PSI-MODEM-SHDSL/PB

SHDSL PROFIBUS leased line modem

INTERFACE

Data sheet
104396_en_01

1   Description

The industrial PROFIBUS SHDSL modem can be used to cover PROFIBUS distances in excess of 1200 m using any cable. Depending on the topology, PROFIBUS data rates of up to 1.5 Mbps can be achieved. Distances of over 20 km can be covered given a low data speed and good line characteristics, see Figure 1 on page 4.

Two DSL ports per device permit the simple construction of redundant point-to-point or linear topologies. In addition, mixed operation using copper conductors and optical fiber cable is also possible with the mounting rail connector (T-BUS).

The clearly visible LEDs on the front of the device provide on-site technicians with quick device diagnostics. Every device also has integrated diagnosis functions and a logbook.

Two freely configurable digital outputs are available for alarm generation for external devices. They can be parameterized using the configuration software. Power is supplied via USB cable, which enables device configuration without external 24 V power supply.

1.1   Features

Areas of application
– Suitable for leased lines, not for the public telephone network
– Point-to-point connection
– Line topology, maximum of 30 SHDSL devices
– Mixed operation with Phoenix Contact PROFIBUS infrastructure components

SHDSL
– Two SHDSL ports
– Symmetrical data transmission
– Up to 15.3 Mbps (2-conductor)
– Path redundancy mode (4-conductor)

PROFIBUS
– Linear topology Up to 500 kbps
– Point-to-point connection Up to 1.5 Mbps

Alarm outputs
– Two digital outputs for external control systems
– Can be configured individually

Configuration software
– Easy, guided configuration
– Online diagnostics
– Logbook function with plain text
– Saving and printing of project and device configurations

ℹ️ Make sure that you are always working with the current documentation.
This is available for download from www.phoenixcontact.net/catalog.

ℹ️ This data sheet is valid for the products listed on the following page:

PHŒNIX CONTACT

INSPIRING INNOVATIONS

2 Ordering data

Modem

Description	Type	Item no.	Pcs./Pkt.
SHDSL PROFIBUS leased line modem, for point-to-point, linear, and star topologies. On the company's leased lines.	PSI-MODEM-SHDSL/PB	2313656	1

Accessories

Description	Type	Item no.	Pcs./Pkt.
System power supply, primary clocked Input voltage range Rated output voltage Rated output current — 45 Hz ... 65 Hz, 85 V AC ... 264 V AC, 24 V DC ±1 %, 1.5 A	MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1
Mounting rail connector (2x required)	ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	1
RJ45(RJ12/RJ11) adapter with voltage surge protection for analog telecoms interfaces. Can alternatively be snapped onto DIN rails.	DT-TELE-RJ4	2882925	1
USB cable, USB type A/mini-USB type B, 5-pin, 1 meter long	PSI-CA-USB A/MINI B/1METER	2313575	1 m
USB cable, USB type A/mini-USB type B, 5-pin, 3 meters long	CABLE-USB/MINI-USB-3,0M	2986135	3 m
SUB-D connector, 9-pin, mail, axial version with two cable entries, bus system: PROFIBUS-DP up to 12 Mbps, terminating resistor can be enabled via a slide switch, pinouts: 3, 5, 6, 8; screwed terminals	SUBCON-PLUS-PROFIB/AX/SC	2744380	1
D-SUB connector, 9-pin, male, cable entry less than 35°, bus system: PROFIBUS-DP up to 12 Mbps, with PG-D-SUB socket for connecting a programming device, terminating resistor can be enabled via a slide switch, pinouts: 3, 5, 6, 8; screwed terminals	SUBCON-PLUS-PROFIB/PG/SC2	2708245	1
D-SUB connector, 9-pin, male, cable entry less than 35°, bus system: PROFIBUS-DP up to 12 Mbps, terminating resistor can be enabled via a slide switch, pinouts: 3, 5, 6, 8; screwed terminals	SUBCON-PLUS-PROFIB/SC2	2708232	1
PROFIBUS cable Fast Connect type, up to 12 Mbps (02YSY (ST)CY 1x2x22 AWG)	PSM-CABLE-PROFIB/FC	2744652	1 m
Modular **PROFIBUSrepeater**, for electrical isolation and increasing the range in PROFIBUS systems, 4-way isolation, DIN-rail mountable	PSI-REP-PROFIBUS/12MB	2708863	1
Active **termination resistor** with redundant power supply for PROFIBUS and RS-485 bus systems. Compact design. Electrical isolation between supply and data interface. Selectable bus termination. Integrated programming interface.	PSI-TERMINATOR-PB	2313944	1

3 Technical data

Power supply	
Supply voltage	18 V DC ... 30 V DC via COMBICON plug-in screw terminal block
	24 V DC ±5% (alternative or redundant, via DIN rail connector and system power supply)
	5 V DC (configuration only, via mini-USB type B)
Nominal current consumption	< 180 mA at 24 V
LED indicator	VCC (green LED) – Steady light: operation – Flashes at 1 Hz: Supply via USB (for configuration)
Switching outputs	2 x U_{rated} /150 mA (the digital outputs cannot be used if supplied via the mounting rail connector), short-circuit proof

SHDSL interface

Connection method	2 x 2-pin COMBICON plug-in screw terminal block
Type	SHDSL interface according to ITU-T G.991.2.bis
Serial transmission speed	2-conductor operation: 32 kbps ... 15.3 Mbps
Path redundancy mode	Yes
Transmission distance	Over 20 km possible with low data rates and good cable quality
Connection data (conductor cross section)	0.2 mm² ... 2.5 mm² (AWG 24-14)
Status and diagnosis indicators	2 x LINK, 2 x STAT (DSL data traffic port A and port B)
	DIAG (yellow LED), diagnostic messages
	ERR (red LED), errors

PROFIBUS interface

Connection method	9-pin D-SUB female connector
Type	PROFIBUS according to IEC 61158, RS-485, 2-conductor, half duplex, automatic control
Data format/encoding	UART (11 bits, NRZ), data direction changeover, automatic control
Transmission speed	– Linear topology Up to 500 kbps
	– Point-to-point connection Up to 1.5 Mbps
Transmission length	Up to 1200 m, maximum depending on the data rate, with shielded, twisted pair data cable
Status and diagnosis indicators	RD/TD, PROFIBUS data traffic
	ERR (red LED), errors
	DIAG (yellow LED), diagnostic messages

USB interface (configuration/diagnostics)

Connection method	Mini-USB type B, 5-pin
Type	USB 2.0
Transmission length	5 m, maximum, only for configuration and diagnostics

General data

Ambient temperature range	
Operation (no other assemblies supplied via the device):	
– freestanding (40 mm spacing)	-20 °C ... +60 °C
– connected in series (low power dissipation to series-connected modules)	-20 °C ... +55 °C
	-20 °C ... +50 °C
– connected in series (no restrictions)	-20 °C ... +45 °C
Operation (other modules supplied via the device (1.5 A, maximum))	-40 °C ... +85 °C
Storage/transport	
Housing	ME 35 with 5-pin bus contact and ground contact
Material	PA 6.6-FR, V0, green
Dimensions (H X W x D)	114.5 mm x 35 mm x 99 mm
Weight of device	183 g
Functional ground	Housing contact with DIN rail
Degree of protection	IP20
Electrical isolation	Supply // PROFIBUS // DSL port A // DSL port B // FE
MTBF according to Telcordia standard	
Ambient temperature 25 °C	1004 years
Ambient temperature 40 °C	199 years
Test voltage	1.5 kV AC, 50 Hz
Vibration resistance	In accordance with IEC 60068-2-6: 5g, 150 Hz
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC

General data (continued)

UL, USA/Canada	UL 508 listed in preparation
Manufacturer's declaration	EN 50121-4 (Railway applications - electromagnetic compatibility, part 4: Emission and immunity of the signaling and telecommunications apparatus)
	Equipment within the 3 m range and devices relevant to safety. There are further requirements for these devices according to EN 50121-4 table 1, note 1.
	Clause 1, paragraph 3 of EN 50121-4 shall apply. Phoenix Contact QUINT power supplies shall be used directly on the device to this end.
Conformity assessment in accordance with 94/9/EC	⟨Ex⟩ II 3 G Ex nA II T4 X

4   Range

ℹ️ The maximum possible SHDSL data rate depends on a number of parameters. Two important parameters are the line length and the line cross section.

It is not possible to draw automatic conclusions regarding the maximum possible PROFIBUS data rate from the maximum possible SHDSL data rate. The maximum possible PROFIBUS data rate is highly dependent on the topology. You may have the possible data rates calculated by the PSI-CONF configuration software.

ℹ️ The current version of the PSI-CONF configuration software is available for download at no cost from www.phoenixcontact.net/catalog.
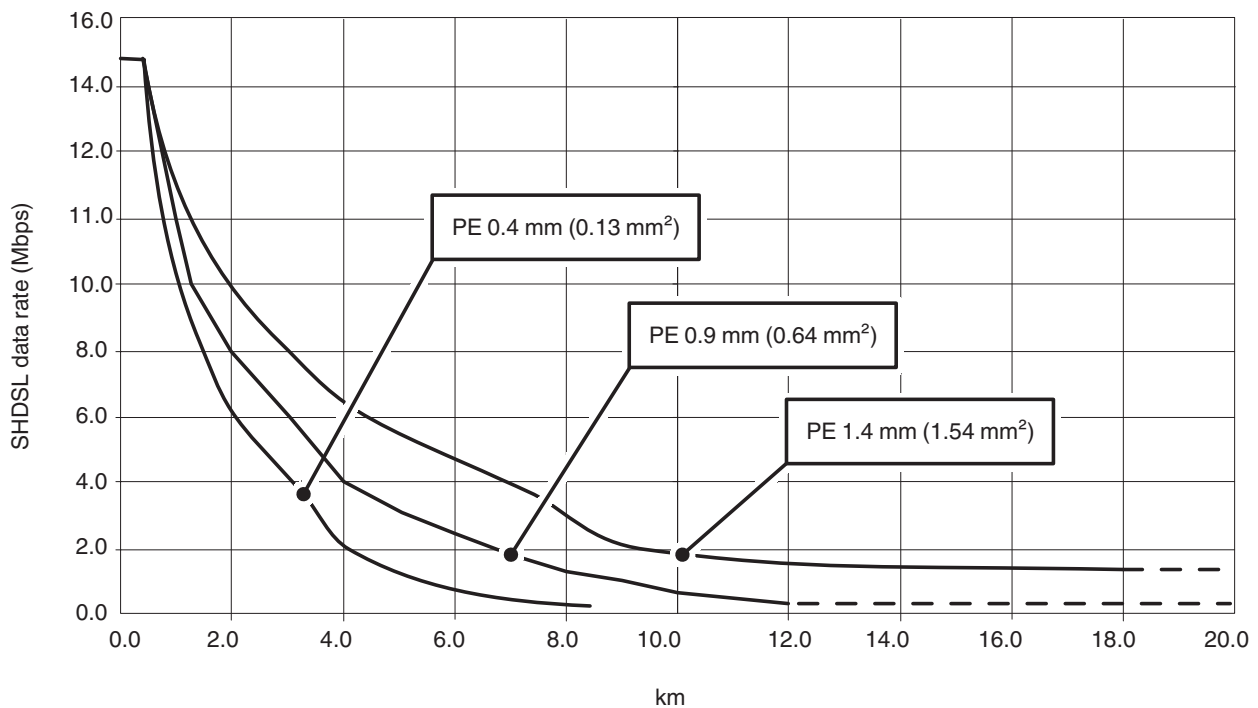

Figure 1   Dependence of the maximum SHDSL data rate (Mbps) on the line length in a 2-conductor connection
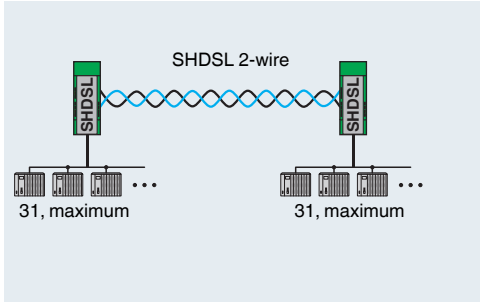
Figure 1 illustrates the dependency of the maximum data rate on the distance with three cable types. Higher ranges can be achieved with high quality cables and larger diameter cables.

Phoenix Contact's industrial SHDSL leased line modems permit data rates in 2-conductor operation from 32 kbps to 15.3 Mbps.
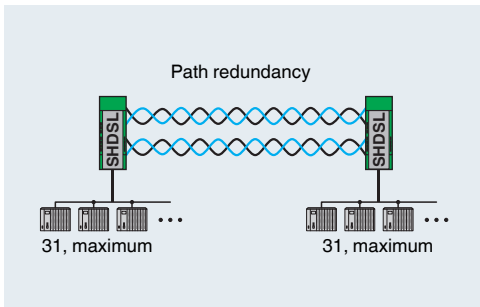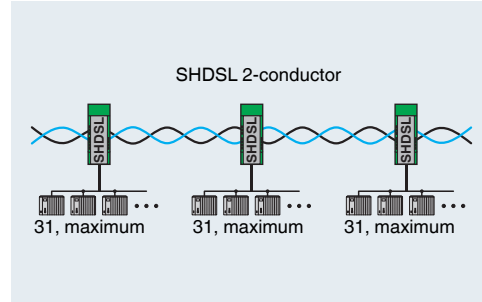
SHDSL leased line modems are suitable for lines leased by the company, not for public telephone networks.
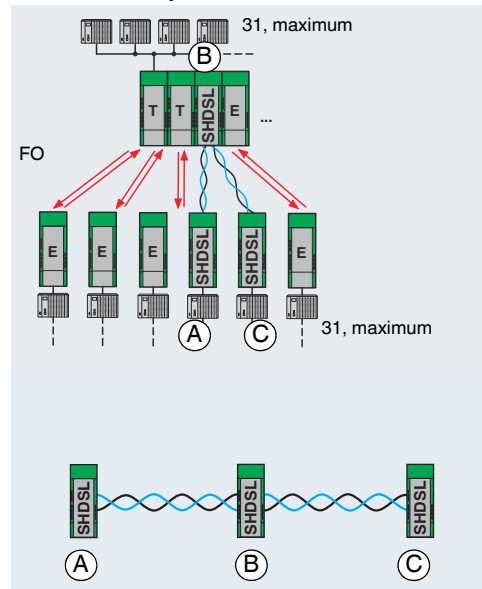
5 Application examples

5.1 point-to-point connection

SHDSL 2-wire

31, maximum   31, maximum

Path redundancy

31, maximum   31, maximum

5.2 Linear topology

SHDSL 2-conductor

31, maximum   31, maximum   31, maximum

5.3 Structures that combine copper cables and fiber optics

31, maximum

FO

31, maximum

In this example, the three SHDSL devices have been configured in a linear topology by the configuration software.

> **i** For more application examples, please refer to the UM EN PSI-MODEM-SHDSL/PB user manual.

6 Use in potentially explosive areas

The PSI-MODEM-SHDSL/PB is intended for use in potentially explosive atmospheres that require **category 3G equipment**.

Special conditions

Observe the specified conditions for use in potentially explosive areas.

WARNING: Explosion hazard

Install the device in suitable **housing with at least IP54 protection** that meets the requirements of EN 60079-15.

WARNING: Explosion hazard

Switch off the power supply to the unit before:

– snapping it on or disconnecting it.
– connecting or disconnecting cables.

WARNING: Explosion hazard

The **mini-USB configuration interface** may only be used if it is ensured that there is no potentially explosive atmosphere present.

WARNING: Explosion hazard

Connection to the **D-SUB port** is permissible only if the screws are fully tightened.

WARNING: Explosion hazard

Only devices which are designed for operation in zone 2 potentially explosive areas and are suitable for the conditions at the installation location may be connected to the signal circuits in zone 2.