DP-Slave, Profi-S-Net (S-IQ, S-Bus)	≤ 1.5 Mbit/s	≤ 1.5 Mbit/s
USB 1.1 Slave device	≤ 12 Mbit/s	≤ 12 Mbit/s
Ethernet-TCP/IP	–	10/100 Mbit/s
Communications interfaces Optional		
Module on socket A, A1, A2		
RS 232, RS 422, RS 485, TTY/20 mA, Belimo MP-Bus	≤ 115 kbit/s	≤ 115 kbit/s
Module on socket C		
Profibus DP master	≤ 12 Mbit/s	≤ 12 Mbit/s
Controller Area Network CAN 2.0B	≤ 1 Mbit/s	≤ 1 Mbit/s
Module in I/O slots		
≤ 8 Schnittstellen PCD2.F2xxx	≤ 115 kbit/s	≤ 115 kbit/s

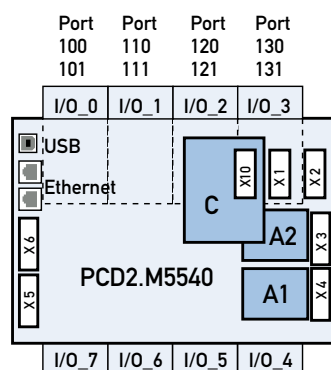
General

Supply voltage (according to s EN/IEC 61 131-2)	24 VDC –20/+25% inc. 5% ripple
Loading capacity 5 V / + V internal	max. 1400 mA/800 mA
Programmable	from PG5 version 1.4.300

System resources PCD2.M5xxxx

Flags	8192 × 1 bit, volatile or non-volatile, division programmable
Register PCD2.M5xx0	16384 × 32 Bit, non-volatile
Computational ranges	Integers: –2147483648...+2147483647 (–2 ³¹ ...+2 ³¹ –1) Floating-point numbers: ±9.22337 × 10 ¹⁸ ...±5.42101 × 10 ^{–20} Formats: decimal, binary, BCD, hexadecimal or floating point
Indexregisters	17 × 13 bits (1 each per COB and XOB)
Timers/counters	1600 volatile timers or non-volatile counters, division programmable
Counting range	31 bits, unsigned (0...2147483647)
Timing range	31 bits, unsigned (0...2147483647) timing signals, selectable (10 ms to 10 s)
Texts and DBs	8192
Date-time	Time values: s/min/h, week/day of week, month/day of month, year
Accuracy PCD2.M5xx0	Better than 1 minute per month
Power reserve	to 3 years

Overview of communication modules PCD2.M5



Communications interfaces

On Board

	Port (in PG5)	PCD2.M5440	PCD2.M5540
RS 232 (serial) on D-type X2 (PGU) or RS 485 (serial) on terminal block X5	0	≤ 115.2 kbit/s ≤ 115.2 kbit/s	≤ 115.2 kbit/s ≤ 115.2 kbit/s
RS 485 (serial) on D-type X1 with 2 Ports for free protocols or Profi-S-Net / Profibus DP slave	3 10	≤ 115.2 kbit/s ≤ 1.5 Mbit/s	≤ 115.2 kbit/s ≤ 1.5 Mbit/s
Ethernet-TCP/IP (2 port switch)	9	—	10/100 Mbit/s
USB 1.1 Slave (PGU)		yes	yes

Options

Steckplatz

PCD7.F110	RS 422 with RTS/CTS or RS 485 (electrically connected), with activatable line termination resistors. Suitable for Modbus, SBus, EnOcean etc.	A1 / A2
PCD7.F121	RS 232 with RTS/CTS, DTR/DSR, DCD, suitable for Modem, EIB, DALI connection	A1 / A2
PCD7.F130	TTY / 20 mA (active or passive)	A1 / A2
PCD7.F150	RS 485 electrically isolated, with activatable line termination resistors	A1 / A2
PCD7.F180	Belimo MP-Bus, for up to 8 drives on one branch	A1 / A2
PCD2.F2100	RS 422 / RS 485 plus PCD7.F1xx as option	I/O_0-3
PCD2.F2210	RS 232 plus PCD7.F1xx as option	I/O_0-3
PCD2.F2810	Belimo MP-Bus plus PCD7.F1xx as option	I/O_0-3
PCD7.F7500	Profibus DP master	C
PCD7.F7400	Control Area Network CAN 2.0B	C

Telecommunications via integral modems on I/O slot

PCD2.T814	Analogue modem 33.6 kBit/s (RS 232 and TTL interface)	I/O_0-2 & 4-6
PCD2.T851	Digital modem ISDN-TA (RS 232 and TTL interface)	I/O_4

External modems see chapter 9

Protocols supported by optional PCD2.F2xxx interface modules

The following protocols can run with the optional PCD2.F2xxx interface modules:

- Modem communication with the PCD FBox library
- HMI editor applications with PCD7.Dxxx text terminals (only with RS 232 Interface)
- Serial S Net
- Modbus
- Belimo MP-Bus
- JCI N2 - Bus
- KNX® S-Mode/EIB
- DALI
- EnOcean
- etc.

Transmission rates supported:

- 1200, 2400, 4800, 9600, 19200, 38400, 56700, 115200 bps.

System dependent characteristics of PCD2.F2xxx modules:

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

- Max 4 PCD2.F2xxx modules (8 interfaces) per PCD2 system can be inserted in slots 0...3.
- The PCD2 system has a powerful processor that deals with both the application and the serial interfaces. Processing of interface modules requires appropriate CPU power.

To determine the maximum communications power per PCD2.M5 system, consult the information and examples provided in manual 26/856 for PCD2.M5.

Integral e-display

Option integral nano-browser control panel Saia® PCD7.D3100E

With the PCD7.D3100E, Saia® has extended the concept of «seamless control», which has only one HMI project for all devices from the small control unit to any device with a browser (Explorer, Mozilla etc.), to include on-site display of the automation device. This is an exciting and totally new way of having on-site automation device control available anywhere in the network on the PC or PDA.

The web project is created with Saia® Web-Editor for micro-browser and Microsoft® Explorer applications.

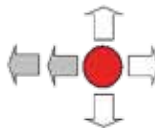


Assembly:

Simply insert and fix in place

Technical data:

- Graphical display
- 4 grey shades
- Resolution 128 × 88 pixels
- LED backlighting
- Display size 35.8 × 24.8 mm
- Dimensions 47 × 67 mm
- Joystick for navigation
- Functionality:
Sub-set of a micro-browser



Operation:

Joystick with 5 switches for configuration, editing user projects and for PCD system settings, such as CPU type, date and time, TCP/ IP address, etc.



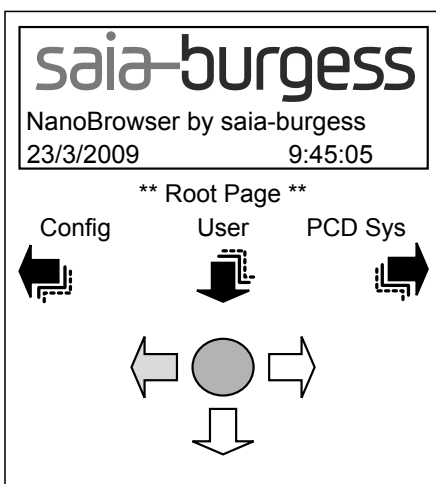
Display:

Seamless, on-site control. The display on the automation device is also available throughout the network, on PC or PDA and on other displays.

This opens up completely new possibilities.

Predefined configuration screens

Together with the possibility of editing user defined projects with the Web Editor (version for e-display) a variety of predefined configuration screens for e-display and the PCD system are also available to the user. This makes it easy to implement initial on-site diagnosis and control.



E-display:

Editable configuration parameters

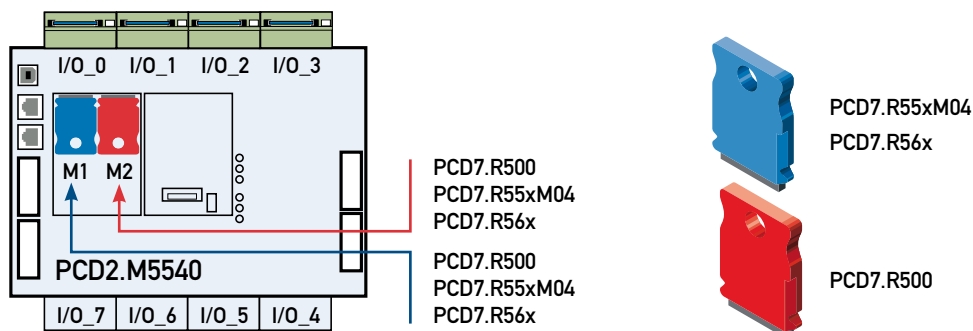
- User start page
- Setup timeout
- Backlighting timeout
- Contrast
- Inactivity timeout
- Sleep timeout
- Sleep refresh time

PCD2 System :

Status and configuration parameters

- CPU type and series number
- HW version
- FW version
- MAC address
- Program name
- TCP/IP parameters
- S-Bus address
- PCD status, time and date

PCD2.M5 memory modules



User memory

On Board

1024 KByte RAM basic equipment
1024 KByte backup flash memory

Options

Flash memory with file system, program and data backup, BACnet

Flash memory cards in slot M1 and/or M2 2

PCD7.R550M04	4 MByte flash card with file system	M1 & M2
PCD7.R551M04	4 MByte flash card with 3 MByte file system & 1 MByte program backup	M1 & M2
PCD7.R560	Flash card with BACnet	M1 & M2
PCD7.R561	Flash card with BACnet, 1 MByte file system & 1 MByte pr. backup	M1 & M2
PCD7.R500	1 MByte flash card for program & data backup	M1 & M2

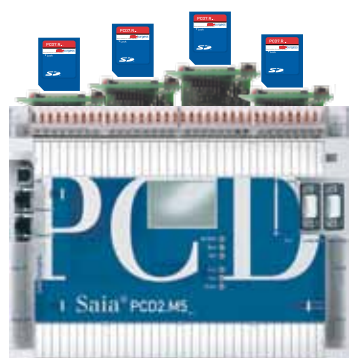


PCD2.R6000

PCD2 base module for SD flash memory cards with file system

Base module with slot for SD flash memory cards
(up to 4 modules in I/O slots 0 to 3 on a CPU)

I/O_0-3



PCD7.R-SD256	Saia® SD flash memory card, 256 MBytes with file system
PCD7.R-SD512	Saia® SD flash memory card, 512 MBytes with file system
PCD7.R-SD1024	Saia® SD flash memory card, 1024 MBytes with file system

Overview of digital I/O modules

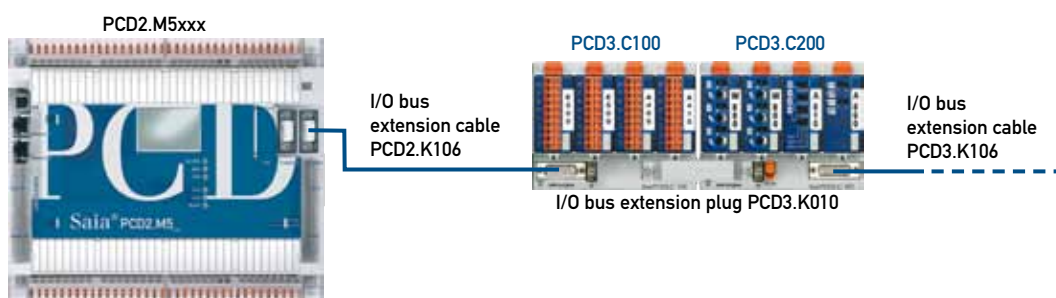
Type	Total I/Os	Input voltage	Breaking capacity DC	AC	Input filter	Electrical isolation	Current draw 5 V ¹⁾ 24 V ²⁾	I/O type	
								PCD2	PCD3 ³⁾
PCD2/3.E110	8 I	15...30 VDC			8 ms		12 mA		A
PCD2/3.E111	8 I	15...30 VDC			0.2 ms		12 mA		A
PCD2/3.E112	8 I	7.5...15 VDC			9 ms		12 mA		A
PCD2/3.E116	8 I	3.5...7 VDC			0.2 ms		12 mA		A
PCD2.E160	16 I	15...30 VDC			8 ms		50 mA		
PCD3.E160	16 I	15...30 VDC			8 ms		8 mA		D
PCD2/3.E161	16 I	15...30 VDC			0.2 ms		50 mA		D
PCD2.E165	16 I	15...30 VDC			8 ms		50 mA		
PCD3.E165	16 I	15...30 VDC			8 ms		8 mA		C
PCD2/3.E166	16 I	15...30 VDC			0.2 ms		50 mA		C
PCD2/3.E500	6 I	80...250 VAC			20 ms	■	1 mA		A
PCD2/3.E610	8 I	15...30 VDC			10 ms	■	12 mA		A
PCD2.E611	8 I	15...30 VDC			0.2 ms	■	12 mA		
PCD2/3.E613	8 I	30...60 VDC			9 ms	■	12 mA		A
PCD2.E616	8 I	3.5...7 VDC			0.2 ms	■	12 mA		
PCD2/3.A200	4 O, relay (make)		2 A/50 VDC	2 A/250 VAC		■	10 mA		A
PCD2.A210	4 O, relay (break) ⁴⁾		2 A/50 VDC	2 A/250 VAC		■	10 mA		
PCD2/3.A220	6 O, relay (make) ⁴⁾		2 A/50 VDC	2 A/250 VAC		■	10 mA		A
PCD2.A250	8 O, relay (make)		2 A/50 VDC	2 A/48 VAC		■	15 mA		
PCD3.A251	8 O, relay (6 changeover + 2 make)		2 A/50 VDC	2 A/48 VAC		■	15 mA		C
PCD2/3.A300	6 O, transistor		2 A/10...32 VDC				12 mA		A
PCD2/3.A400	8 O, transistor		0.5 A/5...32 VDC				15 mA		A
PCD2/3.A410	8 O, transistor		0.5 A/5...32 VDC			■	15 mA		A
PCD2.A460	16 O, transistor ⁵⁾		0.5 A/10...32 VDC				50 mA		
PCD3.A460	16 O, transistor ⁵⁾		0.5 A/10...32 VDC				8 mA		D
PCD2.A465	16 O, transistor ⁵⁾		0.5 A/10...32 VDC				50 mA		
PCD3.A465	16 O, transistor ⁵⁾		0.5 A/10...32 VDC				8 mA		C
PCD3.A810	4 O, relay (2 changeover + 2 make)		2 A/50 VDC	5 A/250 VAC		■	40 mA		F
Manual operation			2 A/50 VDC	6 A/250 VAC		■			
PCD3.A860	2 O, relay (make)		-	12 A/250 VAC		■	18 mA		G
Manual operation	2 I	15...30 VDC			8 ms				H
PCD2/3.B100	2 I + 2 O + 4 I or O selectable I or O	I: 15...32 VDC O: 0.5 A/5...32 VDC			8 ms		15 mA		A

The terminal connectors are provided with the modules

¹⁾ Pluggable I/O terminal connectors for PCD3 modules and cables are not included in the I/O module delivery pack and must be ordered separately

⁴⁾ With contact protection ⁵⁾ With short-circuit protection

PCD2.M5xxx
extension with PCD3
components



A manual control level can only be implemented on the PCD2 system series if the PCD3.C200 is used with PCD3.A810 and PCD3.W800 modules.

PCD3.A810
Relay outputs,
2 changeover/co and
2 make/no contacts



PCD3.A860
Light and shade
Relay outputs,
2 make/no contacts
and 2 inputs



PCD3.W800
4 analogue output
channels
(3 channels with
manual control)



Overview of analogue I/O modules

Customized multifunctional I/O modules

	Type	Total channels	Signal ranges	Resolution	Electrical isolation	Current draw		I/O type	
						5 V ¹⁾	24 V ²⁾	PCD2	PCD3 ³⁾
PCD2/3.W200	8 I		0...+10 V	10 bits		8 mA	5 mA		A
PCD2/3.W210	8 I		0...20 mA ⁴⁾	10 bits		8 mA	5 mA		A
PCD2/3.W220	8 I		Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	10 bits		8 mA	16 mA		A
PCD2.W220Z02	8 I		NTC 10 temperature sensors	10 bits		8 mA	16 mA		A
PCD3.W220Z03	8 I		NTC 10 temperature sensors	10 bits		8 mA	16 mA		A
PCD2/3.W220Z12	4 I + 4 I		4 I: 0...10 V and 4 I: Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	10 bits		8 mA	11 mA		A
PCD2/3.W300	8 I		0...+10 V	12 bits		8 mA	5 mA		A
PCD2/3.W310	8 I		0...20 mA ⁴⁾	12 bits		8 mA	5 mA		A
PCD2/3.W340	8 I		0...+10 V/0...20 mA ⁴⁾ Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	12 bits		8 mA	20 mA		A
PCD2/3.W350	8 I		Pt 100: -50 °C...+600 °C/Ni 100: -50 °C...+250 °C	12 bits		8 mA	30 mA		A
PCD2/3.W360	8 I		Pt 1000: -50 °C...+150 °C	12 bits		8 mA	20 mA		A
PCD2/3.W305	7 I		0...+10 V	12 bits	■	60 mA	0 mA		E
PCD2/3.W315	7 I		0...20 mA/4...20 mA, parameters can be set	12 bits	■	60 mA	0 mA		E
PCD2/3.W325	7 I		-10 V...+10 V	12 bits	■	60 mA	0 mA		E
PCD2/3.W400	4 O		0...+10 V	8 bits		1 mA	30 mA		A
PCD2/3.W410	4 O		0...+10 V/0...20 mA/4...20 mA jumper selectable	8 bits		1 mA	30 mA		A
PCD2/3.W600	4 O		0...+10 V	12 bits		4 mA	20 mA		A
PCD2/3.W610	4 O		0...+10 V/-10 V...+10 V/0...20 mA/4...20 mA jumper selectable	12 bits		110 mA	0 mA		A
PCD2/3.W605	6 O		0...+10 V	10 bits	■	110 mA	0 mA		E
PCD2/3.W615	4 O		0...20 mA/4...20 mA, parameters can be set	10 bits	■	55 mA	0 mA		E
PCD2/3.W625	6 O		-10 V...+10 V	10 bits	■	110 mA	0 mA		E
PCD2/3.W525	4 I + 2 O		I: 0...10 V, 0(4)...20 mA, Pt 1000, Pt 500 or Ni 1000 (selectable by DIP switch) O: 0...10 V or 0(4)...20 mA (selectable by software (FBox, FB))	I: 14 bits O: 12 bits	■	40 mA	0 mA		E
PCD3.W745	4 I		Temperature module for TC and 4-wire Pt/Ni	16 bits	■	200 mA	0 mA		⁴⁾
PCD3.W800	4 O		0...+10 V, short circuit proofed 3 of them manually operated	10 bits		45 mA	35 mA ⁵⁾		J

The terminal connectors are provided with the modules

³⁾ Pluggable I/O terminal connectors for PCD3 modules and cables are not included in the I/O module delivery pack and must be ordered separately

⁴⁾ +4...+20 mA via user program ⁵⁾ With 100% output and 3 kΩ load ⁶⁾ With soldered I/O spring terminal block

Capacity	PCD1	PCD2	PCD2.M48x	PCD2.M5xx0	PCD2.C2000	PCD3.Mxxx0	PCD3.C200	PCD3.Txxx
¹⁾ Internal 5 V bus	750 mA	1600 mA	2000 mA	1400 mA	1400 mA	600 mA	1500 mA	650 mA
²⁾ Internal + V bus	100 mA	200 mA	200 mA	800 mA	800 mA	100 mA	630 mA	100 mA

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

Labelling of PCD2.M5

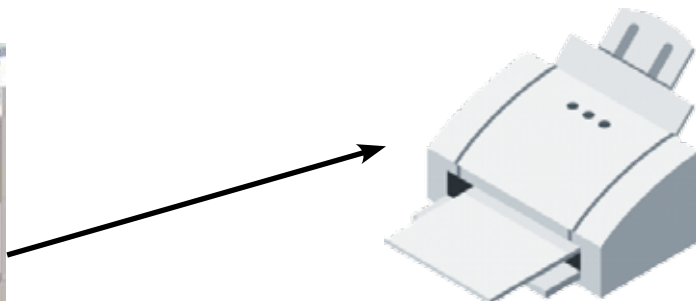
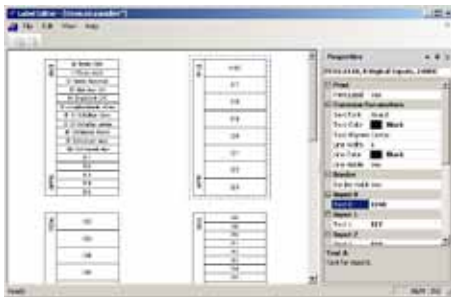


Fast labelling of I/O modules with the Saia® Label Creator

This software tool is used for the efficient inscribing of PCD2 label strips. The user enters unique data point texts in the tool. They can then be printed on A4 paper. For the different PCD2 module types, users can select a matching space format. Text entered can be stored and used again as a template.

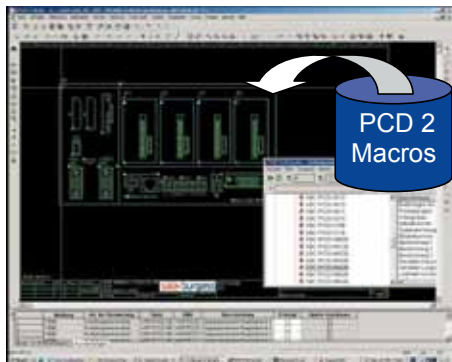
The Saia® Label Creator is supplied with the PG5 Controls-Suite package, or can be downloaded from the internet support site:

www.sbc-support.ch



Product macros for Saia® PCD2.M5

The PCD2.M5 series can be integrated into the system integrator's facility drawings. Designers can download ePLAN®electric P8 macros for Saia® products and copy them directly onto their CAD system wiring diagrams.



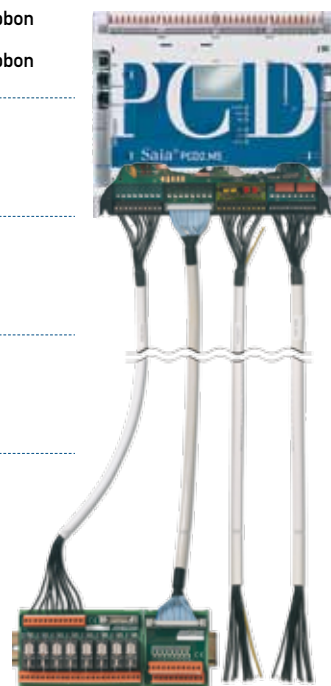
Downloading product macros immediately offers several advantages:

1. Designers waste no time copying parts lists, service plans, etc. because the macros in the ePLAN®electric P8file contain all the relevant product data.
2. As a result, design safety is increased, because errors in transmission can be excluded.
3. All data from wiring diagrams is available throughout subsequent design phases, for example, during the editing of documentation. All product-relevant graphics and master data are stored in the macro library. In addition, this data can be imported in DXF format from the library for processing in AutoCAD or another CAD system.

Download area: www.sbc-support.ch

Ordering information for PCD2.M5 accessories

Type	Description
450748170	Lithium battery for PCD processor unit and PCD7.D73 to ..D78 terminals (RENATA button battery type CR 2032)
	I/O extension
PCD2.C2000	Extension housing with 8 I/O module slots for external 24 Vdc supply
PCD3.C100	Module holder for 4 I/O modules
PCD3.C110	Module holder for 2 I/O modules
PCD3.C200	Module holder for 4 I/O modules with connection for external 24 Vdc supply
	Connector plug
PCD2.K010	Connector plug PCD2.C2000 ⇔ PCD2.C2000
PCD3.K010	Connector plug PCD3.M/T/C ⇔ PCD3.Cxxx
	Extension cables
PCD2.K100	Extension cable, length 0.5 m, PCD2.M ⇔ PCD2.C1x0, below of the base unit, max. gap 150 mm
PCD2.K106	Extension cable, length 0.7 m, PCD2.M ⇔ PCD2.C2000 or PCD3.C/T
PCD2.K110	Extension cable, length 0.7 m, PCD2.M ⇔ PCD2.C1x0, base unit mounted side-by-side
PCD2.K120	Extension cable, length 2 m, PCD2.M ⇔ PCD2.C1x0 (for coupling bus module)
PCD3.K106	Extension cable, length 0.7 m, PCD3.M/T/C ⇔ PCD3.C or PCD2.C2000 ⇔ PCD2.C2000
PCD3.K116	Extension cable, length 1.2 m, PCD3.M/T/C ⇔ PCD3.C or PCD2.C2000 ⇔ PCD2.C2000 (1.2 m)
	for analogue manual control modules PCD3.W800 (J-type plug)
PCD3.K800	Pluggable system cable 2.5 m, PCD side: 8-pole plug-in spring terminal block. Process side: free strands, numbered
	for relay outputs of analogue manual control modules PCD3.W810 (J-type plug)
PCD3.K810	Pluggable system cable 2.5 m, PCD side: 12-pole plug-in spring terminal block. Process side: free strands, numbered.
	Programming cable
PCD8.K111	Programming cable, D-type, 9-pole (PGU) ⇔ D-type, 9-pole (IBM) – also for S-Bus
PCD8.K120	Profi-S-Link adapter
PCD3.K225	Interface cable 2.5 m, PCD3.T76x Web-Server ⇔ PC
	Plug-in system cables (see chapter 9.4)
	for digital modules with 16 I/Os
PCD2.K221	Sheathed, round cable with 32 strands, each 0.25 mm ² , 1.5 m long, PCD side: 34-pole ribbon cable connector type D; process side: strand ends free, colour coded
PCD2.K223	Sheathed, round cable with 32 strands, each 0.25 mm ² , 3.0 m long, PCD-side 34-pole ribbon cable connector type D; process side: strand ends free, colour coded
	for adapters PCD2.K520/..K521/..K525
PCD2.K231	Sheathed, half-round cable with 34 strands, each 0.09 mm ² , 1.0 m long, both ends with 34-pole ribbon cable connector type D
PCD2.K232	Sheathed, half-round cable with 34 strands, each 0.09 mm ² , 2.0 m long, both ends with 34-pole ribbon cable connector type D
	for 2 adapters PCD2.K510/..K511 or 1 adapter and relay interface PCD2.K551
PCD2.K241	Sheathed, half-round cable with 34 strands, each 0.09 mm ² , 1.0 m long, PCD side: 34-pole ribbon cable connector type D; process side: two 16 pole ribbon cable connectors
PCD2.K242	Sheathed, half-round cable with 34 strands, each 0.09 mm ² , 2.0 m long, PCD side: 34-pole ribbon cable connector type D; process side: two 16 pole ribbon cable connectors
	for digital modules with 4, 6 / 8 I/Os or relay interface PCD2.K55x
PCD2.K261	Pluggable system cable 1.5 m, PCD side: 10-pole plug-in spring terminal block. Process side: free strands, numbered
PCD2.K263	Pluggable system cable 3 m, PCD side: 10-pole plug-in spring terminal block. Process side: free strands, numbered
	for analogue I/O modules and H modules
PCD2.K271	Sheathed, screened, round cable 1.5 m, PCD side: 10-pole plug-in spring terminal block. Process side: free strands, numbered
PCD2.K273	Sheathed, screened, round cable 3 m, PCD side: 10-pole plug-in spring terminal block. Process side: free strands, numbered
	for analogue modules PCD2.A250
PCD2.K281	Pluggable system cable 1.5 m, PCD side 14-pole plug-in spring terminal block. Process side: free strands, numbered
PCD2.K283	Pluggable system cable 3 m, PCD side: 14-pole plug-in spring terminal block. Process side: free strands, numbered
	Adapter «ribbon connector ⇔ screw terminals»
PCD2.K510	for 8 inputs/outputs, without LEDs, PCD side: 16-pole ribbon connector, process side 2 × 6 screw terminals
PCD2.K511	for 8 inputs/outputs, with LEDs (source operation only), PCD side: 16-pole ribbon connector, process side 2 × 6 screw terminals
PCD2.K520	for 16 inputs/outputs, without LEDs, PCD side: 34-pole ribbon connector, process side 2 × 10 screw terminals
PCD2.K521	for 16 inputs/outputs, with LEDs (source operation only), PCD side: 34-pole ribbon connector, process side 2 × 10 screw terminals
PCD2.K525	for 16 inputs/outputs, with LEDs (source operation only), PCD side: 34-pole ribbon connector, process side 3 × 16 screw terminals
PCD2.K551	Relay interface for 8 PCD transistor outputs with LEDs, PCD side: 16-pole ribbon connector or screw terminals, process side: 24 screw terminals
PCD2.K552	Relay interface for 8 PCD transistor outputs with LEDs and manual control mode (on-off-auto) and 1 output for acknowledging manual control mode, PCD side: 16-pole ribbon connector or screw terminals, process side: 24 screw terminals



6.4 Automation systems | PCD3

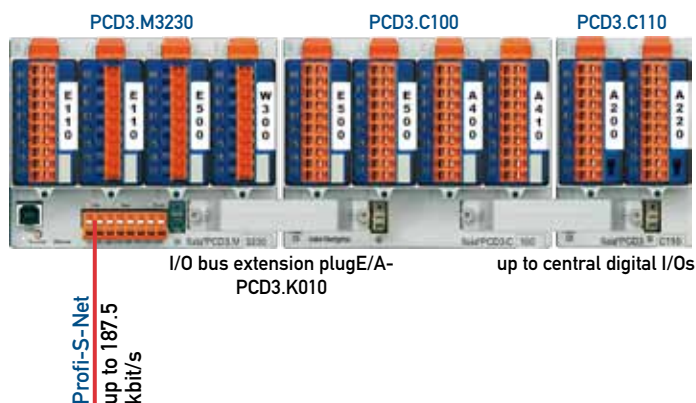
Modular device series, cassette design

The Saia® PCD3 series unites continuity with innovative ideas and new technology. As a result, it covers the performance/function spectrum of several conventional device series. It achieves this through a high degree of modularity in hardware and firmware.

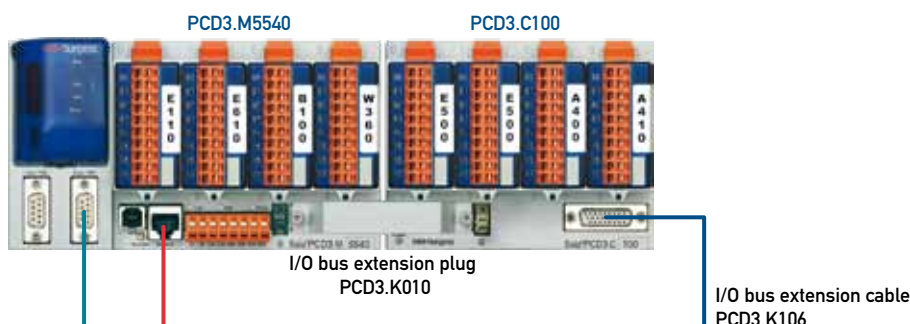
The fast main processor has been incorporated in the back-plate of the device, unlike comparable systems. Its capacity can be increased individually with plug-in co-processor modules and/or intelligent I/O modules. These have a direct, very fast bus connection to the main processor. The Saia® PCD3 series is therefore excellently prepared for the rapidly increasing demands on performance that are to be expected.

Configuration examples:

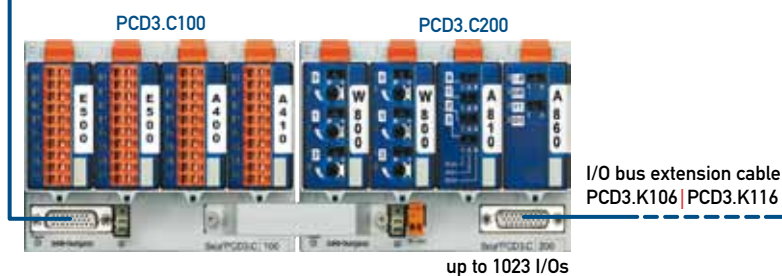
Single-row mounting of PCD3.M3xxx



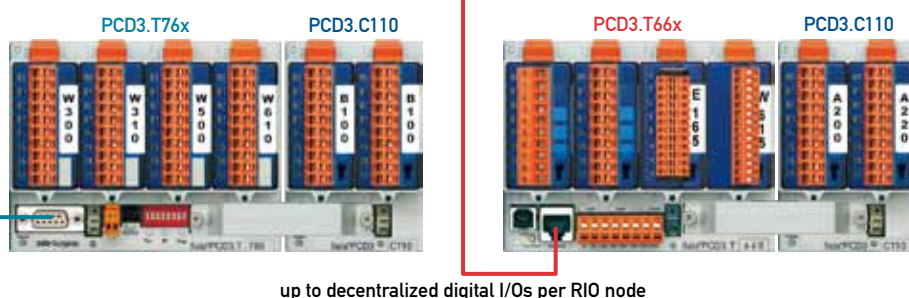
Multiple-row mounting of PCD3.M5xxx and decentralized RIO



Extension via I/O bus



Decentralized extension with PCD3.T76x RIOs via Profibus or Profi-S-Net or with PCD3.T66x Ethernet RIOs via Ethernet or Ether-S-Net



up to decentralized digital I/Os per RIO node

Overview of system components

PCD3.Mxxx0 for centralized and decentralized automation tasks

Up to 15 module holders PCD3.Cxxx can be attached to the PCD3.Mxxx0. Thus allows the user to connect up to 64 I/O-modules or 1023 digital I/O points. Every base unit has room for 4 data-point modules.

(see TI P+P26/397)

Integral ports in base units

PCD3.Mxxxx

- USB 1.1 (slave device) interface, for use as programming interface
- RS 485 port, up to 115.2 kbit/s, usable as free user interface or Profi-S-Net up to 187.5 kbit/s
- Ethernet-TCP/IP - with PCD3.M3120 / M3330/M5340/M5540/M6340 and M6540

PCD3.M5xxx/M6xxx in addition

- RS 232
- RS 422/RS 485 (with PCD3.M5340)
- Profi-S-Net (S-I/O, S-Bus) - with PCD3.M5340/M5x40 and M6x40 - up to 1.5 Mbit/s
- Controller Area Network (CAN 2.0B) - with PCD3.M6240 and PCD3.M6340
- Profibus DP Master - with PCD3.M6440 and PCD3.M6540

Optional

- Memory/Backup Flash Card
- BACnet/IP
- Battery module

Extension of input-/output capacity

PCD3.T760 and PCD3.T765 head stations (RIOs)

- PCD3.T76x head stations serve as remote peripheral nodes.
- Connection of up to 3 PCD3.Cxxx module holders per RIO node.

PCD3.C100 module holder

- 4 PCD3 module slots
- Extension module holder for PCD3.Mxxxx/Txxx/Cxxx and PCD2.Mxxx
- Additional PCD3.Cxxx devices connectable via extension cable/plug
- Indication of internal 5V supply voltage via LED

PCD3.C110 module holder

- 2 PCD3 module slots
- Extension module holder for PCD3.Mxxxx/Txxx/Cxxx and PCD2.Mxxx
- Indication of internal 5V supply voltage via LED

PCD3.C200 module holder with connecting terminals for 24 VDC power supply

- 4 PCD3 module slots
- Extension module holder for PCD3.Mxxxx/Txxx/Cxxx and PCD2.Mxxx
- Additional PCD3.Cxxx devices connectable via extension cable/plug
- Indication of internal 5 V supply voltage via LED
- Connecting terminals for 24 VDC power supply for all connected PCD3 I/O modules, plus any downstream PCD3.Cxxx module holders

Plentiful memory possibilities

(see SI P+P26/458)

- Up to 1 MByte RAM user memory (programs and data), buffer battery, for mid-range applications
- Up to 1 MByte flash on board for backing up user-specific data
- 1 MByte flash card (PCD7.R500) for user-program backups, optional
- 4 MByte flash-memory (PCD7.R550M04) with file system, optional
- Base module (PCD3.R600) for SD flash cards on I/O slots #0..3, optional

PCD3 I/O modules in cassette form (PCD3.Axxx/Exxx/Wxxx/Bxxx/Hxxx)

- More than 50 I/O modules available with differing functionalities
- Status of digital signals indicated via LEDs
- Uniform PG5 and STEP®7 support in all CPUs and RIOs via FBs and FBoxes

Connection technology: plug-in spring/screw terminal blocks or system cable

Connection of the I/O level is either via plug-in screw terminals or spring terminal blocks, or with plug-in system cable, or across a ribbon cable ↔ screw terminal adapter.

I/O terminal blocks and system cables are NOT included with I/O modules (except PCD3.W745).

They must be ordered separately.

(see page 125)

I/O bus extension plug and cables

- PCD2.K106: Extension cable 0.7 m
 - PCD3.K010: Extension plug
 - PCD3.K106: Extension cable 0.7 m
 - PCD3.K116: Extension cable 1.2 m
- PCD2.Mxxx ↔ PCD3.Cxxx
 PCD3.Mxxxx/T76x/Cxxx ↔ PCD3.Cxxx
 PCD3.Mxxxx/T76x/Cxxx ↔ PCD3.Cxxx
 PCD3.Mxxxx/T76x/Cxxx ↔ PCD3.Cxxx

Performance overview PCD3 series



PCD3.M3020



PCD3.M3230



PCD3.M3120



PCD3.M3330

Basic

Technical data CPUs

Number of inputs/outputs or I/O module sockets	64 4	1023 ¹⁾ 64
Extension module holder connector	no	yes
Processing time [µs]	0.3...1.5 µs 0.9 µs	0.3...1.5 µs 0.9 µs
Integrated Web server + USB + Date-time (RTC)	yes	yes

On-board memory

User memory (RAM)	128 KByte	512 KByte ²⁾
Backup memory flash	128 KByte on board	512 KByte on board ²⁾
Data protection	8 hours with SuperCap	8 hours with SuperCap

Optional memory

	up to 4 GByte	up to 4 GByte
--	---------------	---------------

On-board data interfaces

S 485 on terminal block (Profibus DP-Slave, Profi-S-Net (S-I/O, S-Bus))	up to 115.2 kBit/s or Profi-S-Net up to 187.5 kBit/s	up to 115.2 kBit/s or Profi-S-Net up to 187.5 kBit/s
USB 1.1	yes	yes
Ethernet-TCP/IP 10/100 MBit/s	with PCD3.M3120	with PCD3.M3330
RS 232 up to 115.2 kBit/s	no	no
RS 422/RS 485 on port #3	no	no
Profibus DP-Slave, Profi-S-Net (S-I/O, S-Bus), up to 1.5 MBit/s	no	no
Controller Area Network (CAN 2.0B)	no	no
Profibus DP Master up to 12 MBit/s	no	no

Optional data interfaces

	up to 8	up to 8
Optional PCD3.F1xx module for RS 232, RS 485, RS 422, TTY/20 mA and Belimo MP-Bus	only used on Slot #0	only used on Slot #0
Optional PCD3.F2xx modules for RS 232, RS 485, RS 422, TTY/20 mA and Belimo MP-Bus	Slot #0...3 up to 8 ports	Slot #0...3 up to 8 ports

General

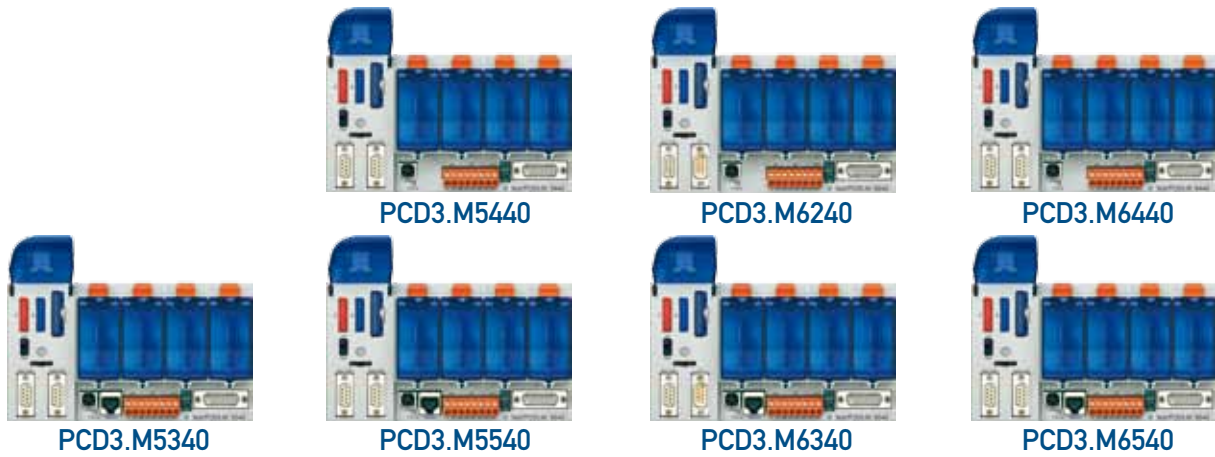
Supply voltage (according EN/IEC 61131-2)	24 Vdc -20/+25 % max. incl. 5 % ripples	24 Vdc -20/+25 % max. incl. 5 % ripples
Current draw from internal 5 V Bus/+V Bus	max. 600 mA/100 mA	max. 600 mA/100 mA
Programmable via USB	PG5 starting from version 1.4.100	PG5 starting from version 1.3.100

¹⁾ when using PCD3.Cxxx and digital I/O-modules with 16 I/Os each.

²⁾ starting from hardware (HW) version D + matching firmware (FW).

System resources

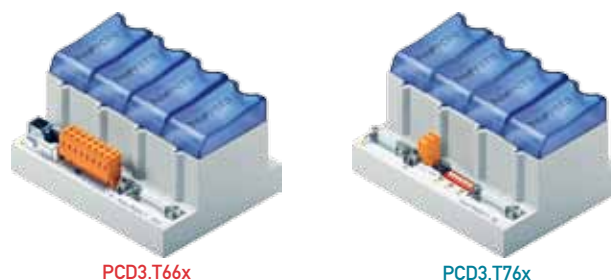
Flags	8192 × 1 bit, volatile or non-volatile, division programmable	Timing range:	31 bit, unsigned (0...2147483647) timing signals, selectable (10 ms to 10 s)
Registers	16384 × 32 bits, non volatile	Texts and DBs	8192
Computational ranges	Integers: -2147483648... +2147483647 (-2 ³¹ ...+2 ³¹ -1) Floating-point numbers: ±9.22337 × 10 ¹⁸ ...±5.42101 × 10 ⁻²⁰ Formats: decimal, binary, BCD, hexadecimal or floating point	Date-time (RTC)	Time values: s/min/h, week/day of week, month/day of month, year
Index registers	17 × 13 bit (1 each per COB and XOB)	Accuracy	better than 1 min/month
Timers/Counters	1600 volatile timers or non-volatile counters, division programmable	Power reserve	8 hours for PCD3.M3xx0 1 to 3 years for PCD3.M5xx0 and PCD3.M6xx0
Counting range	31 bit, unsigned (0...2147483647)		



Extended		CAN		DP Master
1023 ¹⁾ 64	1023 ¹⁾ 64	1023 ¹⁾ 64	1023 ¹⁾ 64	1023 ¹⁾ 64
yes	yes	yes	yes	yes
0.3...1.5 µs 0.9 µs	0.3...1.5 µs 0.9 µs	0.3...1.5 µs 0.9 µs	0.3...1.5 µs 0.9 µs	0.3...1.5 µs 0.9 µs
yes	yes	yes	yes	yes
1 MByte ²⁾ 1 MByte on board ²⁾	1 MByte ²⁾ 1 MByte on board ²⁾	1 MByte ²⁾ 1 MByte on board ²⁾	1 MByte ²⁾ 1 MByte on board ²⁾	1 MByte ²⁾ 1 MByte on board ²⁾
1...3 years with Lithium battery up to 4 GByte	1...3 years with Lithium battery up to 4 GByte	1...3 years with Lithium battery up to 4 GByte	1...3 years with Lithium battery up to 4 GByte	1...3 years with Lithium battery up to 4 GByte
5	4...5	4...5	4...5	4...5
bis 115.2 kBit/s oder Profi-S-Net bis 187.5 kBit/s	bis 115.2 kBit/s	bis 115.2 kBit/s oder Profi-S-Net bis 187.5 kBit/s	bis 115.2 kBit/s oder Profi-S-Net bis 187.5 kBit/s	bis 115.2 kBit/s oder Profi-S-Net bis 187.5 kBit/s
yes	yes	yes	yes	yes
yes	with PCD3.M5540	with PCD3.M6340	with PCD3.M6540	with PCD3.M6540
yes (on D-Sub)	yes (on D-Sub))	yes (on D-Sub)	yes (on D-Sub)	yes (on D-Sub)
yes (on D-Sub)	no	no	no	no
no	(on D-Sub)	no	no	no
no	no	yes (on D-Sub)	no	no
no	no	no	yes (on D-Sub)	yes (on D-Sub)
up to 8	up to 8	up to 8	up to 8	up to 8
only used on Slot #0	only used on Slot #0	only used on Slot #0	only used on Slot #0	only used on Slot #0
Slot #0...3 up to 8 ports	Slot #0...3 up to 8 ports	Slot #0...3 up to 8 ports	Slot #0...3 up to 8 ports	Slot #0...3 up to 8 ports
24 Vdc -20/+25% max. incl. 5% ripples max. 600 mA/100 mA	24 Vdc -20/+25% max. incl. 5% ripples max. 600 mA/100 mA	24 Vdc -20/+25% max. incl. 5% ripples max. 600 mA/100 mA	24 Vdc -20/+25% max. incl. 5% ripples max. 600 mA/100 mA	24 Vdc -20/+25% max. incl. 5% ripples max. 600 mA/100 mA
PG5 starting from version 1.4.120	PG5 starting from version 1.3.100	PG5 starting from version 1.4.100	PG5 starting from version 1.4.100	PG5 starting from version 1.4.120

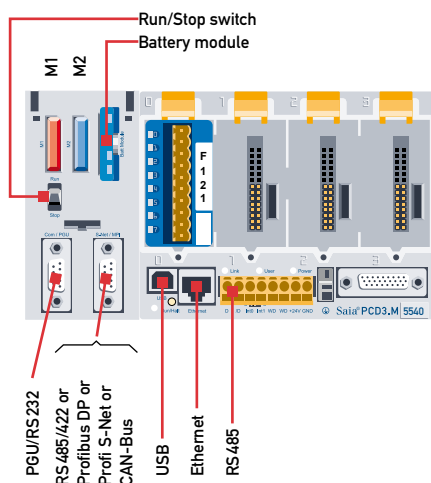
PCD3 decentralized remote I/O nodes (RIOs)

The PCD3.T76x head stations are described in chapter 7.



PCD3 interfaces

OnBoard interfaces



Protocols supported

Optional interfaces can be used to run the following protocols:

- Modem communication with the PCD FBox library
- HMI editor applications with PCD7.Dxxx text terminals (only with RS 232 interface)
- Seriell SNet
- JCI N2 - Bus
- DALI
- Belimo MP-Bus
- KNX® S-Mode/EIB
- EnOcean

Other protocols (drivers from third-party suppliers) are the responsibility of the manufacturer (e.g. restriction mode only up to 9600 bps).

Transmission speeds supported:

- 1200, 2400, 4800, 9600, 19200, 38400, 56700, 115200 bps.

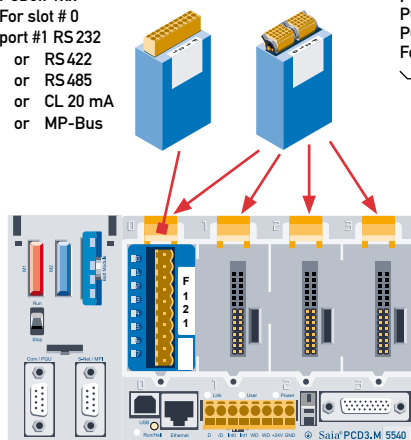
System-dependent characteristics of PCD3.F2xx modules:

The following points should be noted when using PCD3.F2xx interface modules.

- For each PCD system, a max. of 4 PCD3.F2xx modules (8 interfaces) can be inserted in slots #0...#3.
- The PCD3 system has a powerful processor to look after both the application and the serial interfaces. Processing the interface modules requires adequate CPU power. When determining the maximum communications power per PCD3 system, the following should be taken into account:

Optional interfaces

PCD3.F1xx
For slot # 0
port #1 RS 232
or RS 422
or RS 485
or CL 20 mA
or MP-Bus



PCD3.F221 → RS 232
PCD3.F210 → RS 422/RS 485
PCD3.F210 → MP-Bus
For slot #0...#3

PCD3.F221 → RS 232
PCD3.F210 → RS 422/RS 485
PCD3.F281 → MP-Bus
For slot n°#0...#3

Both modules can be equipped with a PCD7.F1xx module for an additional serial interface. PCD7.F1xx.

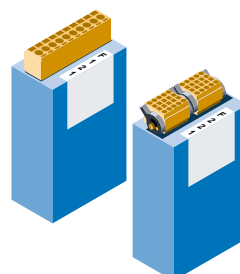
Both modules can be equipped with a PCD7.F1xx module for an additional serial interface.

- The communications volume is determined by peripheral devices connected. For example, this is the case if the PCD3 is being used as an S-Bus **slave station**. If a PCD3 controller is bombarded with heavy telegram traffic at high baud rates, there will not be much CPU capacity left for processing the actual application. The following rules apply here: The use of 8 interfaces with 9.6 kbps will take up approx. 50 percent of CPU capacity. Two interfaces with 57.6 kbps will also take up approx. 50 percent of CPU capacity. Two interfaces with 115 kbps will need around 60 percent of CPU capacity.
- If the PCD3 is the initiator of communication, the volume of communication and with it the communication capacity is determined by the user program in the PCD3 (PCD3 used as **master station**). In theory, all interfaces can run at the top baud rate of 115 kbps. Actual data throughput, however, depends on the user program and number of interfaces, and may therefore be small. It is crucial for any peripheral devices to be capable of running with the chosen configuration and communications capacity.

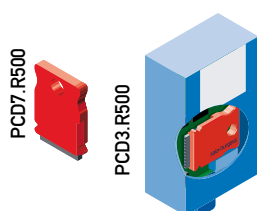
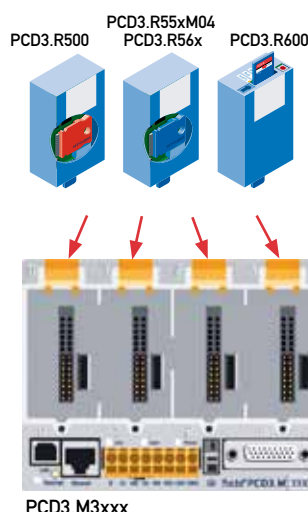
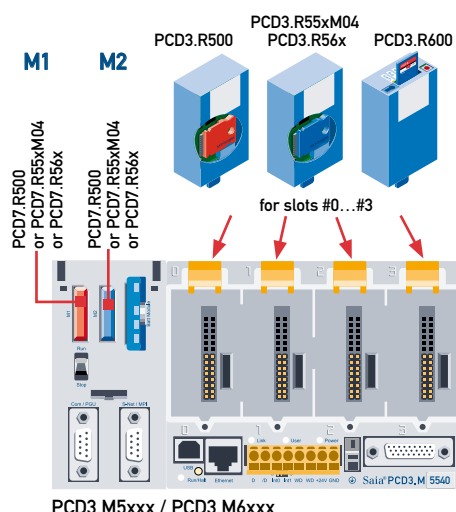
For these reasons we recommend that communications applications with a large number of interfaces and high transmission speeds should first be discussed with a local Saia agent.

Ordering information

Type	Description	
Communication modules		
PCD3.F110	Serial interface RS 422/RS 485	These modules are only used on I/O slot #0 and have one serial interface. Required connector type: A All PCD3.F1xx modules can be equipped with a PCD7.R5xx flash memory module.
PCD3.F121	Serial interface RS 232/Modem	
PCD3.F130	Serial interface CL 20 mA	
PCD3.F150	Serial interface RS 485 electrically isolated	
PCD3.F180	Serial interface Belimo MP-Bus	
PCD3.F221	Serial interface RS 232	These modules are used on I/O slot #0...#3 and have max. two serial interfaces. Required connector type: K All PCD3.F2xx modules can be equipped with one PCD7.F1xx interface module.
PCD3.F210	Serial interface RS 422/RS 485	
PCD3.F281	Serial interface Belimo MP-Bus	



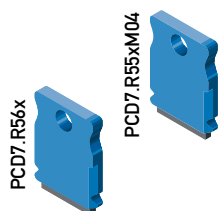
PCD3 flash memory modules



Flash memories for program and data backup

PCD7.R500 1 MByte flash card on slot M1 or M2 of PCD3.M5xx0 and PCD3.M6xx0 CPUs
 PCD3.R500 1 MByte flash module on any CPU I/O slot of all PCD3.M3xx0 CPUs.
 One module can be used per PCD3 CPU.

Note:
 PCD7.R5xx cards can also be fitted into PCD3.F1xx communication interface modules (see page 120).



Flash memories with file system, programm- and data-backup, BACnet Option

Pluggable flash memory cards PCD7.R5xx on slot M1 or/and M2 of PCD3.M5xx0 CPUs

PCD7.R550M04 4 MByte flash card module with file system
 PCD7.R551M04 4 MByte flash card with 3 MByte file system and 1 MByte program backup
 PCD7.R560 Flash card module with BACnet-Option
 PCD7.R561 Flash card module with BACnet-Option, 1 MByte file system and 1 MByte program backup



Pluggable flash memory modules PCD7.R5xx on CPU I/O module slots of all PCD3.Mxxx0 CPUs

With type designation PCD3.R5xx such modules can also be fitted into CPU I/O slots #0...#3. With this modules a memory extension of PCD3.M3xx0 CPUs is possible. Four modules can be used per PCD3 CPU.

PCD3.R550M04 4 MByte flash module with file system
 PCD3.R551M04 4 MByte flash module with 3 MByte file system and 1 MByte program backup
 PCD3.R560 2 MByte flash module with BACnet option
 PCD3.R561 2 MByte flash module with BACnet option, 1 MByte file system and 1 MByte program backup

Note:
 PCD7.R5xx cards can also be fitted into PCD3.F1xx communication interface modules (see page 120).

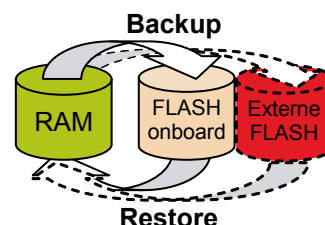


PCD3 basic module for SD flash memory cards with file system

PCD3.R600 Up to 4 modules can be fitted into the CPU I/O slots #0...#3.
 PCD7.R-SD256 Saia®SD flash memory card 256 MByte with file system
 PCD7.R-SD512 Saia®SD flash memory card 512 MByte with file system

Program backup into flash memory

PG5 can be used to load an application program into flash memory. All hardware settings will also be saved to flash. A flash card has priority over the onboard flash.



Maximum number of I/O modules per PCD

PCD type	Maximum number of I/O modules			Maximum number of digital I/Os		
	Base CPU/RIO	PCD3.Cxxx extension	Total	Base CPU/RIO	PCD3.Cxxx extension	Total
PCD2.M12x PCD2.M15x	8	8	16	128	127	255
PCD2.M17x	8	24	32	128	382	510
PCD2.M48x PCD2.M5xxx	8	56	64	128	895	1023
PCD3.M3x3x PCD3.M5xxx PCD3.M6xxx	4	60	64	64	959	1023
PCD3.T76x (RIO)	4	12	16	64	191	256

Overview of digital input/output modules PCD3

Type	Total I/Os	Input voltage	Output breaking capacity DC	Output breaking capacity AC	Input filter	Electrical isolation	Internal current draw		I/O connector-type ³⁾
							5 V ¹⁾	24 V ²⁾	
PCD3.E110	8 I	15...30 VDC			8 ms		12 mA		A
PCD3.E111	8 I	15...30 VDC			0.2 ms		12 mA		A
PCD3.E112	8 I	7.5...15 VDC			9 ms		12 mA		A
PCD3.E116	8 I	3.5...7 VDC			0.2 ms		12 mA		A
PCD3.E160	16 I	15...30 VDC			8 ms		8 mA		D
PCD3.E161	16 I	15...30 VDC			0.2 ms		8 mA		D
PCD3.E165	16 I	15...30 VDC			8 ms		8 mA		C
PCD3.E166	16 I	15...30 VDC			0.2 ms		8 mA		C
PCD3.E500	6 I	80...250 VAC			20 ms	■	1 mA		A
PCD3.E610	8 I	15...30 VDC			10 ms	■	12 mA		A
PCD3.E613	8 I	30...60 VDC			9 ms	■	12 mA		A
PCD3.A200	4 O, relay (make/no)		2 A/50 VDC	2 A/250 VAC		■	10 mA		A
PCD3.A210	4 O, relay (break/nc)		2 A/50 VDC	2 A/250 VAC		■	10 mA		A
PCD3.A220	6 O, relay (make/no)		2 A/50 VDC	2 A/250 VAC		■	10 mA		A
PCD3.A251	8 O, relay (6 changeover/ co + 2 make/no)		2 A/50 VDC	2 A/48 VAC		■	15 mA		C
PCD3.A300	6 O, transistor		2 A/10...32 VDC				15 mA		A
PCD3.A400	8 O, transistor		0.5 A/5...32 VDC				15 mA		A
PCD3.A410	8 O, transistor		0.5 A/5...32 VDC			■	15 mA		A
PCD3.A460	16 O, transistor		0.5 A/10...32 VDC				8 mA		D
PCD3.A465	16 O, transistor		0.5 A/10...32 VDC				8 mA		C
PCD3.A810	4 A, relay (2 changeover/ co + 2 make/no)		2 A/50 VDC	5 A/250 VAC		■	40 mA		F
PCD3.A860	2 O, relay (make/no)		-	12A/250 VAC		■	18 mA		G
manual control	2 I	15...30 VDC			8 ms				H
PCD3.B100	2 I + 2 O + 4 selectable I or O	I:15...32 VDC	0.5 A/5...32 VDC		8 ms		15 mA		A

³⁾ Plug-in I/O terminal blocks and cables (see page 95) are not included with I/O modules. They must be ordered separately

Digital and analogue relay modules with manual control

PCD3.A810

Relay outputs,
2 changeover/co and
2 make/no contacts



PCD3.A860

Light and shade
relay outputs
2 make/no contacts
and 2 inputs



PCD3.W800

4 Analogue outputs
(3 channels with
manual control)



Details see P+P26/388

Overview of analogue input/output modules PCD3

Type	Total I/Os	Signal ranges	Resolution	Electrical isolation	Internal current draw 5 V ¹⁾ 24 V ²⁾		I/O connector type ³⁾
PCD3.W200	8 I	0...+10 V	10 Bit		8 mA	5 mA	A
PCD3.W210	8 I	0...20 mA	10 Bit		8 mA	5 mA	A
PCD3.W220	8 I	Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	10 Bit		8 mA	16 mA	A
PCD3.W220Z03	8 I	NTC 10 temperature sensor	10 Bit		8 mA	16 mA	A
PCD3.W220Z12	4 I + 4 I	4 I: 0...10 V 4 I: Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	10 Bit 10 Bit		8 mA	11 mA	A A
PCD3.W300	8 I	0...+10 V	12 Bit		8 mA	5 mA	A
PCD3.W310	8 I	0...20 mA	12 Bit		8 mA	5 mA	A
PCD3.W340	8 I	0...+10 V/0...20 mA ⁴⁾ Pt 1000: -50 °C...400 °C/Ni 1000: -50 °C...+200 °C	12 Bit		8 mA	20 mA	A
PCD3.W350	8 I	Pt 100: -50 °C...+600 °C/Ni 100: -50 °C...+250 °C	12 Bit		8 mA	30 mA	A
PCD3.W360	8 I	Pt 1000: -50 °C...+150 °C	12 Bit		8 mA	20 mA	A
PCD3.W305	7 I	0...+10 V	12 Bit	■	60 mA	0 mA	E
PCD3.W315	7 I	0...20 mA/4...20 mA parameters can be set	12 Bit	■	60 mA	0 mA	E
PCD3.W325	7 I	-10 V...+10 V	12 Bit	■	60 mA	0 mA	E
PCD3.W400	4 O	0...+10 V	8 Bit		1 mA	30 mA	A
PCD3.W410	4 O	0...+10 V/0...20 mA/4...20 mA jumper selectable	8 Bit		1 mA	30 mA	A
PCD3.W600	4 O	0...+10 V	12 Bit		4 mA	20 mA	A
PCD3.W610	4 O	0...+10 V/-10 V...+10 V/0...20 mA/4...20 mA jumper selectable	12 Bit		110 mA	0 mA	A
PCD3.W605	6 O	0...+10 V	10 Bit	■	110 mA	0 mA	E
PCD3.W615	4 O	0...20 mA/4...20 mA parameters can be set	10 Bit	■	55 mA	0 mA	E
PCD3.W625	6 O	-10 V...+10 V	10 Bit	■	110 mA	0 mA	E
PCD2.W525	4 I + 2 O	I: 0...10 V, 0(4)...20 mA, Pt 1000, Pt 500 or Ni 1000 (selectable by DIP switch) O: 0...10 V or 0(4)...20 mA (selectable by software (FBox, FB))	I: 14 Bit O: 12 Bit	■	40 mA	0 mA	E
PCD3.W745	4 I	Temperature module for TC and 4-wire Pt/Ni	16 Bit	■	200 mA	0 mA	⁴⁾
PCD3.W800	4 O	0...+10 V, short circuit proofed 3 of them manually operated	10 Bit		45 mA	35 mA ⁵⁾	J

³⁾ Plug-in I/O terminal blocks and cables (see page 95) are not included with I/O modules. They must be ordered separately

⁴⁾ 4...20 mA via user program ⁵⁾ At 100% output value and 3 kΩ load ⁶⁾ With soldered I/O spring terminal block

Capacity	PCD1	PCD2	PCD2.M48x	PCD2.M5xx0	PCD2.C2000	PCD3.Mxxx0	PCD3.C200	PCD3.Txxx
¹⁾ Internal 5 V bus	750 mA	1600 mA	2000 mA	1400 mA	1400 mA	600 mA	1500 mA	650 mA
²⁾ Internal + V bus	100 mA	200 mA	200 mA	800 mA	800 mA	100 mA	630 mA	100 mA

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

PCD3.R010 battery kit (for PCD3.M3xxx)

Consists of:

- Battery module for slot #3 only
- Lithium battery CR2032 (buffer time 1...3 years)



Labelling accessories



Addressing and marking I/O modules and module holders

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

- 0...3 (PCD3.Mxxxx /T76x/C100, C200)
- 0...1 (PCD3.C110)

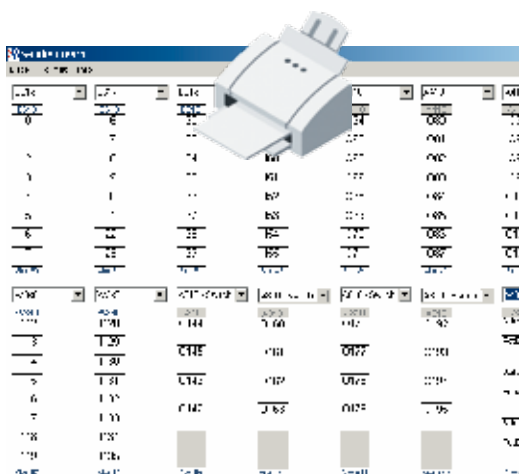
The inscription carrier supplied 2 can either be used for additional labelling of the module holders, or for the I/O modules themselves. They are blank and, depending on requirements, may either be inscribed by hand or by means of preprinted adhesive strips 1.

The connection diagram printed on the side of each I/O module 3 not only makes wiring easier, it also helps during commissioning. On the opposite side of the cassette sufficient space is available 4 for the user to add his own labelling.

5 Additional labelling on front panel

Since summer 2005 all PCD3 module types can be labelled on the front panel.

Optional, neutral labels with a snap-on cover (clip) are available for this purpose.



Fast labelling of I/O modules with the Saia® Label Creator

This software tool is used to inscribe PCD3 label clips efficiently. The user enters unique data-point texts in the tool. These can then be printed on the A4 master sheet. For the different types of PCD3 modules, the user selects formats with the corresponding spacing. Text entered and all standard text parameters (such as size, colour and font) can then be stored and reused as a master.

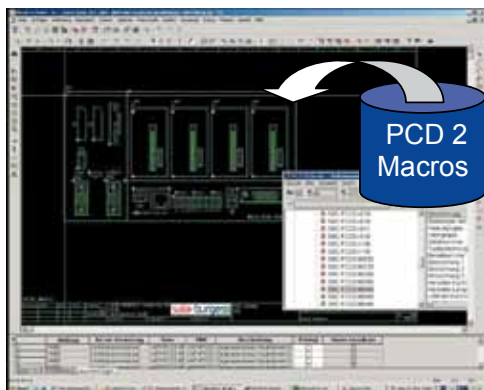
The Saia® Label Creator is supplied with PG5 Controls-Suite, but may also be downloaded from the Internet support site:

www.sbc-support.ch

Special tools

Saia® PCD3 Product macros

From May, our PCD3 Series will be integrated even better in the drawings of our customers: the constructor will be able to download the ePLAN® electric P8 macros for our products now and to copy them directly in his CAD system and his circuit diagrams.



Downloading product macros offers multiple advantages at once. First of all, the constructor no longer wastes time in copying the part lists, maintenance schedules, etc., as the macros from the ePLAN® electric P8 file contain all relevant product data. As a result, the construction safety increases because of transmission errors being avoided – a second advantage. In the third place, all data of the switchgears are available throughout the subsequent engineering stages, for instance when documentation must be compiled. All product-related graphs and master data are stored in the macro library. These data moreover can be imported from the library in DXF format and edited in AutoCAD or other CAD systems.

Download area: www.sbc-support.ch

Ordering information

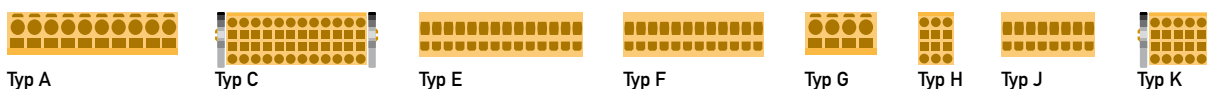
Type Description

Accessories

PCD3.R010	PCD3.R010 battery kit (for PCD3.M3xxx)
4 639 48980	Battery holder module (for PCD3.M5xxx)
4 507 48170	Lithium battery
PCD3.E009	Empty PCD3 module (for unequipped sockets)
4 104 75150	I/O slot cover (for unequipped sockets)
4 405 49950	Spring terminal block 8-pole for power supply PCD3.Mxxx0
4 405 49520	Screw terminal block 2-pole for power supply PCD3.C200
4 405 50050	Bolting device to screw terminal block 2-pole for power supply PCD3.C200



Terminal blocks, Inscription



4 405 49540	1 Plug-in I/O spring terminal block, 10-pole for wiring up to 2.5 mm ² (type A)
4 405 49560	1 Plug-in I/O spring terminal block, 24-pole for wiring up to 1.0 mm ² (type C)
4 405 49980	1 Plug-in I/O spring terminal block, 14-pole for wiring up to 1.5 mm ² (type E)
4 405 49360	1 Plug-in I/O spring terminal block, 12-pole for PCD3.A810 for wiring up to 1.5 mm ² (type F)
4 405 50270	1 Plug-in I/O spring terminal block, 4-pole for PCD3.A860 for wiring up to 2.5 mm ² (type G)
4 405 50280	1 Plug-in I/O spring terminal block, 6-pole for PCD3.A860 for wiring up to 1.0 mm ² (type H)
4 405 49340	1 Plug-in I/O spring terminal block, 8-pole for PCD3.W800 for wiring up to 1.5 mm ² (type J)
4 405 50480	1 Plug-in I/O spring terminal block, 10-pole for wiring up to 1.0 mm ² (type K)
4 310 87230	Set of 10 pcs.: cover including neutral inscription labels (2 × DIN A4)
4 329 48190	Set of 10 pcs.: snap-on inscription carrier for modules
4 310 86860	Set of 10 pcs.: Preprinted adhesive strips for inscription carrier 4 329 48190

Plug-in system cables for manual control/emergency



PCD3.K810	for PCD3.A810 manual control modules with 4 relay outputs 12 strands, each 1.0 mm ² , held together with cable binders, 2.5 m long. PCD side: 12-pole, plug-in spring terminal block type F, process side: strand ends free, numbered
PCD3.K860	for PCD3.A860 light and shade modules 4 strands, each 1.5 mm ² , held together with cable binders, 2.5 m long. PCD side: 4-pole, plug-in spring terminal block type G, process side: strand ends free, numbered
PCD3.K861	6 strands, each 0.75 mm ² , held together with cable binders, 2.5 m long. PCD side: 6-pole, plug-in spring terminal block type H, process side: strand ends free, numbered
PCD3.K800	for PCD3.W800 manual control modules with 4 analogue output channels 8 strands, each 1.0 mm ² , held together with cable binders, 2.5 m long. PCD side: 8-pole, plug-in spring terminal block type J, process side: strand ends free, numbered

System cables and ribbon ↔ screw terminals adapters (see chapter 9.4)

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



Ribbon ↔ screw terminals adapters

PCD2.K510	for 8 inputs or 8 outputs, with 20 screw terminals, without LEDs
PCD2.K511	for 8 inputs or 8 outputs, with 20 screw terminals and with LEDs (source operation only)
PCD2.K520	for 16 inputs or 16 outputs, with 20 screw terminals, without LEDs
PCD2.K521	for 16 inputs or 16 outputs, with 20 screw terminals and with LEDs (source operation only)
PCD2.K525	for 16 inputs or 16 outputs, with 3 × 16 screw terminals and with LEDs (source operation only)
PCD2.K551	for 8 PCD transistor outputs, relay interface with 24 screw terminals and with LEDs
PCD2.K552	for 8 transistor outputs, relay interface with 24 screw terminals, LEDs, manual control mode (switch on-off-auto) and 1 output for acknowledgement of manual control mode

6.5 Automation systems | PCD3.M2130V6 Compact – Ethernet Controller

Measuring less than 8 cm in depth, the PCD3.Compact fits neatly into the smallest environments with a configuration that covers all small industrial and special applications. It includes all the new features of PCD3 technology, such as its communication capabilities (http direct), Web-Server, file system...

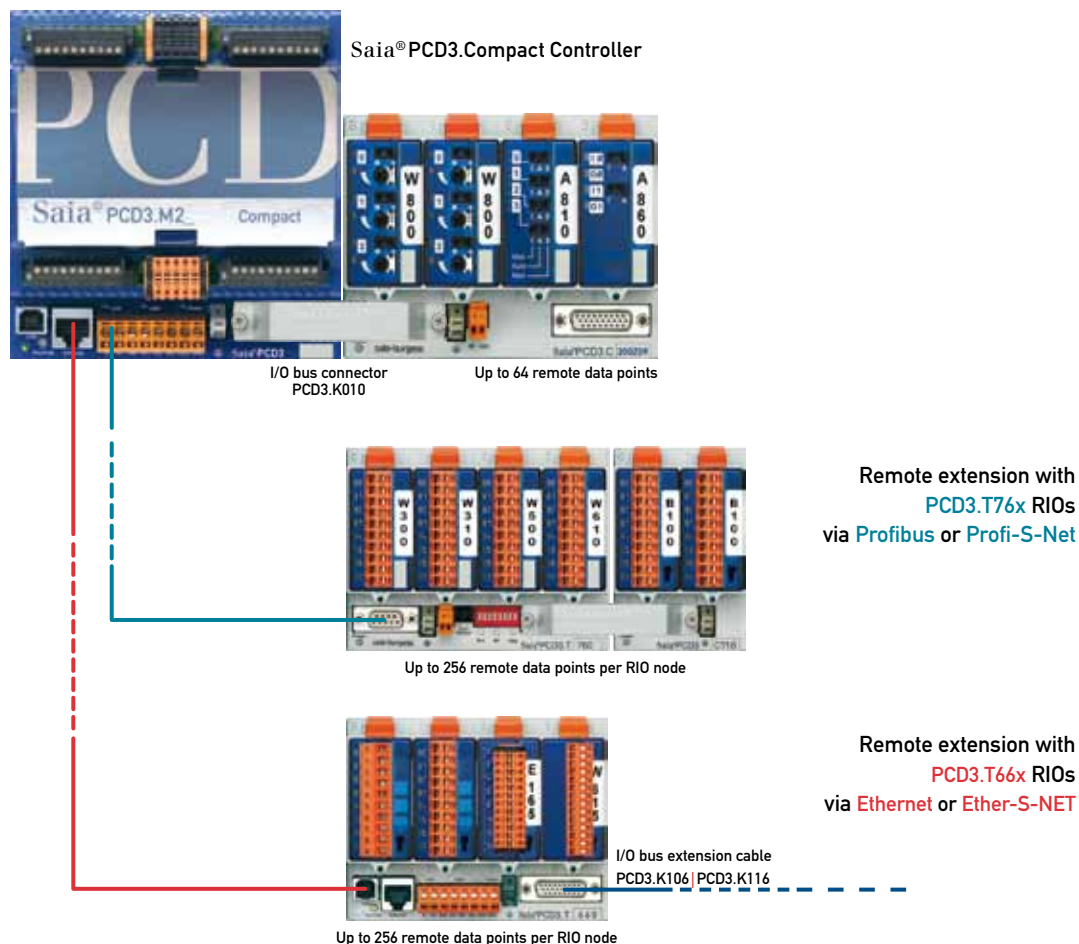
- Freely programmable with PG5 1.4 and/or PG5 2.0
- Compact size: 130 × 140 × 74 mm (W × H × D)
- Integral communications interfaces: USB, Ethernet and RS485
- Slot A for optional PCD7.F1xx serial communications modules
- 38 inputs/outputs already in base unit
- Changeable lithium battery
- Configurable analogue inputs for voltage, current and temperature
- Expandable with PCD3.C200 or PCD3.C110 I/O module holder
- Decentralized I/O extension with remote I/O PCD3.T660 (Ethernet) or PCD3.T760 (Profi-S-I/O)

General technical data

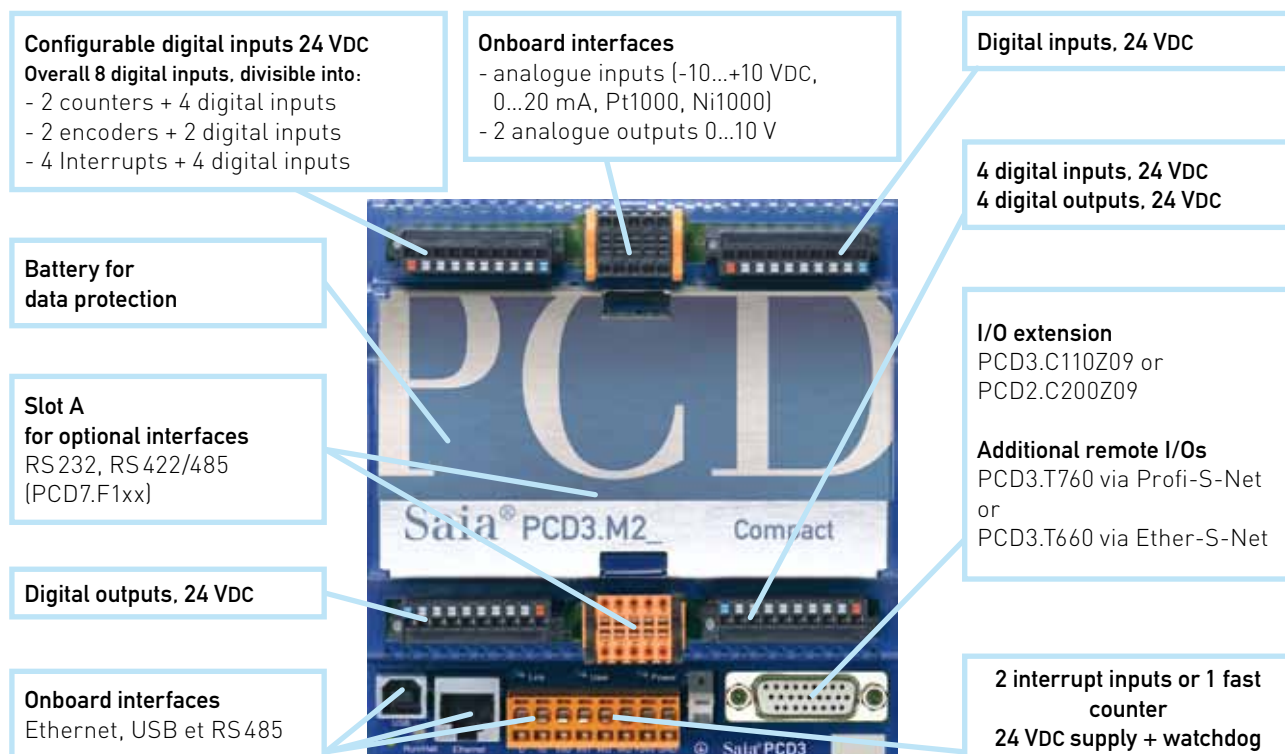
Power supply

Supply voltage (according to EN / IEC 61 131-2)	24 VDC –20 / +25 % inc. 5 % ripple
Current draw / Watt consumption	typ. 175 mA / 4.2 W max. 500 mA / 12 W
Loading capacity 5 V / 24 V intern	max. 600 mA / 100 mA
Short interruptions (according to EN / IEC 61 131-2)	≤ 10 ms at interval ≥ 1 s
Watchdog relay, make contact	48 VAC or VDC 1), 1 A

Configuration examples:



Technical data Saia®PCD3.Compact



PCD3.Compact I/O data points

Type	Number	Input voltage VDC	Signal ranges	Breaking capacity VDC	Resolution	I/O connector type
Digital inputs	20	15...30				plug-in screw terminals
Digital outputs transistor	12			0.5 A/5...32		or «push-in» terminals with LED (optional)
Analogue inputs configurable	4		-10 V...+10 V / 0...20 mA Pt/Ni 1000, Ni 1000 L&S, Resistance 0...2500 Ω		13 Bit / 12 Bit	plug-in spring terminal
Analogue outputs	2		0...10 V		12 Bit	plug-in spring terminal

Ordering information

Type	Description
PCD3.M2130V6	Base units with 38 data points (with plug-in terminal block) CPU with 512 Kbytes user program, backup with onboard Flash memory, 1 MByte File System, USB port for programming with PG5, RS 485, 2 Interrupts, integral Web & FTP server, 1 port (socket A) for communications interface PCD7.F1xx, lithium battery, Ethernet TCP/IP
PCD3.M2030V6	Same as PCD3.M2130V6 but without Ethernet TCP/IP
440550660	Optional pluggable «push-in» terminal block with LED, 10 poles for digital I/Os
440550790	Optional pluggable «push-in» terminal block with LED, 3 × 10 poles (3 wires connection) for digital I/Os

I/O extensions

PCD3.C110	2 module slots (connection with PCD3.K106/K116 cable only)	0 mA
PCD3.C200	4 module slots, with 24 VDC supply (connection with PCD3.K106/K116 cable only)	1500 mA / 630 mA (5 VDC / 24 VDC)
PCD3.C110Z09	2 module slots (connection with PCD3.K010 plug only)	0 mA
PCD3.C200Z09	4 module slots, with 24 VDC supply (connection cable with PCD3.K010 plug only)	1500 mA / 630 mA (5 VDC / 24 VDC)

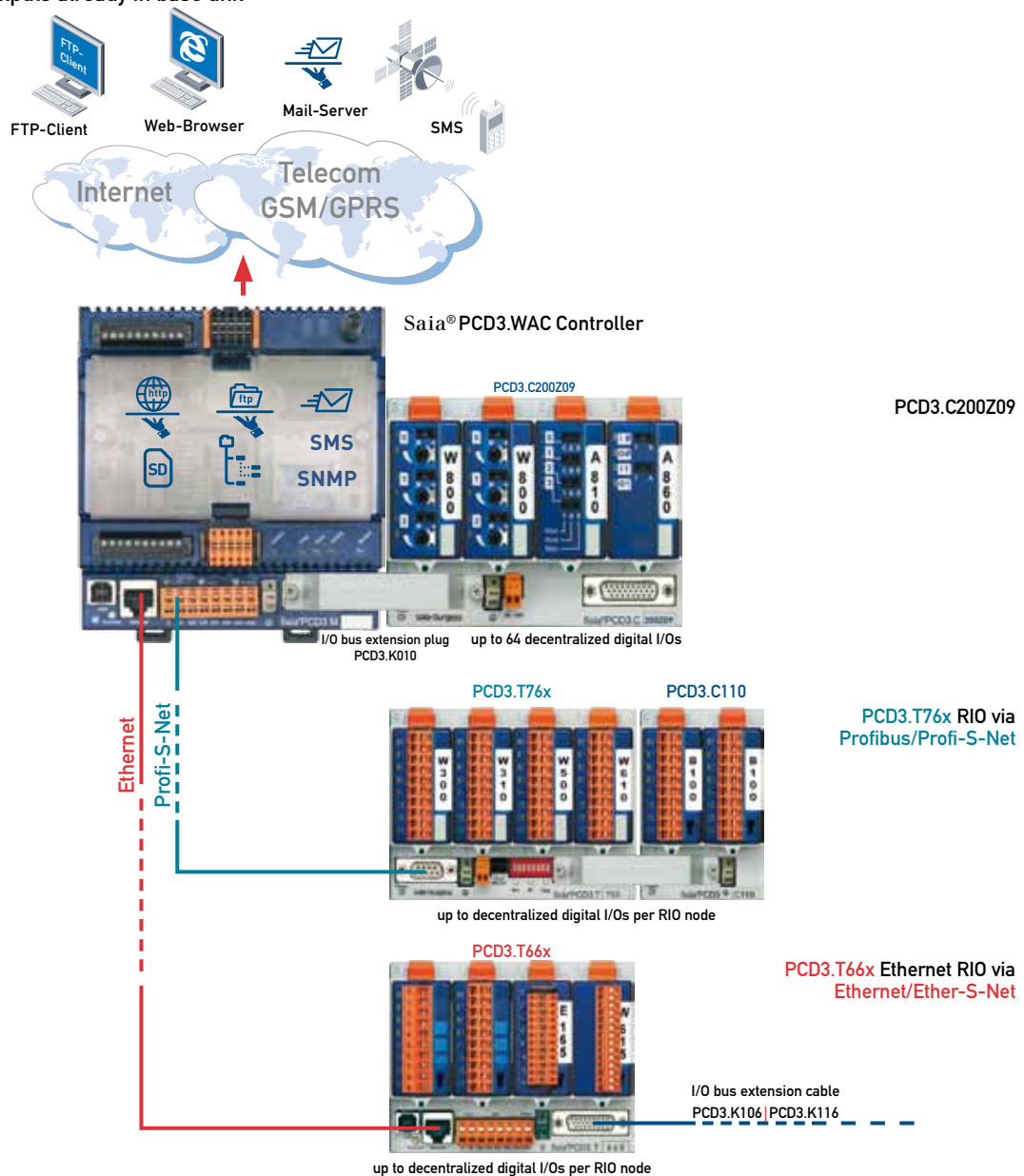
6.6 Automations systems | PCD3 Wide Area Controller System overview

Compact but capable of modular expansion

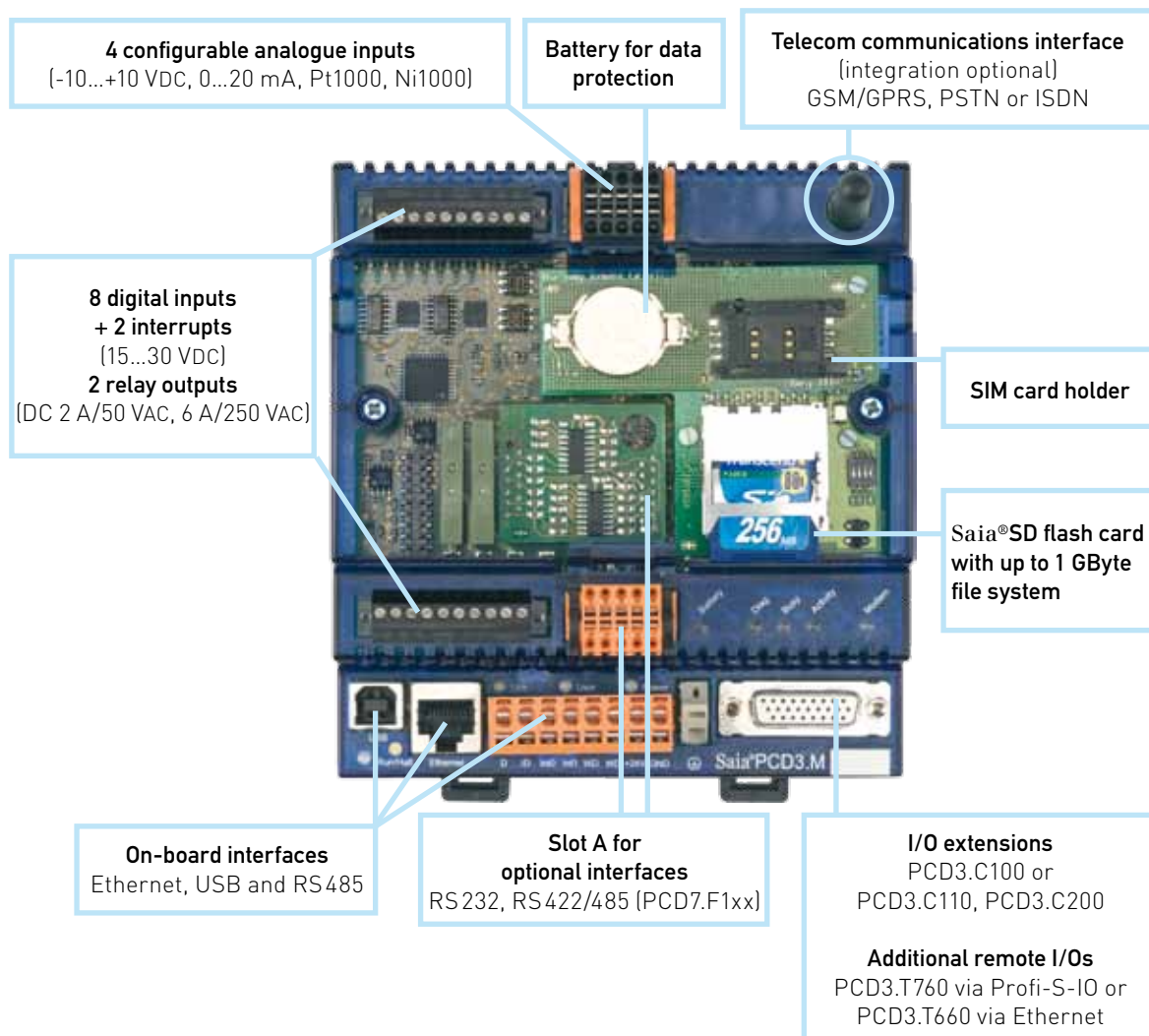
Saia® PCD3 Wide Area Controllers are freely programmable, industrial devices for control and automation with web, IT and telecommunications functions. Its potential uses therefore extend much further than those of a classical RTU station, which is normally only suitable for alarm monitoring with remote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

It is not only compact in size, but also in its all-in-one functionality. The compact size of this device means that space will be found for it even in the smallest control cabinet. It is therefore ideal for the upgrading of existing installations.

- Freely programmable with PG5 2.0
- Compact size: 130 × 140 × 74 mm (W × H × D)
- Management of history data with up to 1 GByte flash memory
- Integral telecom interface (ISDN, PSTN, GSM/GPRS)
- Always available, thanks to redundant communication
- 14 inputs/outputs already in base unit



Technical data



Type	Description
PCD3.M2330A4T1	with PSTN modem
PCD3.M2330A4T3	with ISDN modem
PCD3.M2330A4T5	with GSM/GPRS modem *
PCD3.M2230A4T5	with GSM/GPRS modem, without Ethernet *

* without antenna

Accessories



Type	Description
PCD7.K840	GSM/GPRS dual Band 900/1800 Antenne mit Magnetfuss
PCD3.K010	Extension plug
4405 50660	Optional pluggable «push-in» terminal block with LED, 10 poles for digital I/Os
4405 50790	Optional pluggable «push-in» terminal block with LED, 3 x 10 poles (3 wires connection) for digital I/Os

Performance overview

CPU technology

RAM as user program memory	512 Kbytes
Back-up memory (Flash)	512 Kbytes
Memory for file system (Flash)	1 MByte (on board)
Operating system	Saia®NT operating system
PCD media	8192 Flags / 16'384 × 32 bit registers

Data storage



Integrated SD card slot for	Saia®SD card with up to 1 Gbytes file system
Writing cycles	600'000
Data files	Download and upload via ftp
Up to 1000 files with Saia® file system	
PCD7.R-SD256	Saia®SD flash memory card, 256 MByte with file system
PCD7.R-SD512	Saia®SD flash memory card, 512 MByte with file system
PCD7.R-SD1024	Saia®SD flash memory card, 1024 MByte with file system

Telecom communication interfaces (alternative interfaces for integration)

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

Internet and Intranet protocols

HTTP Server	Visualization with web browser and Web-Panel
FTP Server	Easy exchange of data
TCP/IP-PPP Point to Point Protocol	Efficient communication
SMTP Client	Sending e-mails with files (e.g. log files) as attachment
DHCP and DNS Client	Easy integration into IP networks
SNTP Client	Synchronization of the internal clock
SNMP Server/Client	Network management (in preparation)

Communications interfaces to field level, on board

RS485 for free protocols or Profibus slave, Profi-S-Net	≤ 115 kBit/s or ≤ 187.5 kBit/s
USB 1.1 slave device	≤ 12 MBit/s
Ethernet-TCP/IP	0 10/100 MBit/s

Communications interfaces to field level, options in slot A



PCD7.F110	RS422 with RTS/CTS or RS485 electrically connected, with line termination resistors capable of activation. Suitable for Modbus, SBus, EnOcean etc.
PCD7.F121	RS232 with RTS/CTS, DTR/DSR, DCD. Suitable for modem, EIB, DALI connection
PCD7.F150	RS485 electrically isolated, with line termination resistors capable of activation
PCD7.F180	Belimo® MP bus (RS232), for connection of up to 8 drives.

Field level protocols

Serial-S-Bus, Ether-S-Bus and Profi-S-Bus
 MODBUS RTU or TCP EIB M-Bus IEC 870-5-101/103/104
 For other protocols please refer to chapter 2

I/O Data points

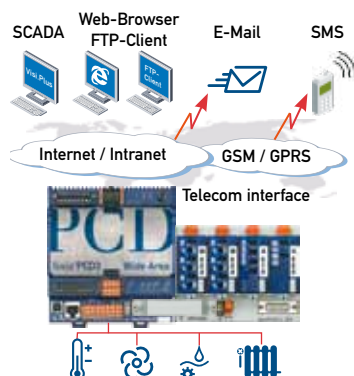
8 Digital Inputs + 2 Interrupt	15...30 VDC
2 Relay Outputs	DC 2 A/50 V, AC 6 A/250 V
4 Analog inputs configurable	-10...+10 VDC, 0...±20 mA, Pt1000, Ni1000, Ni1000 L&S, 0...2.5 kΩ

I/O data points optional



PCD3.C110	2 module slots (connection with PCD3.K106/K116 cable only)	0 mA
PCD3.C200	4 module slots, with 24 VDC supply (connection with PCD3.K106/K116 cable only)	1500 mA / 630 mA (5 VDC / 24 VDC)
PCD3.C110Z09	2 module slots (connection with PCD3.K010 plug cable only)	0 mA
PCD3.C200Z09	4 module slots, with 24 VDC supply (connection with PCD3.K010 plug cable only)	1500 mA / 630 mA (5 VDC / 24 VDC)

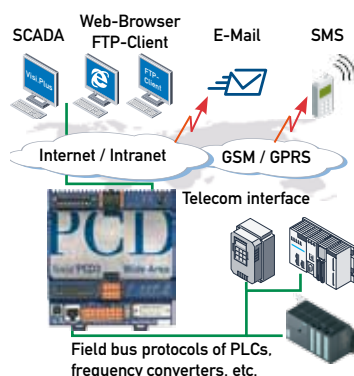
Application examples



PCD3.WAC as RTU controller

Send SMS messages and emails through the GSM/GPRS network. Use the PCD3.WAC with local IO and bring messages, states or alarms to the SCADA system or, by email and SMS, to the end user.

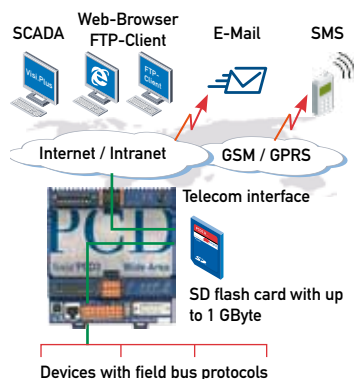
Via integrated web and FTP servers, external stations are easily brought together across internet and intranet. The integrated web server also permits access to external stations via standard web browsers.



WAC communications gateway:

With integrated protocols like FTP, HTTP, or by using open data mode, Ethernet, or a serial interface, the Saia®PCD3.WAC can be used for non Saia systems as a communications gateway to internet or intranet applications.

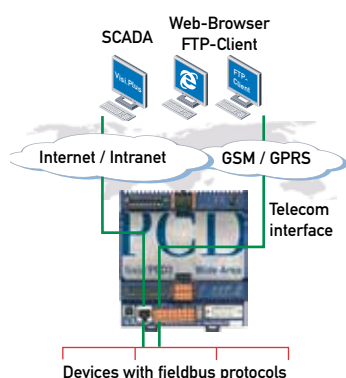
At the field level, there is the benefit of numerous field bus protocols like Modbus TCP/RTU/ ASCII, EIB, M-Bus, ...



Ready for data management:

With up to 1 Gbyte memory, the Saia®PCD3.WAC has enough memory to store data received from the field level over a long period. This data can be processed directly by the Saia®PCD and then transferred to the management or supervision system by email, FTP, HTTP or data communication. This makes the Saia®PCD3 Wide Area Controller independent of management stations and therefore suitable as a data concentrator.

Many potential uses can be found wherever measurements are taken, transferred or monitored, wherever states are monitored and reported, and wherever remote operation and access are required.



Always reachable with redundant communication:

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

6.7 Adapter board Staefa Integral NRUF/A – NRUE/A

The Integral AS 1000 system was discontinued by Siemens Building Technologies in 2003. Since numerous examples of this product were built into the technical systems of buildings, there exists an acute need for action regarding replacement devices, system conversion and extension.

To deal with this problem, a Staefa Integral AS 1000 adapter board was developed that can be speedily inserted when any replacement is required, without converting the control cabinet. Since the adapter board can be equipped with a PCD2.M5540, there are practically no limits to its range of use. Installation is even possible according to BACnet/IP without problem.

Features:

Existing control cabinet infrastructure and all field devices can remain in place.

- With the adapter board, the integral system connector can be compatibly exchanged
- Universal adjustment of active, passive, non-isolated or isolated inputs via jumpers on the adapter board
- Data point extension on adapter board with standard PCD2 data point cards
- The adapter board has a variety of separately fused electric circuits
- By using the PCD2.M5540 with Ethernet on board, communications links can be implemented with higher ranking BACnet systems
- Web based operator guidance for old installations is easily achieved with Saia®Web-Panels

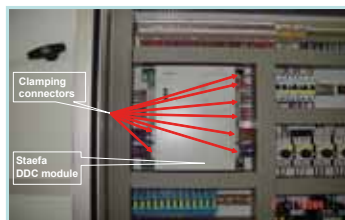


Ordering information

Type	Description
R.ADAP-BOARD	Staefa-Saia® Adaption Board
R.ADAP-SYSTEM2	PCD2.M5540 system for R.ADAP-BOARD comprising: 1 × PCD2.M5540, 2 × PCD2.W400, 1 × PCD2.E110, 2 × PCD2.A400, analogue input cards and interface cards are options and can be added according to detailed technical description.

Step-by-step retrofit on Saia® PCD system:

1



- Switch cabinet with Staefa DDC module before start of the system change

2



- The existing clamping connectors can be used without modifying the connections of all inputs and outputs with the adapter board

3



- Adapter connector of the clamping connectors of the DDC module Staefa
- Clamping connectors from the adapter board to the new Saia® DDC module

4



- Adapter board mounted

5



- New module mounted on the adapter board

6

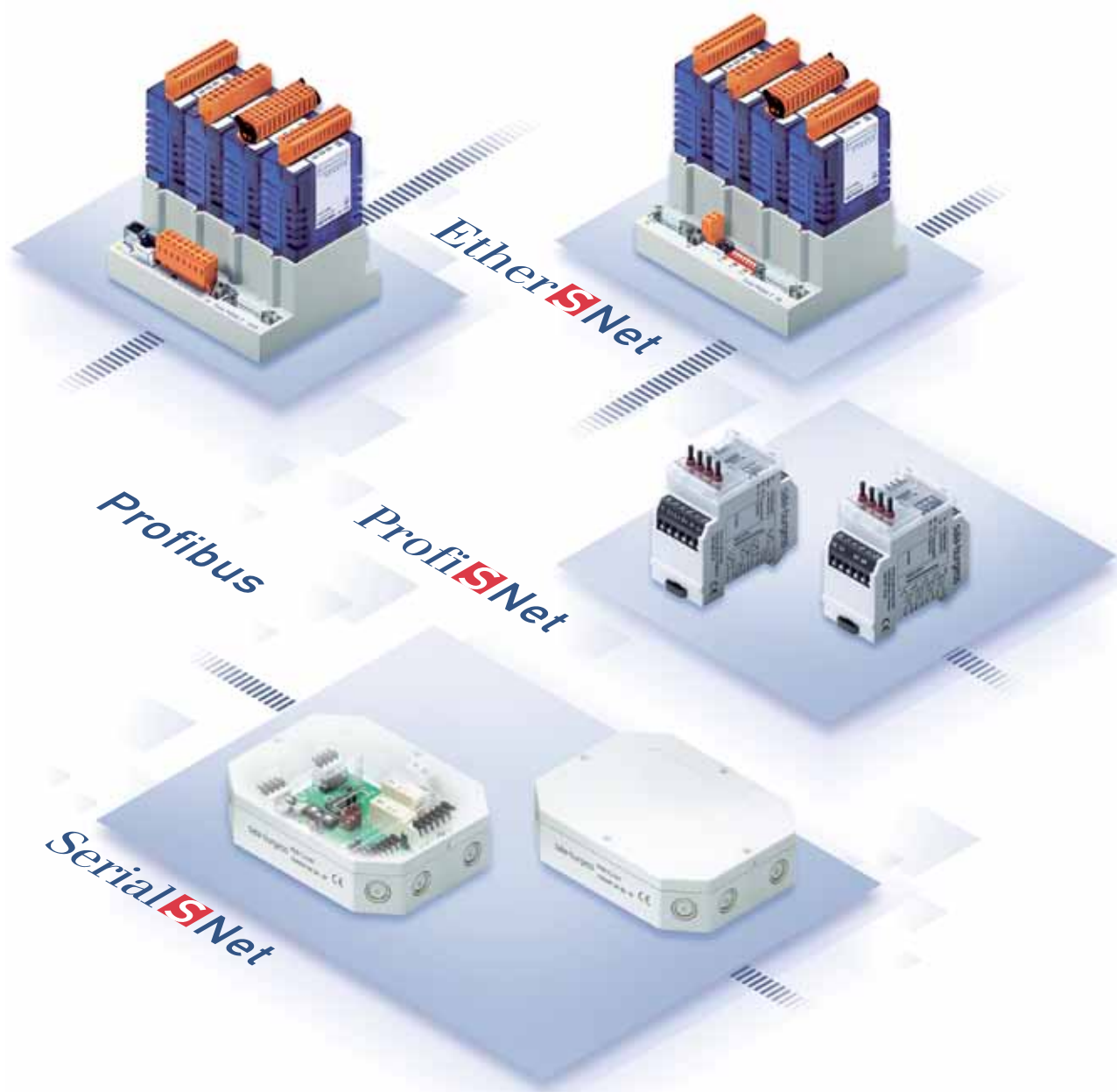


The adapter board makes it happen:

- The entire hardware of the old switch cabinet as well as the old field devices can be used without modifications!

7 Remote data points

Chapter	Page
7.1 Remote input/output modules Serial S-Net (S-Bus)	136
7.2 Remote devices PCD3.T76x (Profi-S-Net-RI0)	139
7.3 Remote devices PCD3.T660 (Ethernet-RI0)	140



7.1 Remote data points: Remote input/output modules for Serial S-Net (S-Bus)

Type RAIL – the switchboard solution

The RAIL-module is extremely expandable. Bridge plugs quickly and easily connect bus and supply voltage between the modules.



RAIL module

Their compact construction allows small units to be built up on site to form an optimum system. Thus these devices save much time and space while being more useful and efficient. These small field bus modules are very well suited for being built into switchboards and sub-distributors.



RAIL modules in a Spelsberg housing

The RAIL-module can also be mounted in series in an IP66 housing for decentralized field assembly.

Type SAFE – the decentralized solution

The SAFE-module really is what the name promises, for the rugged reliable module can do much more than others. Safely built into a nicely shaped shock and water-resistant housing (water-jet protection IP65) the device provides extremely precise data services. The installation is made above casting, under floor, in between ceilings, in cable or balustrade canals, or on the sensor.



SAFE module

In spite of all its compactness, the SAFE-module can be installed quickly and comfortably: The 40 mm flat octagonal housing has got a simple above-casting assembly. By bayonet closings the lid can be opened or closed at once with a 90° turn.

Features of remote input/output modules

- Connection via simple two-wire line
- Automatic recognition of operating mode/Baud rate
- Serial S-Net connection with data and parity mode
- RAIL: Switch cabinet model for mounting on 35 mm DIN rail
- SAFE: Protected model for surface mounting with protection class IP65
- With manual control level and feedback via the bus
- State indication by LED

Use of slaves in Serial S-Net

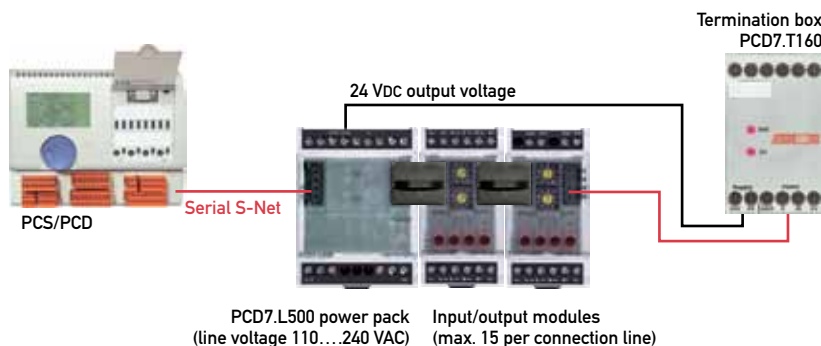
Slaves may be RIOs (remote input/output modules), external devices (e.g. electronic power meters) or PCD stations. When doing this the electric load of the Serial S-Net must be looked after. RAIL and SAFE remote input/output modules have a high impedance and load the Serial S-Net only slightly. Therefore up to 100 of these slaves can be used in one segment (without repeater).

Total PCD systems (inc. master PCD) and RIOs on one S-Bus branch

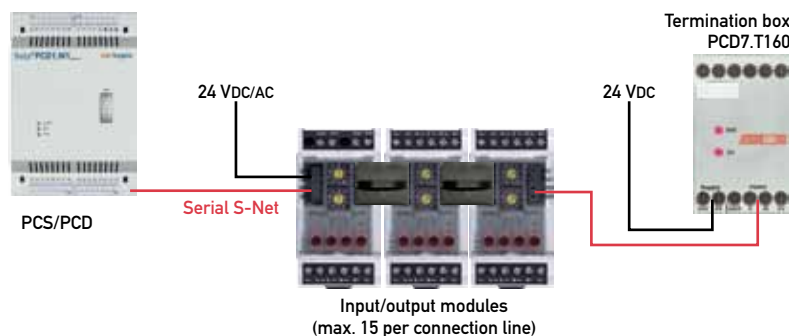
Total PCD	Total RIO	Total PCD	Total RIO	Total PCD	Total RIO	Total PCD	Total RIO
0...7	100	14	72	21	44	28	16
8	96	15	68	22	40	29	12
9	92	16	64	23	36	30	8
10	88	17	60	24	32	31	4
11	84	18	56	25	28	32	0
12	80	19	52	26	24		
13	76	20	48	27	20		

Examples, system structure Serial S-Net (S-Bus)

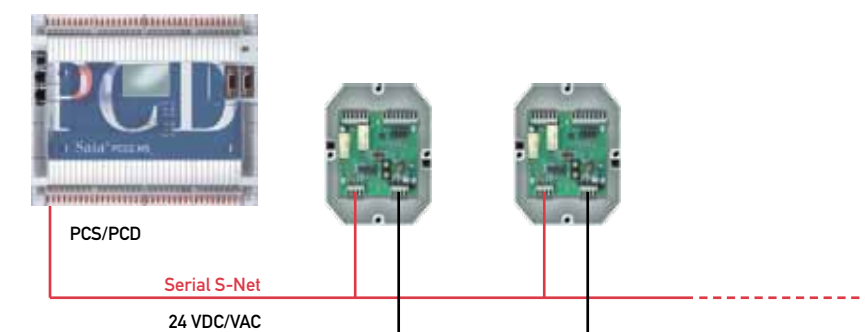
RAIL modules with **Serial S-Net** connection, power pack PCD7.L500 and termination box PCD7.T160



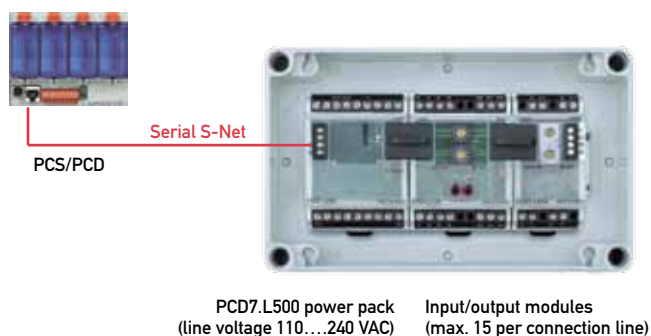
RAIL modules with **Serial S-Net** connection, separate module supply and termination box PCD7.T160



SAFE modules with **Serial S-Net** connection and separate module supply



RAIL modules with **Serial S-Net** connection and power pack PCD7.L500 mounted in series in an IP66 serial connector housing



Ordering information RAIL/SAFE

Serial S-Net RAIL (mounting on DIN top-hat rail)

Type	Description
PCD7.L100	Input module with 4 digital inputs 24 VDC/VAC, with manual switch
PCD7.L110	Input module with 4 digital inputs 24 VDC/VAC, without manual switch
PCD7.L120	Input/Output module with 2 relays 250 VAC and 4 digital inputs 24 VDC/VAC
PCD7.L130	Input module with 10 digital inputs 24 VDC/VAC
PCD7.L200	Output module with 4 relays, 250 VAC, 6 A
PCD7.L210	Output module with 4 triacs 24...250 VAC, 0.8 A
PCD7.L300	Analogue module with 4 inputs each of Pt 1000 and 0...10 VDC
PCD7.L310	Analogue module with 4 inputs each of Ni 1000 and 0...10 VDC
PCD7.L400	Analogue module with 4 outputs 0...10 VDC



Serial S-Net SAFE (surface mounted)

Type	Description
PCD7.L121	Input/Output module with 2 relays 250 VAC and 4 digital inputs 24 VDC/VAC



Power pack 230 VAC/24 VDC

Type	Description
PCD7.L500	For supply of all RAIL and SAFE modules, 240 VAC/24 VDC/700 mA, max. 15 modules



Example: Serial connector housing for surface mounting, IP 66, from Spelsberg

Type	Description
Rk 4/07	100×110×90 IP 66 with 35 mm DIN rail for max. 2 RAIL-modules
Rk 4/018K	180×110×90 IP 66 with 35 mm DIN rail for max. 4 RAIL-modules
...	Please consult manufacturers' catalogues for other housing types. These housings are not available from Saia-Burgess Controls.



* www.spelsberg.com

7.2 PCD3.T76x remote devices (Profibus-RIO)

The PCD3.T76x head station serves as a remote peripheral node. These compact PCD3 RIOs snap onto 35 mm DIN rail and can be equipped with PCD3 I/O modules. Up to 3 PCD3.Cxxx module holders can be connected to the PCD3.T76x. This means that the user can connect a maximum of 16 I/O modules or 256 inputs/outputs per RIO node.



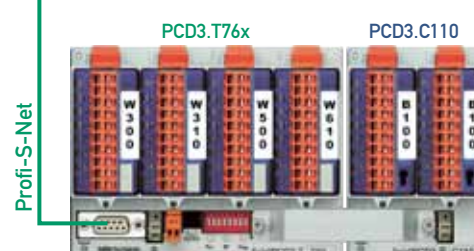
PCD2.M480



PCD3.M5540



up to 256 decentralized digital I/Os per RIO node



up to 256 decentralized digital I/Os per RIO node

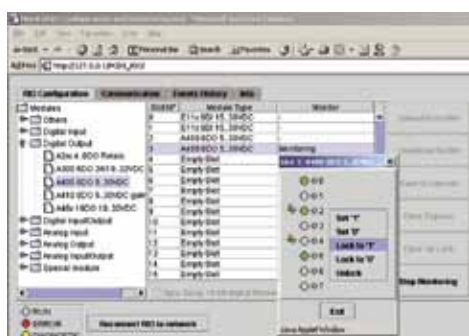
Extension with
PCD3.T76x RIO
via Profibus or
Profibus-S-Net

Profibus-S-Net

Profibus-S-Net

Web server for commissioning, diagnosis and service

The integral web server in the PCD3.T76x offers users the greatest advantages during commissioning, diagnosis and service. Access is via a widely known, easy to operate, standard web browser. Across RS232 or Profibus-S-Net, the user has access not only to the predefined equipment and specific system HTML pages, but also to all information data in the RIOs. This makes it easy to check the states of all I/O signals (digital/analogue/counters), and specifically modify these input/output states with a mouse click (Java applet «MonitoRIO», see illustration).



Technical data RIO head station	PCD3.T760	PCD3.T765 (on demand)
Number of inputs/outputs	256 ¹⁾	256 ¹⁾
I/O module slots	16 ²⁾	16 ²⁾
Extension connection	yes	yes
Profibus DP < 1.5 Mbits/s	DPV0	DPV0
User web server memory	128 KByte flash	128 KByte flash
Plug-in technology	–	yes
General		
Supply voltage	24 VDC ±20% smoothed or 19 VAC ±15% full-wave rectified	
Loading capacity 5V/24V-Bus	max. 650 mA/100 mA	

¹⁾ When using digital I/O modules with 16 I/Os each.

²⁾ With PCD3.Cxxx module holders.

Ordering information to PCD3.T76x accessories

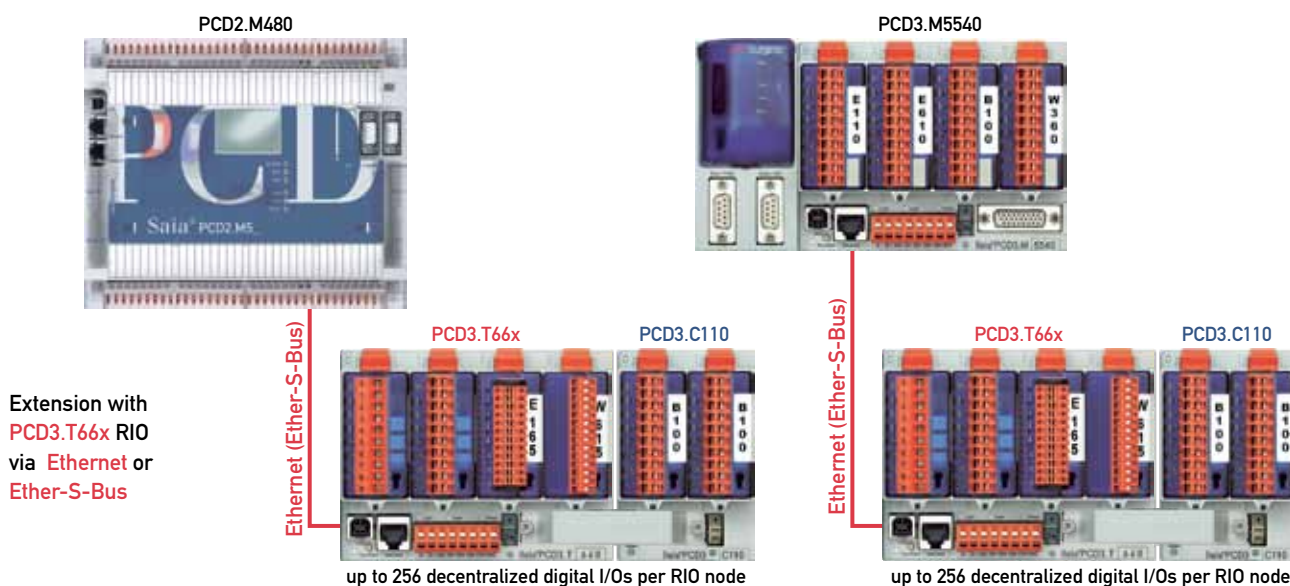
Type	Description
Accessories for the configuration of the PCD3 RIOs	
PCD3.K225	Interface cable PCD3.T76x Web server to PC (2.5 m); RIO configuration cable

7.3 PCD3.T660 remote devices (Ethernet-RIO)

The PCD3 Ethernet RIO extends the PCD3 system family and enables efficient decentralisation of automation tasks. The configuration and management of RIO nodes are handled centrally by the master station. This enables simple commissioning and support of the RIO stations. Communication is handled by the Ether-S-Bus protocol. This data sheet describes the properties of the first version of the new Ethernet RIOs.

Other protocols such as Modbus and SNMP are in preparation. Further powerful functions such as programmable RIOs, the use of fast interrupt inputs and support for cross-communication will also follow in the next version.

System overview of PCD3 Ethernet RIO PCD3.T660



The PCD3.T660 head station serves as a decentralised peripheral node. It is snapped onto a 35 mm DIN rail and can be fitted with up to 4 PCD3 I/O modules. A head station can be extended with PCD3.Cxxx I/O module holders for up to 1023 I/Os. The PCD3.T660 head stations are connected to the PCD2 or PCD3

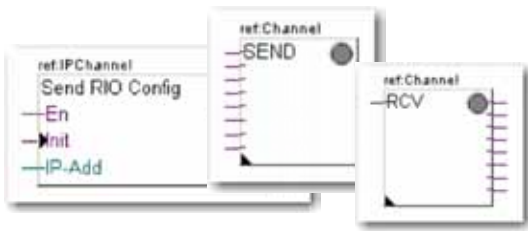
master station via Ethernet. Multiple logical RIO networks can be run within one Ethernet network. The PCD3.T660 RIOs can be operated in Ethernet networks with standard network components (switches, routers, etc.).

Configuration

The RIO stations are configured with the PG5 2.0 programming tool in the device configurator and assigned to the relevant master station.

The configurations of the RIO stations are loaded into the master station by the user program. A specific FBox is used to copy the configuration over to the RIO stations.





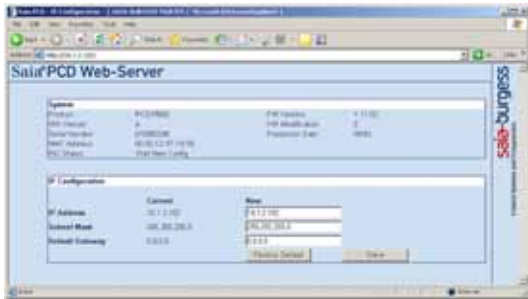
Programming data transfer

Data transfer is programmed using the standard S-Bus communication FBoxes. The cycle time and the priorities of the RIO stations and the individual telegrams can be defined by the programmer and programmed according to the application requirements.

Commissioning and diagnostics

As delivered, the RIO stations have a default IP configuration. This configuration can be easily adapted to the local network infrastructure with a PC and a web browser (e.g. Internet Explorer) via USB or Ethernet interface.

For diagnostic purposes, the current status of the RIOs is displayed by multi-coloured LEDs and on the configuration web page.



Technical data

RIO head station	PCD3.T660
Number of I/Os or	1023 ¹⁾
I/O module sockets	64 ¹⁾
I/O expansion connection	yes
PCD3 I/O modules supported	PCD3.Exxx, Axxx, Bxxx, Wxxx
Ethernet connection	10/100 MBit/s
Default IP configuration	IP address 192.168.10.100 Subnet mask 255.255.255.0 Default gateway 0.0.0.0
Number of RIO stations per master	Limited by available user program memory in the master station
Integrated web server	for configuration and diagnostics
Configuration and programming	PG5 from version 2.0.58
Firmware update	via USB
Master stations	PCD2.M5540, PCD3.M3330/M5340/M5540/M6340/M6540, from CPU firmware version 1.09.44

¹⁾ with PCD3.Cxxx I/O expansion modules

General

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

Order details

Type	Description	Weight
PCD3.T660	PCD3 Ethernet RIO head station with 4 I/O module sockets	400 g

8 Room automation systems

Chapter	Page
8.1 The right system for each requirement: compact, modular or individual	144
8.2 PCD7.L7xx series compact room controller with Serial S-Net	146
8.3 PCD7.L6xx series modular room control system with Serial S-Net, LONWORKS® or BACnet® MS/TP	148
8.4 Room control systems with individual user prompting	156

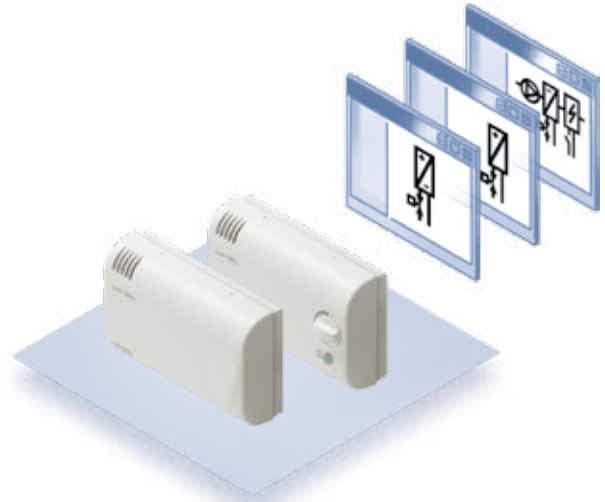


8.1 The right system for every requirement: Compact, modular or individual

Compact room controller (Chapter 8.2)

The compact controller series is especially suitable for simple systems for heating and/or cooling.

The room controller PCD7.L7xx series include the operation for presence and setpoint, the room temperature sensor and the valve or flap control in a housing. The preconfigured regulating and controlling programme is component of the basic software and can be extensively parametrised via network communication and adapted to individual needs.



Modular room automation system (Chapter 8.3)

For the automation of systems with a higher requirement profile like complex fan-coil applications or the integration of light and shade, a modular automation system is used, which provides the required flexibility in setup and application range.

The PCD7.L6xx series consist of several basic controllers, the extension modules for control of light and shade, as well as a multitude of room control units with analogue, digital or radio connections to the basic controller.

In this series as well, the preconfigured regulating and controlling programme is a component of the basic software and can be extensively parametrised by means of communication and adapted to the individual needs.

According to requirement, the basic controller can be connected with the automation stations via communication interfaces like Saia Serial S-Net, BACnet® or LONWORKS®. This enhances the consistency and the quality of the entire building technology system.



Room automation solution

With individual user control (Chapter 8.4)

Complex systems, in which complete air conditioning including humidity control, pressure control, air quality monitoring or individual web-based user control are required, can be conveniently automated and operated on the basis of the Saia®PCD systems.

The product range is very much based on the individual requirements on the room automation and a customer-oriented user control. The system integrator has a comprehensive portfolio of system components at its disposal to fulfil the customer requirements at all levels.

If the requirements in the user control in shape, design and function are not covered, the system integrator can be directly connected to the automation station via open interfaces like EnOcean® radio technology, KNX/EIB, LONWORKS® or BACnet®, etc.



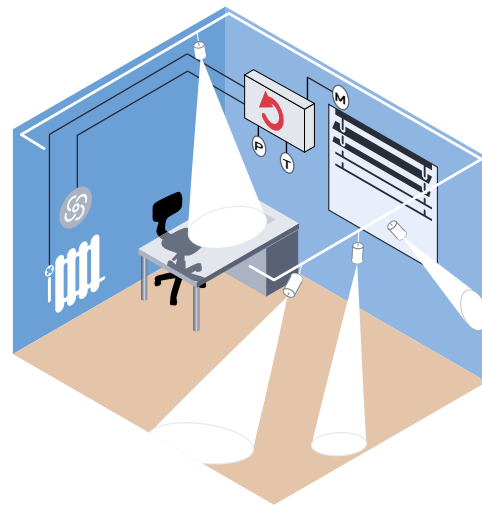
Operating modes of the room automation systems: Autonomous, with communication or RIO operation

Autonomous regulation without communication

The controller regulates room temperature without being connected to any bus system. Regulation is carried out completely by the single room controller using the specified default parameter settings.

Outputs are triggered by a control algorithm, depending on temperatures measured.

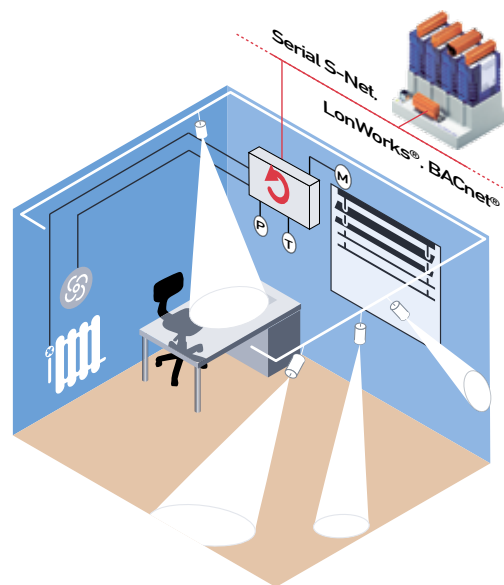
The default setpoint of 21°C can be influenced from the setpoint adjuster (depending on controller).



Autonomous regulation with communication to the automation station

The controller operates as a slave station with a distinct bus address within a Serial S-Net, LonWorks® or BACnet® network. The single room controller performs regulation tasks itself, using its own control algorithm. Time or event-dependent control functions are forwarded to the single room controller by the master station through function blocks that have been configured accordingly. This allows a more individual setting of parameters and mode of operation. In addition, the device (and consequently its regulation functions) can at any time be influenced by the PCD master station.

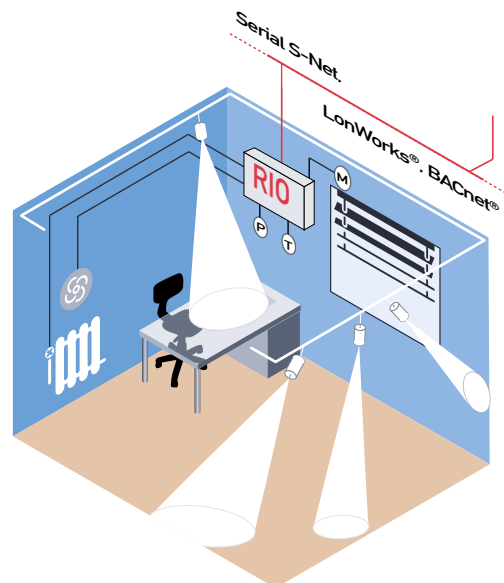
For every room control type, there is a function block available in the library for the parametrisation. For open network connections, this takes place via network variables or network blocks.



External control and regulation by automation stations

The master PCD station takes over all control and regulation tasks. The single room controller itself is only used as a remote input/output unit. This allows great flexibility in adapting individual system requirements for control and regulation to the requirement structure of an installation.

For the parametrisation, RIO function blocks are available in the room controller library.



8.2 Series PCD7.L79x | compact room controller with Serial S-Net

For individual regulation of temperature based on compact single room controller.

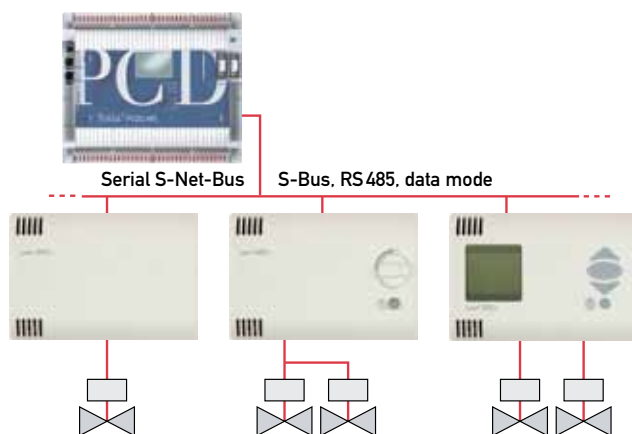
Individual comfort with single room control and energy efficiency

PCD7.L7xx single room controllers allow the user to adapt the climate of a room to individual needs.

Controllers have internal temperature acquisition and – depending on the version – a setpoint adjuster and occupancy button with LED indicator.

All devices from the PCD7.L7xx product family can either be stand-alone controllers or they can be connected directly to the master DDC station as Saia® S-Bus slaves. Different software solutions also allow different possibilities for control and operation in S-Bus mode.

The parameters of these controllers can therefore be set and monitored from a central location, or the entire control can take place externally in the master station. In this case the single room controller is only used as a hardware input/output for climate adjustment.



Different modes of use or operation

The function of single room control is based on different modes of use or operation. This involves assigning different setpoints to every selectable mode of operation.

In use

No heating or cooling energy is channelled to the room. This state is required if a window is opened. Control by the occupancy function is not possible in this state. The room controller keeps room temperature above the specified frost limit of 8°C.

In use / Standby

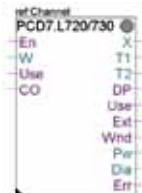
The room is ready for use, but no occupancy has yet been registered in the room. As long as the room is considered unoccupied for the purposes of the occupancy function, the room controller will maintain room temperature at the prescribed standby temperature.

Reduced

No heating or cooling energy is channelled to the room. This condition can be attained via the occupancy button, activation of an external occupancy detector or via network specification.

«ROOM» function block library

The «Room controller PCD7.L79x library» of FBoxes (function blocks) for single room controllers can be downloaded free of charge from the Saia-Burgess Controls homepage: www.sbc-support.ch.



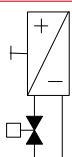
Application Overview

Communications friendly activation with Saia® Serial S-Net for all the usual heating/cooling groups, such as

- Radiators / heating, cooling with change over
- Radiator/cooling ceiling combinations
- Installations with variable current volume (VVS)

2-pipe for heating, cooling or change-over

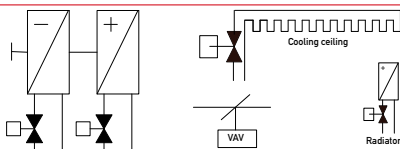
Application



Room controller	Valve	Room operation
PCD7.L790	24 V PWM	-
PCD7.L791	24 V PWM or 24 V 3-stage	-
PCD7.L792	24 V PWM or 24 V 3-stage	Yes
PCD7.L793	24 V PWM or 24 V 3-stage or 0...10 V	Yes
PCD7.L794*	24 V PWM or 24 V 3-stage or 0...10 V	Yes, via display

4-pipe for heating, cooling or change-over

Application



Room controller	Valve	Room operation
PCD7.L791	24 V PWM	-
PCD7.L792	24 V PWM	Yes
PCD7.L793	24 V PWM or 0...10 V	Yes
PCD7.L794*	24 V PWM or 0...10 V	Yes, via display

* in preparation

Overview of devices and technical data: series PCD7.L7xx



Type: PCD7.	L790	L791	L792	L793	L794* in preparation
Functions					
1 output sequence	x				
2 output sequences		x	x	x	x
TRIAC output	x	x	x	x	x
0...10 V output				x	x
Change-over function	x	x	x	x	x
Occupancy button			x	x	x
Setpoint potentiometer			x	x	x
LED acknowledge			x	x	x
S-Bus slave operation					x
Internal temperature sensor NTC	x	x	x	x	x
Stainless steel housing	x	x	x	x	x
Additional inputs:					
Digital inputs, occupancy/window	2	2	2	2	2
Analogue inputs Ni1000/dew point	1	1	1	1	1

General data:

Temperature capture, internal sensor:	NTC 10 kΩ/0...40 °C
Controlled behaviour:	P or PI behaviour
Communications port:	Saia® S-Bus/RS 485 interface/Data Mode/ 4800, 9600, 19200, 38400, 115200 bit/s with automatic detection on restart
Power consumption:	1.5 W without actuator drives
TRIAC output specification:	max. 24 VAC/500 mA
Active direction of TRIAC:	closed when currentless (default setting)/active direction can be inverted
Output specification 0...10 VDC:	0...10 VDC/max. Last 2 mA
Housing:	Plastic, white, surface mounting, protection type IP 20
Measurements:	size 120 × 80 × 40 mm (B × H × T)

Maximum number of room controllers

The maximum number of room controllers, which can be driven by a PCS/PCD system, depends on the bus cycle time and on resources, which are used by the FBoxes.



Resources:	max. 600 program lines per FBox , max. 30 registers per FBox, max. 10 Flags per FBox, 1DB
Bus cycle time per controller:	approx. 15 ms
PCD cycles:	428 at 150 FBoxes measured with a PCD3.M5540

Ordering information PCD7.L7xx

Type	Description compact room controller with Serial-S-Net (Saia® S-Bus)
PCD7.L790	Heating or cooling with triac output, without user control
PCD7.L791	Heating or cooling with 2 triac outputs, without user control
PCD7.L792	Heating or cooling with 2 triac outputs & analogue user prompts (setpoint potentiometer, occupancy button with LED acknowledgement)
PCD7.L793	Heating and cooling with 2 triac outputs and 2× 0...10 VDC outputs & analogue user prompts (setpoint potentiometer, occupancy button with LED acknowledgement)
PCD7.L794*	Heating and cooling with 2 triac outputs and 2× 0...10 VDC outputs & digital display with HeaVAC function for setpoint adjustment and occupancy user prompts
26/739 E	Saia® S-Bus manual

* in preparation

8.3 Serie PCD7.L6xx | modular room automation solutions with Serial S-Net, LonWorks® or BACnet® MS/TP

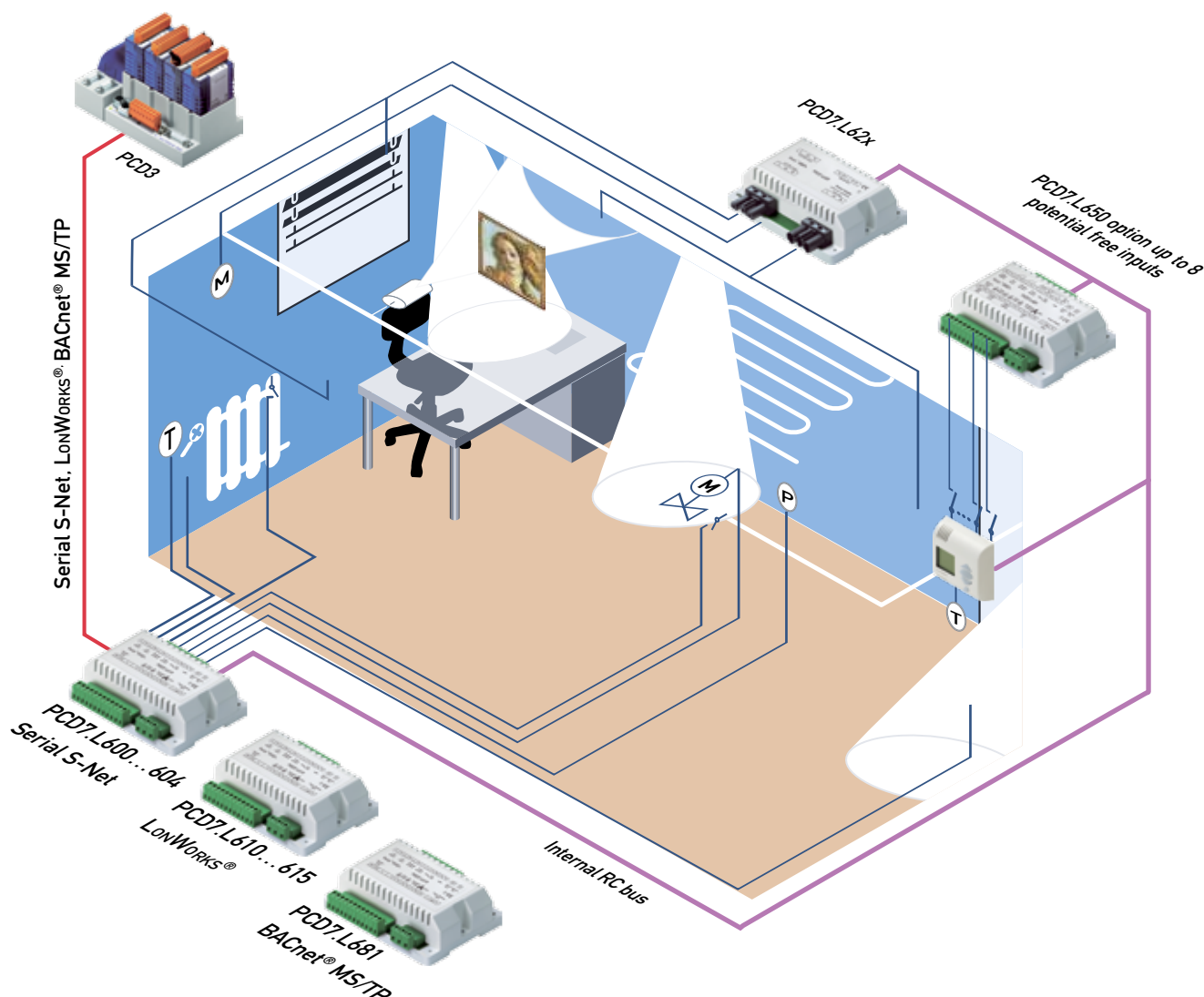
PCD7.L6xx room controllers, based on networks with Serial S-Net, LonWorks® or BACnet® MS/TP, are predominantly used in HeaVAC applications with FanCoil devices, radiator/cooling ceiling combinations or VAV systems. The electrical items can be integrated conveniently in the room automation via the extension modules for light and shade. The customer-oriented operation concepts can be created with the large selection of room control units. Room control units - connected by cable, infrared or radio receivers - ensure user comfort when operating the room controller.

Multisupplier room control units

Operator devices with LON Works communication can be directly linked to LON room controllers. For the connection of EnOcean room components, a receiver module exists that can be hooked up to room controllers directly via the internal RC bus. Moreover, if the form, design or functionality should fail to match the requirements of operator guidance, the system integrator can combine the room controllers with foreign systems across the open interfaces of the automation station or through analogue room control devices.

Features

- Comprehensive application range through application programmes capable of parametrisation
- Room controller for the communication via Serial S-Net, LonWorks® or BACnet® MS/TP
- Extension modules for the electrical items
- Large selection of analogue, digital or mobile room control units
- Combination potential of the basic controller with room control units of third-party suppliers.



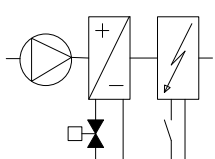
Application overview Series PCD7.L6xx

A flexible solution for the room automation

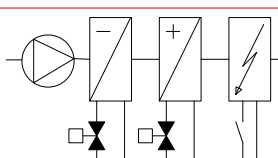
Drives all the normal heating/cooling groups, such as

- Radiators
- Radiator/cooling ceiling combinations
- Installations with variable air volume
- Fan-coil devices
- Easy communications with Saia® Serial S-Net, LONWORKS® or BACnet
- Large selection of analogue, digital, or mobile room operator units
- Light and shade control through optional extension modules

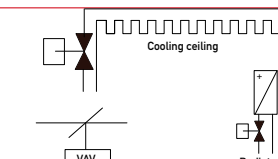
Fan-coil application (2-pipe) for heating, cooling or change-over

Application	Room controller	Fan	Valve	Cooling valve	Electric heating
	PCD7.L6x0	Relay, 3-stage	230 V PWM 230 V 3-point	-	Relay to 2 kW
	PCD7.L6x1	Relay, 3-stage	230 V PWM 230 V 3-point 0...10 V	-	Relay to 2 kW
	PCD7.L6x3 PCD7.L6x4	Relay, 3-stage	24 V PWM 24 V 3-point 0...10 V	-	Relay to 2 kW

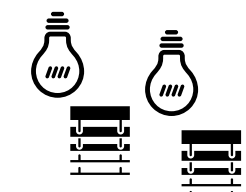
Fan-coil application (4-pipe) for heating, cooling

Application	Room controller	Fan	Valve	Cooling valve	Electric heating
	PCD7.L6x0	Relay, 3-stage	230 V PWM	230 V PWM	Relay to 2 kW
	PCD7.L6x1	Relay, 3-stage	230 V PWM 0...10 V	230 V PWM 0...10 V	Relay to 2 kW
	PCD7.L6x3 PCD7.L6x4	Relay, 3-stage	24 V PWM 0...10 V	24 V PWM 0...10 V	Relay to 2 kW

VAV, cooling ceiling and radiator applications for heating and cooling

Application	Room controller	Fan	Valve	Cooling valve	Electric heating
	PCD7.L6x0	Relay, 3-stage	230 V PWM	230 V PWM	Relay to 2 kW
	PCD7.L6x1	Relay, 3-stage	230 V PWM 0...10 V	230 V PWM 0...10 V	Relay to 2 kW
	PCD7.L6x3 PCD7.L6x4	Relay, 3-stage	24 V PWM 0...10 V	24 V PWM 0...10 V	Relay to 2 kW

Light and shade

Application	Extension	Light	Shade
	PCD7.L620	2 rows of windows	-
	PCD7.L621	2 rows of windows	1×up/down, 230 VAC
	PCD7.L622	-	3×up/down, 230 VAC
	PCD7.L623	-	2×up/down, 24 VDC

Operating modes

The 4 operating modes are set depending on the presence detector, window contact, and the specifications of the communications master.

- Comfort** Standard, default operating mode for an occupied room.
- Standby** Reduced operating mode when the premises are temporarily unoccupied.
- Reduced** Reduced operating mode when the premises are unoccupied for a long period of time.
- Frost protection** The heating control is activated when the temperature drops below 8°C. (e.g. if a window is open).

Commissioning

When room controllers are used in a Saia® S-Bus network, configuration is either by the Saia® PCS/PCD master or the Saia® PG5 programming tool, or dedicated PC software.

Convenient function blocks (FBoxes) are available to help commissioning.

When room controllers are used in a LON network, configuration is facilitated by provision of a LONWORKS® plug-in.

Room controllers comply with the LONMARK® operating profile "Fan Coil Unit Object (8020)".

Overview of devices and technical data: Room controllers

Serial S-Net



PCD7.L600



PCD7.L601



PCD7.L603



PCD7.L604 *

LONWORKS®



PCD7.L610



PCD7.L611



PCD7.L614 *



PCD7.L615 *

BACnet® MS/TP



PCD7.L681 *

Analogue inputs	Temperature sensor NTCA 010-040, setpoint potentiometer 10 kΩ linear, 0...10 V		2
Digital inputs	Main contact (e.g. window contact) Auxiliary contact user selectable (e.g. presence, dewpoint, change-over...)		2 2
Analogue outputs	-	2x0...10 VDC	2
Digital outputs	2xtriac 230 VAC (10 mA...800 mA)	2xtriac 24 VAC (10 mA...800 mA)	4xtriac 24 VAC (10 mA...800 mA)
Relay outputs	3-stage fan (4 connections) 230 VAC (3 A) Relay for electric heating: max. output 2 kW		— 2
Power supply	230 VAC with electronic fuse	24 VAC with electronic fuse	230 VAC with electronic fuse
Current draw	approx. 100 mA		
Protection type	IP 20		
Dimensions	132 x 95 x 45 mm		
Temperature range	5...45 °C, 80 % r.H.		
		The max. output power is 7 VA. For bigger valve loads, use the PCD7.L603	

* in preparation

Communication with Serial S-Net

Interface	RS 485, max. cable length 1200 m, 128 room controller .L60x to a PCD master, without repeater*
Transmission speed	4800, 9600, 19200, 38400, 115200 bit/s with automatic recognition with restart
Protocol	Saia® S-Bus data mode (slave)

Addressing during commissioning via S-Net or an external manual control unit.

Bus line termination resistance should be provided by customers. - integral with L600, L601 and L604, can be activated from software

Communication with LONWORKS®

Interface	FTT 10a
Transmission speed	78 kBit/s
Topology	Free topology max. 500 m, bus topology max. 2700 m
Number of LON nodes	max. 64 per segment, over 32 000 in a domain/according to LONMARK® 8020-Profil

Communication with BACnet® MS/TP

Interface	RS 485, max. cable length 1200 m, 128 room controller L68x, without repeater *
Transmission speed	9600, 19200, 38400, 78600 bit/s – factory setting 38400 bit/s
Protocol	BACnet® MS/TP

* With repeater in case of mixed operation

Room operator units

Analogue room operator units



PCD7.L630



PCD7.L631



PCD7.L632

Temperature sensor	NTCA 010-040	NTCA 010-040	NTCA 010-040
Setpoint adjuster		Poti 10 kΩ linear	Poti 10 kΩ linear
Occupancy button			Contact against GND
Acknowledgement			LED

Digital room operator units



PCD7.L640



PCD7.L641



PCD7.L642



PCD7.L643



PCD7.L644

Temperature sensor	x	x	x	x	x
Setpoint adjuster	x	x	x	x	x
Occupancy button		x	x	x	x
Acknowledgement		x	x	x	x
Fan controller			x	x	x
Display menu for:					
HeaVAC functions				x	parameters can be set *
Light & shade					parameters can be set *

* in preparation

Mobile room operator units with displays and function keys

Operator unit



PCD7.L660



PCD7.L662



PCD7.L664

Receiver



PCD7.L661



PCD7.L663



PCD7.L665



PCD7.L666

Wall holder for operator unit	Included for fixed mounting	Included for fixed mounting	Optional for mobile Montage	Optional for mobile Montage
Communication IR (infrared)	unidirectional		x	x
Communication Radio		bidirectional	manual	x
Temperature sensor	x	x	integrated	integrated
Setpoint adjustment	x	x	x	x
Occupancy controller	x	x	integrated	integrated
Fan controller	x	x	x	x
Light & shade	x	x	x	x
Brightness			integrated	integrated
Power supply, operator unit	2 x AAA 1.5 V micro	2 x AAA 1.5 V micro		
Temperature range	+5...45 °C, 80 % r.H.	+5...45 °C, 80 % r.H.	+5...45 °C, 80 % r.H.	+5...45 °C, 80 % r.H.

Light and shade extension modules

Light and shade modules as room controller extensions



No more than 1 extension module of any one type per room controller!



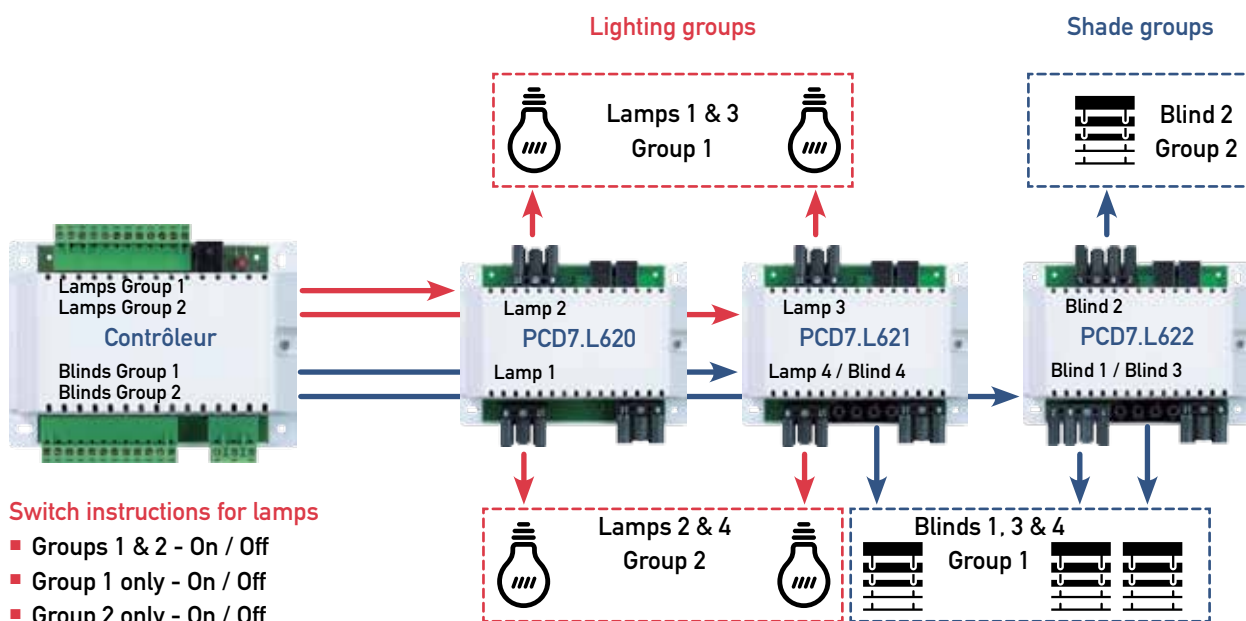
	PCD7.L620	PCD7.L621	PCD7.L622	PCD7.L623	PCD7.L650
Light outputs, 1 relay per output	2×230 VAC, 5 A *	2×230 VAC, 5 A *	—	—	—
Motor outputs, 2 relays per output	—	1×230 VAC, 5 A *	3×230 VAC, 5 A *	2×24 VAC, 650 mA	—
Power supply	230 VAC	230 VAC	230 VAC	230 VAC	via RC-Bus
Max. current draw via supply terminal	10 A	10 A	10 A	650 mA	—
Potential-free contact inputs	—	—	—	—	8
RC bus activation	■	■	■	■	■
Protection type	—	—	IP 20	—	—
Dimensions	—	—	132×95× 45 mm	—	—
Temperature range	—	—	5...45 °C, 80 % r.H.	—	—

* 5 A at AC1 | 3 A at AC3

Light and shade in groups

Light and shade extension modules are controlled using group instructions. For each controller, two independent light and shade groups are available. Each output can be assigned to one or both groups. Light groups can be switched on/off either together or separately. Equally, shade groups can drive the blinds up or down, independently of each other.

Example of module output assignment to group

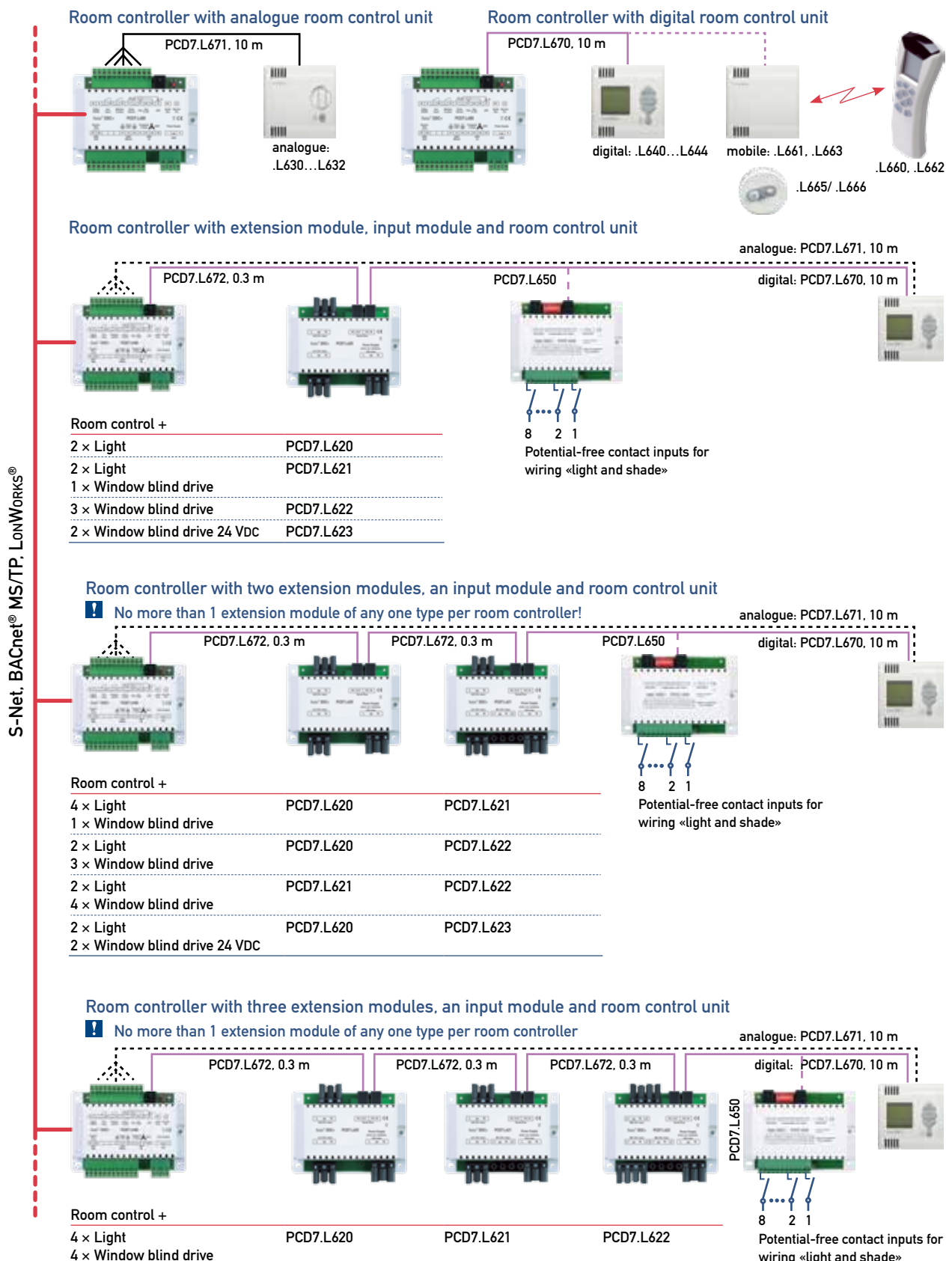


Switch instructions for blinds

- Groups 1 & 2 - Open / Shut
- Group 1 only - Open / Shut
- Group 2 only - Open / Shut

System structure with extension for light and shade

- Room controller: basic pen PCD7.L600/.L601/.L603/.L610/.L611
- Room control units and extension modules are connected to the room controller as required.
(Extension modules can only be operated in connection with a room controller.)
- No more than 4 groups can be configured per light and shade functions.

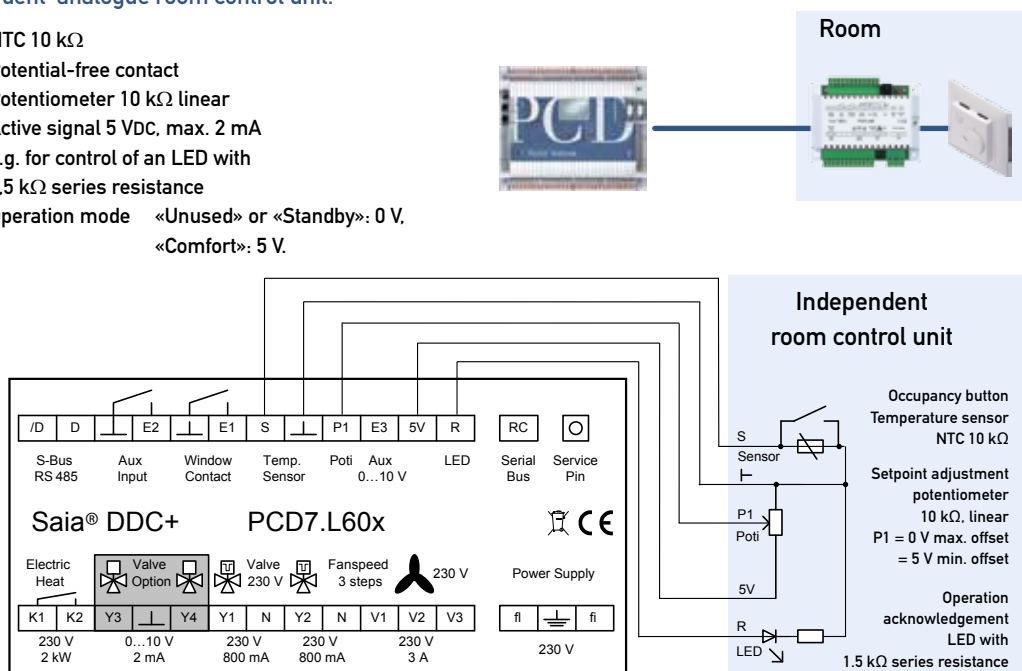


Connection of independent room control units

Analogue room control units

Connection of an independent analogue room control unit:

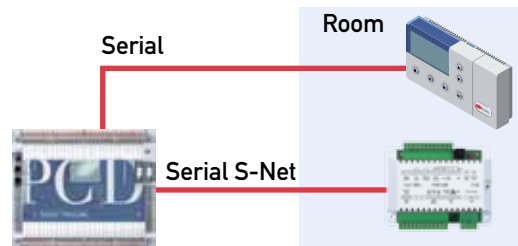
Temperature sensor	NTC 10 k Ω
Occupancy button	Potential-free contact
Setpoint adjustment	Potentiometer 10 k Ω linear
Operation	Active signal 5 VDC, max. 2 mA
acknowledgement	e.g. for control of an LED with 1.5 k Ω series resistance
	Operation mode «Unused» or «Standby»: 0 V, «Comfort»: 5 V.



Communicative room control units

Direct connection of room control units via a serial interface

System configuration: PCD system with Serial S-Net interface



Direct connection of room control units via LONWORKS®

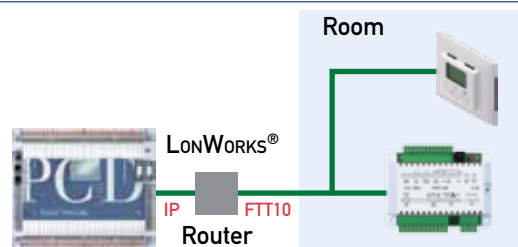
System requirements:

Room controller with LONWORKS® interface.

For additional connection to the automation station, a PCS1, PCD1|PCD2 with LONWORKS® interface or

a PCD2.M55xx with an external FTT10/IP router or

a PCD3 with an external FTT10/IP router

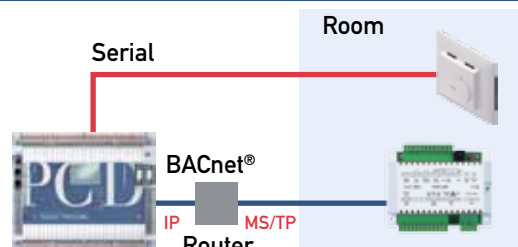


Direct connection of room control units via a serial interface

System requirements:

Room controller with e.g. BACnet® MS/TP interface.

For additional connection to the automation station, a PCD with BACnet® option incl. external BACnet® IP/MSTP router is required

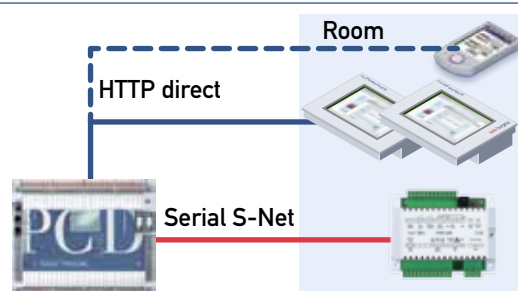


Individual solutions via web-based room control units

System requirements:

Room controller with communication to the PCD via S-Net, LONWORKS® or BACnet®.



PCD with corresponding port and interface to connect the required control units, e.g. web panel, PCD, home-automation system, etc.




Ordering information PCD7.L6xx

Room controller




Type Description

Serial S-Net	PCD7.L600	Room controller 230 VAC with 2 triac outputs, relays for electrical heater and control 3-state fan speed	
	PCD7.L601	Room controller 230 VAC with 2 triac outputs, 2 outputs 0...10 V, relays for electrical heater and control 3-state fan speed	
	PCD7.L603	Room controller 24 VACC with 2 triac outputs, 2 outputs 0...10 V, relays for electrical heater and without fan speed control	
	PCD7.L604*	Room controller 230 VACC with 2 triac outputs, 2 x 0...10 V outputs, inc. 24 VAC (7W) supply, relay for electric heater and 3-stage fan controller	
LonWorks®	PCD7.L610	Room controller 230 VAC with 2 triac outputs, relays for electrical heater and control 3-state fan speed	
	PCD7.L611	Room controller 230 VAC with 2 triac outputs, 2 outputs 0...10 V, relays for electrical heater and control 3-state fan speed	
	PCD7.L614*	Room controller 230 VAC with 2 triac outputs, 2 x 0...10 V outputs, inc. 24 VAC (7W) supply, relay for electric heater and 3-stage fan controller	
	PCD7.L615*	Double room controller 230 VAC for radiator/cooling ceiling combinations and VAV applications, 4 triac outputs, 2 x 0...10 V outputs, 2 relays for electric heater and autonomous interfaces for digital room control units	
BACnet®	PCD7.L681*	Room controller 230 VAC with 2 triac outputs, 2 x 0...10 V outputs, relay for electric heater and 3-stage fan controller	


Extension modules for Light & Shade

PCD7.L620	Extension module to control 2 light-bands	
PCD7.L621	Extension module to control 2 light-bands and 1 sun blind motor	
PCD7.L622	Extension module to control 3 sun blind motors	
PCD7.L623	Extension module to control 2 sun blind motors 24 VAC with angle control	

Room control units/panels

Analogue	PCD7.L630	Temperature sensor	
	PCD7.L631	Temperature sensor and setpoint adjustment	
	PCD7.L632	Temperature sensor, setpoint adjustment, presence-tip-switch and LED	
Digital	PCD7.L640	Temperature sensor and setpoint adjustment	
	PCD7.L641	Temperature sensor, setpoint adjustment, presence-tip-switch and LED	
	PCD7.L642	Temperature sensor, setpoint adjustment, presence-tip-switch, LED and fanspeed control	
	PCD7.L643	Temperature sensor, function keys and LCD display for HeaVAC functions	
	PCD7.L644	Temperature sensor, function keys and LCD display for HeaVAC and light & shade control functions	
Mobile	PCD7.L660	IR (infrared) remote control unit with LCD display, temperature sensor and wall mount adapter	
	PCD7.L661	IR receiver	
	PCD7.L662	Radio remote control unit with LCD display, temperature sensor and wall mount adapter	
	PCD7.L663	Radio receiver	
	PCD7.L664	Optional mobile wall mount adapter	
	PCD7.L665	IR receiver (infrared) with multi-sensor for temperature, presence and brightness for PCD7.L660	
	PCD7.L666	IR and wireless receiver with multi-sensor for temperature, presence and brightness for PCD7.L660/L662	

Extension modules for connection of foreign devices

PCD7.L650	Extension module for connection of up to 8 external contacts for control of light & shade	
PCD7.L651*	In-wall interface for light & shade to connect external control contacts	

Accessories

PCD7.L670	Connection cable for digital room control units, RJ9/RJ9, length 10 m
PCD7.L671	Connection cable for analogue room control units, RJ11/open cable strand, length 10 m
PCD7.L672	Connection cable for room controller/extension module, RJ11/RJ9, length 30 cm
PCD7.L673	Connecting cable set for digital room control units, 3 x RJ9 and 1 x RJ11, length 11 m
PCD7.L679	Handheld for room controller configuration setup

* in preparation

8.4 Room automation systems with individual user control

Application examples

Communicative room control units

for the local user control via bus-linked operation panel (PCD7.290 incl. temperature and humidity sensor) as well as decentralised input/output systems for the control and inclusion of all necessary units.

Decentralised intelligent IP 65 modules

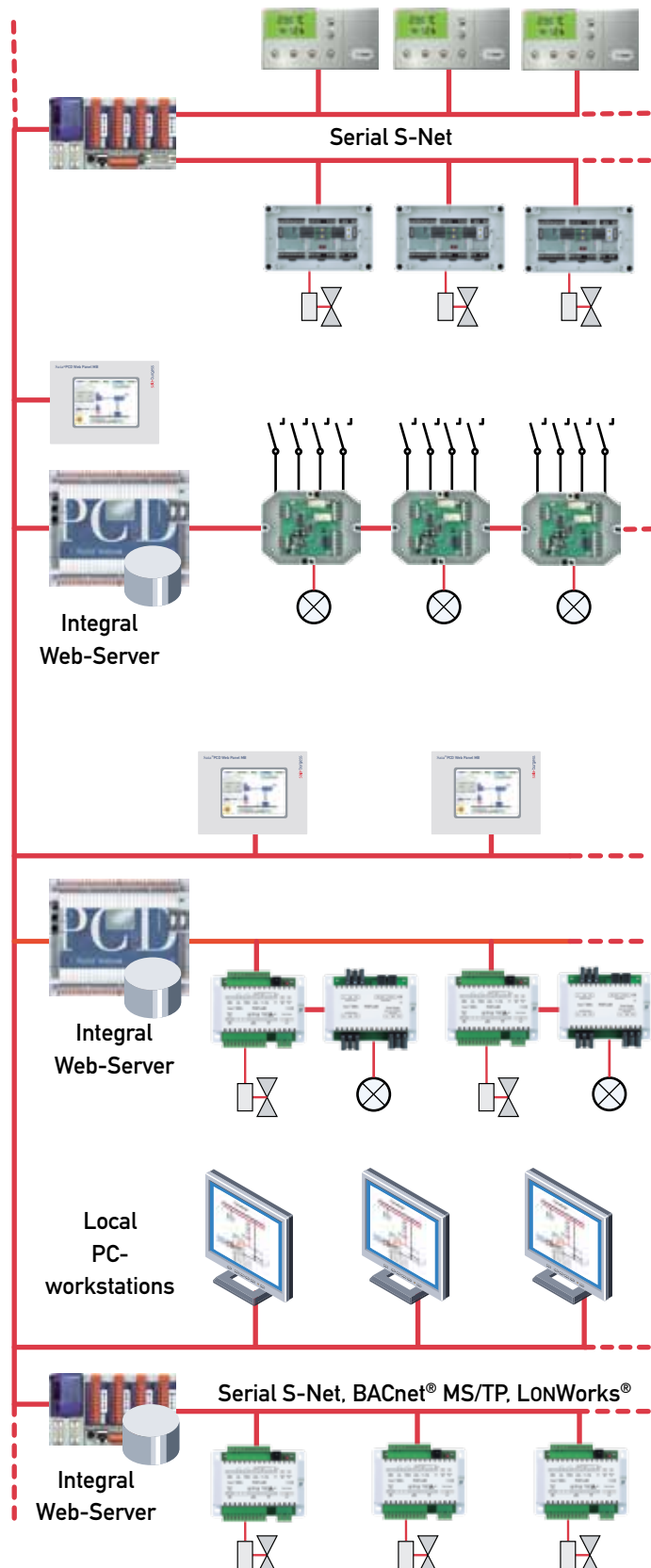
for the control of light and shade applications. To optimise the response time, the modules operate in a local mode for direct output circuit. The operation takes place via a web-enabled operating panel, which uploads and displays the pages of the manual directly from the automation station

Integral room automation system

PCD7.L6xx for HeaVAC-type applications as well as the integration of electrical items. To enable the user control in fulfilling the high demands, web-enabled operating panels are used to execute the higher level functions like the setting of timer programmes and the on-site operation

Local user control of PC workstation

The illustrations in the manual are uploaded and displayed directly from the password-protected web server integrated in the automation station. The control of the HeaVAC or electrical unit is carried out via network-linked room automation systems.



Graphic-enabled room control unit with integrated temperature and humidity sensor

Any individual room control concept must have components that can be quickly adapted to the requirements of individual user groups. The latest product of the portfolio in individual rooms is the room control unit PCD7.D290.

The outstanding features of this room control device are*:

- User-friendly housing in white plastic
- Large graphic displays with 128×64 pixels and (8×20 characters) LED backlighting
- Six integral keys with tactile action point & with LEDs backlight allow individual adaptation to all necessary room parameters
- Temperature and humidity sensors are built-in, so that the external controller can directly influence room climate
- Connection to the controller level is via a point-to-point or bus link. The PLC takes over all control and regulation tasks
- Mounting should take place directly on the wall

*details, see chapter 5

HMI-Editor: Add-on tool for the PG5 programming package

In order to satisfy all user needs, the PCD7.D290 has been fully integrated into the HMI-Editor. This tool allows the comfortable configuration of the product and representation of text or symbol information on the display.

Some examples of application with Saia® PCS and Saia® PCD

Examples using one PCS1 with embedded ports.

Application 1 with x1 PCD7.D290

RS 232 RTS/CTS

Using graphic capabilities (Icons).

Application 2 with x PCD7.D290

RS 485 (bus mode)

No graphic capabilities.

When one terminal is active, the others are busy.



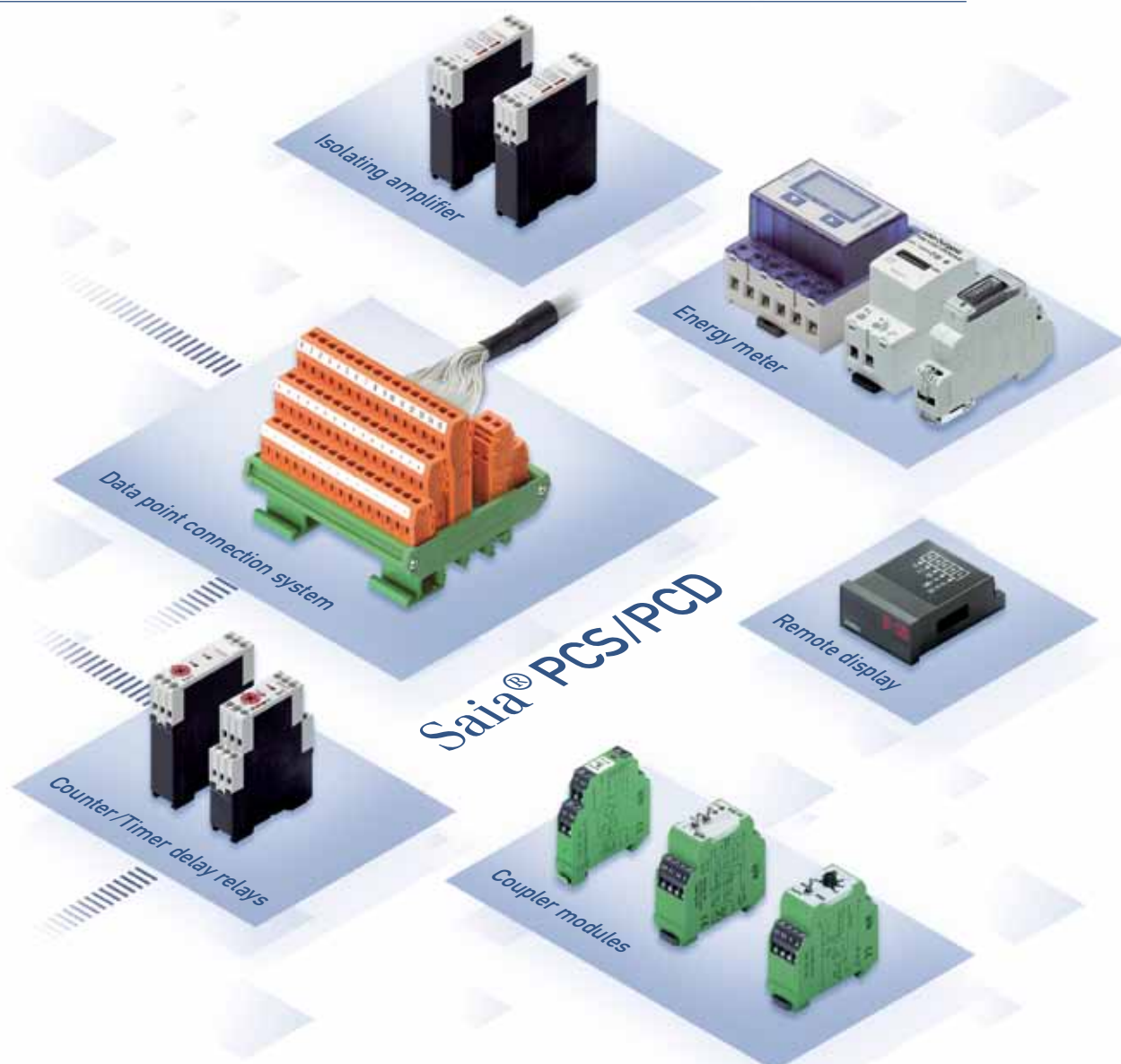
Nbr of D290	Port 0	Port 1
1	RS 232	
Up to 6		RS485 (bus mode)

Ordering Information PCD7.D290

Type	Description	Weight
PCD7.D290	Individual Room Control Panel with graphic display for wall mounting	200 g
26/841 E	Manual PCD7.D290	

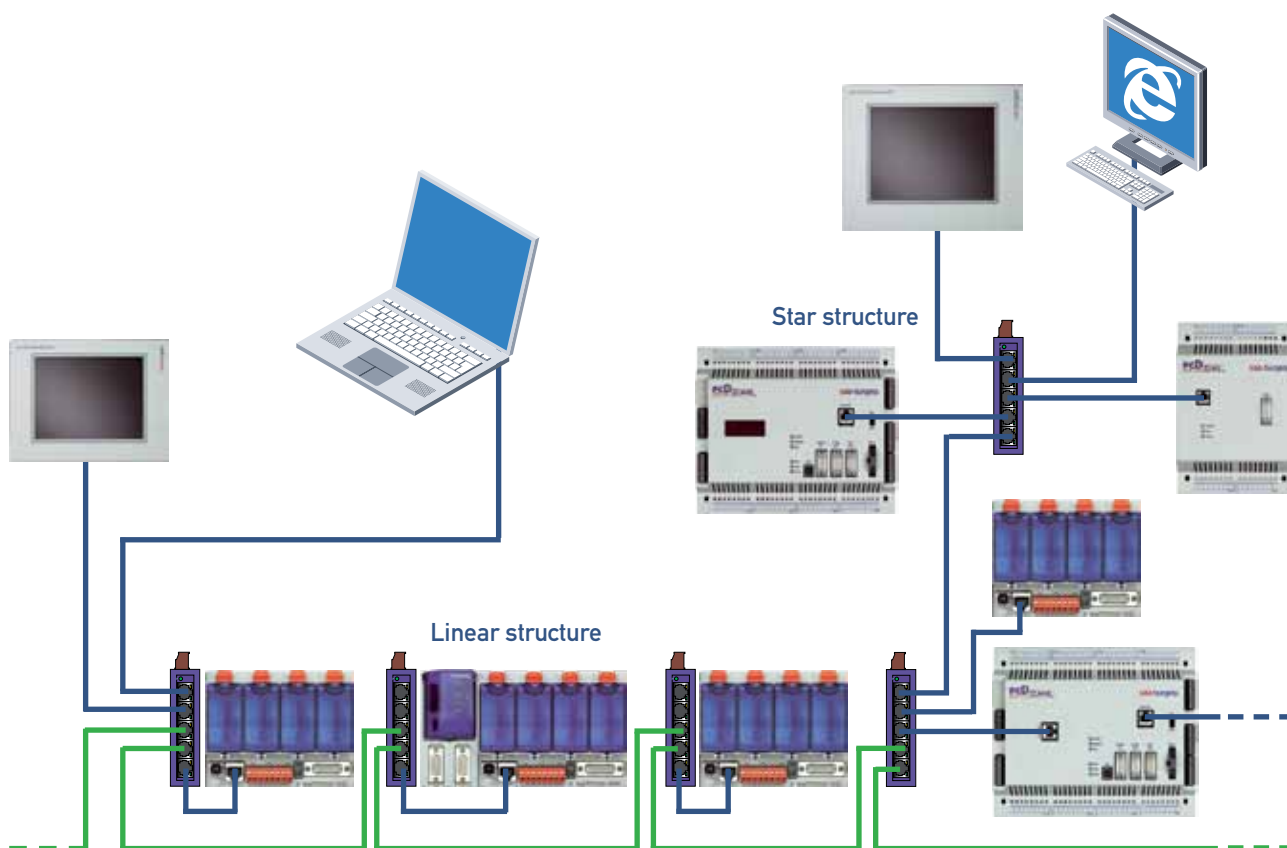
9 Switch cabinet – coupler modules

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9.1 Industrial Ethernet Switch Q.NET-5TX with 5 ports

Ethernet networks in industry and infrastructure automation



Build economical, industrial Ethernet networks with both linear and star structures

This compact, unmanaged switch operates according to the plug-and-work principle.

The mounted switch is equal in height to PCD3 systems, which saves space when it is snapped onto the DIN rail. The PCD controller is connected with the patch cable provided. Due to its robust construction, this switch is suitable for use in rugged industrial environments and in infrastructure automation.

Product characteristics

- Entry level industrial Ethernet rail switch, with store-and-forward switching mode.
- Allows construction of switched Ethernet networks according to IEEE 802.3 with copper technology
- The device has five 10/100 Mbit/s twisted pair ports (RJ 45 connections)
- Up to five end devices or additional TP segments can be connected to the TP ports via twisted pair
- Extremely light, compact construction with IP30 protection system
- Simple commissioning with 'plug-and-work' via auto-negotiation, auto-polarity and auto-crossing
- Fast network diagnosis, due to integral LEDs at TP ports
- DIN rail mounting and 24 VDC supply for trouble-free use in infrastructure automation, and in rugged industrial environments



Application example



Technical data Q.NET-5TX

Operation

Port type and number	Ethernet 10/100 MBit/s, 5 × RJ 45
Plug-and-work	Auto-negotiation, Auto-polarity, Auto-crossing
Network line lengths	Twisted pair (TP), 0...100 m
Network cascade depth	Linear/star structure – as required
Operating voltage	9,6 VDC...32,0 VDC
Current consumption at 24 VDC	max. 100 mA
Indicators/diagnostics	1 × green LED: P – power, 5 × yellow LEDs: 10/100 – data rate 5 × green LEDs: DA/STAT – data, link status:

Ambient conditions

Operating temperature	0 °C to + 60 °C
Storage temperature	-40 °C to +70 °C
Air humidity	up to 95 % (non-condensing)

Standards/approvals

EMC noise immunity	EN 61 000-4
EMC noise emission	EN 55 022 class A, FCC CFR47 part 15 class A
Security for industrial control equipment	cUL 508 CSA 22.2 no.142 E175531
Mechanical stability	IEC 60068-2 (shock, vibration)

Mechanical

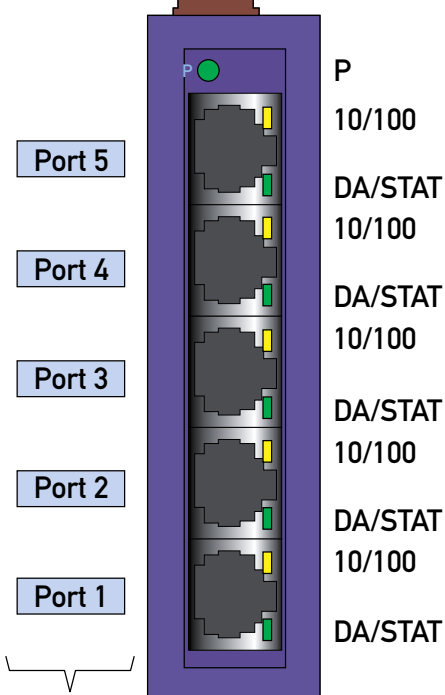
Dimensions W × H × D	25 mm × 114 mm × 79 mm
Mounting	on 35 mm DIN rail
Weight	113 g
Protection system	IP30

Ordering information

Q.NET-5TX	Rail Switch Q.NET-5TX , terminal block, patch cable and operating instructions
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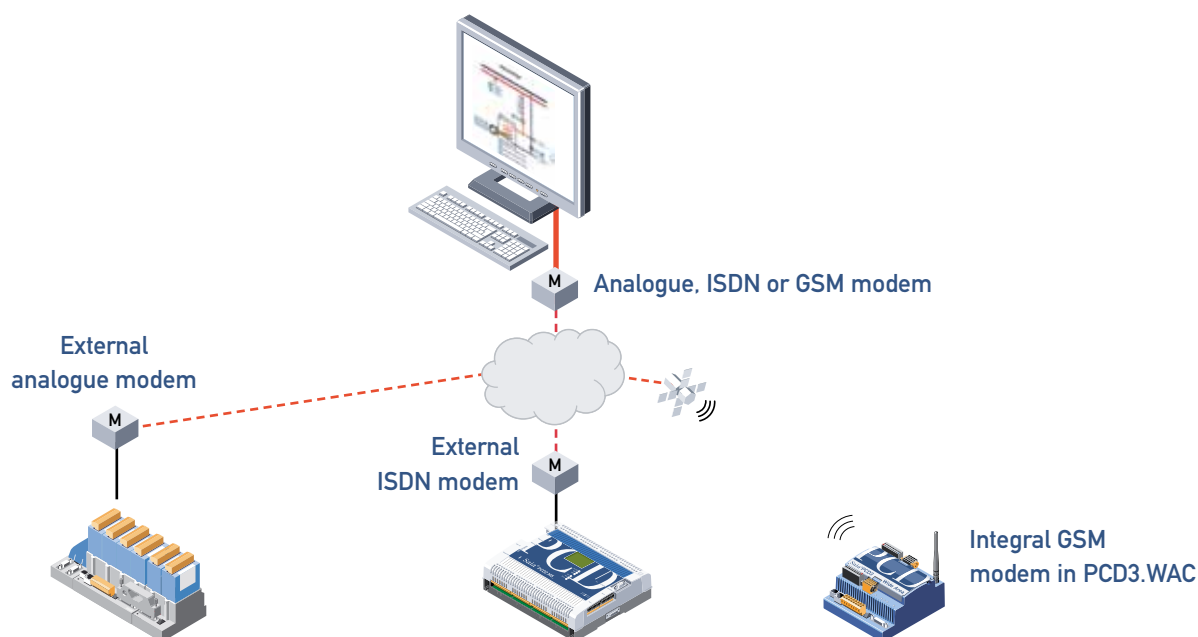
Plug-in
terminal block
3-pole

LEDs



5 ports as 10/100BASE-T(X)
RJ 45 connections
auto-negotiation,
auto-polarity,
auto-crossing

9.2 External modems for mounting on DIN rail



Telecommunication – today's choice for overcoming distances and saving costs

Combining modern telecommunications with the Saia® PCD will not only allow cost savings on commissioning and maintenance, but simultaneously increase the reliability, availability and profitability of an installation. This is achieved, for example, by:

- Remote support during commissioning
- Event or time-controlled transmission of information and requests to operating or service personnel
- Fault elimination by remote diagnosis
- Process optimization through software updates and/or updating of process parameters
- Preventive, efficient maintenance by qualified technicians, leading to low maintenance costs
- On-screen, remote support available directly to users, close to their operations

GSM modem

Technical data Q.G736-AS2



Frequency band	Dual band GSM 900 and GSM1800
SIM interface	SIM card: 3 V, slide-in
Transmission standards	2.400 (V.22bis/V.110), 4.800 (V.32/V.110), 9.600 (V.32/V.110), 14.400 (V.34/V.110) bps
Interface speed	1.200, 2.400, 4.800, 9.600, 19.200, 38.400, 57.600 and 115.200 bps, auto-bauding
Interface	V24 (RS 232), D-type, 9-pole
Instruction set	Extended AT instruction set
Antenna connector	FME-m
Power supply	24 VDC +15%, -30%



Analogue modem

Technical data Q.M716-KS1

ITU transmission standards	V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34, Bell 103, Bell 212A
Interface speeds	1.200, 2.400, 4.800, 9.600, 19.200, 38.400, 57.600 and 115.200 bps auto-bauding
Interface	V.24 (RS 232), D-type, 9-pole
Instruction set	Extended AT instruction set
Dial method	DTMF (multi-frequency)
Telephone line	RJ 11 and screw terminals for La + Lb
Power supply	24 VDC +15%, -30%



ISDN Modem

Technical data Q.T726-RS1

ITU transmission standards	X.75, V.110, V.120
Interface speeds	1.200, 2.400, 4.800, 9.600, 19.200, 38.400, 57.600 and 115.200 bps auto-bauding
Interface	V.24 (RS 232), D-type, 9-pole
Instruction set	Extended AT instruction set
Telephone line	RJ 45 (ISDN 4-core)
Power supply	24 VDC +15%, -30%

Cable between external modem and PCD

Q.VM-09SAS/18: RS 232 interface cable



External GSM antenna

PCD7.K830: antenna for GSM modem



Ordering information

	Telecommunication via external modems
Q.M716-KS1	Analogue modem
Q.T726-RS1	ISDN modem
Q.G736-AS2	GSM modem
PCD7.K830	Antenna for GSM modem
Q.VM-09SAS/18	RS 232 interface cable external modem/PCD



9.3 Remote display 6-character with LEDs

Read measurements at a glance with this very bright display – and it does not tie up a serial port

Economical solution for the remote display of process data

- Particularly bright, 6-digit LED display with decimal point. Very easy to read, even under poor conditions of visibility (up to 4 metres away and at a viewing angle of 150°).
- Ties up none of the PCD's valuable serial ports: Only requires 3 transistor outputs on the following standard modules: PCD2.A400 (inc. version Z06), PCD2.A460/..A465 or PCD2.B100 or the corresponding modules from the PCD4 and PCD6 series.
- Standard-size housing: 24 × 48 mm, front panel protection class IP 65.
- Set of 77 units on self-adhesive labels: z. B. I, P, gal, U, f, 1/min, N, kJ, K, kHz, % ...

Comfortable commissioning and programming

- Ease of adjustment to different modules: This is done with FBox in the Fupla editor or FBs in the IL editor. The refresh rate for the display is defined at the same time.
- Up to 14 remote displays can be driven in parallel: For every display different data sources (with up to 6 digits) can be chosen by an FBox.
- Serial driving of 2 (or more) remote displays: An advantage when more than 6 digits have to be displayed.



Technical data

Display	7-segment LED, 8 mm high with decimal point
Supply voltage	10...30 VDC (U _b), residual ripple max. 5%
Power consumption	max. 50 mA
Input voltage (data, clock, enable)	low 0...0.2 × U _b high 0.6 × U _b ...30 VDC
Input resistance	approx. 10 kΩ
EMC/noise immunity	class B according to EN 55011 or bzw. EN 50082-2
EMC/emission	according to EN 55081-2
Protection class	front panel IP 65
Ambient temperature	operation: -10 °C to +50 °C, storage: -25 °C to +70 °C
Mounting	flush mounting, fastened with collar or 2 × M4 screws, any mounting position
Terminals	screw terminals for 0.3...1.6 mm ²

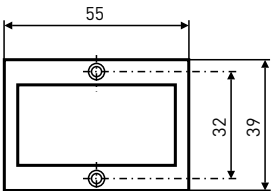
Ordering information

Type	Description
PCD7.D120	Remote display with 6-digit LED indicator Delivery includes collar, front frame for screw fastening, seal and a set of units on self-adhesive labels.



Accessory

- 4 108 4836 0 Adaptation frame for cut out 24.5 × 48.5 mm.

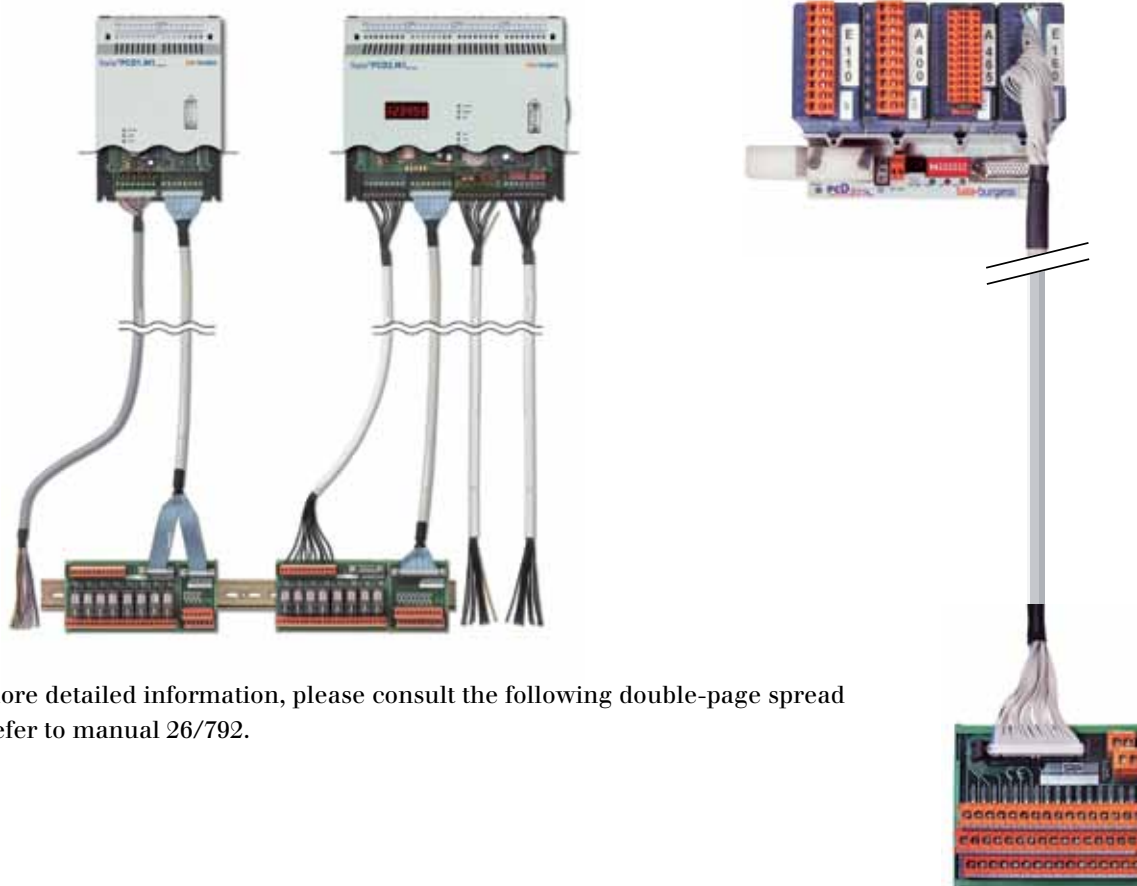


9.4 Switch cabinet – coupler modules

Plug-in system cables with connector at PCD end

The route to quick, convenient connection includes preassembled cable. At the PCD end of the cable the connector is ready mounted, so connection is just a matter of plugging it in.

At the process end there are ribbon connectors for the terminal adapters or relay interface, or numbered strands, or colour-coded strands.



For more detailed information, please consult the following double-page spread and refer to manual 26/792.

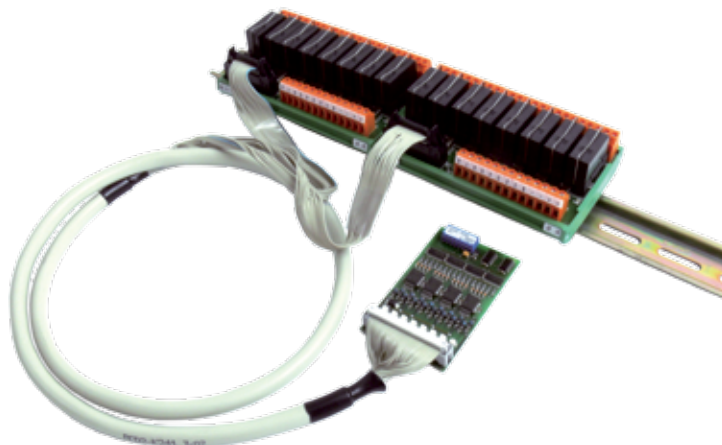
PCD2.K552

Increasingly, building automation applications require the necessary manual control and coupler level in automation stations. Saia-Burgess Controls has decided to take this requirement into account in its new relay interface module, the PCD2.K552.

With relay interface modules, it is possible to override process outputs directly.

Features

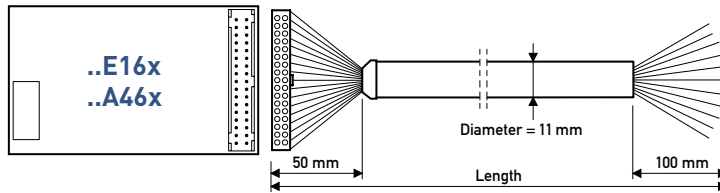
- Manual control function at outputs
- Easy connection to a 16-point output module (PCD1, PCD2 or PCD3) via prefabricated cable
- Direct acknowledgement of manual mode to automation station via a common output
- Also suitable for two-stage functions



Plug-in system cables PCD1 | PCD2

Plug-in system cables with connector at PCD end

Cable for digital I/O modules with 16 inputs or 16 outputs



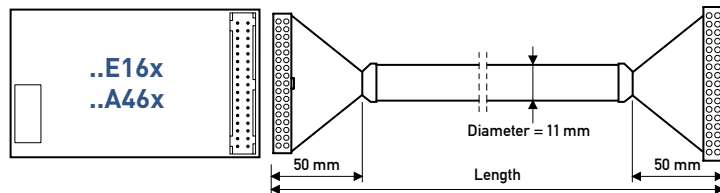
Cable PCD2.K221/K223

Sheathed, round cable with 32 strands of 0.25 mm² (AWG 24)
34-pole ribbon connector at PCD end.

Free ends on process side, unsheathed for 100 mm,
with colour coded strands

Length PCD2.K221 = 1.5 m
PCD2.K223 = 3.0 m

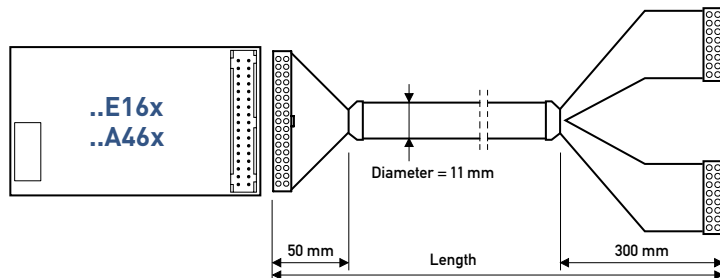
Ribbon/screw terminal adapters for digital I/O modules



Cable PCD2.K231/K232

Sheathed, half-round cable with 34 strands of 0.09 mm²,
34-pole ribbon connector at both ends

Length PCD2.K231 = 1.0 m
PCD2.K232 = 2.0 m



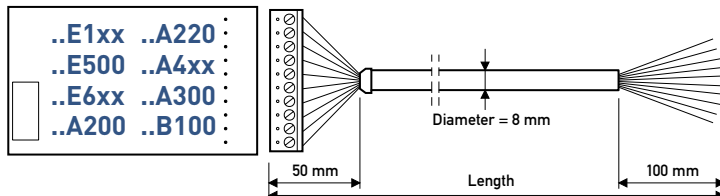
Cable PCD2.K241/K242

Sheathed, half-round cable with 34 strands of 0.09 mm²
34-pole ribbon connector at PCD end

Divided on process side into 2 branches, each 300 mm in
length, leading to 16-pole ribbon connectors

Length PCD2.K241 = 1.0 m
PCD2.K242 = 2.0 m

Cable PCD2.K26x for digital I/O modules with 10-pole



Cable PCD2.K261/K263

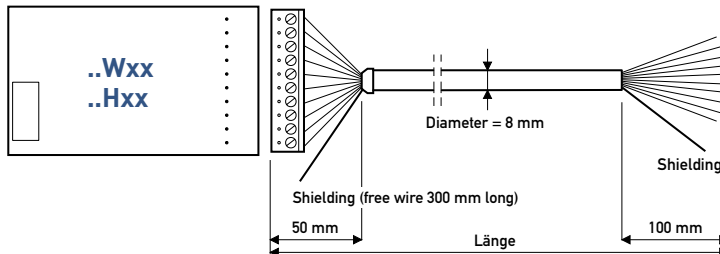
Sheathed, round cable with 10 strands of 0.5 mm²

10-pole, plug-in screw terminal block
at PCD end (remove existing terminal block)

Free ends on process side, unsheathed
for 100 mm, with numbered strands

Length PCD2.K261 = 1.5 m
PCD2.K263 = 3.0 m

Cable PCD2.K27x for analogue I/O modules Wxx and ..Hxx modules



Cable PCD2.K271/K273

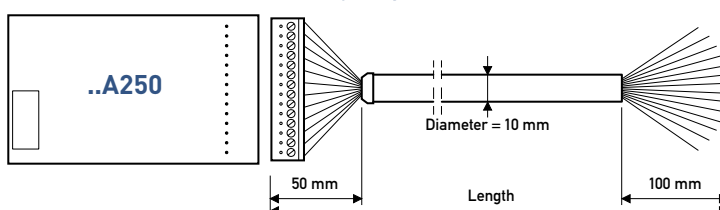
Sheathed, shielded, round cable with 10 strands of 0.25 mm²,
shielding drawn out at both ends

10-pole, plug-in screw terminal block at PCD end
(remove existing terminal block)

Free ends on process side, unsheathed for 100 mm,
with colour coded strands

Length PCD2.K271 = 1.5 m
PCD2.K273 = 3.0 m

Cable PCD2.K28x for ..A250 relay output module



Cable PCD2.K281/K283

Sheathed, round cable with 14 strands of 0.5 mm²

14-pole, plug-in screw terminal block at PCD end
(remove existing terminal block)

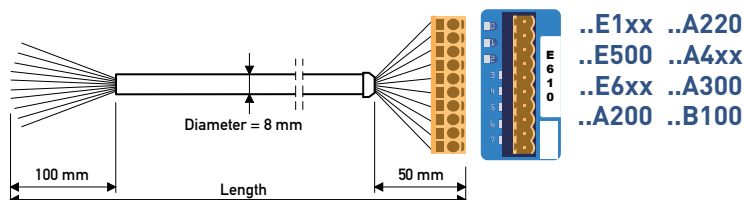
Free ends on process side, unsheathed for 100 mm,
with numbered strands

Length PCD2.K281 = 1.5 m
PCD2.K283 = 3.0 m

Plug-in system cables PCD3

Plug-in system cables with connector at PCD end

Cable PCD2.K26x for digital I/O modules with 10-pole

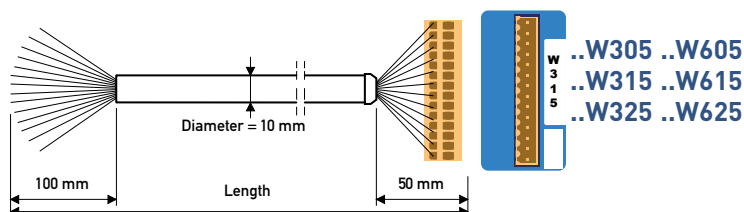


Cable PCD3.K261/K263

Sheathed, round cable with 10 strands of 0.5 mm²
10-pole, plug-in spring terminal block at PCD end
Free ends on process side, unsheathed for 100 mm, with numbered strands

Length PCD3.K261 = 1.5 m
PCD3.K263 = 3.0 m

Cable PCD2.K28x for ..A250 relay output module



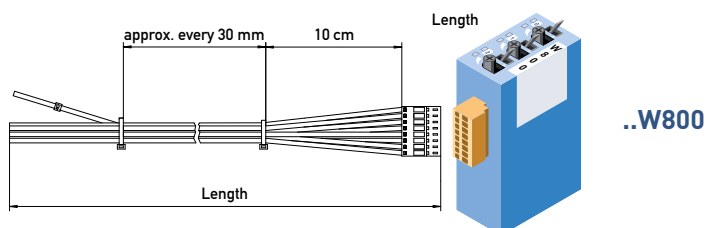
Cable PCD3.K281/K283

Sheathed, round cable with 14 strands of 0.5 mm²
14-pole, plug-in spring terminal block at PCD end

Free ends on process side, unsheathed for 100 mm, with numbered strands

Length PCD3.K281 = 1.5 m
PCD3.K283 = 3.0 m

Cable PCD2.K27x for analogue I/O modules Wxx and ..Hxx modules



Cable PCD2.K271/K273

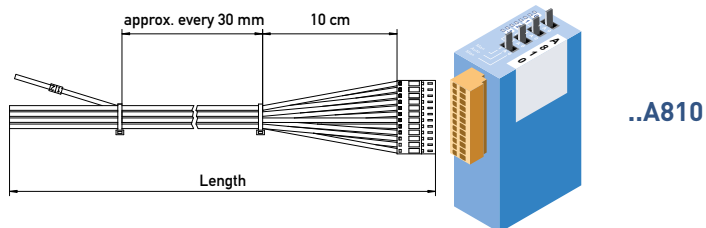
Sheathed, shielded, round cable with 10 strands of 0.25 mm², shielding drawn out at both ends

10-pole, plug-in screw terminal block at PCD end (remove existing terminal block)

Free ends on process side, unsheathed for 100 mm, with colour coded strands

Length PCD2.K271 = 1.5 m
PCD2.K273 = 3.0 m

Cable for the digital manual control module PCD3.A810



Cable PCD3.K810

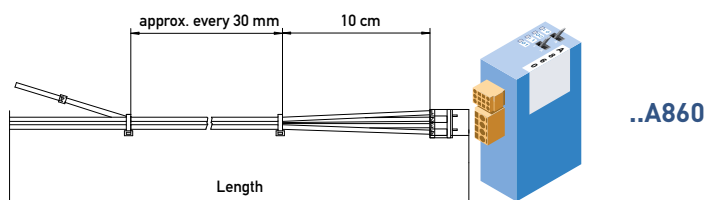
This cable is for PCD3.A810 manual control modules with 4 relay outputs. 12 black strands, each 1.0 mm², held together with black cable ties

PCD side: 12-pole, plug-in spring terminal block, type F

Process side: free strands, numbered

Cable length: 2.5 m

Cables for the digital manual control module PCD3.A860



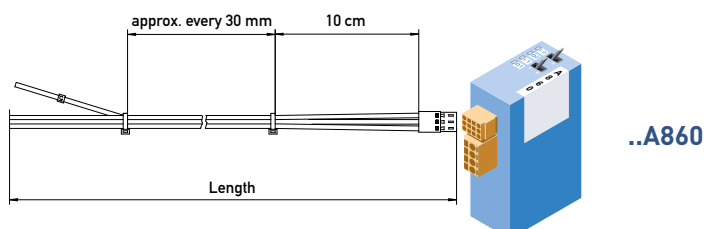
Cable PCD3.K860 (for power outputs)

This cable is for PCD3.A860 light and shade modules. 4 black strands, each 1.5 mm², held together with black cable ties.

PCD side: 4-pole, plug-in spring terminal block, type G

Process side: free strands, numbered

Cable length: 2.5 m



Cable PCD3.K861 (for inputs)

This cable is for PCD3.A860 light and shade modules. 6 black strands, each 0.75 mm², held together with black cable ties.

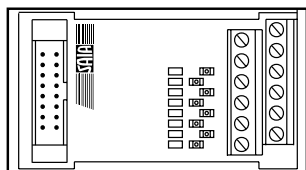
PCD side: 6-pole, plug-in spring terminal block, type H

Process side: free strands, numbered

Cable length: 2.5 m

Ribbon/screw terminal adapters, relay interface

Terminal adapter for 8 inputs or 8 outputs

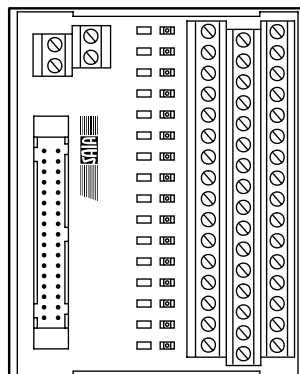


Terminal adapter PCD2.K51x

16-pole ribbon connector at PCD end
2×6 screw terminals at process end, 0.5...1.5 mm²
PCD2.K510 without LEDs
PCD2.K511 with LEDs

(source operation)

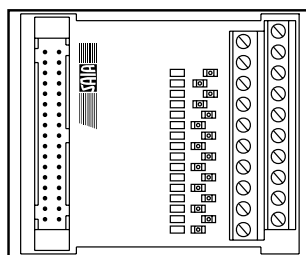
Terminal adapter for 16 inputs or 16 outputs



Terminal adapter PCD2.K525

34-pole ribbon connector at PCD end
3×16 screw terminals at process end, 0.5...1.5 mm²
with LEDs (source operation)

Terminal adapter for 16 inputs or 16 outputs



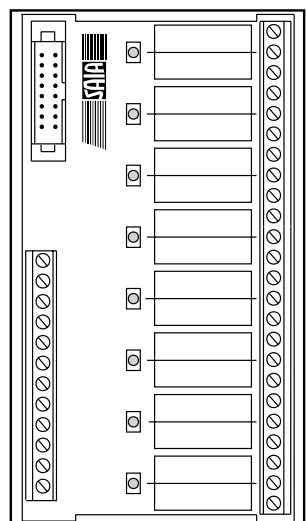
Terminal adapter PCD2.K520/K521

34-pole ribbon connector at PCD end
2×10 screw terminals at process end, 0.5...1.5 mm²

PCD2.K520 without LED
PCD2.K521 with LEDs

(source operation)

Relay interface



Relay interface PCD2.K551 for 8 PCD transistor outputs with 24 screw terminals and LED

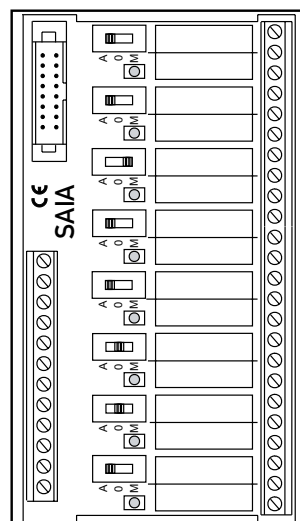
Rupturing capacity of change-over contacts is 10 A/250 VAC or 10 A/24 VDC (ohmic) respectively, coil 24 VDC

Screw terminals or 16-pole ribbon connector at PCD end

24 screw terminals at process end, 0.5...1.5 mm²

Mechanical data

Ø of screw terminals: M2.6 mm
Tightening torque: 0.4 Nm



Relay interface PCD2.K552 for 8 PCD transistor outputs with 24 screw terminals LED and manual control mode (switch on-off-auto) and 1 output feedback signal of manual mode

Rupturing capacity of change-over contacts is 10 A/250 VAC or 10 A/24 VDC (ohmic) respectively, coil 24 VDC

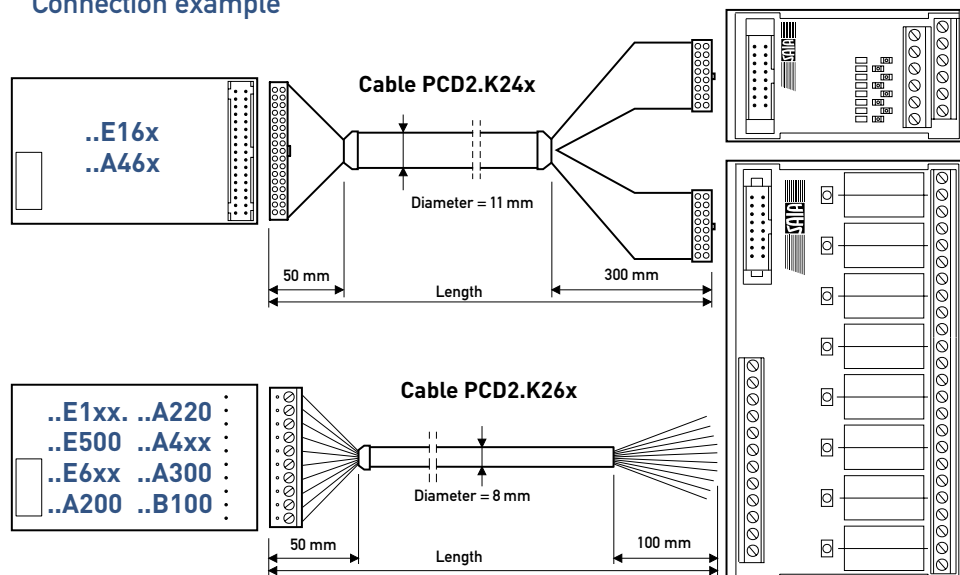
Screw terminals or 16-pole ribbon connector at PCD end

24 screw terminals at process end, 0.5...1.5 mm²

Mechanical data

Ø of screw terminals: M2.6 mm
Tightening torque: 0.4 Nm

Connection example



Ribbon/screw terminal adapters PCD2.K51x for 8 inputs or 8 outputs

Relay interface PCD2.K551 for transistor output modules with 8 outputs





9.5 Power Supplies Q.PS

Power supplies with 24 VDC output

- Short-circuit protection
- Overload protection
- Strong overload without switch-off
- IP20
- Mounting on DIN rail
- Extremely small size

From left to right: Q.PS-ADB, Q.PS-AD2, Q.PS-AD1



Product Range				
Picture	Input	Output	Protection	Features
Q.PS-AD1 	Single-phase 24 VAC / 40 VDC	24 VDC, 3 A 24 VDC, 5 A 24 VDC, 7 A	Short-circuit Overload	
Q.PS-AD2 	Single phase 110...240 VAC	24 VDC, 2.5A 24 VDC, 5 A 24 VDC, 10 A	Short-circuit Overload Overvoltage	Adjustable output voltage 22...26 VDC
Q.PS-AD3 	Double-phase 400...480 VAC	24 VDC, 5 A	Short-circuit Overload Overvoltage	Adjustable output voltage 22...26 VDC
Q.PS-ADB 	Single phase 110...230 VAC / 24 VDC battery	24 VDC, 5 A	Short-circuit Overload Overvoltage	Adjustable charging current 1...5 A, battery diagnostic and different charging modes

Applications

Control panels, where 24 VDC is required to supply PLC's, actors, sensors etc.

- Building automation
- Industrial automation
- Infrastructure plants, such as water or sewage treatment
- Machineries
- Material handling
- Etc.

Norms and certifications

- According to EMC 89/336/EEC and Low voltage 93/68/EEC

Electrical Safety

- According to IEC/EN 60950 (VDE 0805) and EN 50178 (VDE 0160) for assembling device.
The unit must be installed according to IEC/EN 60950.

EMC Generic

- Immunity according to EN 50082-2 Level 4 Class B Noise
Radiation according to EN 55011

9.6 Coupler modules with manual control level for wiring in drives, valves or damper systems

PCD7.L250: Reversing switch with manual control level Auto/0/Manual

- 1 reversing switch
- Manual control level
- Manual acknowledge
- LED display
- 11.2 mm overall width

Single-stage coupler module with manual control level, acknowledgement of switch position and an LED for status display.

PCD7.L260: Coupler module for two-stage motor control

- Mutually latched relay
- Manual control level
- Manual acknowledge
- LED display
- 22.5 mm overall width

When switching back from stage 2 to stage 1, stage 2 is switched off first and, after a <60 ms delay, stage 1 is switched on. A manual control level has been integrated for service purposes. The time function is operational here too.

PCD7.L450: Analogue value transmitter for manual correcting variables

- Potentiometer 0...10 V
- Manual control level
- Manual acknowledge
- LED display
- 22.5 mm overall width

The analogue value transmitter has two operating modes: AUTO and MANU. In the AUTO switch position, the correcting variable is looped without modification via the YR terminal to correcting variable output Y. In the MANU switch position, it is possible to define the correcting variable with the potentiometer on the front panel. The output signal is available at terminal Y.



PCD7.L250



PCD7.L260



PCD7.L450

Input side

Supply voltage	24 VDC/VAC, $\pm 10\%$	24 VDC, $\pm 10\%$	24 VDC/VAC, $-15\%/+20\%$
Current draw	13 mA, protection wiring with recovery diode	30 mA	19 mA at 24 VDC 24 mA at 24 VAC
Input current	—	max. 4 mA, terminal B1 / B2	0.2 mA at 10 VDC (input YR)
Response / release time	10 ms / 5 ms	20 ms / 20 ms	— / —
Input / output voltage	—	—	0...10 VDC
Operating state indicator	Red LED to indicate relay state	Two red LEDs to indicate relay state	Red LED (brightness in proportion to control variable)

Output side

Output contact	1 changeover	1 changeover with 0 position	—
Turn-on voltage	max. 250 VDC / VAC	max. 250 VDC / VAC	—
On / off switching current	max. 8 A / —	max. 6 A / max. 6 A	— / —
Output current	—	—	1 mA, output Y in switch position MANU
Constant current	6 A	4 A	—
Breaking capacity (ohmic load)	24 VDC/150 W 50 VDC/25 W 230 VDC/50 W 230 VAC/1500 VA	24 VDC/150 W 50 VDC/25 W 230 VDC/50 W 230 VAC/1500 VA	— — — —
Breaking capacity, min.	24 VDC / 20 mA	24 VDC / 20 mA	—
Service life, mechanical	2 $\times 10^7$ switch cycles	1 $\times 10^7$ switch cycles	—
Service life, electrical	1 $\times 10^5$ hystereses	1 $\times 10^5$ hystereses	—
Switching frequency, max.	600 hystereses / h max. at max. current	1 200 hystereses / h	—

PCD7.L252:
Changeover switch with manual control level Auto / 0 / Hand

- 1 changeover switch
- Manual control level
- Auto acknowledge
- LED indicator
- 11.2 mm overall width
- Spring terminals

Single-stage coupler component with manual control level, acknowledgement of switch position and an LED for status indication.

Compared with the PCD7.L250, it has 2 added terminals for jumpers.

Screw terminals allow for quick and easy wire connection.

PCD7.L452:
Analogue data encoder for manual control variables

- Potentiometer 0...10 V
- Manual control level
- Auto acknowledge
- LED indicator
- 11.2 mm overall width
- Spring terminals

The analogue data encoder has three operating modes: ON, OFF and AUTO. In switch position AUTO, the control variable will be looped unchanged via the YR terminal to the control variable output Y.

In switch position ON, the control variable can be set using the potentiometer on the front of the device. The output signal will be available at terminal Y.






PCD7.L252

PCD7.L452

Input side		
Supply voltage	24 VDC/VAC, -15%/+10%	24 VDC/VAC, -15%/+20%
Current draw	13 mA, protection wiring with recovery diode	19 mA at 24 VDC 30 mA at 24 VAC
Input current	—	2 mA at 10 VDC (input YR)
Response / release time	10 ms/ 5 ms	—/—
Input / output voltage	—	0...10 VDC
Operating state indicator	Green LED to indicate relay state	Red LED (brightness in proportion to control variable)
Output side		
Output contact	1 changeover	—
Turn-on voltage	max. 250 VDC/VAC	—
On / off switching current	max. 8 A/—	—/—
Output current	—	10 mA, output Y in switch position MANU
Constant current	8 A	—
Breaking capacity (ohmic load)	24 VDC/180 W 50 VDC/65 W 230 VDC/50 W 250 VAC/2000 VA	— — — —
Breaking capacity min.	24 VDC/20 mA	—
Service life, mechanical	2 × 10 ⁷ switch cycles	—
electrical	1 × 10 ⁵ hystereses	—
Switching frequency	max. 300 hystereses/h at max. current	—

Ordering information, accessories

Type	Description
PCD7.L290	Labelling plate for PCD7.L252
	
PCD7.L291	Jumper for connection of the supply voltage of up to 10 modules PCD7.L252 and PCD7.L452
	
PCD7.L490	Labelling plate for PCD7.L452
	

9.7 DC/DC isolating amplifier

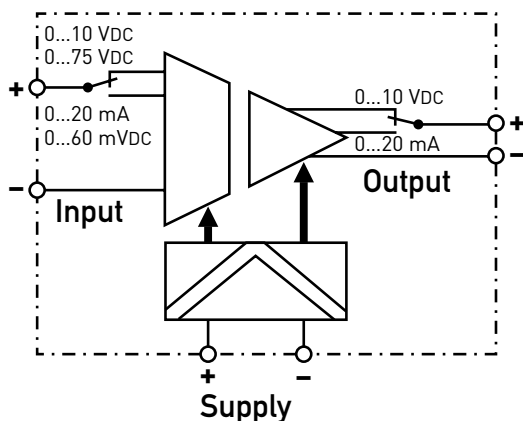


Electrical isolation of analogue signal circuits or for voltage/current conversion

As the name “isolating amplifier” states, the KFD1 isolates individual analogue channels not only from input to output, but also from the supply and from frame ground potential. This electrical separation is particularly recommended for long lines in large installations.

However, the KFD1 can also be used to amplify a weak signal and convert it into a noise-proof current signal.

Function diagram



Technical data

Input ranges¹⁾

KFD11 0...10 VDC, input impedance 200 k Ω or 0...20 mA, load 47 Ω ²⁾

KFD12 0...75 VDC, input current 0...20 mA or 0...60 mV, input current 0... 60 μ A³⁾

Output ranges¹⁾

0...10 VDC, load (≥ 3 k Ω); 0...20 mA, load (≤ 500 Ω)

Input/output

electrically isolated with optical isolating amplifier

Conversion time 20 ms

Short-circuit proof

yes, 1 minute, fault current 100 mA

Status display

LED green: supply voltage present

Isolating characteristics

800 VDC between supply, input and output

Accuracy

0.5 % of final value

Supply voltage

19...70 VDC or 24 V ± 20 % full-wave rectified

Power consumption

1.0...2.4 W depending on voltage and load

Duty cycle 100 %

Terminals

screw terminals for 1 \times 0.5 mm² to 2 \times 2.5 mm²

Mounting

surface mounting; snap-on mounting onto 35 mm DIN-rail or screw fixing by adapter (accessory) and 2 screws M4

Ambient temperature

operation 0...50 °C, storage -25...+70 °C

Atmospheric humidity

95 % r.H. without condensation (DIN 40040, class F)

EMC/Interference immunity

EN 61000-4-4 (2 kV) at input and output

EN 61000-4-4 (4 kV) at supply

EMC/Emissions

EN 55022, class B

¹⁾ 2 input ranges/2 output ranges selectable with 2 slide switches on front panel

²⁾ Overvoltage protection by stress limiter, 27 V max.

³⁾ Overcurrent or overvoltage protection by stress limiter

Ordering details

KFD11 JVTN Isolating signal amplifier DC/DC with input and output ranges 0...10 VDC or 0...20 mA

KFD12 JVTN with input ranges 0...75 VDC or 0...60 mA and output ranges 0...10 VDC or 0...20 mA



9.8 Control Components | Timers

Timers, electronic

KOL2 and KOL3

- Multi function or mono function
- 4 time ranges (KOL251)
- 6 time ranges (KOL 3)
- 17.5 mm width for DIN rail
- 24...48 VDC and 24...240 VAC
- 2 make contact (KOL 251)
- 1 changeover contact (KOL 3)

KOP.J

- Multi function or mono function
- 10 time ranges
- 22.5 mm width for DIN rail
- 24...48 VDC and 24...240 VAC
- 24...240 VAC/DC
- 1 changeover contact

KOP.K

- Multi function or mono function
- up to 10 time ranges
- 22.5 mm width for DIN rail
- 24...48 VDC and 24...240 VAC, 50/60 Hz
- 24...240 VAC/DC
- 1 or 2 changeover contacts, instantaneous and/or timed contacts



KOL360H... KOL311H...



KOP160J...



KOP170J...



KOP219K...



KOP511K...



KOP560K...

Product range		KOL2	KOL3xxH...	KOP1xx.J...		KOPxxx.K...	
	Order number	KOL251H7MKV/PN00	KOL360H7MRV/PN00	KOP160J7MWV/PN00	KOP170J7MWV/PN00	KOP219K7MWV/PN00	KOP560K7MWV/PN00
Functions	Delayed operation		•	•			•
	Delayed release		•	•			•
	Delayed release after failure of operating voltage					•	
	Delayed operation and release			•			•
	Fleeting-on delay timer		•	•			•
	Fleeting-off delay timer			•			•
	Flasher relay		•				
	Star-delta timer	•					
	Pulse converter			•			•
	Pulse generator			•			•
	Flasher relay with pulse starting			•			•
	Asymmetrical pulse generator				•		
	On/off function for startup and maintenance			•			•
Time ranges	0.15 s...10 min	•				•	
	0.05 s...10 h		•				
	0.05 s...60 h			•	•		•
Operating voltage	24...48 VDC and 24...240 VAC	•	•	•	•		•
	24...240 VDC or 24...240 VAC					•	
Contacts	2 make contacts with a joint connection	•					
	1 changeover contact		•	•	•		
	2 changeover contacts					•	
	2 changeover contacts, instantaneous and/or timed contacts						•

9.9 Monitoring relays

Monitoring relays

KFE102 /103 /300 /302

- Voltage and current monitoring, Three-phase asymmetry monitoring
- Phase order, phase failure
- Three-phase voltage monitoring
- 230 VAC, 3 × 400 VAC 50/60 Hz
- 1 change-over contact

KFT100/200

- Electric motor monitoring by PTC
- PTC short circuit monitoring
- PTC broken wire detection with memory function (KFT200)
- 230 VAC
- 1 relay (NO contact, KFT100)
- 2 relays (change-over contact, KFT200)



Product range		KFE102/103/300/302				KFT100/200	
	Order number	KFE102NE1N	KFE103NE1N	KFE300NE9N	KFE302NE9N	KFT100JE1N	KFT200KE1N
Function KFE102/103/300/302	Voltage monitoring	•					
	Current monitoring		•				
	Monitors phase loss, order, asymmetry and under voltage			•			
	Three-phase voltage monitoring (AC)				•		
	Memory function	•	•		•		•
Setting KFE102/103/300/302	Parameterizable, LCD display	•	•				
	Analogue			•	•		
Function KFT100/2002	Electric motor monitoring by PTC					•	•
	Short circuit monitoring in the PTC					•	•
	Broken wire detection in the PTC					•	•
	Memory function						•
Reset KFT100/2002	automatic					•	
	manual or automatic						•
Operating voltage	230 VAC	•	•			•	•
	3 × 400 VAC			•	•		
Output	1 relay (NO contact)					•	
	1 relay (change-over contact)	•	•	•	•		
	2 relays (change-over contact)						•
Function control							
	LED display	•	•	•	•	•	•

9.10 Display counters | Temperature display | Preset counters

Electronic display counters

CXG2xx, CXG301

- Pulse counting, position display, frequency-/speed display, time meter, short-term measurement
- Multiplier and decimal setting for scalable figures
- Set value for time meters and position display
- Max. counting frequency up to 60 kHz
- Programmable using 2 large keys

Temperature display

CXM201, CXM211

- Input for Pt/Ni 100, galvanically separated (CXM 201)
- Input for J, K, N thermo elements, galvanically separated (CXM 211)
- Defined characteristic line
- Automatic minimum-/maximum display
- Programmable using 2 large keys

Multifunctional preset counters

CXQ312, CXQ322

- Preset, batch or totalising counter
- 1 or 2 presets
- Scalable figures via multiplier and divisor value
- Max. counting frequency up to 60 kHz
- Programmable via easy-to-use decade keyboard



CXG2xx

CXG291



CXM2x1



CXQ3x2

Product range		CXG2xx / CXG301						CXM2x1		CXQ312				CXQ322					
		Order number	CXG201M4N	CXG211M4N	CXG212M4N	CXG221M4N	CXG231M4N	CXG291M4N	CXG301M4N	CXM201M4N	CXM211M4N	CXQ312M4L	CXQ312M4N	CXQ312 V3L	CXQ312 V3N	CXQ322M4L	CXQ322M4N	CXQ322 V3L	CXQ322 V3N
Mounting	Flush mounting		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Function	One-channel, adding counting method		•									•	•	•	•	•	•	•	•
CXG2xx & CXQ3x2	Two-channel counting method, counting direction, difference, totalising, phase discriminator (single, ouble, 4 times)			•	•							•	•	•	•	•	•	•	•
	Rotation display, frequency display, speed display (1/sec, 1/min)					•						•	•	•	•	•	•	•	•
	Operating hours/timer meters with resolution in msec						•					•	•	•	•	•	•	•	•
CXG291	Power entry 0...20 mA, 4...20 mA							•											
	Voltage entry 0...10 Vdc, 2...20 Vdc							•											
CXG301	Double function for pulses, frequency and time								•										
CXM201	Input for resistance thermometers Pt/Ni 100 Correction over the entire measurement area									•									
CXM211	Input for J, K, N thermo elements										•								
	External/internal reference point compensation																		
Display range	0...999 999		•			•	•		•										
	–199 999...999 999			•	•														
	19.999...99 999 freely programmable							•											
	Min/max value display							•		•	•								
	Temperature display in °C or °F with 1 or 2 right-of-comma positions									•	•								
	Standard LCD display												•		•		•		•
	Display backlight												•		•		•		•
Reset	Manual and electrical reset		•	•	•	•			•										
	Only min./max. value									•	•								
Counting inputs	NPN		•	•	•	•	•		•										
	PNP		•	•	•	•	•		•										
Output	1/2 relay outputs for 1/2 presets											•	•	•	•	•	•	•	•
	Optocoupling signal entry at 0				•														
Operating voltage	10...30 Vdc		•	•	•	•	•	•	•	•	•	•	•			•	•		
	90...260 VAc													•	•			•	•

9.11 Single-phase energy meter | Three-phase energy meter

Whether in shopping centres, housing complexes, on camping sites or in marinas, today's rising energy costs mean that increasingly consumption based energy billing is required instead of an all-inclusive charge.

Sais-Burgess Controls therefore offers a range of small, economical energy meters. These meters not only have a built-in mechanical counter, but also a pulse counter output for the central capture of energy data in a Saia®PCD and its automatic processing for individual billing on a PC.

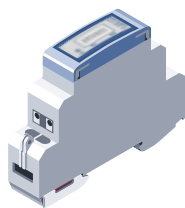
Alternating current / three-phase electricity meters, electronic

ALD1/AAE1, 1 tariff

- 1-phase alternating current meter, 230 VAC, 50 Hz, 5 (32) A, or 10 (65) A
- 7-digit display, MID
- Display of energy only, or energy, current, voltage and power
- Resettable counter
- Precision class 1 according to IEC 62053-21, or B according to EN 50470-3
- Sealable with lead cap as accessory
- S0 output

ALE3, AWD3, , 1 or 2 tariffs

- 33-phase electricity meter, 3 × 230/400 VAC, 50 Hz, 10 (65) A, or 5 (6) A
- Direct measurement or through converter up to 6000 A
- 7-digit display, MID
- Display of energy only, or energy, current, voltage and power
- Resettable counter
- Precision class 1 according to IEC 62053-21, or B according to EN 50470-3
- Sealable with lead cap as accessory
- S0 output



ALD1



AAE1



ALE3



ALE3, 2 Tariffs

Series		ALD1	AAE1	ALE3	AWD3
Order reference		ALD1D5F10KB2A00	AAE1D5F10KR3A00	ALE3D5F10KB2A00 ALE3D5F11KC3A00	AWD3D5F10MC3A00 AWD3D5F10ND3A00
Tariff	1 tariff	•	•	•	•
	2 tariffs			•	
Approvals	MID directive		•	•	•
	without	•		•	•
Rated/max current	$I_N = 5 \text{ A}, I_{\text{max}} = 6 \text{ A}$				•
	$I_N = 5 \text{ A}, I_{\text{max}} = 32 \text{ A}$	•	•		•
	$I_N = 10 \text{ A}, I_{\text{max}} = 65 \text{ A}$		•	•	
Measuring mode	Direct measurement	•	•	•	
	Conversion to 1500 A				•
	Conversion to 6000 A				•
Operating voltage	230 VAC, 50 Hz	•	•		
	3 × 230/400 VAC, 50 Hz			•	•
S0 output	1000 pulses/kWh	•	•	•	
	10 pulses/kWh				•
	1 pulses/kWh				•
Counter	Resettable		•		•
Display	Electromechanical		•		
	LCD energy only	•		•	•
	LCD energy, current, voltage, power		•	•	•

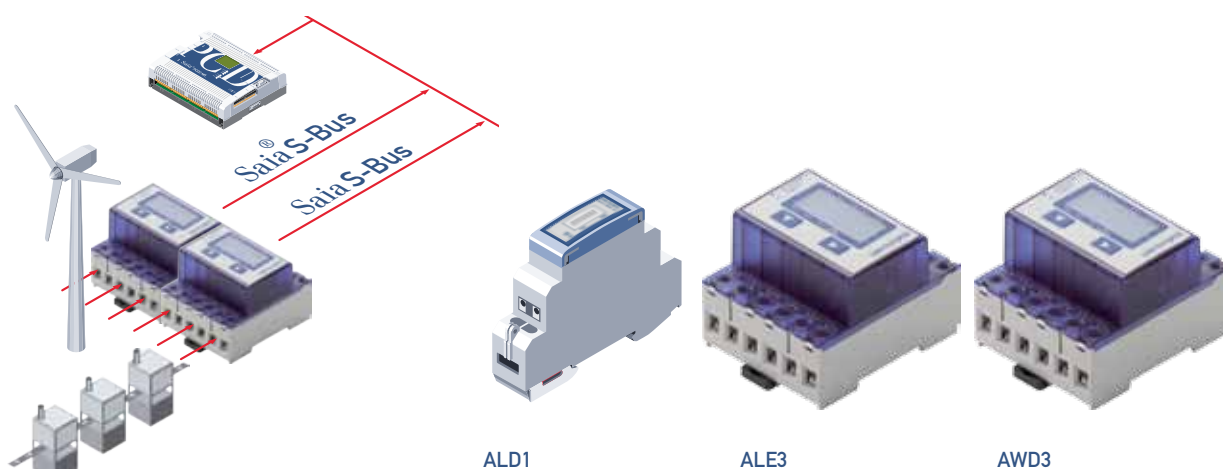
9.12 Energy meter | with integral Serial S-Net interface

Energy meters with an integral Serial S-Net interface allow direct reading of all relevant data, such as energy, current, voltage, power (active and reactive), $\cos\phi$ and energy values for the preceding 30 days.

In addition, the following data can be called up via the Serial S-Net interface:

- Query total and partial energy
- Query current, voltage (active and reactive), power and $\cos\phi$
- Energy gradient of the last 30 days available. Last 30 minutes in steps of one minute, last 6 hours in steps of 15 minutes, last 24 hours in steps of one hour and last 30 days in steps of 24 hours.

! Technical data as on previous page

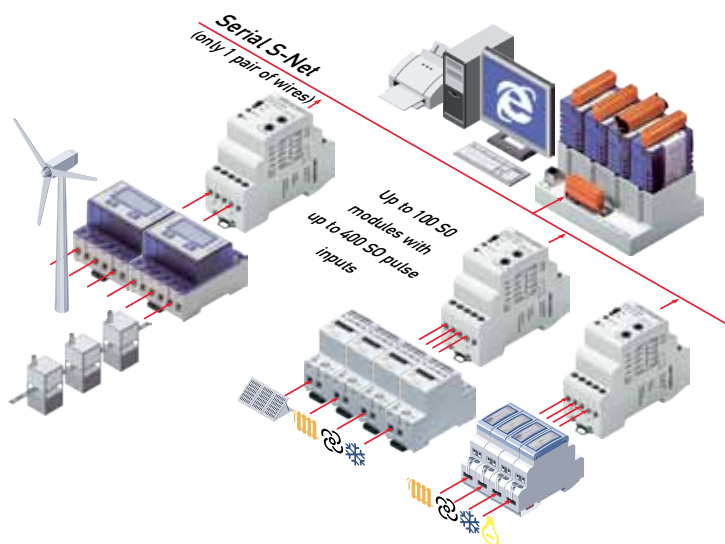


Series		ALD1	ALE3	AWD3
Order reference		ALD1D5FS0KA3A00	ALE3D5FS0KC3A00	AWD3D5FS0MC3A00
Tariff	1 tariff	•	•	•
	2 tariffs			
Approvals	MID directive	•	•	•
	Without			
Rated/max current	$I_N = 5 \text{ A}, I_{\text{max}} = 6 \text{ A}$			•
	$I_N = 5 \text{ A}, I_{\text{max}} = 32 \text{ A}$	•		
	$I_N = 10 \text{ A}, I_{\text{max}} = 65 \text{ A}$		•	
Measuring mode	Direct measurement	•	•	
	Conversion to 1500 A			•
	Conversion to 6000 A			
Operating voltage	230 VAC, 50 Hz	•		
	$3 \times 230/400 \text{ VAC}, 50 \text{ Hz}$		•	•
S0 output	1000 pulses/kWh		•	
	10 pulses/kWh			•
	No S0 output	•		
Counter	Resettable	•	•	•
Anzeige	Electromechanical			
	LCD energy only			
	LCD energy, current, voltage, power	•	•	•

9.13 Energy meter connection to Serial S-Net

With this interface module, Saia® energy meters or the energy meters of other manufacturers can be directly connected via a serial link to automation stations. This allows for the efficient transmission, evaluation and forwarding of energy data.

Transfer of count pulses via Serial S-Net



Low installation costs through transmission of individual consumption values via Serial S-Net

- Much lower installation costs with Saia® S-Bus S0 modules
- Up to 100 Saia® S-Bus S0 modules per Saia®PCD/PCS billing point
- Up to 400 energy meters (4 per Saia® S-Bus S0 module)
- 4 S0 pulse inputs (S01+ ... S04+) per Saia® S-Bus S0 module
- LED signalling:
green = device-on indicator,
rot = bus activity

Data transmission:

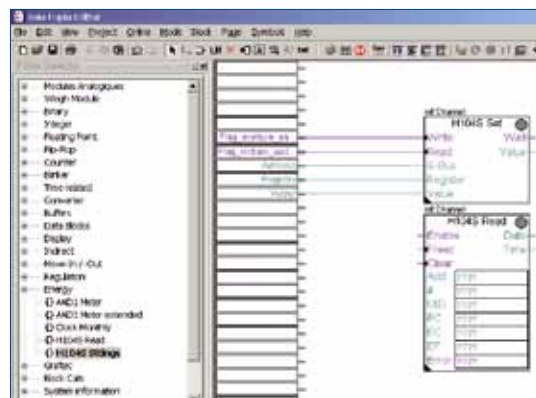
«Read and write instructions» are supported. Registers are read and written to individually.

The default setting is «Automatic transmission rate».

The module has a voltage monitoring system that stores registers in EEPROM in case of power failure (S0 number of registers, transmission rate, etc.).

Technical data: S-Net

Bus system	Serial S-Net
Transmission rate	9600-19'200-28'800-33'600- 56'600
Transmission mode	Data
Bus length, max.	1200 m (without repeater)
Response time: (to system response)	Write : 200 ms Read : 10 ms
Reactivation time	200 ms



FBoxes H104S Set / Read. Download from www.sbc-support.ch

Convenient programming/parameter setting of energy meter networks with Saia® PG5 Fupla FBoxes

Technical data for Saia® S-Bus S0 modules

Order reference	PCD7.H104S
Operating voltage	230 VAC (-20/+15 %)
Current draw	< 12 mA
Power draw	< 3 W
Mounting	On DIN rail, 35 mm (EN 60715) Any mounting position
	S0x, S-Bus, 230 VAC 0.5...2.5 mm ²
Environmental conditions	
Operating temperature	-20 °C...+55 °C
Storage temperature	-25 °C...+70 °C
Atmospheric humidity	25...40 °C 95 % rF. (according to IEC 60068-2-30)
LEDs	
Operating indicator	Green LED (On)
Function indicator	red LED for bus activity
Protection type according to DIN 40050	IP 40 IP 20 connections



10 Software: From configuring to programming

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10.1 System components: Software tools

For programming, configuring, commissioning and monitoring overall automation technology.

- Cost-optimized configuration, visualization and commissioning of standard installations with Compact-Easy
- Fast, comfortable engineering through prefabricated libraries for the automation and management level with DDC-Suite
- Tailor-made engineering with Saia® PG5 Controls-Suite
- Know-how transfer with Saia® FBox-Builder
- Web applications made easy with Saia® S-Web

		Configuration	Visualization/ Engineering tools	Automation libraries	Creation of object masters
Modular and compact systems	PCS/PCD		PG5	Standard HeaVAC/ DDC-Suite	FBox- Builder
Management systems	Visi.Plus		Visi.Plus	HeaVAC/ DDC-Suite	
Web operator panel	Web		S-Web- Editor	HD-Log/ DDC-Suite	
Graphical operator panel	Graphics		VT-Win		
Text and semigraphical operator panel	Text		HMI-Editor	HeaVAC / DDC-Suite	
Communication	Com		Network configurator	FBoxes	

■ LonWORKS® ■ S-Net
 ■ KNX/EIB ■ Modem
 ■ EnOcean ■ DALI
 ■ JCI-N2 ■ Modbus
 (see Chapter 2)

10.2 Saia® PG5 Controls-Suite: The programming tool for automation systems

Advantages of the PG5 programming tools

- Program portability : PG5 programs can run on all Saia®PCD/PCS platforms.
- Program organization by files (containing several program blocks) simplifies the shared use of program files between several Saia®PCD/PCS controllers.
- Programming and debugging environments united in each program editor.
- Extensive function object (FBox) library.
- Powerful instruction set supported by macros and assembler directives.

Features

- Project Manager administers complex installations of networked DDC systems, including displays and documentation.
- Integrated programming environments :
 - Fupla (function block diagram)
 - S-Edit (instruction list IL)
 - Graftec (sequential function chart)
- Online functions for commissioning and error detection via USB, Ethernet-TCP/IP, Modem etc.
- Symbol Manager administers all local, global and network symbols or symbol groups. Automatic address allocation largely dispenses with the need for fixed addressing.
- Integrated network editors for Saia®S-Net, Profibus DP, LonWORKS®.
- Extensive additional libraries, like HeaVAC, Modem, DALI, EnOcean and EIB functions, broaden the scope of PG5 functions.

Project Tree ...

This is similar to Windows Explorer in both appearance and operation. The Project Tree window allows direct access to all DDC systems used in the project, their settings and the program files and documents that go with them..

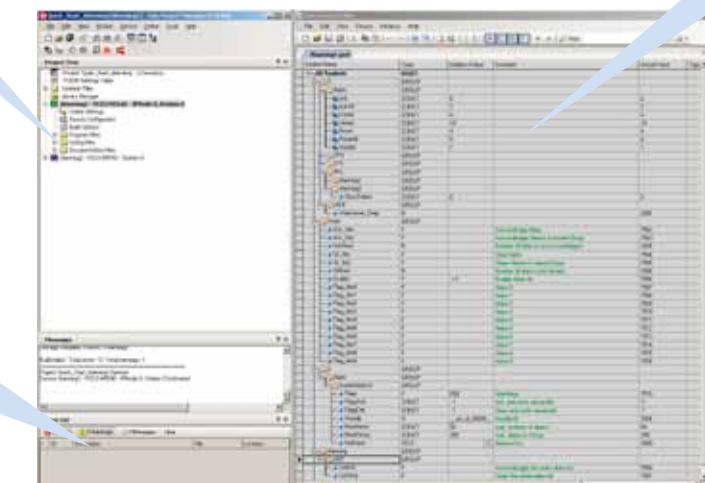
Program organization by files (containing one or more program blocks) simplifies the shared use of program files between several stations. Parts of the program that are used in common are located in a Common Files folder. Changes in one station are immediately effective in all associated stations.

... and Project Manager

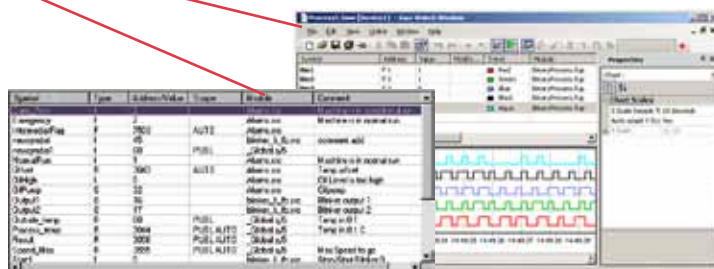
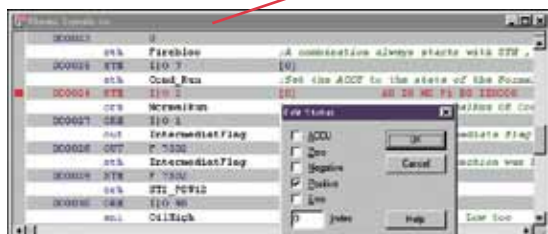
At all times the project tree and Project Manager windows provide a complete overview, even of complex projects with networked DDC systems.

Message Window

Displays the build log, error and status messages. Errors in the program code are listed here after the build, and can be located directly with a mouse-click.



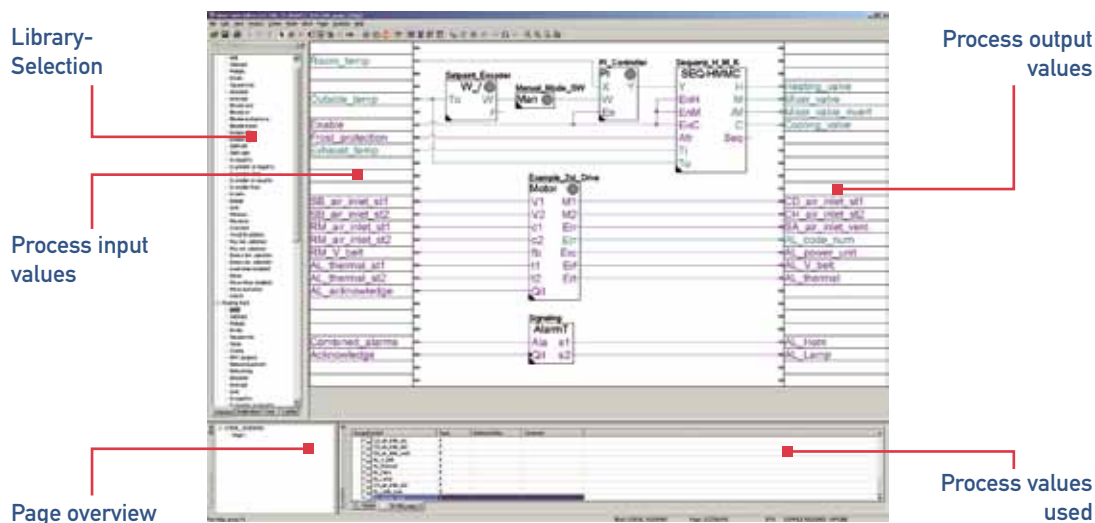
The PG5 package also contains additional modules - such as online debugger, cross-reference data window, etc. - that offer users easier oversight and operation.



10.3 Applications Library | Building Automation

- Programming is made much easier with pre-programmed function blocks (FBoxes) for all functions like heating circuits, pumps, valves, sequence control in monoblocks, lighting, shade, etc.
- Creation of complex user programs by simply positioning and linking of function blocks. This does not require extensive programming knowledge.
- Detailed context sensitive FBox information, clear parameter descriptions and graphical presentation in the Fupla editor make user programs easy to read and understand.
- On-line display of process values and parameter adjustment makes commissioning considerably easier and saves maintenance costs.

Comfortable solutions for heating, ventilation, air conditioning, sanitary and electrical engineering



Essential features of the HeaVAC-SE library

- Over 150 function blocks (FBoxes)
- Clearly set out in a tree structure makes FBox selection very easy
- Parameters are conveniently entered via adjust windows in the Fupla editor, without losing program clarity
- Obvious differentiation between data types through use of different colours
- Import of object lists to the HMI editor on Saia® text terminals with all text, data sources, formats, etc. and the connection to the appropriate function block. This allows process parameters to be displayed and modified on a control terminal.

Clear differentiation of data types

Each data type is identified by a different colour. This makes programs easier to read.

Binary data	violet
Integer data ¹⁾	blue
Floating-point data	yellow
Texts (TX) and data blocks (DB)	green

Text data is inserted in text fields.

Inputs triggered by flanks are marked with a wedge.

Static input
Flank-triggered input

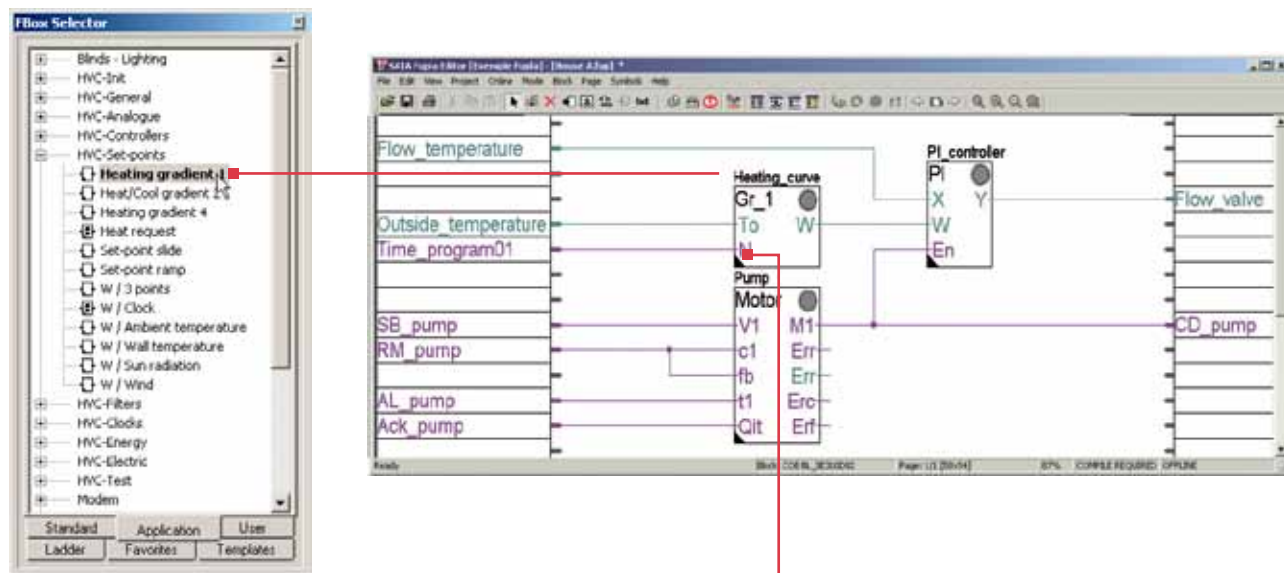
¹⁾ These values are used with a resolution of 1/10



Function blocks

Clear grouping into families

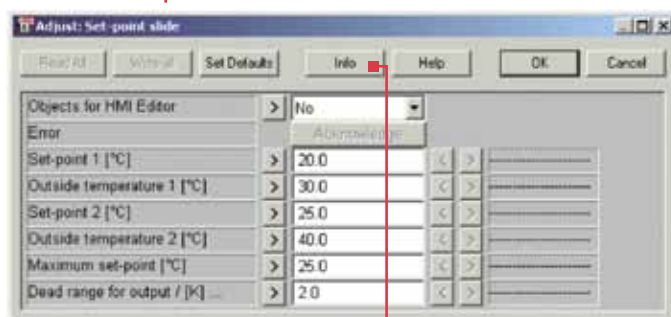
The libraries are arranged in function object families. Use drag-and-drop to position a selected function block in the program.



Parameter windows with online view

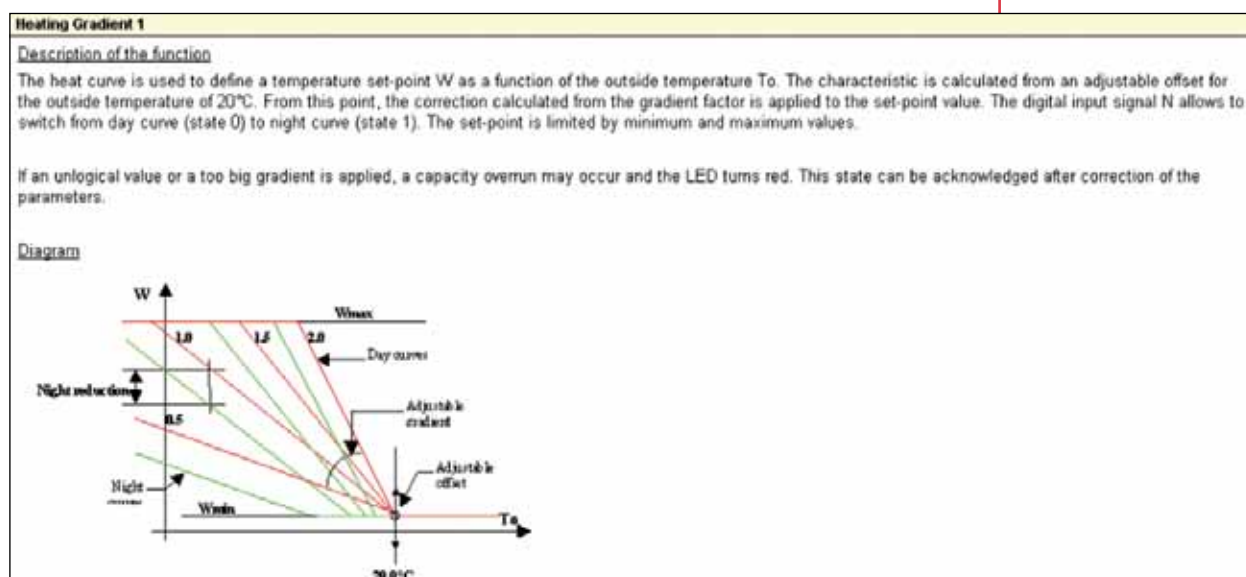
To avoid overloading the display with unnecessary lines, function blocks marked with a triangle have been provided with an «Adjust window».

System information is displayed online in the adjust window, enabling users to adjust parameters directly, such as scheduler functions or controller settings.



Info

Under Info users will find detailed information about inputs, outputs, parameters etc. of each function block (example: Heating Gradient 1).



10.4 Applications Library | Building automation

For speed and comfort in engineering the technical systems of buildings, consistency is required in the automation objects used at the functional, control and management levels.

The two automation libraries «HeaVAC» and «DDC-Suite» form the basis of object structure. These libraries are made up of ready-made function objects called FBoxes (e.g. representing a fan motor or reheater) so that user programs can be created and their parameters set individually.

Control objects for Saia®Text-Panels, Saia®Web-Panels and the Saia® management system coordinate with the function library and can be used to create control concepts that meet customer requirements.

Consistency among all available objects ensures program quality in installations and minimizes the costs of program writing and service.

Features

- Automation objects that suit HeaVAC-specific installations
- Function objects for creating the user program
- Control objects that coordinate with the Saia®HMI-Editor for text-oriented control panels
- Graphics and control objects that coordinate with the Saia®Web-Editor for web-based control panels
- Graphics and control objects that coordinate with the Saia®Visi-Plus management system
- Consistency throughout windows used to set and adjust parameters of all objects.
- Easy symbol and resource assignment with group addressing
- Complete system templates for the commonest applications, e.g. heating circuit, boiler, hot water tank, ventilation systems
- All templates are adaptable to individual use
- Web-Panel templates available with 2D or 3D visual effects
- Considerable reduction of programming time for system program and entire user prompting

Function library for Saia® PCD/Saia® PCS systems

Comprehensive HeaVAC and DDC-Suite libraries provide system integrators with a basis on which to build fast, efficient, customer-specific system programs. Ready-made system components are encapsulated as function objects in these libraries. Their parameters can be set and adjusted with the appropriate configuration and adjustment windows.

Such objects as, for example, a fan motor will include all necessary functions: enable; operating status; service and error messages; and the capture of switching cycles and running times. Through group addressing, fast error-free links can be made to user prompting and visualization.

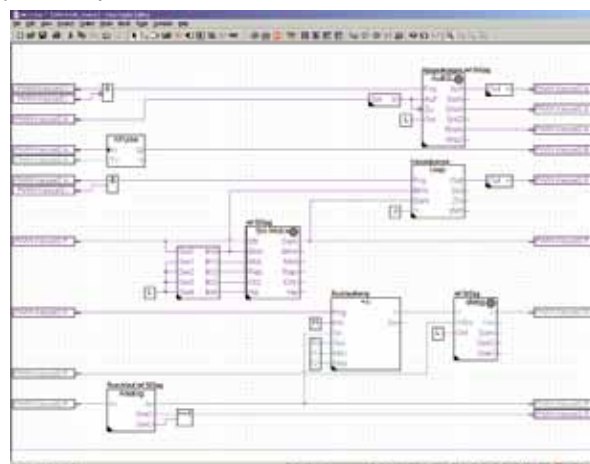
To simplify the construction of complete sections of an installation, the library also includes system templates, e.g. for the heating circuit, water heater, boiler and ventilation systems.



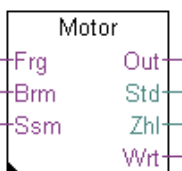
DDC-Suite features

This library differs from the HeaVAC library in the strictness of its attention to a high level of integration for individual, HeaVAC-specific functions. Moreover, from version 2.0 it has also been possible to add: the automatic set-up of offline trend tracking, generation of Web-Panel-compatible alarm entry, automatic construction of BACnet objects, and automatic editing of customer documentation.

System templates



Function box for
motor control with
parameter window





Text-Panel library

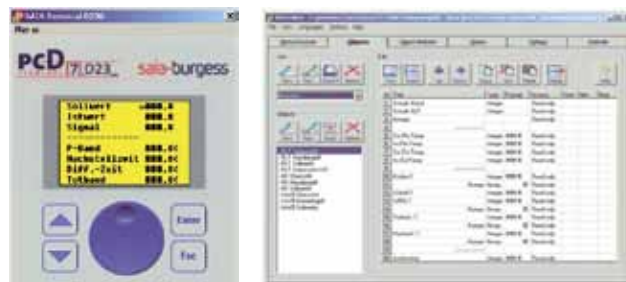
for user prompting on text-oriented control panels

System integrators can use this library to build customer-specific user prompting for Saia®Text-Panels.

These control objects can be used to adjust all necessary parameters, such as set-points and time-switch functions, in accordance with the technical realities of an installation.

All object templates are also supplied in source code. Users can adapt the structure and text of templates to the customer's needs, as required.

Control object for text-oriented control panel



Web-Panel library

for user prompting on web-based control panels

For perfect adaptation of the comprehensive Saia®Web-Panel range to the requirements of a building's technical systems, a library of graphics and control objects has been developed with a regard to demands for engineering efficiency.

Since all control objects have a parameter structure that matches the function library, very fast linking of automation objects or entire automation templates is possible through group addresses in the user program.

The control objects comprise the graphical symbol in 2D or 3D format and a corresponding adjust window, through which object parameters are configured.

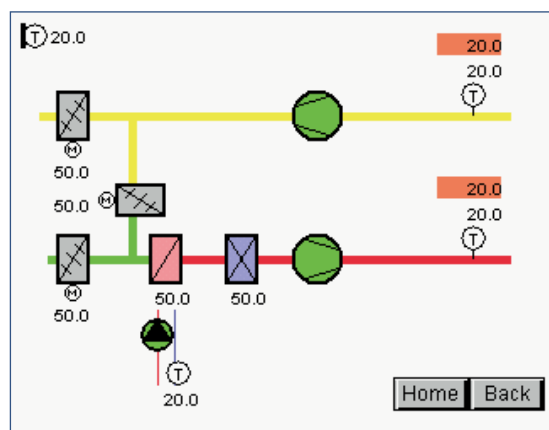
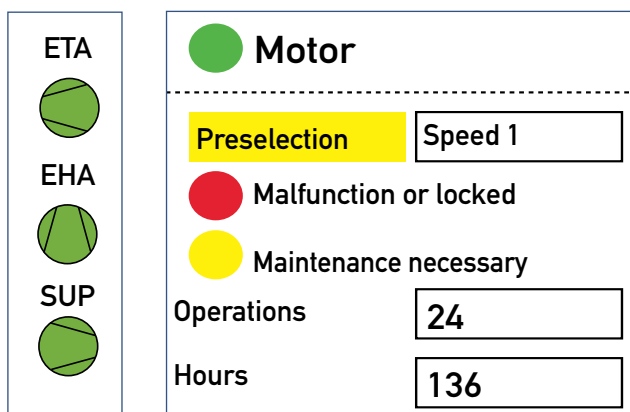


Alongside the control objects themselves, the graphically oriented «Saia®Web-Editor» configuration software also includes all the control templates that users find in the function library.

Graphical object: fan

Object control window

2D template for ventilation system

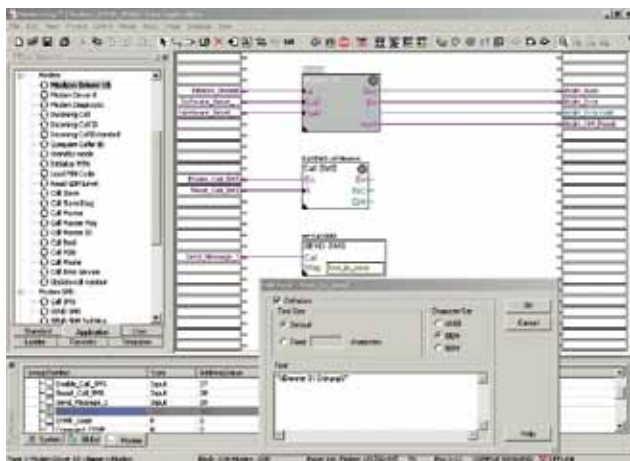


Visi.Plus library see chapter 4.1

10.5 Applications Library | Modem Communications

Modern telecommunication, when combined with systems, not only allows cost savings on commissioning and maintenance, but at the same time increases installation safety, availability and profitability. Examples of how this can be achieved include:

- remote support during commissioning.
- event or time-controlled information and requests to operators or service personnel.
- fault rectification by remote diagnosis.
- process optimization through software updates and/or the updating of process parameters.
- efficient, preventive maintenance by qualified specialists, resulting in low maintenance costs.
- remote user support directly on-screen and close to operations.



Software Libraries

Modem Basic

Initialization and diagnosis, user profiles, list of call numbers, password protection, establishing connection, event or time-controlled data transmission and reception between PCD systems and foreign devices (e.g. building management system), Serial S-Net-network via modem connections.

Modem Pager

Event or time-controlled transmission of single or multiple messages by pager. TAP and various country-specific protocols are supported.

Modem SMS

Event or time-controlled transmission of single or multiple SMS short messages. UCP and TAP are supported. Reception of SMS messages → SMS for control of systems.

Modem DTMF

Supports reception of DTMF signals for control commands via telephone = DTMF signals for control of systems.

You will get further information from Technical Information 26/368.

Master-Station

The master station calls one of two slave stations. When a connection is present, data can be read or written with send and receive FBoxes.

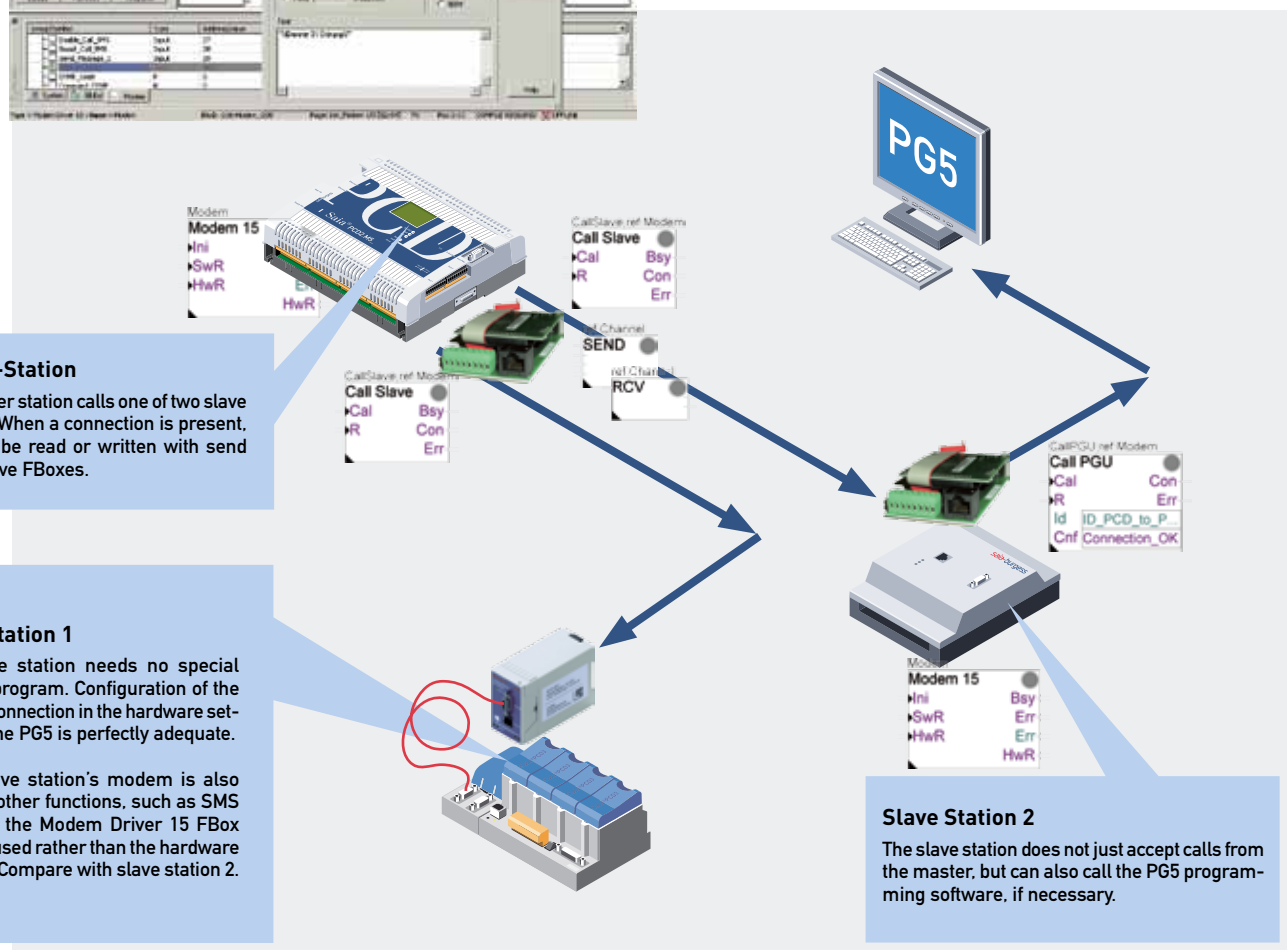
Slave Station 1

The slave station needs no special modem program. Configuration of the modem connection in the hardware settings in the PG5 is perfectly adequate.

If the slave station's modem is also used for other functions, such as SMS or DTMF, the Modem Driver 15 FBox must be used rather than the hardware settings. Compare with slave station 2.

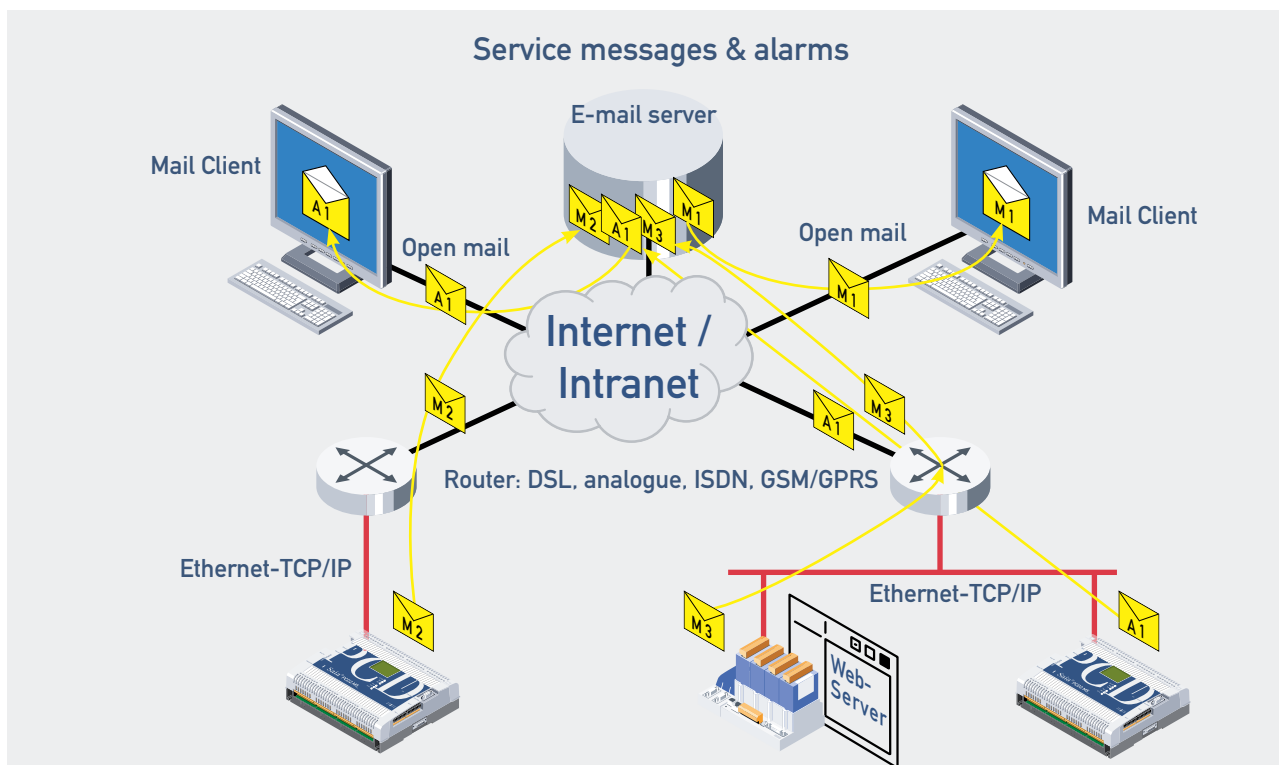
Slave Station 2

The slave station does not just accept calls from the master, but can also call the PG5 programming software, if necessary.



10.6 Applications Library | E-Mail

Sending e-mail with PCD controllers

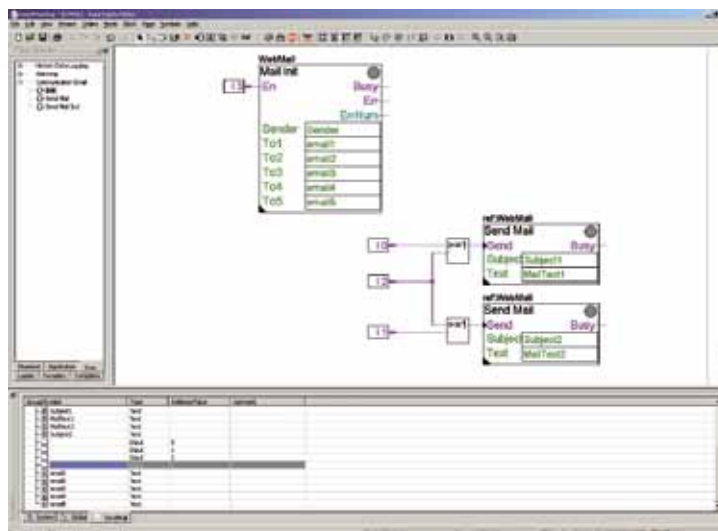


The e-mail function and integral SMTP client (simple mail transfer protocol) enable PCD controllers to send process and system information via the Ethernet interface to a mail server. Alarm, service and status messages – or any process information required – can therefore be sent by e-mail to a management centre and/or to service personnel.

To make the most of e-mail functions, IL instructions (Call System Function) and convenient Fupla FBoxen have been provided.

Technical characteristics of the e-mail function:

- E-mail subject: PCD text
- E-mail text: PCD text
- E-mail with process data: PCD text can contain formatted data
- E-mail with attachment: transmission of files (e.g. log data) from file system, supported by PCD3.Mxxxx
- Authentication with mail server: supported by PCD3.Mxxxx
- Despatch indicating multiple e-mail addresses
- Despatch to multiple mail servers
- PCD systems with SMTP client: PCD3.Mxxxx, PCD1.M135F655, PCD2.M150F655, PCD2.M170 with PCD7.F655, PCD2.M480 with PCD7.F655



10.7 Bauer Optimisation system (BAOPT system) ...how it works

Energy savings over 30%

The BAOPT system produces a room climate that counteracts the air in its physical direction. «Cold air no longer falls – warm air no longer rises.»

Energy savings in excess of 30 percent are achievable for existing and new ventilation/air-conditioning plant using this system, with the possibility of amortisation periods below two years.

More efficient ventilation and greater comfort increase the satisfaction of room users.

At the same time, there is a (project-specific) reduction in the number of air vents. These can be distributed in the room as desired. With new projects, this leads to significantly smaller primary energy installations and correspondingly lower investment costs.

Control is crucial

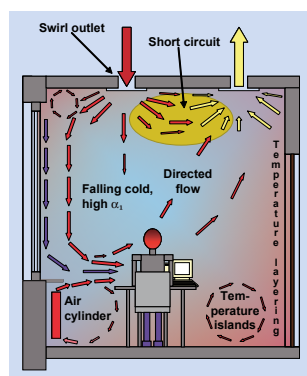
The BAOPT system is a patented process using a special measurement and control strategy for the continuous optimization and control of a HeaVAC system in a particular way.

The aim is to use the separate regulation of fresh and exhaust air in a zone to generate an undirected, chaotic air-flow in a room, with low flow speeds and a simultaneously very homogeneous temperature distribution.

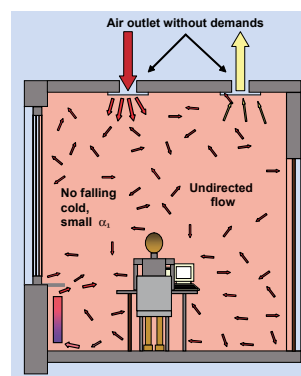
The flow volumes of fresh and exhaust air are controlled in such a way that they continuously counteract and eliminate the effective (thermal) lifting and driving forces in the zone.

Air behaviour in a room

Conventional ventilation technology



Bauer Optimisation technology



System comparison

Typical project: office space with approx. 50 staff – surface area approx. 800 m² – room heating via HeaVAC system

Conventional system

Bauer Optimisation Technology System

Requisite air volumes

Fresh air volume, Winter operation	10 000 m ³ /h	Fresh air volume, Winter operation	2 500 m ³ /h
Fresh air volume, Summer operation	10 000 m ³ /h	Fresh air volume, Summer operation	5 000 m ³ /h
A high exit speed is required at the fresh-air outlets to achieve adequate induction for thorough mixing of air in the room		Through optimum, slow, steady mixing of fresh air with the mass of air in the room an undirected flow pattern is achieved. Even rooms with high ceilings no longer present any problems	

Disadvantages

- As a rule, there is a very high proportion of short circuiting between fresh-air inlets and exhaust outlets
- Sometimes comfortable room air speeds are exceeded
- High expenditure on energy to circulate high volumes of air
- Insufficiently thorough mixing of fresh air with air in room results in islands of temperature, humidity and pollutants

Advantages

- Comfort is improved decisively by low flow speeds and a uniform temperature distribution
- Reducing air flow in the room permits a reduction in the heating setpoint of 1 to 2 °C. Staff find this more pleasant
- From 1 to 2-fold air exchange, it is normally possible to dispense with static heating and, in many cases, with a cooling ceiling also
- Type and location of air outlets no longer play a role
- Enormous reduction in the room's energy consumption:
 - no short-circuiting between air inlets and outlets
 - the energy content of fresh air is exchanged 100 percent with air in room
 - constant adjustment of required fresh air volumes through air quality measurement

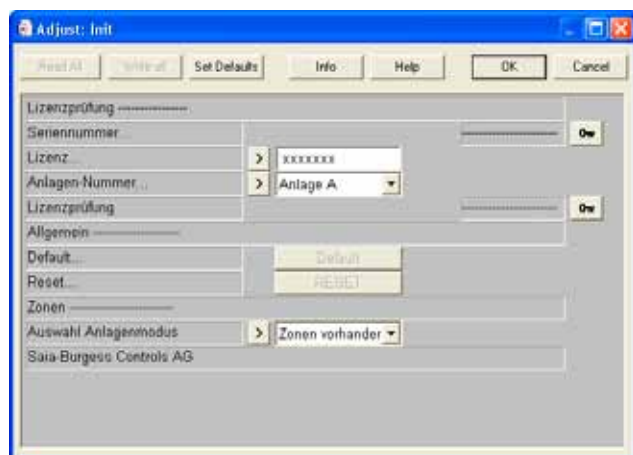
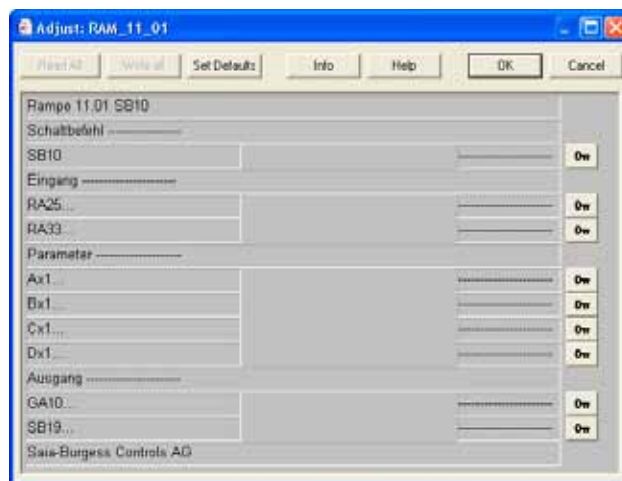
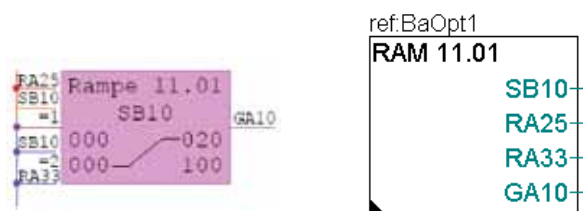
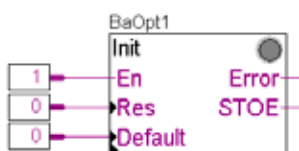
For further information, see www.baopt.de

The Bauer Optimization system in practice on a Saia® PCD automation station using a convenient function object library

Implementation

When putting Bauer Optimization software into practice on a Saia automation system, rigorous care was taken to ensure that individual optimization functions and parameter terminology used in BAOPT software were represented like-for-like in the Saia library. This fact made setting the parameters and servicing the entire optimization program considerably easier.

All the necessary parameters could be checked and adapted online via the function block adjust windows. This made commissioning clear and convenient for the integrator.



Basic program and secondary zones

The BAOPT function library contains all the necessary control and regulation functions to operate ventilation installations in accordance with the Bauer Optimization system. Up to 5 installations can be operated per automation station. For each basic installation, the integrator must put in place one initialization FBox and the parameter FBoxes specific to that installation. The initialization FBox of any secondary zone will directly reference the basic installation.

To hook up physical data points to the optimization program, integrators are provided with input and output FBoxes. After connection of the data points, the system is ready for operation.

Optimization software templates

System templates, included in the library, can make engineering fast and efficient. These templates cover the areas of the main systems and their corresponding secondary zones. System integrators can import these templates, set their parameters, and link them with the necessary input signals. They can then already proceed to commission the system.

If partial areas of a system are not required, the corresponding parameter FBoxes may simply be deleted from the template.



10.8 User prompting | HMI editor: Individual presentation of system user prompts for Saia® text panels

Menu structure and organization

Unlike standard commercial editors, the operator's desktop editor has a hierarchical structure. Menus point to submenus, which in turn point to other submenus, and so on. This sequence of branches constitutes the menu structure. At the lowest level, the last menu or submenu item points to an OBJECT.

Root menu

This is the very first menu that the terminal will display. Three different root menus are possible, depending on the chosen topology:

- One single terminal connected: standby menu
- Multi-point connection of terminals: standby menu and busy menu
- Network connection of terminals: standby menu, login menu and busy menu

These menus can include: text, date/time, password, alarm states, state of acknowledgement and PCD variables.

The bottom 2 lines may be replaced with a line of icons.

Standard objects and elements

An object is a collection of elements. These always comprise a variable (flag, float...), a format (###.##, HH.MM, Phone...) and an access mode (read only, action...) but they may also include a unit of measurement (°C, kW...), or some limiting values. Instead of values, one can choose to display states (run/stop, manual/auto...).

The bottom 2 lines may be replaced with a line of icons.

Resources

The variables (which are associated with elements and comprise the objects) are imported automatically from the PG5. The PG5's global resources constitute the database. These resources can be filtered by type, name, etc. All types of media may be used: flags, registers, inputs, outputs, timers, counters, constants, DBs, etc.

Importing predefined objects

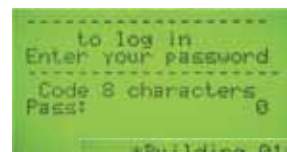
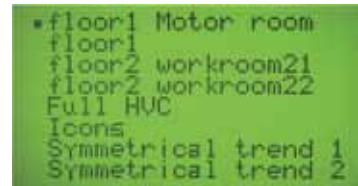
The import/application button is used to import an object library (HeaVAC library, modem library) with all its predefined texts.

Transfer also includes connection to the corresponding function box (FBox) with all its parameters (which then become object elements) and all its texts, data sources, formats, etc.

Icons and icon management

An icon is a predefined figure displayed on the screen.

The Icons Menu, with icons and status bar, are new features supported by D23x series terminals. Status bars have a fixed number of 6 icons. Up to 100 icons can be imported to an HMI file and then loaded into the D23x terminals. Menu items can be created with an icon (static icon) and 2 text lines. A status bar can be defined for: Root, Menus, Objects and Alarm buffer. Status bars can use static or dynamic icons. Any bars defined will appear on the 2 bottom lines of the display. Dynamic icons can be switched by means of a flag, or selected via a register value.



User prompting | HMI editor

Language manager

The language manager allows all text to be edited simultaneously in 5 languages in the same HMI project.

Text can be sorted and languages changed according to the revised language. Untranslated text is marked and translated text is checked.

Language selection prior to compiling a program is quick and simple.

Alarms and alarm settings

The alarm tab is used to create a list of alarms associated with flags, and to define alarm messages in the buffer. For each alarm, 4 lines of text can be defined, + 2 lines for the date, time, alarm state, acknowledgement and number.

Options and adjustment possibilities allow almost all requirements to be met.

The bottom 2 lines may be replaced with a line of icons.

Terminal choice and settings

The «settings» tab is used to select terminal type (text (D170) or graphics (D23x)), define topology (stand-alone, multipoint, network), and to choose the port number, serial interface type, transmission speed, etc.

Options can be defined, such as: duration of backlighting, access rights, types of media supported, etc.

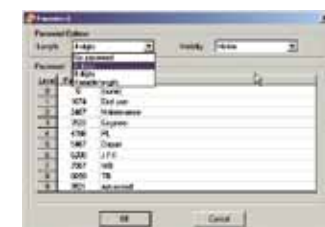
Password and Enable flag

10 password levels of 4 or 8 characters (or of variable length) control the read/write access to each menu or submenu line. Passwords may be visible or hidden; or they may be visible during editing and then hidden, as with the D230.

Enable flag: The status of a flag also allows restrictions to be applied that are similar to password restrictions.

Internal variables

The "Internals" button displays internal variables that can be accessed by the user program for interaction with the HMI editor's internal functions. These variables (S.HMI.xxxxxx) are accessible with predefined system symbols. The variables comprise: passwords, LEDs, F-keys, buzzers, alarms, communications variables, root menu variables and text, and error registers.

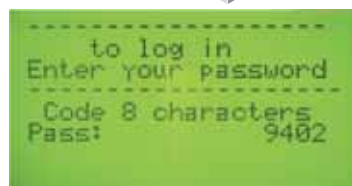
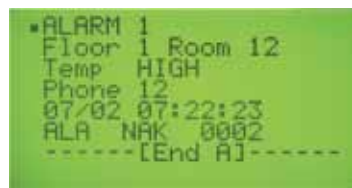
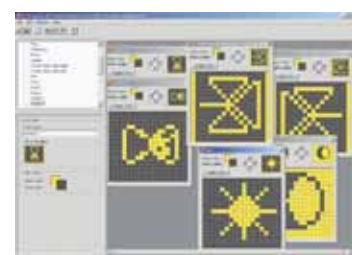


Importing HMI projects

This command allows any part of an existing HMI project to be imported into a new HMI project.

A dialog box is used to select which parts of the project to import.

Parts to be imported are ticked: objects with or without resources, with or without min-max, alarms with or without text, with or without settings, etc.



PLAY function

By pressing the «PLAY» button, the terminal's menus can be displayed (offline) at any time. This is a way of checking presentation, alignment, spacing, window sequencing, navigation and word-breaks.

Also, by simply clicking on the «pre-view » button, the contents of an object can be viewed in a virtual window. Complex objects and icons are not displayed.

ICON Editor

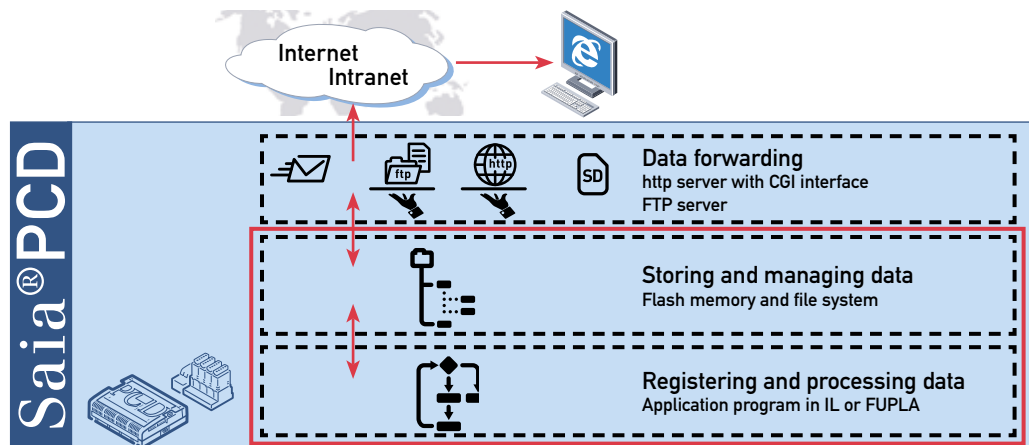
The icon editor is installed automatically in the PG5 when the HMI editor is installed. It will be found in the pull-down «Tools» menu.

The icon editor is the only tool for creating a library of icons to use in the HMI editor. The icon editor always works with just one library at a time and can contain a large number of icons. When the icon editor is opened, one icon library is accessed by default. An icon is a rectangle of 18×16 pixels. Icons are very simple to create and freely definable for the requirements of each application.

10.9 FBox library for file system

Files in the file system can be actively processed and managed by the Saia®PCD. With function libraries, system integrators can create their applications easily and conveniently with the PG5 programming tool.

The integral web and FTP servers allow the direct exchange of files with higher ranking IT systems. No proprietary communications drivers are required.



Storing data

For application programming, users choose between the convenience of graphical Fupla FBoxes and the flexibility of instruction list (IL). Process data can therefore be saved directly to files.

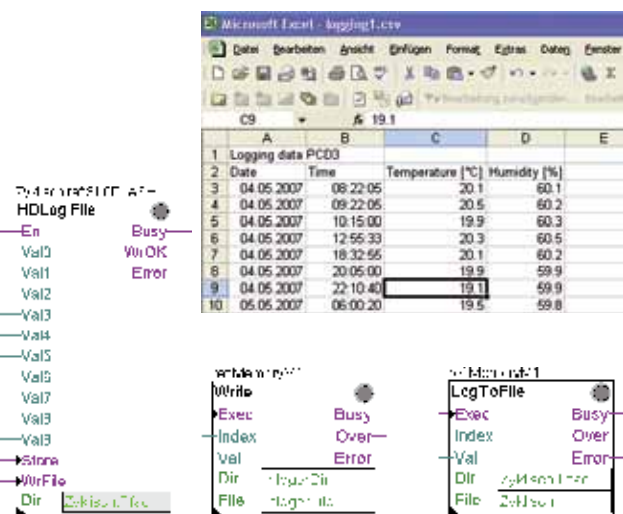
The data recording format (binary, ASCII, ...) is freely definable by the user. For example, log data can be recorded in Excel-compatible CSV files. The advantage of this is that data can be further processed by a higher ranking PC system directly, without proprietary conversion programs.

Managing files securely

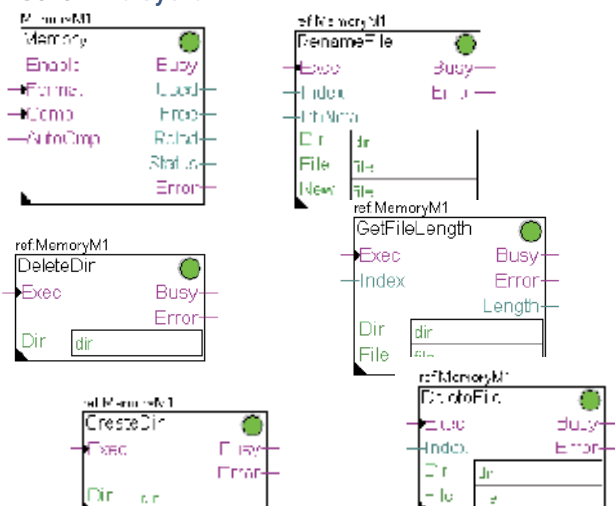
Data in flash memory modules or on-board memory is managed using a file system in the normal way for a Windows PC.

Unlike the office PC, however, machine controllers operate in rough industrial environments. Data loss or corruption resulting from power cuts or other faults will not be accepted. Accordingly, the file system in the Saia®PCD's operating system has been implemented for robustness and reliability.

Up to 1000 files can be stored in a Saia®PCD system. Files and directories can be individually assigned to different user groups and thereby protected from unauthorized access. Functions like Delete, Edit, Rename, Copy, etc. allow for efficient data management directly from the user program.



Fupla FBoxes for direct access to the Saia® file system



10.10 Web user prompting | S-Web-Editor: Easy, efficient editing of Java-based web pages

One tool for all web-based Saia® HMI devices::

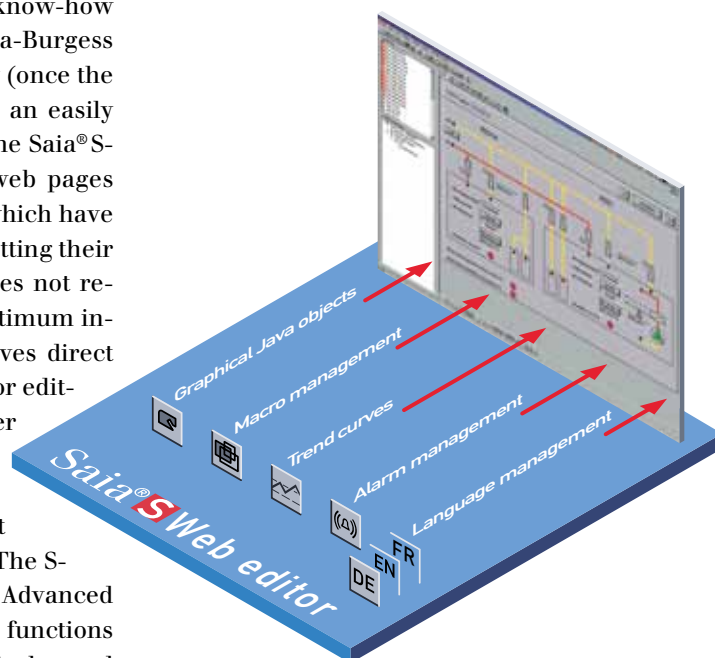
- Web pages are edited by placing on them graphical objects (which have been specially adapted to Saia® PCD controllers) and setting their parameters. Operation is intuitive and does not require knowledge of HTML or Java programming.
- Web pages are generated with the WYSIWYG procedure (what you see is what you get) for all normal screen resolutions.
- Precise, efficient operation is facilitated using familiar Windows formatting tools and extended drawing functions.
- The use of background and foreground pages saves valuable engineering time, following the principle: edit once, use often.
- Macro-management for editing and reusing one's own macro objects, which are derived from basic objects.
- Additional, important engineering savings due to optimum integration within Saia® PG5 Controls-Suite with its associated direct access to PG5 symbol variables. Duplication of data entry - a source of potential errors - is therefore avoided.
- Comfortable trend function for the display and analysis of history data.
- Powerful alarm management for machine or system monitoring.

Powerful software tools are crucial

When producing web-based visualization and control interfaces, web-page editing is an essential element of engineering expenditure. Appealing, functionally designed web pages are the public face of the machine or installation, supporting operational efficiency and safety. It is therefore crucial to have a powerful tool for editing web pages.

Saia® S-Web-Editor: easy, intuitive, efficient

With a normal HTML editor, the construction of dynamic, animated web pages is laborious and requires special know-how (sound programming skills in HTML and Java). Saia-Burgess broadens the user base for this innovative technology (once the preserve of a small group of specialists) by offering an easily operated software tool for editing HMI web pages - the Saia® S-Web-Editor. With the S-Web-Editor, Java-based web pages are edited simply and efficiently by placing objects, which have been specially adapted to the PCD.Web-server, and setting their parameters. Operating the editor is intuitive and does not require knowledge of HTML or Java programming. Optimum integration within Saia PG5 Controls-Suite - which gives direct access to all symbols, powerful macro management for editing one's own, reusable macros, and numerous other useful functions for the efficient design of web pages - significantly reduces engineering expenditure compared with other editors. The investment in a one-off licence pays for itself in the first project. The S-Web-Editor is available in both a Basic Edition and an Advanced Edition. The Advanced Edition provides important functions that go beyond the basic function set, such as the display and analysis of trend curves, or powerful alarm management.



S-Web-Editor | Trend capture and display

Capture and display of history data

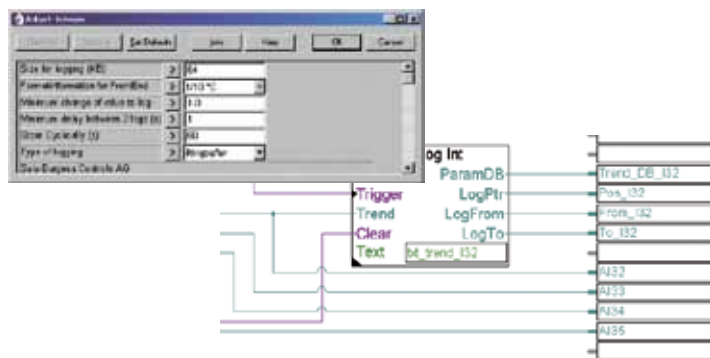
Trend macros can be used for the graphical display of history data in the web browser as trend curves. Data capture and storage can take place either online (through the browser) or offline (through the PCD controller).

Data registration

Offline data registration in the controller takes place by means of the HDLog FBox library for PCD-Classic.

The user configures in FBoxes whether data registration should be event controlled and / or cyclic.

Data can be registered in compact SRam data blocks (binary format) or/and in an Excel-compatible CSV format in the file system of flash memory modules.



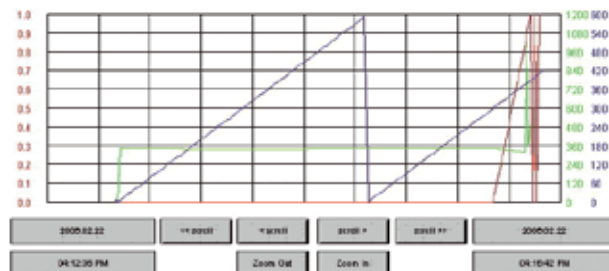
Data points are always recorded with a date and time stamp (1 s resolution) in data blocks or CSV files.

For registration in data blocks, the on-board SRam memory is used (up to 1 MByte for program and data). For registration in CSV files, flash memory modules may be used (up to 4 GBytes with SD flash cards).

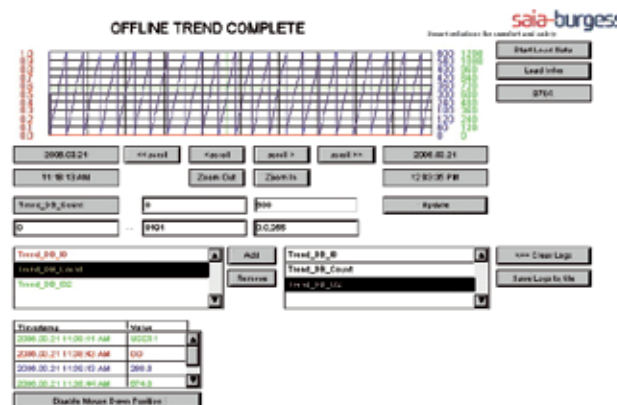
Display of trend curves in web browser

Up to 5 curves can appear simultaneously in one window. These trend curves can be analysed in detail with powerful scroll and zoom functions. The ruler function allowed detailed values on the curves to be displayed for a specific point in time. Trend data can, if required, be stored in Excel-compatible CSV format in a file on the browser PC.

Depending on the macro used, runtime modification in the web browser of adjust parameters (number of trend curves, min/max values, colours, ...) is also possible.



Various trend macros are available for both online and offline data capture. In the case of online data capture, the HDLog library for data registration in the PLC is not needed. Data is read cyclically by the web browser and displayed online as trend curves. For registration of the data, the corresponding view must be displayed in the browser.



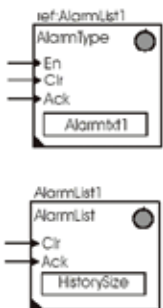
Depending on requirements, users can select from three different trend macros.

- TrendMinimal supports a reduced functional scope. The emphasis here has been placed on ease of operation.
- TrendComplete supports the full functional scope.
- TrendScalable supports a reduced functional scope and can be easily adapted by the user.

With all these macros, the design (size and order of various elements, such as buttons, display fields, fonts, etc.) can be adapted by the user to individual needs. In the web editor, trend curve properties and display (colours, labels, scaling, etc.) are configured.

S-Web-Editor | Alarm management

The monitoring of process signals and alarm capture take place independently of the web browser in the PCD controller. The alarm function itself is implemented in



the firmware of the PCD controller. Its activation and parameter setting take place with the Fupla FBox library for PCD-Classic.

Alarms are permanently stored in alarm lists in the PCD controller's internal memory. A basic difference is drawn between the alarm status list and the alarm history list.

The **alarm status list** in the PCD controller contains the following information for each type of alarm defined:

- Alarm number (the relevant alarm text can be defined either as PCD text and/or with an HTML tag in a CSV file)
- Date and time stamp of last alarm entry
- Status of alarm (pending or fallen) or of date and time stamp when the alarm fell.
 - Acknowledgement status
 - Counter total of alarm concerned

The **alarm history list** stores all alarm events in the PCD controller with the following information:

- Alarm number (the relevant alarm text can be defined either as PCD text and/or with an HTML tag in a CSV file)
- Date and time stamp of each alarm that comes
- Date and time stamp of each alarm that goes
- Acknowledgement status

The alarm history list can be configured as ring memory or fixed memory.

For each alarm list there is a common alarm, which signals a new alarm entry. This enables the user to trigger individually defined actions (e.g. superimpose alarm message in browser).

Up to 10 different alarm lists can be defined and kept in one PCD controller. Depending on the PCD type used, the memory reserved for the entire alarm database amounts to no more than 64 kBytes. Each entry in an alarm list requires 15 bytes. This means that up to 4200 entries (alarm status list and alarm history list) can be stored in the alarm database.

Display and processing of alarm lists in the web browser

For the display and processing of alarm lists in the web browser, users can select from 3 different alarm macros.

Online Mode With History

ID	Alarmtext	Alarm	OK	ACK	
1	Alarm 1	11-11-2002 17:08	Alarm	ACK	Pa
2	Alarm 2	11-11-2002 17:08	Alarm	ACK	
3	Alarm 2	11-11-2002 17:08	Alarm	NAK	
4	Alarm 4	11-11-2002 17:08	Alarm	ACK	
5	Alarm 5	11-11-2002 17:08	Alarm	NAK	
6	Alarm 6	11-11-2002 17:08	Alarm	NAK	Pa
7	Alarm 7	11-11-2002 17:08	Alarm	ACK	
8	Alarm 8	11-11-2002 17:08	Alarm	ACK	
9	Alarm 2	11-11-2002 17:08	Alarm	NAK	
10	Alarm 5	11-11-2002 17:08	Alarm	ACK	

The **Alarm status list** macro lets the alarm status list be displayed and processed online. Alarms can be acknowledged and deleted individually or in groups, through multiple selection.

The **Alarm history online** macro lets the alarm history list be displayed and processed online. Alarms can be acknowledged and deleted individually or in groups, through multiple selection.

The **Alarm history offline** macro lets the alarm history list be loaded into the browser and efficiently analysed offline (i.e. without connecting to the alarm list in the PCD controller). For this purpose, the list can be sorted by a variety of criteria, or saved in an Excel-compatible CSV file on the harddisk of the browser PC and, for example, sent by e-mail to other persons for further analysis.

Alarm texts can be defined as PCD text or by means of HTML tags. HTML tags are defined in CSV files and therefore support multiple languages. For each language, a CSV file exists that is activated in the browser during runtime.

Software | PG5 Controls-Suite

Ordering information

Description	Type
Programming tools	
PG5 – Demo version with all functionalities. Runtime limited to 90 days	PG5 Demo
PG5 – Standard Package Programming software including editors (IL, Fupla, Graftec, HMI), standard libraries (analogue, communication, LONWORKS®, HMI, ...), Network configurators (Profibus DP/FMS, Profi-S-IO, LONWORKS®, S-Net, CAN), Web-Builder and FBox Builder (basic version)	PG5 Standard
PG5 – Building Package Standard (HeaVAC) Like PG5 standard software package with addition libraries (HeaVAC, Belimo, Room Controller and Modem)	PG5 Building Std
PG5 - Building Advanced Package (HeaVAC) Like PG5 building standard software package with addition library DDC-Suite (D/E)	PG5 Building Adv
Update (according to customer's key) - version 1.4 to 2.0	PG5 - Update
PG5 options - Add-on tools	
PG5 – Modem Library Modem base library incl. Data Buffer, DTMF, Pager & SMS libraries	PG5 Modem
PG5 – HeaVAC Library Heavac library for building control	PG5 HeaVAC
PG5 - DDC Suite Library DDC-Suite library for building automation (D/E)	PG5 - DDC-Suite
PG5 - Modbus Library Library Modbus Saia®PCD including library for Siemens® P-Bus	PG5 – Modbus
PG5 – EIB Library (KNX S-Mode Standard) EIB library for building control	PG5 EIB
PG5 - DALI Communication Library Library to connect DALI network components	PG5 DALI
PG5 - EnOcean Library Bidirectional EnOcean Library to connect the EnOcean technology	PG5 EnOcean
PG5 - Belimo MP-Bus Library Library for BELIMO MP-Bus	PG5 – MP-Bus
PG5 – JCI N2-Bus Library Library to connect JCI installations	PG5 - JCI N2-Bus
PG5 - Web Editor (basic version) Software package for Saia®S-Web-Editor	PG5 – Web Editor «basic version»
PG5 - Web Editor (advanced version) Software package for Saia®S-Web-Editor Like basic version with in addition Alarming and Trending functions	PG5 – Web Editor «advanced version»
Saia®.Net Suite Communication components based on Microsoft®.Net with documentation and examples as well as support service and access to updates for 1 year	PCD8.SNET-SUITE
Saia®.Net Suite Support One year extension for support service and access to updates	PCD8.SNET-SUP





System Catalogue: type listing

Article	Weight [g]	Catalogue page	Article	Weight [g]	Catalogue page	Article	Weight [g]	Catalogue page
AAE1D5F10KR3A00	114	176	KFT100JE1N	148	174	PCD2.E500	55	100/112
ALD1D5F10KA3A00	82	176	KFT200KE1N	148	174	PCD2.E610	40	100/112
ALD1D5F10KB2A00	80	176	KOL251H7MKVPN00	76	173	PCD2.E611	40	100/112
ALD1D5FS0KA3A00	—	177	KOL360H7MRVPN00	74	173	PCD2.E613	40	100/112
ALE3D5F10KB2A00	217	176	KOP160J7MWVPN00	113	173	PCD2.E616	40	100/112
ALE3D5F11KC3A00	221	176	KOP170J7MWVPN00	115	173	PCD2.F2100	40	17/47/109
ALE3D5FS0KC3A00	—	177	KOP219K7MWVAN00	135	173	PCD2.F2210	40	17/47/109
AWD3D5F10MC3A00	217	176	KOP560K7MWVPN00	149	173	PCD2.F2810	40	17/47/109
AWD3D5F10ND3A00	217	176	PCD1.M110	500	8/16/98	PCD2.F510	40	104
AWD3D5FS0MC3A00	—	177	PCD1.M125	700	8/16/98	PCD2.F520	35	102/104
CXG201M4N	100	175	PCD1.M135	700	8/16/98	PCD2.F522	40	102/104
CXG211M4N	100	175	PCD1.M135F655	750	99/104/191	PCD2.F530	45	102/104
CXG212M4N	100	175	PCD2.A200	60	100/112	PCD2.G400	370	101
CXG221M4N	100	175	PCD2.A210	60	100/112	PCD2.G410	300	101
CXG231M4N	100	175	PCD2.A220	65	100/112	PCD2.K010	40	106/107/ 115
CXG291M4N	100	175	PCD2.A250	65	100/112	PCD2.K100	65	96/97/ 105/115
CXG301M4N	100	175	PCD2.A300	45	100/112			96/97/ 100/105/ 106/112/ 115/117/
CXM201M4N	125	175	PCD2.A400	40	100/112	PCD2.K106	68	96/97/ 105/115
CXM211M4N	125	175	PCD2.A410	40	100/112	PCD2.K110	70	105/115
CXQ312M4L	125	175	PCD2.A460	30	100/112	PCD2.K120	200	105/115/ 125/166
CXQ312M4N	125	175	PCD2.A465	35	100/112	PCD2.K221	150	105/115/ 125/166
CXQ312V3L	125	175	PCD2.B100	45	100/112	PCD2.K223	330	105/115/ 125/166
CXQ312V3N	125	175	PCD2.C100	560	96/97/99	PCD2.K231	120	105/115/ 125/166
CXQ322M4L	125	175	PCD2.C150	400	96/97/99	PCD2.K232	210	105/115/ 125/166
CXQ322M4N	125	175			106/107/ 113/115/ 123	PCD2.K241	120	105/115/ 125/166
CXQ322V3L	125	175	PCD2.C2000	420		PCD2.K242	210	105/115/ 125/166
CXQ322V3N	125	175	PCD2.E110	35	100/112	PCD2.K261	100	115/166
KFD11 JVTN	117	172	PCD2.E111	35	100/112	PCD2.K263	210	115/166
KFD12 JVTN	116	172	PCD2.E112	35	100/112	PCD2.K271	100	115/166
KFE102NE1N	210	174	PCD2.E116	35	100/112	PCD2.K273	210	115/166
KFE103NE1N	208	174	PCD2.E160	25	100/112	PCD2.K281	200	115/166
KFE300NE9N	187	174	PCD2.E161	25	100/112			
KFE302NE9N	185	174	PCD2.E165	30	100/112			
			PCD2.E166	30	100/112			

Article	Weight [g]	Catalogue page
PCD2.K283	270	115/166
PCD2.K510	100	105/115/ 125/168
PCD2.K511	100	105/115/ 125/168
PCD2.K520	150	105/115/ 125/168
PCD2.K521	150	105/115/ 125/168
PCD2.K525	280	105/115/ 125/168
PCD2.K551	350	105/115/ 125/168
PCD2.K552	360	12/105/ 115/125 165/168
PCD2.M110	860	8/16/99
PCD2.M150	920	8/16/99
PCD2.M150F655	965	99/104/ 191
PCD2.M170	950	8/16/99
PCD2.M480	950	8/16/99
PCD2.M480F655-2	1040	102/104/ 191
PCD2.M5440	1140	8/17/ 108/109
PCD2.M5540	1140	8/17/ 108/109
PCD2.R6000	60	107/108/ 111
PCD2.T500	100	46/47/ 103
PCD2.T814	120	103/109
PCD2.T851	120	103/109
PCD2.W200	35	101/113
PCD2.W210	35	101/113
PCD2.W220	40	101/113
PCD2.W220Z02	40	101/113
PCD2.W220Z12	40	101/113
PCD2.W300	40	101/113
PCD2.W305	55	101/113
PCD2.W310	40	101/113
PCD2.W315	55	101/113
PCD2.W325	55	101/113

Article	Weight [g]	Catalogue page
PCD2.W340	40	101/113
PCD2.W350	40	101/113
PCD2.W360	40	101/113
PCD2.W400	35	101/113
PCD2.W410	45	101/113
PCD2.W525	85	101/113
PCD2.W600	40	101/113
PCD2.W605	60	101/113
PCD2.W610	45	101/113
PCD2.W615	60	101/113
PCD2.W625	60	101/113
PCD2.W745	60	101/113
PCD3.A200	85	100/112/ 122
PCD3.A210	90	100/112/ 122
PCD3.A220	90	100/112/ 122
PCD3.A251	90	100/112/ 122
PCD3.A300	70	100/112/ 122
PCD3.A400	65	100/112/ 122
PCD3.A410	65	100/112/ 122
PCD3.A460	65	100/112/ 122
PCD3.A465	70	100/112/ 122
PCD3.A810	100	100/112/ 122
PCD3.A860	109	100/112/ 122
PCD3.B100	70	100/112/ 122
PCD3.C100	350	97/107/ 115/117
PCD3.C110	180	97/107/ 115/117
PCD3.C110Z09	180	127/129/ 130
PCD3.C200	350	97/107/ 115/117
PCD3.C200Z09	350	127/129/ 130
PCD3.E009	35	125

Article	Weight [g]	Catalogue page
PCD3.E110	60	100/112/ 122
PCD3.E111	60	100/112/ 122
PCD3.E116	60	100/112/ 122
PCD3.E160	65	100/112/ 122
PCD3.E161	65	100/112/ 122
PCD3.E165	65	100/112/ 122
PCD3.E166	65	100/112/ 122
PCD3.E500	80	100/112/ 122
PCD3.E610	65	100/112/ 122
PCD3.E613	65	100/112/ 122
PCD3.F110	80	120
PCD3.F121	80	120
PCD3.F130	80	120
PCD3.F150	80	120
PCD3.F180	80	47/120
PCD3.F210	80	47/120
PCD3.F221	80	47/120
PCD3.F281	80	47/120
PCD3.K010	40	97/115/ 117/129
PCD3.K106	70	97/115/ 117
PCD3.K116	120	97/115/ 117
PCD3.K225	185	115/139
PCD3.K261	100	167
PCD3.K263	210	167
PCD3.K281	200	167
PCD3.K283	270	167
PCD3.K800	120	115/125/ 167
PCD3.K810	190	115/125/ 167
PCD3.K860	170	115/125/ 167
PCD3.K861	70	115/125/ 167

Article	Weight [g]	Catalogue page
PCD3.M2030V6	—	16/127
PCD3.M2130V6	880	16/127
PCD3.M2230A4T5	—	16/129
PCD3.M2230A4T5	—	16/129
PCD3.M2230A4T5	—	16/129
PCD3.M2230A4T5	—	16/129
PCD3.M3020	400	8/17/118
PCD3.M3120	400	8/17/118
PCD3.M3230	400	8/17/118
PCD3.M3330	400	8/17/118
PCD3.M5340	560	8/17/119
PCD3.M5440	560	8/17/119
PCD3.M5540	560	8/17/119
PCD3.M6240	560	8/17/119
PCD3.M6340	560	8/17/119
PCD3.M6440	560	8/17/119
PCD3.M6540	560	8/17/119
PCD3.R010	30	123/125
PCD3.R500	40	121
PCD3.R550M04	40	121
PCD3.R551M04	40	121
PCD3.R560	40	37/121
PCD3.R561	40	37/121
PCD3.R580	40	39
PCD3.R581	40	39
PCD3.R600	40	121
PCD3.T760	370	9/140/ 141
PCD3.T760	370	9/139
PCD3.T765	370	9/139
PCD3.W200	60	101/113/ 123
PCD3.W210	60	101/113/ 123
PCD3.W220	65	101/113/ 123

Article	Weight [g]	Catalogue page
PCD3.W220Z03	65	101/113/ 123
PCD3.W220Z12	65	101/113/ 123
PCD3.W220Z18	65	101/113/ 123
PCD3.W300	65	101/113/ 123
PCD3.W305	80	101/113/ 123
PCD3.W310	65	101/113/ 123
PCD3.W315	80	101/113/ 123
PCD3.W325	80	101/113/ 123
PCD3.W340	65	101/113/ 123
PCD3.W350	65	101/113/ 123
PCD3.W360	65	101/113/ 123
PCD3.W400	60	101/113/ 123
PCD3.W410	45	101/113/ 123
PCD3.W525	—	101/113/ 123
PCD3.W600	60	101/113/ 123
PCD3.W605	80	101/113/ 123
PCD3.W610	45	101/113/ 123
PCD3.W615	80	101/113/ 123
PCD3.W625	80	101/113/ 123
PCD3.W745	95	101/113/ 123
PCD3.W800	45	101/113/ 123
PCD7.D120	70	164
PCD7.D162	260	98/99/ 104
PCD7.D163	260	104
PCD7.D164	260	104
PCD7.D165	260	104
PCD7.D170	260	10/78
PCD7.D230	400	10/78/ 91/94

Article	Weight [g]	Catalogue page
PCD7.D231	400	10/78
PCD7.D232	400	10/78
PCD7.D290	200	10/12/78/ 157
PCD7.D3100E	90	10/110
PCD7.D410VTCF	2000	80/81
PCD7.D410-IWS	—	80
PCD7.D410-OWS	—	80
PCD7.D435TLCF	—	80
PCD7.D457BTCF	1100	80
PCD7.D457SMCF	1000	80
PCD7.D457STCF	1100	80
PCD7.D457VMCF	1000	80
PCD7.D457VTCF	1000	80
PCD7.D457-IWS	—	80/84
PCD7.D457-OWS	—	80
PCD7.D5064TX010	1000	82
PCD7.D5100TL010	2800	82
PCD7.D5100TLW10	—	85
PCD7.D5100TM010	2800	82
PCD7.D5100TX010	2800	82
PCD7.D5120TL010	—	82
PCD7.D5120TLW10	—	85
PCD7.D5150TL010	—	82
PCD7.D5150TLW10	—	85
PCD7.D6100TM010	—	83
PCD7.D6100TM020	—	83
PCD7.D6100TLW10	—	85
PCD7.D6120TL010	6200	83
PCD7.D6120TLW10	—	85
PCD7.D6120TM010	6200	83
PCD7.D6100TM020	6200	83
PCD7.D6150TL010	9820	83
PCD7.D6150TLW10	—	85

Article	Weight [g]	Catalogue page
PCD7.D6150TM010	9820	83
PCD7.D6150TM020	9820	83
PCD7.D700	800	79
PCD7.D710	800	79
PCD7.D740	1200	79
PCD7.D761	500	79
PCD7.D761ET	500	79
PCD7.D763	1400	79
PCD7.D763ET	1400	79
PCD7.D771	1400	79
PCD7.D771ET	1400	79
PCD7.D776	1500	79
PCD7.D776ET	1500	79
PCD7.D786	1900	79
PCD7.D786ET	1900	79
PCD7.D787	1900	79
PCD7.D787ET	1900	79
PCD7.F110	8	91/102/ 104/109/ 130
PCD7.F120	8	91/104
PCD7.F121	8	102/104/ 109
PCD7.F130	8	102/104/ 109/130
PCD7.F150	8	75/86/88
PCD7.F180	8	91/102/ 104/109/ 130
PCD7.F655	45	102/104
PCD7.F700	45	102/104
PCD7.F750	45	102/104
PCD7.F770	45	102/104
PCD7.F772	45	102/104
PCD7.F7400	45	109
PCD7.F7500	45	109
PCD7.F800	45	39/103/ 104

Article	Weight [g]	Catalogue page
PCD7.F802	45	39/103/ 104
PCD7.H104S	165	178
PCD7.K412	146	—
PCD7.K413	180	—
PCD7.K422	104	—
PCD7.K423	146	91/94
PCD7.K456	200	—
PCD7.K830	—	163
PCD7.K840	—	129
PCD7.L100	95	9/138
PCD7.L110	97	138
PCD7.L120	120	11/138
PCD7.L121	368	11/138
PCD7.L130	80	138
PCD7.L200	95	9/138
PCD7.L210	95	138
PCD7.L250	45	170
PCD7.L252	45	171
PCD7.L260	70	170
PCD7.L290	—	171
PCD7.L291	—	171
PCD7.L300	95	9/138
PCD7.L310	95	138
PCD7.L400	95	9/94/138
PCD7.L450	70	170
PCD7.L450	70	171
PCD7.L490	—	171
PCD7.L500	90	137/138
PCD7.L600	500	11/149/ 150/155
PCD7.L601	500	11/149/ 150/155
PCD7.L603	800	11/149/ 150/155
PCD7.L604	—	11/150/ 155

Article	Weight [g]	Catalogue page
PCD7.L610	500	11/150/ 155
PCD7.L611	500	11/150/ 155
PCD7.L614	—	11/150/ 155
PCD7.L615	—	11/150/ 155
PCD7.L620	500	11/149/ 152/153/ 155
PCD7.L621	500	11/149/ 152/153/ 155
PCD7.L622	500	11/149/ 152/153/ 155
PCD7.L623	800	11/149/ 152/153/ 155
PCD7.L630	250	151/155
PCD7.L631	250	151/155
PCD7.L632	250	151/155
PCD7.L640	250	151/155
PCD7.L641	250	151/155
PCD7.L642	250	151/155
PCD7.L643	250	151/155
PCD7.L644	250	151/155
PCD7.L650	250	152/155
PCD7.L651	—	155
PCD7.L660	250	151/155
PCD7.L661	100	151/155
PCD7.L662	250	151/155
PCD7.L663	250	151/155
PCD7.L664	100	151/155
PCD7.L665	—	151/155
PCD7.L666	—	151/155
PCD7.L670	100	153/155
PCD7.L671	100	153/155
PCD7.L672	50	153/155
PCD7.L673	200	155

Article	Weight [g]	Catalogue page
PCD7.L679	250	155
PCD7.L681	—	150/155
PCD7.L790	250	11/146/ 147
PCD7.L791	250	11/146/ 147
PCD7.L792	250	11/146/ 147
PCD7.L793	250	11/12/146/ 147
PCD7.L794	250	11/146/ 147
PCD7.R400	6	99
PCD7.R500	9	108/111/ 121
PCD7.R550M04	9	108/111/ 121
PCD7.R551M04	9	108/111/ 121
PCD7.R560	9	37/108/ 111/121
PCD7.R561	9	37/108/ 111/121
PCD7.R580	9	39
PCD7.R581	9	39
PCD7.R-CF128	—	—
PCD7.R-CF1024	—	—
PCD7.R-CF2048	—	—
PCD7.RD4-SD	—	—
PCD7.R-SD256	10	111/121/ 130
PCD7.R-SD512	10	111/121/ 130
PCD7.R-SD1024	10	111/130
PCD7.T160	160	137
PCD8.C59001E1	—	73
PCD8.C59001M9	—	73
PCD8.C59001M93	—	73
PCD8.C59001M95	—	73
PCD8.C59001M9A	—	73
PCD8.C59001M9S	—	73
PCD8.C59001M9U	—	73
PCD8.D81WLT	500	76

Article	Weight [g]	Catalogue page
PCD8.K111	200	91/94/ 105/115
PCD8.K120	—	30
PCD8.S89V00M1	—	72
PCD8.S89V04x9	—	72
PCD8.S89V05x9	—	72
PCD8.S89V06x9	—	72
PCD8.S89V09M5	—	72
PCD8.S89V10M5	—	72
PCD8.S89V11M5	—	72
PCD8.S89V12M5	—	72
PCD8.S89V21M5	—	72
PCD8.S89V24M5	—	72
PCD8.S89V27M5	—	72
PCD8.S89V39M5	—	72
PCD8.S89V46M5	—	72
PCD8.S89V47M5	—	72
PCD8.S89V48M5	—	72
PCD8.S89V50M5	—	72
PCD8.S89V51M5	—	72
PCD8.S89V52M5	—	72
PCD8.S89V53M5	—	72
PCD8.S89V55M5	—	72
PCD8.S89V56M5	—	72
PCD8.S89V57M5	—	72
PCD8.S89V70M5	—	72
PCD8.S89V71M5	—	72
PCD8.S89V72M5	—	72
PCD8.S89V73M5	—	72
PCD8.S89V74M5	—	72
PCD8.SNET-SUITE	—	59/200
PCD8.SNET-SU0	—	59/200
PCS1.C420	1210	8/90/91
PCS1.C421	1155	8/90/91

Article	Weight [g]	Catalogue page
PCS1.C422	1150	8/90/91
PCS1.C423	1100	8/90/91
PCS1.C42-CONFIG	—	90/91
PCS1.C620	1210	8/90/91/94
PCS1.C621	1155	8/90/91/94
PCS1.C622	1135	8/90/91/94
PCS1.C623	1080	8/90/91/94
PCS1.C62-CONFIG	—	90/91/94
PCS1.C820	1210	8/90/91/94
PCS1.C821	1155	8/90/91/94
PCS1.C822	1135	8/90/91/94
PCS1.C823	1080	8/90/91/94
PCS1.C82-CONFIG	—	90/91/94
PCS1.C880	1210	8/39/90/91
PCS1.C881	1155	8/39/90/91
PCS1.C882	1135	8/39/90/91
PCS1.C883	1080	8/39/90/91
PCS1.C88-CONFIG	—	90/91
PCS1.T814	—	91/94
PCS1.T830	—	91
PCS1.T851	—	91/94
PG5 - Building Adv	450	200
PG5 - Building Std	450	200
PG5 - DALI	—	42/200
PG5 - DDC-Suite	—	71/200
PG5 - Demo	450	200
PG5 - EIB	—	35/40/200
PG5 - EnOcean	—	34/43/200
PG5 - HeaVAC	—	200
PG5 - JCI N2-Bus	—	49/200
PG5 - Mobus	—	34/44/200
PG5 - Modem	—	24/190/ 200
PG5 - MP-Bus	—	34/46/200

Article	Weight [g]	Catalogue page
PG5 - Standard	450	200
PG5 - Update	—	200
PG5 - Web Editor „Basic“ Version	—	197/200
PG5 - Web Editor „Advanced“ Version	—	197/200
Q.APG03U-RS485	—	43
Q.APG03B-RS485	—	43
Q.CVAD25M9M	—	—
Q.CVCOM11102	—	—
Q.CVCOM25F8M	—	—
Q.CVCOM25F9M	—	—
Q.CVPLC01402	—	—
Q.CVPLC04202	—	—
Q.G736-AS2	200	162
Q.LIWBox-100M	—	85
Q.LIWBox-120M	—	85
Q.LIWBox-150M	—	85
Q.LIWFrm-100-01	—	85
Q.LIWFrm-120-01	—	85
Q.LIWFrm-150-01	—	85
Q.LIWFrm-100-02	—	85
Q.LIWFrm-120-02	—	85
Q.LIWFrm-150-02	—	85
Q.M716-KS1	—	163
Q.NET-5TX	230	160/161
Q.PS-AD1-2403	200	169
Q.PS-AD1-2405	200	169
Q.PS-AD1-2407	350	169
Q.PS-AD2-2402	450	169
Q.PS-AD2-2405	700	169
Q.PS-AD2-2410	1150	169
Q.PS-AD3-2405	700	169
Q.PS-ADB-2405	680	169
Q.SRC65-RS485E	—	43

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Q.STC65-RS485E	—	43
Q.T726-RS1	—	163
Q.VM-09SAS/18	—	163
410474090	160	104
410473380	160	104
410474100	243	104
410474270	150	104
410475030	210	104
410475150	8	125
432948190	20	105
410848360	2	164
410948490	-	91/94
410948810	-	80
411149270	-	91/94
412149100	-	84
431086810	-	91/94
431086860	-	124/125
431087230	-	124/125
432948490	-	91/94
440549340	8	125
440549360	11	125
440549410	100	91/94
440549520	-	125
440549540	15	125
440549560	15	125
440549950	12	125
440549980	15	125
440550050	-	125
440550270	6	125
440550280	4	125
440550480	-	125
440550660	11	127
440550790	15	127

Article	Weight [g]	Catalogue page
450748150	10	79
450748170	10	79/105/ 115/125
463948980	10	125



10	Software
9	Switch cabinet components
8	Room automation
7	Remote data points
6	Automation systems
5	Control panels
4	Management system
3	Web-based automation
2	Communication
1	System solutions

Reference projects

Parking buildings

Railway stations

Banks

Office buildings

Breweries

Shopping centres

EXPO 2000

TV transmitters

Festival and event sites

Leisure and recreation centres

Hotels

Industrial facilities

Institutes

Cinemas

Churches

Power plants

Hospitals

Furniture warehouses

Museums

Private houses

Race tracks

Ships

Schools

Administrative buildings

Docks

etc.

Switzerland

Cadiom district heating, Onex
Sälpark shopping centre, Olten
Accor-Hotel, Berne
Kunsthaus, Zurich
Edipresse journal publishers, Lausanne
Road tunnel, A5
Grand Casino, Lucerne
Basic tunnel, Lötschberg
Stadthalle, Zurich
Hospital, Davos
Family Park, Embrach
University, Zurich
Metropole shopping centre, La Chaux-de-Fonds
etc.

Germany

Atlantis leisure pool, Neu-Ulm
Daimler Chrysler, Rastatt/Sindelfingen
EDEKA Center, Hamburg
Lidl stores, throughout Germany
Thermal baths, Bayreuth
District heating, Straubing
Zoo, Hanover
Deutsche Telekom Property, throughout Germany
University campus, Münster
Ritz-Carlton Hotel, Berlin
Müller chemist shops, throughout Germany
Winterberg clinics, Saarbrücken
GENO building (banking centre), Stuttgart
etc.

Austria

Admiral gambling, Vienna
Schwarzenberg barracks, Schwarzenberg
EU patent office, Vienna
Forensic Science, Salzburg
Telekom Head Office heating stations, Wien
Hospital, Lainz
Secondary School, Neumarkt
Sports Center, Traun
University Campus, Krems
University, Salzburg
Technology Park, Vienna
Readymix Fertigteile GmbH, Vienna
Hospital, Mittersill
etc.

France

Accor Building, Evry
Communal Administration, Nantes
Cultural Centre, Rennes
El Building, Lyon
Hospital, Montpellier
Hospital, Nantes
Prison, Liancourt
etc.

Italy

European Space Agency, Frascati
Hotel Tower, Cagliari
Hotel Villa Cimbrone, Ravello
Modern Art Gallery, Torino
Palaghiaccio (Olympic Games 2006), Pinerolo
Shopping centre Auchan, Volla and Giugliano
Hospital Accident and Emergency Department, S. Antonio, Padova
Town Hall – Nursery School – Fire Brigade, Corvara
Reale Mutua Insurance, Torino
Town swimming centre, Bressanone
Railway station, Padova
Technology Offices, Rozzano
Italcuscinetti Head Office, Rubiera
Town Theatre, Modena
etc.

Benelux

High Tech Campus, Eindhoven
Luxembourg Center, Kirchberg
Swimming centre, Velzen / Woerden
Flower Market Flora Holland, Naaldwijk
Flower Market Bloemenveiling, Aalsmeer
Flower Market Flora Holland, Rijnsburg
Hospital, Twenteborg
University hospital AMC, Amsterdam
KPN Cyber Centre, Amsterdam
Gefängnis, Vught / Grave
Steueramt, CJIB Leeuwarden
Financial Office, Apeldoorn
Lidl, Etten-Leur
SCANIA, Zwolle
etc.

Hungary

Airport, Budapest
Police station, Budapest
Sports Center, Győr
etc.

Scandinavia

Arla Milk Production, Vimmerby
Pharma Astra Zeneca, Gothenburg
Ersmark School, Umeå
Hospital, Mälarsjukhuset
Hospital, Nyköping
NK Shopping centre, Stockholm
Power Generation, Eskilstuna
Subway, Stockholm
Kattem Water Distribution, Trondheim
K-Rauta 75 Building, Helsinki
Lentoasema Building, Rovaniemi
etc.

Czech Republic

Hotel L'Opera, Prague
IKEM Hospital, Prague
Metro, Prague
Military Hospital, Prague
Nuclear factory, Dukovany
University, Prague
Skoda, Mlada Boleslav
Transgas, Prague
etc.

Poland

Air traffic control centre, Mielec
Fire brigade, Szczecin
Cultivation house, Silesia
Hospital, Szczecin
etc.

Portugal

Continente Supermarket, Oporto
Shopping centre, Loures
TAP, Lisbon
etc.

China

Pharmaceutical factory, Tianjing
Fanlin Center, Hong Kong
Stadium, Guanzhou
Jayin Building, Meizhou
Sony Factory III, Huizhou
Terra Cotta Museum, Xian
etc.



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