

# PROCEN<sup>TEC</sup>



## Installation Manual (English)

# Compact IP66 Repeater D1

### Transparent PROFIBUS DP single channel repeater

Single channel PROFIBUS repeater  
Transparent  
Max. 12 Mbps  
Auto baudrate detection  
IP 66  
Digital glitch filtering  
No limit in cascading  
On-board switchable termination  
Diagnostic LEDs  
M12 connector for measurements  
Horizontal or vertical mounting

**PROCEN<sup>TEC</sup>**  
**Klopperman 16**  
**2292 JD WATERINGEN**  
**The Netherlands**

**Tel.: +31-(0)174-671800**  
**Fax: +31-(0)174-671801**  
**Email: [info@procentec.com](mailto:info@procentec.com)**  
**Web: [www.procentec.com](http://www.procentec.com)**

## Introduction

**The compact PROFIBUS DP Repeater D1 offers an economic alternative and tackles the technological limitations of existing repeaters. This first-class network component fulfils the electrical, mechanical and diagnostic requirements of the demanding modern industry.**

The advanced 12 Mbps core of the D1 is identical to the ProfiHub B5+ and B2+; it can be cascaded unlimitedly and is equipped with the latest isolated RS 485 interface. The data is constantly monitored for glitches which are digitally filtered out. Every channel has on-board switchable termination and can drive 31 devices.

The robust M12 connectors of the PROFIBUS interface provide flexible wiring; a channel can be terminated or daisy-chained to a neighbouring component. An extra M12 connector is featured on the outgoing channel (channel 2) for ProfiTrace or other maintenance/engineering tools.

## Installation instructions

### Location

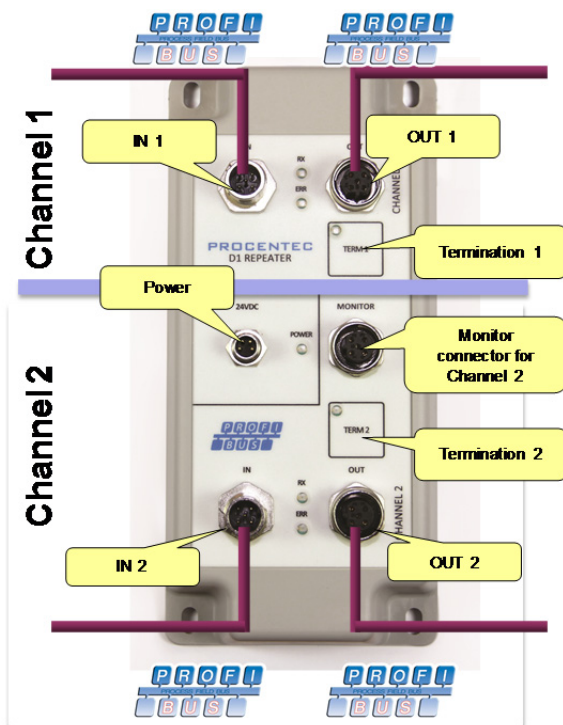
The D1 can be installed everywhere in a non-hazardous area that complies with IP 66 (DIN 40 050) and the specified ambient temperature range of -25° to +70° Celsius.

### Position

The D1 can be installed in every position. When installing the D1 on a vertical surface, it is recommended to install it with Channel 2 pointing down. In this position it is easier to read the front plate.

### Mounting and dismounting

The D1 has to be mounted on a flat surface, by using the four screw holes in the corners of the D1. The M5 mounting screws need to cover at least 3 mm.



## PROFIBUS

### Connectors

Each channel has 2 connectors (IN and OUT). They are both linked 1-on-1, even when the termination is ON.

When a channel of the repeater is NOT the last device on the segment, it does not matter which connector (IN or OUT) is utilized.

### PROFIBUS Pin layout

Pin 1: + 5 V DC  
 Pin 2: A or green wire  
 Pin 3: DGND  
 Pin 4: B or red wire  
 Pin 5: not used  
 Thread: Shield

### Termination

Each channel has its own termination which can be switched ON/OFF. If one of the channels is not used, turn on the termination. Press and hold the 'TERM' button for 3 seconds. The yellow TERM LED will illuminate. After power down/up the D1 will remember the termination state.

### Monitoring connector

The busmonitor connector is connected 1-on-1 with channel 2.

### Not used connectors

Verify that the unused connectors have the protective cap screwed on tightly to avoid water or dirt entering the connector.

### Robust Repeating mode

The D1 has two repeating modes: normal (default) and Robust Repeating. In normal mode the bits are transferred directly on the other channel with a minimal delay (see delay times on the next page). In Robust mode, the first byte is checked to verify if the following bits are a real PROFIBUS message. If the byte is illegal, the message will not be transferred to the other channel. This helps network stability in EMC sensitive environments.

To enable the Robust Repeating mode, press and hold both TERM buttons simultaneously for 5 seconds. When Robust Repeating has been enabled, you will see the Power LED flashing quickly for 500 ms. After that the Power LED will blink shortly every 5 seconds to indicate that Robust Repeating mode is enabled.

After power down/up the D1 will remember the repeating mode.

In Robust Repeating mode the delay time increases. See the table in Technical Data (next page).

### Diagnostic LEDs

	OFF	Blinking	ON
POWER	☹ Power is OFF or an internal failure.	☹ Power supply not stable or an internal failure. ☺ Blinking every 5 sec: Robust Repeating mode enabled.	☺ Power supply OK.
RX	☹ No communication detected (this Channel).	☺ 1 or more devices communicating (this Channel).	☹ Internal error
ERR	☺ No problem has been detected.	☹ Communication problem (this Channel).	☹ Baud rate not found

Technical Data Compact PROFIBUS DP Repeater D1	
Dimensions and weight	
Dimensions L x W x H (mm)	169 x 79 x 42 (height of housing excluding connectors: 28 mm)
Weight	500 grams
Ambient conditions	
Operating temperature Isolation class	-25° to +70° Celsius IP 66 (DIN 40 050)
Protocol specifications	
Supported Protocols	DP-V0, DP- V1, DP-V2, FDL, MPI, FMS, PROFIsafe, PROFIdrive and any other FDL based protocol.
Transmission speed Transmission speed detection Transmission speed detection time	9,6 kbps to 12 Mbps (including 45,45 kbps) Auto detect < 10 s
Data delay time	At baudrate: 9.6 - 93.75 kbps 187.5 - 500 kbps 1.5 Mbps 3 Mbps 6 Mbps 12 Mbps  Normal mode: ≤1.7 Tbit ≤1.8 Tbit ≤1.9 Tbit ≤2.2 Tbit ≤3.0 Tbit ≤4.0 Tbit  Robust mode: ≤13.25 Tbit ≤13.30 Tbit ≤13.40 Tbit ≤13.60 Tbit ≤14.00 Tbit ≤15.00 Tbit
Delay time jitter	Max. ¼ bit time
PROFIBUS specifications	
Cable lengths	1200 m at 9,6 kbps to 93,75 kbps 1000 m at 187,5 kbps 400 m at 500 kbps 200 m at 1,5 Mbps 100 m at 3 Mbps to 12 Mbps
Number of devices	Max. 31 per channel (including ProfiHubs, OLMs etc.)
Termination	Integrated and switchable (hold 'TERM' button for 3 seconds). Powered according to IEC 61158 (390/220/390 Ohms)
Cascading depth	No limits
PROFIBUS connector specifications	
<div><div>Male Connector</div><div><div>Pin 4: B-wire</div><div>Pin 3: DGND</div><div>Pin 5: not used</div><div>Pin 1: + 5V DC</div><div>Pin 2: A-wire</div><div>Thread: shield</div></div></div>	<div><div>Female Connector</div><div><div>Pin 3: DGND</div><div>Pin 4: B-wire</div><div>Pin 5: not used</div><div>Pin 2: A-wire</div><div>Pin 1: + 5V DC</div><div>Thread: shield</div></div></div>
Power supply specifications	
Power connector Nominal supply voltage Current consumption Power dissipation  Reverse polarity protection	M8 12 to 24 V DC Max. 125 mA at 24 Vdc Max. 3 W  Yes <div><div>Pin 2: +24V DC</div><div>Pin 3: 0V GND</div><div>Pin 1: +24V DC</div><div>Pin 4: 0V GND</div><div>Thread: Shield</div></div>