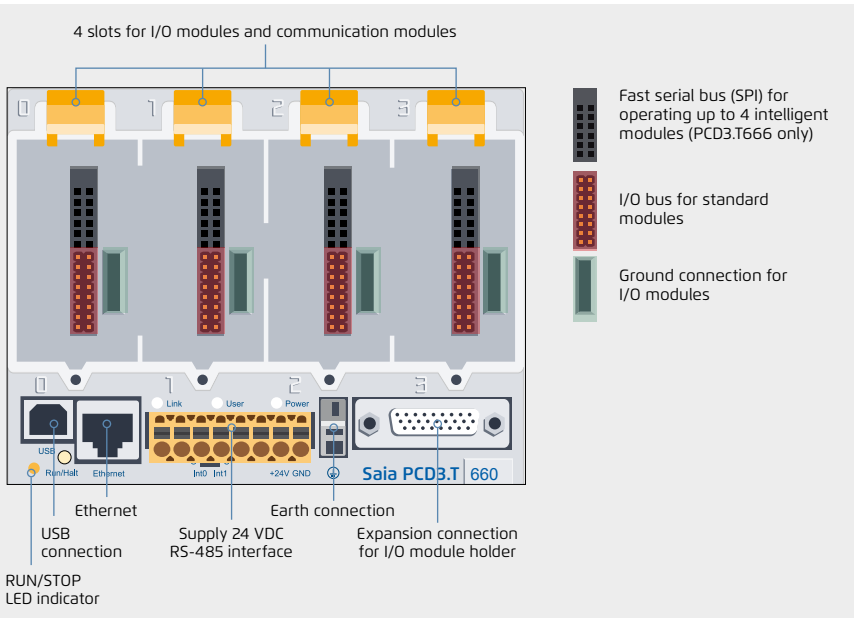


1.2.2 Saia PCD3.T66x remote I/O stations

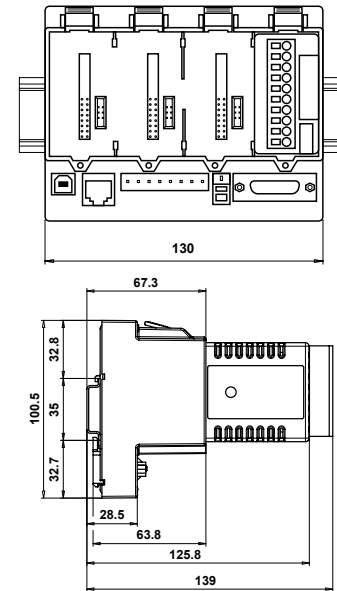
The Smart RIOs are more than just another Ethernet remote I/O system. They can be programmed like a PLC and are therefore the ideal solution for distributed automation in line with the lean philosophy. Smart RIOs can be equipped with PCD3 I/O modules and expanded with PCD3 I/O module holders up to 256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



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



Dimensions

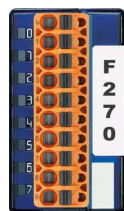


System properties

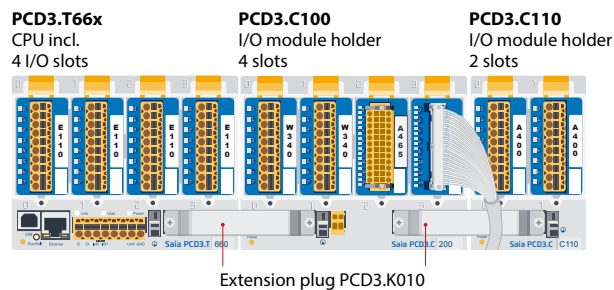
- ▶ Can be used as a simple remote I/O station or an intelligent programmable I/O station.
- ▶ Can be programmed with PG5. Important or time-critical tasks can be processed direct in the RIO.
- ▶ The RIO user programs are managed centrally in the Smart RIO Manager (PCD) and distributed to the RIOs automatically.
- ▶ Data exchange with efficient Ether S-IO protocol. Simple configuration with the RIO network configurator.
- ▶ Cross-communication with other PCD systems using Ether S-Bus (FBoxes).
- ▶ Intelligent communication modules (M-Bus, DALI) are supported with PCD3.T666.
- ▶ Other communication protocols (e.g. Modbus) via Ethernet TCP/IP and with PCD3.T666, also via the onboard RS-485 interface.
- ▶ Integrated Automation Server

I/O modules

The standard I/O modules of the PCD3 series can be used. For more information and types, see Chapter "Saia PCD3 input and output modules in cassette design" on page 26.



I/O extensions up to 256 I/O per RIO station



Order details

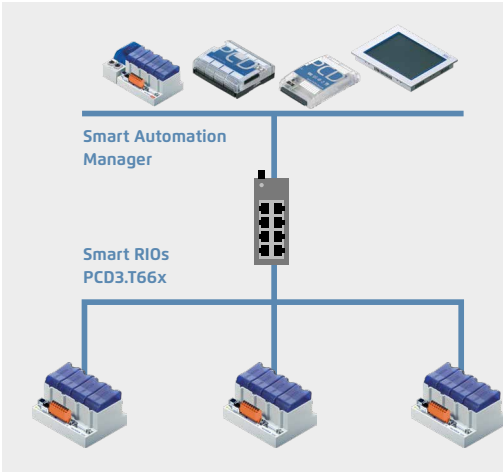
Smart RIO

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

I/O module holder

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

Distributed automation system design with Smart RIO



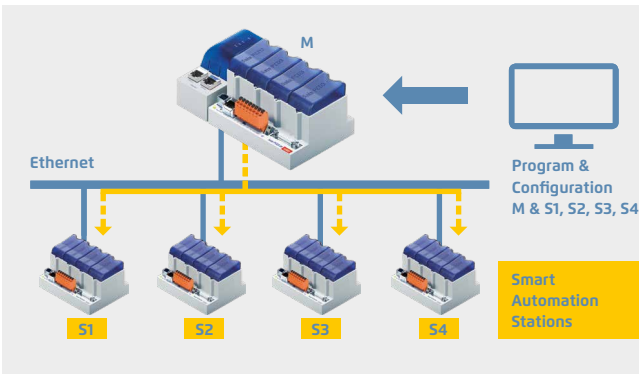
As Smart Automation Managers, PCD1.M21x0, PCD2.M5, PCD3.M2/3/5 CPUs and the programmable micro browser panel PCD7.D4xxxT5F can be used

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

The maximum number of RIOs per Manager depends on the type of Manager used

The Smart RIOs can be used both as simple remote I/O stations and as intelligent programmable RIO stations.

Central program management in the Manager



The application programs are centrally managed by the Smart Automation Manager and distributed to the Smart RIOs. If hardware is replaced, the programs and the configuration are reloaded automatically.

The Manager must have sufficient memory resources to save the RIO programs. The onboard program memory and the plug-in flash memory modules PCD7.Rxxx and PCD3.Rxxx can be used for this.

Data transfer with Ether S-IO protocol

The screenshot shows the 'SBC RIO Network Configurator - All' software interface. It displays a table of RIO configurations with columns for RIO Name, IP Address, RIO Type, Description, Program, Enabled, RIO #, RIO ID, Diag ID, and Device File Path. Below the table, there are sections for 'Media Mapping' and 'IO Mapping'.

Simple configuration of the data transfer in the RIO network configurator

Data transfer cycle times

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

2 different transfer cycle times can be set per RIO station:

- Short cycle time for high-priority data
- Normal cycle time for low-priority or slow data

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

Technical Data

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

Smart Automation Manager (master station)

max. 16 RIO stations	PCD3.M2130, PCD3.M2330
max. 32 RIO stations	PCD1.M212x, PCD3.M3120, PCD3.M3160, PCD3.M3330, PCD3.M3360
max. 64 RIO stations	PCD1.M2160, PCD2.M4160, PCD3.M5340, PCD3.M5540, PCD3.M6x40, PCD7.D457VT5F, PCD7.D410VT5F, PCD7.D412DT5F
max. 128 RIO stations	PCD2.M4560, PCD3.M5360, PCD3.M5560, PCD3.M6560, PCD3.M6860

General data

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

System properties/limits and recommendations for lean automation

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



- ▶ The load on the RIO Manager increases with the rising number of RIO stations. This has an impact on the overall application in the RIO Manager.
- ▶ If there is a large number of RIOs, a sufficiently large volume of PCD media must be reserved on the Manager for the data transfer.
- ▶ With the increased number of RIO stations, the build and download process in PG5 is extended accordingly. Likewise, the start-up behaviour of the Manager or the entire RIO network is proportionately longer.

Recommendation: 20 Smart RIOs per Manager is an effective configuration for efficient and flawless operation and easy commissioning and support.

The Smart RIOs do not have a battery. In the event of an interruption to the power supply, all the data in the RAM memory (registers, flags, DBs/text) will be lost. Data and parameters that are remanent must either be transferred by the Manager or stored in the RIO's flash file system. If this is not possible, it is recommended to use a normal controller instead of a Smart RIO.

The user programs are stored in the flash memory of the RIOs and are retained in the event of an interruption to the power supply.