

# Saia<sup>®</sup> PCD3 system Remote I/O

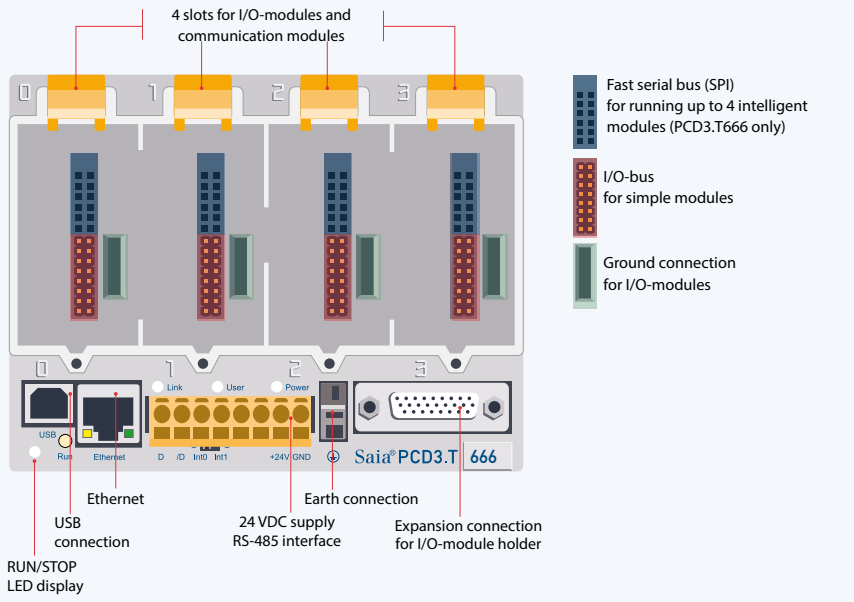


## 1.6.1 Saia® PCD3.T66x remote I/O-stations

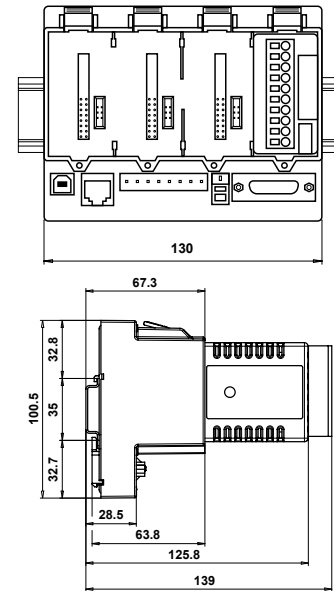
The Smart RIOs are more than just another Ethernet remote I/O-system. They can be programmed like a PLC and are therefore the ideal solution for distributed automation in line with the lean philosophy. Smart RIOs can be equipped with PCD3 I/O-modules and extended to max. 256 I/Os per RIO station using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



### Layout for Saia® PCD3.T66x: Smart RIO head station with 4 slots for I/O-modules



### Dimensions



### System properties

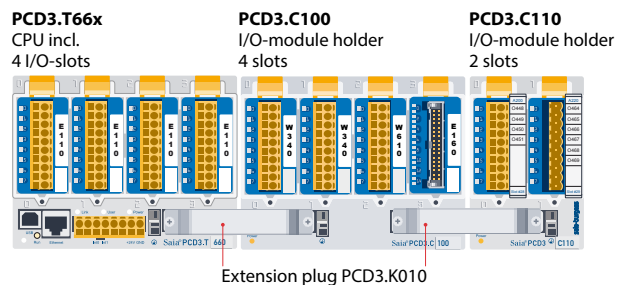
- ▶ Can be used as a simple local I/O-station or an intelligent programmable I/O-station.
- ▶ Can be programmed with PG5. Important or time-critical tasks can be processed directly in the RIO.
- ▶ The RIOs' user programs are managed centrally in the Smart RIO Manager (PCD) and distributed to the RIOs 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, via the on-board RS-485 interface as well.
- ▶ Integrated AutomationServer

### I/O-modules

The standard I/O-modules of the PCD3 series can be used. For more information and types, see section "PCD3 input/output modules".



### I/O-expansions to max. 256 I/Os per RIO station



### Ordering information

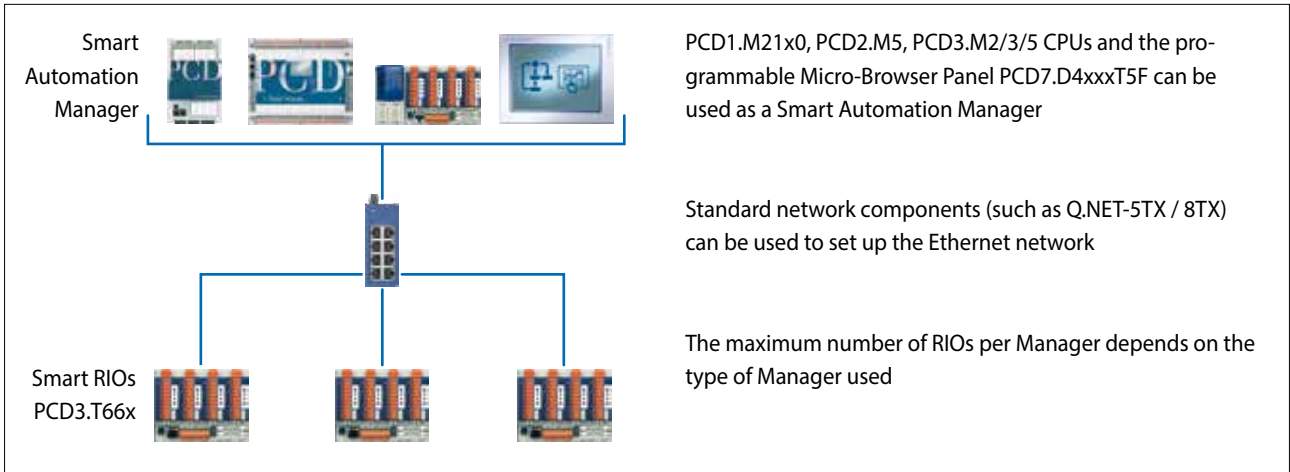
#### Smart RIO

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**



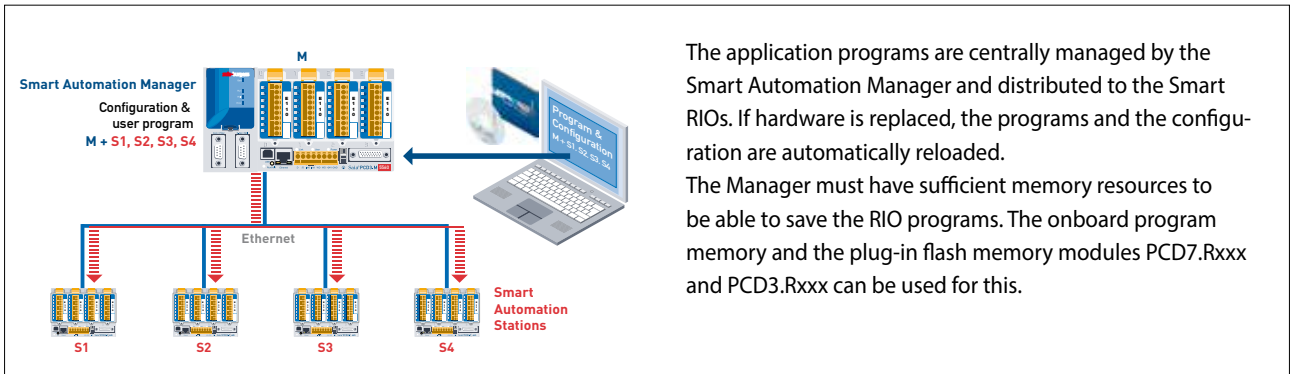
PCD1.M21x0, PCD2.M5, PCD3.M2/3/5 CPUs and the programmable Micro-Browser Panel PCD7.D4xxxT5F can be used as a Smart Automation Manager

Standard network components (such as 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 local I/O-stations and as intelligent programmable RIO stations.

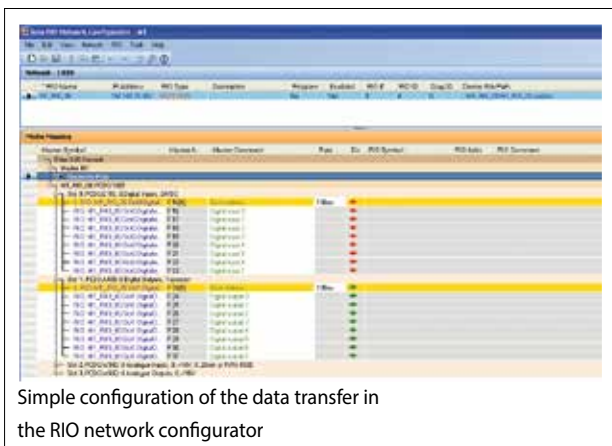
**Central program management in the Manager**



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 automatically reloaded.

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

**Data transfer with Ether-S-IO protocol**



Simple configuration of the data transfer in the RIO network configurator

**Data transfer cycle times**

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

**2 different transfer cycle times can be set for each RIO station:**

- a 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 the 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, extensible to 256	
I/O-module slots	4 in base unit, extensible to 16	
I/O-modules supported	PCD3.Exxx, PCD3.Axxx, PCD3.Bxxx, PCD3.Wxxx	
Max. number of RIO stations	128	
Protocol for data transfer	Ether-S-IO	
Ethernet connection	10/100 Mbit/s, full-duplex, auto-sensing, auto-crossing	
Default IP configuration	IP address: 192.168.0.100 Subnet mask: 255.255.255.0 Default gateway: 0.0.0.0	
USB port 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 --- ---
S-Web alarming/trending	no	no
Watchdog	no	
Real-time clock	no	
Software clock (not battery-powered)	yes, synchronized by the Manager	
Battery	no	

## Smart Automation Manager (master station)

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

## General data

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

## System properties/limits and recommendations for lean automation

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



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

**Recommendations:** 20 Smart RIOs per Manager is a sensible configuration for efficient and problem-free operation, and simple commissioning and support.

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