

## Technical Data - SCOPE Repeater (101-201210)

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<b>Dimensions and weight</b>			
Dimensions L x W x H	137 x 25 x 103 mm (including backplane, per module)		
Weight	120 g (excluding plug-able connectors, backplane and packing material)		
Mounting DIN-rail type	35mm × 7.5mm (EN 50022, BS 5584, DIN 46277-3)		
<b>Ambient conditions</b>			
Ambient operating temperature range	-20° ... +60° Celsius (for mounting position see manual) -4° ... 158° Fahrenheit		
Isolating class	IP 20 (IEC/EN 60529, DIN 40050)		
<b>Backplane</b>			
PROFIBUS networks	4 (set by dipswitches or web server)		
Modules	10 (positioned in the first 10 slots)		
Power supply	Provided through the backplane		
Typical backplane current consumption	400 mA (at 5.72 VDC)		
Max. backplane current consumption	600 mA (at 5.72 VDC) At this current consumption the module is switched OFF from backplane. Occurs when module is faulty, e.g. internal short circuit.		
Compatible backplane units	101-200011, 101-200022, 101-200023, 101-200024, 101-200027		
<b>Protocol specifications</b>			
Supported Protocols	DP-V0, DP- V1, DP-V2, FDL, MPI, FMS, PROFIsafe, PROFIdrive and any other FDL based protocol		
Address	NO bus address required		
Transmission speed	9.6 kbps .. 12 Mbps (including 45.45 kbps)		
Transmission speed detection	Auto detect (< 10 s detection and 50 s baudrate switchover time)		
Data delay time	At baudrate	Normal mode	Redundant mode
	9.6 - 500 kbps	2.8 Tbit	13.8 Tbit
	1.5 Mbps	3.2 Tbit	14.2 Tbit
	3 Mbps	3.9 Tbit	14.5 Tbit
	6 Mbps	4.6 Tbit	15.6 Tbit
	12 Mbps	6.4 Tbit	17.4 Tbit

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Deviation	2 bit times (over the complete message) for received messages is allowed and is corrected to nominal speed when transmitted.																						
<b>Oscilloscope specifications</b>																							
Frequency Resolution Differential range	192 MS/s 50 mV -6.436 .. 6.436 V																						
<b>PROFIBUS cable specifications</b>																							
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 (for the screw terminals) Wire type	< 2.5 mm <sup>2</sup> Stranded or solid core																						
Number of devices	Maximum 31 devices per channel (busload)																						
Termination	Integrated and switchable Powered according to PB RS 485 (390/220/390 Ohms)																						
Redundancy	Yes, maximum 10 cables activated by switch																						
Cascading depth	No limit (only limited by busparameter of the master)																						
Cascading units	<p>With standard busparameters:</p> <table border="1"> <thead> <tr> <th>At baudrate</th> <th>Normal mode[units]</th> </tr> </thead> <tbody> <tr> <td>9.6 kbps</td> <td>7</td> </tr> <tr> <td>19.2 kbps</td> <td>7</td> </tr> <tr> <td>45.45 kbps</td> <td>42</td> </tr> <tr> <td>93.75 kbps</td> <td>7</td> </tr> <tr> <td>187.5 kbps</td> <td>7</td> </tr> <tr> <td>500 kbps</td> <td>17</td> </tr> <tr> <td>1.5 Mbps</td> <td>23</td> </tr> <tr> <td>3 Mbpps</td> <td>19</td> </tr> <tr> <td>6 Mbps</td> <td>16</td> </tr> <tr> <td>12 Mbps</td> <td>15</td> </tr> </tbody> </table> <p>Formula to calculate number of cascading units with adjusted  <math>T_{slot} : \text{Cascading units} = (T_{slot} - \max T_{sdr}) / (2 \times T_{data\_delay\_time})</math>  <math>T_{data\_delay\_time}</math> is described in protocol specifications on previous page.                      Example 1.5 Mbps, normal mode:                      Cascading units = <math>(300-150) / (2 \times 3.2) = 23</math></p>	At baudrate	Normal mode[units]	9.6 kbps	7	19.2 kbps	7	45.45 kbps	42	93.75 kbps	7	187.5 kbps	7	500 kbps	17	1.5 Mbps	23	3 Mbpps	19	6 Mbps	16	12 Mbps	15
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#### Connector Lay-out

PROFIBUS screw terminal CH1

Plug-able screw terminal, pitch 5,08 mm

Pin A: PROFIBUS A (green wire)

Pin B: PROFIBUS B (red wire)

Pin SH: Shield

Pin I: Indirect Shield

PROFIBUS DB9 CH1

D Sub connector, 9 contacts (PROFIBUS specification)

Pin 1: N.C.

Pin 2: N.C.

Pin 3: PROFIBUS - B

Pin 4: PROFIBUS - RTS

Pin 5: GND

Pin 6: VPP

Pin 7: N.C.

Pin 8: PROFIBUS - A

Pin 9: N.C.

Housing: Shield

*Pin SH is connected internally to the DIN-rail with spring-loaded contact.*

*Pin I is connected internally with 10nF/1MΩ to shield.*

#### LEDs

RDY : Ready

RX : Receiving

SW : Switch Network Termination

HWE : Hardware Error

ER : Error

MIN : Minus

TERM : Termination voltage

Module is ready for operation (ON)

Receiving telegrams (blinking)

Network Termination active (ON)

Internal repeater error (ON contact PROCEN TEC)

No or bad receiving telegrams detected (ON or blinking)

Signal amplitude of the telegrams too low < 2.5 V (ON)

Idle voltage too low <0.95 V or >1.26 V (ON)

*Alarm values can be changed through the web server.*

#### Dipswitches

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<p><u>NW0</u>   <u>NW1</u>            LEFT   LEFT            RIGHT   LEFT            LEFT   RIGHT            RIGHT   RIGHT</p> <p><u>RED</u>            LEFT / RIGHT</p> <p><u>H/S</u>            LEFT / RIGHT</p>	<p><u>PROFIBUS Network</u>            1            2            3            4</p> <p><u>Redundancy</u>            OFF / ON</p> <p><u>Settings</u>            Hardware / Software</p>
<b>Standard and approvals</b>	
<p>CE</p> <p>FCC</p> <p>UL</p>	<p>EMC Directive 2014/30/EU, class A Digital Device            RoHs Directive 2011/65/EU</p> <p>47 CFR 15, Unintentional Radiator, class A Digital Device.</p> <p>Report reference: E468970            Standards for safety: UL 508 - Industrial Control Equipment.            CSA C22.2 No. 142-M1987 - Industrial Control Equipment</p>
<b>Others</b>	
<p>Head Station firmware            MTBF</p>	<p>At least version 1.260            1123748 hours, at 30° Celsius, IEC TR 62380</p>
<p><b>PROCENTEC</b>            Klopperman 16            2292 JD WATERINGEN (NL)</p>	<p><b>Tel.: +31-174-671800</b>  <b>Fax: +31-174-671801</b>  <b>Email: info@procentec.com</b></p>