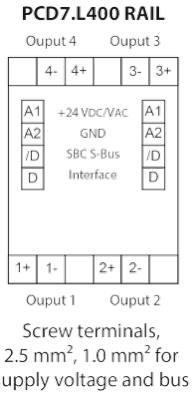
PCD7.L400 Analogue module with 4 outputs, 0…10 VDC

Description
The RIO module was developed as a S-Bus data node for local switching tasks. Via a DDC of the type PCDx / PCS1 ouputs can be write. 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. If the bus cycle time is critical, fewer than 30 slaves should be operated in one segment.

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	<50 mADC / <110 mAAC
Power consumption	1.2 W / 2.7 VA
Relative duty cycle	100 %
Reaction time	15 ms (from receive data to send data reaction)
Recovery time	< 550 ms
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
Function indicator	Green LED for bus activity
Status indicator	Red LED for bus error message



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 35 mm 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. 1.0mm2 connection cross-section. Check correct connection of bus lines and supply.

Signal outputs

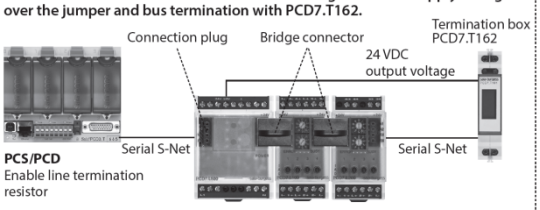
Signale type	4 × 0…10 VDC
Output current	5 mA by 10 VDC (2 kOhm)
Accuracy	10 mV/Digit
Data range	0…1000 (2 comma stages)

Housing

Protection class	Housing IP50 / Terminals IP20
Humidity class	F (DIN 40040)
Connection cross-section	2.5 mm² (terminals)
Plug-in terminal	1.0 mm² (screw-type)
Mounting position	any
Weight	95 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.

Supply and Bus concept

Example with power supply PCD7.L500 with Serial S-Net connection over the terminal block and RAIL-modules with connecting of bus and supply voltage over the jumper and bus termination with PCD7.T162.



Operational safety:

Please take care to following points for a safety operation:

- Maximal cable length
- S-Bus member and segment division
- Potential compensation by one single grounding of power supply
- Termination of both network sides
- Cable shield grounding on one side only.

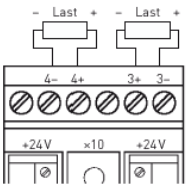
Data transmission
All S-Bus instructions (level 1) are recognized. Instructions that have no function in the device are answered with <NAK>. The module has integral, automatic baud rate and transmission mode recognition.

Display/Write Register" **Register 1 to 4 can be called together (Is is recommended to call them individually)**

Adresse	Information
1	Output 1 (devided with 100 => Voltage value)
2	Output 2 (devided with 100 => Voltage value)
3	Output 3 (devided with 100 => Voltage value)
4	Output 4 (devided with 100 => Voltage value)

Remark: The voltage value will be set with a number as (100 => 1 VDC) linear.

Connection example



„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") 1 to 4 / 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 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)

Address	Value	Meaning
10	0	Reset of error count register

"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.

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

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