Proven fieldbus networks

Modern and future-proof

PHOENIX CONTACT

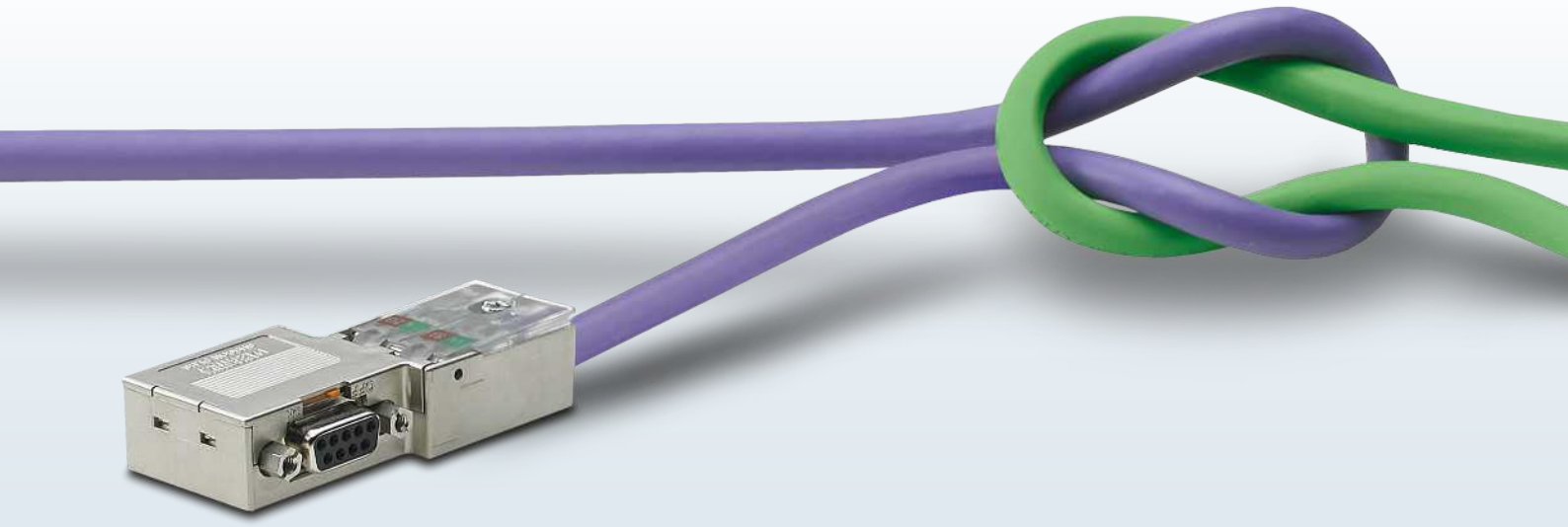
Proven fieldbus networks: Modern and future-proof

With so many applications out there, and the need to satisfy specific industry requirements, fieldbuses are up against some significant challenges. Influencing factors such as electromagnetic interference, potential differences, large distances to cover, increasing numbers of devices, and rising data rates require a high-performance, flexible network.

By choosing interface devices from Phoenix Contact, you will benefit from robust network installations in copper and FO versions. These help form interference-free, powerful fieldbus solutions that provide a secure and reliable way of supplying your application with data.

Copper transmission

Copper cables are easy to handle and offer excellent value for money, making them the ideal choice for most standard applications.



RS-485 **RS-422** **RS-232** PROFIBUS Modbus INTERBUS

A good fieldbus network

Good networks are characterized in particular by their smooth operation. Robust networks reliably supply your automation devices with data for many years. Your plant's central nervous system is important. By giving it the necessary attention early in the configuration stage, you will have fewer issues with your network later on.

Contents

FO transmission

Fiber-optic cables are superior to copper cables in terms of the immunity to interference, electrical isolation, and range they offer. What's more, FO technology has what it takes to cope with growing volumes of data and higher data rates.

CANopen DeviceNet

Find out more with the web code

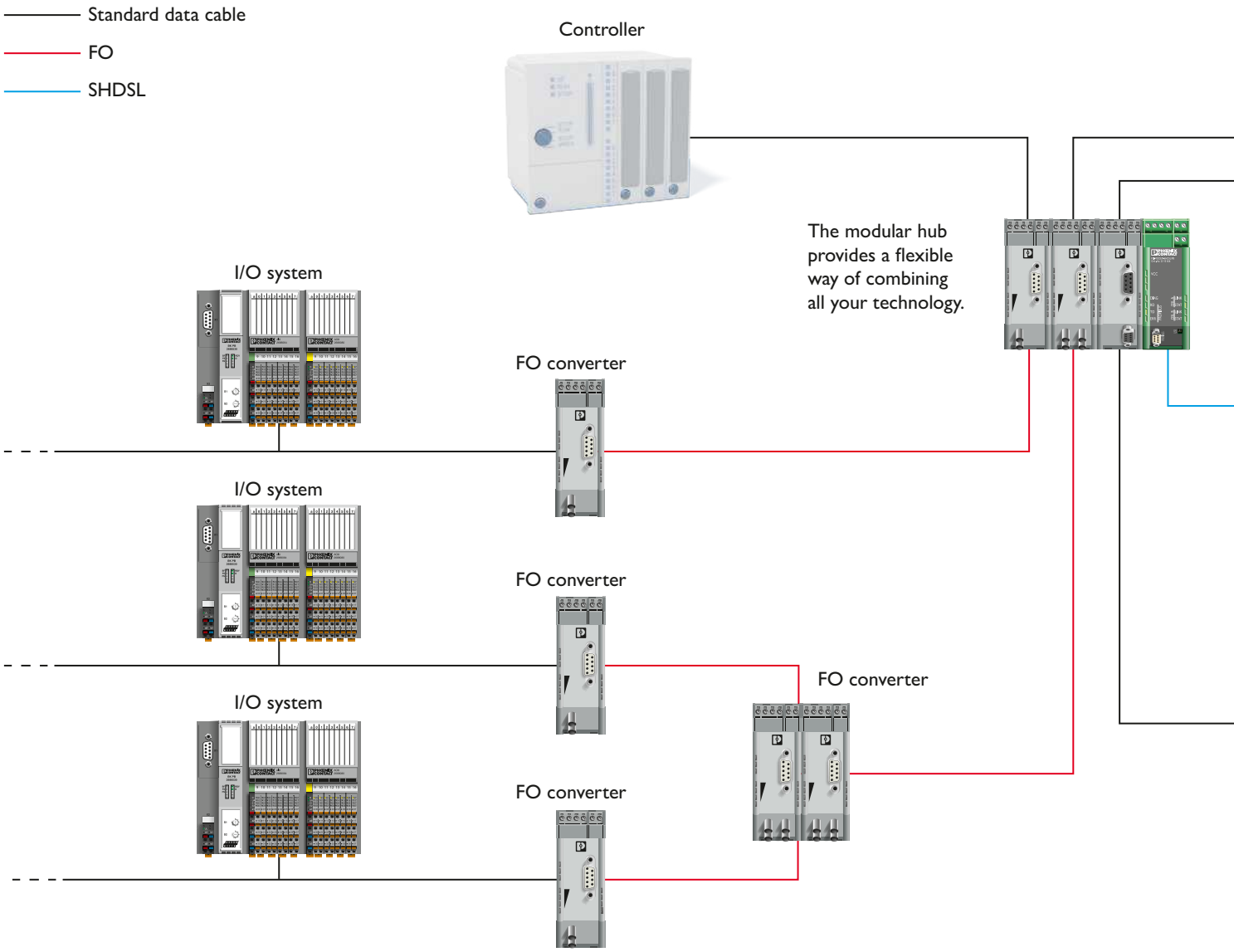
For detailed information, use the web codes provided in this brochure. Simply enter # and the four-digit number in the search field on our website.

Web code: #1234 (example)

Or use the direct link:
phoenixcontact.net/webcode/#1234

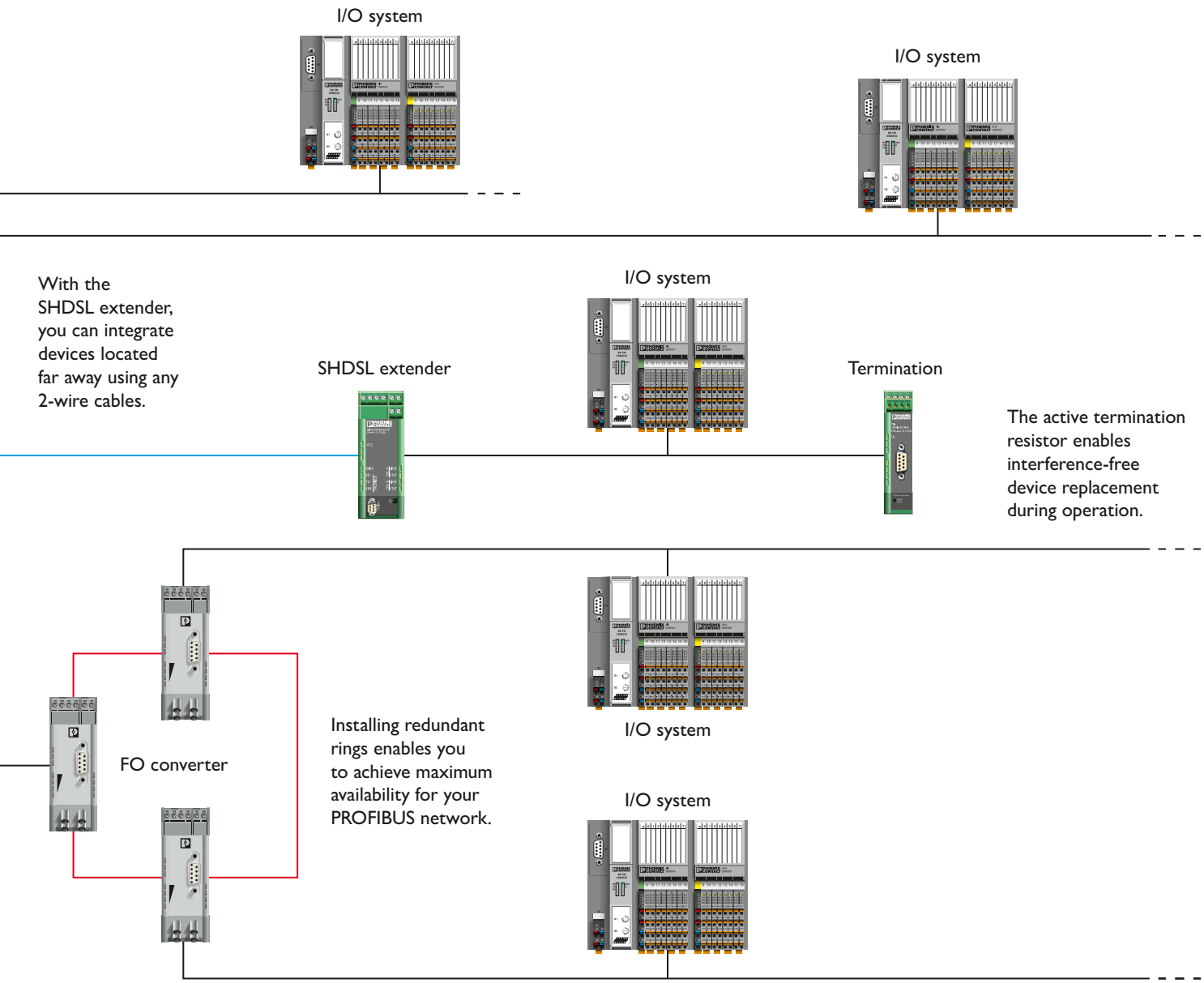
Install a network that meets your needs

With the modular hub, you can create any combination of topologies in a single station. Point-to-point, tree, and star configurations as well as redundant line and ring structures can all be used to generate maximum availability – and meet the needs of your system. If you are working with in-house telephone lines, for example, you can team FO converters with repeaters and SHDSL extenders for 2-wire communication. Thanks to this level of flexibility, the modular hub is able to live up to all your requirements and give you the option of extending your system however you choose, at any time.



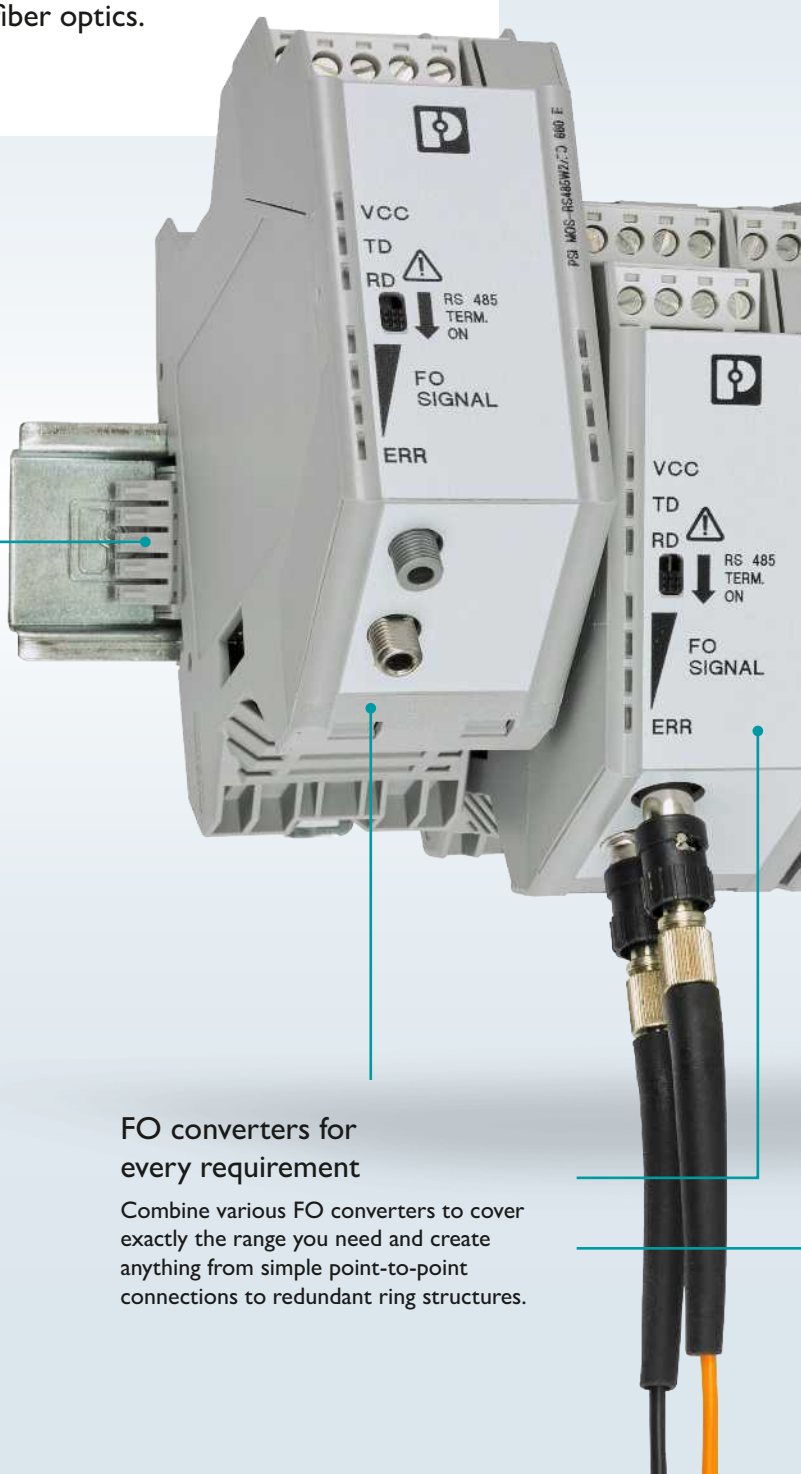
Your advantages

- ☑ Flexible connection of different transmission media in a single system
- ☑ Easy coupling of a range of topologies in the same network
- ☑ Choose from simple or redundant designs for the power supply and data communication
- ☑ Error-free installation and minimum wiring effort required in the modular hub station



The modular hub: Combine copper and fiber optics however you choose

The modular hub enables you to install automation networks according to your specific needs, with hardly any wiring effort required. It's all made possible by the intelligent DIN rail connector – simply snap the devices onto the DIN rail. This minimizes the potential for error and saves valuable time during installation. FO converters can be combined with copper repeaters as desired. From simple point-to-point connections right through to redundant ring structures, any topology is possible – and you can even combine copper and fiber optics.



Error-free installation

The DIN rail connector instantly provides data and the supply voltage to every device belonging to the station.

FO converters for every requirement

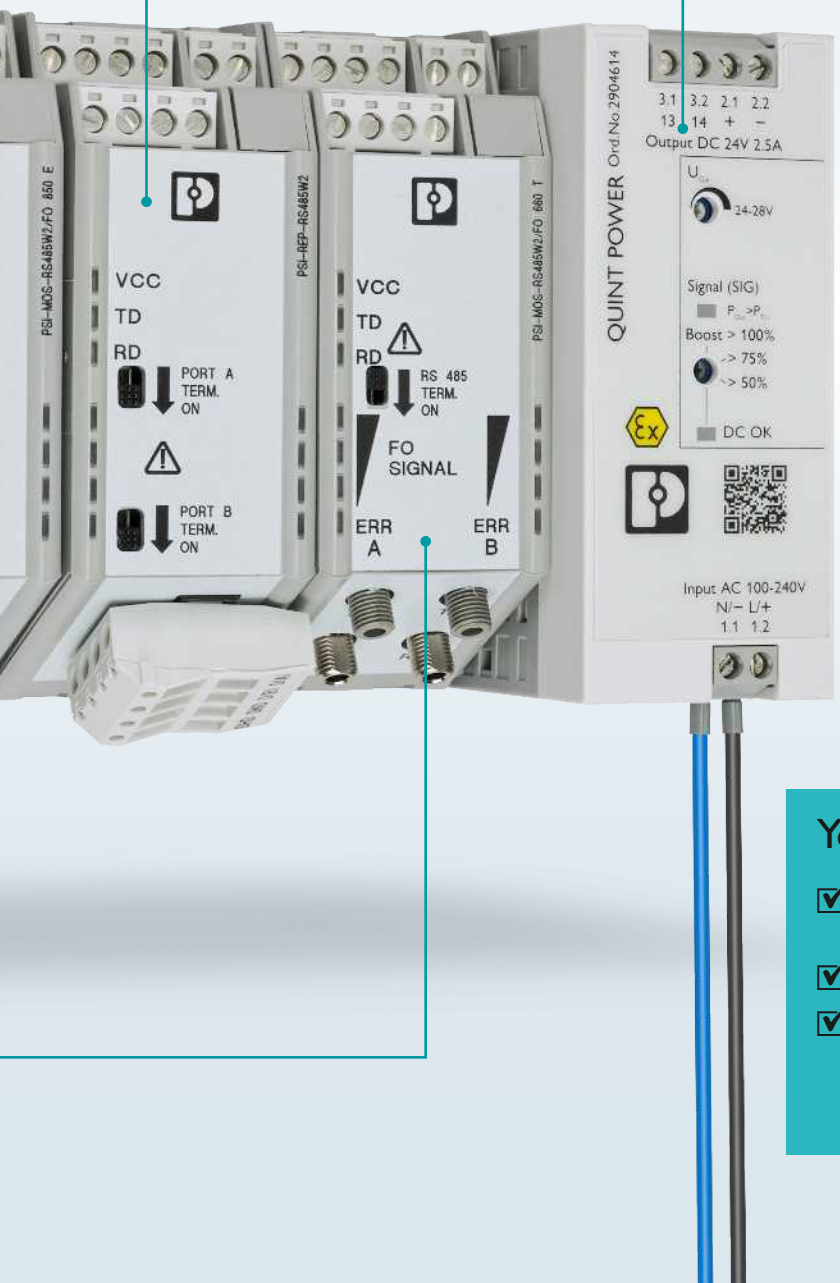
Combine various FO converters to cover exactly the range you need and create anything from simple point-to-point connections to redundant ring structures.

Repeaters for intelligent segmentation

The copper repeaters ensure that the maximum number of devices can be incorporated and help increase the data rate by means of intelligent segmentation.

Power supply

Supply all devices of the modular hub via the DIN rail connector – without the need for elaborate wiring.



Your advantages

- ☑ Electrical isolation between all ports for VCC/TBUS/PROFIBUS (A)/PROFIBUS (B)
- ☑ Extended temperature range: -20°C to +60°C
- ☑ Approvals: UL HazLoc, ATEX, DNV, operation at altitudes of up to 5,000 m, railway applications in accordance with EN 50121-4

FO transmission: Interference-free and powerful

High availability in challenging industrial applications – this is where FO converters are in their element.

The modular FO transmission system provides you with a consistent solution for all serial communication interfaces and bus systems.
This provides an elegant way of overcoming the restrictions of copper-based communication technology in terms of transmission range, the number of devices per segment, and – above all – immunity to electromagnetic interference.

Error-free marshalling

The straightforward snap-on concept for the DIN rail connectors enables marshalling of the data signal and the supply voltage between all the devices. Snapping on components instead of wiring them saves time and prevents installation errors.

Diagnostics at a glance

Multiple diagnostic LEDs provide an immediate indication of the device's operating state. This allows you to localize errors more quickly.

Your advantages

- ☑ Extended temperature range: -20°C to +60°C
- ☑ Integrated shield connection to the DIN rail
- ☑ Convenient wiring with plug-in COMBICON terminal blocks
- ☑ Device-specific approvals: cULus Class 1, Zone 2 and Class 1, Div. 2, ATEX, DNV, operation at altitudes of up to 5,000 m as well as railway applications in accordance with EN 50121-4

Warning before failure

The floating switch contact of the PSI-MOS devices is activated when the optical system reserve is reached. This enables early maintenance to be carried out long before the system fails.

High-grade electrical isolation

High-grade electrical isolation between the data ports, the DIN rail bus, and the supply ensures maximum immunity.

Monitoring of the signal quality

The luminous power received is continuously evaluated and visualized using a four-stage bar graph. This enables you to assess the optical quality of the transmission path without the need for measuring devices.

Any bus system, any distance

The devices feature either one or two optical ports and support all leading bus systems. Ranges of up to 45 km can be achieved.

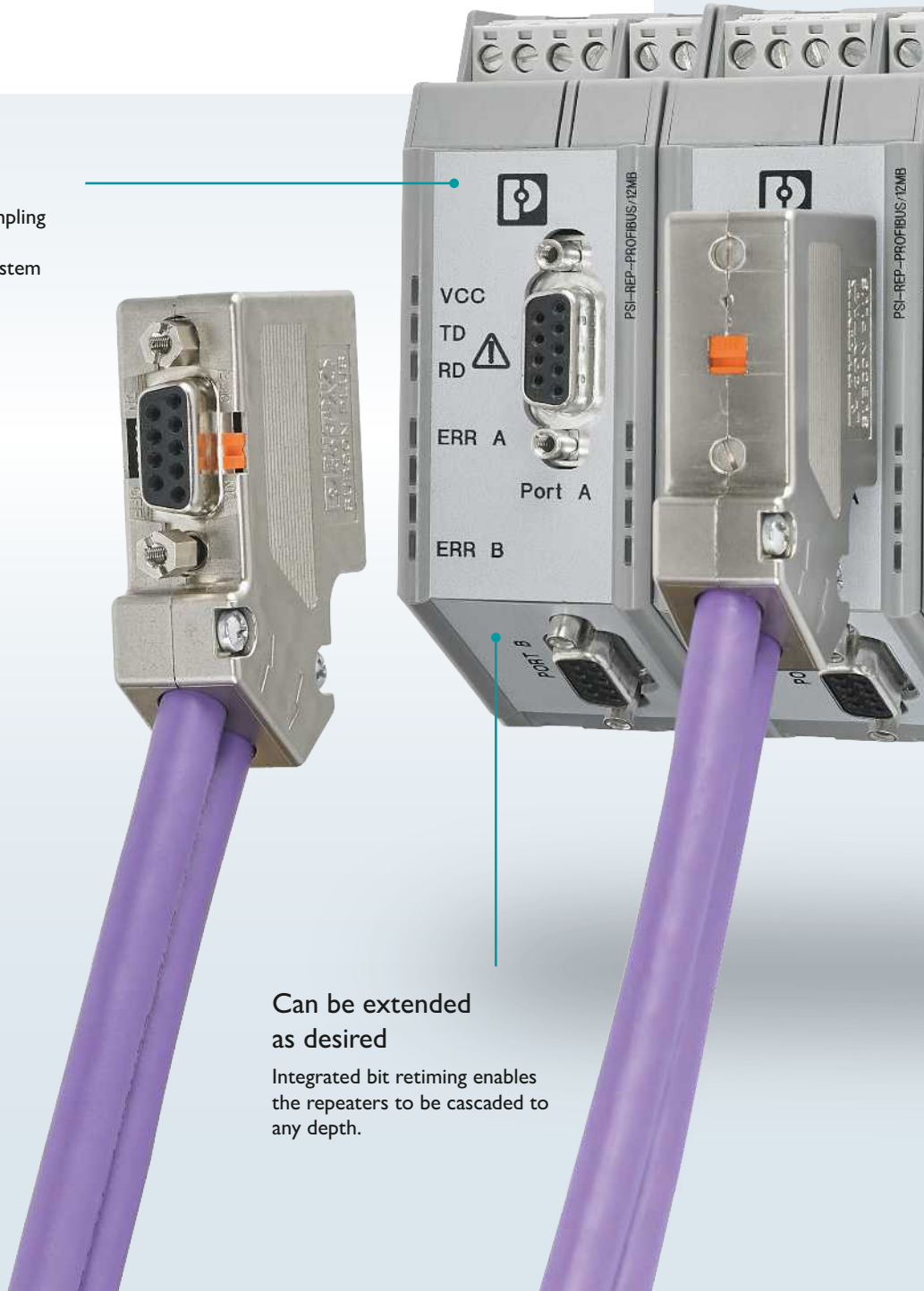
Fieldbus repeaters: Segment and extend networks

Using copper repeaters, you can extend your network over a wide area regardless of the data rate. Even the number of devices can be extended through segmentation with repeaters.

The modular concept supports any combination of copper and FO channels. You can increase the range, transmit without EMI, and extend and distribute channels as required.

Signal conditioning

The integrated bit oversampling ensures interference-free telegrams and increases system availability.

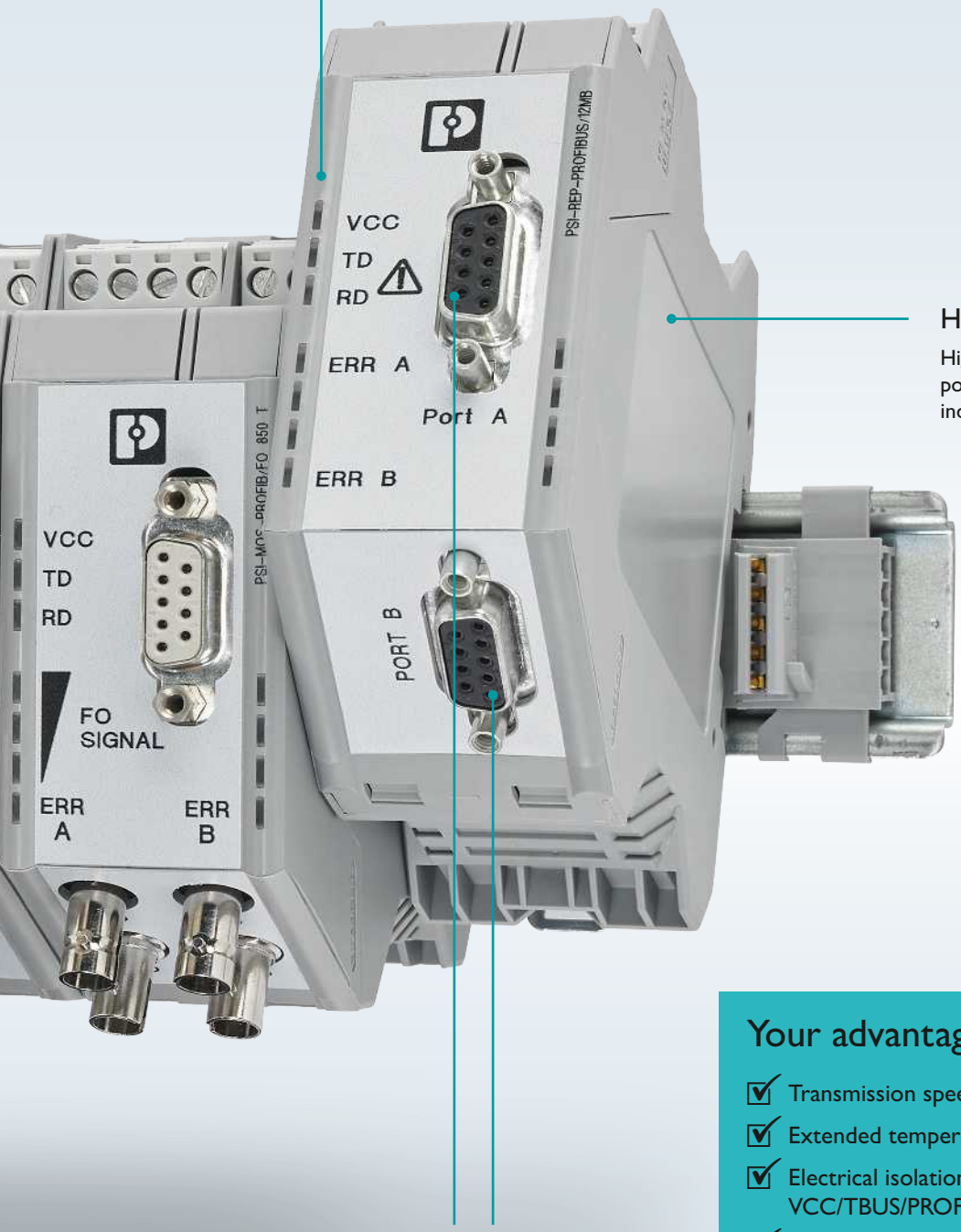


Can be extended as desired

Integrated bit retiming enables the repeaters to be cascaded to any depth.

Error detection

Start delimiter detection detects damaged PROFIBUS telegrams without causing any impact and filters them out of the network.



High-grade electrical isolation

High-grade electrical isolation between all the ports ensures immunity that is suitable for industrial applications.

One repeater – two segments

One repeater opens two independent, electrically isolated segments, enabling greater flexibility with fewer devices.

Your advantages

- ☑ Transmission speed: ≤12 Mbps
- ☑ Extended temperature range: -20°C to +60°C
- ☑ Electrical isolation between all ports for VCC/TBUS/PROFIBUS (A)/PROFIBUS (B)
- ☑ Approvals: ATEX, cULus Listed 508, Class 1, Zone 2 and Class 1, Div. 2
- ☑ Operation at altitudes of up to 5,000 m as well as railway applications in accordance with EN 50121-4

Fieldbus extenders:
Make use of your existing cables

You can use SHDSL extenders to network PROFIBUS devices and serial end devices with RS-232, RS-485, and RS-422 via existing copper cables. Distances of up to 20 km can be covered without the need for special fiberglass cables.

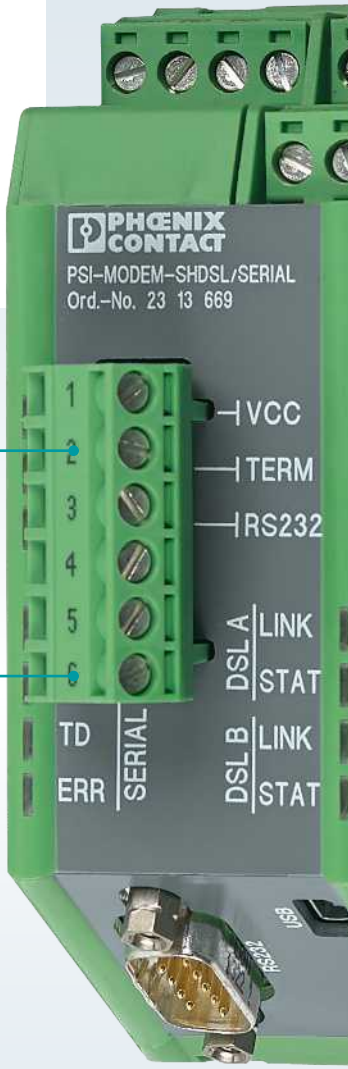
Data rates of up to 2 Mbps can be achieved depending on the system used. With two SHDSL ports on a device, flexible network structures are possible. Create point-to-point, redundant, line, or star structures to suit the requirements of your system.

Protocol transparent

Transmit any protocols and data rates up to 2000 kbps via the RS-232/RS-422 or RS-485 W2 interface.

SHDSL serial extender

For networking serial devices via in-house telephone lines or any other copper cables.



Your advantages

- Any copper cables can be used for distances up to 20 km
- Software tool for quick and easy extender configuration
- Various topologies supported: line, star, and point-to-point
- Extended temperature range: -20°C to +60°C
- Approvals: ATEX, cULus Listed 508, railway applications in accordance with EN 50121-4

Easy cross-wiring

The DIN rail connector enables rapid system extension without the need for elaborate wiring of the data cables or supply voltage.

SHDSL PROFIBUS extender

For PROFIBUS data rates of up to 1.5 Mbps and distances up to 20 km using any copper cables.

Communication path diagnostics

Two freely configurable digital outputs are available for alerting external devices.

Overview of fieldbus components

	Device type	Polymer fiber range	HCS fiber range	Glass MM range
DeviceNet and CANopen				
CANopen / DeviceNet	FO converter 660 nm	100 m	800 m	–
	FO converter 660 nm	100 m	800 m	–
	FO converter 850 nm	–	2,800 m	4,800 m
	FO converter 850 nm	–	2,800 m	4,800 m
	FO converter 850 nm	–	1,800 m	4,600 m
	FO converter 850 nm	–	1,800 m	4,600 m
	Repeater	–	–	–
PROFIBUS				
PROFIBUS	FO converter 660 nm	70 m	400 m	–
	FO converter 660 nm	70 m	400 m	–
	FO converter 850 nm	–	800 m	2,600 m
	FO converter 850 nm	–	800 m	2,600 m
	FO converter 1,300 nm	–	–	25 km
	FO converter 1,300 nm	–	–	25 km
	Repeater	–	–	–
	Terminator	–	–	–
	Extender	–	–	–
RS-232				
RS-232	FO converter 660 nm	100 m	800 m	–
	FO converter 660 nm	100 m	800 m	–
	FO converter 850 nm	–	2,800 m	4,200 m
	FO converter 850 nm	–	2,800 m	4,200 m
	FO converter 1,300 nm	–	–	27 km
	Extender	–	–	–
RS-422				
RS-422	FO converter 660 nm	100 m	800 m	–
	FO converter 660 nm	100 m	800 m	–
	FO converter 850 nm	–	2,800 m	4,200 m
	FO converter 850 nm	–	2,800 m	4,200 m
	FO converter 1,300 nm	–	–	27 km
	Extender	–	–	–
RS-485				
RS-485	FO converter 660 nm	100 m	800 m	–
	FO converter 660 nm	100 m	800 m	–
	FO converter 850 nm	–	2,800 m	4,200 m
	FO converter 850 nm	–	2,800 m	4,200 m
	FO converter 1,300 nm	–	–	25 km
	Repeater	–	–	–
	Terminator	–	–	–
	Extender	–	–	–

	Device type	Description
Additional accessories		
	System power supply	For supply voltage feed-in via the foot element (DIN rail connector)
	DIN rail connector	For bridging the supply voltage
	DIN rail connector	For bridging the supply voltage

Glass SM range	Copper range	FO interfaces	Copper interfaces	Data rate	Order No.
–	1,000 m	1 x FO	1 x copper	800 kbps	2708054
–	1,000 m	1 x FO	1 x copper	800 kbps	2708067
–	1,000 m	1 x FO	1 x copper	800 kbps	2708083
–	1,000 m	1 x FO	1 x copper	800 kbps	2708096
–	1,000 m	1 x FO	1 x copper	1,000 kbps	2313999
–	1,000 m	2 x FO	1 x copper	1,000 kbps	2313986
–	1,000 m	–	2 x copper	1,000 kbps	2313423
–	1,200 m	1 x FO	1 x copper	Up to 12 Mbps	2708290
–	1,200 m	2 x FO	1 x copper	Up to 12 Mbps	2708287
–	1,200 m	1 x FO	1 x copper	Up to 12 Mbps	2708274
–	1,200 m	2 x FO	1 x copper	Up to 12 Mbps	2708261
45 km	1,200 m	1 x FO	1 x copper	Up to 12 Mbps	2708559
45 km	1,200 m	2 x FO	1 x copper	Up to 12 Mbps	2708892
–	1,200 m	–	2 x copper	Up to 12 Mbps	2708863
–	–	–	2 x copper	–	2702636
–	20 km	–	2 x copper	Up to 1.5 Mbps	2313656
–	15 m	1 x FO	1 x copper	115.2 kbps	2708368
–	15 m	2 x FO	1 x copper	115.2 kbps	2708410
–	15 m	1 x FO	1 x copper	115.2 kbps	2708371
–	15 m	2 x FO	1 x copper	115.2 kbps	2708423
45 km	15 m	1 x FO	1 x copper	115.2 kbps	2708588
–	20 km	–	2 x copper	230.4 kbps	2313669
–	1,000 m	1 x FO	1 x copper	2 Mbps	2708342
–	1,000 m	2 x FO	1 x copper	2 Mbps	2708384
–	1,000 m	1 x FO	1 x copper	2 Mbps	2708355
–	1,000 m	2 x FO	1 x copper	2 Mbps	2708397
45 km	1,000 m	1 x FO	1 x copper	2 Mbps	2708575
–	20 km	–	2 x copper	Up to 2,000 kbps	2313669
–	1,200 m	1 x FO	1 x copper	500 kbps	2708313
–	1,200 m	2 x FO	1 x copper	500 kbps	2708300
–	1,200 m	1 x FO	1 x copper	500 kbps	2708339
–	1,200 m	2 x FO	1 x copper	500 kbps	2708326
45 km	1,200 m	1 x FO	1 x copper	500 kbps	2708562
–	1,200 m	–	2 x copper	500 kbps	2313096
–	–	–	2 x copper	–	2702636
–	20 km	–	2 x copper	Up to 2,000 kbps	2313669

	Output voltage	Output current	Order No.
In Ex areas	24 V DC	2.5 A	2904614
	–	–	2201756
	–	–	2713645

Converters and isolators for RS-232/ RS-485 interfaces

The reliable PSM-ME devices have been developed specifically for harsh industrial environments. High-grade 3-way isolation of 2 kV between the data interfaces and the supply, plus integrated surge protection with transients discharged to the DIN rail, ensure reliable, protected communication.

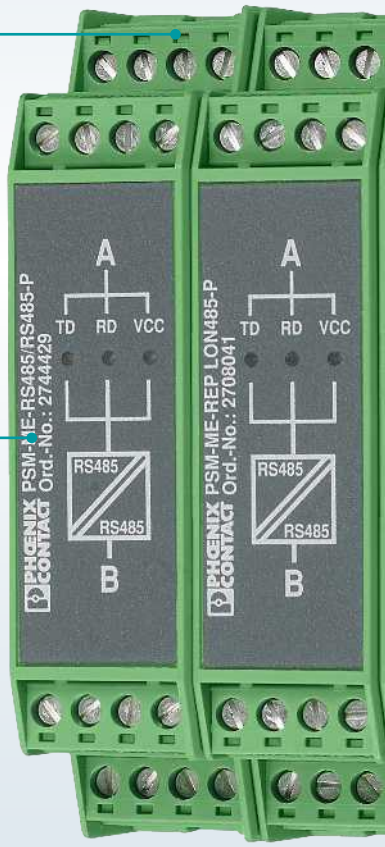
A comprehensive package of approvals and the extended temperature range emphasize the level of quality that these products provide and allow them to be used in a wide range of industries.

Integrated power supply unit

The devices, which are designed for use in control cabinets, can be supplied directly with 24 V AC/DC. This eliminates the need to use and install external plug-in power supply units, as would usually be required in this device class.

Designed with control cabinets in mind

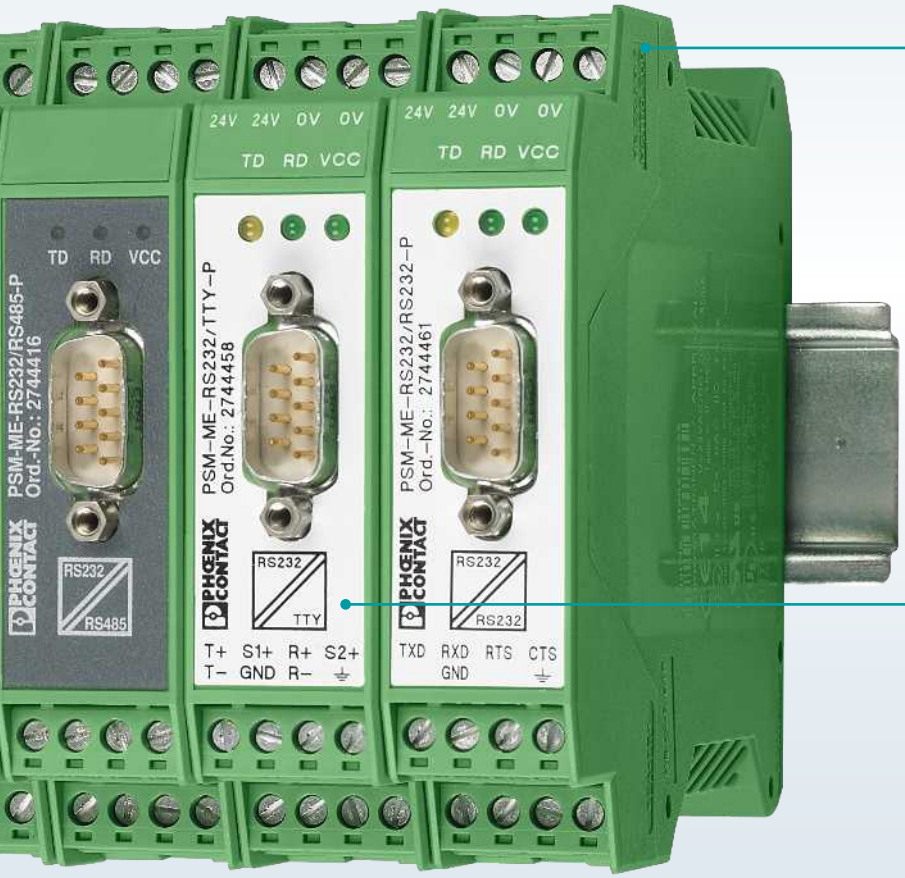
Narrow width of just 22.5 mm, can be mounted on DIN rails with direct shield connection to the DIN rail.



Your advantages

- Extended temperature range: -40°C to +70°C
- Convenient connection with plug-in COMBICON screw terminal blocks
- Device-specific approvals: DNV, UL HazLoc, ATEX, operation at altitudes of up to 5,000 m, railway applications in accordance with EN 50121-4

Interface converters and isolators					
Device type	**First interface**	**Second interface**	**Range (max.)**	**Data rate (max.)**	**Order No.**
RS-232 isolator	RS-232	RS-232	15 m	115.2 kbps	2744461
RS-232 to TTY converter	RS-232	TTY	1,000 m	19.2 kbps	2744458
RS-232 to RS-485/RS-422 converter	RS-232	RS-485/RS-422	1,200 m	115.2 kbps	2744416
RS-485 repeater	RS-485	RS-485	1,200 m	1,500 kbps	2744429
LON repeater	RS-485	RS-485	1,200 m	2,000 kbps	2708041



Interference-free and robust

High-grade 2 kV electrical isolation between the supply and the data interfaces.

Improve performance

Thanks to integrated signal amplification, you can significantly improve the transmission speed and range of your network.

D-SUB fast connectors: Convenient connection in the field

With the SUBCON fast connectors, D-SUB assembly under field conditions is exceptionally easy and convenient. No special soldering or crimping tools are required – the connection is established via screw, spring-cage, or IDC terminal blocks. The pre-assembled M12 fast connectors now also allow tool-free installation.

Versions with different cable entry angles and various numbers of positions round off the product range.

The classic, flexible choice

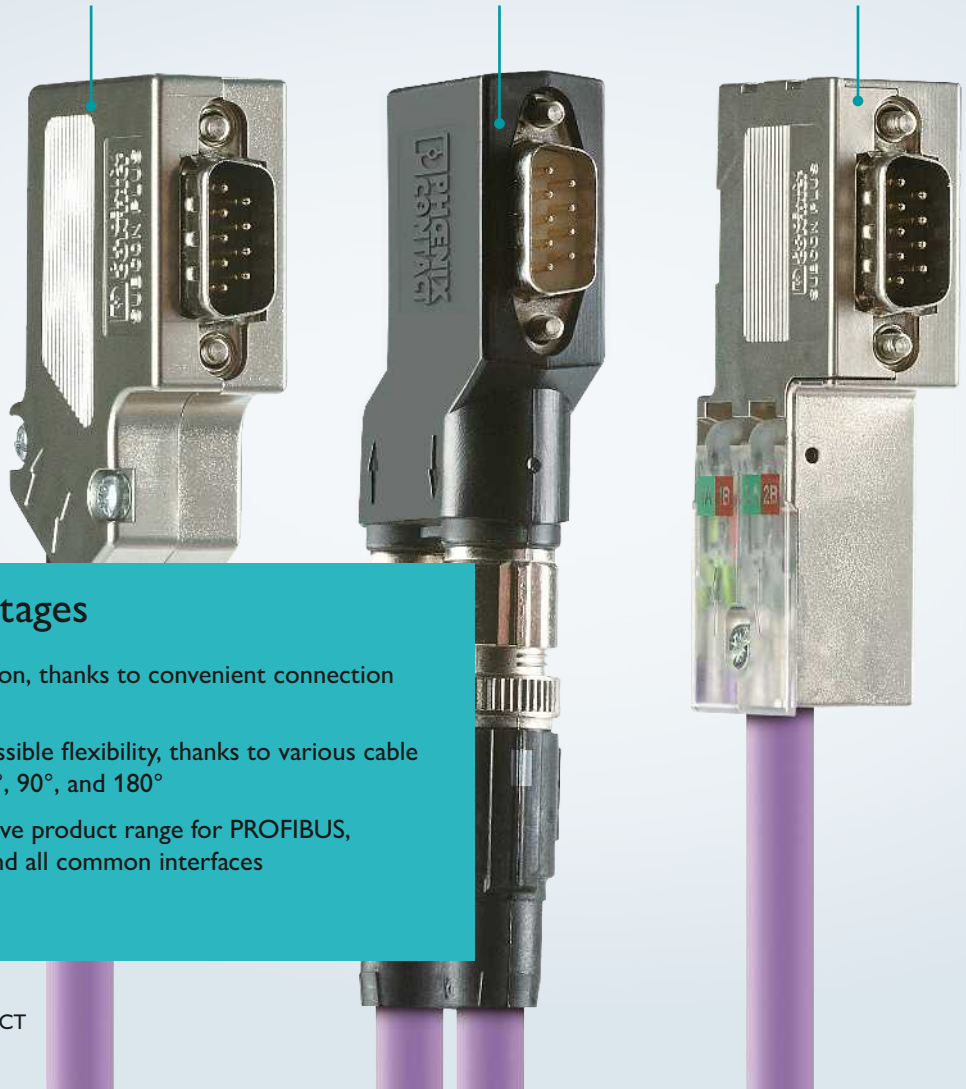
Screw or spring-cage connection, for bus systems or as a universal version.

Reliable Plug and Play connectors

M12 connection technology for PROFIBUS und CANopen – preventing installation errors.

Specifically for PROFIBUS

It only takes a minute: convenient cable connection via screw or IDC technology.



Your advantages

- ☑ Easy installation, thanks to convenient connection technology
- ☑ Maximum possible flexibility, thanks to various cable outlets of 35°, 90°, and 180°
- ☑ Comprehensive product range for PROFIBUS, CANopen, and all common interfaces

Product overview

For PROFIBUS				
	Connection technology	**Cable inlet**	**Pg interface**	**Order No.**
	M12	90°	2902317	2902318
		90° long, S7-compatible	2902728	2902729
		35°	2902319	2902320
		180° (axial)	–	2902321
	IDC displacement connection	90°	2313685	2313672
	Screw connection terminal blocks	90°	2313708	2313698
		35°	2708245	2708232
		180° (axial)	–	2744380
	Spring-cage connection terminal blocks	35°	2744403	2744348
		180° (axial)	–	2744377
For CANopen				
	M12	90°	2902322	2902323
		90° long	2902730	2902731
		35°	2902324	2902325
		180° (axial)	–	2902326
	Screw connection terminal blocks	35°, cable diameter 6 … 10 mm	–	2744694
		35°, cable diameter 7.6 … 8.4 mm	2708119	2708999
		180° (axial)	–	2306566

Universal connectors with screw connection terminal blocks and 35° cable outlet				
	Housing	**Pin assignment**	**D-SUB no. of pos.**	**Order No.**
	With one cable entry	All contacts (pin/socket) to terminal block	9-pos. pin	2761509
			15-pos. pin	2761606
			15-pos. pin HD	5604602
			25-pos. pin	2761622
			9-pos. socket	2761499
			15-pos. socket	2761596
			15-pos. socket HD	5604603
			25-pos. socket	2761619
	With two cable entries	Full assignment to one terminal block	9-pos. pin	2744018
		1, 2, 3, 5, 6, 8 to two terminal blocks		2761826
		2, 3, 4, 5, 7, 9 to two terminal blocks		2761839
		Full assignment to one terminal block	9-pos. socket	2744241
		1, 2, 3, 5, 6, 8 to two terminal blocks		2744267
		2, 3, 4, 5, 7, 9 to two terminal blocks		2799490
		2, 3, 6, 7, 8, 9 to two terminal blocks		2761871
		2, 3, 4, 5, 6, 7 to two terminal blocks		2744089
Universal connectors with screw connection terminal blocks and 180° (axial) cable outlet				
	180° (axial)	Full assignment to one terminal block	9-pos. pin	2904467
	180° (axial)		9-pos. socket	2311797

FO and copper installation technology

In a world that is presenting us with growing volumes of data, increasing electromagnetic interference, and longer distances to cover, FO technology is becoming increasingly important. Our installation technology provides you with all the cables, connectors, and tools you need to create FO and copper fieldbus networks that are suitable for industrial applications.

The product range includes individual cables available by the meter, cables pre-assembled with connectors, and various panel feed-throughs. Depending on the application, products are available for the control cabinet as well as for direct field installation.

Tools

We offer practical cases containing the tools you need to install copper and fiber optics – and, of course, for polymer, HCS, and fiberglass cables.

Your advantages

- ☑ Consistent installation system for devices in the control cabinet and for field devices with a high degree of protection
- ☑ Easy assembly of HCS cables in the field without the need for grinding and polishing
- ☑ Strip bus lines cleanly and in stages, using just one tool
- ☑ Pre-assembled, tested cables for smooth, error-free installation

Copper installation technology

Phoenix Contact offers a comprehensive range of products for quick and reliable copper cabling. This includes individual cables available by the meter, cables pre-assembled with connectors, and various panel feed-throughs.

The robust products, which are suitable for industrial applications, support the quick and safe installation of your bus system. Furthermore, the pre-assembled and tested cables ensure smooth installation without errors.

Cables by the meter

Include the cables you need in your order. We can supply polymer, HCS, and fiberglass cables in the length required.

FO connectors

Our installation-friendly connectors can be assembled quickly and easily.
We offer various connector formats in IP20 and IP67.

FO and copper accessories

FO accessories			
Tools	**Description**	**Features**	**Order No.**
	Polymer fiber assembly kit	For F-SMA and SC-RJ quick mounting connectors	2744131
	Polymer fiber polishing set	For F-SMA quick mounting connectors	2799348
	HCS assembly kit	For F-SMA quick mounting connectors	2799526
	HCS assembly kit	For B-FOC(ST) quick mounting connectors	2708465
	HCS assembly kit	For SC-RJ/SC duplex quick mounting connectors	2708876
	Fiber cleaving tool	For HCS fibers and F-SMA quick mounting connectors	2744995
	Fiber cleaving tool	For HCS fibers and B-FOC(ST) quick mounting connectors	2708478
	Fiber cleaving tool	For HCS fibers and SC-RJ/SC duplex quick mounting connectors	2313122
	Optical fiber stripping tool	For removing the primary coating	2744885
	Microscope	For visual checks following connector assembly	2744898
	Aramid scissors	For shortening aramid yarn	2744872
Measuring devices			
	FO measuring case	Optical power measuring device	2799539
	Supplementary set	For additional fiber and connector types	2901560
Cables (by the meter)			
	Polymer fiber cable	Duplex 980/1000 µm, medium-weight type for indoor installation	2744319
	Polymer fiber cable	Duplex 980/1000 µm, heavy-duty type for indoor installation	2744322
	Polymer fiber cable	Duplex 980/1000 µm, for drag chain applications	2744335
	HCS cable	Duplex 200/230 µm, for indoor installation	2799885
	HCS cable	Duplex 200/230 µm, for outdoor installation	2799445
	Fiberglass cable	Duplex 50/125 µm, for indoor installation	2799322
	Fiberglass cable	Duplex 50/125 µm, for outdoor installation	2799432
Assembled cables			
	Various FO cables produced according to customer requirements	Polymer, HCS, or fiberglass, FO connectors in IP20 or IP67	**Web code:** #0524
Patch cables			
	Pre-assembled patch cables	Multimode or singlemode fiberglass	**Web code:** #0333
IP20 connectors			
	F-SMA set	For polymer fibers, for self-assembly	2799720
	SC-RJ set	For polymer fibers, for self-assembly	2708656
	F-SMA set	For HCS fibers, for self-assembly	2799487
	SC-RJ set	For HCS fibers, for self-assembly	2313070
	B-FOC(ST) set	For HCS fibers, for self-assembly	2708481

FO accessories

Couplings	Description	Features	Order No.
	LC/LC coupling	For multimode fiberglass	1207355
	LC/LC coupling	For singlemode fiberglass	1208073
	SC-RJ/SC-RJ socket insert	For polymer fibers, HCS fibers, or fiberglass	1652978
	F-SMA/F-SMA coupling	For connecting F-SMA connectors	2799416
	B-FOC(ST)/B-FOC(ST) coupling	For connecting B-FOC connectors	1208099
	SC duplex multimode coupling	For polymer fibers, HCS fibers, or fiberglass	1208081
	SC duplex singlemode coupling	For fiberglass	1208086

Copper accessories

Tools	Description	Features	Order No.
	Stripping pliers	For PVC-insulated cables	1204384
	Quick stripping tool	For PROFIBUS cable type Fast Connect	2744623
	Replacement knife block	For quick stripping tool	2744636
	Screwdriver	Bladed, size: 0.4 x 2.5 x 75 mm	1204504
Cables			
	PROFIBUS cable	Fast Connect type	2744652
	PROFIBUS cable	Drag chain type	1511491
	M12 bus system cables	With M12 SPEEDCON connector for PROFIBUS/PROFIBUS PA	**Web code:** #0525
Connectors			
	D-SUB connector set	PROFIBUS, male, screw connection, IP67 degree of protection	1654549
	D-SUB connector set	PROFIBUS, male, spring-cage connection, IP67 degree of protection	1654345
	Bus system connector	Female, straight, 2-pos., M12 shielded	1424680
	Bus system connector	Male, straight, 2-pos., M12 shielded	1424678
	Bus system flush-type female connector	PROFIBUS, 2-pos., M12	1534397
	Bus system flush-type male connector	PROFIBUS, 2-pos., M12	1534355
Distributors			
	Connection distributor	Passive RS-485 T distributor, 5 ports	2799364
	Connection distributor	Passive RS-485 T distributor, 3 ports	2760623
	T distributor	Bus system T connector, PROFIBUS, M12 male	1424711
Termination resistor			
	Active termination resistor	For PROFIBUS and RS-485 bus systems	2702636
	M12 male connector	PROFIBUS M12 termination resistor	1507803
	M12 male connector	CANopen/DeviceNet termination resistor	1507816

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Phoenix Contact is a global market leader based in Germany. We are known for producing forward-thinking products and solutions for the comprehensive electrification, networking, and automation of all sectors of the economy and infrastructure. With a global network, we maintain close relationships with our customers, something we believe is essential for our common success.

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