

TC EXTENDER 2001 ETH-2S - Ethernet extenders



2702409

<https://www.phoenixcontact.com/us/products/2702409>

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Second generation: Unmanaged Ethernet extender for point-to-point connections, line and ring structures, data rates up to 30 Mbps, distances of up to 20 km on in-house copper cables, diagnostics via USB and LEDs, 2 SHDSL ports, 1 LAN port

Product description

The Ethernet extender makes broadband Ethernet applications on existing cables possible. It is the successor to the first generation PSI MODEM SHDSL/ETH, Item No. 2313643. The Ethernet extender can be used for in-house 2 and 4-wire cables, but not in the public telephone network. Point-to-point, line or ring structures can be established, with ranges of up to 20 km.

You can use the Ethernet extender in a network with first generation devices (PSI-MODEM-SHDSL/ETH from firmware version 4.xx). The Ethernet extender can also be combined with managed Ethernet extenders: TC EXTENDER 6004 ETH-2S, Item No. 2702255 and TC EXTENDER 4001 ETH-1S, Item No. 2702253. This enables the central diagnosis of all users and lines via IP.

Your advantages

- Distances up to 20 km
- Up to 15.3 Mbps in 2-wire operation
- Up to 30 Mbps in 4-wire operation
- Robust modulation method (SHDSL)
- Automatic SHDSL data rate detection
- Transparent transmission of all standard Ethernet protocols, including EtherNet/IP™, Modbus/TCP, PROFINET, PROFIsafe, EtherCAT®, KNX, BACnet/IP
- Network transparent (no IP configuration required)
- Automatic detection of network cable type (auto MDI(X))
- Automatic network data rate detection (10/100 Mbps)
- Easy startup, plug and play
- Future proof (IPv4 and IPv6-compatible)
- 2 digital outputs for alerting external controllers

Commercial data

Item number	2702409
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN24
Product key	DNC442
Catalog page	Page 349 (C-6-2019)
GTIN	4055626162560
Weight per piece (including packing)	267.6 g

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Weight per piece (excluding packing)	258.7 g
Customs tariff number	85176200
Country of origin	DE

Technical data

Notes

Note on application

Note on application	Only for industrial use
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Utilization restriction

CCCex note	Use in potentially explosive areas is not permitted in China.
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Product properties

Product type	Ethernet extenders
MTTF	711 Years (SN 29500 standard, temperature 25°C, operating cycle 21%)
	308 Years (SN 29500 standard, temperature 40°C, operating cycle 34.25%)
	125 Years (SN 29500 standard, temperature 40°C, operating cycle 100%)

Data management status

Article revision	05
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System properties

Functionality

Basic functions	Ethernet extenders in accordance with ITU-T G.991.2
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Electrical properties

Electrical isolation	VCC // Ethernet // DSL (A) // DSL (B) // FE
Maximum power dissipation for nominal condition	4.32 W
Mains type	Permanent line
Test voltage data interface/power supply	500 V AC (In accordance with EN/IEC 60079-7)
	1.5 kV AC (50 Hz, 1 min.)

Supply

Supply voltage range	18 V DC ... 30 V DC
Nominal supply voltage	24 V DC $\pm 5\%$ (as an alternative or redundant, via backplane bus contact and system current supply)
	5 V DC (configuration only, via mini-USB type B)
Typical current consumption	< 180 mA (24 V DC)
Max. current consumption	≤ 2 A (For operation in a joining station, via the DIN rail connector)

Function

Status and diagnostic indicators	LEDs: US (supply voltage), ACT/LINK (Ethernet data traffic), ERR (errors) 2x LINK / 2x STAT (DSL data traffic port A and port B), DIAG (diagnostic messages)
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Output data

Signal

Output name	Digital output
Number of outputs	2
Voltage output signal	18 V DC ... 30 V DC (depending on the operating voltage)
Current output signal	≤ 150 mA (Short-circuit-proof)
Behavior of outputs	Deactivated for device supply via DIN rail connector

Connection data

Supply

Connection method	COMBICON plug-in screw terminal block
Tightening torque	0.56 Nm ... 0.79 Nm

Interfaces

Signal	Ethernet
Basic functions	Ethernet extenders in accordance with ITU-T G.991.2

Data: Ethernet interface, 10/100Base-T(X) in accordance with IEEE 802.3

Serial transmission speed	10/100 Mbps, auto negotiation
Connection method	RJ45 jack, shielded
	1 port 10/100Base-T(X), auto negotiation
No. of channels	1
Transmission length	< 100 m (shielded twisted pair)
Protocols supported	Protocol-transparent for TCP/IP, IPv4, and IPv6

Data: SHDSL interface according to ITU-T G.991.2.bis

Serial transmission speed	4-wire operation: 64 kbps ... 30 Mbps
	2-wire operation: 32 kbps ... 15.3 Mbps
Connection method	2 x 2-pos. COMBICON plug-in screw terminal blocks
No. of channels	2 (2-wire operation)
Tightening torque	0.56 Nm ... 0.79 Nm
Transmission length	< 20 km (Depending on data rate and cable cross section)
Single conductor/terminal point, rigid	0.2 mm² ... 2.5 mm²
Single-wire/terminal point, flexible	0.2 mm² ... 2.5 mm²
Max. AWG conductor cross section, flexible	14
Min. AWG conductor cross section, flexible	24
Single-wire/terminal point, rigid AWG max.	14
Single-wire/terminal point, rigid AWG min.	24
Stripping length	7 mm

Data: USB 2.0

Connection method	Mini-USB type B, 5-pos.
Transmission length	< 5 m (only for configuration and diagnostics)

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Dimensions

Width	35 mm
Height	99 mm
Depth	114.5 mm

Material specifications

Color (Housing)	gray (RAL 7042)
Material (Housing)	PA 6.6-FR

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-20 °C ... 60 °C (Freestanding (40 mm spacing to the right and left), no supply of other modules via the device)
	-20 °C ... 55 °C (Mounted in rows with zero spacing and low power dissipation of aligned modules)
	-20 °C ... 50 °C (Mounted in rows with zero spacing)
	-20 °C ... 45 °C (aligned without spacing and supply of other modules via the device, 1.5 A)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Altitude	≤ 5000 m (For restrictions, see the manufacturer's declaration for altitude operation)
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	10 % ... 95 % (non-condensing)

Approvals

CE

Certificate	CE-compliant
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ATEX

Identification	Ex II 3 G Ex ec IIC T4 Gc
Certificate	PxCIF11ATEX2313643X
Note	Please follow the special installation instructions in the documentation!

UKEX

Identification	Ex II 3 G Ex ec IIC T4 Gc
Certificate	PxCIMA22UKEX2313643X

UL, USA/Canada

Identification	508 Listed
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Corrosive gas test

Identification	ISA-S71.04-1985 G3 Harsh Group A
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EMC data

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Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Electrostatic discharge	
Standards/regulations	EN 61000-4-2
Electrostatic discharge	
Contact discharge	± 6 kV
Discharge in air	± 8 kV
Indirect discharge	± 6 kV
Comments	Criterion B
Electromagnetic HF field	
Standards/regulations	EN 61000-4-3
Electromagnetic HF field	
Frequency range	80 MHz ... 3 GHz
Field intensity	10 V/m
Comments	Criterion A
Fast transients (burst)	
Standards/regulations	EN 61000-4-4
Fast transients (burst)	
Input	± 2 kV
Signal	± 2 kV
Comments	Criterion B
Surge current load (surge)	
Standards/regulations	EN 61000-4-5
Surge current load (surge)	
Input	± 0.5 kV (sym./asym.)
Output	± 1 kV (asymmetrical, unshielded)
Signal	± 1 kV (asymmetrical, shielded Ethernet cable) ± 1 kV (asymmetrical: line to ground, unshielded SHDSL cable)
Comments	Criterion A
Conducted interference	
Standards/regulations	EN 61000-4-6
Conducted interference	
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V
Emitted interference	
Standards/regulations	EN 55011
Comments	Class A, industrial applications

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Criteria

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

Standards and regulations

Standards/regulations	EN 50121-4
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Mounting

Mounting type	DIN rail: 35 mm
Assembly note	The product can be snapped onto all 35 mm DIN rails in accordance with EN 60715.

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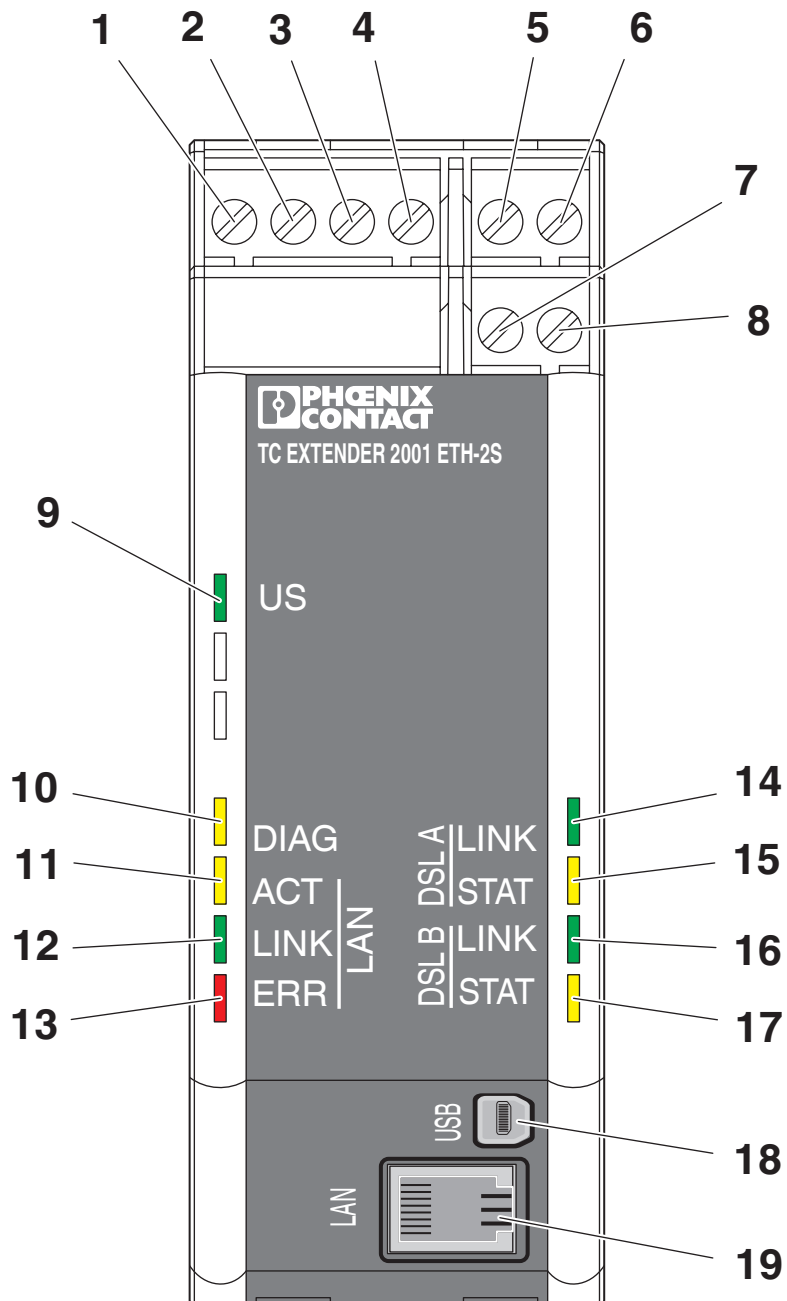
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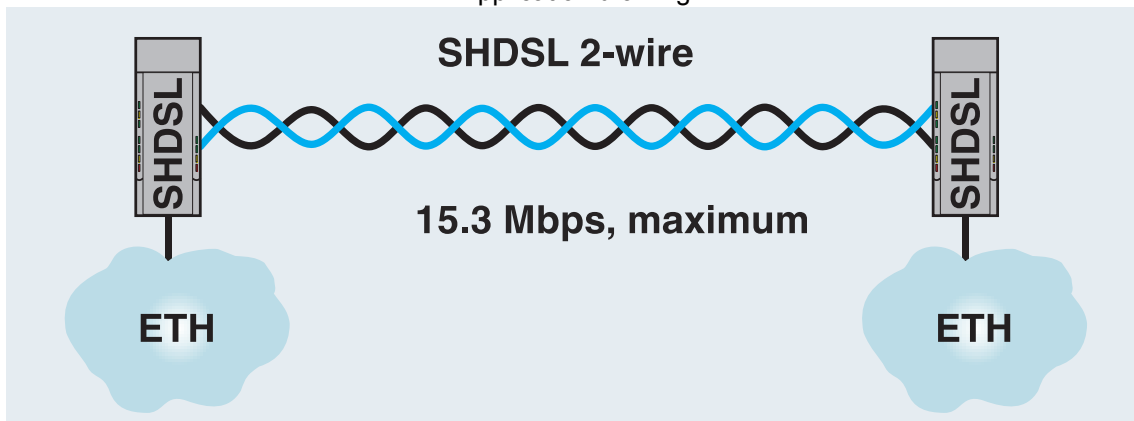
Drawings

Schematic diagram



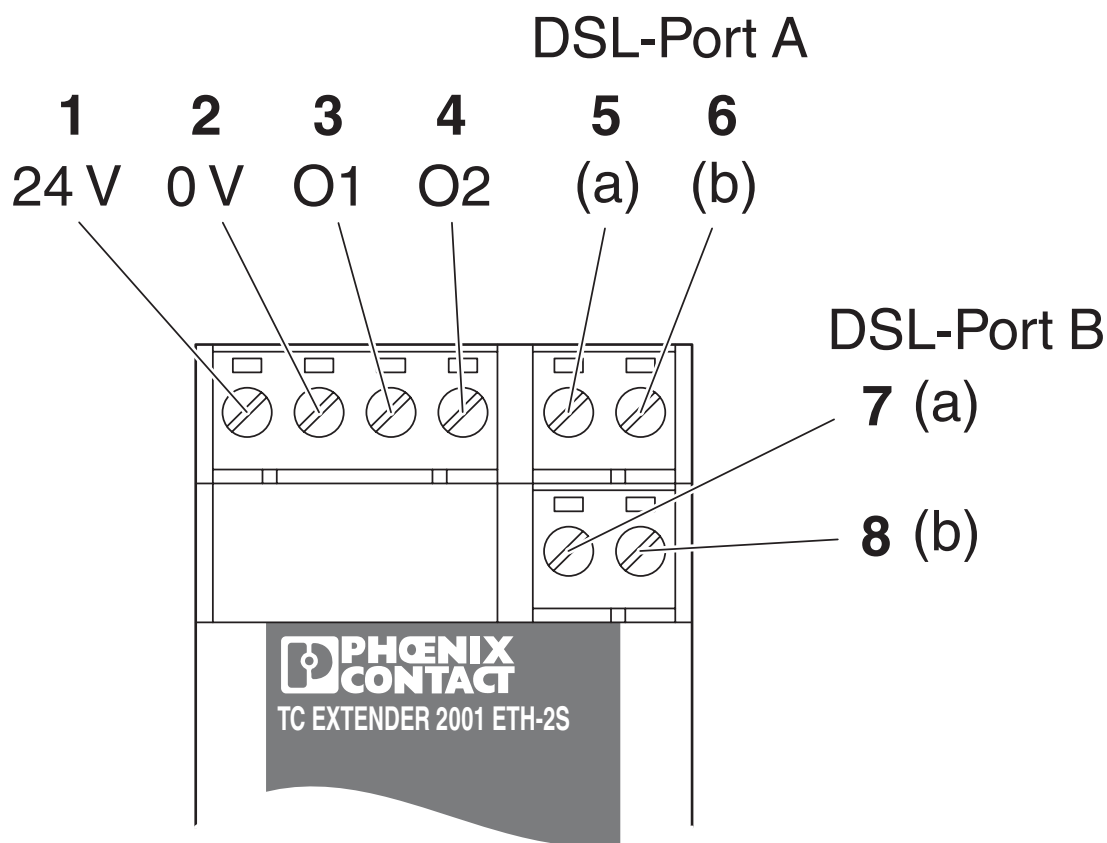
Front view

Application drawing



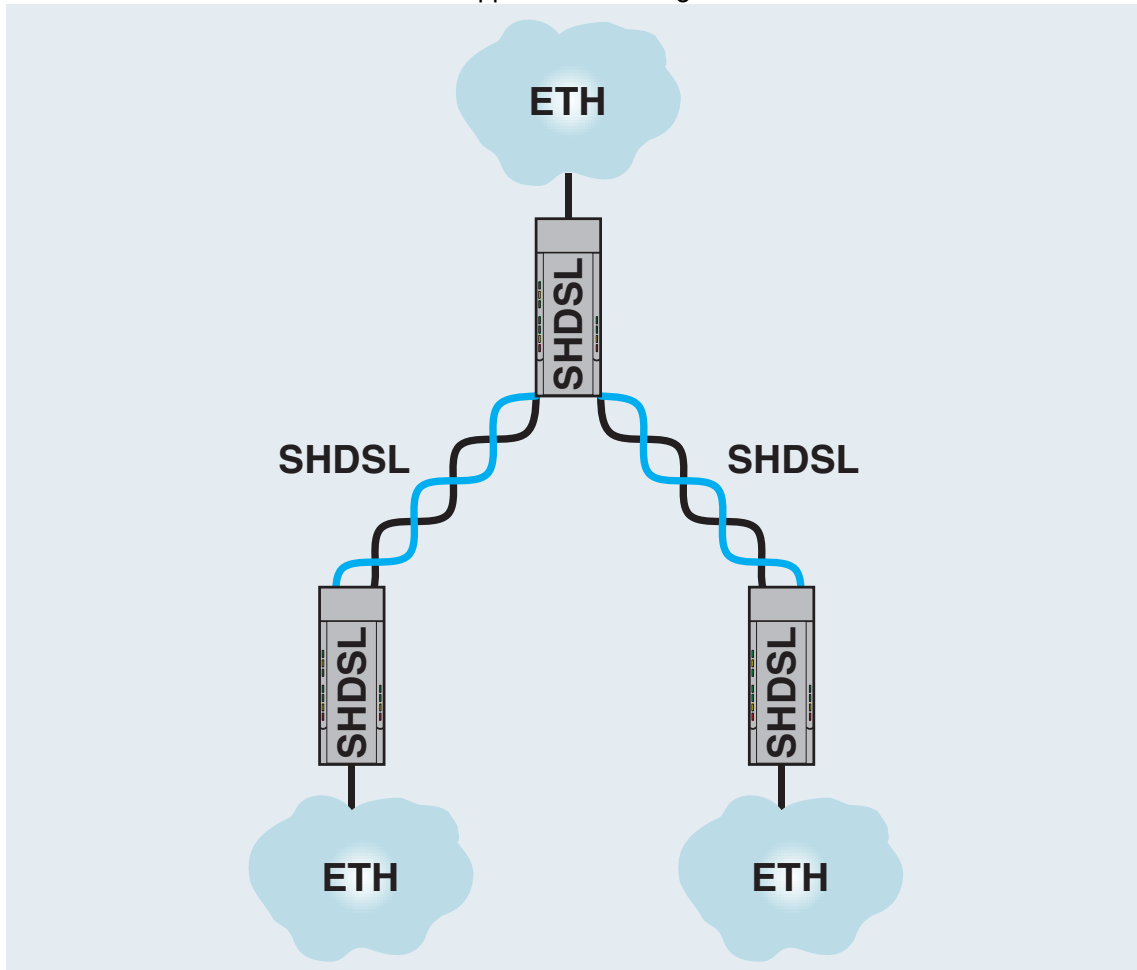
Point-to-point connection (2-wire)

Schematic diagram



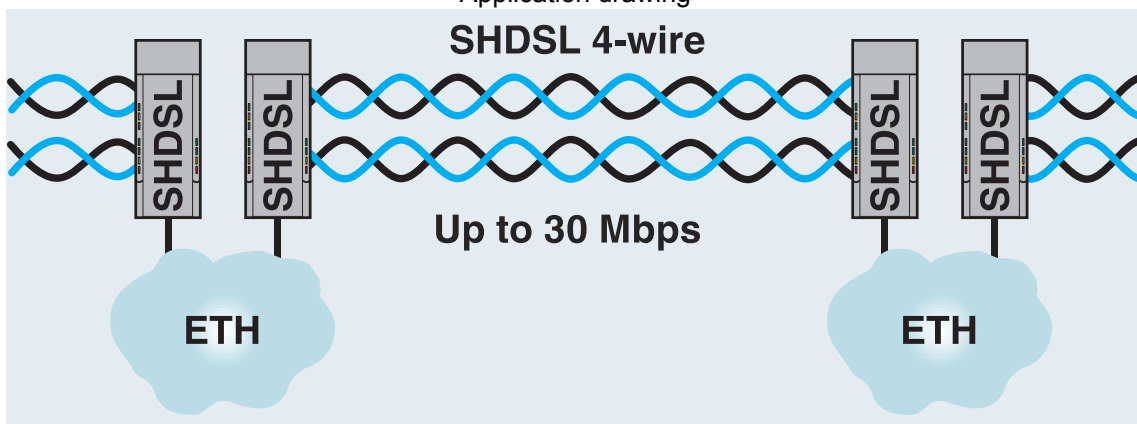
Device connections

Application drawing



Star structure

Application drawing

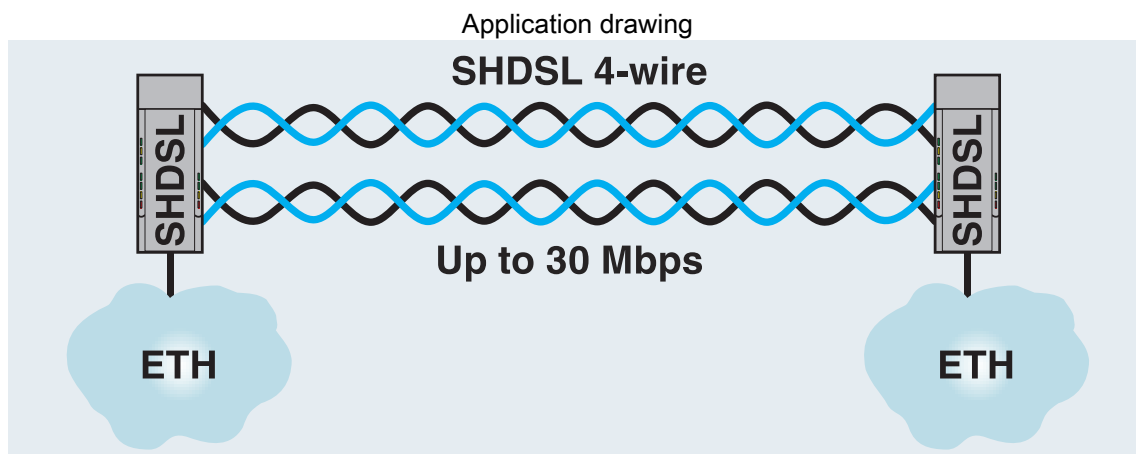


Linear structure (4-wire)

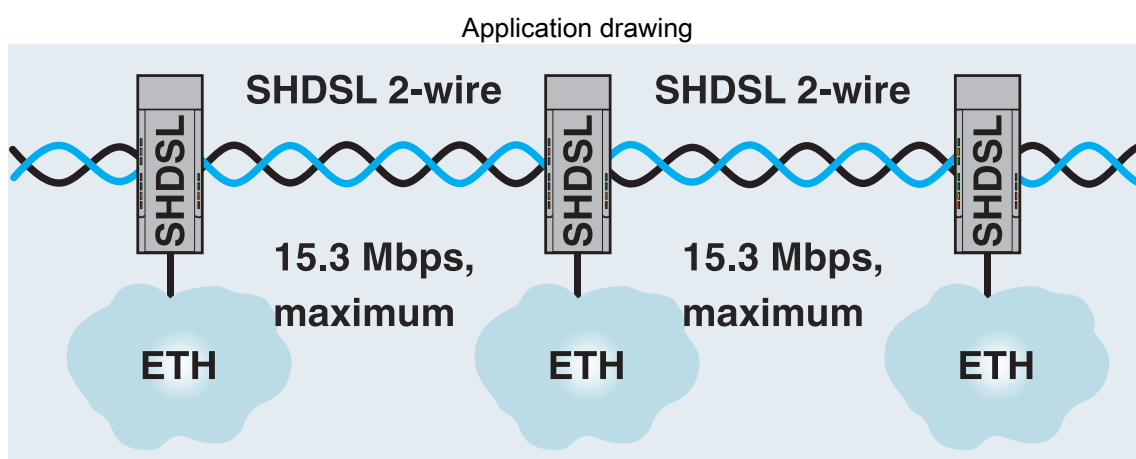
<https://www.phoenixcontact.com/us/products/2702409>

Diagram illustrating the connection of TC extenders:

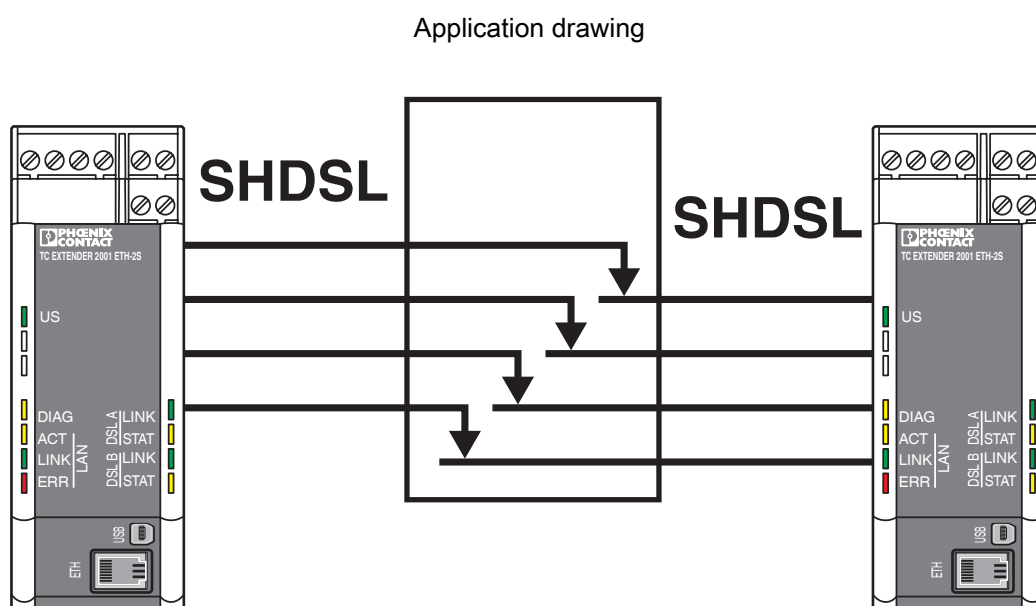
- Top Configuration:** Four TC extenders are connected in a chain. Each extender is labeled **+24 V**. The distance between the first and last extender is indicated as **≥40 mm**. The temperature range is **-20 °C ... +60 °C**.
- Middle Configuration:** Multiple TC extenders are connected to a common **+24 V** bus. The temperature range is **-20 °C ... +50 °C**.
- Bottom Configuration:** Multiple TC extenders are connected to a common **+24 V** bus. The temperature range is **-20 °C ... +45 °C**. The maximum number of extenders is **≤ 10x TC EXTENDER**.



Point-to-point connection (4-wire)



Linear structure (2-wire)



Slip ring communication

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The diagram illustrates a 1FO SHDSL connection between two Phoenix Contact modules. At the top, two identical modules are shown, each with a '1FO' label and a 'SHDSL' label. These modules are connected to a central '1FO' label. Below them, two more identical modules are shown, each with a 'SHDSL' label. These modules are connected to a central 'SHDSL' label. The connection is made using a red cable for the 1FO line and a green cable for the SHDSL line. The modules are labeled 'Phoenix Contact' and 'SHDSL'.

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Approvals

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UAE-RoHS

Approval ID: 23-02-63194



cULus Listed

Approval ID: E238705

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Classifications

ECLASS

ECLASS-11.0	19170407
ECLASS-12.0	19170407
ECLASS-13.0	19170407

ETIM

ETIM 9.0	EC000309
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UNSPSC

UNSPSC 21.0	43223100
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Environmental product compliance

EU RoHS	
Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I
China RoHS	
Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.
EU REACH SVHC	
REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	dba34674-8cbd-46b5-9b49-69846dee180d
EF3.0 Climate Change	
CO2e kg	15.96 kg CO2e

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