Anybus ComBricks 1 Channel SCOPE Repeater

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The Anybus ComBricks is the first PROFIBUS based automation system that unites repeaters and permanent monitoring in a web browser. With an evolving industry using more mixed architecture networks, users are able to integrate ComBricks into their PROFINET network via Osiris, allowing to monitor everything from one single cross-platform.

The Anybus SCOPE Repeater is a 1 Channel RS 485 PROFIBUS diagnostic repeater module with an integrated quality-oscilloscope for 12 Mbps with diagnostic LEDs and redundancy feature. Bus connection is utilized by screw terminals and additional DB9 connector.

The repeater channel and the integrated oscilloscope are directly connected with the ProfiTrace OE core in the 1B/1C Head Station. Scope images and busmonitor data are directly available in the web server.

The advanced 12 Mbps core of the repeater module can be cascaded unlimitedly and has increased RS 485 strength. The data traffic is constantly monitored for glitches which are digitally filtered out. It has on-board switchable termination and able to drive 31 devices.

Distinctive features
- Integrated quality-oscilloscope
- Diagnostic LEDs
- Bus speed up to 12 Mbps,
- 31 devices per channel
- Screw terminals bus connection,
- DB9 connector for monitoring
- Redundancy feature included
- Bus termination integrated

Your benefits
- It is the easiest to use PROFIBUS oscilloscope available
- Works automatically, even images saves to SD card
- Oscilloscope data is never mistaken with the wrong segment
- No probe wiring
- No spur lines
- No limit in cascading

- Remote maintenance station with ProfiTrace OE
- Modular repeater backbone with hot swap
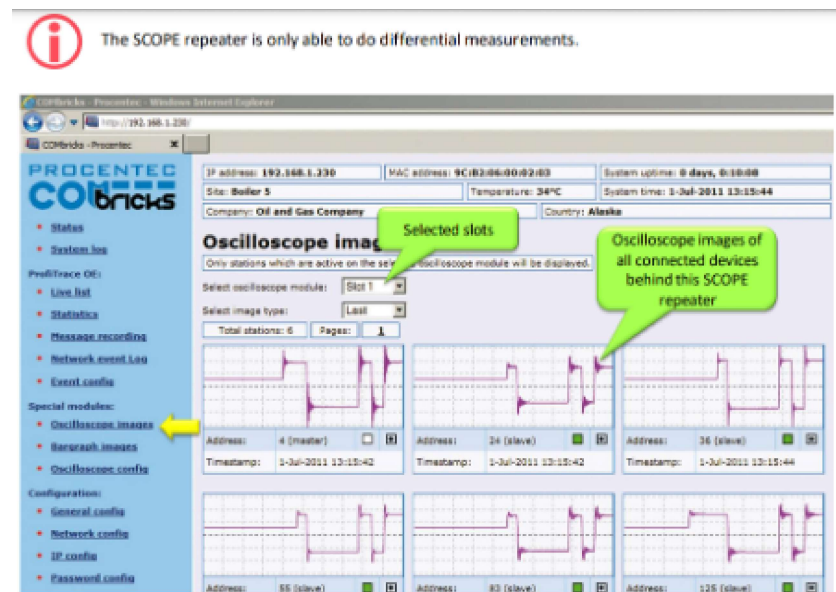- Transparent data hub (repeaters, fiber optic, RS-485-IS, DP slave, PROFINET, etc.)

Figure 1 - Oscilloscope images from all devices

Dimensions and weight

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)

Ambient conditions

Operating temperature range	-20° ... $+60^O$ Celsius (for mounting position see manual) -4° ... 158° Fahrenheit
Isolation class	IP 20 (IEC/EN 60529, DIN 40050)

Backplane

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

otocol specifications

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	Redundunt 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

Deviation	2 bit times (over the complete message) for received messages is allowed and is corrected to nominal speed when transmitted.

Oscilloscope specifications

Frequency	192 MS/s
Resolution	50 mV
Differential range	-6.436 .. 6.436 V

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 (for the screw terminals)	< 2.5 mm^2

Wire type	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	With standard busparameters: 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 Mbps 19 6 Mbps 16 12 Mbps 15 Formula to calculate number of cascading units with adjusted T_{slot} : Cascading units = $(T_{slot} - maxT_{sdr}) / (2 \times T_{data\_delay\_time})$ $T_{data\_delay\_time}$ is described in protocol specifications on previous page. Example 1.5 Mbps, normal mode: Cascading units = (300-150) / (2x3.2) = 23

Connector Lay-out

PROFIBUS DB9 CH1	<u>D Sub connector, 9 contacts (PROFIBUS specification)</u> 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/1MOhm to shield.

LEDs

RDY: Ready	Module is ready for operation (ON)
RX: Receiving	Receiving telegrams (blinking)
SW: Switch Network Termination	Network Termination active (ON)
HWE: Hardware Error	Internal repeater error (ON contact HMS Technical Support)
ER: Error Receiving	No or bad receiving telegrams detected (ON or blinking)
MIN: Minus	No or bad receiving telegrams detected (ON or blinking)

TERM: Termination voltage	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

NW0	NW1	PROFIBUS Network
LEFT	LEFT	1
RIGHT	LEFT	2
LEFT	RIGHT	3
RIGHT	RIGHT	4
RED		Redundancy
LEFT		OFF
RIGHT		ON
H/S		Settings
LEFT		Hardware
RIGHT		Software

Standard and approvals

CE	EMC Directive 2014/30/EU, class A Digital Device
	RoHs Directive 2011/65/EU
FCC	47 CFR 15, Unintentional Radiator, class A Digital Device.
UL	Report reference: E468970
	Standards for safety: UL 508 - Industrial Control Equipment.
	CSA C22.2 No. 142-M1987 - Industrial Control Equipment

Others

Head Station firmware	At least version 1.260
MTBF	1123748 hours, at 30° Celsius, IEC TR 62380
HMS Industrial Networks Vlasmarkt 1 3011 PW, ROTTERDAM	**Tel.: +31-174-671800** **Fax: +31-174-671801** **Email: info@procentec.com**

File	Version	Size	Read online

Ordering Information

Order Codes	101-201210
Included Components	Anybus Combricks, backplane socket
Warranty	1 year