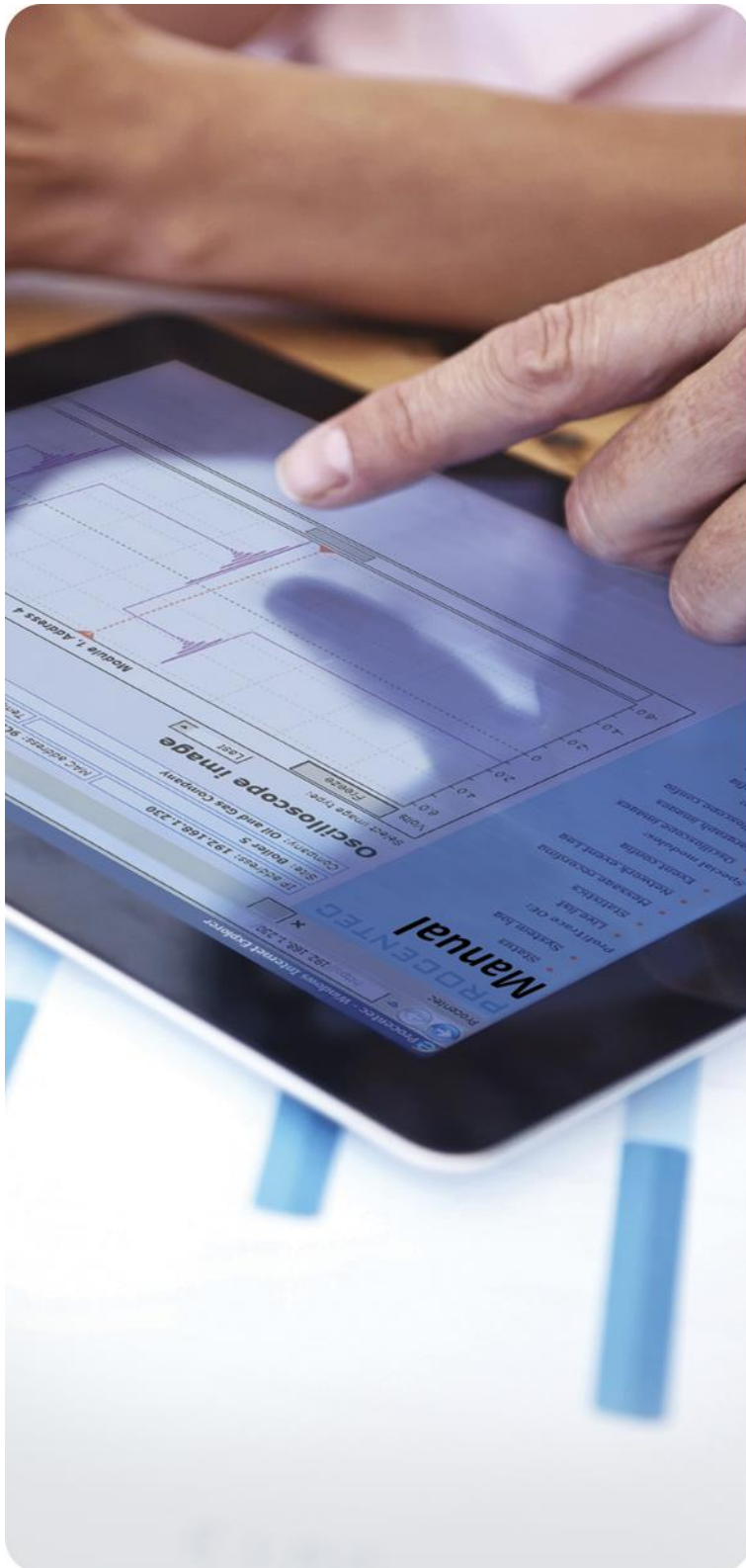# Compact IP66 Repeater D1+D

Transparent PROFIBUS DP single channel repeater

**Safety Guidelines**

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning sign and are marked as followed according to the level of danger:

Draws your attention to important information on handling the product, a particular part of the documentation or the correct functioning of the product.

**Warning**

This device and its components may only be used for the applications described in this manual and only in connection with devices or components that comply with PROFIBUS and RS 485 interface.
This product can only function correctly and safely if it is transported, stored, set up, installed, operated and maintained as recommended. The D1 Repeater is a CE class A product. In a domestic environment it may cause radio interference in which case the user may be required to take adequate measures.

**Warranty**

Warranty is void if you open the D1 Repeater.

**Qualified Technicians**

Only qualified technicians should be allowed to install and work with this equipment. Qualified technicians are defined as persons who are authorized to commission, to ground, to tag circuits and systems in accordance with established safety practices and standards. It is recommended that the technicians carry a Certified PROFIBUS Installer or Certified PROFIBUS Engineer certificate.

**Disclaimer of Liability**

We have checked the contents of this manual as much as possible. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the content in this manual is reviewed regularly and necessary corrections will be included in subsequent editions. Suggestions for improvements are welcome.

# Important information

**Purpose of the manual**

This user manual provides information how to work with the compact IP66 Repeater D1.

**Recycling and Disposal**

The parts of the compact IP66 Repeater D1 can be recycled. For further information about environment-friendly recycling and the procedure for disposing your old equipment, please contact:

PROCENTEC
Klopperman 16
2292 JD WATERINGEN
The Netherlands

Tel.: +31-(0)174-671800
Fax: +31-(0)174-671801
Email: info@procentec.com

**Document Updates**

You can obtain constantly updated information on PROCENTEC products on the Internet at www.procentec.com

You can also contact PROCENTEC Customer Support:

• by phone at +31-(0)174-671800
• by fax at +31-(0)174-671801
• by email at support@procentec.com

# Content

# 1   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 other members of the ProfiHub+ family; 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.

The D1+D comes with a built-in Diagnostics Device. The Diagnostics Device is a very versatile statistics/diagnostics logger. It can be used to keep track of the overall PROFIBUS network health and inform the PLC or DCS of any network failure such as repeats or illegals, missing ProfiHub termination, live list changes, or power supply problems.

# 2    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 -25⁰ to +70⁰ 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 M4 mounting screws need to cover at least 3 mm.

# 3 PROFIBUS
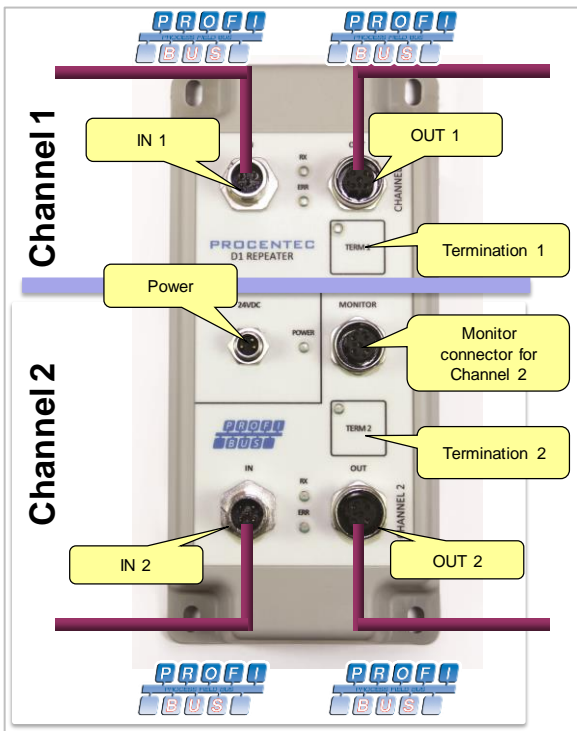


**Connectors**

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 or disable the Robust Repeating mode, proceed as follows:

1. Enter the 'Settings menu' by pressing and holding both TERM buttons simultaneously for 5 seconds. You will see the Power LED flashing every second, to indicate that settings can be changed.
2. Press and hold the TERM2 button for 1 second. The green RX LED of Channel 2 will switch ON to indicate that Robust Repeating has been enabled.
3. To switch OFF Robust Repeating, Press the TERM2 button for 1 second again. The RED Error LED of Channel 2 will turn ON and the green LED goes OFF.
4. To exit the 'Settings menu', press and hold both TERM1 and TERM2 simultaneously for 5 seconds. The Power LED will stop flashing every second.

The 'Settings menu' will be exited automatically when no key has been pressed for 20 seconds.

After power down/up the D1 will remember the settings.

In Robust Repeating mode the data delay time of the unit increases; see the table in Technical Data.

**Diagnostic LEDs**

| LED | OFF | Blinking | ON |
|---|---|---|---|
| **READY** | ☺ Power is not switched on or an internal failure. | ☹ Trying to detect the transmission speed, but has not locked it yet. | ☺ The transmission speed has been detected. |
| **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 |
| **TERM1/2** | ☺ internal termination is switched off. | ☹ Internal error | ☺ internal termination is switched on. |

# 4    Diagnostics Device

The D1+D comes with a built-in Diagnostics Device. The Diagnostics Device is a very versatile statistics/diagnostics logger. It can be used to keep track of the overall PROFIBUS network health and inform the PLC or DCS of any network failure such as repeats or illegals, missing ProfiHub termination, live list changes, or power supply problems.

You can use a ComBricks to display the most important diagnostics of every channel. The information of this ProfiHub Diagnostics slave is displayed as follows:



Fig.  1 - Information window of the Diagnostic slave

It displays the following information:

- Address and Tag-name of the Diagnostic slave
- Type and serial number of the Diagnostic slave
- Firmware version of the Diagnostic slave
- Connection to the Network, Module and Channel number of the ComBricks
- Power status of the ProfiHub
- Alarm status (of the relay)
- Termination status of all channels
- Illegal count for all channels
- A live list of all channels

For more information see the ComBricks manual, paragraph 'Diagnostic Slave info'.

To enable or disable the Diagnostic Device mode, proceed as follows:

1. Enter the 'Settings menu' by pressing and holding both TERM buttons simultaneously for 5 seconds. You will see the Power LED flashing every second, to indicate that settings can be changed.
2. Press and hold the TERM1 button for 1 second. The green RX LED of Channel 1 will switch ON to indicate that the Diagnostic slave has been enabled. The default address of the slave is 126.
3. To switch OFF Diagnostic slave, Press the TERM1 button for 1 second again. The RED Error LED of Channel1 will turn ON and the green LED goes OFF.
4. To exit the 'Settings menu', press and hold both TERM1 and TERM2 simultaneously for 5 seconds. The Power LED will stop flashing every second.

The 'Settings menu' will be exited automatically when no key has been pressed for 20 seconds.

After power down/up the D1 will remember the settings.

## 4.1.1 Changing the default PROFIBUS address

By default the address of the Diagnostic Device is set to 126. To change the address, use a configuration tool which supports the 'Set Slave Address' command. Most configuration tools support this feature.
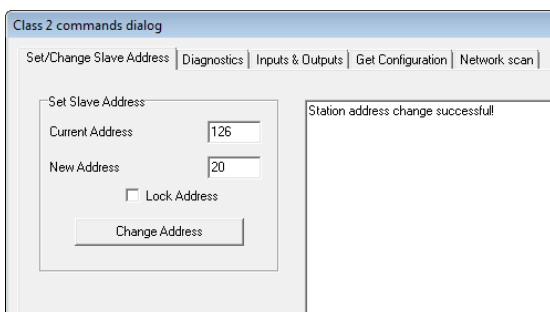


Fig. 2 - ProfiCaptain changes the address from 126 to 20

### 4.1.2 GSD file

Locate and download the appropriate GSD file for the Diagnostics Device on www.procentec.com/downloads . The correct GSD file for the ProfiHub D1+D is: **PROC6974.gsd**. The zip file also contains the corresponding .bmp (Bitmap) files. Import the GSD file into your configuration tool and insert the device in the PLC hardware configuration.

## 4.2 Configuring the Diagnostic Device

The Diagnostic Device has many configuration options. It can be configured modularly. This paragraph describes all the available options per module in list order.

### 4.2.1 Info data (mandatory module)

There is only one mandatory module, which is the first module in the list ("INFO DATA MANDATORY ON 1st SLOT"). It has 4 input bytes with the following meaning:

Byte 1: Input Identifier byte (always 0xDE)
Byte 2: Device type byte (0xD1 is ProfiHub D1+D)
Byte 3: Version byte: 0x01
Byte 4: Data format byte (0x00 is Little Endian, 0x01 is Big Endian)

### 4.2.2 Baudrate Status

Input Identifier byte: 0x11

The next input byte is to indicate the baudrate lock status.

| Dec | Meaning |
|-----|---------|
| 1 | No baudrate detected |
| 2 | 9.6 Kbit |
| 3 | 19.2 Kbit |
| 4 | 45.45 Kbit |
| 5 | 93.75 Kbit |
| 6 | 187.5 Kbit |
| 7 | 500 Kbit |
| 8 | 1.5 Mbit |
| 9 | 3 Mbit |
| 10 | 6 Mbit |
| 11 | 12 Mbit |

### 4.2.3 Termination Status

Input Identifier byte: 0x14

The next input byte is to indicate the status of the termination switches on the ProfiHub channels.

| Bit | Meaning |
|-----|---------|
| 0 | Channel 1 termination ON |
| 1 | Channel 2 termination ON |

Examples:   0x03 = Channel 1 and 2 terminations are ON
0x02 = Only Channel 2 termination is ON

## 4.2.4   Channel Status

Input Identifier byte: 0x15

The next input byte is to indicate the communication status of the individual channels.

| Bit | Meaning |
|-----|---------|
| 0 | Communication on Channel 1 |
| 1 | Communication on Channel 2 |

Example:    0x03 = Communication on Channels 1 and 2

## 4.2.5   Livelist Status
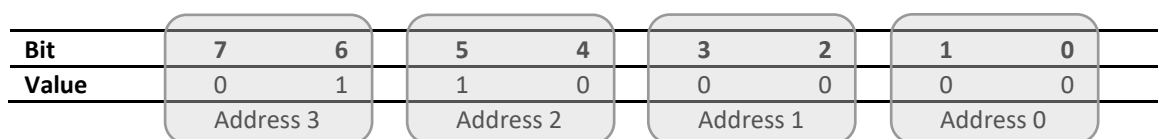
Input Identifier byte: 0x20

The next input byte is to indicate which Channel is selected to display the Livelist status.

| Hex | Meaning |
|-----|---------|
| 80 | Livelist of Channel 1 |
| 81 | Livelist of Channel 2 |
| 86 | Livelist of this ProfiHub |
| FF | Livelist of all channels (entire network) |

The next 32 input bytes are used for the actual Livelist data. Each address uses two bits. So the first two bits of the first byte are for address 0, the next two bits of the first byte are for address 1 and so on. The bits are used to indicate if the station is a slave device, master device or both.

| Device: | Bit 1: | Bit 0: |
|---------|--------|--------|
| None | 0 | 0 |
| Slave Device | 0 | 1 |
| Controller | 1 | 0 |
| Both | 1 | 1 |

Example:  If there is a master device on address 2, and a slave device on address 3, then the first byte will be 0x60, because it will look like this:

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-----|---|---|---|---|---|---|---|---|
| Value | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Address 3 | | Address 2 | | Address 1 | | Address 0 | |

This module also has 2 Output bytes. The first Output byte is used to select the Livelist of a specific Channel. This selection can be read-back in the Input byte described above.

| Hex | Meaning |
|-----|---------|
| 80 | Livelist of Channel 1 |
| 81 | Livelist of Channel 2 |
| 86 | Livelist of this ProfiHub |
| FF | Livelist of all channels (entire network) |

The next Output byte can be used to reset the Livelist. Write 0x01 to this Output byte to reset the Livelist.

## 4.2.6 Statistics (Short Format, Long Format)

Input Identifier byte: 0x30 (short format) or 0x31 (Long Format)

The next byte is used to display the current selection of statistics that it sends.

| Hex | Meaning |
|---|---|
| 00..7E | Statistics for device 0..126 |
| 7F | Statistics for undefined devices |
| 80 | Statistics of Channel 1 |
| 81 | Statistics of Channel 2 |
| 86 | Statistics of this ProfiHub |
| FF | Statistics of all channels (entire network) |

The next 16 bytes (Short Format) or 32 bytes (Long Format) are used to transfer the statistics of the selected address, selected Channel or all Channels of the ProfiHub. Each statistic uses 2 bytes (Short Format, so a maximum of 65535 decimal per statistic) or 4 bytes (Long Format) and is sent in the following order:

1. Lost count
2. Sync count
3. Repeats total count
4. Repeats max per cycle count
5. Illegals count
6. Int. diagnostics count
7. Ext. diagnostics count
8. Diagnostics while in Data Exchange count

This module also has 2 output bytes. The first byte is used to configure the ProfiHub Statistics; you can choose which stations or Channels will display statistics. Configure it by sending the following output value:

| Hex | Meaning |
|---|---|
| 00..7E | Statistics for device 0..126 |
| 7F | Statistics for undefined devices |
| 80 | Statistics of Channel 1 |
| 81 | Statistics of Channel 2 |
| 86 | Statistics of this ProfiHub |
| FF | Statistics of all channels (entire network) |

The next output byte can be used for clearing the statistics. Please note that the selected statistics of ALL node addresses and/or ProfiHub channels are cleared, not only for the displayed address or channel.

| Bit | Meaning |
|---|---|
| 0 | Clear LOST statistics |
| 1 | Clear SYNC statistics |
| 2 | Clear REPEATS TOTAL statistics |
| 3 | Clear REPEATS MAX statistics |
| 4 | Clear ILLEGALS statistics |
| 5 | Clear INT. DIAG statistics |
| 6 | Clear EXT. DIAG statistics |
| 7 | Clear DIAG WHILE IN DX statistics |

Example:  To clear all LOST and ILLEGALS statistics, send 0x11
To clear all statistics, send 0xFF

## 4.3 Parameterizing the Diagnostic Device

The Diagnostic Device has many user-definable parameters that can be changed, to alter the behaviour and options of the ProfiHub Diagnostics Device.

### 4.3.1 Diagnostics

The Diagnostics Device sends a diagnostic message on PROFIBUS whenever certain conditions are changed. These changes can be any of the following:

- Livelist change (a station added or removed)
- Bitrate error
- Alarm relay active
- Power status changed (one of the two power sources added or removed)
- Redundancy status change (one of the redundant cables added or removed)
- Termination status change (a termination switch on the ProfiHub has been changed)
- Channel status change (communication stopped or started on a channel)
- Statistics change (any statistic has changed)

In your configuration tool you can toggle the diagnostics for each item.
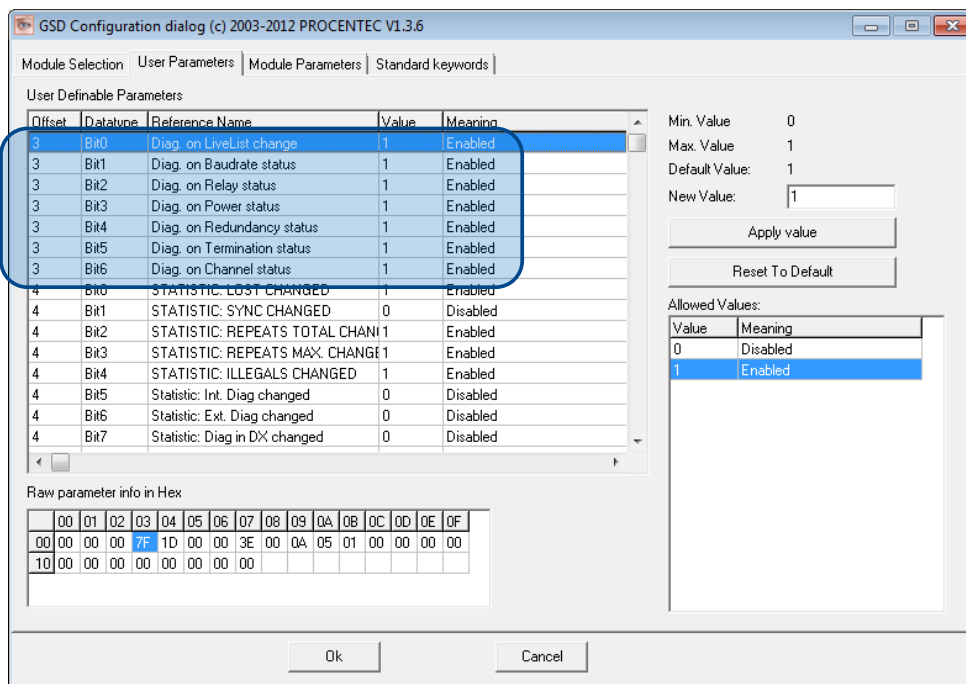


Fig. 3 - Screenshot of ProfiCaptain - User Parameter window

The 8<sup>th</sup> byte of a diagnostic message from the Diagnostic Device indicates which options have been enabled or disabled.

### 4.3.2 Statistics

You can choose which Statistics can trigger a diagnostic message, because not all statistics are interesting in all networks. For example, Syncs have been disabled by default because this is not a statistic that is suitable for PROFIBUS health monitoring.
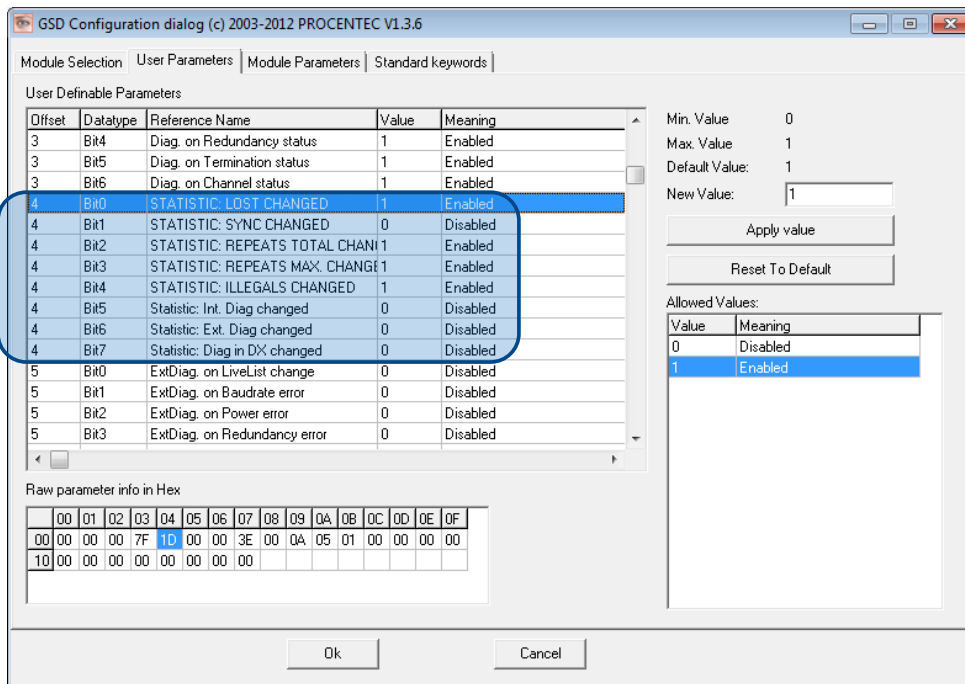
Fig. 4 – You can choose which statistics trigger a diagnostic message

The following Statistics can trigger a diagnostic message of the Diagnostic Device:

- Lost changed
- Sync changed
- Repeats (total) changed
- Repeats (max) changed
- Illegals changed
- Internal Diagnostics changed
- External Diagnostics changed
- Diagnostics in Data Exchange changed

### 4.3.3   Extended Diagnostics on Events change

For more critical applications you can choose to enable the 'Extended Diagnostics' option for each of the previously mentioned events. In the case of such an event, the Diagnostics Device will send out a diagnostics message with the 'Extended Diagnostic' bit on. In a Busmonitor tool such as ProfiTrace the extended diagnostics bit will appear as a red blinking square.



All Events described in paragraph 3.3.1 can trigger the Extended Diagnostic bit of the Diagnostic Device. By default, the Extended Diagnostic option is disabled. Each item can be enabled individually.
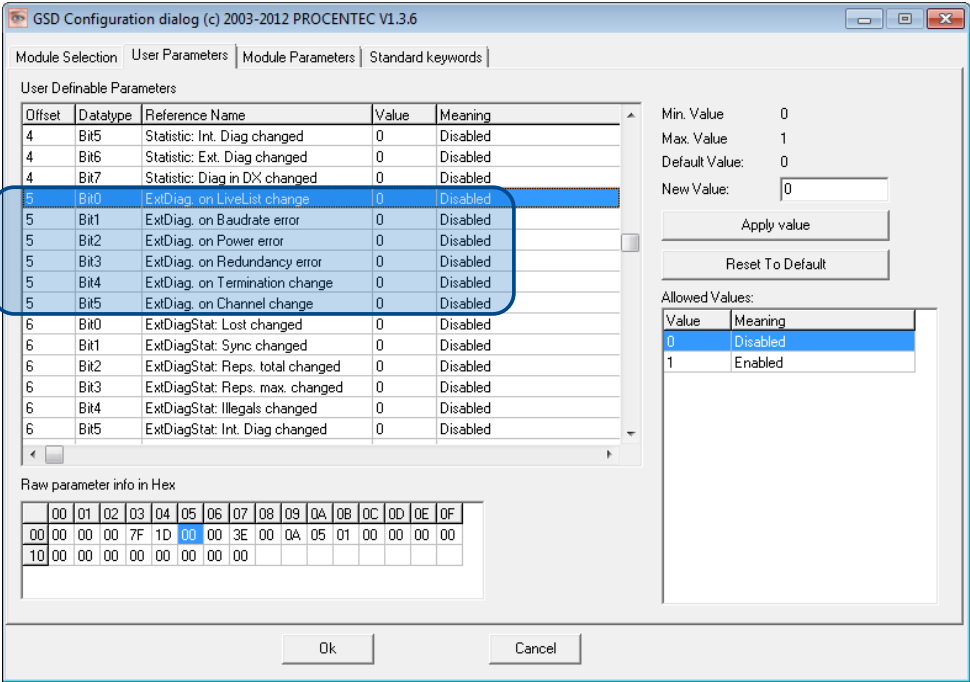
### 4.3.4   Extended Diagnostics on Statistics change

The Extended Diagnostic option can also be enabled for each individual available statistic. This works the same way as the Events described in paragraph 3.3.3.
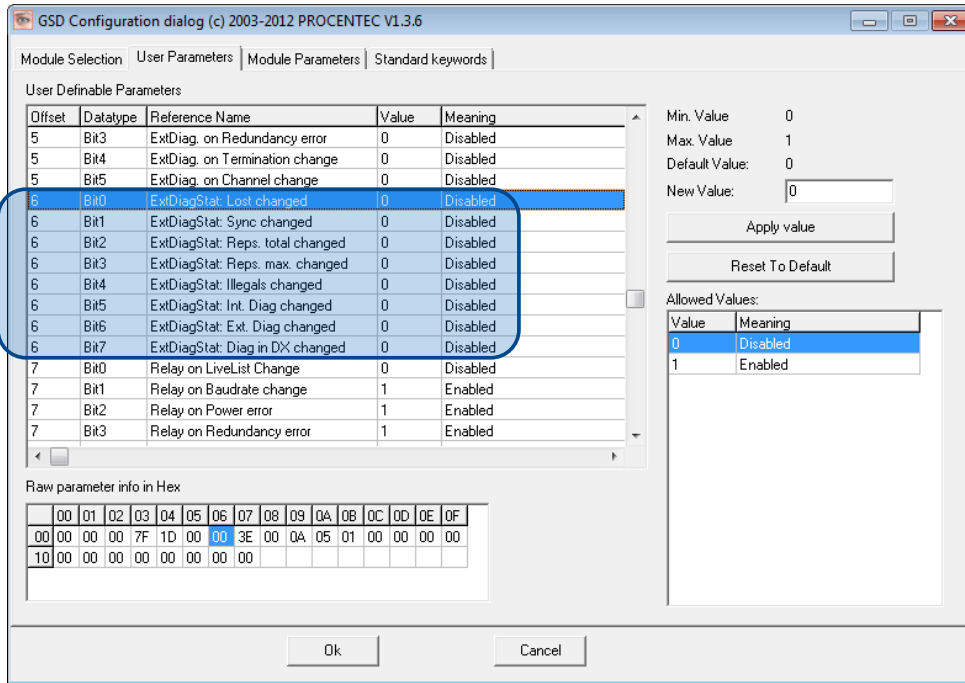


### 4.3.5   Alarm Relay on Events change

The Alarm Relay on the ProfiHub can be switched on each Event described in paragraph 4.3.1. When such an Event occurs, the Relay will be switched immediately without delay. The only Event that can delay the switching of the Alarm Relay is the Lost event.
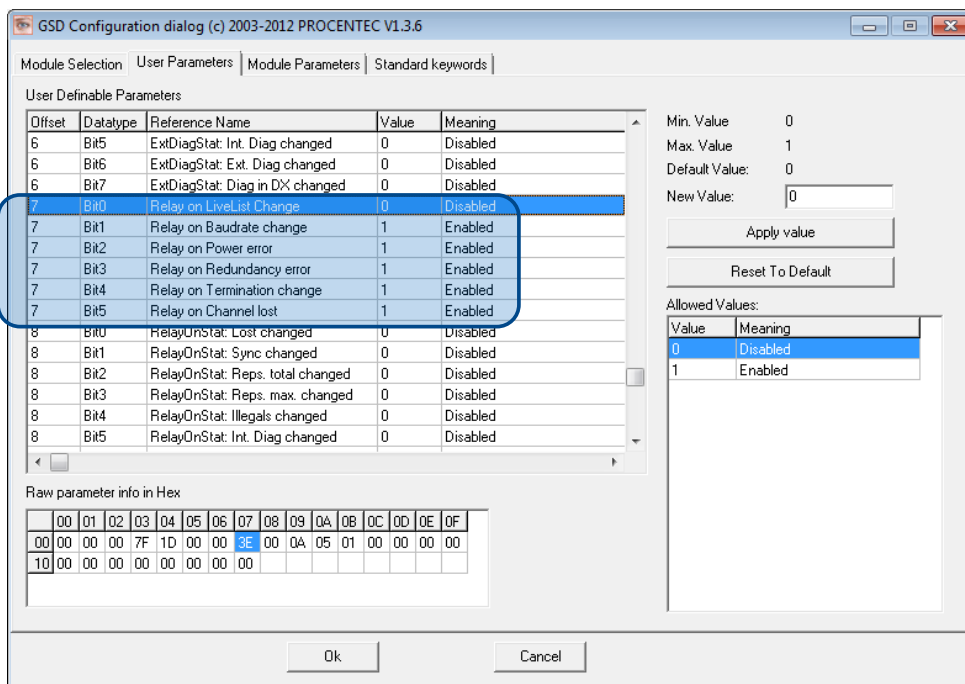
### 4.3.6 Alarm relay on Statistics change

The Alarm Relay on the ProfiHub can be switched (closed) on each change in Statistics, described in paragraph 3.3.2. When such an (enabled) Statistic change occurs, the Relay will be switched immediately without delay. The only Statistic that can delay the closing of the Alarm Relay is the Lost event.
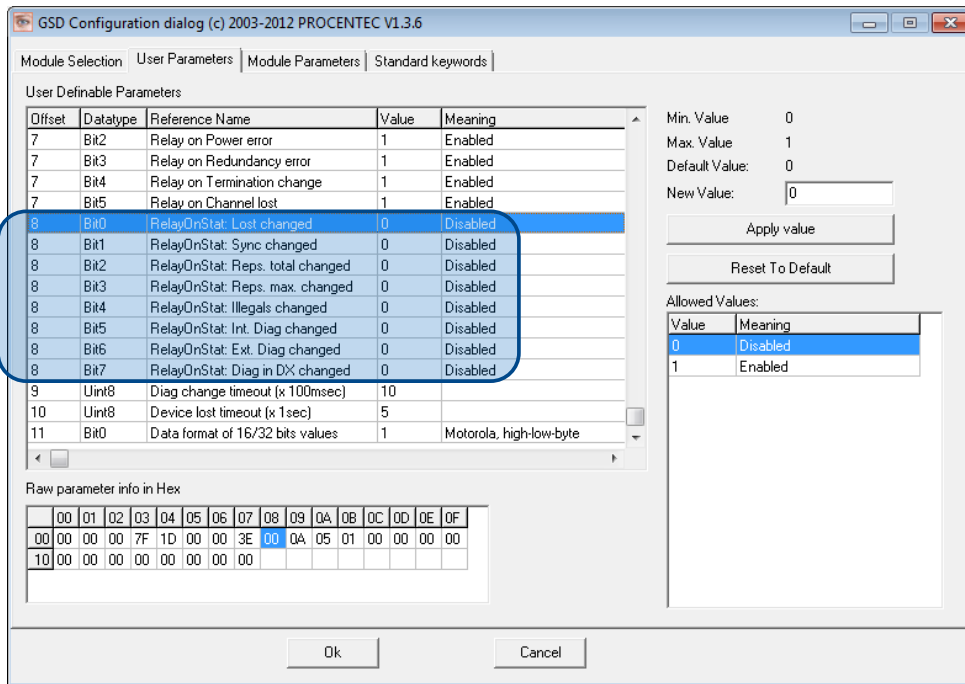


### 4.3.7 Changing the Diagnostics duration/timeout

You can change the duration of the Extended Diagnostics warning in steps of 100 milliseconds. The default value is 10, so 1 second. The maximum value is 255.
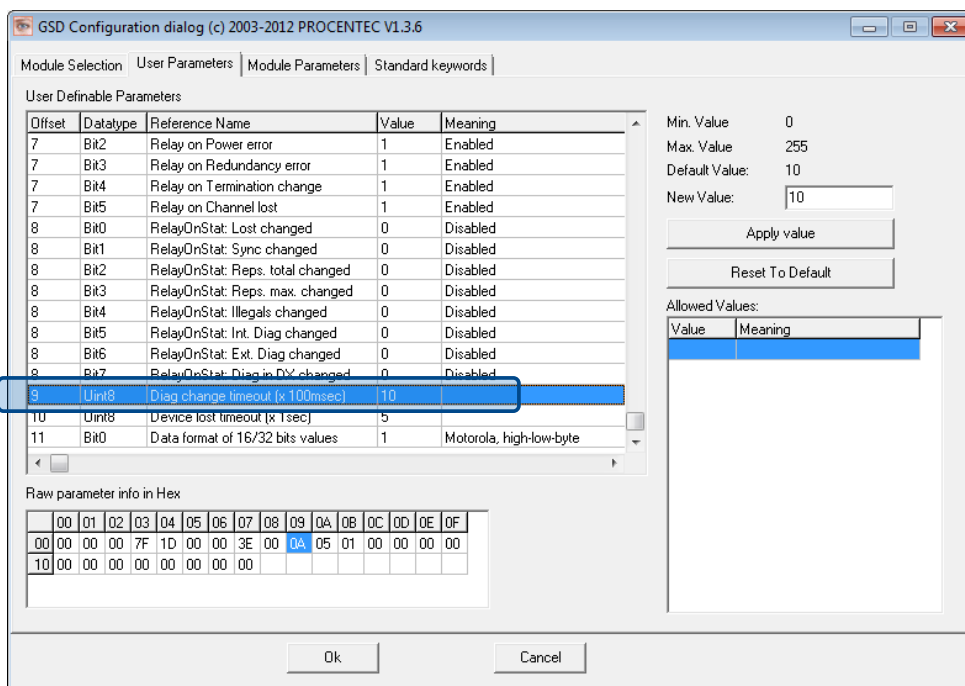
### 4.3.8 Changing the Device Lost timeout

The Diagnostics Device waits for a certain time before it considers a slave to be lost. This works in a similar way as the ProfiTrace Live List, where the background turns yellow when a slave stops communicating. This timeout can be changed in steps of 1 second. Default value is 5, and maximum value is 255.
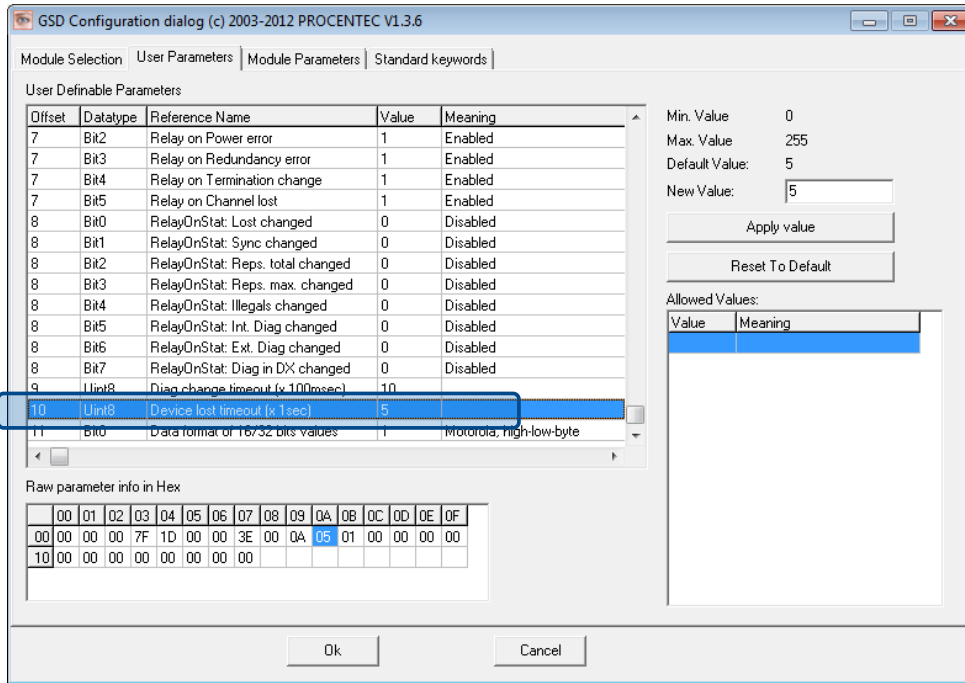


### 4.3.9 Changing the data format

The data format can be changed if needed. Default is Motorola, high-low-byte format.
You can change it to Intel, low-high-byte format.
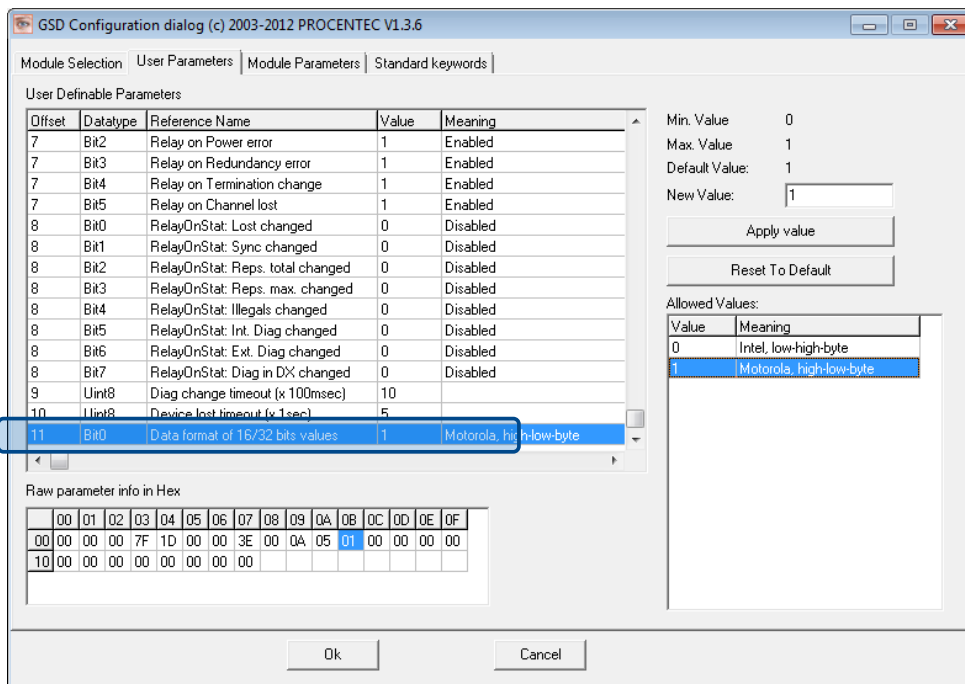
## 4.4 ProfiTrace plugin for the Diagnostic Device

On the download section of www.procentec.com you can download a useful plugin for the Diagnostic Device. It interprets all messages to and from the Diagnostic Device and displays the data in the Info Panel of ProfiTrace.

### 4.4.1 Installing the Plugin

Once you have downloaded the file and extracted it to your hard drive, start ProfiTrace and choose 'Settings – Plugins' to bring up the Plugin window.

Click 'Install Plugin' and locate it on your harddrive.
Next, click 'Enabled' so that ProfiTrace starts the plugin on startup.
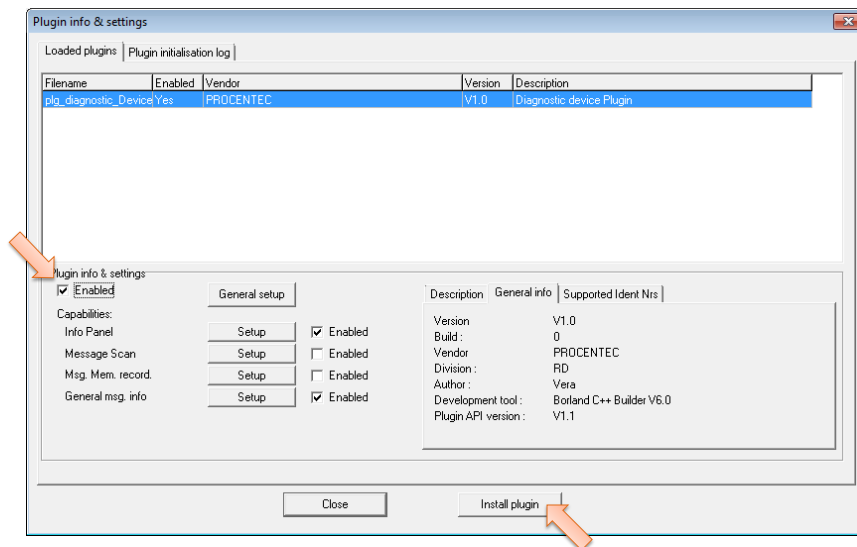


### 4.4.2 Using the Plugin

When the Plugin is correctly started and you have a ProfiHub with Diagnostics Device running, click 'Start Message Recording' in ProfiTrace, and view the screen with messages (see Fig. 5). If you click on a data exchange message to or from a Diagnostics Device, you will see all the interpreted data bytes in the Info Panel. This is very useful for Troubleshooting activities.

A good example is the Statistics. These statistics are available per individual channel or station address (see paragraph 3.2.10), so it is easy to see the source of the problem.

Fig.  5 - Info Panel with ProfiHub Diagnostics information

# 5  Technical Specifications

| Technical Data ProfiHub D1 | |
|---|---|
| **Dimensions and weight** | |
| Dimensions L x W x H (mm) | 169 x 79 x 42 mm (excluding DIN-rail and plug-able screw connectors) |
| Weight | 490 g (excluding plug-able screw connectors and packing material). |
| Mounting holes L x W | 155 × 65 mm M4 |
| **Ambient conditions** | -25 to +70º Celsius |
| Operating temperature | -13 to +158º Fahrenheit |
| Isolation class | IP 66 (IEC/EN 60529, DIN 40050) |
| **Protocol and Timing specifications** | |
| Supported Protocols | DP-V0, DP- V1, DP-V2, FDL, MPI, FMS, PROFIsafe, PROFIdrive and any other FDL based protocol. |
| Transmission speed | 9.6 kbps to 12 Mbps (including 45.45 kbps) |
| Transmission speed detection | Auto detect |
| Transmission speed detection time | < 10 s detection and 50 s baudrate switchover time. |
| Data delay time unit | At baudrate      Normal mode     Robust mode<br>9.6 - 500 kbps     3.0 Tbit       14 Tbit<br>1.5 Mbps          4.0 Tbit       15 Tbit<br>3 Mbps             4.5 Tbit       15 Tbit<br>6 Mbps             5.0 Tbit       16 Tbit<br>12 Mbps         7.0 Tbit       18 Tbit |
| Jitter per message frame | 0.0625 Tbit at 9.6 Kbps - 3 Mbps<br>0.125   Tbit at 6 Mbps<br>0.25    Tbit at 12 Mbps |
| Deviation | 2 bit times (over the complete message) for received messages is allowed and is corrected to nominal speed when transmitted. |

| PROFIBUS Diagnostics Device Specifications | |
|---|---|
| Supported protocol | DP-V0 |
| Ident Number | 6974 |
| GSD filename | PROC6974.gsd |
| Bus address | 0-126 (software address only, set by software, default 126) |
| Transmission speed | 9.6 kbps to 12 Mbps (including 45.45 kbps) |
| Transmission speed detection | Auto Detect |
| Maximum transferrable data | 85 bytes input and 5 bytes output |

| PROFIBUS cable 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 |
| Wire diameter | < 2.5 mm$^2$ |
| Wire type | Stranded or Solid core |
| Number of devices | Max. 31 per Channel (including ProfiHubs, OLMs, Laptops/PCs, etc.) |
| Termination | Integrated and switchable, default on (to toggle termination ON/OFF hold 'TERM' button for 3 seconds). Powered according to IEC 61158 (390/220/390 Ohms) |
| Cascading depth | No limits (only limited by busparameters of the master) |

With standard busparameters:

| At baudrate | Normal mode[units] | Robust mode[units] |
|---|---|---|
| 9.6 kbps | 6 | 1 |
| 19.2 kbps | 6 | 1 |
| 45.45 kbps | 39 | 8 |
| 93.75 kbps | 6 | 1 |
| 187.5 kbps | 6 | 1 |
| 500 kbps | 16 | 3 |
| 1.5 Mbps | 20 | 5 |
| 3 Mbps | 17 | 5 |
| 6 Mbps | 13 | 4 |
| 12 Mbps | 13 | 5 |

Formula to calculate number of cascading units with adjusted Tslot :
Number cascading units = (Tslot - maxTsdr) / (2 × Data_delay_time_unit)
* Data_delay_time_unit: Normal or Robust mode see table

| Power supply specifications | |
|---|---|
| Power supply operating voltage range | 12 to 24 VDC |
| Power supply absolute max. rated voltage | 9 to 31 VDC |
| Redundant power supply | No |
| Current consumption | Max. 125 mA |
| Power dissipation | Max. 1.8 W |
| Reverse polarity protection | Yes |

| Connector lay-out | |
|---|---|
| Power supply M8 Male | Pin 1   : 12 to 24 VDC<br>Pin 2   : 12 to 24 VDC<br>Pin 3   : 0 V<br>Pin 4   : 0 V<br>Thread : Shield |
| PROFIBUS M12 Male CH1 and CH2 | Pin 1: +5V<br>Pin 2: PROFIBUS A (green wire)<br>Pin 3: DGND<br>Pin 4: PROFIBUS B (red wire)<br>Pin 5: not used<br>Thread : Shield |
| PROFIBUS M12 Female CH1, CH2 and MONITOR | Pin 1: +5V<br>Pin 2: PROFIBUS A (green wire)<br>Pin 3: DGND<br>Pin 4: PROFIBUS B (red wire)<br>Pin 5: not used<br>Thread : Shield |
| **Standards and approvals** | |
| CE | EMC Directive 2014/30/EU, class B Digital Device<br>RoHs Directive 2011/65/EU |
| FCC | 47 CFR 15, Unintentional Radiator, class B Digital Device. |
| UL | Report reference: E365044-A1-UL<br><br>Standards for safety: UL 60950-1, Information Technology Equipment - Safety - Part 1 General Requirements<br><br>CAN/CSA C22.2 No. 60950-1-07, Information Technology Equipment - Safety - Part 1: General Requirements |

**PROFIBUS connector specifications**

**Male Connector**

Pin 4: B-wire

Pin 3: DGND

Pin 5: not used

Pin 1: + 5V DC

Pin 2: A-wire

Thread: shield

**Female Connector**

Pin 3: DGND

Pin 4: B-wire

Pin 5: not used

Pin 2: A-wire

Pin 1: + 5V DC

Thread: shield
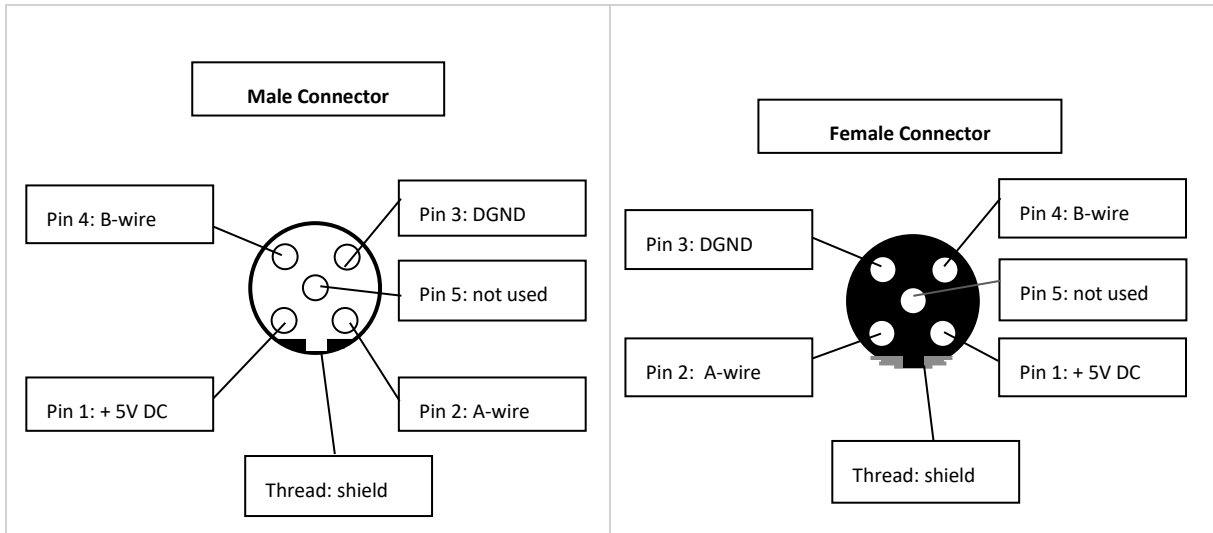
## Power supply specifications

| | |
|---|---|
| Power connector | M8 |
| Nominal supply voltage | 12 to 24 V DC |
| Current consumption | Max. 125 mA at 24 Vdc |
| Power dissipation | Max. 1.5 W |
| | |
| Reverse polarity protection | Yes |

Pin 2: +24V DC

Pin 3: 0V GND

Pin 1: +24V DC

Pin 4: 0V GND

Thread: Shield

# Certificate

PROFIBUS Nutzerorganisation e.V. grants to

**PROCENTEC**
Klopperman 16, 2292 JD Wateringen, The Netherlands

the Certificate No: **Z02190** for the PROFIBUS device:

| | |
|---|---|
| Model Name: | D1+D Repeater Diagnostics |
| Revision: | 1.0; SW/FW: 2.0; HW: 1.3 |
| GSD: | PROC6974.GSD File Version: 2.0 |

This certificate confirms that the product has successfully passed the certification tests with the following scope:

| ☑ | DP-V0 | MS0, Sync, Freeze, Auto_Baud, Set_Slave_Add |
|---|---|---|
| ☑ | Physical Layer | RS485 |

| | |
|---|---|
| Test Report Number: | PCN210-DPS-01 |
| Authorized Test Laboratory: | PROCENTEC, Wateringen, The Netherlands |

The tests were executed in accordance with the following documents:
"Test Specifications for PROFIBUS DP Slaves, Version 3.09 from September 2008".

This certificate is granted according to the document:
"Framework for testing and certification of PROFIBUS and PROFINET products".

For all products that are placed in circulation by **January 02, 2022** the certificate is valid for life.

Karlsruhe, January 29, 2019

Board of PROFIBUS Nutzerorganisation e. V.

(Official in Charge)

(Karsten Schneider)

(Dr. Jörg Hähniche)

# 6    Sales offices and distributors

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| Buenos Aires | | I: | www.efalcom.com.ar |
| Argentina | | | |

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| **IS Systems Pty Limited** | | T: | +61 2 4964 8548 |
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| Tomago | | E: | fritz.woller@issystems.com.au |
| NSW, Australia, 2322 | | I: | www.issystems.com.au |

| **Pentair Flow Control Pacific** | | T: | +61 2 4448 0466 |
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| 1 Percival Road | | F: | +61 2 4423 3232 |
| Smithfield | | E: | sharee.hazell@pentair.com.au |
| NSW, Australia, 2164 | | I: | www.profibuscentre.com.au |

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For the up to date list of the Sales Offices and Distributors see www.procentec.com/company/distributors/. If your country or region is not listed, please contact us. We are still searching for distributors who can cover complete areas or countries.

# 7 About PROCENTEC

**PROCENTEC is a specialist in PROFIBUS and PROFINET technology and develops products to optimize the production processes of end users. Our innovative solutions ensure that our customers successfully operate in the world of industrial automation and enjoy maximum results from their process.**

PROCENTEC globally supplies all the components required to install a measurable and steerable network. We develop and produce all products in the Netherlands and they are exported through our worldwide distribution network. At PROCENTEC, we have a professional team of qualified support engineers who provide technical support on-site and online. Our professionals have more than 20 years of experience with PROFIBUS and PROFINET technology. They provide the necessary support to end users during implementation procedures, certification processes, audits and malfunctions. PROCENTEC also is the international accredited Competence and Training centre for PROFIBUS and PROFINET. We provide training courses that help employees using those techniques optimally for their business objectives.

## Products

- ProfiTrace
- ComBricks
- ProfiHub
- PROFINET tools
- Cables and connectors
  - Competence centre

## Services

- On-site & Online Support
- Network Audit
- Network Certfication
- Consultancy
- Testlab & Democenter

## Training courses

- PROFIBUS training courses
- PROFINET training courses
- Product training courses

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