PCD7.L130 Input module with 10 digital inputs

Description

The RIO module was developed as a S-Bus data node for local switching tasks. Via a DDC of the type PCDx / PCS1, inputs can be read and manual/auto function monitored.
Two address switches (×1 / ×10) on the front panel allow module addressing and identification. Addresses can be set between 00 and 99. Up to 100 RIO modules and a maximum of 3 PCD stations can be connected to one bus branch simultaneously.

Technical data

Bus system	S-Bus
Transmission rate	1200... 38400
Transmission mode	Parity / Data
Bus length max.	1200 m (without repeater)
Nominal voltage UN	18 VDC…32 VDC / 20 VAC…28 VAC
Current consumption	<75 mADC / <80 mAAC
Power consumption	1.8 W / 1.9 VA
Relative duty cycle	100 %
Reaction time	15 ms (from receive data to send data reaction)
Recovery time	< 3 s
Operating temperature range	0 °C…+55 °C
Storage temperature range	-25 °C…+70 °C
Protective wiring	Reverse battery protection of service voltage Reverse battery protection of supply and bus EMC according to DIN EN 61000-6-2
Input state indicator	Yellow LED
Function indicator	Green LED for bus activity
Status indicator	Red LED for bus error message
Test voltage input / bus	2500 VAC / 50 Hz / 1 min.
Protection class (DIN 40050)	Housing IP50 / Terminals IP20

Signal inputs

Input voltage max.	30 VDC
High signal recognition	> 7 VDC

Housing

Protection system	30 VDC
Humidity class	F (DIN 40040)
Connection cross-section	2.5 mm² (terminals)
Plug-in terminal	1.0 mm² (screw-type)
Mounting position	any
Weight	83 g
Housing dimensions	W×H×D: 35 × 70 × 74 mm
Joined without spacing	After 15 modules have been joined in sequence or a maximum supply current of 2 A (AC or DC) per port on the powersupply, the external supply voltage must be reapplied.

PCD7.L130 RAIL

Input 10…6

Input 1…5

Screw terminals,
2.5 mm², 1.0 mm² for
supply voltage and bus

Mounting and commissioning to be conform with current regulations:

1. Power-off the installation
2. Place module onto 35mm tophat rail and press down to engage.
3. Strip insulation from 7mm of cable (max. single wire 4 mm², fine strand 2.5 mm², diameter 0.3 mm to 2.7 mm), insert into binding and tighten with a screwdriver.

Connect supply voltage and field bus to plug-in screw terminal.

Caution!!
Plug-in terminal has max. 1.0 mm² connection cross-section. Check correct connection of bus lines and supply.

Connection examples 1 + 2

Connection example 3

Data transmission

All S-Bus instructions (level 1) are recognized. Instructions that have no function in the device are answered with <NAK>. The module has integral, automatic baud rate and transmission mode recognition.

"Display Input"

Address	Information		Address	Information
1	0= Status input 1 open		9	0= Status input 9 open
	1= Status input 1 connected (Signal >7 VAC/DC)	. . . .		1= Status input 9 connected (Signal >7 VAC/DC)
2	0= Status input 2 open		10	0= Status input 10 open
	1= Status input 2 connected (Signal >7 VAC/DC			1= Status input 10 connected (Signal >7 VAC/DC)

The inputs 1 to 10 can be called together

„Display Register"

Address	Information
5	Baud rate (plain text => kBit/s)
6	Module address
7	Status register
8	Bus timer
9	Current transmission mode (data / parity)
10	Bus error counter (divided into 4 bytes)

The following registers can be called together
(Display Register "x" to "y") 5 to 7 / 8 to 10

"Write Register"

Address	Value	Baud rate setting (Baud kbit/s)
5	4	1 200
	5	2 400
	6	4 800
	7	9 600
	8	19 200
	9	38 400

Address	Value range	Meaning
8	2 <-> 20	20 <-> 200 ms

Status register:

Bit 0:	1= Device recognized last transmission
	0= Device did not recognize last transmission
Bit 1:	1= Last transmission was a broadcast
	0= Last transmission was not a broadcast
Bit 2:	1= Last transmission came from master
	0= Last transmission came from a slave
Bit 3:	1= CRC of last message was correct
	0= CRC of last message was incorrect
Bit 5:	1= Device has executed an internal reset
	0= Device function is OK
Bit 8:	1= Internal bus to EEPROM is OK
	0= Internal bus not working perfectly
Bit 9:	1= EEPROM data memory is OK
	0= EEPROM data memory is faulty
Bit 10:	1= Baud rate uploaded from EEPROM
	0= Baud rate is at default value (9600 Bd.)

All other bits are reserved for factory tests.

Bus connection

Connection plan in switch cabinet or for short connections

Up to max.15 modules

Bus termination i.e.
with termination box
PCD7.T162

Bus timer (register 8)

The value displayed indicates how long the module waits until a telegram is complete. The time is shown in 10 ms steps (e.g.: value 20 => a time of 200 ms). The recommended time is 100 ms, i.e. a register value of 10. If the time is reduced, modules will react faster to telegrams from the master. If there is a heavy load on the master station, a bus timer setting that is too low may lead to lost telegrams. Times of less than 20 ms (value 2) are not permitted.
Times that reach the master station within 20 ms of the timeout will lead to lost connections. The value is stored in EEPROM and protected against voltage loss. (Factory setting : 2)

"Write Register"

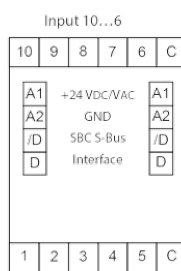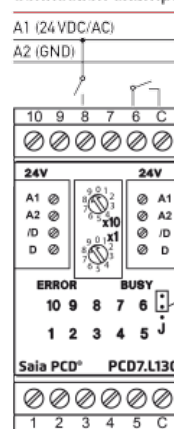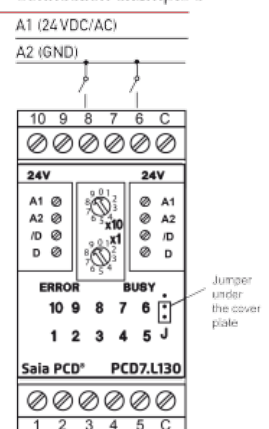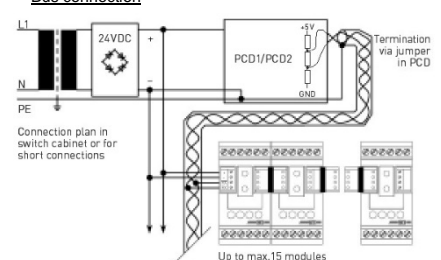| Address	Value	Meaning
9	1	Parity mode
	2	Data mode (factory setting)

"Write Output"

The write output instruction at address 255 is recognized as broadcast message.
Automatic baud function: "Write or Display output 255" (1 = autobaud active / 0 = autobaud inactive)

N.B:
After a power failure, the last baud rate set will be reinstalled.
The autobaud function must not be turned on permanently, but only on the commisioning. At the condition as supplied to the customer, the autobaud is turned on, to adjust the device automatically to the system. But after the commisioning it has to be switched-off via bus command.

Address	Value	Meaning
10	0	Reset of error count register

For further information on the use of modules linked to S-Bus, including all restrictions, see documentation 26/339 EN

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