## 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 the second data and the second data addressing and the second data addressing the second data addres one bus branch simultaneously. If the bus cycle time is critical, fewer than 30 slaves should be operated in one segment.

Technical data       PCD7/L400 KAL       Mounting and commissioning to be conform with current regulations:         Bus system       S-Bus       Ouput 4       Ouput 4       Ouput 3         Transmission rate       1200 38400       4. 4.4       3. 3+       1. Power-off the installation         Bus length max.       1200 m (without repeater)       18 VDC32 VDC / 20 VAC28 VAC       A.1       A.2       A.1       A.2       B.2       1. Power-off the installation       2. Place module onto 35 mm tophat rail and down to engage.       3. Strip insulation from 7mm of cable (max. wire 4 mm², fine strand 2.5 mm², diamete 10 %       3. Strip insulation from 7mm of cable (max. wire 4 mm², fine strand 2.5 mm², diamete 0.3 mm to 2.7 mm², linest thito binding an tighten with a screwdriver.         Recovery time       < 550 ms       Operating temperature range       -25°C+70°C       1+ 1- 2+ 2-       Ouput 1       Ouput 2       Connect supply voltage and field bus to plug-in terminal.         Protective wiring       Caccording to DIN EN 61000-6-2       Screw terminals, EMC according to DIN EN 61000-6-2       Screw terminals, supply voltage and bus       Caution!!       Plug-in terminal has max. 1.0mm2 connectio cross-section. Check correct connection of supply and bus EMC according to DIN EN 61000-6-2       Screw terminals, supply voltage and bus       Caution!!       Plug-in terminal has max. 1.0mm2 connectio cross-section. Check correct connection of supply and bus EMC according to DIN EN 61000-6-2       Screw terminals, supply vo	Bus system         S-Bus           Transmission rate         1200 38400           Transmission mode         Parity / Data           Bus length max.         1200 m (without repeater)           Nominal voltage UN         18 VDC32 VDC / 20 VAC28 VAC           Current consumption         -50 mADC / -110 mAAC           Power consumption         1.2 W / 2.7 VA           Relative duty cycle         100 %           Reaction time         15 ms           Grow receive data to send data reaction)         send data reaction)           Recovery time         <550 ms           Operating temperature range         -25°C+75°C           Protective wiring         Reverse battery protection of service Reverse battery protection of supply	Ouput 4     Ouput 3       4-     4+       4-     4+       3-     3+       1     Power-off th       2     Place module down to eng       3     Strip insulati wire 4 mm², 0.3 mm to 2 tighten with       0     Interface       1+     1-       2+     2-	s: the installation ule onto 35 mm tophat rail and press gage. tion from 7mm of cable (max. single f, fine strand 2.5 mm², diameter 2.7 mm), insert into binding and n a screwdriver.
Transmission rate       1200 38400       Image: Comparison of the installation         Transmission mode       Parity / Data       Image: Comparison of the installation         Bus length max       1200 m (without repeater)       Image: Comparison of the installation         Nominal voltage UN       18 VDC32 VDC / 20 VAC28 VAC       Image: Comparison of the installation         Current consumption       -50 mADC / <110 mAAC	Transmission rate     1200 38400       Transmission mode     Parity / Data       Bus length max.     1200 m (without repeater)       Nominal voltage UN     18 VDC32 VDC / 20 VAC28 VAC       Current consumption     -50 mADC / <110 mAAC	4-       4+       3-       3+         A1	he installation ule onto 35 mm tophat rail and press igage. titon from 7mm of cable (max. single , fine strand 2.5 mm <sup>2</sup> , diameter 2.7 mm), insert into binding and n a screwdriver.
Hubbles length matches       1 any P bda         Bus length matches       1 any P bda         Bus length matches       1 any P bda         Nominal voltage UN       18 VDC32 VDC / 20 VAC28 VAC         Current consumption       1.2 W / 2.7 VA         Power consumption       1.2 W / 2.7 VA         Relative duty cycle       100 %         Reaction time       15 ms         (from receive data to send data reaction)         Storage temperature range       -25°C+70°C         Protective wiring       Reverse battery protection of service voltage Reverse battery protection of service voltage Reverse battery protection of service voltage Reverse battery protection of supply and bus EMC according to DIN EN 61000-6-2       Screw terminals,         Function indicator       Green LED for bus activity       2.5 mm², 1.0 mm² for supply voltage and bus         Signal outputs       Signal outputs       Supply and Bus concept         Signal outputs       Signal bus to VDC (2 kOhm)       Supply and Bus concept	Bus length max.       1200 m (without repeater)         Nominal voltage UN       18 VDC32 VDC / 20 VAC28 VAC         Current consumption       <50 mADC / <110 mAAC	Image: Arrow of the second	ule onto 35 mm tophat rail and press gage. tion from 7mm of cable (max, single fine strand 2.5 mm <sup>2</sup> , diameter 2.7 mm), insert into binding and n a screwdriver.
Bus length max.       1200 m (without repeater)         Nominal voltage UN       18 VDC32 VDC / 20 VAC28 VAC         Current consumption       1.2 W / 2.7 VA         Power consumption       1.2 W / 2.7 VA         Relative duty cycle       100 %         Reaction time       15 ms         (from receive data to send data reaction)       send data reaction)         Recovery time       <550 ms	Bus length max.       1200 m (without repeater)         Nominal voltage UN       18 VDC32 VDC / 20 VAC28 VAC         Current consumption       <50 mADC / <110 mAAC	A1       +24 VDC/VAC       A1       2.       Place module down to eng         A2       GND       A2       3.       Strip insulati         //D       SBC S-Rus       /D       wire 4 mm², 0.3 mm to 2 tighten with         1+       1-       2+       2-       Caution!!	ule onto 35 mm tophat rail and press gage. tion from 7mm of cable (max, single fine strand 2.5 mm <sup>2</sup> , diameter 2.7 mm), insert into binding and n a screwdriver.
Nominal voltage UN       18 VDC32 VDC / 20 VAC28 VAC         Current consumption       <50 mADC / <110 mAAC	Nominal voltage UN       18 VDC32 VDC / 20 VAC28 VA         Current consumption       <50 mADC / <110 mAAC	A1     +24 VDC/VAC     A1     down to eng       A2     GND     A2     3.     Strip insulati       D     SBC S-Bus     /D     0.3 mm to 2     tighten with       D     Interface     D     Connect supply vol terminal.       1+     1-     2+     2-     Caution!!	gage. tion from 7mm of cable (max. single , fine strand 2.5 mm <sup>2</sup> , diameter 2.7 mm), insert into binding and n a screwdriver.
Current consumption       <50 mADC / <110 mAAC	Current consumption       <50 mADC / <110 mAAC	A2 /D     GND     A2 /D     3.     Strip insulation in the strip insult i	tion from 7mm of cable (max. single , fine strand 2.5 mm <sup>2</sup> , diameter 2.7 mm), insert into binding and n a screwdriver.
Power consumption       1.2 W / 2.7 VA         Relative duty cycle       100 %         Reaction time       15 ms         (from receive data to send data reaction)       interface         Power consumption       1.2 W / 2.7 VA         Reaction time       15 ms         (from receive data to send data reaction)       interface         Portective wiring       0°C +55°C         Protective wiring       0°C +55°C         Protective wiring       2.5 cm.+70°C         Protective wiring       Reverse battery protection of supply and bus EMC according to DIN EN 61000-6-2         Screw terminals,       Caution!!         Function indicator       Green LED for bus activity         Status indicator       Red LED for bus error message         Signale type       4 × 010 VDC         Signale type       4 × 010 VDC         Signale type       5 mA by 10 VDC (2 kOhm)	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	/D     SBC S-Bus     /D     wire 4 mm², 0.3 mm to 2 tighten with       D     Interface     D     Connect supply vol terminal.       1+     1-     2+     2-	<sup>2</sup> , fine strand 2.5 mm <sup>2</sup> , diameter 2.7 mm), insert into binding and a screwdriver.
Relative duty cycle       100 %         Relative duty cycle       100 %         Reaction time       15 ms         (from receive data to send data reaction)       Immediate control         Recovery time       <550 ms	Relative duty cycle     100 %       Reaction time     15 ms       (from receive data to send data reaction)       Recovery time     < 550 ms	Interface     0.3 mm to 2 tighten with       Connect supply vol terminal.       1+     1-       2+     2-       Caution!!	2.7 mm), insert into binding and a screwdriver.
Reaction time       15 ms       tighten with a screwdriver.         Reaction time       15 ms       tighten with a screwdriver.         Recovery time       <550 ms	(from receive data to send data reaction)           Recovery time         < 550 ms	1+         1-         2+         2-         Caution!!	a screwdriver.
(from receive data to send data reaction)       <	send data reaction)       Recovery time     < 550 ms	1+         1-         2+         2-         Connect supply vol terminal.           Caution!!         Caution         Caution         Caution         Caution	
Recovery time       < 550 ms	Recovery time         < 550 ms	1+         1-         2+         2-         Caution!!	oltage and field bus to plug-in screw
Recovery time       < 550 ms	Operating temperature range 0°C +55°C Storage temperature range -25°C+70°C Protective wiring Reverse battery protection of servic Reverse battery protection of supply	1+         1-         2+         2-         Caution!!	
Operating temperature range Storage temperature range Protective wiring       0°C+55°C -25°C+70°C       1+ 1- 2+ 2-       Caution!!         Protective wiring       Reverse battery protection of service voltage Reverse battery protection of supply and bus EMC according to DIN EN 61000-6-2       Ouput 1       Ouput 2       Caution!!         Function indicator       Green LED for bus activity       2.5 mm², 1.0 mm² for supply voltage and bus       Interview of supply.       Caution!!         Signal outputs       Signal type       4 × 010 VDC       Supply and Bus concept       Operational safety:         Output current       5 mA by 10 VDC (2 KOhm)       Supply and Bus concept       Operational safety:	Storage temperature range -25°C+70°C Protective wiring Reverse battery protection of servic Reverse battery protection of supply	1+ 1- 2+ 2- Caution!!	
Storage temperature range Protective wiring       -25°C+70°C       Caution!!         Protective wiring       Reverse battery protection of service voltage Reverse battery protection of supply and bus EMC according to DIN EN 61000-6-2       Ouput 1       Ouput 2       Plug-in terminal has max. 1.0mm2 connection cross-section. Check correct connection of I lines and supply.         Function indicator       Green LED for bus activity       2.5 mm², 1.0 mm² for supply voltage and bus       Iines and supply.         Signale outputs       Signale type       4 × 010 VDC       Supply and Bus concept       Operational safety:         Output current       5 mA by 10 VDC (2 kOhm)       Supply and Bus concept       Operational safety:	Protective wiring Reverse battery protection of servic Reverse battery protection of supply	Caution!!	
Reverse battery protection of supply and bus     Copart     Copart     Copart       EMC according to DIN EN 61000-6-2     Screw terminals,     Ines and supply.       Function indicator     Green LED for bus activity     2.5 mm², 1.0 mm² for supply voltage and bus       Signal outputs     Signale type     4 × 010 VDC       Signale type     4 × 010 VDC     Supply and Bus concept       Output current     5 mA by 10 VDC (2 KOhm)	Reverse battery protection of supply	Ge Ouput 1 Ouput 3 Plug in terminal b	
Reverse battery protection of supply and bus EMC according to DIN EN 61000-6-2       Screw terminals, Screw terminals, Screw terminals, Screw terminals, Screw terminals, Screw terminals, Signal outputs       cross-section. Check correct connection of I lines and supply.         Signal outputs Output current       Status indicator       Screw terminals, Screw terminals, Screw terminals, Screw terminals, Screw terminals, Screw terminals, Supply voltage and bus       Cross-section. Check correct connection of I lines and supply.			has max. 1.0mm2 connection
Function indicator       Green LED for bus activity       2.5 mm², 1.0 mm² for supply voltage and bus         Status indicator       Red LED for bus error message       Supply voltage and bus         Signal outputs Output current       5 mA by 10 VDC (2 kOhm)       Supply and Bus concept       Operational safety:	EMC according to DIN EN 61000 6	OUS cross-section Ch	
Function indicator     Green LED for bus activity     2.5 mm², 1.0 mm² for supply voltage and bus       Signale type     4 × 010 VDC     Supply and Bus concept     Operational safety:       Output current     5 mA by 10 VDC (2 kOhm)		Screw terminals, lines and supply.	
Signal outputs         Signale type         4 × 010 VDC         Supply and Bus concept         Operational safety:           Output current         5 mA by 10 VDC (2 kOhm)		2.5 mm <sup>2</sup> , 1.0 mm <sup>2</sup> for	
Signal outputs         Signale type         4 × 010 VDC         Supply and Bus concept         Operational safety:           Output current         5 mA by 10 VDC (2 kOhm)	Status indicator Red LED for bus error message	supply voltage and bus	
Data range       01000 (2 comma stages)       terminal block and RAIL-modules with connecting of bus and supply voltage over the jumper and bus termination with PCD7.T162.       for a safety operation:         Housing Protection class       Housing IP50 / Terminals IP20 F (DIN 40040)       Example Connection plug       Bridge connector plug       Termination box brain to plug and the terminal compensation by single grounding of power and segme division       - Maximal cable length         Plug-in terminal       1.0 mm² (screw-type)       - Connection plug       Bridge connector plug       - Connection plug       -	Signale type     4 × 010 VDC       Output current     5 mA by 10 VDC (2 kOhm)       Accuracy     10 mV/Digit       Data range     01000 (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 sequence or a maximum supply current	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. Connection plug Bridge connector PCD7.T162 24 VDC output voltage PCS/PCD Serial S-Net Enable line termination resistor PCD7.L500 power pack Input/output modules (operating voltage 110240 VAC) (max. 15 per connection line)	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

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/V Adresse	Nrite Register	<u>.</u>	ogether (Is is reco	ommended to call them individually)	8	Connection example
1	<ol> <li>Output 1 (devided with 100 =&gt; Voltage value)</li> </ol>				8	- Last + - Last
	2 Output 2 (devided with 100 => Voltage value)				8	
3	3 Output 3 (devided with 100 => Voltage value)				2	
4	Output 4 (o	levided with 100 => Voltage value)			N N	
					8	4- 4+ 3+ 3-
Remark:	The voltage va	lue will be set with a number as (100 =>	<ul> <li>1 VDC) linear.</li> </ul>			000000
Display	"Display Register"		Status r	Status register:		
Address	Information	1	Bit 0:	1= Device recognized last transmission	<u> </u>	+24V ×10 +24V
5	Baud rate	plain text => kBit/s)		0= Device did not recognize last transmission	<u> </u>	
6	Module ad		Bit 1:	1= Last transmission was a broadcast	8	
7	Status regi			0= Last transmission was not a broadcast	8	
8	Bus timer		Bit 2:	1= Last transmission came from master	<u> </u>	
9		nsmission mode (data / parity)		0= Last transmission came from a slave		
10		ounter (divided into 4 bytes)	Bit 3:	1= CRC of last message was correct		
	240 01101 0		Dit 0.	0= CRC of last message was incorrect		
The following registers can be called together			Bit 5:	1= Device has executed an internal reset		
(Display Register "x" to "y") 1 to 4 / 5 to 7 / 8 to 10		Dit 0.	0= Device function is OK			
(Biopidy i		y / 10 4 / 0 10 / / 0 10 / 0	Bit 8:	1= Internal bus to EEPROM is OK		
"Write Re	eaister"		Dit 0.	0= Internal bus not working perfectly		
Address	Value	Baud rate setting (Baud kbit/s)	Bit 9:	1= EEPROM data memory is OK		
5	4	1 200	Dit 0.	0= EEPROM data memory is faulty		
5	5	2 400	Bit 10:	1= Baud rate uploaded from EEPROM		
	6	4 800	Dit 10.	0= Baud rate is at default value (9600 Bd.)		
	7	9 600	All other	bits are reserved for factory tests.		
	8	19 200	All Uller	Dits are reserved for factory lests.		
	9	38 400				
	9	30 400				

Value range 2 <-> 20

Meaning 20 <-> 200 ms

Address 8

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 Regis Address 9	ter" Value 1 2	<u>Meaning</u> Parity mode Data mode (factory setting)	<ul> <li>"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)     </li> <li>N.B:</li> <li>After a power failure, the last baud rate set will be reinstalled.</li> <li>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, permanently the device automatically to the system. But after the commisioning it has to be switched-off via bus command.</li> </ul>
Address 10	Value 0	<u>Meaning</u> Reset of error count register	For further information on the use of modules linked to S-Bus, including all restrictions, see documentation 26-339 ENG