

CANopen

ControlNet

Modbus

INTERBUS

DeviceNet

PROFIBUS

Proven fieldbus networks

State of the art and fit for the future

Proven fieldbus networks: State of the art and fit for the future

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 EMC load, 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 fiber-optic versions – creating interference-free, efficient fieldbus solutions that provide a safe and reliable way of supplying your application with data.

Protect interfaces

Increase ranges



Copper transmission

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



DeviceNet™

A good fieldbus network

What makes a network stand out? More than anything, it's the fact that you don't even know it's there. Robust networks have what it takes to provide your automation devices with a reliable supply of data over many years. In fact, you might say that they're the central nervous system of your plant – so it's worth giving them the attention they deserve as early as the configuration stage. And that's ultimately what will keep them running happily in the background later on.

Boost immunity to interference

Adapt interfaces

Electrical isolation



RS-232

RS-422

RS-485



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FO transmission

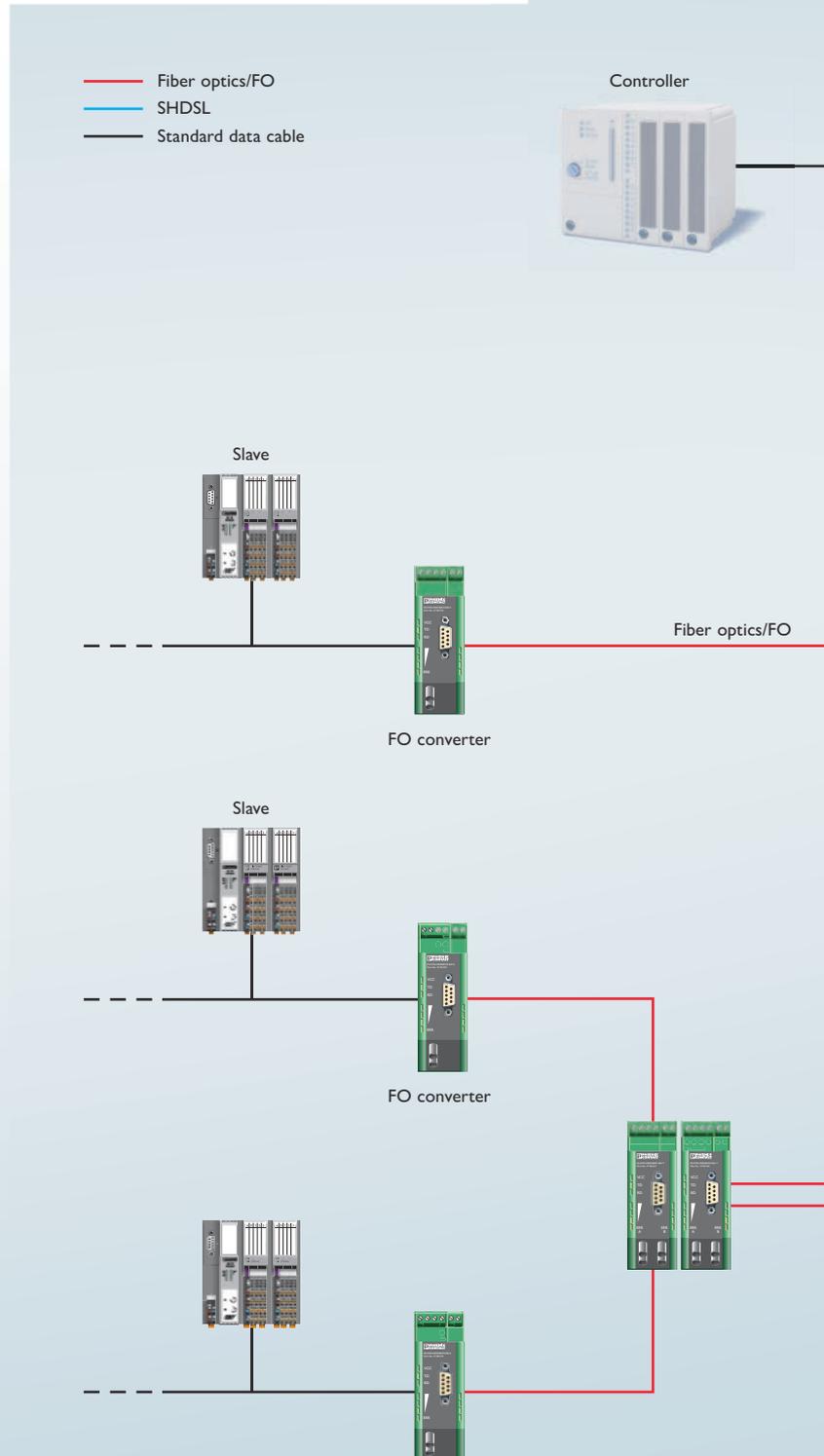
Fiber-optic cables are superior to copper cables in terms of the interference immunity, electrical isolation, and range they offer. What's more, fiber-optic technology has what it takes to cope with rising data quantities and higher data rates.

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 single or redundant designs for the power supply and data communication
- Smooth installation and minimum wiring work required in the modular hub station



1

The modular hub provides a flexible way of combining all your technology.

2

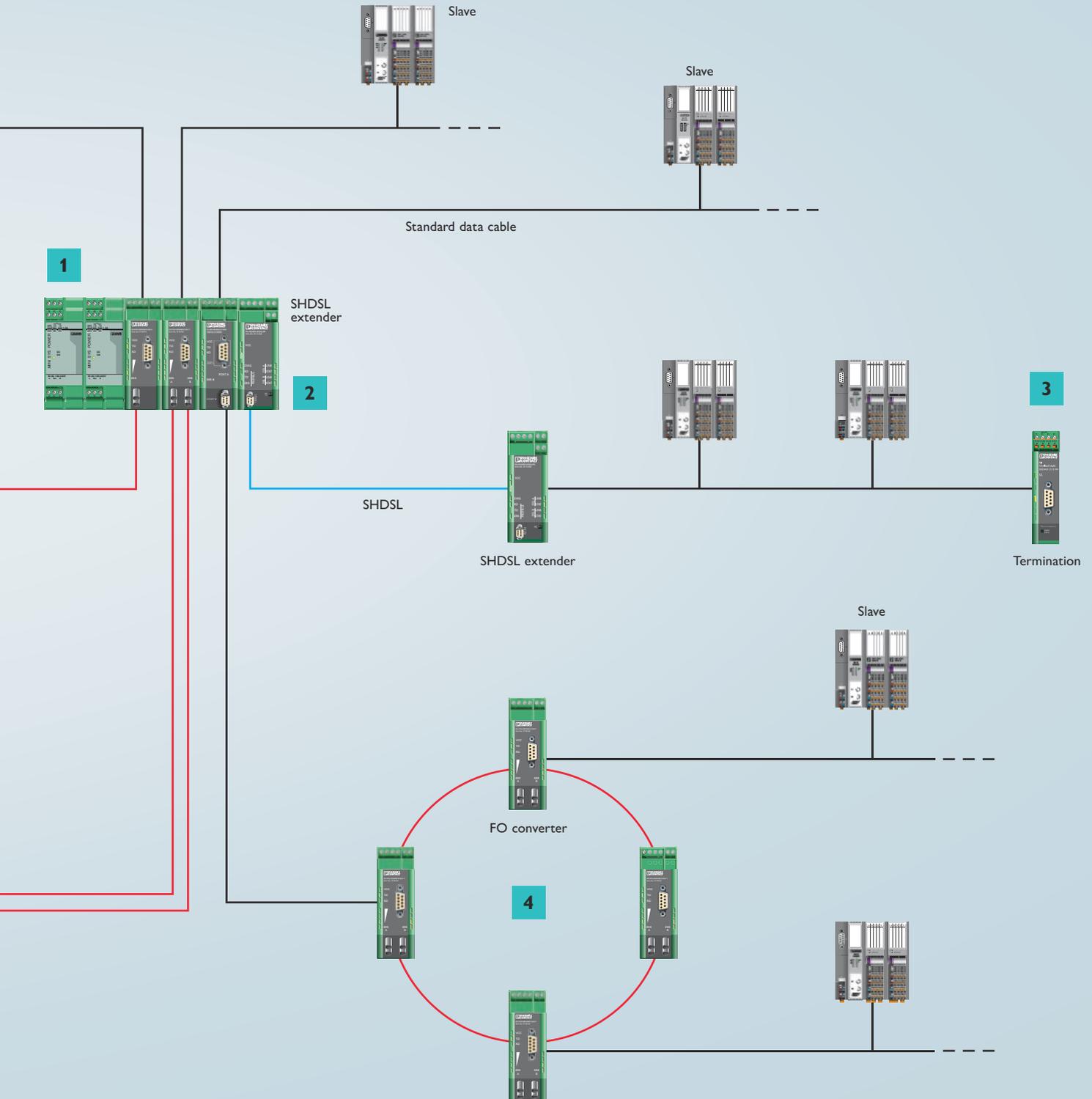
With the SHDSL extender, you can integrate devices located far away using any 2-wire lines.

3

The active termination resistor enables interference-free device replacement during operation.

4

Installing redundant rings enables you to achieve maximum availability for your PROFIBUS network.



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

The modular hub enables you to install automation networks precisely according to your needs, with hardly any wiring work required.

It's all thanks to the intelligent DIN rail connector – simply snap the devices onto the DIN rail and go.

This minimizes the potential for error and saves valuable time during installation.

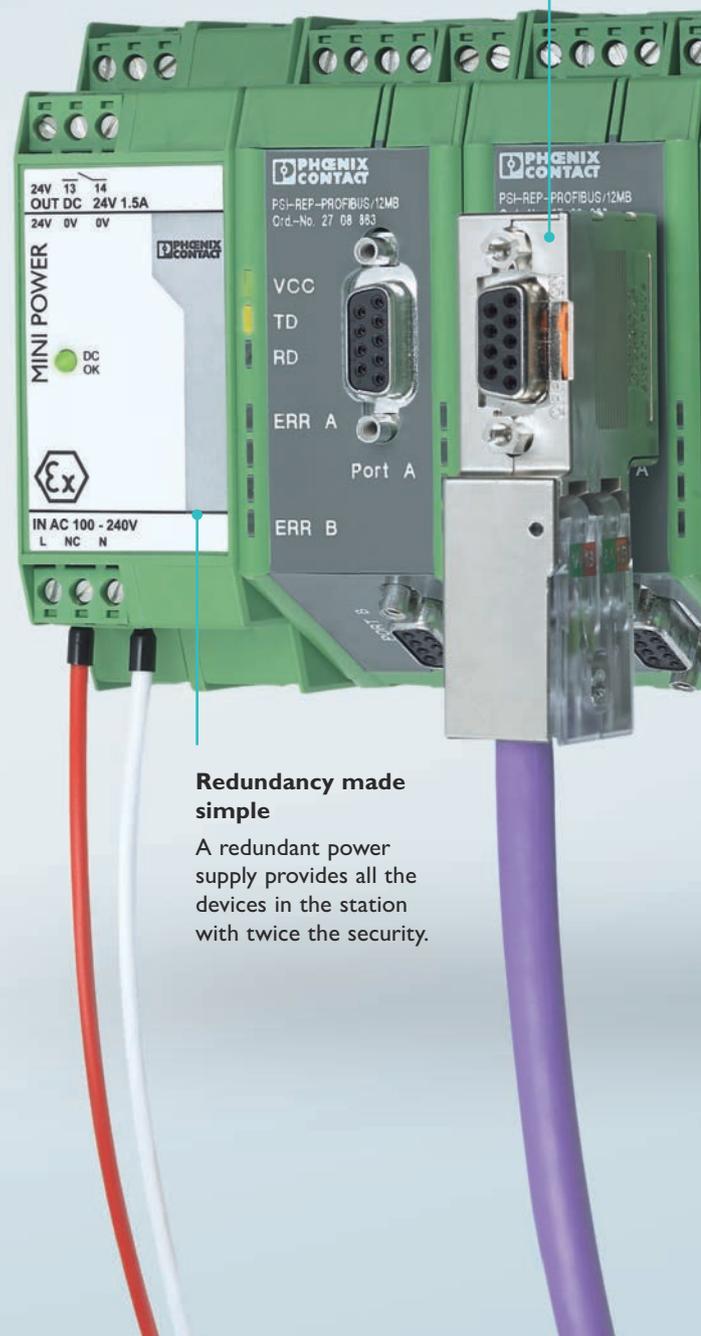
The FO converters can be combined with copper repeaters in whichever way you choose. From simple point-to-point connections right through to redundant ring structures, any topology is possible – and you can even combine copper and fiber optics.

Your advantages:

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

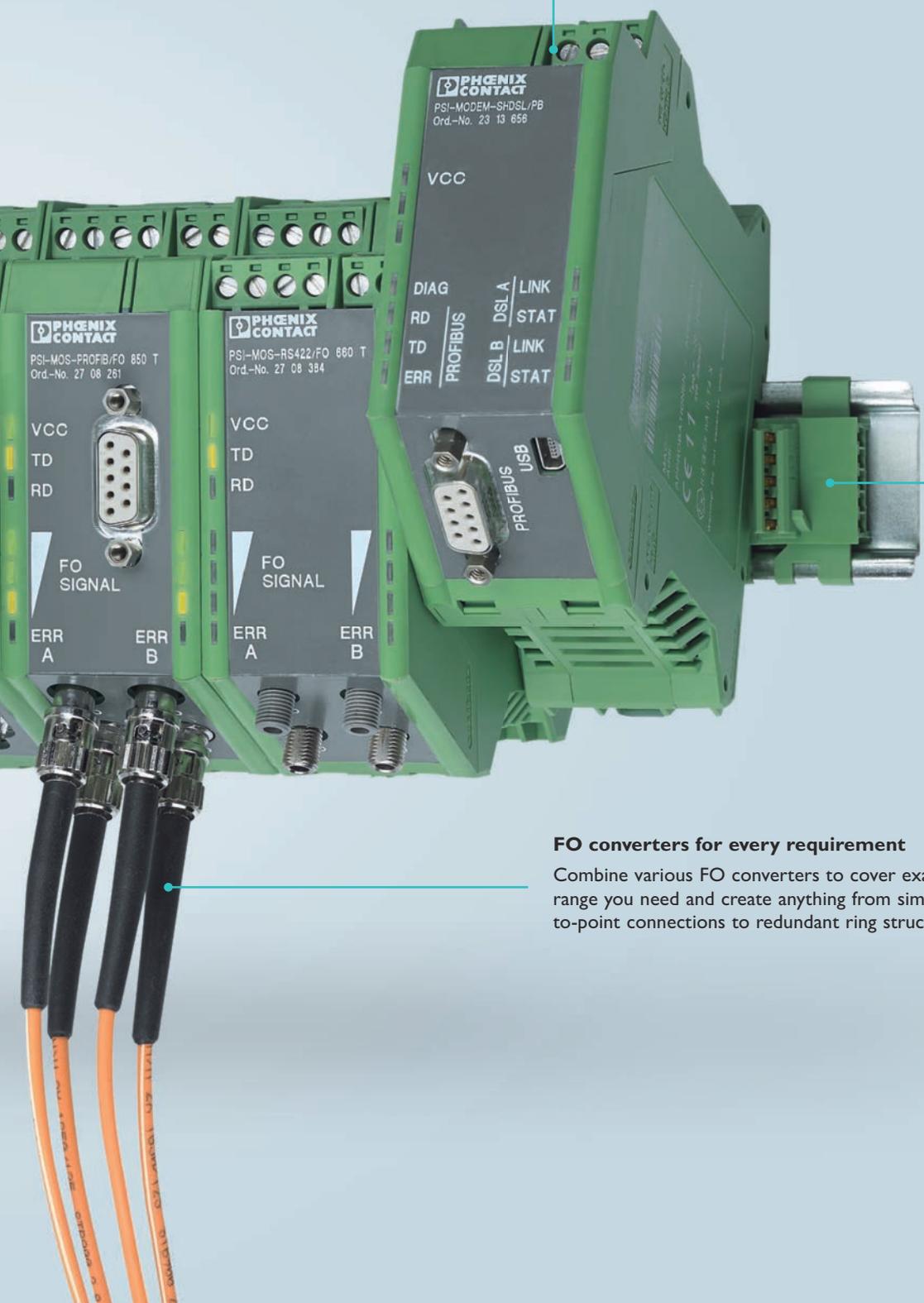
Repeaters for intelligent segmentation

The copper repeaters ensure that as many devices as possible can be incorporated, and help increase the data rate thanks to intelligent segmentation.



Redundancy made simple

A redundant power supply provides all the devices in the station with twice the security.



Use existing cables

Network devices that are up to 20 km away via existing copper cables, such as in-house telephone lines.

Smooth installation

The DIN rail connector instantly provides data and the supply voltage to each device associated with 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.

Fiber-optic transmission: Interference-free and high-performance

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

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

Your advantages:

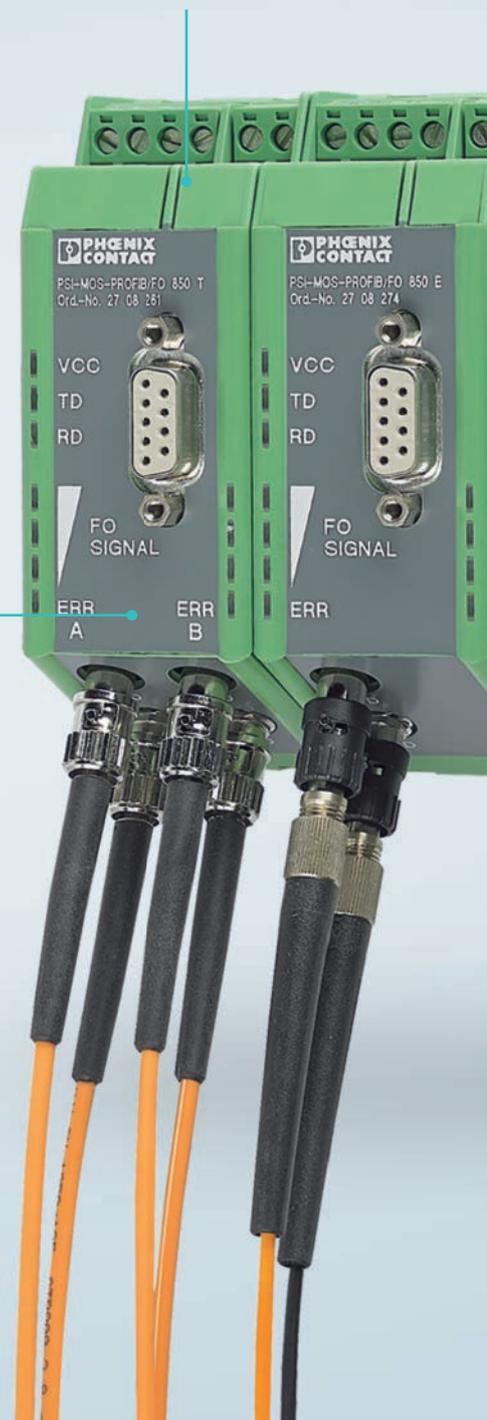
- Wide temperature range: -20°C to +60°C
- Integrated shield connection to DIN rail
- User-friendly wiring thanks to COMBICON plug-in terminal blocks
- Device-specific approvals: cULus Class 1, Zone 2 and Class 1, Div. 2, ATEX, DNV, operation at altitudes of up to 5,000 m, plus rail applications in line with EN 50121-4

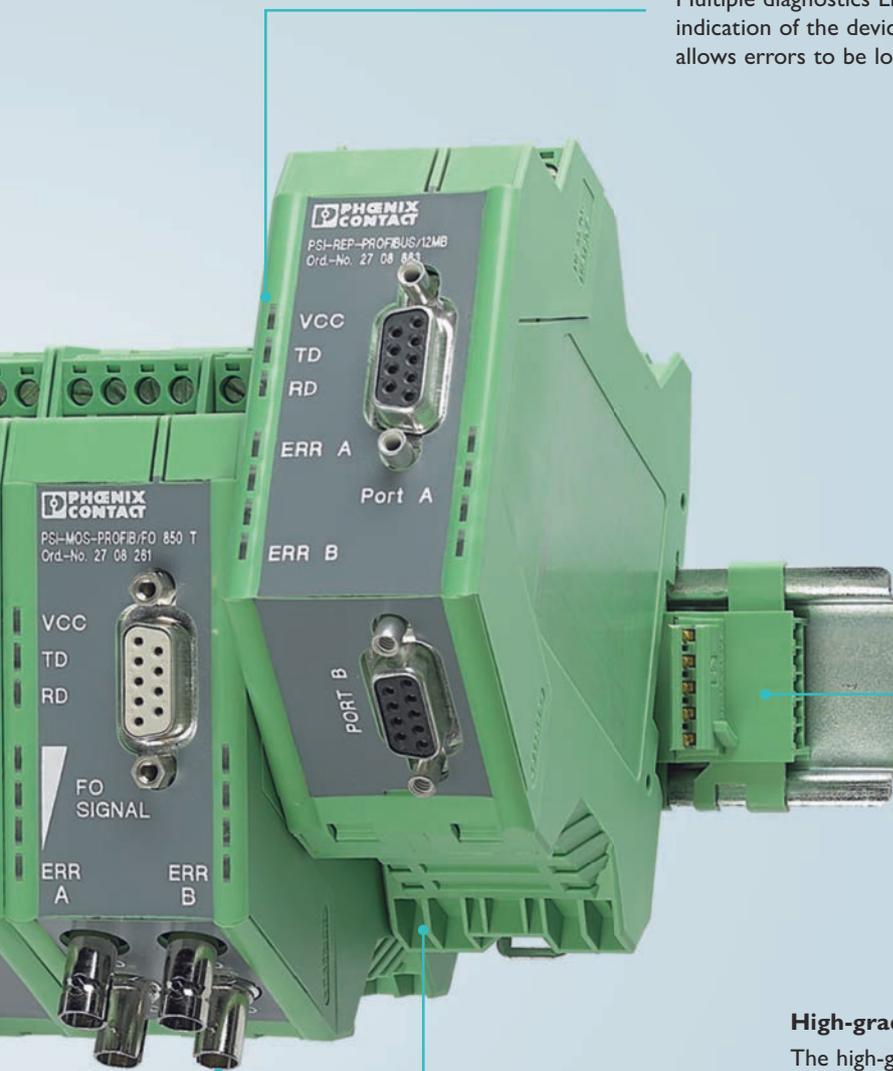
Warning before failure

The potential-free main switching 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.

Signal quality monitoring

The luminous power received is continuously evaluated and visualized using a four-stage bar graph. This makes it possible to assess the optical quality of the transmission line without the need for measuring instruments.





Diagnostics at a glance

Multiple diagnostics LEDs provide an immediate indication of the device's operating status. This allows errors to be located more quickly.

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 both saves time and prevents installation errors.

High-grade electrical isolation

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

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 by segmenting with repeaters.

The modular concept supports any combination of copper and fiber-optic channels.

You can increase the range, transmit without EMC, and extend and distribute channels as required.

Signal conditioning

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

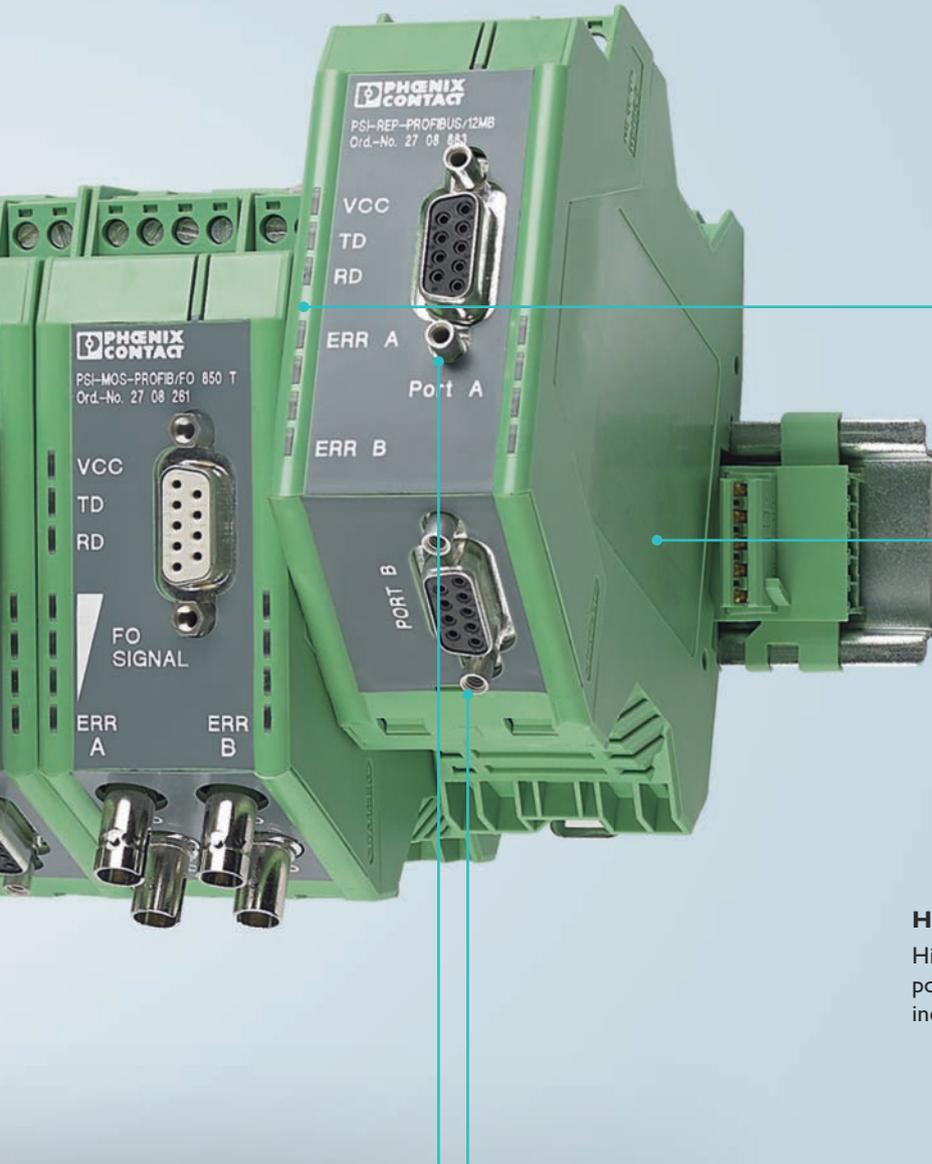
Your advantages:

- Transmission speed: ≤ 12 Mbps
- Wide 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 plus rail applications in line with EN 50121-4



Can be extended freely

Thanks to integrated bit retiming, the repeaters can be cascaded to any required depth.



Error detection

Start delimiter detection detects damaged PROFIBUS telegrams in isolation 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 more flexibility with fewer devices.

Fieldbus extenders: Make use of your existing cables

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

Depending on the system you use, data rates of as much as 2 Mbps can be achieved. With two SHDSL ports on a device, you can create flexible network structures to suit your requirements – using point-to-point, redundant, line, or star configurations.

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
- Wide temperature range: -20°C to +60°C
- Approvals: ATEX, cULus Listed 508, rail applications in line with EN 50121-4

SHDSL serial extender

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





SHDSL PROFIBUS extender

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

Easy cross-wiring

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

Communication line diagnostics

Two freely configurable digital outputs are available for alarm generation for external devices.

	Device type	Polymer fiber range	HCS fiber range	Glass MM range
DeviceNet and CANopen				
	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	–	–	–
	Segment coupler	–	–	–
	Bridge	–	–	–
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	–	–	–
ControlNet				
	FO converter 850 nm	–	1,200 m	3,100 m
	FO converter 850 nm	–	1,200 m	3,100 m
	Repeater	–	–	–
Device type		Description		
Additional accessories				
System power supply		For providing the supply voltage via the foot element (DIN rail connector)		
System power supply		For providing the supply voltage via the foot element (DIN rail connector)		
DIN rail connector		For bridging the supply voltage and for data communication		
DIN rail connector		For bridging the supply voltage		

MM = multimode, SM = single mode

Glass SM range	Copper range	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
–	1,000 m	–	2 x copper	1,000 kbps	2313449
–	1,000 m	–	2 x copper	1,000 kbps	2313533
–	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	–	2313944
–	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	–	2313944
–	20 km	–	2 x copper	up to 2,000 kbps	2313669
–	1,000 m	1 x FO	1 x copper	5 Mbps	2313711
–	1,000 m	2 x FO	1 x copper	5 Mbps	2313724
–	1,000 m	–	2 x copper	5 Mbps	2313737
	Output voltage		Output current		Order No.
in ex areas	24 V DC		1.5 A		2866653
	24 V DC		1.5 A		2866983
	–		–		2709561
	–		–		2890014

Converters and isolators: Interference-free and high-performance RS-232/RS-485 interfaces

Straightforward serial interfaces are still a common sight in today's automation technology. Easy and inexpensive to integrate, they are designed for decades' worth of operation.

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 diverted to the DIN rail, ensure reliable, protected communication.

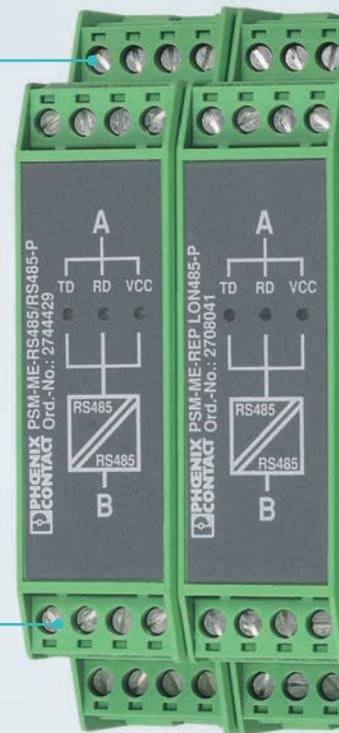
A comprehensive package of approvals and the enhanced temperature range underscore the level of quality that these products provide, and allow them to be used in a wide range of industries.

Your advantages:

- Wide temperature range: -40°C to +70°C
- User-friendly connection via COMBICON plug-in screw terminal blocks
- Device-specific approvals: DNV, UL HazLoc, ATEX, operation at altitudes of up to 5,000 m, rail applications in line with EN 50121-4

Integrated power supply unit

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

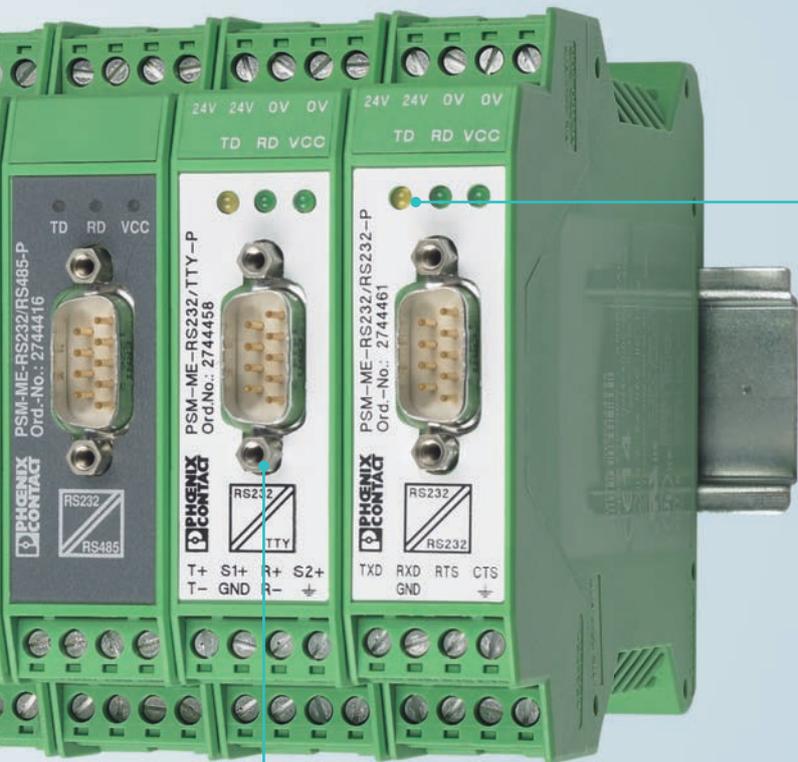


Designed with control cabinets in mind

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

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 on TTY converter	RS-232	TTY	1,000 m	19.2 kbps	2744458
RS-232 on RS-485/RS-422 converter	RS-232	RS-485/RS-422	1,200 m	115.2 kbps	2744416
RS-485 on 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 achieve a significant improvement in the transmission speed and range of your network.

D-SUB fast connectors: User-friendly connections 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, or IDC terminal blocks. The new pre-assembled M12 fast connectors now also allow tool-free connection.

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

Your advantages:

- Easy mounting, thanks to user-friendly connection technology
- Maximum flexibility thanks to various cable outlets of 35°, 90°, and 180°
- Comprehensive product range for PROFIBUS, CANopen, and all standard interfaces

Reliable Plug and Play connectors

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

The classic, flexible choice

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

Specifically for PROFIBUS

It only takes a minute: user-friendly cable connection via screw or IDC terminal block technology.



	Connection technology	Cable inlet	Pg interface	Order No.
For PROFIBUS				
	M12	90°	2902317	2902318
		90° long, S7-compatible	2902728	2902729
		35°	2902319	2902320
		180° (axial)	–	2902321
	IDC terminal block connection	90°	2313685	2313672
	Screw connection terminal blocks	90°	2313708	2313698
		35°	2708245	2708232
		180° (axial)	–	2744380
	Spring 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

	Housing	Pin assignment	D-SUB/No. of pos.	Order No.	
Universal connector with screw connection terminal blocks and 35° cable outlet					
	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	
			37-pos. pin	2300973	
			9-pos. socket	2761499	
			15-pos. socket	2761596	
			15-pos. socket HD	5604603	
			25-pos. socket	2761619	
			37-pos. socket	2300986	
	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	1, 2, 3, 5, 6, 8 to two terminal blocks	2744241
				2, 3, 4, 5, 7, 9 to two terminal blocks	2744267
				2, 3, 6, 7, 8, 9 to two terminal blocks	2799490
				2, 3, 4, 5, 6, 7 to two terminal blocks	2761871
				1, 1, 2, 3, 6, 7 to two terminal blocks	2744089
					2744102

Universal connector 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

Fiber-optic and copper installation technology: Robust and easy

In a world that is presenting us with growing data quantities, more EMC interference, and longer distances to cover, fiber-optic technology is gaining an increasingly high profile. Phoenix Contact installation technology provides you with all the cables, connectors, and tools you need to create fiber-optic and copper fieldbus networks that are suitable for industrial applications.

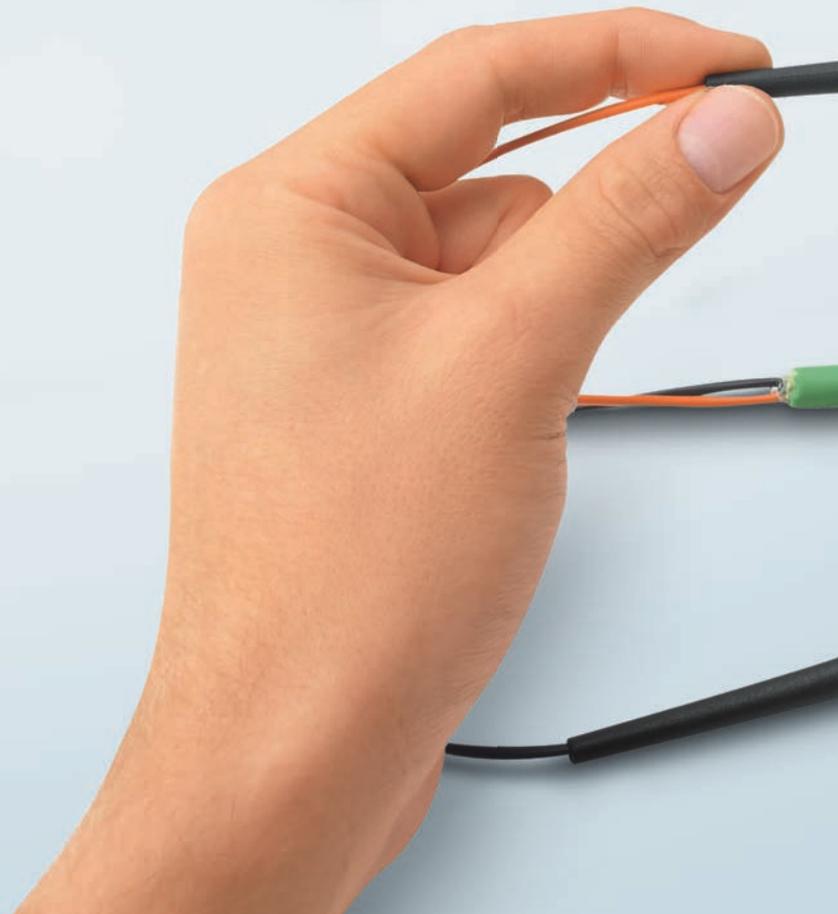
If reliable, fast copper cabling is what you are looking for, we offer a product range that includes individual cables available by the meter, cables pre-assembled with connectors, and various panel feed-throughs. Depending on the application, products are available with a high degree of protection for the control cabinet as well as for direct field installation.

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

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.



Copper installation technology

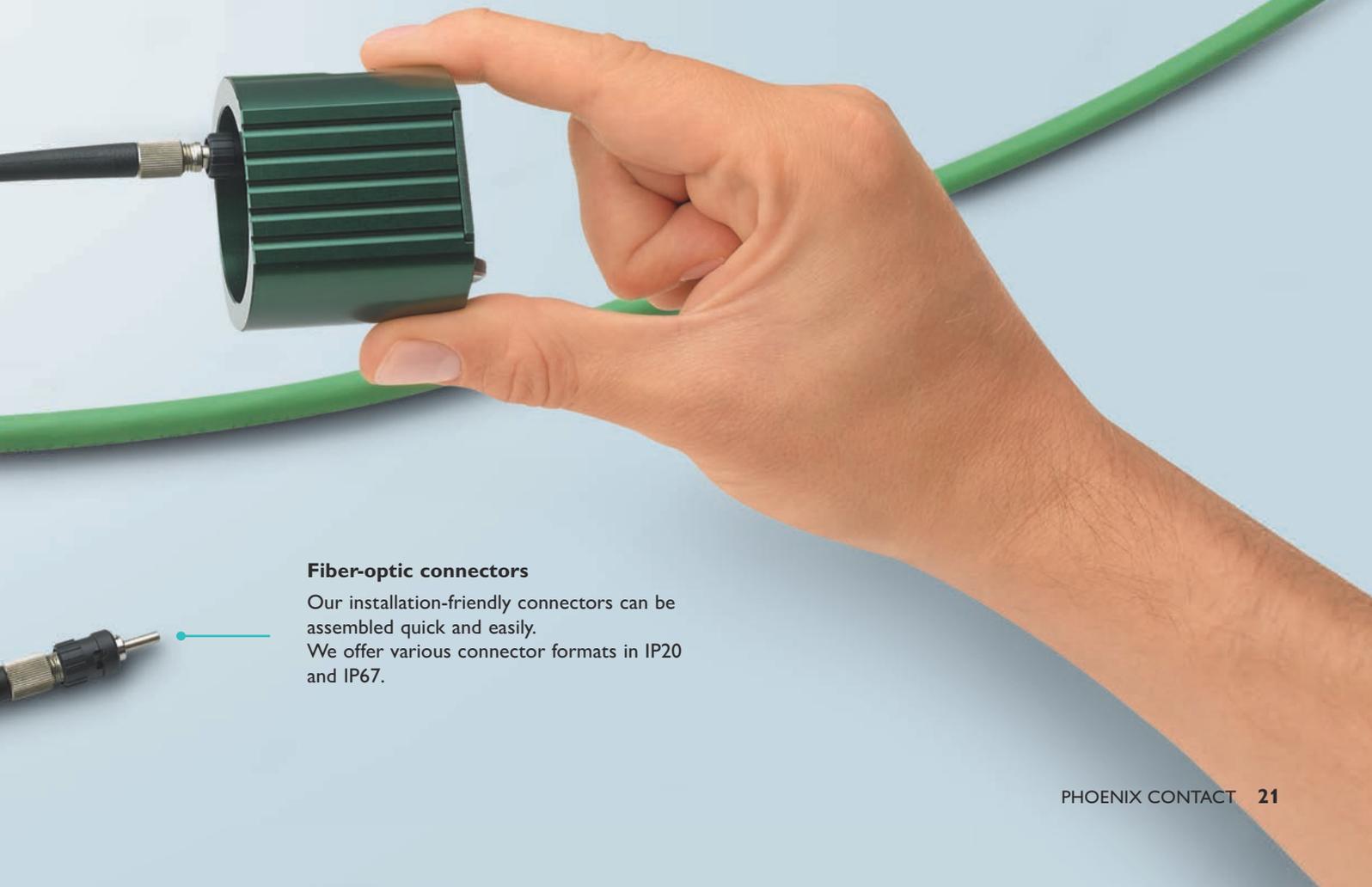
Phoenix Contact offers a comprehensive range of products for quick and reliable copper cabling. This includes individual cables available by the meter, cables pre-assembled with connectors, and various panel feed-throughs.

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.



Fiber-optic connectors

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

Fiber-optic accessories

	Description	Features	Order No.
Tools			
	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
	Fiber optics stripping tool	For removing the primary coating	2744885
	Microscope	For visual checks following connector assembly	2744898
	Aramide scissors	For shortening aramide yarn	2744872
	Stripping pliers	For removing individual elements of the fiber-optic cable	2744199
Measuring instruments			
	Fiber optics measuring case	Optical power measuring device	2799539
	Supplementary set	For additional fiber and connector types	2901560
Cables (by the meter)			
	Polymer fiber cable	Duplex 980/1,000 µm, medium-weight type for indoor installation	2744319
	Polymer fiber cable	Duplex 980/1,000 µm, heavy-duty type for indoor installation	2744322
	Polymer fiber cable	Duplex 980/1,000 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 fiber-optic cables produced according to customer requirements	Polymer, HCS, or fiberglass, fiber-optic connectors in IP20 or IP67	 Web code: #0524
Patch cables			
	Pre-assembled patch cables	Multimode or single mode fiberglass	 Web code: #0526
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
Couplings			
	LC/LC coupling	For multimode fiberglass	2700312
	LC/LC coupling	For single mode fiberglass	2700313
	SC-RJ/SC-RJ socket insert	For polymer, HCS, 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	2799429
	SC duplex/SC duplex coupling	For polymer, HCS, or fiberglass	2901788

Copper accessories

	Description	Features	Order No.
Tools			
	Stripping pliers	For PVC-insulated lines	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
	Screwdriver	Phillips, size: PH 1 x 80 mm	1205150
Cables			
	PROFIBUS cable	Fast Connect type	2744652
	Bus system cable M12	With M12 SPEEDCON connector for PROFIBUS/PROFIBUS PA	 Web code: #0525
Connectors			
	D-SUB connector set	PROFIBUS, pin, screw connection, IP67 degree of protection	1654549
	D-SUB connector set	PROFIBUS, pin, spring connection, IP67 degree of protection	1654345
	Bus system connector	Socket, straight, 5-pos., M12 shielded	1507777
	Bus system connector	Connector, straight, 5-pos., M12 shielded	1507764
	Bus system flush-type socket	PROFIBUS, 2-pos., M12	1534397
	Bus system panel-mount connector	PROFIBUS, 2-pos., M12	1534355
Distributors			
	Connection distributor	Passive RS-485 T distributor, 3 ports	2760623
	Connection distributor	Passive RS-485 T distributor, 6 ports	2799364
	T-distributors	Bus system T-connector, PROFIBUS, M12 connector	1458884
Termination resistors			
	Active termination resistor	For PROFIBUS and RS-485 bus systems	2313944
	M12 connector	PROFIBUS M12 termination resistor	1507803
	M12 connector	CANopen/DeviceNet termination resistor	1507816

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