

C-DIAS Profibus DP Slave module

CPB 021

The C-DIAS Profibus DP slave module CPB 021 serves as an interface module between the C-DIAS control system and Profibus. This module supports a galvanically separated Profibus slave.



Technical Data

Performance data

Number of channels	1
Field bus	Profibus DP slave (V0)
Communications interface netX50 – C-DIAS	64-Kbyte Dual Port Memory (DPM)
Data transfer rate RS485	up to 12 MBit/s
Electrical interface	RS485 / 9-pin DSUB socket
Status display	Yes

Electrical requirements

Voltage supply from C-DIAS bus	+24 V	
Current consumption	Typically 80 mA	Maximum 100 mA
Voltage supply from C-DIAS bus	+5 V	
Current consumption	Typically 40 mA	Maximum 60 mA
Output voltage	+5 V (no supply voltage; for bus termination only)	
Load capacity	Maximum 20 mA	

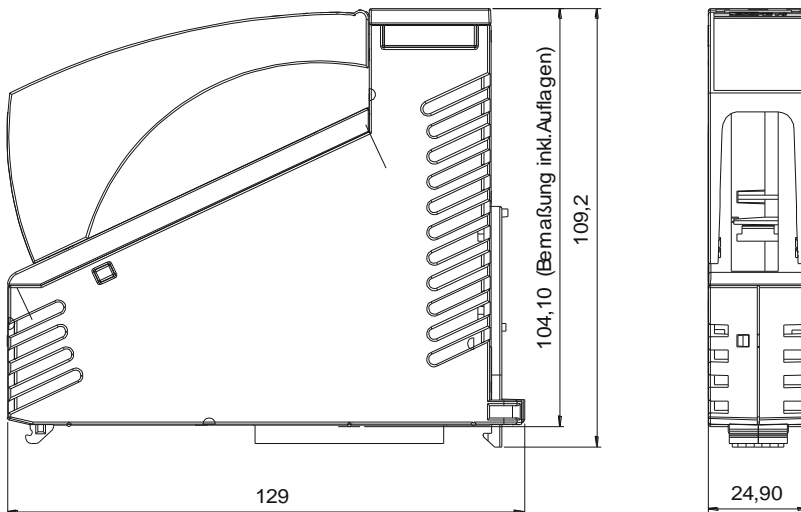
Miscellaneous

Article number	12-057-021
Hardware version	1.x
Standard	UL 508 (E247993)
Approbations	cUL, UL

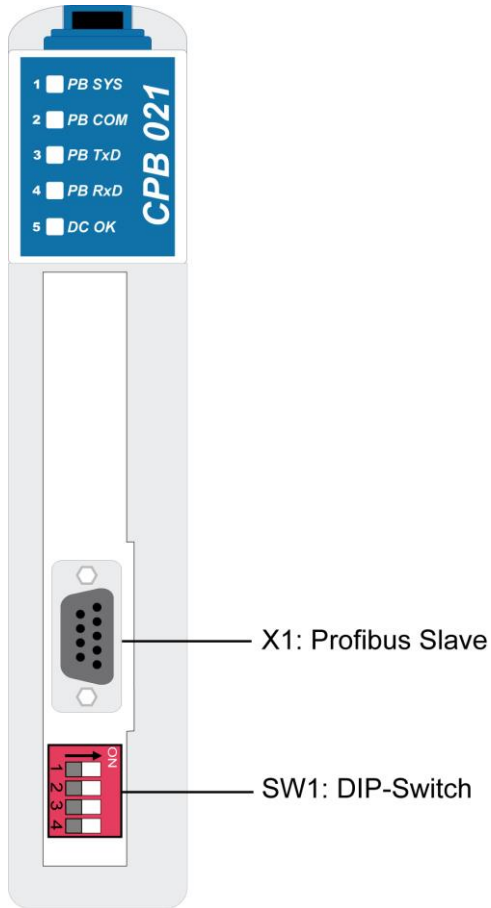
Environmental conditions

Storage temperature	-20 – +85 °C	
Operating temperature	0 – +60 °C	
Humidity	0 - 95 %, uncondensed	
EMV stability	According to EN 61000-6-2:2001 (industrial area)	
Shock resistance	EN 60068-2-27	150 m/s ²
Protection Type	EN 60529	IP 20

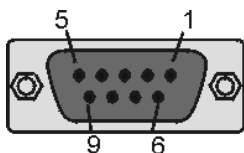
Mechanical Dimensions



Connector Layout

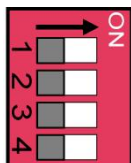


X1: Profibus Interface (9-pin DSub socket)



Pin	Signal	Function
1	Not used	-
2	Not used	-
3	RxD / TxD – P	Receive / Transmit Data – P Data Line B
4	CNTR-P	Repeater Control Signal
5	D – GND	Data Ground
6	VP	Positive Power Supply
7	Not used	-
8	RxD / TxD - N	Receive / Transmit Data – N Data Line Inverse A
9	Not used	-
	Shield	Shield

SW1: DIP-Switch (4-pin)



Pin	Signal	Function
1	ON / OFF	Termination ON/OFF
2	ON / OFF	Termination ON/OFF
3	ON / OFF	-
4	ON / OFF	-

Dipswitch	Termination
	Profibus: open
	Profibus: terminated

Dipswitch	
	Not used.

Status Displays

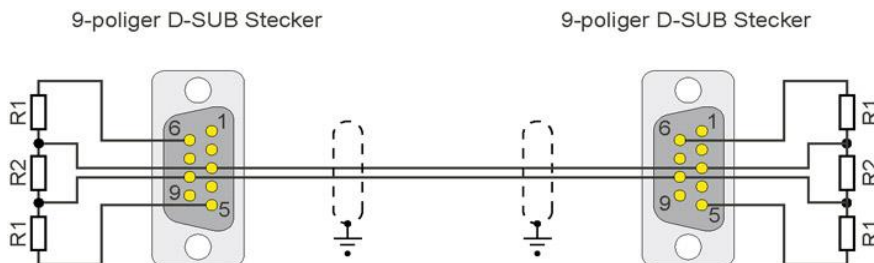


LED number	LED color	Definition
1	Yellow / Green	PB SYSTEM Yellow: READY Green: RUN
2	Green / Red	PB COM Green: STATUS Red: ERROR
3	Yellow	PB TXD
4	Green	PB RXD
5	Green	DC OK

Description	PB SYSTEM	PB COM	PB TXD	PB RXD
Boot loader programmed only	Yellow / Green blinking	Off	Yellow	Off
Programming firmware; waiting for configuration	Green	Red blinking	Yellow	Off
Configuration loaded; no communication	Green	Red blinking	Off	Off
Communication	Green	Green	Yellow lights during data exchange	Green lights during data exchange

Profibus Termination

Example:



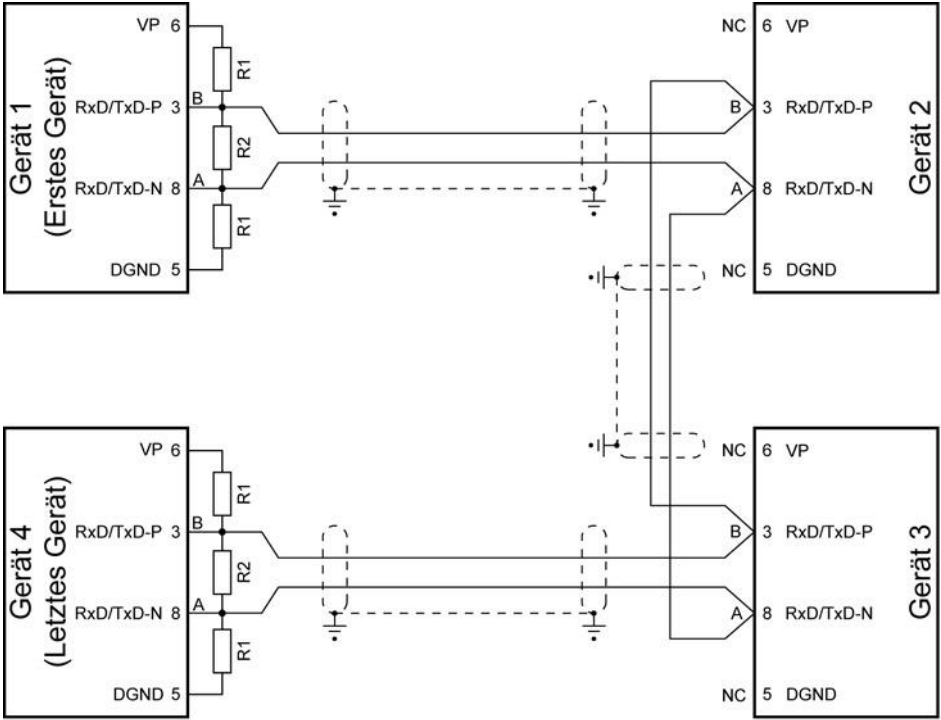
	Cable Type A	Cable Type B
Baud rate	> 500 kBaud	< 500 kBaud
R1	390 Ohm	330 Ohm
R2	220 Ohm	120 Ohm

Cable type: Profibus cable A or B

In this module, termination resistors are provided for cable type A.

- All resistors are at least 1/3 Watts.
- In a Profibus system, both end modules must be terminated.
- The Profibus termination resistance using spread resistors can be set in the first and last modules only. This is necessary to avoid transmission errors caused by reflections in the line.
- Pins 6 (VP) and 5 (D-GND) should not be connected to the Profibus cable, rather are reserved for the termination resistors.

Example



Connectors

Applicable connectors

1. Phoenix Contact SUBCON9

With a 90° angled cable outlet.

2. Siemens Profibusconnector 6ES7972-0BB10-0XA0

With Bus termination switches On the topside, an additional socket is provided, to which additional Profibus plugs can be connected.

3. ERNI Profibus connector

Variants with and without termination.

CAUTION:

With use of the Profibus connectors mentioned above, the C-DIAS housing cover cannot be used/closed!

Cable

Profibus cable specifications

The Profibus standard defines cable type A as follows:

(see also <http://www.profibus.com/support.html> under FAQs.)

Wellenwiderstand:	35 bis 165 Ohm bei Frequenzen von 3 bis 20 MHz
Betriebskapazität:	< 30 pF pro Meter.
Adernquerschnitt:	> 0,34 mm ² , entsprechend AWG 22.
Kabeltyp:	Twisted-pair Kabel. 1x2 oder 2x2 oder 1x4 Adern.
Schleifenwiderstand:	< 110 Ohm per km.
Signaldämpfung:	max. 9 dB über die Gesamtlänge der Verbindung.
Abschirmung:	CU-Abschirmgeflecht oder CU-Abschirmgeflecht und CU-Abschirmfolie.
Max. Bus Length:	200 m bei 1500 kbit/s, bis zu 1,2 km bei 93,75 kbit/s. Erweiterbar durch Repeater.

Verwendbare Profibus-Kabel

Zum Beispiel:

Lapp Kabel: UNITRONIC® BUS PA; PROFIBUS-PA für die Prozess-Automation - Für feste Verlegung

Phoenix Contact PSM-CABLE-PROFIB/FC

Profibus-Kabel Typ A für feste Verlegung bis 12 MBit/s nach EN 50 170, Typ A

Wiring Guidelines

To ensure a good bus connection, several wiring guidelines must be followed:

- To ensure error-free operation, a careful wiring method must be followed.
- The 0 V connection of the supply voltage must be connected with the 0 V assembly point over the shortest route possible.
- The Profibus cable used must be designed for the data transfer rate
- The shielding must be connected over a large area and the shortest possible route.

CAUTION:

Fundamentally, the connectors/cables or wiring must meet the Profibus specifications!