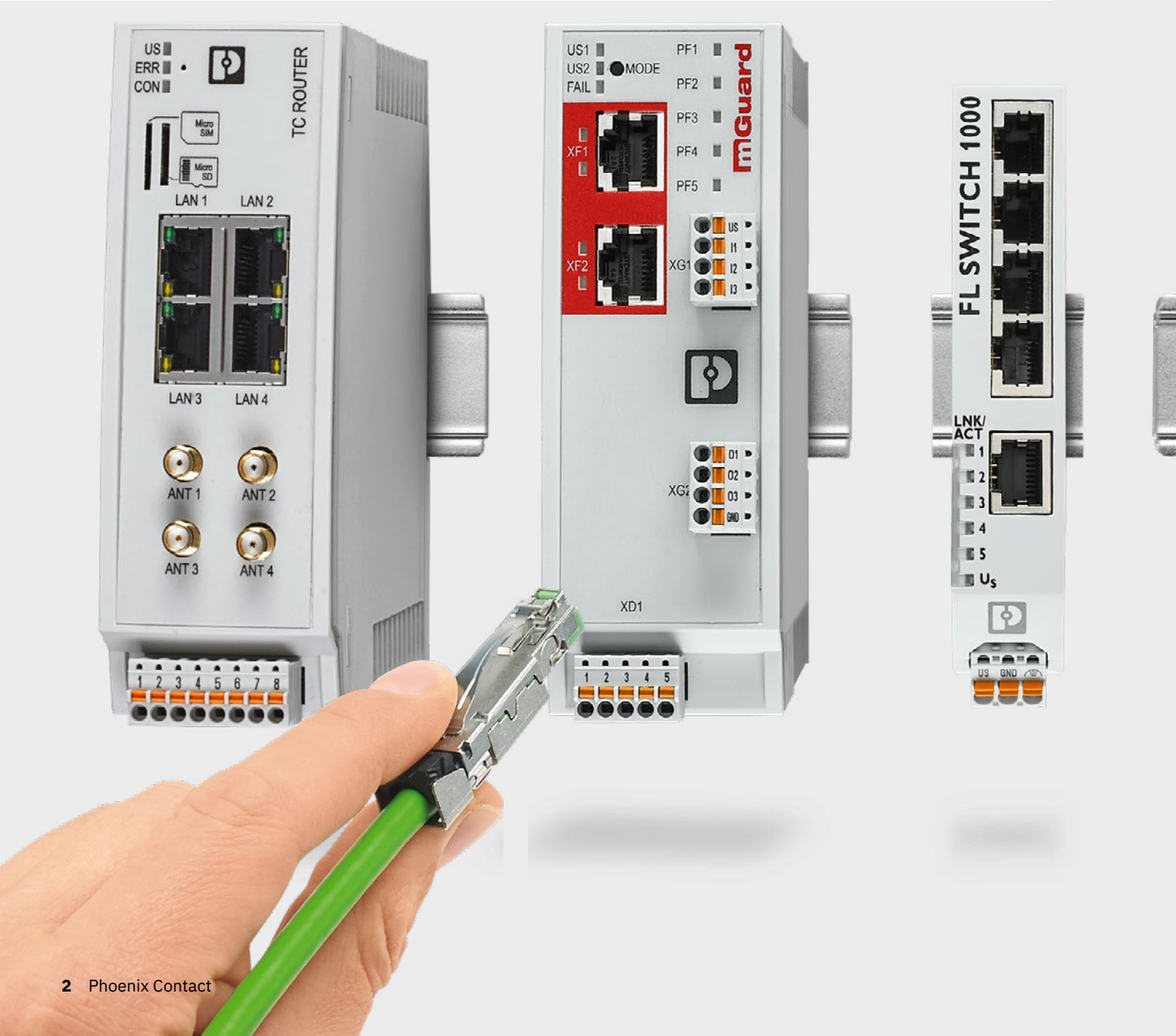
Industrial Ethernet

One network, all options

The Industrial Ethernet network portfolio from Phoenix Contact

Phoenix Contact provides end-to-end networking from the field to the control level. Reliable solutions with Industrial Ethernet, the latest wireless technologies, and cybersecurity increase the availability and security of your automation infrastructure.

With our many years of experience in automation technology, we know the challenges you face and can support you with network planning and commissioning. Get to know our products and solutions.



Contents

Solutions 4
- Networked production 4
- Networked machine 8
- Networked infrastructure 12
- Networked process plant 16
- The right network setup 20

Products 22
- Media converters for Ethernet networks 22
- Unmanaged switches 26
- Managed automation switches 28
- Managed switches for the latest communication technologies 30
- Managed switches for power plants 32
- Power over Ethernet (PoE) 48
- Industrial Wireless 54
- Industrial security 58
- Remote communication 62
- Time servers 66
- Protocol and interface converters 68
- Network management software 72
- Surge protection 74
- Installation technology 76
- Copper-based data cabling for networks and fieldbuses 82
- FO-based data cabling for networks and fieldbuses 102

Your partner for ICS security and industrial communication 110

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.

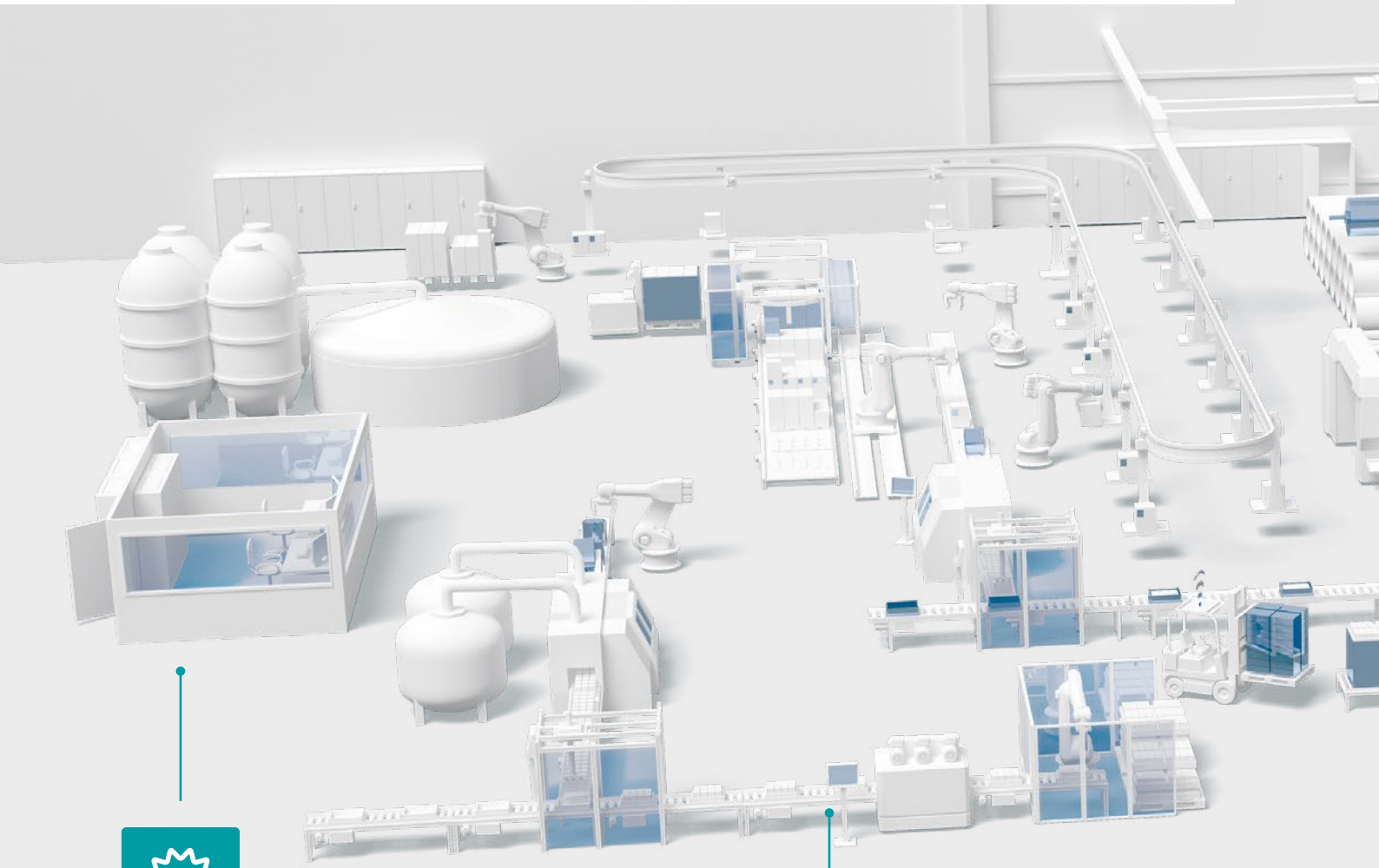
Web code: #1234 (example)

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

Solutions

Networked production

Efficient production requires well structured, high-performance, and secure network infrastructure. The ideal concept and the right components protect your system against automation system failures and costly downtimes. With industrial network products from Phoenix Contact, you can easily implement the high requirements of your production network in a future-proof manner. As well as the appropriate products, we also provide support for the optimum planning of your production network.

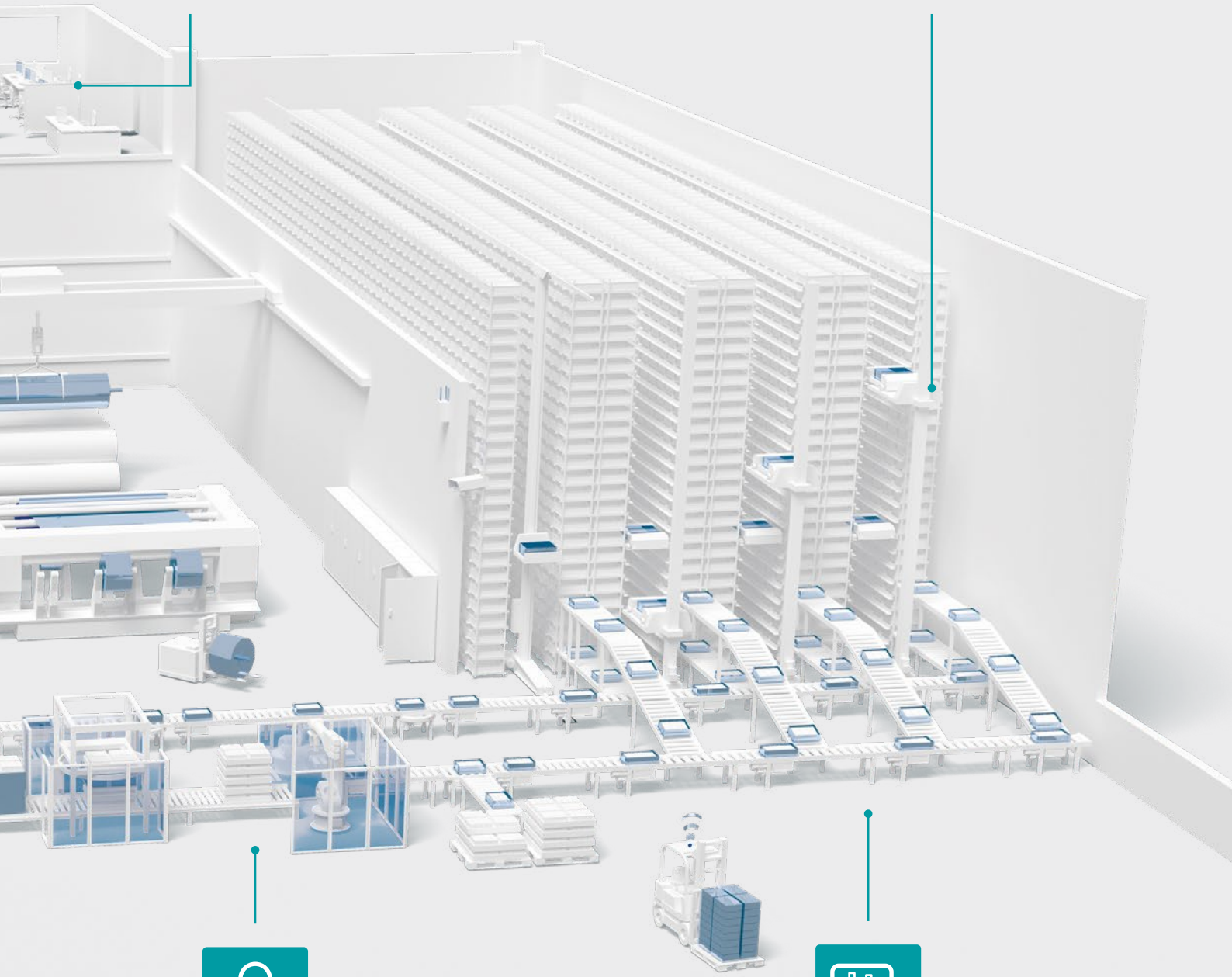


High-availability production network

Integration of machines

Connection to the company network

Communication with mobile systems



Cybersecurity

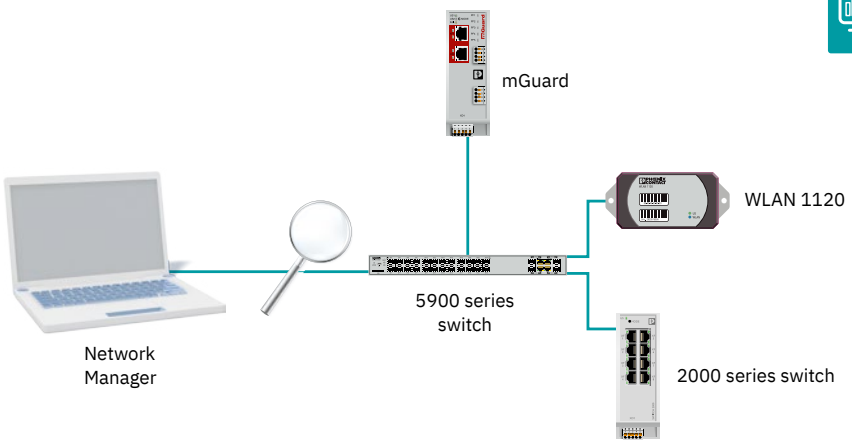
Network management

Solutions for the production network

Network management

Large production networks include many different network components that all have to be configured and diagnosed. Phoenix Contact managed switches, WLAN components, and security appliances can be easily started up using network management software. You can centrally assign IP addresses for network devices, configure several devices at the same time, and update the firmware.

> More information on software starting on page 72

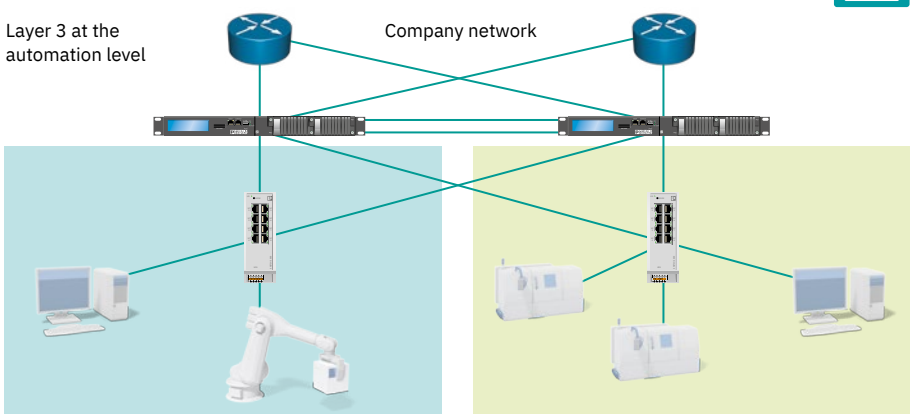


Network management with the FL Network Manager software

High-performance and failsafe connection to the company network

The Virtual Router Redundancy Protocol (VRRP) allows you to redundantly connect your routers to the company network. Gigabit performance ensures high data throughput, while support of IT standards provides seamless integration (such as VLAN, SNMP, RSTP). For consistent communication between up to 28 different IP subnetworks, you can use the Layer-3 function.

> More information on modular managed switches starting on page 32

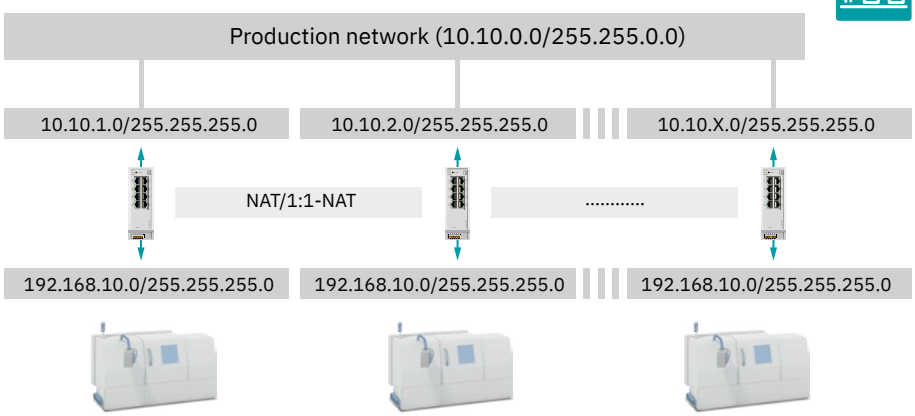


Subnet 1 *Subnet 2*

Integration of machines with the same IP address

Machines and their devices use fixed IP addresses. Therefore, address conflicts can occur during integration into overlapping networks. However, a complex adaptation of the IPs is not necessary. Our NAT switches and mGuard routers simply translate the internal address ranges of the machine into the desired IP range of the automation network.

> More information on NAT switches starting on page 28 and on mGuard security routers starting on page 58



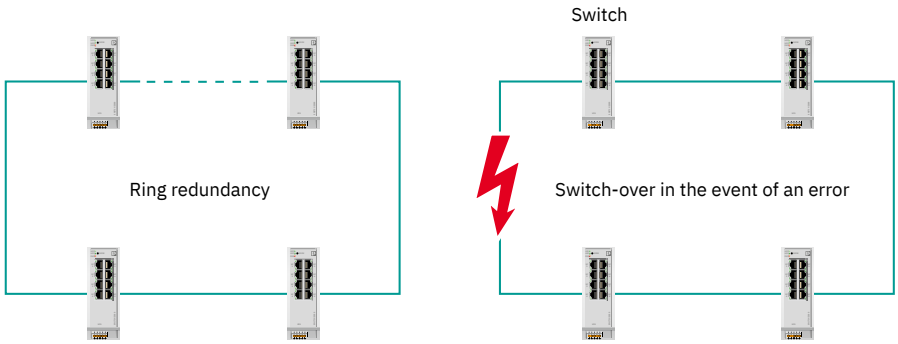
Automatic IP address translation using switches with NAT function

High network availability due to network redundancy

Fast redundancy switch-over ensures the uninterrupted operation of automation networks in the event of connection failure. We offer:

- DLR (Device Level Ring) for EtherNet/IP™ networks
- MRP (Media Redundancy Protocol) for PROFINET networks
- RSTP (Rapid Spanning Tree Protocol) for standard industrial IT networks
- ERR (Extended Ring Redundancy)

> More information on managed switches starting on page 28

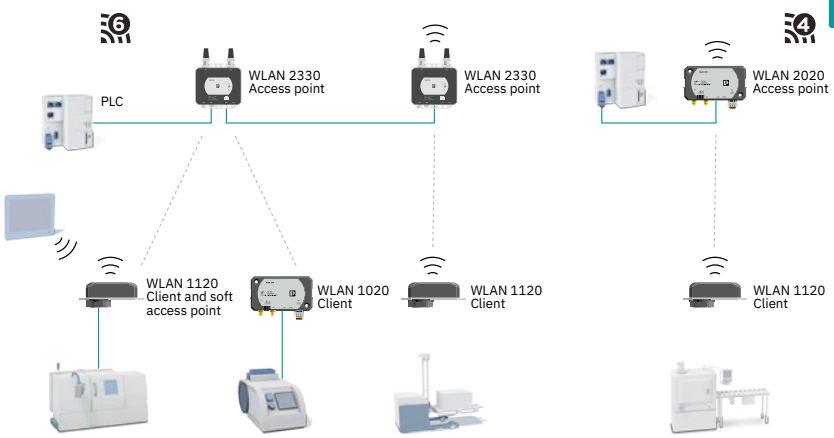


If an error occurs, the network structure is reorganized so that all devices can be reached again

Reliable WLAN communication for cellular systems

With optimized roaming and MIMO technology, the WLAN products from Phoenix Contact enable fast cell changes in the millisecond range. This means that real-time communication between the control system and the automated guided vehicle system remains stable even when there is a high volume of data. With support for the current Wi-Fi 6/6E standard, the WLAN modules enable efficient use of the frequency spectrum and particularly high data rates.

> More information on Industrial WLAN starting on page 54

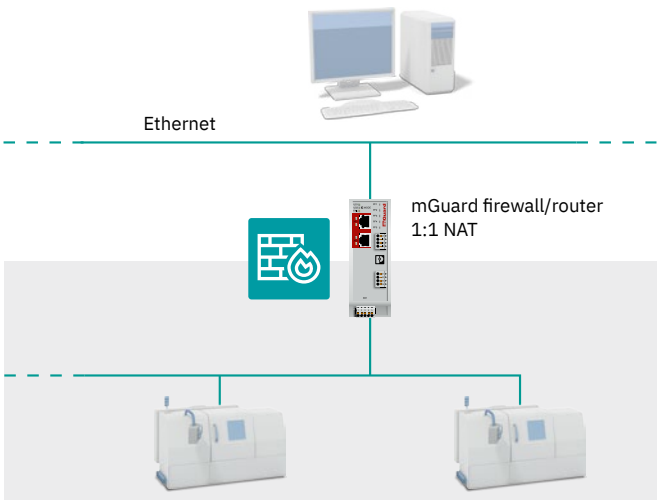


Wireless machine communication with Industrial WLAN

Industrial mGuard security solution

The mGuard firewall routers securely protect your network against the dangers associated with increased networking. Firewall rules based on user authentication and the conditional firewall enable person-, company-, and situation-dependent activation of different firewall rules.

> More information on mGuard security routers starting on page 58



Decentral protection and the secure remote maintenance of production cells

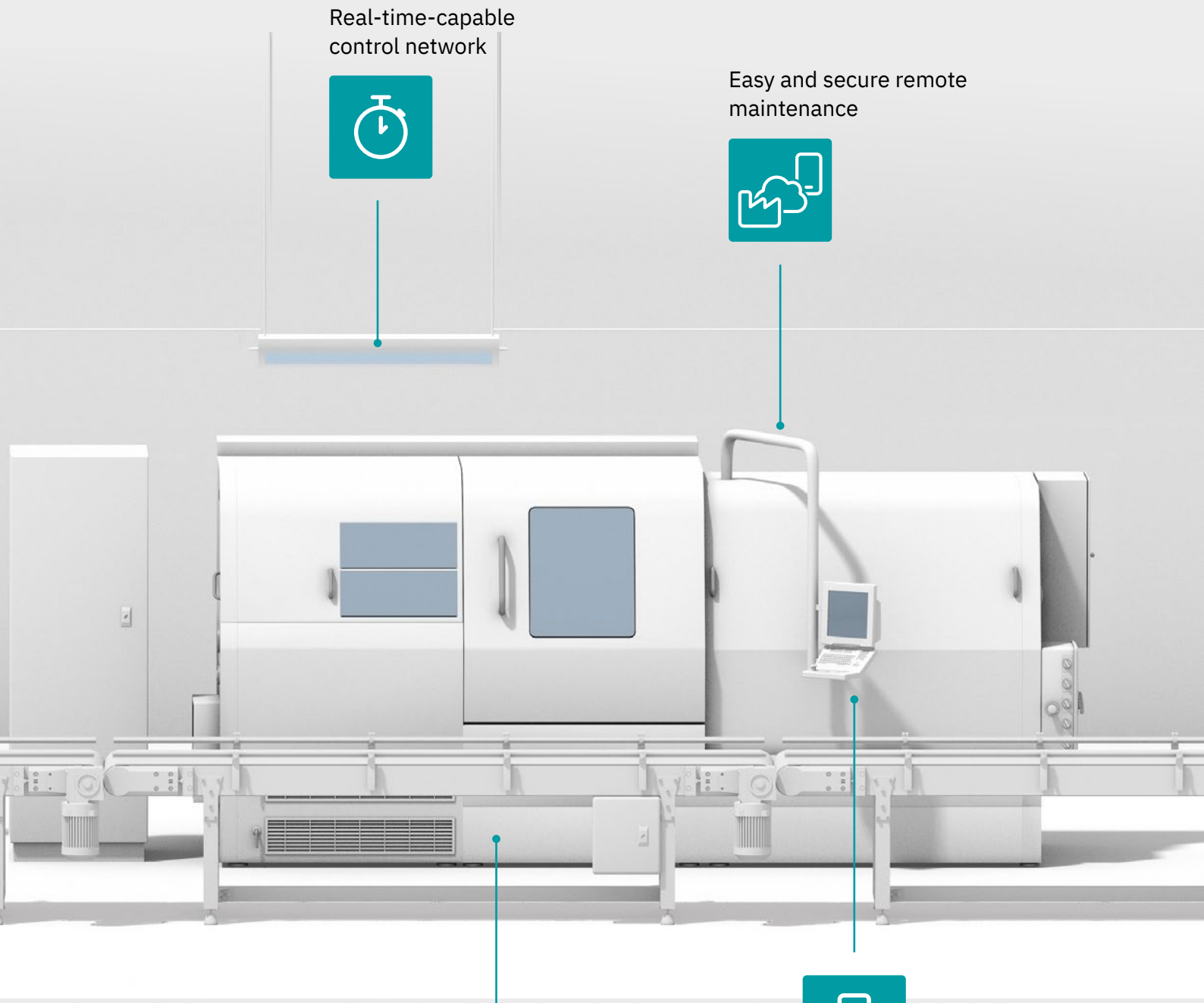
Networked machine

Today, modern production machines are often networked in various ways. Whether with the Internet for remote maintenance, the company network for exchanging production data, or with other machines for automated production. However, greater networking also means larger networks, more communication and increasing security requirements. Phoenix Contact provides industrial Ethernet solutions for machine networks that meet both current and future requirements.

SPE

Integration of sensors and field devices

Stable machine networks

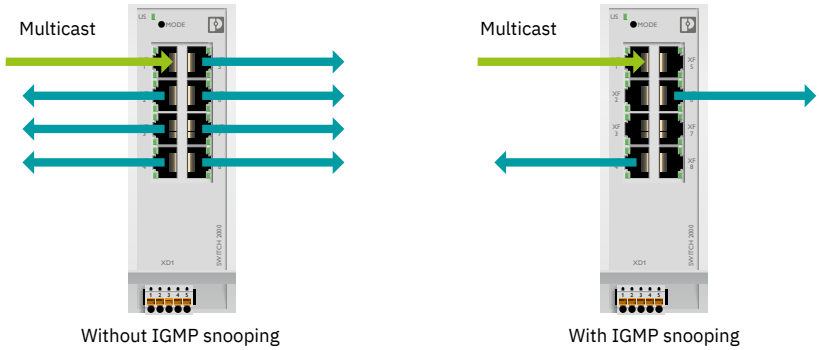

Real-time-capable control network
Easy and secure remote maintenance
Control via REST API
Integration into the production network

Solutions for the machine and system network

Stable machine networks

Intelligent switches offer extensive configuration and monitoring options for the machine network. In doing so, the data load in the network is reduced using multicast filter functions. Redundancy mechanisms maintain communication even in the case of undesired loops or device failures.

> More information on switches for growing networks starting page 28

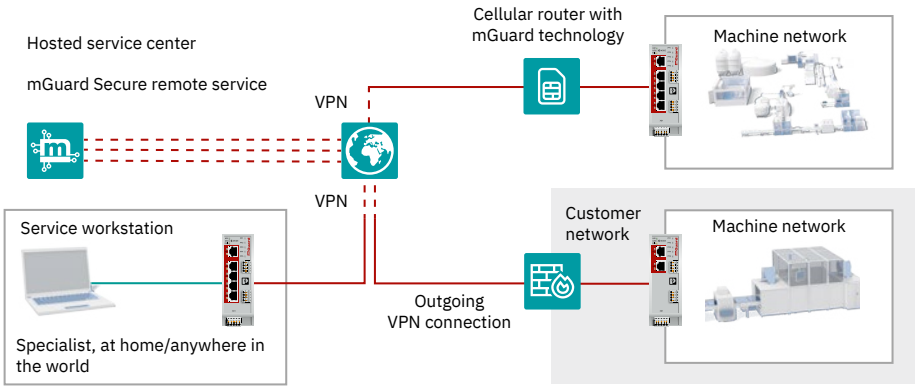


Multicast filters reduce the data load in the network

Easy and secure remote maintenance

The mGuard Secure Remote Service offers machine builders and system manufacturers a turnkey comprehensive VPN solution, which enables secure remote maintenance without specialist IT knowledge – from a simple VPN cloud client to an extensive security solution, including remote maintenance. The wide range of remote maintenance components means that the highly varied requirements of the network operator can be met.

> More information on secure remote maintenance starting on page 62

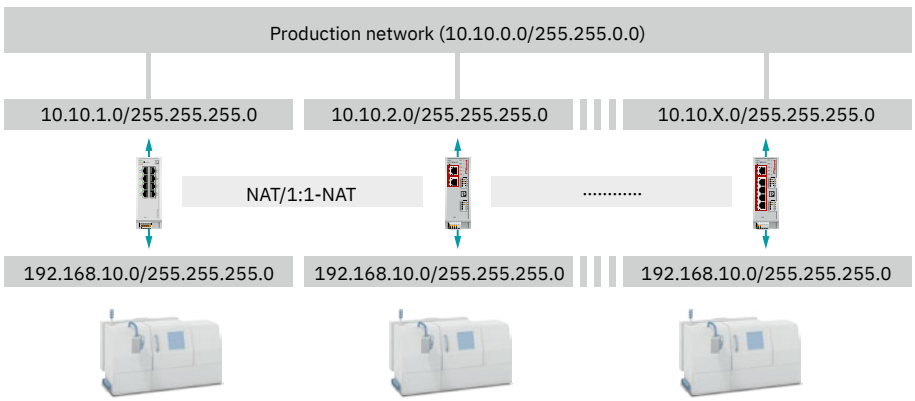


Secure remote maintenance concept with mGuard components

Secure integration into the production network

Machine connection via an NAT or security router enables transparent communication and protects the machine network against unwanted communication at the same time. Faults and threats from the production network are effectively kept away from the machine network. The availability and real-time capability of internal machine communication is thus ensured.

> More information on NAT switches starting on page 28 and on mGuard security routers starting on page 58

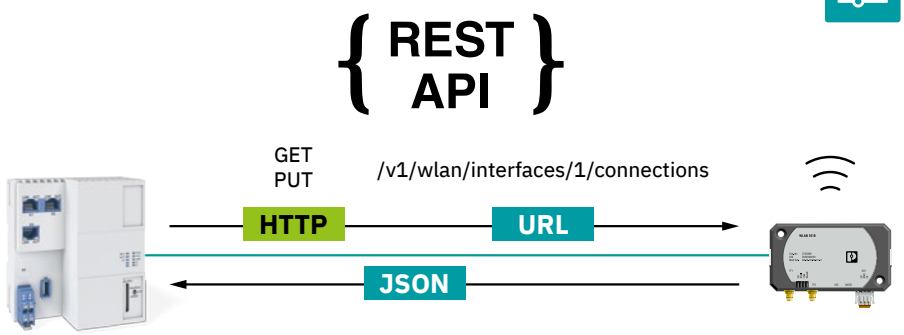


Machine connection with NAT and security routers

WLAN control via REST API

Our WLAN modules with REST API enable seamless integration into your applications. The standardized HTTP interface can be used to automate configurations, integrate status data into dashboards, and execute control commands directly from your application. This gives you full control, simplifies monitoring, and optimizes processes for maximum efficiency and flexibility.

More information on Industrial WLAN starting on page 54



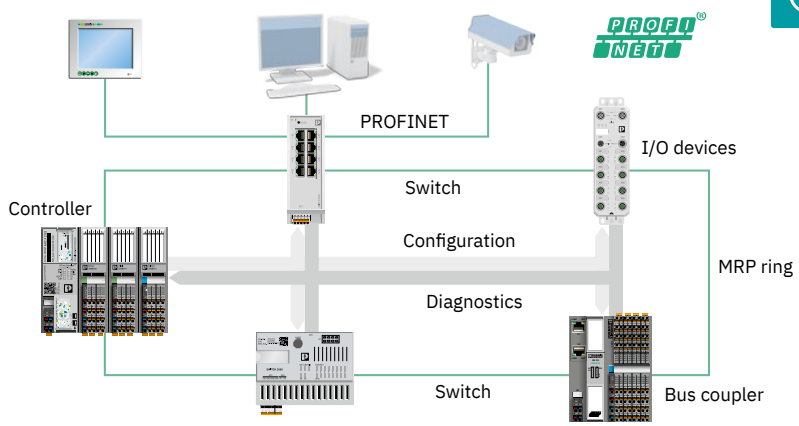
Full control for machine programming

Real-time-capable control network

Automation switches combine IT functions with managed and real-time properties which optimally support the PROFINET and EtherNet/IP™ protocols. They ensure stable and real-time-capable communication.

The integrated, fast redundancy methods, such as the Device Level Ring (DLR) for EtherNet/IP™ and the Media Redundancy Protocol (MRP) for PROFINET, prevent the control process from being adversely affected even in the case of device failure.

More information on managed automation switches starting on page 28

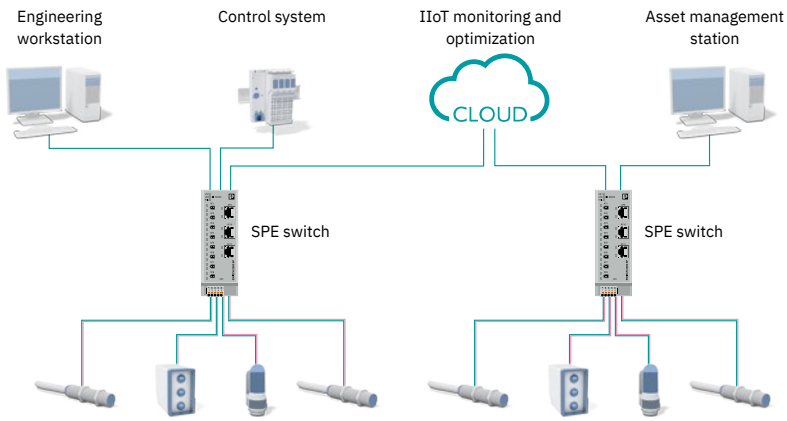


MRP redundancy for a failsafe machine network

Integration of sensors and field devices

The managed switches for Single Pair Ethernet (SPE) from Phoenix Contact enable you to integrated sensors and field devices with an SPE interface directly into the existing Ethernet network. Additional gateways or subsystems are no longer required. Data is transmitted via just one pair of wires, which saves space – at the same time, power can be supplied to the connected devices via PoDL (Power over Data Line).

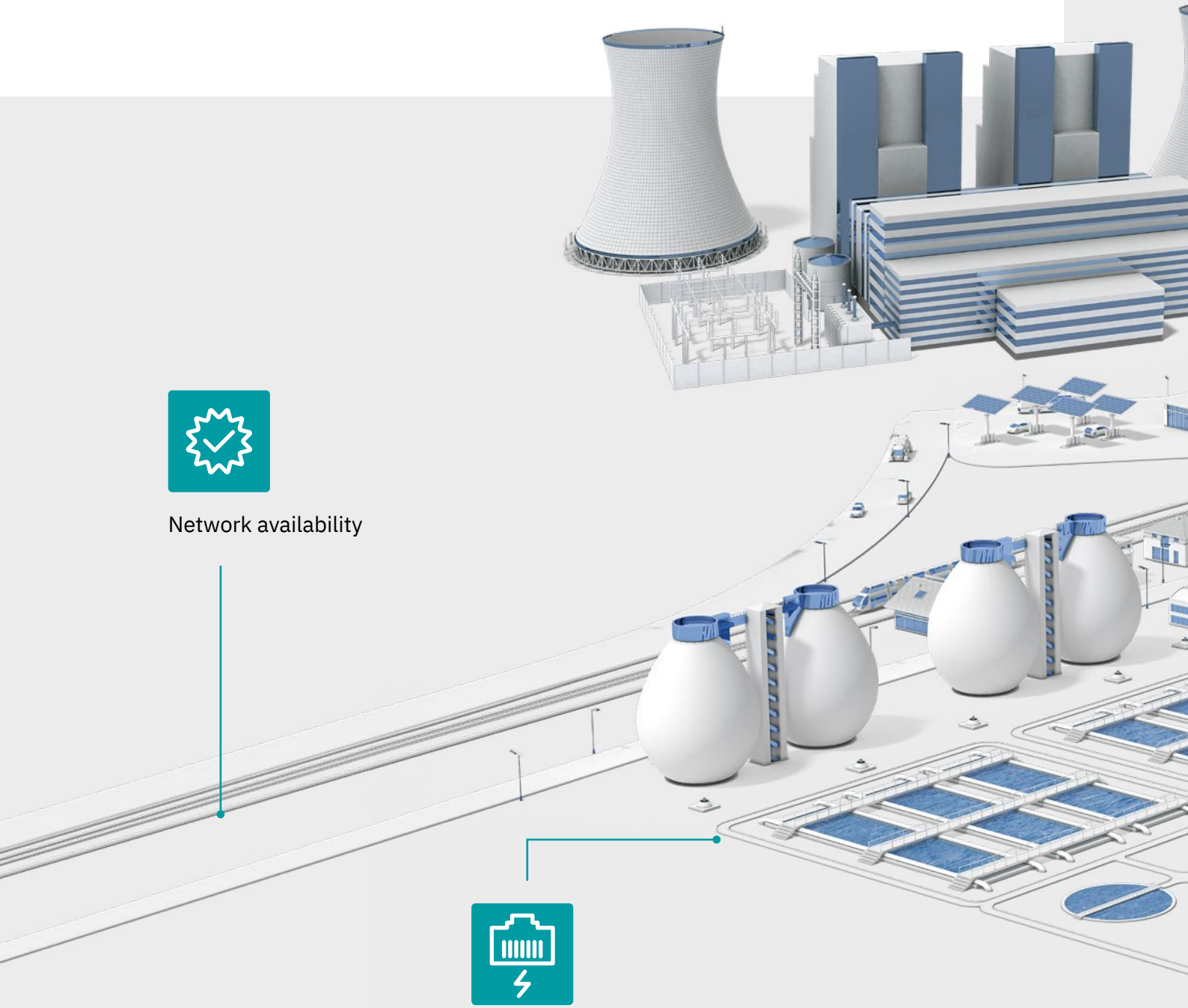
More information on managed switches for state-of-the-art communication technologies starting on page 30.

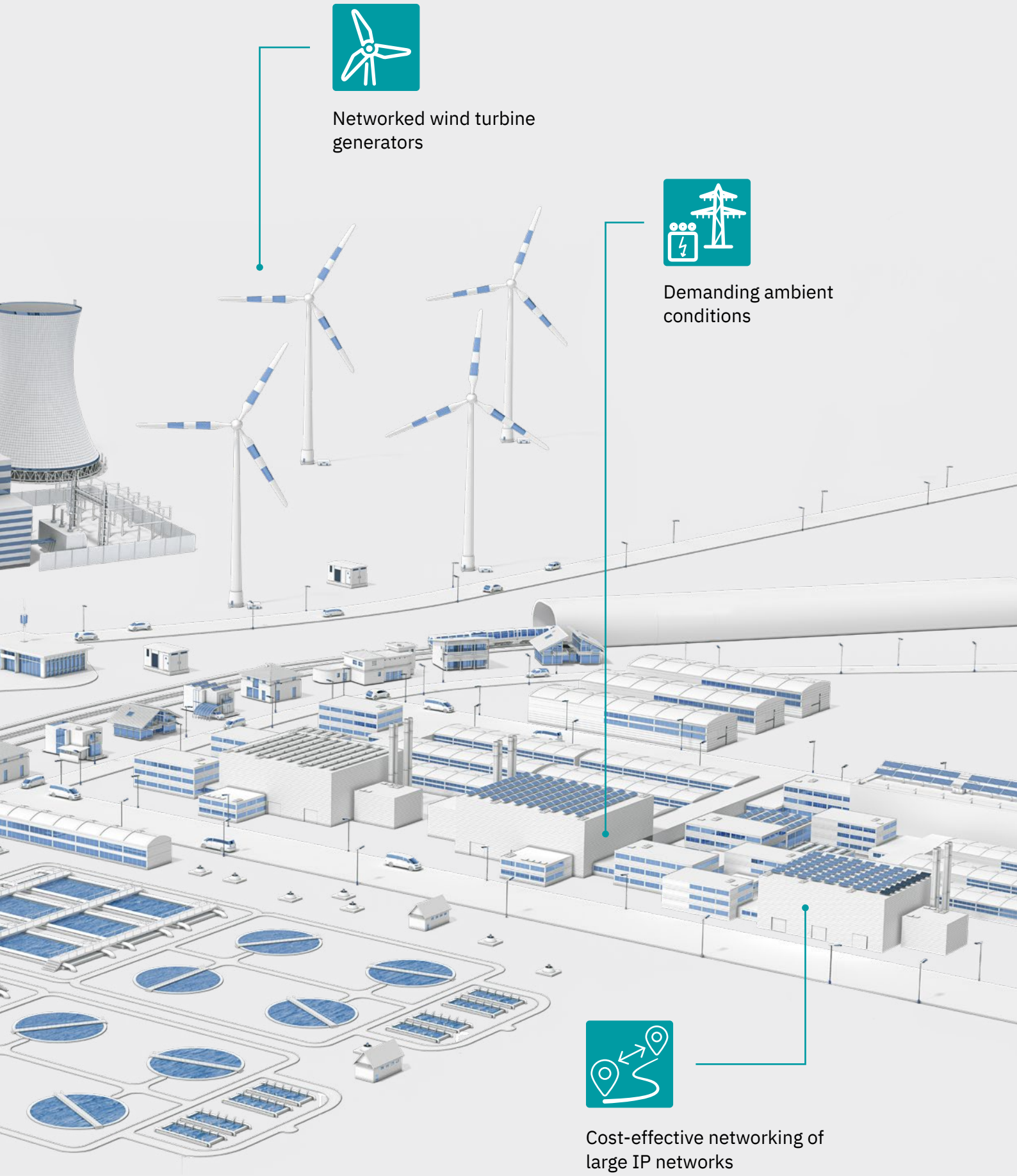


With SPE, Ethernet can be used right through to the field level

Networked infrastructure

In today's industry, virtually all trades are networked via Ethernet. High demands are placed on the network infrastructure and network components used. Reliable availability, support for specific protocols, long ranges, and robust functionality under demanding conditions are essential. Protection against attacks and manipulation is particularly important. Phoenix Contact provides secure and powerful network components for your systems.



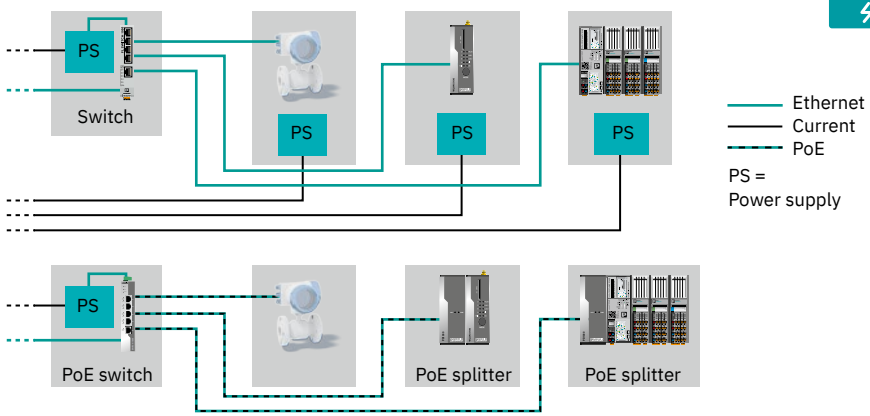

Networked wind turbine generators
Demanding ambient conditions
Cost-effective networking of large IP networks

Solutions for infrastructure networks

Power over Ethernet

With Power over Ethernet (PoE), data and power are transmitted via the same standard Ethernet cable. This considerably reduces the cabling effort for the network devices installed in the field, such as surveillance cameras or WLAN access points. PoE is standardized in IEEE 802.3 and thus non-proprietary use is supported. With PoE splitters, you can also supply standard Ethernet devices with power via PoE.

More information on Power over Ethernet starting on page 48



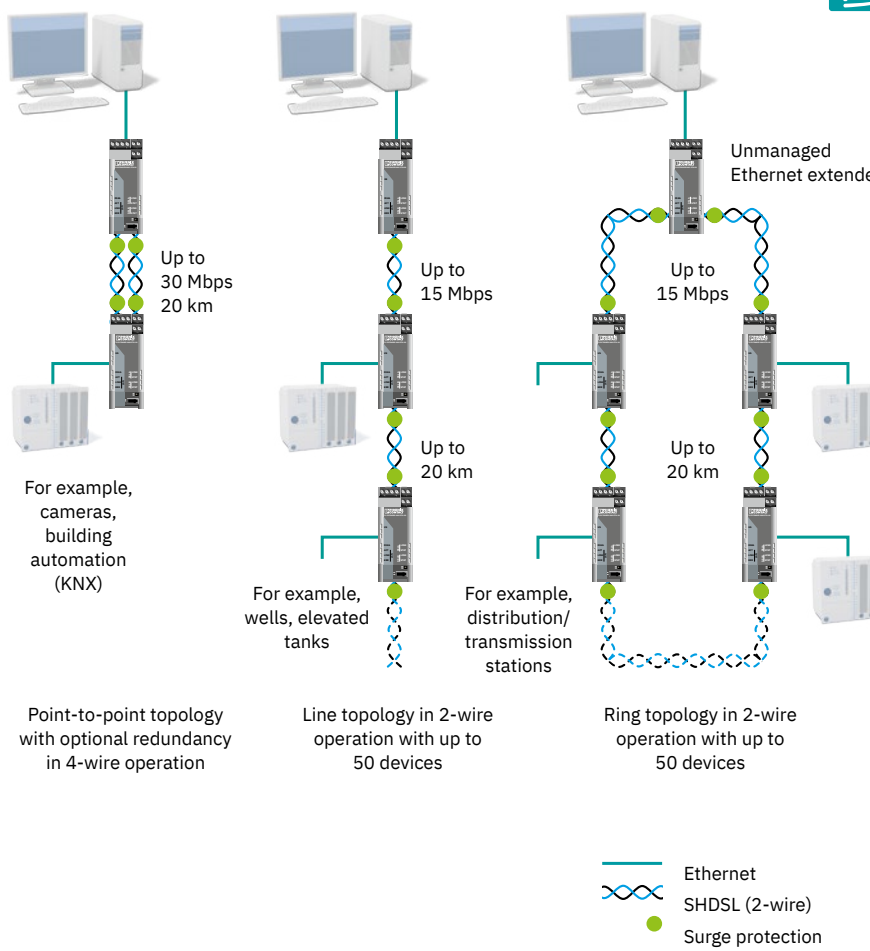
Streamlined and cost-effective cabling with PoE

Ethernet communication up to 20 km using any 2-wire cables

With the Ethernet extenders, not only can you connect simple point-to-point Ethernet applications, but also large IP networks over distances of up to 20 km.

Thanks to managed Ethernet extenders, unmanaged Ethernet extenders can now also be diagnosed centrally via IP. The system generates a warning via SNMP when unexpected events occur, such as path weakening.

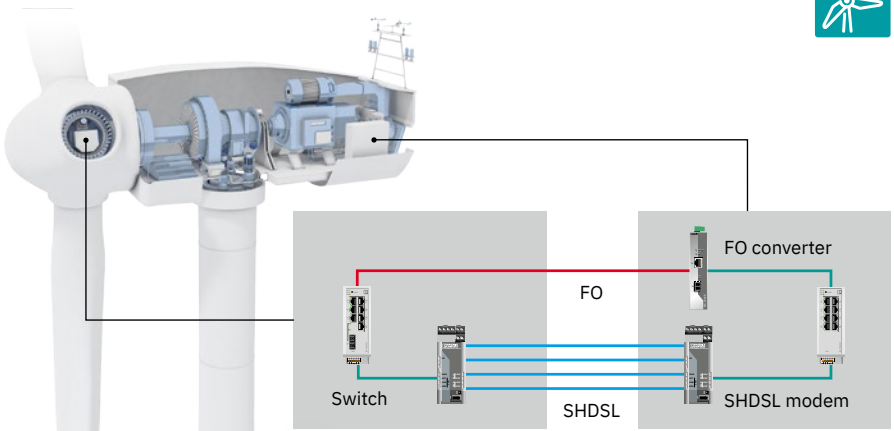
More information on Ethernet extenders starting on page 63



Networked wind turbine generators

With the WDM method, two different wavelengths (1310/1550 nm) enable simultaneous data transmission without any loss of quality or bandwidth. This means that interference-free full duplex communication is possible in rotating applications. Double redundancy can be established via the copper slip ring using SHDSL technology and two Ethernet extenders.

> More information on WDM products starting on page 28 and on modems starting on page 63

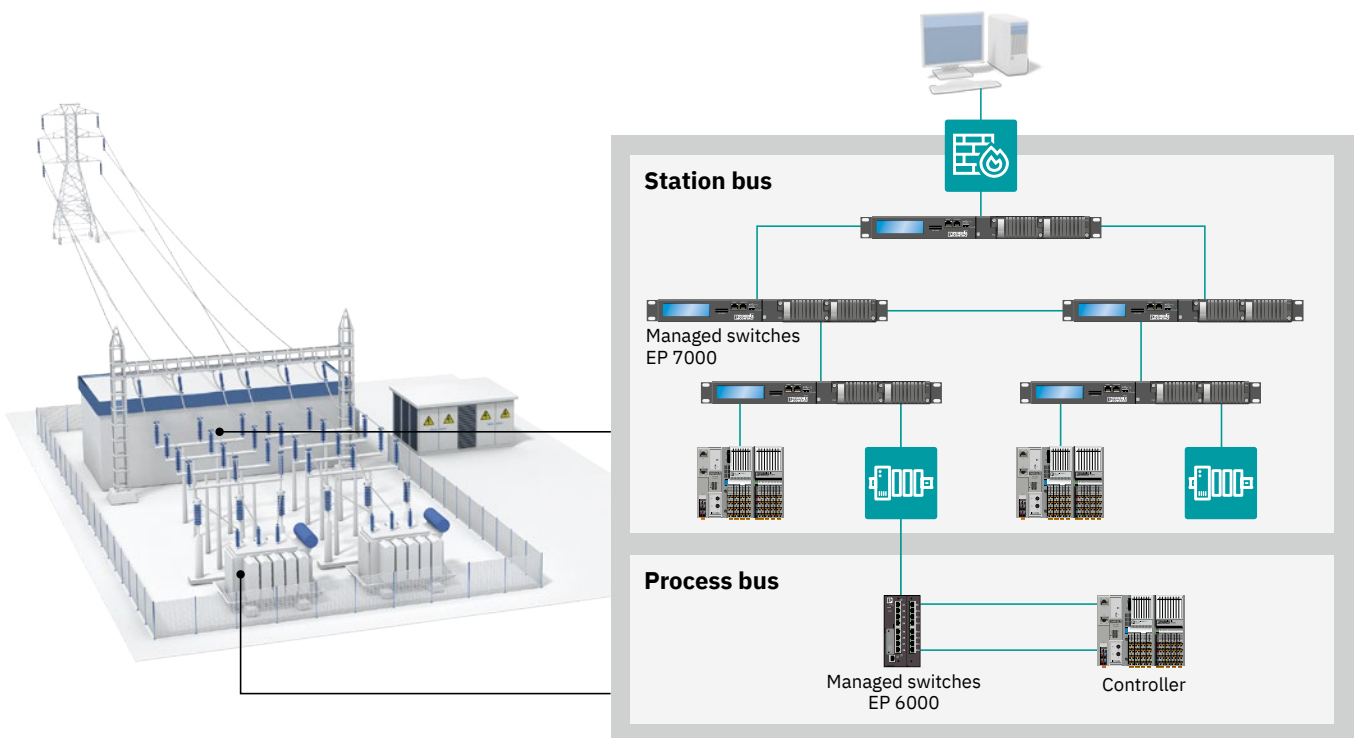


Redundant communication solution for secure data transmission to the hub

Demanding environments

For energy and infrastructure applications, network components have to withstand extreme conditions. The raptor switches from Phoenix Contact comply with IEC 61850 and IEEE 1613 and feature particularly high resistance to interference, temperatures from -40 to +85°C, as well as shock and vibration.

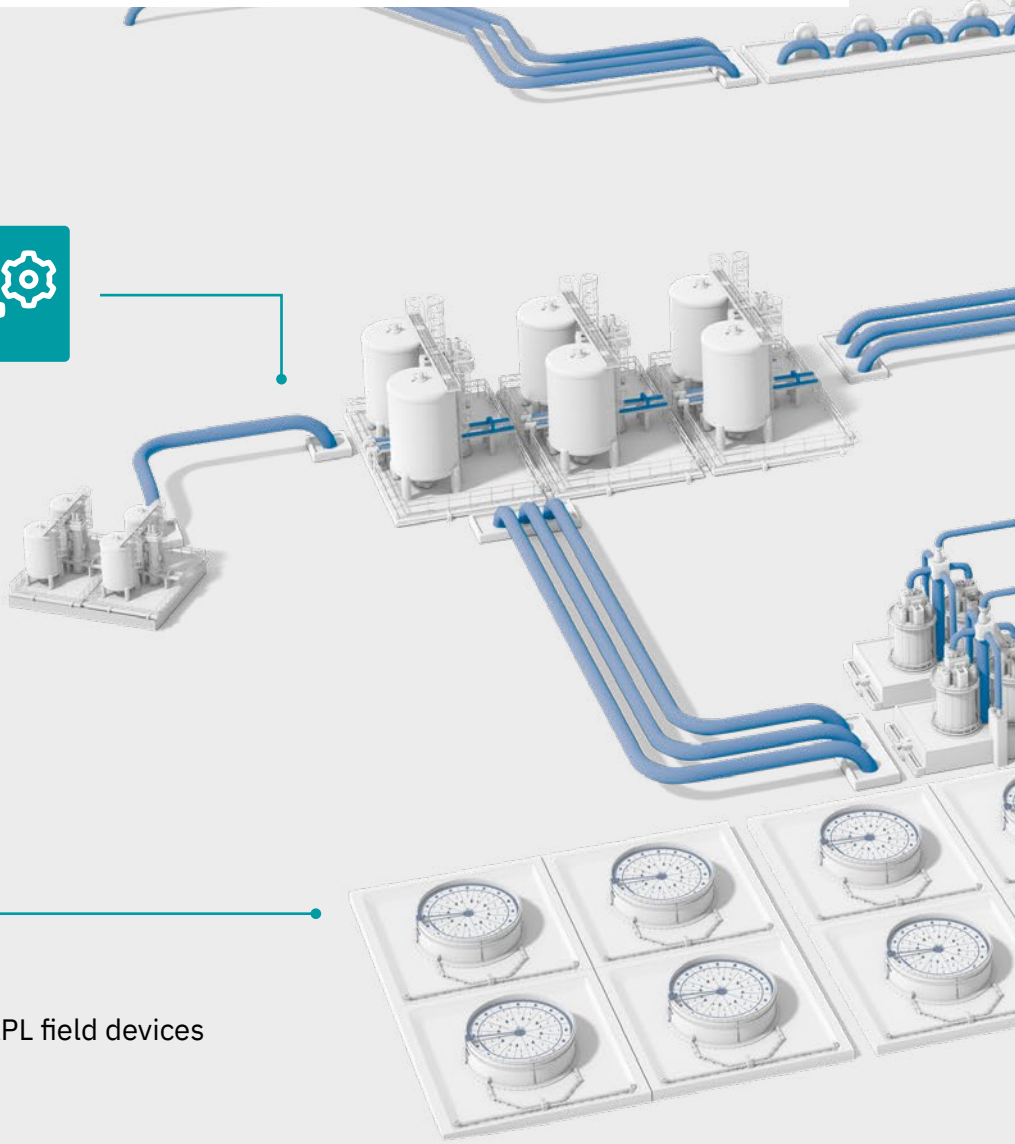
> More information on robust managed switches starting on page 32

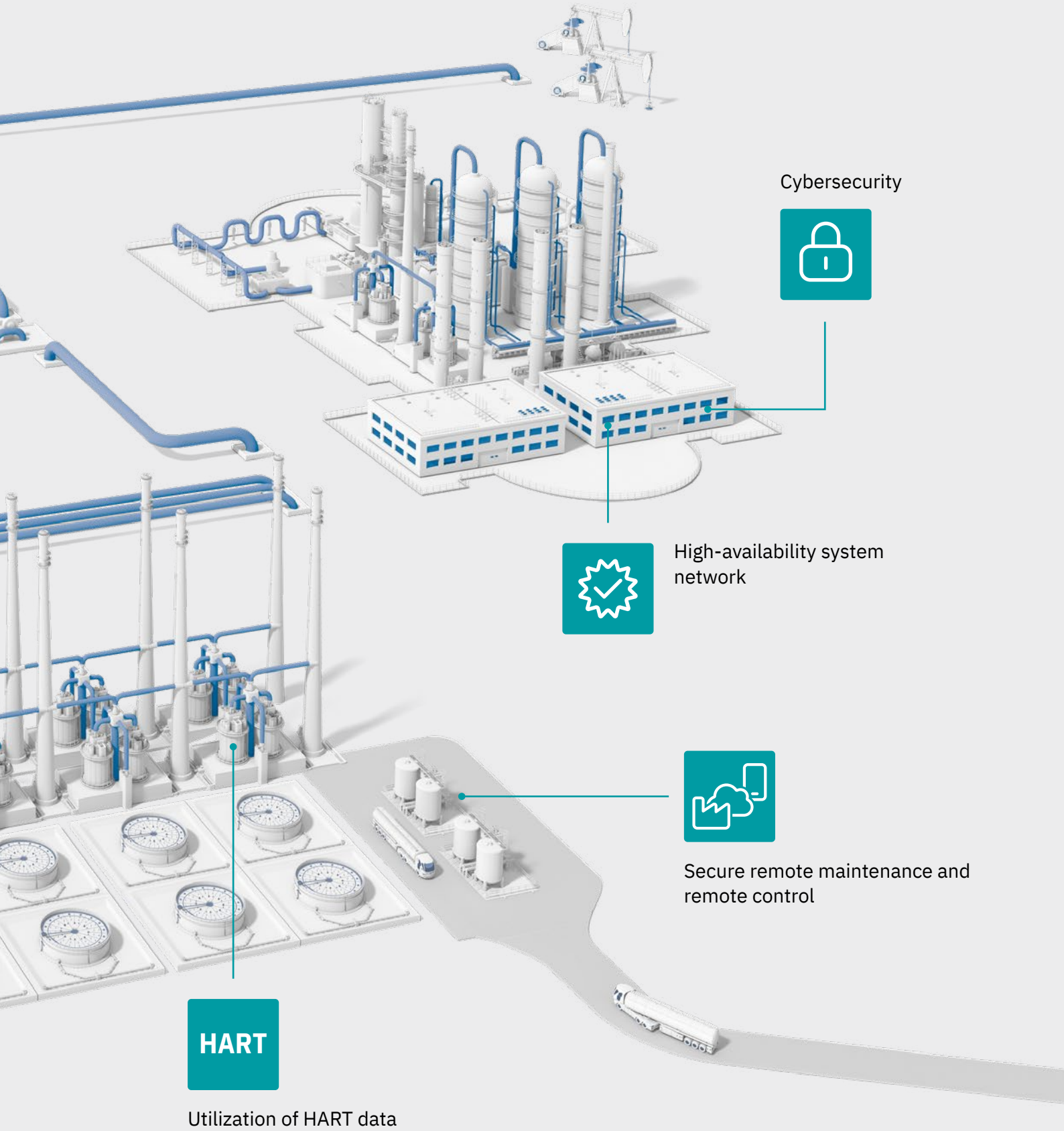


Raptor switches have been developed for use in substations

Networked process plant

Transparent communication from the sensor to the control room is a prerequisite for optimum control of continuous processes in process engineering plants. Robust, high-availability, and secure Ethernet networks are therefore the basis for communication in modern process plants. Secure protection against unauthorized access by people or malware is a must. Phoenix Contact offers industrial Ethernet solutions and components for high-performance and secure networking of process plants.



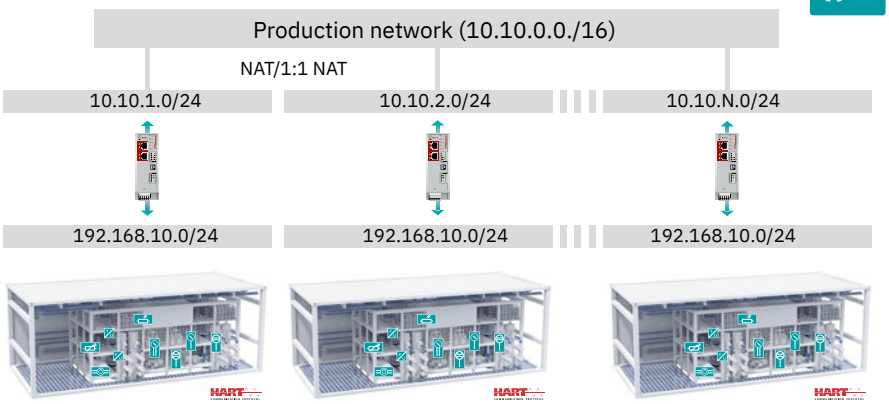

Cybersecurity
High-availability system network
Secure remote maintenance and remote control
HART
Utilization of HART data

Solutions for process networks

Solution to IP address conflicts

Modular system components have permanently configured IP addresses. Conflicts can arise during integration into overlapping networks. Instead of laboriously adapting the IP addresses, NAT switches and mGuard routers simply translate the internal address ranges into the desired range of the automation network.

> More information on NAT switches starting on page 28 and on mGuard security routers starting on page 58

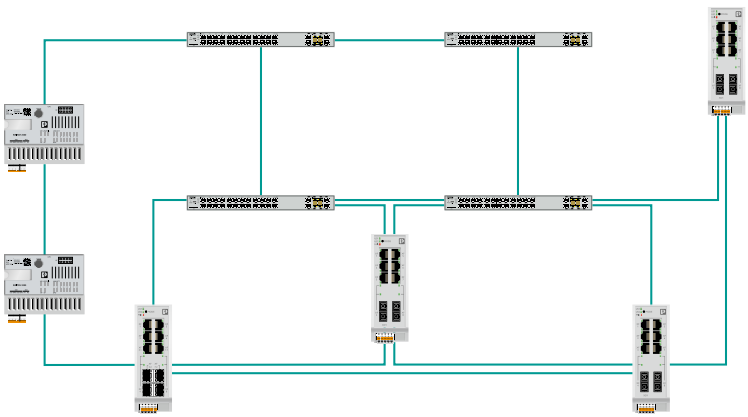


Access to system parts with the same IP addresses, thanks to 1:1 NAT function

Rapid Spanning Tree for high-availability systems

RSTP is a standardized redundancy method (IEEE 802.1D-2004) which is supported by virtually all managed switches from Phoenix Contact. The redundancy method supports ring and tree topologies and meshed networks. Special extensions include Fast Ring Detection for faster switching times and Large Tree Support for networks with up to 57 devices.

> More information on managed switches starting on page 28

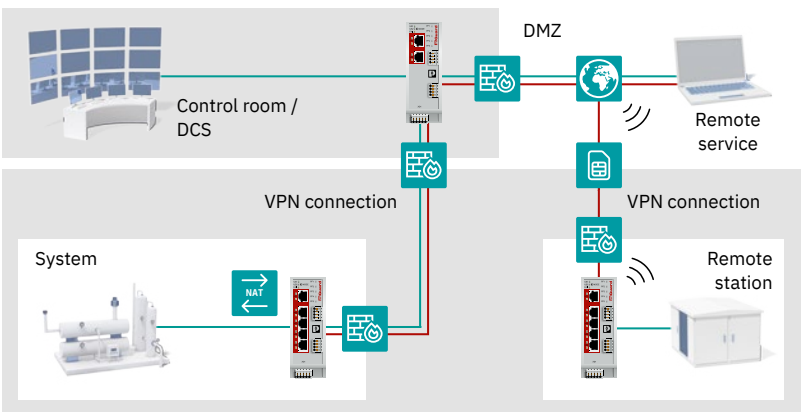


RSTP redundancy for high network availability

Cybersecurity

The mGuard firewall routers securely protect your network against the many dangers associated with increased networking. Reliably protect your system parts against unauthorized access by using secure VPN connections with an integrated firewall. The central management software enables the configuration, maintenance, and administration of a large number of installed mGuard firewall routers.

> More information on mGuard security routers starting on page 58

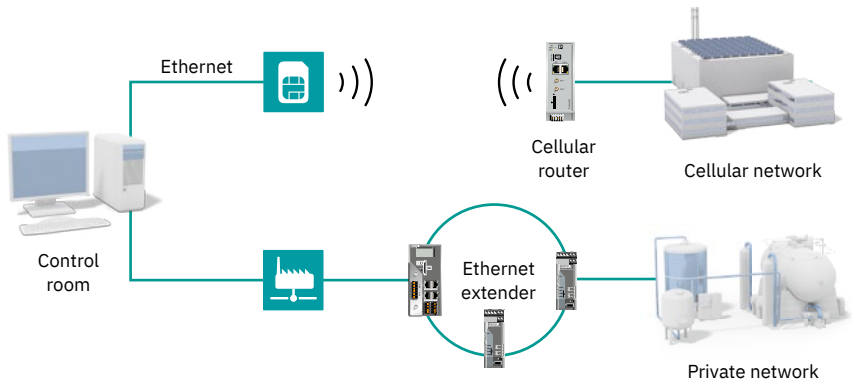


Protection of process plants with mGuard technology

Remote communication

Various communication methods are available for data transmission in remote or large networks and for monitoring systems all over the world. Communicate wirelessly at high speed via cellular networks. Access remote network devices via the telephone network, which is available worldwide, or use two-wire in-house cables for transmission speeds of up to 30 Mbps.

More information on remote communication starting on page 62



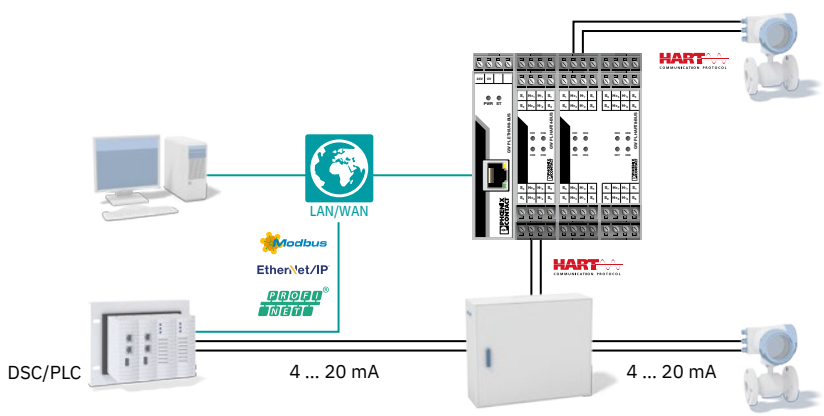
Remote communication via cellular communication and private networks

Utilization of HART data

HART

Ethernet HART multiplexers are an easy and cost-effective option for converting HART signals into Ethernet-based protocols. You can connect up to 40 HART devices via your own HART master. This enables communication at Ethernet speed. The modular design provides a scalable solution for modern distributed control systems and phased roll-outs.

More information on HART multiplexers on page 68

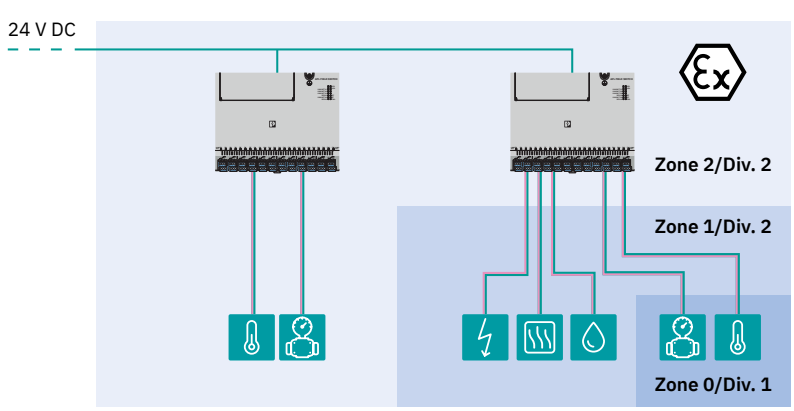


HART multiplexers can also be easily retrofitted in existing systems

Integration of APL field devices

Ethernet-APL enables the direct two-wire Ethernet connection of sensors and field devices in hazardous areas. With Ethernet-APL switches from Phoenix Contact, you can integrate APL devices seamlessly into existing networks and access field data directly. The technology features a range of up to 1,000 m at 10 Mbps and meets explosion protection requirements.

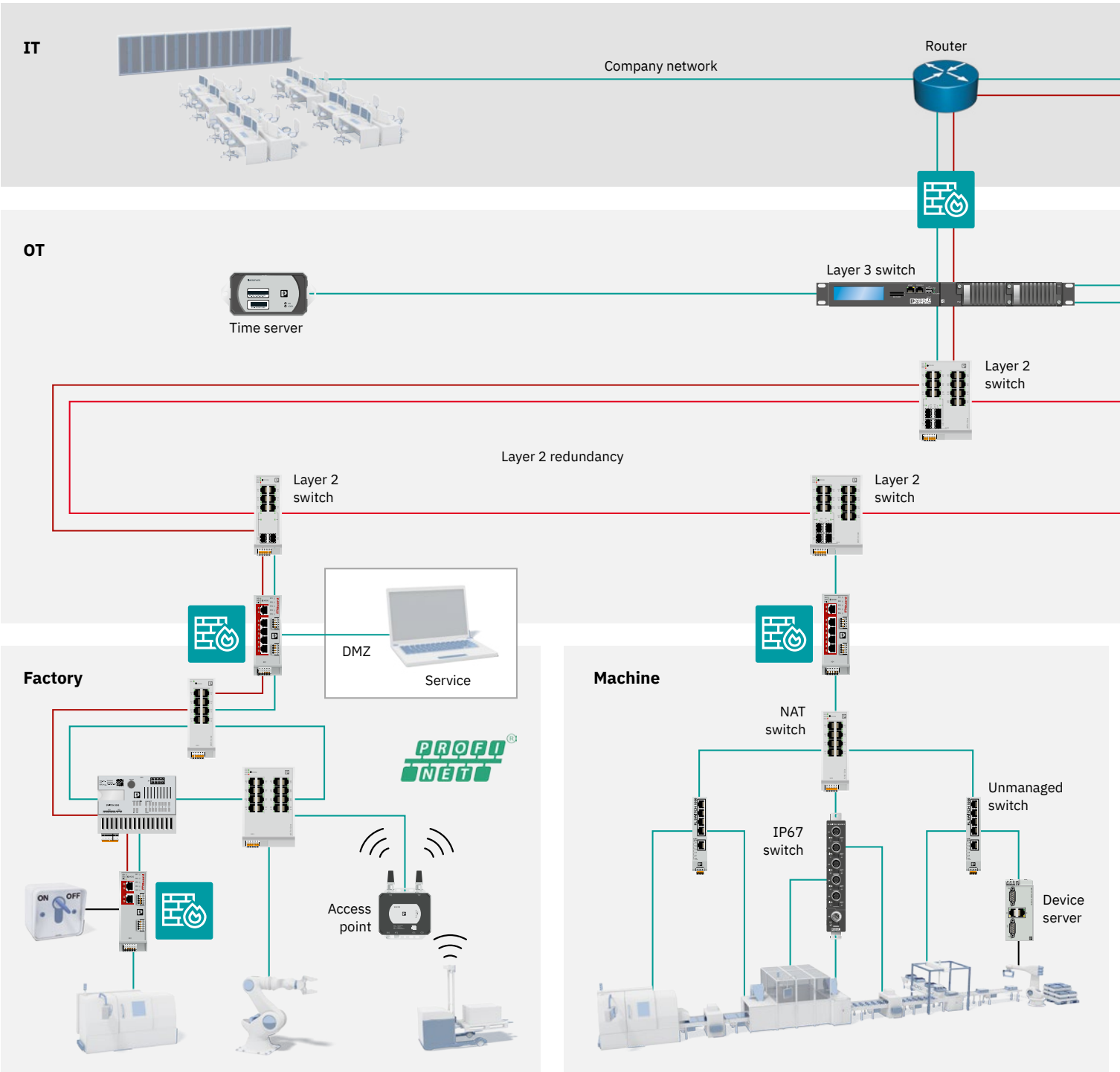
More information on managed switches for state-of-the-art communication technologies starting on page 30.

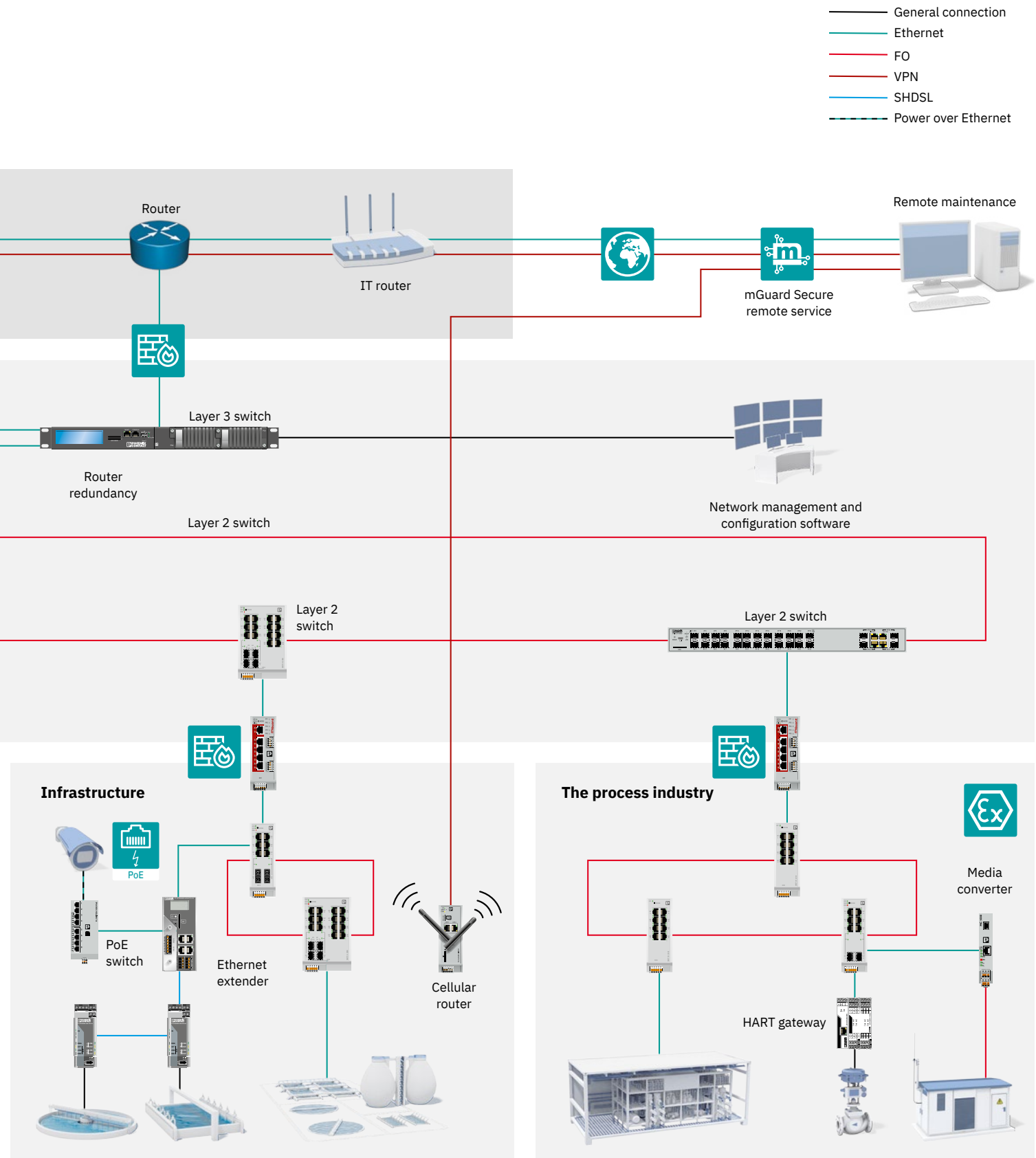


Two-wire Ethernet connection of devices in the Ex area

How to set up your network reliably

Whether for factory, infrastructure, or process industry applications – you need the right network concept and the right components for a highly productive system. Starting with a high-performance and secure connection to the company network, through redundant, failsafe connections for critical applications, to firewalls and solutions for communication with remote locations, you will find the right solution for your network at Phoenix Contact. We will be happy to advise you on how best to set up your network and which components you will need for this.




General connection
Ethernet
FO
VPN
SHDSL
Power over Ethernet
Router
IT router
Remote maintenance
mGuard Secure remote service
Layer 3 switch
Router redundancy
Network management and configuration software
Layer 2 switch
Layer 2 switch
Layer 2 switch
Infrastructure
PoE
PoE switch
Ethernet extender
Cellular router
The process industry
Media converter
HART gateway

Media converters for Ethernet networks

For high-level immunity to interference and long transmission ranges in industrial applications, media converters transparently convert Ethernet data to fiber optics. Depending on the device and cable, they bridge distances of up to 80 km at data rates of up to 1 Gbps.

Choose among the range of functions suitable for your application and various fiberglass interfaces. The unique mounting accessories also offer particularly flexible installation options.

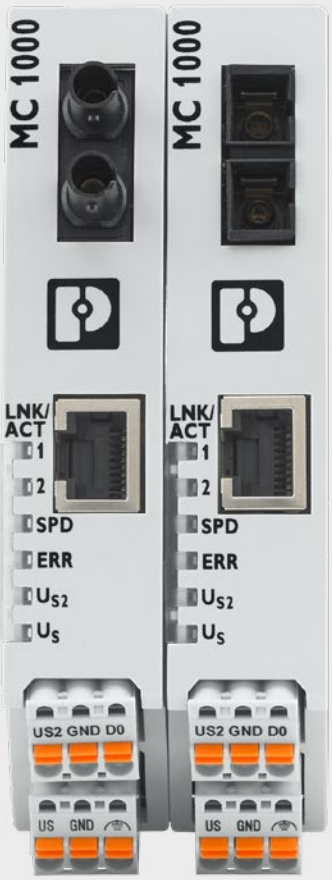
Web code: #3391

Your advantages

- Broad portfolio for every application
- Gigabit communication – ideal for high data throughput applications
- Compact design and flexible installation
- Low latency for applications with real-time protocols
- Redundant power supply

For basic requirements

The series MC 1000 Ethernet media converters are designed for applications with basic requirements. They offer you simple and cost-effective integration of fiber optic technology into your industrial Ethernet networks.



For demanding industrial environments

The MC 1000T media converters meet advanced requirements from applications in demanding industrial environments. The devices are equipped with a metal housing and feature, among other things, an extended temperature range and a redundant power supply. Additional DNV approval enables use in shipbuilding.

With special approvals

The MC 1000E series media converters in this category are suitable for applications with requirements for special approvals. These include potentially explosive areas and power supply and distribution applications. The approval package with IECEx, ATEX, UL HazLoc, as well as IEC 61850 and IEEE 1613 makes the devices ready for worldwide use.

Product overview – Ethernet media converters

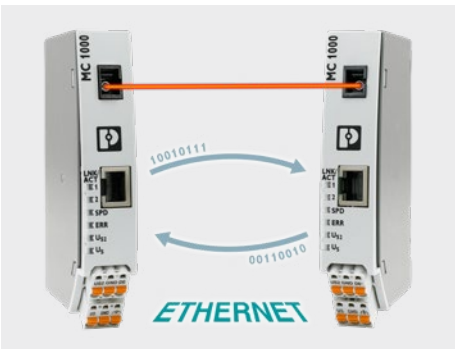
	FO connection	Range	Data rate	Special features	Type	Item no.
MC 1000 – media converters for applications with basic requirements						
Temperature range: -10°C ... +60°C, for an easy introduction to FO technology						
	MM SC	Up to 10 km	10/100 Mbps	• Automatic switching between store-and-forward and cut-through mode • Short latency times for real-time protocols • Link Fault Pass Through (LFPT) – activated via DIP switch	MC 1000-MM SC	1329817
	MM ST				MC 1000-MM ST	1329818
	MM LC				MC 1000-MM LC	1329819
	SM SC	Up to 20 km			MC 1000-SM20 SC	1329820
	SM ST				MC 1000-SM20 ST	1329821
	MM WDM A	Up to 10 km			MC 1000-MM WDM A	1329822
	MM WDM B				MC 1000-MM WDM B	1329823
	MM SC		10/100/1000 Mbps		MC 1100-MM SC	1330888
	SFP	Depending on module			MC 1100-SFP	1330903
MC 1000T – media converters for applications in demanding industrial environments						
Temperature range: -40°C ... +75°C, robust metal housing, shipbuilding approval, redundant power supply						
	MM SC	Up to 10 km	10/100 Mbps	• Automatic switching between store-and-forward and cut-through mode • Short latency times for real-time protocols • Link Fault Pass Through (LFPT) – activated via DIP switch • Redundant power supply • Digital output for reading out alarm messages • DNV-GL approval	MC 1000T-MM SC	1329827
	MM ST				MC 1000T-MM ST	1330244
	MM LC				MC 1000T-MM LC	1330259
	SM SC	Up to 20 km			MC 1000T-SM20 SC	1330262
	SM SC	Up to 40 km			MC 1000T-SM40 SC	1330276
	SM ST	Up to 20 km			MC 1000T-SM20 ST	1330282
	SM WDM A	Up to 40 km			MC 1000T-SM40 WDM A	1330293
	SM WDM B				MC 1000T-SM40 WDM B	1330296
	MM WDM A	Up to 10 km			MC 1000T-MM WDM A	1330494
	MM WDM B				MC 1000T-MM WDM B	1330509
	SFP	Depending on module	10/100/1000 Mbps		MC 1100T-SFP	1330902
	MM SC	Up to 10 km			MC 1100T-MM SC	1330900
	SM SC	Up to 20 km			MC 1100T-SM20 SC	1330898

Product overview – serial media converters

	FO connection	Range	Data rate	Special features	Type	Item no.
MC 1000E – media converters for applications with requirements on special approvals						
Temperature range: -40°C ... +75°C, robust metal housing, extended approval package, redundant power supply						
	MM SC	Up to 10 km	10/100 Mbps	• Automatic switching between store-and-forward and cut-through mode • Short latency times for real-time protocols • Link Fault Pass Through (LFPT) – activated via DIP switch • Redundant power supply • Digital output for reading out alarm messages • Increased resistance to EMI • DNV-GL, ATEX, IECEx, and UL HazLoc approval • IEC 61850 and IEEE 1613 for applications in the energy sector	MC 1000E-MM SC	1330507
	MM ST				MC 1000E-MM ST	1330504
	MM LC				MC 1000E-MM LC	1330611
	SM SC	Up to 20 km			MC 1000E-SM20 SC	1330728
	SM SC	Up to 40 km			MC 1000E-SM40 SC	1330725
	SM ST	Up to 20 km			MC 1000E-SM20 ST	1330723
	SM LC	Up to 40 km			MC 1000E-SM40 LC	1330722
	SM WDM A				MC 1000E-SM40 WDM A	1330885
	SM WDM B				MC 1000E-SM40 WDM B	1330892
	MM WDM A	Up to 10 km			MC 1000E-MM WDM A	1330588
	MM WDM B				MC 1000E-MM WDM B	1330890
	SFP	Depending on module	10/100/1000 Mbps		MC 1100E-SFP	1331375
	MM SC	Up to 10 km			MC 1100E-MM SC	1330896
	SM SC	Up to 20 km			MC 1100E-SM20 SC	1331377

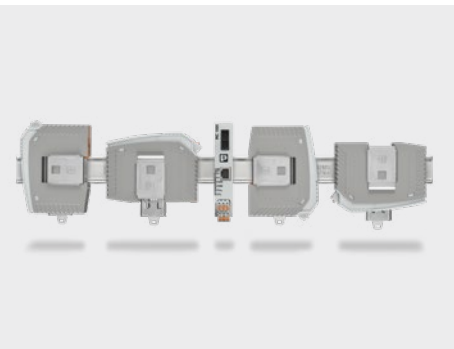
For time-critical applications

The MC 1000, MC 1000T, and MC 1000E series devices switch automatically between standard store-and-forward mode with auto negotiation and cut-through operating mode. This enables particularly low latencies to be achieved, ideal for applications with time-critical Ethernet protocols such as PROFINET IRT, Powerlink, EtherCAT, and Sercos lll.



One fiber, numerous possibilities

Media converters with a WDM interface enable a full duplex FO connection with just one FO fiber. This makes the devices ideal for rotating applications. With the WDM media converters, it is possible to connect optical slip rings using a single fiber. They are several times more cost-effective than slip rings with multiple fibers.



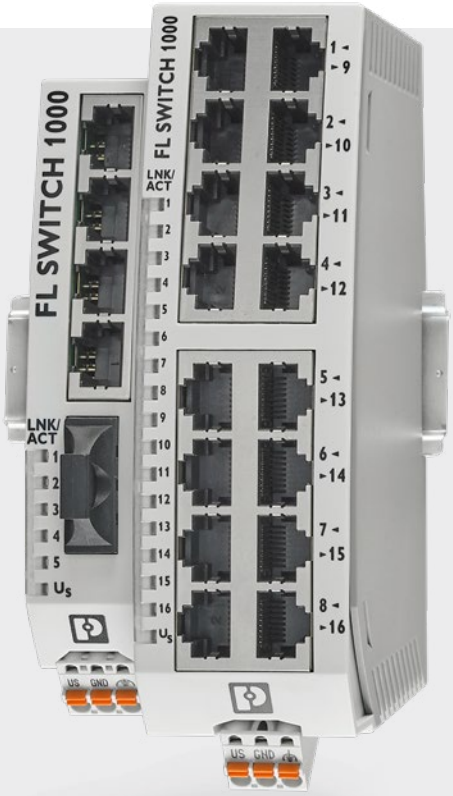
Flexible installation

Special mounting accessories enable the devices to be mounted flat on the DIN rail to save space. This means that the devices can also be used in small and flat control cabinets. The outlet directions of the connections can be selected as required. Status LEDs on the front and side show connection statuses at a glance.

Unmanaged switches

Unmanaged switches from Phoenix Contact stand out thanks to their standard functions, variable number of ports, and various designs. With a high level of immunity and a wide temperature range, they are entirely suitable for continuous operation in industrial applications. Select the right switch for your application.

Web code:
#1550



For standard applications

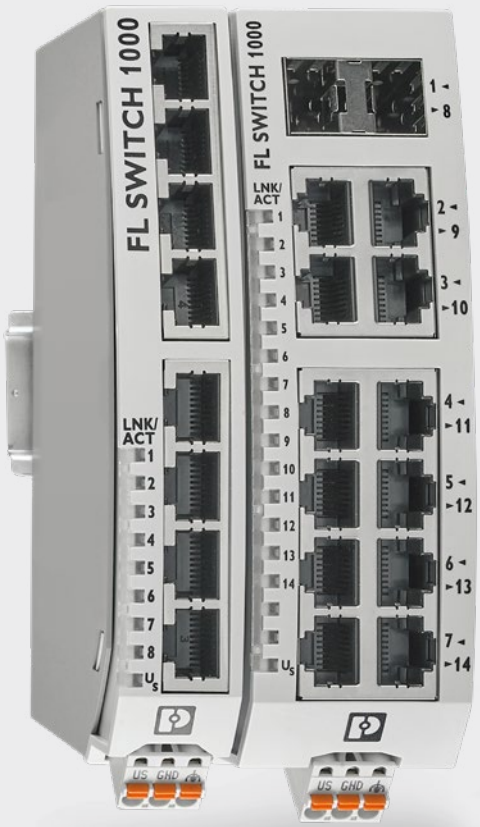
The 1000N series unmanaged switches feature compact designs and flexible installation options. The 1100N switch versions also feature transmission speeds in the Gigabit range. The prioritization of data traffic ensures a more stable network and increases system availability.

For building automation

The 1100 series also includes versions with a suitable design for building automation. Their DIN rail-mount format in accordance with DIN 43880, means that they are specifically designed for use in building distribution boards.

Your advantages

- Auto negotiation and autocrossing ensure easy network creation and expansion
- Gigabit versions for high data throughput
- Electrical isolation and fiber optic versions for failure-free operation in industrial environments
- Quality of Service for the prioritization of automation protocols



For harsh ambient conditions

Thanks to the extended temperature range, the 1000NT series is designed for use in very demanding applications for the oil and gas industry, shipbuilding, and other outdoor applications. Fiberglass versions also enable long transmission distances.

For field installation

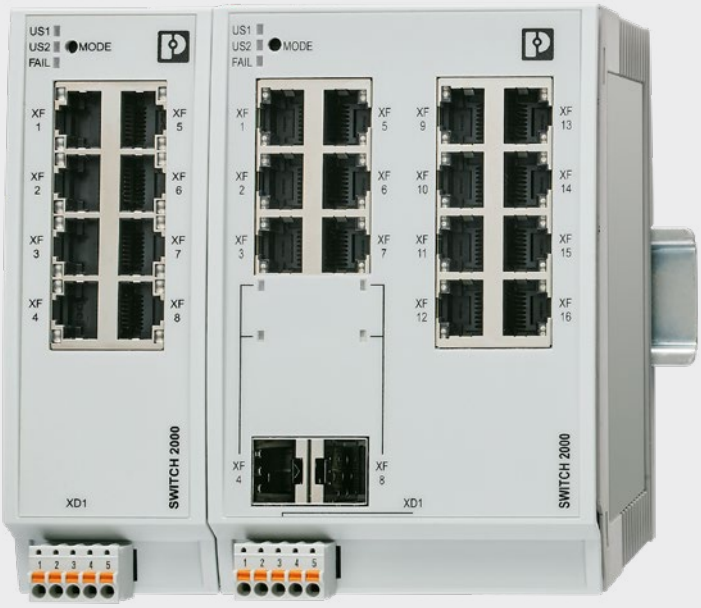
With IP65/IP66/IP67 degrees of protection and M12 connection technology, the 1600 and 1700 series devices are particularly resistant to environmental influences and mechanical strain. The use of filtering and prioritization mechanisms ensures consistent behavior in the network. The use of filtering and prioritization mechanisms ensures consistent behavior in the network.

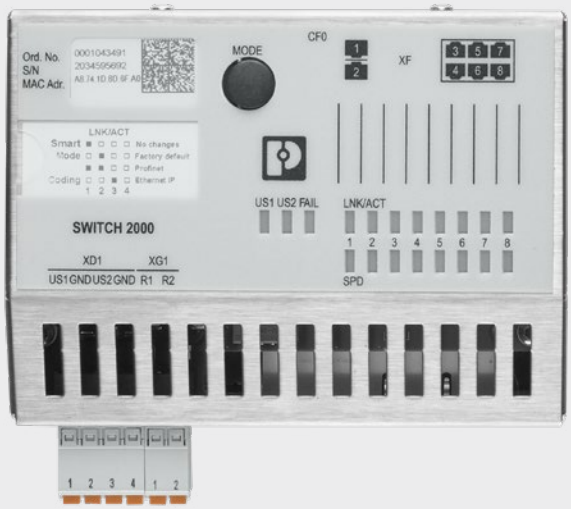
Managed automation switches

Communication in automation networks differs from communication in company networks in several key aspects. The switches must be tailored to the specific requirements of industrial environments.

Phoenix Contact provides universal 2000 series managed switches tailored to your system with an optimum performance spectrum for standard and PROFINET applications – you can select the appropriate design, approvals, and connections for your needs.

Web code: #1555





For standard applications

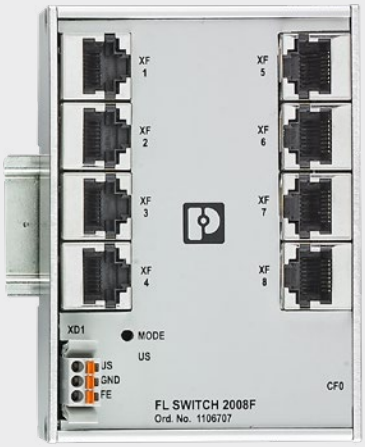
The 2000 series Managed Switches offer clear configuration and diagnostics options as well as automatic error detection and troubleshooting. In addition to the extended scope of functions, the 2200 and 2300 versions enable communication via fiberglass as well as approvals for the process industry and maritime sector. The NAT versions combine switching and routing in just one device.

For flat control cabinets

With their low depth and downward port outlet direction, the FL SWITCH 2400 and 2500 versions are particularly suitable for use in flat control cabinets. The devices with eight or 16 ports can also be used in extreme ambient conditions due to their robust metal housing.

Your advantages

- Easy integration into existing networks and flexible redundancy for all topologies thanks to the RSTP standard
- High availability with fast redundancy switch-over by means of Fast Ring Detection and MRP
- Diagnostics and analysis options thanks to integrated software functions
- Certified in accordance with IEC 62443-4-1 and IEC 62443-4-2



For flat control cabinets

The FL SWITCH 2008F provides the proven functions of the FL SWITCH 2000 family in tight spaces. Featuring an extremely flat design, the eight-port device with forward port outlet direction can be used in very flat control cabinets.

For field applications

The FL SWITCH 2600 and 2700 versions are available for applications directly in the field. The robust housings enable mounting on a profile or on the wall and support classic M12 and M12 push-pull connections which makes them extremely flexible in application. Moreover, a redundant power input/output also enables scalable networks.

Managed switches for the latest communication technologies

New technologies such as TSN, SPE, and Ethernet-APL are required to control large volumes of data and operate real-time-critical applications in a convergent network right down to the field level. Discover our portfolio of state-of-the-art switches for the direct integration of sensors and actuators into the Ethernet network with SPE/APL and the realization of real-time capable Ethernet networks with TSN.

Web code: #1555

For Time-Sensitive Networking

With innovative TSN mechanisms, the FL SWITCH TSN 2300 increases the performance, robustness and availability of Ethernet networks. They support all relevant functions for use in PROFINET TSN and CC-Link IE TSN applications – such as precise time synchronization, frame preemption, and scheduled traffic/ time-aware shaping.

Your advantages

- SPE and Ethernet-APL enable end-to-end Ethernet communication right down to the sensor level
- TSN enables real-time and deterministic data transmission for complex automation networks
- The managed switches have the proven FL SWITCH-2300 features
- Setup of a future-proof network infrastructure

For Single Pair Ethernet

Single Pair Ethernet (SPE) enables consistent IP-based communication down to the field level. Transmission of Ethernet data and the power supply via a single pair of wires. The SWITCH 2303-8SP1 devices support the 10BASE-T1L standard and enable long distances of up to 1,000 m.

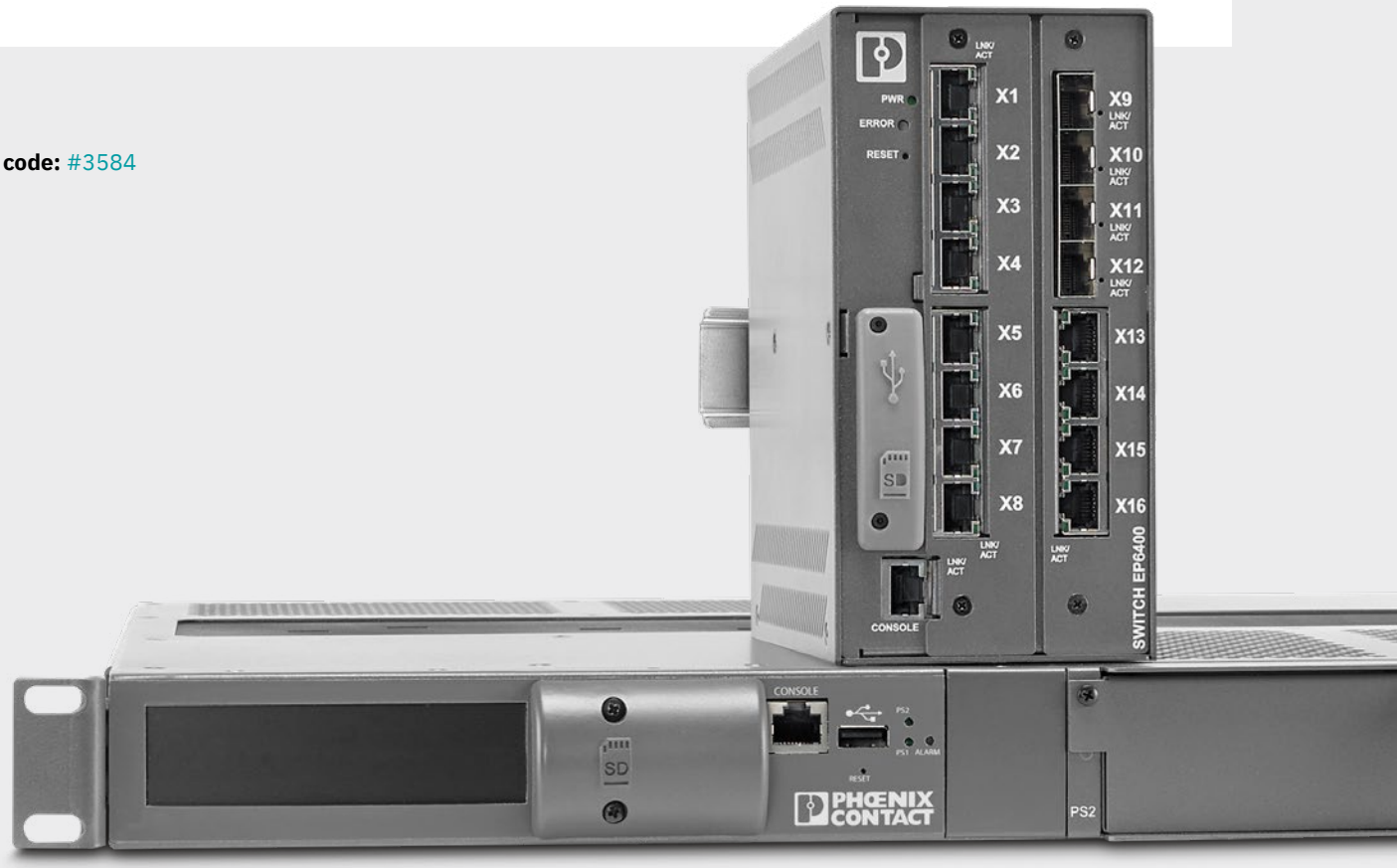
For Ethernet-APL

The APL switch connects sensors and field devices that communicate via two-wire Ethernet (10BASE-T1L, Ethernet-APL) to the system's Ethernet network in the Ex zones. This network can be used for process control and/or monitoring and diagnostics.

Managed switches for power plants

The Raptor portfolio features particularly high performance and availability for demanding applications in areas such as power supplies and critical infrastructure. The EP series modular managed switches have been specially designed for robust networks and ensure efficient data communication and maximum operational safety.

Web code: #3584

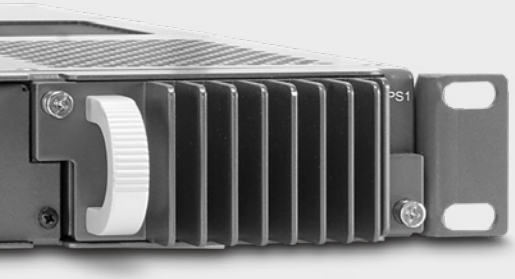


For demanding applications

The EP series managed switches are ideal for demanding applications in the energy sector. They ensure reliable operation even under extreme ambient conditions. The portfolio meets the strict requirements of IEC 61850-3 and IEEE 1613 and feature comprehensive safety functions. With their modular design, the switches can be adapted flexibly to different requirements.

Your advantages

- Reliable operation under extreme conditions with IEC 61850 and IEE 1613 certification
- Support of partner applications for network management, specific fields of application, and security
- Flexible 19" rack or DIN rail mounting
- High connection density and diverse selection of communication modules



Overview of switches

	Unmanaged switches	Managed switches		
	1000/1100	**2000/2100**	**2200/2300/ 2400/2500**	**2600/2700**
Port speed (Mbps)	10/100/(1000)	10/100/(1000)	10/100/(1000)	10/100/(1000)
Alarm contact / alarm output	– / –	– / –	(●) / (●)	– / –
Filter functions				
Quality of Service: Class of Service / DSCP	● / (●)	● / ●	● / ●	● / ●
Static VLANs	–	●	●	●
Multicast filters: IGMP snooping / querier	–	●	●	●
Traffic delimiter	–	●	●	●
Precision Time Protocol (PTP)	–	–	–	–
TSN features	–	–	–	–
Management functions				
Role-based user management (LDAP / Radius)	–	●	●	●
Port configuration	–	●	●	●
IP configuration: BootP/DHCP/DCP	– / – / –	● / ● / –	● / ● / ●	● / ● / ●
Command Line Interface (CLI)	–	●	●	●
Time synchronization: SNTP client / server	– / –	● / –	● / –	● / –
Diagnostic functions				
Port statistics and utilization	–	●	●	●
SNMP (v1 / v2 / v3)	–	●	●	●
Event messages: Syslog / SNMP traps	– / –	● / ●	● / ●	● / ●
N:1 port mirroring	–	●	●	●
Link Layer Discovery Protocol (LLDP)	–	●	●	●
Redundancy functions				
Rapid Spanning Tree Protocol (RSTP)	–	●	●	●
Fast Ring Detection / Large Tree Support	– / –	– / –	● / ●	● / ●
Extended ring redundancy	–	–	–	–
MRP manager / client	– / –	– / ●	● / ●	● / ●
Link aggregation: Static trunking / LACP	– / –	– / –	● / ●	● / ●
Security functions				
Port security: MAC-based / IEEE 802.1x	–	–	●	●
Certified in accordance with IEC 62443-4-2	–	●	●	●
Layer 3 functions				
Routing / NAT	– / –	– / –	– / –	– / –
Router redundancy (VRRP)	–	–	–	–
Automation protocols				
PROFINET: Conformance class / PN device	(A) / –	A / –	B / ●	B / ●
Diagnostics via Modbus/TCP	–	–	–	–
Approvals / certificates				
Maritime / Ex approvals / IEC 61850	(●) / (●) / -	– / – / –	(●) / (●) / –	– / – / –

– not available, ● available, (●) available in selected models

TSN 2300	**SPE 2300**	**APL 2200**	**5900**	**NAT 2000/2200/2300**	**EP 4000/5000**	**EP 6000/7000**
10/100/1000	10/100/1000	10/100/1000	10/100/1000/10000	10/100/(1000)	10/100/1000/10000	10/100/1000/10000
– / ●	– / –	● / ●	– / –	– / (●)	● / ●	● / ●
● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	–	–	●	–	●	●
●	–	–	●	–	–	–
●	●	●	●	●	●	●
●	●	●	●	●	●	●
● / ● / ●	● / ● / ●	● / ● / ●	● / ● / ●	● / ● / (●)	– / ● / –	– / ● / –
●	●	●	●	●	●	●
● / –	● / –	● / –	● / –	● / –	● / –	● / ●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
●	●	●	●	●	●	●
● / ●	● / ●	● / ●	● / ●	(●) / (●)	– / –	– / –
–	–	●	–	–	–	–
● / ●	● / ●	● / ●	● / ●	(●) / ●	–	● / ●
● / ●	● / ●	● / ●	● / ●	(●) / (●)	● / ●	● / ●
●	●	●	●	(●)	●	●
–	●	–	–	●	–	–
– / –	– / –	– / –	– / –	● / ●	– / –	● / (●)
–	–	–	–	–	–	●
B / ●	B / ●	B / ●	B / ●	(B) / ●	– / –	– / –
–	–	–	–	–	●	–
– / – / –	– / – / –	– / ● / –	– / – / –	(●) / (●) / –	– / – / ●	– / – / ●

Product overview for unmanaged switches

Characteristics	Copper ports	FO ports	Port speed	Quality of Service	Special features	Item No.
Unmanaged switches for universal use: FL SWITCH 1000N and 1100N						
Supply voltage: 9 V DC ... 32 V DC, 18 V AC ... 30 V AC, temperature range: -10°C ... +60°C						
	5 x RJ45	–	10/100 Mbps	●	–	1085039
	5	–		●	Package with 28 FL SWITCH 1005N	1544302
	4 x RJ45	1 x MM SC		●	–	1084159*
		1 x MM ST		●	–	1085179
		1 x SM SC		●	–	1085214
		1 x SFP		●	–	1085177
	5 x RJ45	2 x SFP		●	–	1085176
	8 x RJ45	–		●	–	1085256
	16 x RJ45	–		●	–	1085255
	5 x RJ45	–	10/100/1000 Mbps	●	Jumbo frames, extended Quality of Service functionality (such as EtherNet/IP™, BACnet)	1085254
	4x RJ45	1 x SFP		●		1085173
	5 x RJ45	2 x SFP		●		1085171
	8 x RJ45	–		●		1085243
	16 x RJ45	–		●		1085219
Robust unmanaged switches for harsh ambient conditions: FL SWITCH 1000NT/1100NT and 1000T/1100T						
Supply voltage: 9 V DC ... 32 V DC, 18 V AC ... 30 V AC, temperature range: -40°C ... +75°C, approvals: DNV/GL, process (ATEX, IECEx, C1D2)						
	5 x RJ45	–	10/100 Mbps	●	–	1085170
	4 x RJ45	1 x SFP		●	–	1085169
	8 x RJ45	–		●	–	1085165
	5 x RJ45	2 x SFP		●	–	1085164
	12 x RJ45	2 x SFP	10/100 Mbps (RJ45), 10/100/1000 Mbps (SFP)	●	–	1249598*
	5 x RJ45	2 x MM SC	10/100/1000 Mbps	●	Jumbo frames, extended Quality of Service functionality (such as EtherNet/IP™, BACnet)	1085163
	8 x RJ45	–		●		1085162

Characteristics	Copper ports	FO ports	Port speed	Quality of Service	Special features	Item no.
Robust unmanaged switches for harsh ambient conditions: FL SWITCH 1000NT/1100NT and 1000T/1100T						
Supply voltage: 9 V DC ... 32 V DC, 18 V AC ... 30 V AC, temperature range: -40°C ... +75°C, approvals: DNV/GL, process (ATEX, IECEx, C1D2)						
	4 x RJ45	1 x SFP	10/100/1000 Mbps	●	Jumbo frame	1343023
	5 x RJ45	2 x SFP		●		1343025
	12 x RJ45	2 x SFP	10/100 Mbps	●	–	1249598
	5 x RJ45	–		●	Conformal coating	1085161
	8 x RJ45	–		●		1085156
	8 x RJ45	–		●	–	1085094
	24 x RJ45	–		●	–	1343027
	8 x RJ45	–	10/100/1000 Mbps	●	Jumbo frame	1085088
	16 x RJ45	–		●		1085115

Characteristics	Mounting type	Width	Designation	Item No.
Mounting accessories for DIN rail devices				
Adapters for panel mounting or flat mounting on the DIN rail, such as for FL SWITCH 1000N(T) series devices				
	Panel mounting	22.5 mm	FL PANEL ADAPTER 22.5	1085488
		40 mm	FL PANEL ADAPTER 40	1085486
	Flat DIN rail mounting	22.5 mm	FL DIN-RAIL ADAPTER 22.5	1085485
		40 mm	FL DIN-RAIL ADAPTER 40	1085484

Characteristics	Copper ports	FO ports	Port speed	Quality of Service	Special features	Item no.
Unmanaged switches with DIN rail-mount format						
Supply voltage: 9 V DC ... 32 V DC, 12 V AC ... 30 V AC, temperature range: 5°C ... 50°C						
	8 x RJ45	–	10/100/1000 Mbps	●	DIN rail-mount design in accordance with DIN 43880	1473643
	4 x RJ45 4 x PoE	–	10/100/1000 Mbps	●		1473642
Unmanaged switches for rack mounting: FL SWITCH 1800 and 1900						
Supply voltage: 120/220 V AC, temperature range: 0°C ... +60°C						
	24 x RJ45	–	10/100 Mbps	●	19" mounting	2891041
		–	10/100/1000 Mbps	●		2891057

* DC supply only

Product overview for unmanaged switches

Characteristics	Copper ports	FO ports	Port speed	Quality of Service	Special features	Item No.
Robust unmanaged switches with IP67: FL SWITCH 1600 and 1700						
Supply voltage: 24 V DC, temperature range: -40°C ... +70°C						
	5 x M12	–	10/100 Mbps	●	With PTCP filter for PROFINET	2700200
	5 x M12	–w	10/100/1000 Mbps	●	Jumbo frames, extended Quality of Service functionality (such as EtherNet/IP™, BACnet)	1386090
	8 x M12	–	10/100 Mbps	●	M12 push-pull, Quality of Service functionality (PROFINET)	1196227
	8 x M12	–	10/100/1000 Mbps	●	M12 push-pull, extended Quality of Service functionality	1196228

Characteristics	Copper ports	FO ports	Port speed	Quality of Service	Special features	Item No.
Unmanaged Power over Ethernet switches: FL SWITCH 1000 PoE						
Supply voltage: 18 V DC ... 57 V DC, extended temperature range: -40°C ... +75°C, IEEE 802.3 af/at (PoE+)						
	4 x RJ45 (PoE) 1 x RJ45	–	10/100 Mbps	●	30 W per port, max. 120 W	2891064
	2 x RJ45 (PoE)	2 x SFP	10/100/1000 Mbps	●	52 V DC ... 57 V DC, 30 W per port, max. 60 W	1026765
	4 x RJ45 (PoE) 1 x RJ45	–		●	30 W per port, max. 120 W	1026937
	4 x RJ45 (PoE) 1 x RJ45	1 x SFP		●		1026932

Characteristics	Copper ports	FO ports	Port speed	Quality of Service	Special features	Item No.
Supply voltage: 18 V DC ... 57 V DC, temperature range: -10°C ... +60°C, IEEE 802.3 af/at (PoE+)						
	4 x RJ45 (PoE), 1 x RJ45	–	10/100/1000 Mbps	●	30 W per port, max. 120 W, electrical isolation, IEEE 802.3 af/at (PoE+)	1102077
	8 x RJ45 (PoE)	–		●		1102079
	8 x RJ45 (PoE)	–	10/100 Mbps	●	Max. 120 W, ultra-narrow housing	1343031
Supply voltage: 20 V DC ... 57 V DC, extended temperature range: -40°C ... 70°C, IEEE 802.3 af/at (PoE+)						
	8 x RJ45 (PoE+)	2 x SFP	10/100/1000 Mbps	●	–	1467018
Supply voltage: 46 V DC ... 57 V DC, temperature range: -10°C ... +60°C, IEEE 802.3 af/at/bt (PoE++)						
	8 x RJ45 (PoE++)	–	10/100 Mbps	●	90 W per port, max. 240 W	1342622
		–	10/100/1000 Mbps	●		1343034
	5 x RJ45 (PoE++)	2 x SFP	10/100/1000 Mbps	●		1342621
Supply voltage: 18.7 V DC ... 30.5 V DC, extended temperature range: -40°C ... +50°C, IEEE 802.3 af/at (PoE+)						
	8 x M12 (PoE+)	-	10/100/1000 Mbps	●	Jumbo frames up to 9600 bytes	1119230

Product overview for managed switches

Character-istics	Copper Ports	FO ports	Combo ports	Port speed	Special features	Designation FL SWITCH...	Item no.
Intelligent switches for the machine: FL SWITCH 2000 and 2100							
Supply voltage: 18 V DC ... 32 V DC, temperature range: 0°C ... +60°C, IP20, front port outlet direction, IEC 62443-4-2 certified							
	5 x RJ45	–	–	10/100 Mbps	–	2005	2702323
	8 x RJ45	–	–		–	2008	2702324
					Flat design	2008F	1106707
	16 x RJ45	–	–		–	2016	2702903
	5 x RJ45	–	–	10/100/1000 Mbps	–	2105	2702665
	8 x RJ45	–	–		–	2108	2702666
	16 x RJ45	–	–		–	2116	2702908

Characteristics	Mounting type	Width	Designation	Item No.
Mounting accessories for DIN rail devices				
Adapters for panel mounting or flat mounting on the DIN rail, such as for FL SWITCH 2000 series devices				
	Mounting panel	45 mm	FL PANEL ADAPTER 45	1456055
		45 mm	FL DIN-RAIL ADAPTER 45	1456045

Character-istics	Copper Ports	FO ports	Combo ports	Port speed	Special features	Designation FL SWITCH...	Item no.
Managed switches for universal use: FL SWITCH 2200 and 2300							
Supply voltage: 12 V DC ... 57 V DC (redundant), temperature range: -40°C ... +70°C, IP20, front port outlet direction, PROFINET Class B Approvals: DNV/GL, BV, ABS, LR, RINA, NK, IECEx, ATEX zone 2, IEC 62443-4-2 certified							
	5 x RJ45	–	–	10/100 Mbps	–	2205	2702326
	8 x RJ45	–	–			2208	2702327
	8 x RJ45	–	–		Conformal coating	2208C	1095627
	7 x RJ45	1 x MM SC	–		–	2207-FX	2702328
	7 x RJ45	1 x SM SC	–			2207-FX SM	2702329
	6 x RJ45	2 x MM SC	–			2206-2FX	2702330
	6 x RJ45	2 x MM SC	–		Conformal coating	2206C-2FX	1095628
	6 x RJ45	2 x SM SC	–		–	2206-2FX SM	2702331
	6 x RJ45	2 x MM ST	–			2206-2FX ST	2702332
	6 x RJ45	2 x SM ST	–			2206-2FX SM ST	2702333
	6 x RJ45	2 x SFP	–			2206-2SFX	2702969
	4 x RJ45	2 x SFP	2 x SFP/RJ45			2204-2TC-2SFX	2702334
	16 x RJ45	–	–			2216	2702904
	14 x RJ45	2 x MM SC	–			2214-2FX	2702905
	14 x RJ45	2 x SM SC	–			2214-2FX SM	2702906
	14 x RJ45	2 x SFP	–			2214-2SFX	1006188
	12 x RJ45	2 x SFP	2 x SFP/RJ45			2212-2TC-2SFX	2702907
	8 x RJ45	–	–	10/100/1000 Mbps		2308	2702652
	6 x RJ45	2 x SFP	–			2306-2SFP	2702970
	4 x RJ45	2 x SFP	2 x SFP/RJ45			2304-2GC-2SFP	2702653
	16 x RJ45	–	–			2316	2702909
	14 x RJ45	2 x SFP	–			2314-2SFP	1006191
	12 x RJ45	2 x SFP	2 x SFP/RJ45			2312-2GC-2SFP	2702910
	8 x RJ45	–	–	10/100 Mbps	PROFINET preset, PROFINET status LEDs, PROFINET certified	2208 PN	1044024
	6 x RJ45	2 x SFP	–			2206-2SFX PN	1044028
	16 x RJ45	–	–			2216 PN	1044029
	14 x RJ45	2 x SFP	–			2214-2SFX PN	1044030
	8 x RJ45	–	–	10/100/1000 Mbps		2308 PN	1009220
	6 x RJ45	2 x SFP	–			2306-2SFP PN	1009222
	16 x RJ45	–	–			2316 PN	1031673
	14 x RJ45	2 x SFP	–			2314-2SFP PN	1031683

Product overview for managed switches

Characteristics	Copper Ports	FO ports	Combo ports	Port speed	Special features	Designation FL SWITCH...	Item no.
Managed switches for use in flat control cabinets: FL SWITCH 2400 and 2500							
Supply voltage: 19.2 V DC ... 32 V DC (redundant), temperature range: -40°C ... +70°C, IP20, downward port outlet direction, PROFINET Class B Approvals: DNV/GL, BV, ABS, LR, RINA, IEC 62443-4-2 certified							
	8 x RJ45	–	–	10/100 Mbps	–	2408	1043412
	16 x RJ45	–	–		–	2416	1043416
	14 x RJ45	2 x SFP	–		–	2414-2SFX	1043423
	8 x RJ45	–	–	10/100/1000 Mbps	–	2508	1043484
	6 x RJ45	2 x SFP	–		–	2506-2SFP	1043491
	4 x RJ45	2 x SFP	2 x SFP/RJ45		–	2504-2GC-2SFP	1088872
	16 x RJ45	–	–		–	2516	1043496
	14 x RJ45	2 x SFP	–		–	2514-2SFP	1043499
	8 x RJ45	–	–	10/100 Mbps	PROFINET preset, PROFINET status LEDs, PROFINET certified	2408 PN	1089133
	8 x RJ45	–	–	10/100/1000 Mbps		2508 PN	1089134
	6 x RJ45	2 x SFP	–			2506-2SFP PN	1089135
	16 x RJ45	–	–			2516 PN	1089205
Robust managed switches with IP67: FL SWITCH 2600 and 2700							
Supply voltage: 12 V DC ... 57 V DC (redundant), temperature range: -40°C ... +70°C, IP67, PROFINET Class B, IEC 62443-4-2 certified							
	8 x M12	–	–	10/100 Mbps	–	2608	1106500
		–	–		PROFINET preset and certified, status LEDs	2608 PN	1106616
		–	–	10/100/1000 Mbps	–	2708	1106615
		–	–		PROFINET preset and certified, status LEDs	2708 PN	1106610

Characteristics	Copper ports	FO ports	Combo ports	Port speed	Special features	Designation FL SWITCH...	Item no.
Managed switches with routing functions: FL NAT 2000							
Supply voltage: 18 V DC ... 32 V DC, temperature range: 0°C ... +60°C, IP20, IEC 62443-4-2 certified							
	8 x RJ45	–	10/100 Mbps	–	FL NAT 2008	–	2702881
Supply voltage: 12 V DC ... 57 V DC, temperature range: -40°C ... +70°C, IP20, Approvals: DNV/GL, BV, ABS, LR, NK, RINA, IECEx, ATEX zone 2, IEC 62443-4-2 certified							
	8 x RJ45	–	10/100 Mbps	Digital alarm output, Fast Ring Detection, Large Tree Support, MRP manager, up to 32 static VLANs, pool-based DHCP server and Option 82	FL NAT 2208	–	2702882
	4 x RJ45	2 x combo ports (SFP or RJ45), 2 x SFP	10/100/1000 Mbps		FL NAT 2304-2GC-2SFP	–	2702981
Managed switches with real-time capability for Time-Sensitive Networking							
Supply voltage: 12 V DC ... 57 V DC, temperature range: -40°C ... +60°C, port outlet direction: front							
	16 x RJ45	–	–	10/100/1000 Mbps	TSN functions (frame preemption, gPTP (IEEE 802.1AS), IEEE 1588v2 (transparent clock), streams (in accordance with PROFINET V2.4))	TSN 2316	1232304
	14 x RJ45	2 x SFP	–	10/100/1000 Mbps		TSN 2314-2SFP	1232302
	12 x RJ45	2 x SFP	2	10/100/1000 Mbps		TSN 2312-2GC-2SFP	1232305
Managed switches for Single Pair Ethernet							
Supply voltage: 20 V DC ... 32 V DC, temperature range: -40°C ... +70°C, PROFINET Class B, IEC 62443-4-2 certified							
	3 x RJ45 8 x SPE	–	–	10/100/1000 Mbps (RJ45) 10 Mbps (SPE)	10BASE T1L, PoDL Power Class 11	2303-8SP1	1278397

Product overview for managed switches

Characteristics	Copper ports	FO ports	Combo ports	Port speed	Special features	Designation FL SWITCH...	Item no.
Managed switches for Ethernet-APL							
Supply voltage: 22 V DC ... 30 V DC (redundant), temperature range: -40°C ... +70°C, approvals: ATEX, IECEx							
	2 x RJ45 2 x SFP 24 x APL	–	–	10/100 Mbps (RJ45) 100/1000 Mbps (SFP) 10 Mbps (APL)	PROFIBUS PA field switch, Ex ia, power class A and B	APL 2224-4A-213-PA	1384244
	2 x RJ45 2 x SFP 24 x APL	–	–		PROFIBUS PA field switch, Ex ia, power class A	FL SWITCH APL 2224-4A-211-PA	1843743
	2 x RJ45 2 x SFP 12 x APL	–	–		Ex ia, power class A	FL SWITCH APL 2212-4A-211	1718555
	2 x RJ45 2 x SFP 12 x APL	–	–		Ex ic, power class A	FL SWITCH APL 2212-4A-221	1718554
Managed switches for infrastructure applications: FL SWITCH 3000 and 4000							
Supply voltage: 24 V DC ... 48 V DC (redundant), extended temperature range: -40°C ... +75°C, IP20							
	5 x RJ45	–	–	10/100 Mbps	-10°C ... +60°C	3005	2891030
		–	–		ATEX, IECEx, C1D2	3005T	2891032
	8 x RJ45	–	–		-10°C ... +60°C	3008	2891031
		–	–			3016	2891058
		–	–		ATEX, IECEx, C1D2	3008T	2891035
	6 x RJ45	2 x MM SC	–			3006T-2FX	2891036
		2 x MM ST	–			3006T-2FX ST	2891037
		2 x SM SC	–			3006T-2FX SM	2891060
	8 x RJ45	2 x SFP	–	10/100 Mbps (RJ45) 1000 Mbps (SFP)		4008T-2SFP	2891062

Characteristics	Copper ports	FO ports	Combo ports	Port speed	Special features	Designation FL SWITCH...	Item no.
Managed Power over Ethernet switches: FL SWITCH 4000 PoE							
Supply voltage: 52 V DC ... 57 V DC, extended temperature range: -40°C ... +75°C, IEEE 802.3 af/at (PoE+), prepared for IEEE 802.3 bt (PoE++)							
	4 x RJ45 (PoE)	1 x SFP	–	10/100 Mbps (RJ45) 1000 Mbps (SFP)	60 W per port, max. 180 W	4000T-4POE-SFP	1026924
	8 x RJ45 (PoE)	2 x SFP				4000T-8POE-2SFP	1026923
	8 x RJ45 (PoE), 4 x RJ45	4 x SFP		10/100/1000 Mbps	60 W per port, max. 240 W	4004T-8POE-4SFP	1026922
Managed switches for rack mounting: FL SWITCH 5900							
Supply voltage: 100 V AC ... 240 V AC (optionally redundant), temperature range: -10°C ... 60°C							
	24 x RJ45	4 x SFP+	–	10/100/1000 Mbps 10 Gbps	TSN functions (Frame preemption, gPTP (IEEE 802.1AS), streams (in accordance with PROFINET V2.4))	5924-4SFP+	1525939
	16 x RJ45	4 x SFP+	8			5916-8GC-4SFP+	1525942
	–	16 x SFP 4 x SFP+	8			5916SFP-8GC-4SFP+	1525943
	–	24 x SFP	4	10/100/1000 Mbps		5924SFP-4GC	1525944
	24 x RJ45	–	4			5924-4GC	1525945
	–	–	–	–	Power supply unit for redundant power supply	5900-P5	1525946

Easy configuration

The managed Switches enable configuration via web browser, SD card, SNMP, CLI, or controller.

Common protocols supported

Phoenix Contact managed switches support functions for use in PROFINET and EtherNet/IP™ applications.

Flexible transmission distance

Thanks to SFP ports and compatible SFP modules, you can adapt the switches to your application and bridge even large distances.

Product overview for managed switches

Characteristics	Copper ports	FO ports	Combo ports	Port speed	Special features	Designation FL SWITCH...	Item no.
Layer 2 switches for power plants: FL SWITCH EP 4200 and 5200							
Supply voltage: 12 V DC ... 48 V DC , temperature range: -40°C ... +85°C, certified in accordance with IEC 61850-3 and IEEE 1613							
	12 x RJ45	4 x SFP	–	10/100/1000 Mbps	Low voltage power supply	EP4212-4SFP-LV	1732181
	8 x RJ45	4 x SFP	–			EP4208-4SFP-LV	1732183
	8 x RJ45	2 x SFP	–			EP4208-2SFP-LV	1732185
	4 x RJ45	4 x SFP	–			EP4204-4SFP-LV	1732189
	4 x RJ45	2 x SFP	–			EP4204-2SFP-LV	1732190
	12 x RJ45	4 x SFP+	–	10/100/1000 Mbps 10 Gbps		EP4212-4TGSFP-LV	1732187
	8 x RJ45	4 x SFP+	–			EP4208-4TGSFP-LV	1732184
	8 x RJ45	2 x SFP+	–			EP4208-2TGSFP-LV	1732188
	4 x RJ45	4 x SFP+	–			EP4204-4TGSFP-LV	1732191
	4 x RJ45	2 x SFP+	–			EP4204-2TGSFP-LV	1732192
Supply voltage: 100 V AC/DC ... 240 V AC/DC , temperature range: -40°C ... +85°C, certified in accordance with IEC 61850-3 and IEEE 1613							
	24 x RJ45	4 x SFP+	–	10/100/1000 Mbps 10 Gbps	High voltage power supply	EP5224-4SFP-HV	1732654
	16 x RJ45	8 x SFP 4 x SFP+	–			EP5216-12SFP-HV	1732656
	8 x RJ45	16 x SFP 4 x SFP+	–			EP5208-20SFP-HV	1732657
	–	24 x SFP 4 x SFP+	–			EP5200-28SFP-HV	1732659
	24 x RJ45	4 x SFP+	–		Low voltage power supply	EP5224-4SFP-LV	1732660
	16 x RJ45	8 x SFP 4 x SFP+	–			EP5216-12SFP-LV	1732662
	8 x RJ45	16 x SFP 4 x SFP+	–			EP5208-20SFP-LV	1732663
	–	24 x SFP 4 x SFP+	–			EP5200-28SFP-LV	1732664
Layer 3 switches for power plants: FL SWITCH EP 6400 and 6500							
Supply voltage: 100 V AC/DC ... 240 V AC/DC , temperature range: -40°C ... +85°C, certified in accordance with IEC 61850-3 and IEEE 1613							
	–	16 x SFP	–	10/100/1000 Mbps	High voltage power supply	EP6400-16GSFP-HV	1471546
	16 x RJ45	–	–			EP6416-HV	1471544
	4 x RJ45	4 x SFP	–		Intel Atom® co-processor, High voltage power supply	EP6404-4GSFP-W256-HV	1559223
			4 x HSR/PRP		High voltage power supply	EP6404-4GSFP-RED-HV	1524692
	12 x RJ45	4 x SFP	–			EP6412-4GSFP-HV	1471547
			–			EP6512-4GSFP-HV	1539368
Supply voltage: 36 V DC ... 72 V DC, temperature range: -40°C ... +85°C							
	12 x RJ45	4 x SFP	–	10/100/1000 Mbps	Medium voltage power supply	EP6412-4GSFP-MV	1559224

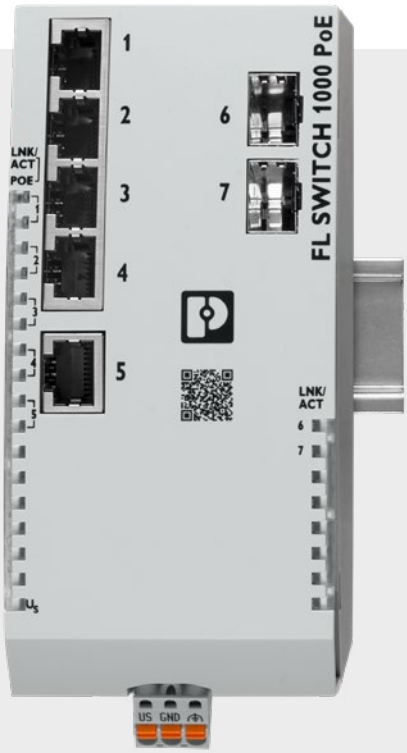
Characteristics	Copper ports	FO ports	Combo ports	Port speed	Special features	Designation FL SWITCH...	Item no.
Supply voltage: 10 V DC ... 36 V DC, temperature range: -40°C ... +85°C							
	–	16 x SFP	–	10/100/1000 Mbps	Low voltage power supply	EP6400-16GSFP-LV	1574601
	12 x RJ45	4 x SFP	–			EP6412-4GSFP-LV	1471548
			–			EP6512-4GSFP-LV	1539381
Light layer 3 switches for power plants: FL SWITCH EP 7200							
Supply voltage: 100 V AC/DC ... 240 V AC/DC , temperature range: -40°C ... +85°C, certified in accordance with IEC 61850-3 and IEEE 1613							
	16 x RJ45	16 x SFP	–	10/100/1000 Mbps	High voltage power supply	EP7216-16GSFP-HV	1688993
	32 x RJ45	–	–			EP7232-HV	1688995
	–	24 x SFP	4 x Gigabit HSR/PRP	100/1000 Mbps		EP7200-24GSFP-RED-HV	1688992
	–	32 x SFP	–			EP7200-32GSFP-HV	1688994
Supply voltage: 36 V DC ... 72 V DC , temperature range: -40°C ... +85°C, certified in accordance with IEC 61850-3 and IEEE 1613							
	16 x RJ45	16 x SFP	–	10/100/1000 Mbps	Medium voltage power supply	EP7216-16GSFP-MV	1688985
	32 x RJ45	–	–			EP7232-MV	1688987
	–	24 x SFP	4 x Gigabit HSR/PRP	100/1000 Mbps		EP7200-24GSFP-RED-MV	1688983
	–	32 x SFP	–			EP7200-32GSFP-MV	1688986
Supply voltage: 10 V DC ... 36 V DC , temperature range: -40°C ... +85°C, certified in accordance with IEC 61850-3 and IEEE 1613							
	16 x RJ45	16 x SFP	–	10/100/1000 Mbps	Low voltage power supply	EP7216-16GSFP-LV	1688989
	32 x RJ45	–	–			EP7232-LV	1688991
	–	32 x SFP	–	100/1000 Mbps		EP7200-32GSFP-LV	1688990
	–	24 x SFP	4 x Gigabit HSR/PRP			EP7200-24GSFP-RED-LV	1688988
Layer 3 switches for power plants: FL SWITCH EP 7400 and 7500							
Supply voltage: dependent on the modular power supply, temperature range: -40°C ... +85°C, certified in accordance with IEC 61850-3 and IEEE 1613							
	24 x RJ45*	4 x SFP	–	10/100/1000 Mbps	–	FL SWITCH EP7428R-L3F1	1144353
	24 x RJ45*	4 x SFP	–		Conformal coating	FL SWITCH EP7428R-L3F1-C1	1216924
	24 x RJ45*	4 x SFP	–		Power over Ethernet	FL SWITCH EP7428R-L3F1P	1539668
	24 x RJ45*	4 x SFP	–		–	FL SWITCH EP7528R-L3F1	1539667

* Optionally available with 24 SFP ports

Power over Ethernet (PoE)

Power over Ethernet devices suitable for industrial use enable the combined transmission of power and data via an Ethernet connection (LAN). You can therefore integrate end devices, such as WLAN access points, IP phones, and IP cameras into your network quickly and cost-effectively.

Web code: #1557



Injectors

The compact stand-alone solution is available in different performance classes up to 60 W. In addition to the RJ45 jack, the PoE injectors feature alternative connection technologies for the field cabling as well as integrated surge protection.

Unmanaged switches

The extended temperature range of the unmanaged PoE switches enables reliable operation in harsh environments. Furthermore, the switches have full gigabit ports and jumbo frames that were developed specifically for the high data requirements of surveillance cameras.

Smart Ethernet Box

The Smart Ethernet Box is an outdoor PoE switch with integrated power supply, surge protection, splice tray for fiber optics, and a DIN rail for additional accessories. Featuring up to four Gigabit Power over Ethernet ports and two uplink ports, it is the ideal all-in-one device for a large number of applications, such as video surveillance, LED lighting, WLAN access point, and other network applications.

Managed switches

The managed PoE switches offer a high degree of flexibility with multiple port constellations and high power budgets of 60 W per port for the use of PoE-operated high-power devices. PoE-specific managed features make it possible to control, plan, and monitor devices from a remote location.

Splitter

The PD 1001 PoE splitter splits data and power locally and therefore enables even non-PoE-capable devices to be installed in remote stations in an easy and inexpensive way.

Product overview for PoE modules

Characteristics	Connection method	Temperature range	Power budget	Special features	PoE standard	Designation	Item no.
PoE injector							
	RJ45 / RJ45	0°C ... +60°C	15/30 W	–	IEEE 802.3 af/at (PoE+)	INJ 1000	2703005
			60 W		Prepared for IEEE 802.3 bt (PoE++)	INJ 1010	2703007
		-40°C ... +75°C	15/30 W		IEEE 802.3 af/at (PoE+)	INJ 1000-T	2703006
			60 W		Prepared for IEEE 802.3 bt (PoE++)	INJ 1010-T	2703008
			15/30 W	Electrical isolation in the power supply unit, ATEX	IEEE 802.3 af/at (PoE+)	INJ 1100-T	2703009
			60 W		Prepared for IEEE 802.3 bt (PoE++)	INJ 1110-T	2703010
	RJ45 / IDC		15/30 W	Electrical isolation in the power supply unit, surge protection and shield current diagnostics, ATEX	IEEE 802.3 af/at (PoE+)	INJ 2102-T	2703012
			60 W		Prepared for IEEE 802.3 bt (PoE++)	INJ 2112-T	2703014
	RJ45 / Push-in		15/30 W		IEEE 802.3 af/at (PoE+)	INJ 2103-T	1004065
			60 W		Prepared for IEEE 802.3 bt (PoE++)	INJ 2113-T	1004066
	RJ45 / screw		15/30 W		IEEE 802.3 af/at (PoE+)	INJ 2101-T	2703011
			60 W		Prepared for IEEE 802.3 bt (PoE++)	INJ 2111-T	2703013

Characteristics	Connection method	Transmission speed	Power budget	Special features	PoE standard	Designation	Item no.
PoE splitter							
Supply voltage: 24 V DC, extended temperature range: -40°C ... +70°C							
	RJ45 / RJ45	10/100/1000 Mbps	30 W	–	IEEE 802.3 af/at (PoE+)	FL PD 1001 T GT	2891042

Characteristics	Uplink ports	Transmission speed	Power budget	PoE standard	PoE ports	Designation	Item no.
Smart Ethernet Box							
Supply voltage: 100 V AC ... 240 V AC, temperature range: -40°C ... +70°C							
	2 x FO	10/100/1000 Mbps	90 W per port (max. 165 W)	IEEE 802.3 bt, at, af	4 x RJ45	SCX 4POE 2LX	1102626
					2 x RJ45	SCX 2POE 2LX	1108543
	2 x RJ45				4 x RJ45	SCX 4POE 2T	1108542
					2 x RJ45	SCX 2POE 2T	1108544

Product overview for PoE modules

Characteristics	Connection method	Transmission speed	Power budget	Special features	PoE standard	Designation	Item no.
Unmanaged Power over Ethernet switches: FL SWITCH 1000 PoE							
Supply voltage: 18 V DC ... 57 V DC, extended temperature range: -40°C ... +75°C, IEEE 802.3 af/at (PoE+)							
	4 x RJ45 (PoE), 1 x RJ45	10/100 Mbps	30 W per port, max. 120 W	–	IEEE 802.3 af/at (PoE+)	FL SWITCH 1001T-4POE	2891064
	2 x RJ45 (PoE), 2 x SFP	10/100/1000 Mbps	30 W per port, max. 60 W	52 V DC ... 57 V DC		FL SWITCH 1000T-2POE-GT-2SFP	1026765
	4 x RJ45 (PoE), 1 x RJ45	10/100/1000 Mbps	30 W per port, max. 120 W	–		FL SWITCH 1001T-4POE-GT	1026937
	4 x RJ45 (PoE), 1 x RJ45, 1 x SFP	10/100/1000 Mbps	30 W per port, max. 120 W	–		FL SWITCH 1001T-4POE-GT-SFP	1026932
Supply voltage: 18 V DC ... 57 V DC, extended temperature range: -10°C ... +60°C, IEEE 802.3 af/at (PoE+)							
	4 x RJ45 (PoE), 1 x RJ45	10/100/1000 Mbps	30 W per port, max. 120 W	Electrical isolation	IEEE 802.3 af/at (PoE+)	FL SWITCH 1001-4POE-GT	1102077
	8 x RJ45 (PoE)					FL SWITCH 1000-8POE-GT	1102079
	8 x RJ45 (PoE)	10/100 Mbps		–		FL SWITCH 1000N-8POE	1343031
Supply voltage: 18 V DC ... 57 V DC, extended temperature range: -10°C ... +70°C, IEEE 802.3 af/at (PoE+)							
	8 x RJ45 2 x SFP	10/100/1000 Mbps	30 W per port, max. 120 W	–	IEEE 802.3 af/at (PoE+)	FL SWITCH 1100T-8POE-2SFP	1467018

Characteristics	Connection method	Transmission speed	Power budget	Special features	PoE standard	Designation	Item no.
Unmanaged Power over Ethernet switches: FL SWITCH 1000 PoE							
Supply voltage: 46 V DC ... 57 V DC, temperature range: -10°C ... +60°C, IEEE 802.3 af/at/bt (PoE++)							
	8 x RJ45 (PoE)	10/100 Mbps	90 W per port, max. 240 W	–	IEEE 802.3 af/ at/bt (PoE++)	FL SWITCH 1000-8POE	1342622
		10/100/1000 Mbps		–		FL SWITCH 1100-8POE	1343034
	5 x RJ45 (PoE) 2 x SFP			–		FL SWITCH 1100-5POE-2SFP	1342621
Supply voltage: 18.7 V DC ... 30.5 V DC, extended temperature range: -40°C ... +50°C, IEEE 802.3 af/at (PoE+)							
	8 x M12 (PoE)	10/100/1000 Mbps	30 W per port, max. 120 W	Jumbo frames up to 9600 bytes	IEEE 802.3 af/at (PoE+)	FL SWITCH 1701 7POE	1119230
Managed Power over Ethernet switches: FL SWITCH 4000 PoE							
Supply voltage: 52 V DC ... 57 V DC, extended temperature range: -40°C ... +70°C							
	4 x RJ45 (PoE), 1 x SFP	10/100 Mbps (RJ45) 1000 Mbps (SFP)	60 W per port, max. 180 W	–	IEEE 802.3 af/at (PoE+) Prepared for IEEE 802.3 bt (PoE++)	FL SWITCH 4000T-4POE-SFP	1026924
	8 x RJ45 (PoE), 2 x SFP	10/100 Mbps (RJ45) 1000 Mbps (SFP)	60 W per port, max. 180 W	–		FL SWITCH 4000T-8POE-2SFP	1026923
	8 x RJ45 (PoE), 4 x RJ45 4 x SFP	10/100/1000 Mbps	60 W per port, max. 240 W	–		FL SWITCH 4004T-8POE-4SFP	1026922

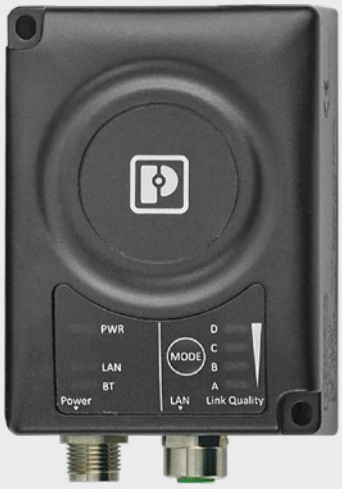
Industrial Wireless

Industrial wireless systems enable flexible automation. With wireless LAN or Bluetooth, you can avoid cable runs and integrate mobile devices into the network. The wireless Ethernet systems from Phoenix Contact ensure reliable communication under harsh conditions and are optimized for fast PROFINET and EtherNet/IP™ transmission. We also support you in designing your custom wireless network.

Web code: #0958

Contactless power and data transmission

With NearFi couplers, power (24 V, 2 A) and real-time Ethernet data (100 Mbps, full duplex) can be transmitted across an air gap of a few centimeters.



Industrial Bluetooth

The EPA modules combine a reliable wireless module with an integrated antenna in a robust IP65 housing. This allows you to establish functionally safe communication via PROFIsafe or SafetyBridge Technology.

Your advantages

- Seamless and inexpensive integration into existing networks with flexible installation and configuration concepts
- Particularly high levels of reliability and availability with optimum properties for industrial applications
- Versatile use with Ethernet as the common communication standard – even for safety applications

Industrial WLAN

The high-performance WLAN modules with the latest WLAN standard 802.11ax (Wi-Fi 6/6E) offer maximum reliability, improved real-time capability, and support large networks with many participants. Wi-Fi 6E also opens up the 6 GHz band with numerous new, previously unused transmission channels.

Product overview – Industrial Wireless, NearFi couplers, and accessories

Characteristics	Function	Frequency band	Data rate	Special features	Designation	Item no.
Ethernet port adapter						
Supply voltage: 9 V DC ... 30 V DC, extended temperature range: -40°C ... +65°C, IP65						
	Combined WLAN and Bluetooth wireless module	2.4 GHz and 5 GHz	Up to 65 Mbps	Internal antenna	FL EPA 2	1005955
				External antenna	FL EPA 2 RSMA	1005957
	Bluetooth wireless module	–	Up to 3 Mbps	Internal antenna	FL BT EPA 2	1005869
Compact wireless module IEEE 802.11ax / Wi-Fi 6/6E						
Supply voltage: 9 V DC ... 32 V DC, WLAN client, soft access point, and WLAN access point						
	WLAN client and soft access point with IP65 ... IP68	2.4 / 5 GHz	WLAN up to 2400 Mbps Ethernet connection 10/100/1000 Mbps	Internal antennas	FL WLAN 1120	1386091
		2.4 / 5 / 6 GHz		Internal antennas, USA and Canada only	FL WLAN 1121	1386092
				Internal antennas	FL WLAN 1122	1752496
	WLAN client and soft access point with IP20	2.4 / 5 GHz		External antennas	FL WLAN 1020	2702992
		2.4 / 5 / 6 GHz		External antennas, USA and Canada only	FL WLAN 1021	2702993
				External antennas	FL WLAN 1022	1752493
	WLAN access point with IP65	2.4 / 5 GHz		External antennas	FL WLAN 2330	1360275
				External antennas, USA and Canada only	FL WLAN 2331	1360276
				Internal antennas	FL WLAN 2340	1510147
				Internal antennas, USA and Canada only	FL WLAN 2341	1510249
		6 GHz		Internal antennas	FL WLAN 2350	1513603
				Internal antennas, USA and Canada only	FL WLAN 2351	1513600

	Function	Coupling type	Designation	Item No.
Contactless power and data transmission				
	Contactless power (50 W) and data coupler (100 Mbps full duplex)	Base coupler	NEARFI 2200 B	1433050
		Remote coupler	NEARFI 2200 R	1433049
Contactless power couplers				
	Contactless power coupler (50 W, US*)	Base coupler	NEARFI 200 B	1433047
		Remote coupler	NEARFI 200 R	1433046
	Contactless power coupler (50 W, UA*)	Base coupler	NEARFI 300 B	1464614
		Remote coupler	NEARFI 300 R	1509989

	Function	Coupling type	Designation	Item No.
Contactless data couplers				
	Contactless data coupler (100 Mbps full duplex)	Base coupler	NEARFI 2000 B	1433041
		Remote coupler	NEARFI 2000 R	1433040

* US = sensor/logic voltage, UA = actuator voltage

	Description	Gain	Connection	Characteristics	Item no.
Accessories					
2.4 GHz antennas					
	Omnidirectional antenna, saltwater-resistant	6 dBi	N (female)	Temperature range: -40°C ... +70°C, degree of protection: min. IP65, Including mounting bracket	2885919
5 GHz antennas					
	Omnidirectional antenna	5 dBi	N (female)	Temperature range: -40°C ... +70°C, degree of protection: min. IP65, Including mounting bracket	2701347
2.4 GHz and 5 GHz antennas					
	Omnidirectional antenna	2.5 dBi at 2.4 GHz, 5 dBi at 5 GHz	N (male)	Temperature range: -40°C ... +70°C, degree of protection: min. IP65, Including mounting bracket	2701408
	Omnidirectional antenna, vandalism-proof	Up to 6 dBi at 2.4 GHz, up to 8 dBi at 4.9 GHz	N (female)		2702898
	Panel directional antenna, saltwater-resistant	9 dBi	N (female)		2701186
2.4 GHz, 5 GHz, and 6 GHz antennas					
	Multiband omnidirectional antenna	2 dBi at 2.0 GHz, 2.5 dBi at 4.9 GHz, 3 dBi at 5.9 GHz	N (male)	Temperature range: -40°C ... +85°C, Degree of protection: IP68/IP69K	1284780
	Multiband omnidirectional antenna	6 dBi at 2.4 GHz, 8 dBi at 4.9 GHz	N (female)	Temperature range: -40°C ... +80°C Degree of protection: IP68	2702898
Leaky cables (LCX)					
	Leaky cable 2.4 GHz	Longitudinal attenuation: 14.7 dB/100 m, coupling attenuation 95%: 60 dB, temperature range: -40°C ... +85°C			2702553
	Leaky cable 5 GHz	Longitudinal attenuation: 19.1 dB/100 m, coupling attenuation 95%: 71 dB, temperature range: -40°C ... +85°C			2702860

Further accessories can be found on our website: **Web code:** #0569

Industrial security

Protect your systems against unauthorized access by people or malware with the mGuard security product family from Phoenix Contact. Use industrial router/firewall solutions and industrial-grade virus protection to protect your automation network.

The VPN-compatible devices also enable sensitive data to be transmitted in encrypted form, providing secure remote maintenance of machines over public networks.

Web code: #3960

Your advantages

- Certified in accordance with IEC 62443-4-1 und IEC 62443-4-2
- Can be retrofitted easily, thanks to stealth mode
- Central management software for global management of several thousand field devices

Protection of machines and production cells

Use mGuard devices to protect your machines and production cells against unauthorized access – regardless of whether access is from the local network or via the Internet. A wide range of security functions as well as central management software help to easily increase the security level of your production facilities.

Product overview for industrial security

Characteristics	Port configuration	Port speed	VPN	Special features	Designation FL MGUARD...	Item no.
Secure integration of machines in production networks: mGuard 2000						
Routing, NAT, firewall, VPN remote access and mGuard Secure Cloud connection, IEC 62443-4-2 certified						
	2 x RJ45	10/100/1000 Mbps	Up to 2 VPN tunnels	–	FL MGUARD 2102	1357828
	5 x RJ45			Integrated 4-port unmanaged switch	FL MGUARD 2105	1357850
Secure integration and segmentation of OT networks: FL mGuard 4000						
+ PI/Port group, conditional firewall, user firewall, domain name firewall, IEC 62443-4-2 certified, DNV certified						
	2 x RJ45	10/100/1000 Mbps	Up to 250 VPN tunnels		FL MGUARD 4302	1357840
	5 x RJ45			Integrated 3-port managed switch, DMZ port	FL MGUARD 4305	1357875
	2x RJ45			ATEX and IECex certified	FL MGUARD 4302 KX	1696708
	5 x RJ45				FL MGUARD 4305 KX	1696779
High-performance security plug-in card for IPCs: mGuard PCI/PCIE 4000						
+ PI/Port group, conditional firewall, user firewall, domain name firewall, IEC 62443-4-2 certified, DNV certified						
	2 x RJ45	10/100/1000 Mbps	Up to 10 parallel tunnels (up to 250 as an option)		4102 PCI	1441187
					4102 PCIE	1357842
Central device and patch management: mGuard Device Manager (MDM)						
	The mGuard Device Manager provides support for the configuration, rollout, and management of all mGuard devices. Create and manage all security-related mGuard settings centrally and then transfer them to the desired devices.			English	DM UNLIMITED	2981974

Certified security for your network

Phoenix Contact provides a broad portfolio of IEC 62443 certified products. These certifications confirm compliance with international security standards and reduce the risk of cyberattacks on industrial networks.

Planning reliability for the future

In addition to the product certifications, our development process has also been tested by TÜV Rheinland in accordance with IEC 62443-4-1. Secure by Design is incorporated into all new products. In addition, our certified Product Security Incident Response Team (PSIRT) ensures a rapid response to security incidents.

Our certifications facilitate integration into new and existing security concepts and give you the assurance that you will also be able to meet future requirements. All certifications are part of Phoenix Contact's holistic 360° security concept, which ensures the security of products and systems throughout their entire life cycle.

> For more information on our 360° security concept, visit phoenixcontact.com/cybersecurity

360° security: All-round protection for your systems

Remote communication

Machines and systems are often distributed over wide areas. Securely connecting distributed stations to the control room is made possible with the versatile possibilities of remote communication. Remote communication enables access as well as continuous process data monitoring from the central station.

Phoenix Contact provides a broad portfolio of products for wireless and wired remote access for this purpose.

Web code: #0499

Remote maintenance via the Internet

The Cloud Clients and mGuards enable secure connection to the mGuard Secure Cloud. Communication takes place via the operator network (Ethernet/WLAN) or cellular communication. While the cloud client can only connect to the mGuard Secure Cloud, the mGuard devices also offer peer-independent VPN tunnels, NAT, and more powerful firewalls.

Remote maintenance via the cellular network

The TC ROUTER cellular routers enable robust data connections over public and private 4G/5G networks. This allows you to establish a mobile broadband connection for highly flexible site networking even in harsh and demanding environments where a wired Internet connection is not available.

mGuard Secure Cloud

The mGuard Secure Cloud is a turnkey solution for remote maintenance. You can connect quickly and securely to machines, industrial PCs, and controllers via a simple web interface. Service employees can access the devices worldwide via VPN and carry out maintenance without being on site – this saves time, costs and increases efficiency.

Global cellular connection

The Cellulink outdoor cellular routers connect your system flexibly and securely to the cellular network. The robust housing with integrated antennas and PoE saves time and money. With IEC 62443-4-2 certification, Cellulink guarantees secure data transmission.

Remote control via in-house cabling

With the Gigabit Ethernet extender system, you can easily connect large IP networks over distances of up to 20 km using existing two-wire cables. The combination of unmanaged and managed extenders enables particularly cost-effective networking and central diagnostics of all devices and paths via IP.

Product overview for remote maintenance

Characteristics	Internet access (WAN)	VPN tunnel	Ports	Special features	Type	Item no.
Outdoor cellular routers						
IEC 62443 device certification, Network Address Translation (NAT) or Exposed Host, outdoor housing: IK10, IP66/IP69K, temperature range: -40°C ... +70°C, Device and Update Management, dual SIM, GNSS: positioning and time synchronization, IEC 62443-4-2 certified						
	4G LTE CAT1	-	1x RJ45, PoE in	European version, Panel/mast mounting	CELLULINK 2401-4G EU M25	1503433
	4G LTE CAT1	-	1x RJ45, PoE in	European version, control cabinet mounting, 10 V DC ... 30 V DC	CELLULINK 2401-4G EU M40	1503487
	4G LTE CAT4	-	1x RJ45, PoE in	Worldwide version, Panel/mast mounting	CELLULINK 4401-4G GL M25	1637527
	4G LTE CAT4	-	1x RJ45, PoE in	Worldwide version, control cabinet mounting, 10 V DC ... 30 V DC	CELLULINK 4401-4G GL M40	1637627
	5G	-	1x RJ45, PoE in	Worldwide version, Panel/mast mounting	CELLULINK 6501-5G GL M25	1637531
	5G	-	1x RJ45, PoE in	Worldwide version, control cabinet mounting, 10 V DC ... 30 V DC	CELLULINK 6501-5G GL M40	1637530
	-	-	-	Wall adapter for mounting the M25 versions on a wall	CELLULINK WALL MOUNT ADAPTER	1513259
	-	-	2x RJ45	Passive PoE injector for Cellulink	ETH POWER ADAPTER	1679314
Security routers						
Integrated firewall for the protection of the machine network, Network Address Translation (NAT), VPN tunnel to the mGuard Secure Cloud, central device management, IEC 62443-4-2 certified						
	Operator network (RJ45)	2	2x RJ45	–	FL MGUARD 2102	1357828
		2	5 x RJ45	–	FL MGUARD 2105	1357850
		Up to 250	2x RJ45	Extended firewall for complex security	FL MGUARD 4302	1357840
		Up to 250	5 x RJ45		FL MGUARD 4305	1357875
Universal cellular routers						
Temperature range: -40°C ... +70°C, up to four digital inputs and two digital outputs and serial interface (depending on version), device and patch management (TC Router Online Manager)						
	4G LTE	3 VPN connections via IPsec or OpenVPN	2x RJ45	Worldwide version	3002T-4G GL	1632697
	4G LTE + operator network (RJ45)	No limit, limited by system resources and available bandwidth	2x RJ45 (2x LAN or 1x WAN 1x LAN)	European version	4002T-4G EU	1234352
	4G LTE + operator network (WLAN / RJ45)				4102T-4G EU WLAN	1234353
					4202T-4G EU WLAN	1234354
	5G SA/NSA	3 VPN connections via IPsec or OpenVPN	4x RJ45	European version	5004T-5G EU	1439475

Product overview for remote control

Characteristics	Internet access (WAN)	VPN tunnel	Ports	Special features	Type	Item no.
Simple remote control router						
Configuration and operation via mGuard Secure Cloud, simplified web interface, two digital inputs, and one digital output						
	Operator network (RJ45)	1 tunnel to mGuard Secure Cloud	2x RJ45 (1x LAN, 1x WAN)	Worldwide	CLOUD CLIENT 1101T-TX/TX	1221706

Cellular communication accessories

Phoenix Contact offers a variety of antenna and cable accessories for its products.

Web code: #3803

Characteristics	Managed/ unmanaged	Ports	Local diagnostics	Topologies	Surge protection	Remote diagnostics	Designation	Item no.
Remote control via in-house cables: Ethernet extenders								
Any two-wire cable up to 20 km, plug-and-play commissioning, VLAN and RSTP functionality								
	Managed	2x SHDSL 4x Ethernet	Display	Point-to-point, line, ring	SHDSL, integrated, can be replaced	Any location via IP	TC EXTENDER 6004 ETH-2S	2702255
	Unmanaged	2x SHDSL 1x Ethernet	LED	Point-to-point, line, ring	–	Stationary connection via USB	TC EXTENDER 2001 ETH-1S	2702409
	Unmanaged	1 x Ethernet	LED	Point-to-point	–	–	EXTENDER 1010 ETH COAX-G	1319319
	Unmanaged	1 x Ethernet	LED		–	–	EXTENDER 2010 ETH COAX-G	1319320
	Unmanaged	1 x Ethernet	LED		–	–	EXTENDER 1010 ETH TP-G	1319321
	Unmanaged	1 x Ethernet	LED		–	–	EXTENDER 2010 ETH TP-G	1319322

Time servers

The FL TIMESERVER makes time and location information available in the Ethernet network via NTP protocol. The time is received via GPS, Galileo, or GLONASS even without an Internet connection. The IP68 housing with integrated antenna is suitable for outdoor installation.

Web code: #2459

Your advantages

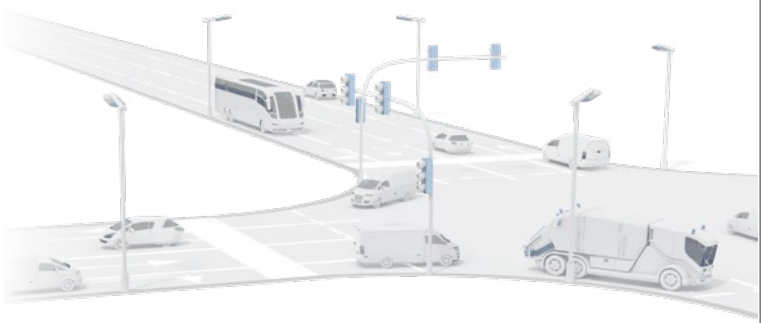
- NTP time server for Ethernet networks
- GNSS (Global Navigation Satellite System) receiver for GPS, Galileo, and GLONASS
- Location information can be obtained via NMEA, SNMP, or web-based management
- Diagnostic LEDs for power supply and satellite reception

Product overview – Time servers

NTP time server with GNSS receiver			
	Main features	**Designation**	**Item no.**
	• Power over Ethernet supply via the network cable • Alternative 10 V DC ... 30 V DC supply • IP68 housing • Integrated antenna • Temperature range: -40°C ... +70°C • Outdoor installation including panel feed-through (40 mm diameter)	FL TIMESERVER NTP	1107132

Geolocation

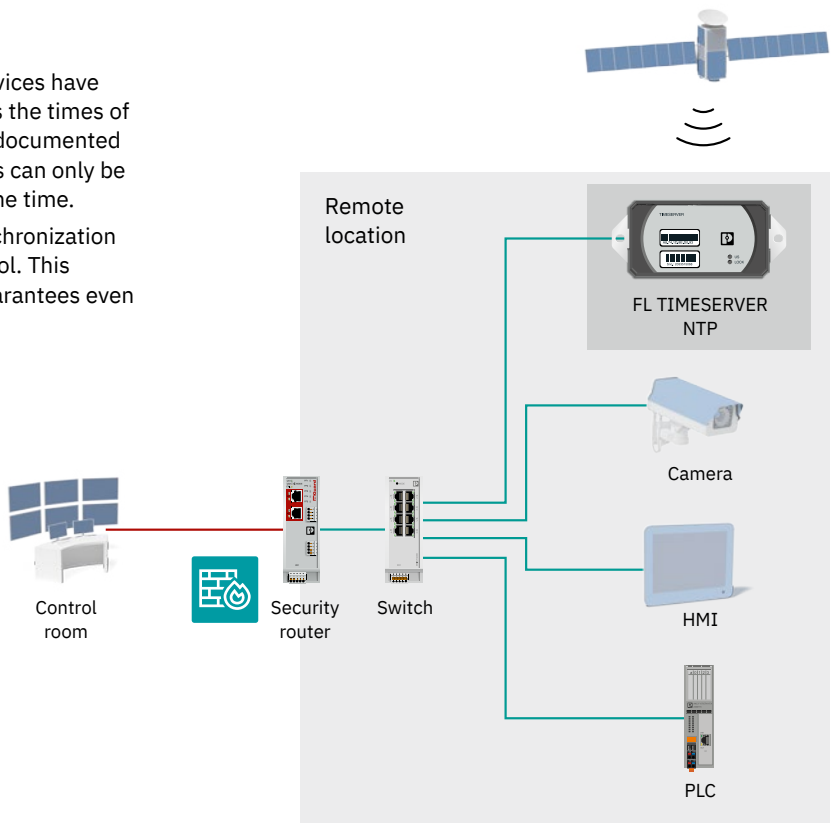
The FL TIMESERVER NTP provides accurate geolocation information (GPS coordinates). This information can be used for determining the exact location, such as of containers, vehicles, and buildings. Precise position determination via web-based management, SNMP, NMEA, or JSON streaming.



Time synchronization

In Ethernet networks, it is very important that all devices have an accurate, synchronized system time. This enables the times of all decentralized activities within the network to be documented with a high degree of accuracy. A sequence of events can only be displayed if all of the devices display exactly the same time.

The FL TIMESERVER NTP provides precise time synchronization for Ethernet devices in a network via the NTP protocol. This function does not require Internet access, which guarantees even greater security in the network.



Protocol and interface converters

Device servers and gateways enable easy integration of legacy serial devices and buses into modern Ethernet networks. The most common industrial data transmission protocols are supported, with various combinations of serial transmission.

Depending on the application, choose between simple device servers for interface conversion or gateways and proxies with integrated protocol conversion.

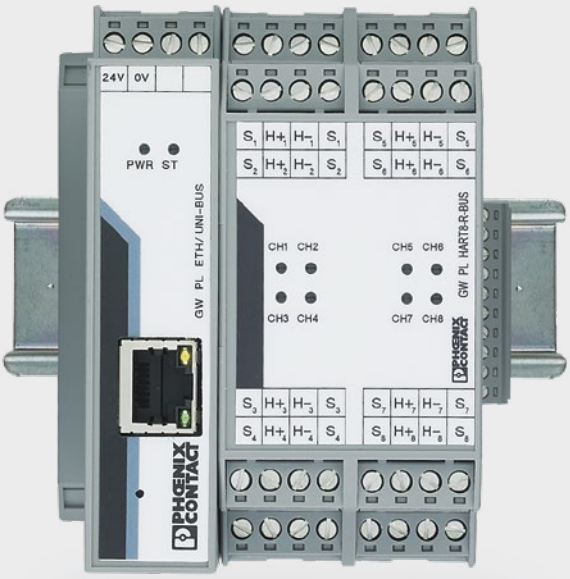
Web code: #2717

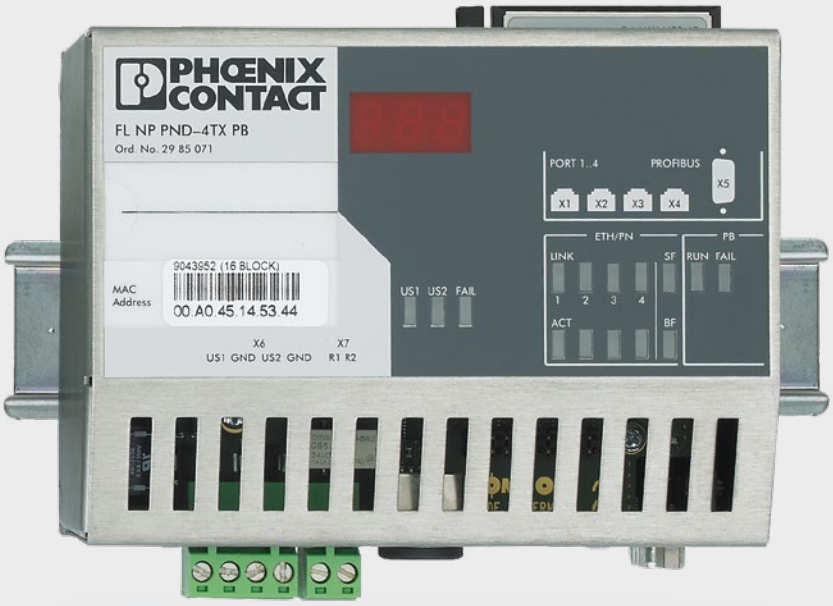
Converting serial interfaces

You can integrate any serial protocols into your Ethernet network using the serial device servers and gateways. Serial data can either be transmitted transparently over Ethernet or converted to Modbus/TCP, PROFINET, or EtherNet/IP™ using the gateways.

Your advantages

- Universal use in various applications
- Network integration of serial devices via virtual COM ports
- Cable replacement in serial point-to-point connections
- Integration of serial devices into modern Ethernet protocols





Converting the HART protocol

The HART gateways convert the digital HART protocol into Ethernet protocols, HART-IP, Modbus/TCP, or PROFINET. This means you can easily parameterize and monitor HART field devices via Ethernet networks. Thanks to the modular HART to Ethernet gateway, you can connect up to 40 HART devices.

Converting the PROFIBUS and INTERBUS protocols

Use the gateways and proxies to smoothly integrate PROFIBUS and INTERBUS applications into a PROFINET network. Our gateways for PROFIsafe also enable controller-independent and comprehensive integration of functional safety.

Product overview for protocol and interface converters

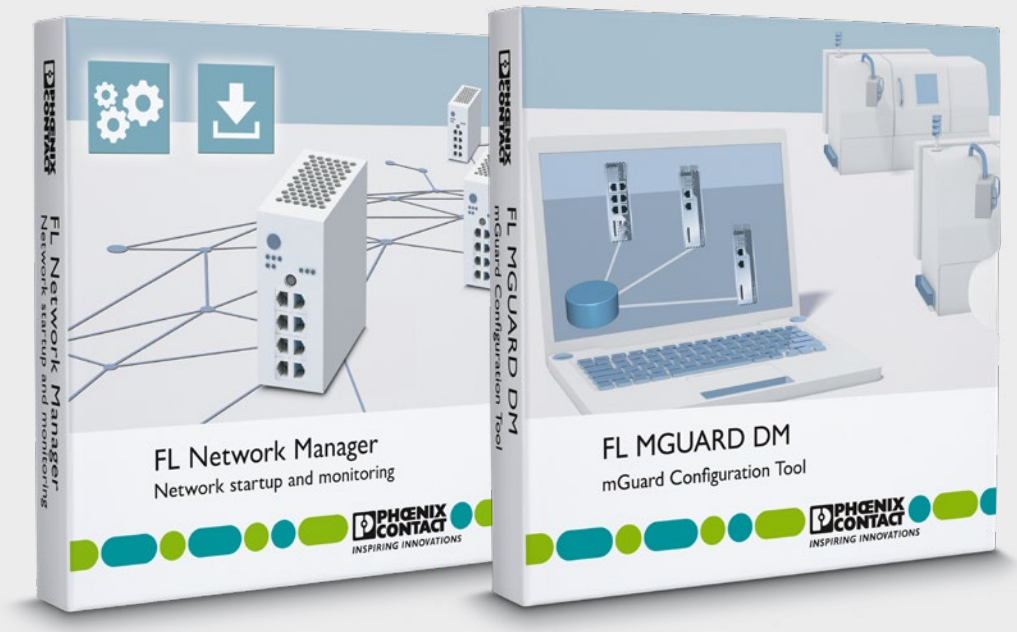
	Protocol	Ethernet interface	Serial interface (RS-232/RS-422/ RS-485)	Special features	Designation	Item no.
Converting serial data into Ethernet data: Serial device servers						
	Protocol transparent	1 x RJ45	1 x D-SUB 9	ATEX, IECEx, UL (Class I, Division 2)	FL COMSERVER BASIC	2313478
					GW DEVICE SERVER 1E/1DB9	2702758
			2 x D-SUB 9		GW DEVICE SERVER 1E/2DB9	2702760
		2 x RJ45			GW DEVICE SERVER 2E/2DB9	2702761
			4 x D-SUB 9		GW DEVICE SERVER 2E/4DB9	2702763
Conversion of serial protocols into Ethernet protocols: Gateways						
	Modbus/RTU to Modbus/TCP	1 x RJ45	1 x D-SUB 9	ATEX, UL (Class I, Division 2)	FL COMSERVER UNI	2313452
		1 x RJ45	1 x D-SUB 9	ATEX, IECEx, UL (Class I, Division 2)	GW MODBUS TCP/RTU 1E/1DB9	2702764
			2 x D-SUB 9		GW MODBUS TCP/RTU 1E/2DB9	2702765
		2 x RJ45			GW MODBUS TCP/RTU 2E/2DB9	2702766
			4 x D-SUB 9		GW MODBUS TCP/RTU 2E/4DB9	2702767
	RAW, ASCII to Modbus/TCP	1 x RJ45	1 x D-SUB 9		GW MODBUS TCP/ASCII 1E/1DB9	2702768
			2 x D-SUB 9		GW MODBUS TCP/ASCII 1E/2DB9	2702769
		2 x RJ45			GW MODBUS TCP/ASCII 2E/2DB9	2702770
			4 x D-SUB 9		GW MODBUS TCP/ASCII 2E/4DB9	2702771
	RAW, ASCII to PROFINET	1 x RJ45	1 x D-SUB 9		GW PN/ASCII 1E/1DB9	1021080
			2 x D-SUB 9		GW PN/ASCII 1E/2DB9	1021058
		2 x RJ45			GW PN/ASCII 2E/2DB9	1021056
			4 x D-SUB 9		GW PN/ASCII 2E/4DB9	1020882
	RAW, ASCII to EtherNet/IP™	1 x RJ45	1 x D-SUB 9		GW EIP/ASCII 1E/1DB9	2702772
			2 x D-SUB 9		GW EIP/ASCII 1E/2DB9	2702773
		2 x RJ45			GW EIP/ASCII 2E/2DB9	2702774
			4 x D-SUB 9		GW EIP/ASCII 2E/4DB9	2702776
	Modbus RTU/ ASCII/TCP to EtherNet/IP™	1 x RJ45	1 x D-SUB 9		GW EIP/MODBUS 1E/1DB9	1062540
			2 x D-SUB 9		GW EIP/MODBUS 1E/2DB9	1062423
		2 x RJ45			GW EIP/MODBUS 2E/2DB9	1062380
			4 x D-SUB 9		GW EIP/MODBUS 2E/4DB9	1062388
	Modbus RTU/ ASCII/TCP to MQTT	1 x RJ45	2 x D-SUB 9		GW MQTT/MODBUS 1E/2DB9	1380012
		2 x RJ45	2 x D-SUB 9		GW MQTT/MODBUS 2E/2DB9	1380014
		2 x RJ45	4 x D-SUB 9		GW MQTT/MODBUS 2E/4DB9	1380015

	Protocol	Ethernet interface	Second interface	Special features	Designation	Item no.
Conversion of serial protocols into Ethernet protocols: Gateways						
	Modbus RTU/ ASCII/TCP to PROFINET	1 x RJ45	1 x D-SUB 9	ATEX, IECEx, UL (Class I, Division 2)	GW PN/MODBUS 1E/1DB9	1105707
			2 x D-SUB 9		GW PN/MODBUS 1E/2DB9	1105708
		2 x RJ45			GW PN/MODBUS 2E/2DB9	1105709
			4 x D-SUB 9		GW PN/MODBUS 2E/4DB9	1105710
	PROFIBUS DP to PROFINET	1 x RJ45	1 x D-SUB 9 up to 12 Mbps	FDT/DTM	GW PN/DP 1E/1DB9	1108712
	IO-Link to PROFINET, Modbus/TCP, and OPC UA	2 x RJ45	8 x DI	–	IOL MA8 PN DI8	1072838
	IO-Link to EtherNet/IP™, Modbus/TCP, and OPC UA	2 x RJ45	8 x DI	–	IOL MA8 EIP DI8	1072839
	PROFIBUS PA to PROFINET	2 x RJ45	–	Bus coupler	AXL P BK PN AF	2316390
		–	–	Power distributors	AXL P FBPS BASE	2316393
		–	–	Power module	AXL P FBPS 28DC/0.5A	2316394
		–	–	Termination resistor	AXL P TERM PAIR	2316402
	HART to Modbus/ TCP, PROFINET, HART IP, FDT/DTM, OPC UA	1 x RJ45	–	Head station, supports 5 extension modules	GW PL ETH/ BASIC-BUS	2702321
		1 x RJ45	–		GW PL ETH/ UNI-BUS	2702233
		–	HART, 4-channel	Extension module	GW PL HART4-BUS	2702234
		–		Extension module with 250 Ω internal input resistance	GW PL HART4-R-BUS	2702879
			4-channel, digital inputs and outputs	Extension module	GW PL DIO4-BUS	2702237
		–	HART, 8-channel	Extension module with analog loop supply	GW PL HART8+AI-BUS	2702236
		–		Extension module	GW PL HART8-BUS	2702235
		–		Extension module with 250 Ω internal input resistance	GW PL HART8-R-BUS	2702880
	INTERBUS to PROFINET	4 x RJ45 10/100 Mbps	1 x F-SMA 500 kbps / 2 Mbps (can be selected)	Conformance class B	FL NP PND-4TX IB-LK	2985929
	INTERBUS to PROFINET	4 x RJ45 10/100 Mbps	1 x D-SUB 9 500 kbps / 2 Mbps (can be selected)		FL NP PND-4TX IB	2985974

Network management software

Configure and monitor your system intuitively using software tools from Phoenix Contact. Our solutions enable you to use Ethernet networks efficiently in automation systems.
The FL Network Manager and the mGuard Device Manager help you to easily configure and commission your network components.

Web code: #1557



Your advantages

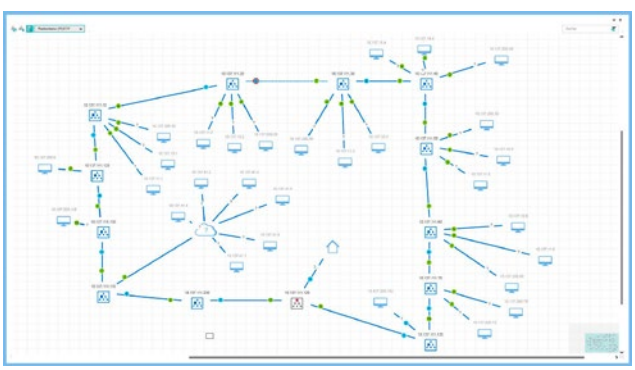
- Fast diagnostics with continuous querying of the network devices
- Reduced downtimes and outages, thanks to the short response time in the network
- Direct access to the individual web interfaces of the devices
- Error detection even for temporary errors in the network

Product overview for software

	Description	Language	Basic	Item no.
Network configuration and startup: FL Network Manager				
	Start up your network quickly and easily with the FL Network Manager software. The software provides support for the scanning and display of existing networks, the IP assignment and configuration of multiple devices, handling configuration files, and firmware updates.	English	SNMP	2702889
mGuard configuration and startup: mGuard Device Manager				
	The mGuard Device Manager provides support for the configuration, rollout, and management of all mGuard devices. Create and manage all security-related mGuard settings centrally and then transfer them to the desired devices.	English	–	2981974

Network Manager

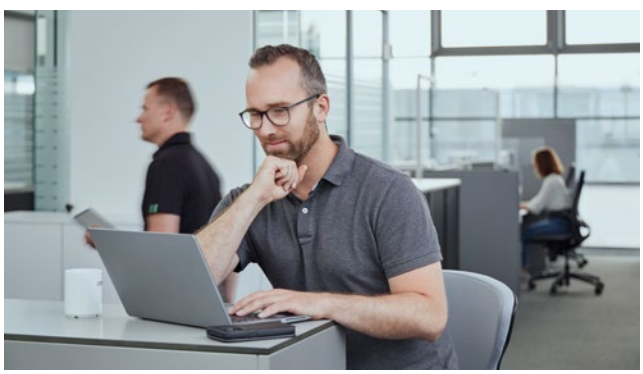
The use of managed switches or WLAN components always involves configuration effort. The Network Manager makes it easier to deal with the growing number of managed devices in a network, as network components can be monitored, configured, and kept up to date using one tool. To also satisfy industrial Ethernet protocols EtherNet/IP™ and PROFINET, IP assignment is integrated via DHCP and DCP. To check the configuration, a topology with redundancy diagnostics can be displayed. The new VLAN wizard makes configuring virtual networks quicker and easier than ever before – even for less experienced users.



Startup support for the mGuard Device Manager

The mGuard Device Manager is ideal for rolling out and managing large groups of mGuard devices that are configured identically. Widely distributed installations with thousands of systems can be implemented quickly and efficiently.

For easy initial startup of the software, support from a member of the Phoenix Contact team by means of remote access is included.



Surge protection

To ensure uninterrupted production, all the relevant data and signals must be transmitted reliably. In addition to unauthorized access and malware, overvoltages caused by lightning strikes or switching operations also pose a danger to your network. The devices are particularly at risk if the cabling spans several buildings.

Protect your devices with surge protection from Phoenix Contact and avoid expensive repairs, downtimes, and data losses.

Web code: #0145

Your advantages

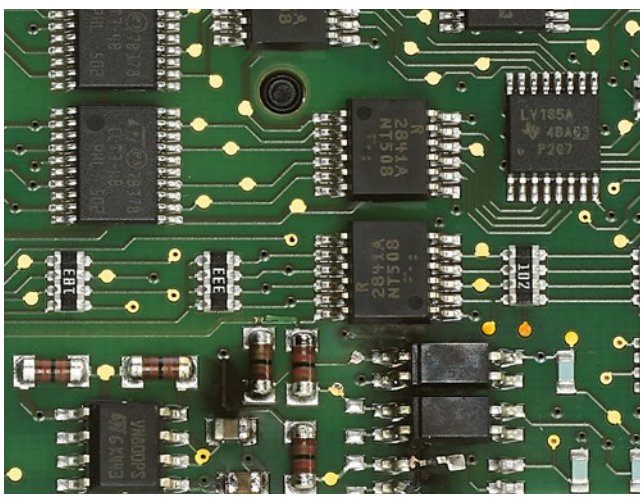
- Protection in accordance with Class E_A ($CAT6_A$)
- Reliable transmission up to 10 Gbps
- Power over Ethernet (PoE+) “Mode A” and “Mode B”
- RJ45 intermediate plug with separate grounding cable and ground connection snap-on foot for NS 35 DIN rails

Product overview for surge protection

Description	IEC test classification EN type	Maximum continuous voltage	Nominal discharge current	Characteristics	Designation	Item no.
DATATRAB adapter/DIN rail module						
Ethernet (10GBase-T) and PoE, token ring, CDDI, in accordance with Class E_A/$CAT6_A$						
	B2/C1/C2/C3/D1	3.3 V DC	100 A/2 kA	1 port	DT-LAN-CAT.6+	2881007
DATATRAB 19" versions						
Ethernet (1000Base-T), token ring, CDDI, in accordance with Class D/CAT5e, EN 50173						
	C1/C2/C3	6 V DC	350 A/350 A	24 ports	D-LAN-19"-24	2838791
				16 ports	D-LAN-19"-16	2880147
				8 ports	D-LAN-19"-8	2880163
PLUGTRAB type 3 surge protective device						
Type 3 surge protection for 1-phase power supplies						
	III/T3	230 V AC	5 kA	Plug, base element	PLT-SEC-T3-230-FM-UT	2907919
		120 V AC			PLT-SEC-T3-120-FM-UT	2907918

Microelectronics are at particular risk

Sensitive electronic components are the most commonly affected by surge voltage damage.



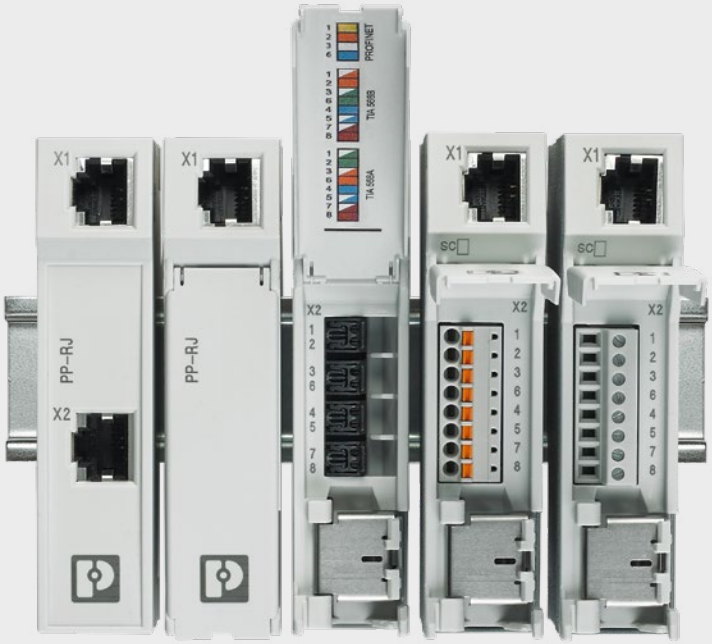
Customized use

The DATATRAB series can be used as an adapter or DIN rail module.

Installation technology

In addition to reliable active components, a high-performance network requires a robust installation. Phoenix Contact installation technology provides you with all the necessary components for implementing industrial networks.

Web code: #1561



Injectors

The compact stand-alone solution is available in different performance classes up to 60 W. In addition to the RJ45 jack, the PoE injectors feature alternative connection technologies for the field cabling as well as integrated surge protection.

Patch panels

Ethernet patch panels enable quick and easy connection between your field and control cabinet cabling. In the covered wiring space, IDC, Push-in, or screw connection simplifies installation of the field cable. As an option, these interface modules are also available with surge protection and shield current monitoring.

SFP modules

SFP (small form-factor pluggable) modules enable you to flexibly use the SFP ports of your Ethernet switches. Whether you require singlemode or multimode transmission, Fast Ethernet or Gigabit, Phoenix Contact offers the right SFP modules for your application.

Network isolators

The FL ISOLATOR electrically isolates copper-based Ethernet devices with transmission speeds of up to 1 Gbps. The Ethernet isolator is simply installed upstream of the network device that is to be protected. As such, high-voltage ranges in power distributions up to 4 kV can be disconnected securely from the data network and equipotential bonding currents prevented.

Product overview for installation technology

	Connection method	Temperature range	Power budget	Special features	PoE standard	Designation	Item no.
PoE injector							
	RJ45 / RJ45	0°C ... +55°C	2 x 15 W	Electrical isolation in the power supply unit	IEEE 802.3 af	FL PSE 2TX	2891013
		0°C ... +60°C	15 W/30 W	–	IEEE 802.3 af/at (PoE+)	INJ 1000	2703005
			60 W		Prepared for PoE bt (PoE ++)	INJ 1010	2703007
		-40°C ... +75°C	15 W/30 W		IEEE 802.3 af/at (PoE+)	INJ 1000-T	2703006
			60 W		Prepared for PoE bt (PoE ++)	INJ 1010-T	2703008
			15 W/30 W	Electrical isolation in the power supply unit, ATEX	IEEE 802.3 af/at (PoE+)	INJ 1100-T	2703009
			60 W		Prepared for PoE bt (PoE ++)	INJ 1110-T	2703010
	RJ45 / IDC		15 W/30 W	Electrical isolation in the power supply unit, surge protection and shield current diagnostics, ATEX	IEEE 802.3 af/at (PoE+)	INJ 2102-T	2703012
			60 W		Prepared for PoE bt (PoE ++)	INJ 2112-T	2703014
	RJ45 / Push-in		15 W/30 W		IEEE 802.3 af/at (PoE+)	INJ 2103-T	1004065
			60 W		Prepared for PoE bt (PoE ++)	INJ 2113-T	1004066
	RJ45 / screw		15 W/30 W		IEEE 802.3 af/at (PoE+)	INJ 2101-T	2703011
			60 W		Prepared for PoE bt (PoE ++)	INJ 2111-T	2703013

Electrical isolation

The high-quality isolation protects your installation from short circuits on the supply side.

Wide-range input

The injectors feature redundant feed-in, 18 to 57 V DC is possible.

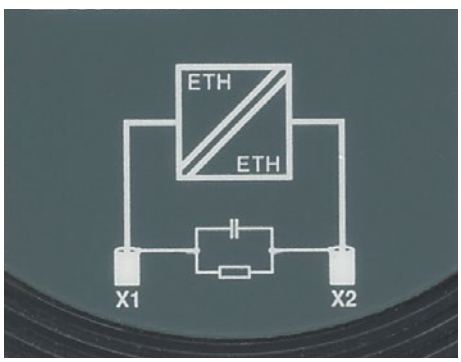
Surge protection

The integrated surge protection reliably protects the connected network.

	Connection method	Description	Shielding	Cable shield connection	Surge protection	Designation	Item no.
Patch panels							
	RJ45 / RJ45	Standard Ethernet patch panel, 8-pos., 10/100/1000 Mbps, UL listed	Directly on the DIN rail	Via RJ45 jack	No	PP-RJ-RJ	2703015
	RJ45 / screw			Tool-free via shield contact spring		PP-RJ-SC	2703016
	RJ45 / Push-in					PP-RJ-SCC	2703018
	RJ45 / IDC					PP-RJ-IDC	2703019
	RJ45 / RJ45	Standard Ethernet patch panel, 8-pos., 10/100/1000 Mbps, With extended approvals: UL listed, UL HazLoc, DNV-GL, ATEX, IEC Ex		Via RJ45 jack		PP-RJ-RJ-E	1746811
	RJ45 / screw			Tool-free via shield contact spring		PP-RJ-SC-E	1746809
	RJ45 / Push-in					PP-RJ-SCC-E	1746807
	RJ45 / IDC					PP-RJ-IDC-E	1746805
	RJ45 / RJ45	Function version Ethernet patch panel 8-pos., 10/100/1000 Mbps, UL listed, DNV-GL, ATEX With surge protection and shield current diagnostics		Via RJ45 jack	Integrated	PP-RJ-RJ-F	2703020
	RJ45 / screw			Tool-free via shield contact spring		PP-RJ-SC-F	2703021
	RJ45 / Push-in					PP-RJ-SCC-F	2703022
	RJ45 / IDC					PP-RJ-IDC-F	2703023
	RJ45 / screw	4 pos., 10/100 Mbps	Directly on the DIN rail	Clamp with screws	No	FL CAT5 TERMINAL BOX	2744610
	RJ45 / screw	8 pos., 10/100/1000 Mbps, ATEX	Either directly on DIN rail or via RC combination			FL-PP-RJ45-SC	2901643
	RJ45 / spring-cage connection					FL-PP-RJ45-SCC	2901642
	RJ45 / LSA	8 pos., 10/100/1000 Mbps				FL-PP-RJ45-LSA	2901645
	RJ45 / RJ45	8 pos., 10/100/1000 Mbps, ATEX		Via RJ45 jack		FL-PP-RJ45/ RJ45	2901646
	RJ45 / RJ45	Extended temperature range of -40°C ... +85°C, narrow overall width	Continuous shield			FL-PP-RJ45/ RJ45-B	2904933
	RJ45 / spring-cage connection	Cable sharing module with front cable outlet	Either directly on DIN rail or via RC combination	Clamp with screws		FL-PP-RJ45-SCC/SC041	2903532
	RJ45 / spring-cage connection	Cable sharing module with upward cable outlet				FL-PP-RJ45-SCC/SC045	2904577

Product overview for installation technology

	Electrical isolation	Approvals	Connection method	Transmission speed	Characteristics	Designation FL ISOLATOR	Item no.
Ethernet isolators							
	Up to 4 kV	EN 50155 – rolling stock, EN 50121 – rail	M12/M12 D-coded	10/100 Mbps	Panel mounting	100-M12	2902985
	–	–	–	–	Adapter for DIN rail mounting	FL EPA RMS	2701133
	Up to 4 kV	EN 50155 – rolling stock EN 50121 – rail	RJ45 / RJ45	10/100/1000 Mbps	–	1000-RJ/RJ	2313915
				10/100 Mbps	–	100-RJ/RJ	2313931



Protect network devices

With the high-quality isolation for up to 4 kV, you can protect your Ethernet devices and interfaces and increase immunity.

Flexible mounting

Available either as a DIN rail module with RJ45 connection or for panel mounting with an M12 connection.

Approved for railway applications

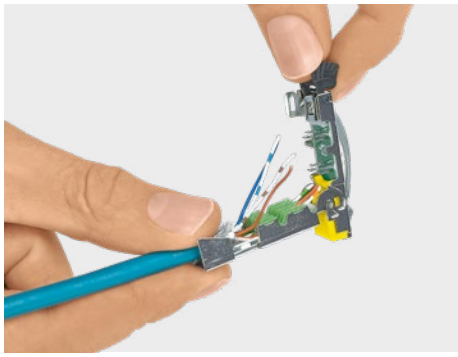
With vibration-resistant M12 connection technology, railway requirements are satisfied in accordance with EN 50155 and EN 50121.

	Port	Transmission speed	Transmission distance	Wavelength	Special features	Designation FL SFP...	Item no.
Accessories: SFP modules							
	LC MM	100 Mbps	2 km	1310 nm	–	FX	2891081
	LC SM		40 km		–	FX SM	2891082
	RJ45		100 m	-	-	TX	1287353
	LC MM	1000 Mbps	1 km	850 nm	–	SX	2891754
			2 km	1310 nm	–	SX2	2702397
	LC SM		10 km		–	LX10-B	1025401
			30 km		–	LX	2891767
			40 km		–	LX40	1113081
	LC SM, LC MM	10,000 Mbps	300 m	850 nm	–	10G-SR	1145046
	RJ45	1000 Mbps	100 m	–	–	GT-3	1818735
				–	–	GT	2989420

Copper-based data cabling for networks and fieldbuses

Complex automation processes call for high volumes of data at ever-increasing transmission speeds. Benefit now from powerful connectors and cables for assembly on-site. Whether future-proof high-speed cabling up to 10 Gbps or innovative hybrid cabling – we have the perfect solution for your automation network.

Web code: #0297



Fast assembly

Fast assembly without special tools with IDC and pierce fast connection.

Wide range of connectors

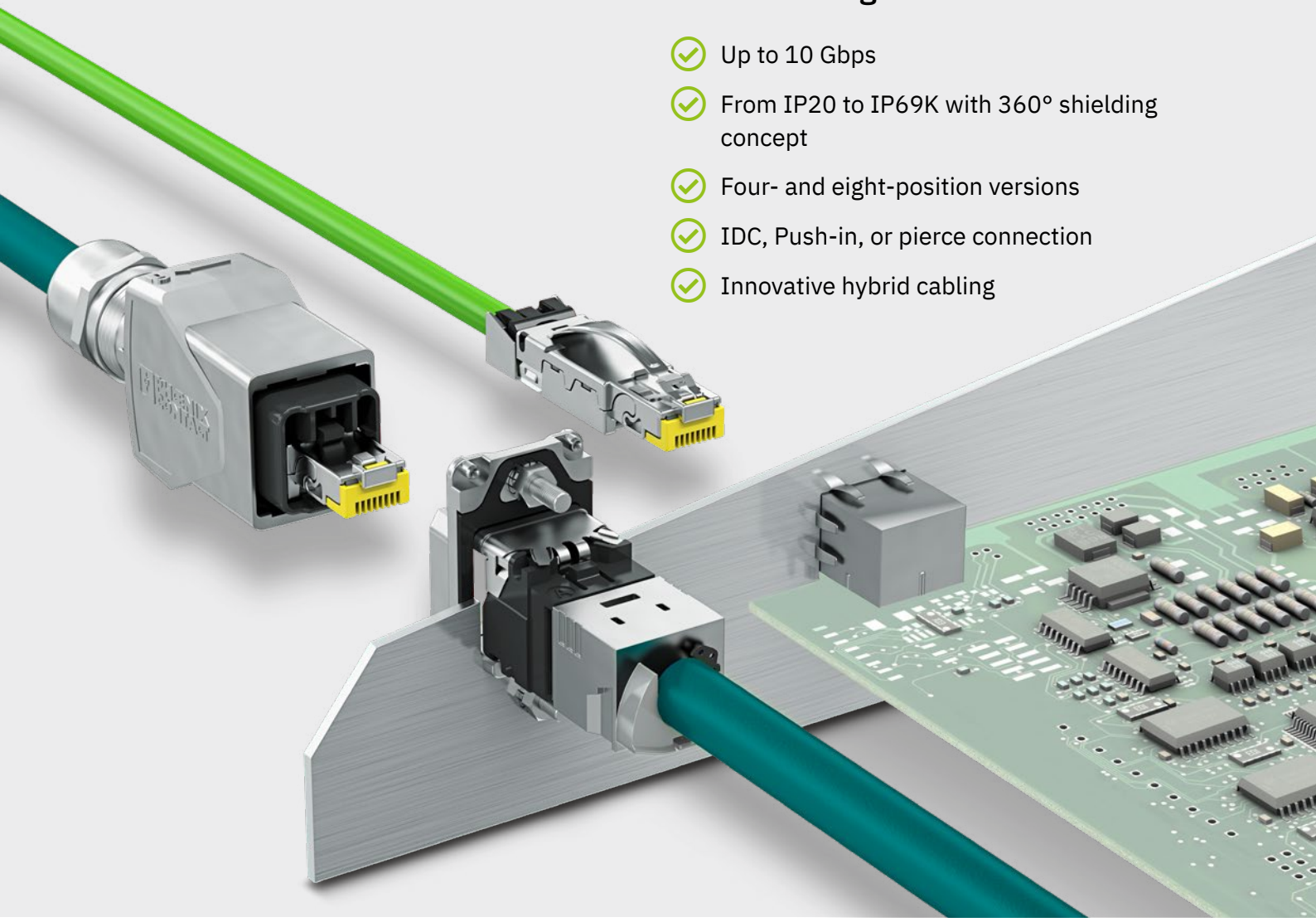
From SPE and RJ45 through USB, HDMI, coaxial, and D-SUB to M12.

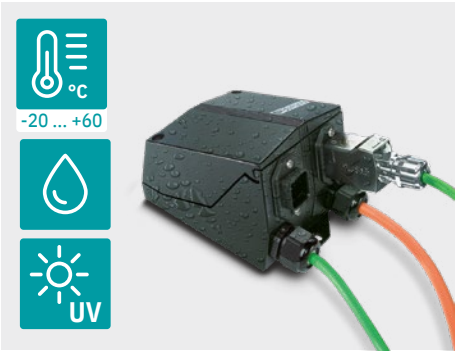
Flexible device connection

Flexible device connection with versatile housing feed-throughs for devices and control cabinets.

Your advantages

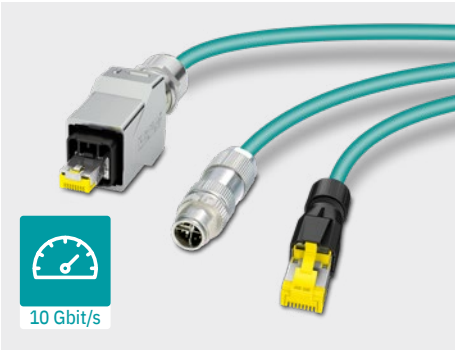
- Up to 10 Gbps
- From IP20 to IP69K with 360° shielding concept
- Four- and eight-position versions
- IDC, Push-in, or pierce connection
- Innovative hybrid cabling





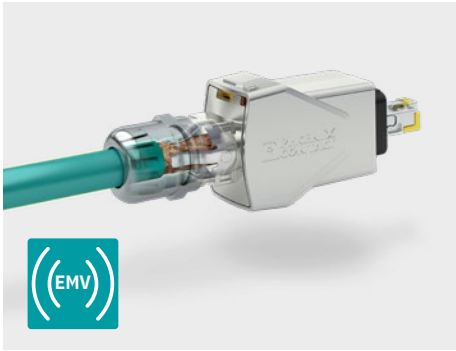
Reliable protection

Reliable protection against extreme temperatures, liquids, vibrations, and UV light.



Fast data transmission

Fast data transmission with data rates up to 10 Gbps and components that meet the CAT6$_A$ standard.



Special shielding concepts

Special shielding concepts with 360° EMC shielding guarantee a high level of resistance to EMI and ESD.

RJ45, connectors and sockets, IP20

Web code: #0330

	Cable outlet	Ethernet	PROFINET	Material	AWG	Connection method	Data rate	Item no.
Connector								
	Straight	●	–	Plastic, gray	27 … 24	Crimp connection	Up to 1 Gbps CAT5	1414382*
		●	–				Up to 10 Gbps CAT6$_A$	1414395*
		●	–	Plastic, black	26 … 24	IDC fast connection	Up to 10 Gbps CAT6$_A$	1419001
		●	–	Plastic, gray	26 … 23		Up to 1 Gbps CAT5	1656725
		●	–	Plastic, black				1658008
		–	●	Plastic, gray	22		Up to 100 Mbps CAT5	1658435
		●	–	Die-cast zinc	26 … 24		Up to 1 Gbps CAT5	1421607
		●	●		23 … 22			1421126
	Bottom	●	–		26 … 24			1421877
		●	●		23 … 22			1421128
	Top	●	–		26 … 24			1421876
		●	●		23 … 22			1421127
	Straight	●	–		26 … 24		Up to 10 Gbps CAT6$_A$	1149846
		●	●		23 … 22			1149847
Panel-mount frame								
	–	●	●	Plastic, gray	–	Square panel cutout	–	1689433
Socket inserts								
	Straight	●	●	Metal	26 … 22	Cable module	Up to 10 Gbps CAT6$_A$	1419021
	Straight	●	●		–	Coupler module	Up to 1 Gbps CAT5	1689064
	Straight	●	●		–		Up to 10 Gbps CAT6$_A$	1086108

* Tool 1653265 required

RJ45, distributors and modules, IP20

Web code: #0330

	Mounting type	Specification	Item no.
Modular distribution panels			
	19" mounting	Patch bay with plastic brackets	1407994
		Patch bay with metal brackets, gray	1409283
Patch panels			
	19" mounting	Patch panel for Freenet modules, 16 installation slots, unassembled	1652994
		Patch panel for socket inserts, adapter-free, 24 installation slots, unassembled, gray	1422978
		Patch panel for socket inserts, adapter-free, 24 installation slots, unassembled, black	1422979
	DIN rail mounting	Housing that integrates RJ45 and FO module inserts	1041740
		Housing with cable module, up to 10 Gbps CAT6$_A$	1100077
Socket inserts			
	Adapter-free	Cable module, up to 10 Gbps CAT6$_A$	1417274
	Freenet system	Cable module, up to 10 Gbps CAT6$_A$	1418984
	Freenet system	Cable module, up to 1 Gbps CAT5	1652936
	Adapter-free	Cable module, up to 10 Gbps CAT6$_A$	1041760
	Freenet system		1086111

RJ45, PCB connectors, IP20

Web code: #2059, #2341

	Soldering process	Orientation	Specification	Item No. without LED	Item No. with LED	Item no. Without LED, short solder contacts	Item no. With LED, short solder contacts
RJ45 INDUSTRIAL PCB jacks							
	Wave/THR	90° horizontal	Housing shield springs: Yes	1099280	1099281	1321248	1321246
			Housing shield springs: No	1091946	1091950	1321104	1321101
		180° vertical	Housing shield springs: Yes	1099279	1099282	1321249	1321247
			Housing shield springs: No	1091942	1091947	1321106	1321102
RJ45 singleport PCB jacks							
	Wave	180° vertical	–	1149872	1149871	–	–
		90° horizontal	Locking clip at top	1149870	1149867	–	–
			Locking clip at bottom	1149868	1149866	–	–
	Wave / THR	180° vertical	–	–	–	1337238	1337239
		90° horizontal	Top	–	–	1337240	1337243
	SMD	180° vertical	–	1149611	–	–	–
		90° horizontal	Locking clip at top	1149882	1149873	–	–
			Locking clip at bottom	1149874	–	–	–
RJ45 multiport PCB jacks							
	Wave	90° horizontal	2 RJ45 ports, locking clip at top	1149858	1149854	–	–
			2 RJ45 ports, locking clip at bottom	1149855	1149852	–	–
			4 RJ45 ports, locking clip at top	1149851	1149848	–	–
			4 RJ45 ports, locking clip at bottom	1149849	1149616	–	–
	Wave / THR		2 RJ45 ports, locking clip at top	–	–	1337251	1337254

RJ45, push-pull locking (V14), IP65/IP67

Web code: #0325

	Cable outlet	Material	AWG	Connection method	Data rate	Specification	Item no.
Connector							
	Straight	Die-cast zinc	26 … 24	IDC fast connection	Up to 10 Gbps CAT6$_A$	Push-pull (Version 14)	1149841
			23 … 22				1149843
			26 … 24		Up to 1 Gbps CAT5		1422661
			23 … 22				1422664
	Angled, downward		26 … 24				1422662
			23 … 22				1422665
	Angled, upward		26 … 24				1422663
			23 … 22				1422667
	Straight		26 … 24				1403367
			26 … 24	Crimp connection	Up to 10 Gbps CAT6$_A$		1422108*
			23 … 22	IDC fast connection	Up to 100 Mbps CAT5		1403366
Panel-mount frame							
	Straight	Die-cast zinc	26 … 22	Square panel cutout	Assembled, CAT6$_A$, socket insert, cable connection		1413961
			–		Assembled, CAT6$_A$, socket insert, coupler module		1413962
	–		–		Unequipped, For PCB modules		1413963
	–		–	Round panel cutout	Unequipped, For Freenet modules		1405222
Socket inserts							
	Straight	Die-cast zinc	–	Cable module	Up to 1 Gbps CAT5	Freenet	1652936
			–		Up to 10 Gbps CAT6$_A$		1418984
			–	Coupler module	Up to 10 Gbps CAT6$_A$		1086111
Couplings							
	Straight	Die-cast aluminum	–	1 x RJ45, 1 x RJ45	Up to 1 Gbps CAT5	Push-pull (version 14)	1405183
Multiports							
	Straight	Die-cast aluminum	22 … 26	Cable module	Up to 10 Gbps CAT6$_A$	1 x RJ45	1403678
						1 x RJ45, 1 x power	1403682
			–	Coupler module	Up to 1 Gbps CAT5	1 x RJ45, 1 x RJ45	1403685
	Straight		18 … 13	Cable module	Up to 10 Gbps CAT6$_A$	1 x power	1403684
	Straight			Coupler module			1403681

* Tool 1653265 required

RJ45, snap-in locking (V6), IP65/IP67

Web code: #0329

	Material	AWG	Connection method	Data rate	Characteristics	Item no.
Connector						
	Plastic, gray	23 ... 26	IDC fast connection	Up to 1 Gbps CAT5	–	1656990
		24 ... 27	Crimp connection		–	1414383*
				Up to 10 Gbps CAT6$_A$	–	1414406*
	Plastic, black	23 ... 26	IDC fast connection	Up to 1 Gbps CAT5	–	1658493
		24 ... 27	Crimp connection		–	1414408*
				Up to 10 Gbps CAT6$_A$	–	1414410*

Tool 1653265 required

Panel-mount frame						
	Plastic, gray	–	Round panel cutout	–	For Keystone modules	1689844
		–		–	For Freenet modules	1653744
	Plastic, black	–		–	For Keystone modules	1658053
		–		–	For Freenet modules	1658668
	Plastic, gray	–	Square panel cutout	–	For Keystone modules	1689080
		–		–	For PCB modules	1689446
	Plastic, black	–		–	For Keystone modules	1658642
		–		–	For PCB modules	1658655
Socket inserts						
	Metal	22 ... 24	Cable module	Up to 1 Gbps CAT5	Freenet module	1652936
		22 ... 26		Up to 10 Gbps CAT6$_A$		1418984
		26- 22	Cable module	Up to 10 Gbps CAT6$_A$	Keystone module	1419021
		–	Coupler module	Up to 1 Gbps CAT5	Keystone module	1689064
		–		Up to 1 Gbps CAT6		1086108
		–		Up to 10 Gbps CAT6$_A$	Freenet module	1086111
Couplings						
	Plastic, gray	–	Coupling	Up to 1 Gbps CAT5	1 x RJ45/RJ45	1689268
	Plastic, black	–			1 x RJ45/RJ45	1658684
Terminal outlets						
	Die-cast aluminum	22 ... 24	IDC fast connection	Up to 1 Gbps CAT5	2 x RJ45	1404278

RJ45, patch cables for PROFINET, up to 100 Mbps

Web code: #0326

		IP20 cables			IP65/IP67 cables			
		Free cable end	RJ45 connector, straight	RJ45 connector, angled	RJ45 connector, version 14, metal	RJ45 connector, version 14, plastic	M12 male, straight	M12 male, angled
IP20 cables, variable cable length								
	RJ45 connector, straight	–	–	–	1411863	1411864	1408639	1408613
	RJ45 connector, angled	–	–	–	–	–	1408638	1408612
IP65/IP67 cables, variable cable length								
	RJ45 connector, version 14, metal	1411859	1411863	–	1411866	–	1408636	1408610
	RJ45 connector, version 14, plastic	1411860	1411864	–	–	1411867	1408635	1408609
	M12 male, straight	1408640	1408639	1408638	1408636	1408635	1408634	1408608
	M12 male, angled	1408633	1408632	1408631	1408628	1408626	1408625	1408624
	M12 female, straight	1408623	1408622	1408621	1408619	1408618	1408617	1408616
	M12 female, angled	1408615	1408613	1408612	1408610	1408609	1408608	1408607
IP65/IP67 cables, limited cable length								
	M12 flush-type female connector, rear mounting	1 m, 1437779	0.5 m, 1404367	–	–	–	–	–
		2 m, 1437782	1 m, 1404368	–	–	–	–	–
		5 m, 1437795	5 m, 1404369	–	–	–	–	–

PROFINET cable, type 93B

The type 93B PROFINET cable is designed for flexible installation and is oil-resistant to a degree. It is UV-resistant for 1,200 seconds in accordance with UL 1581, which makes it suitable for outdoor use. Its transmission properties meet CAT5.

- Outer sheath material: PVC
- Minimum bending radius: 7 x D
- Tested at: -20°C ... +25°C

RJ45, patch cables for Ethernet, up to 1 Gbps

Web code: #0327

		IP20 cables			IP65/IP67 cables			
		Free cable end	RJ45 connector	RJ45 connector, version 6	RJ45 connector, version 14, metal	RJ45 connector, version 14, plastic	M12 male, straight	M12 male, angled
IP20 cables, variable cable length								
	RJ45 connector	1411838	1411842	1411843	1411844	1411845	1408681	1408674
IP65/IP67 cables, variable cable length								
	RJ45 connector, version 6	1411839	1411843	1411846	–	–	1408679	1408671
	RJ45 connector, version 14, metal	1411840	1411844	–	1411847	–	1408678	1408670
	RJ45 connector, version 14, plastic	1411841	1411845	–	–	1411848	1408677	1408668
	M12 male, straight	1408682	1408681	1408679	1408678	1408677	1408676	1408667
	M12 male, angled	1408675	1408674	1408671	1408670	1408668	1408667	1408666
	M12 female, straight	1408665	1408664	1408662	–	1408660	1408659	1408658
	M12 female, angled	1408657	1408655	1408653	1408652	1408651	1408650	1408649

Ethernet cable, type 94B

The Ethernet type 94B cable is designed for flexible installation. The cable is resistant to oil and chemicals, and is flame-retardant. Its transmission properties meet CAT5.

- Outer sheath material: PUR
- Minimum bending radius: 5 x D

RJ45, patch cables for Ethernet, up to 10 Gbps

Web code: #0328

		IP20 cables		IP65/IP67 cables						
		Free cable end	RJ45 connector	RJ45 connector, version 6, plastic	RJ45 connector, version 14, metal	RJ45 connector, version 14, plastic	M12 male, straight	M12 male, angled	M12 female, straight	M12 female, angled
IP65/IP67 cables, variable cable length										
	Free cable end	–	1411853	1415639	1415637	1415638	1408648	1 m 1080716 2 m 1080717 5 m 1080718 10 m 1080719	1 m 1080728 2 m 1080729 5 m 1080731 10 m 1080732	1 m 1080746 2 m 1080747 5 m 1080748 10 m 1080750
	RJ45 connector, plastic	1411853	1411854	1414321	1411855	1411856	–	–	1 m 1080733 2 m 1080734 5 m 1080736 10 m 1080737	–
	RJ45 connector, version 6	1415639	1414321	1414322	–	–	–	–	–	–
	RJ45 connector, version 14, Metal	1415637	1411855	–	1414323	–	–	–	1 m 1080738 2 m 1080739 5 m 1080740 10 m 1080741	–
	RJ45 connector, version 14, plastic	1415638	1411856	–	–	1414324	–	–	–	–
	M12 male, straight	1408648	1408647	–	1408646	1408645	1408644	1 m 1080724 2 m 1080725 5 m 1080726 10 m 1080727	1 m 1080742 2 m 1080743 5 m 1080744 10 m 1080745	1 m 1080751 2 m 1080752 5 m 1080753 10 m 1080754
	M12 male, angled	1 m 1080716 2 m 1080717 5 m 1080718 10 m 1080719	–	–	–	–	1 m 1080724 2 m 1080725 5 m 1080726 10 m 1080727	1 m 1080720 2 m 1080721 5 m 1080722 10 m 1080723	–	–
IP65/IP67 cables, limited cable length										
	M12 flush-type female connector, rear mounting	1 m 1424148	–	–	–	–	–	–	–	–
		2 m 1424151	–	–	–	–	–	–	–	–
		5 m 1424164	–	–	–	–	–	–	–	–

Ethernet cable, type 94F

The Ethernet type 94F cable is designed for flexible installation. The cable is resistant to oil and chemicals, and is flame-retardant. It is also halogen-free and its transmission properties meet $CAT6_A$.

- Outer sheath material: PUR
- Minimum bending radius: 10 x D

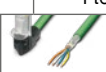
RJ45, patch cables and accessories, IP20

Web code: #2675, #2676

RJ45 office/building patch cables								
Transmission	**CAT5 (up to 1 Gbps)**				**CAT6$_A$ (up to 10 Gbps)**			
Sheath material	LSZH							
Cable design	4 x 2 x 26/7 AWG							
Shielding	S/UTP				S/FTP			
Length	0.3 m	1227558	5.0 m	1227564	0.3 m	1227572	5.0 m	1227583
	0.5 m	1227559	7.5 m	1227565	0.5 m	1227573	7.5 m	1227585
	1.0 m	1227560	10.0 m	1227566	1.0 m	1227575	10.0 m	1227588
	1.5 m	1227561	12.5 m	1227567	1.5 m	1227578	12.5 m	1227590
	2.0 m	1227562	15.0 m	1227570	2.0 m	1227580	15.0 m	1227591
	3.0 m	1227563	20.0 m	1227571	3.0 m	1227581	20.0 m	1227593

Cable overview: RJ45 INDUSTRIAL							
Cable	**93B**	**93C**	**93M**	**93K**	**93R**	**94C**	**94F**
Schema							
Sheath	PVC	PUR	PUR	PVC	PUR	PUR	PUR
Number of positions	4	4	4	4	4	8	8
Design	AWG 22/7	AWG 22/19	AWG 22/7	AWG 22/7	AWG 22/7	AWG 26/7	AWG 26/7
Shielding	SFTQ	SFTQ	SFTQ	SFTQ	SFTQ	SF/UTP	S/FTP
Protocol	PROFINET	PROFINET	PROFINET	Sercos	PROFINET	Ethernet	Ethernet
Transmission category	CAT5 (100 Mbps)	CAT5 (100 Mbps)	CAT5 (100 Mbps)	CAT5 (100 Mbps)	CAT5 (100 Mbps)	CAT5 (1 Gbps)	CAT6$_A$ (10 Gbps)

Detailed information on our cables can be found in the technical data for the item in our web shop

RJ45 INDUSTRIAL patch cables										
Application	Type B Flexible	Type C Drag chain		Type B Flexible		Type B Flexible	Type R Robot		Type C Drag chain		Type B Flexible	
										
Item No.	1247656	1247661	1247629	1247649	1247658	1247660	1247630	1247634	1247639	1247647
Cable Configurable length between 0.5 and 50 m	93B 93K 93M 93C 93R	93B 93K 93M 93C 93R	93B 93K 93M 93C 93R	93B 93K 93M 93C 93R	93B 93K 93M 93C 93R	93B 93K 93M 93C 93R	93B 93K 93M 93C 93R	93B 93K 93M 93C 93R	94C 94F	94C 94F

USB and HDMI, patch cables and device connectors

Web code: #2888, #2889

Patch cable					
Version	**USB 2.0**	**USB 3.2 Gen. 1**		**USB 3.2 Gen. 2**	**HDMI high speed with Ethernet channel**
Head 1 type	Type A			Type C	HDMI type A
Head 2 type	Type A		Type C		HDMI type A
Sheath material	PVC				–
0.3 m	1333130	1333148	1333158	1333194	1332077
0.5 m	1333131	1333150	1333160	1333195	1332078
1.0 m	1333136	1333151	1333165	1333197	1332079
1.5 m	1333137	1333153	1333166	1333210*	1332081
1.8 m	1333138	1333155	1333185	1333211*	1332082
2.0 m	1333139	1333156	1333187	1333213*	1332083
3.0 m	1333140	1333157	1333190	1333214*	1332084
5.0 m	1333145	–	–	–	1332086

* USB 3.2 Gen. 1

Device connectors							
Version	**USB 2.0**				**USB 3.2 Gen. 1**		
Type	Type A						
Orientation	90° horizontal	90° vertical	180° vertical	90° horizontal	90° horizontal	180° vertical	90° vertical
Soldering process	Wave			SMD	THR		
Item no.	1332630	1332631	1332632	1332634	1332637	1332638	1332636

Device connectors					
Version	**USB 3.2 Gen. 2**			**HDMI 2.0**	
Type	Type C			HDMI type A	
Orientation	90° horizontal	180° vertical	90° horizontal	90°	180°
Soldering process	SMD/THR	SMD	SMD	SMD	
Item no.	1332643	1332645	1332646	1332071	1332073

IP65/67 M12 connectors

Web code: #0338

M12 connectors										
			Push-in connection		IDC connection		Piercecon connection		Screw connection	
			Straight	Angled	Straight	Angled	Straight	Angled	Straight	Angled
Networks										
Ethernet	CAT5, 4-pos.	Male	–	–	1411066	1553624	–	–	1521261	–
		Female	–	–	1411069	1553637	–	–	–	–
	CAT5, 8-pos.	Male	–	–	1421679	1553653	–	–	–	–
		Female	–	–	1421680	1553666	–	–	–	–
	CAT6$_A$, 8-pos.	Male	–	–	1411043	–	1417430	1417443	–	–
		Female	–	–	1414586	–	–	–	–	–
PROFINET		Male	1424682	1424684	1411068	1554539	–	–	1521261	–
		Female	1424683	1424685	1411071	1554542	–	–	–	–
VARAN		Male	–	–	1429130	1429156	–	–	–	–
		Female	–	–	1429143	1429169	–	–	–	–
Fieldbuses										
INTERBUS		Male	1424674	1424675	–	–	–	–	1507764	1430417
		Female	1424676	1424677	–	–	–	–	1507777	1430420
PROFIBUS		Male	1424678	1424679	1413931	–	–	–	1507764	1430417
		Female	1424680	1424681	1413932	–	–	–	1507777	1430420
CANopen®, DeviceNet™		Male	1424670	1424671	1422759	–	–	–	1508352	–
		Female	1424672	1424673	1422760	–	–	–	1508365	–
CC-Link		Male	1424699	–	–	–	–	–	–	–
		Female	1424700	–	–	–	–	–	–	–

Coaxial cables

Web code: #2890

Coaxial cables and PCB connectors						
Head 1	**N (m)**	**N (f) BH**	**N (m)**	**N (f) BH**	**N (m)**	**SMA (m)**
Head 2	**N (m)**	**R-SMA (m)**	**R-SMA (m)**	**SMA (m)**	**SMA (m)**	**SMA (f)**
0.5 m	1340122	1340129	1340130	1340138	1340139	–
1.0 m	–	–	1340131	–	1340143	–
1.5 m	–	–	1340133	–	–	–
2.0 m	–	–	1340135	–	–	–
3.0 m	1340123	–	1340136	–	1340144	–
5.0 m	1340124	–	1340137	–	1340147	1340149
10 m	1340125	–	–	–	–	1340148
15 m	1340126	–	–	–	–	–
30 m	1340127	–	–	–	–	–

Coaxial PCB connectors				
Web code: #2890				
Soldering process	Wave / THR	Wave	Wave / THR	Wave
Series	SMA	SMA	R-SMA	R-SMA
Orientation	90°	90° bulkhead	90°	90° bulkhead
Item no.	1340151	1340153	1340150	1340152

SPE connectors

Web code: #2671, #2670

SPE connectors, IP20					
Description	SPE PCB connector, 180°	SPE PCB connector, 90°	SPE PCB connector, 90° LED	SPE network cables	SPE IDC connector
Contact connection type	Male			Female	Female
Connection method	THR and wave soldering			–	IDC insulation displacement connection
LED	–		Yes	–	–
Type	SPE-T1-STSM-180	SPE-T1-STSM-90	SPE-T1-STRM-90-LED	SPE-T1-CCP-SF/.../ AWG22/CCP/SF	SPE-T1-CIM-SF
Item no.	1163798	1163797	1215778	1 m,1183807 2 m,1183808 3 m, 1183810 5 m, 1183811	1343953

SPE connectors, IP67 (M8)							
Description	SPE device connector, 180°	SPE device connector, 180°	SPE device connector, 90°	SPE network cable, PVC	SPE network cable, PUR	SPE network cable, PVC	SPE network cable, PUR
Contact connection type	Male	Male	Male	Female – female Female – male	Female – female Female – male	Male – male	Male – male
Soldering process	THR and wave soldering	SMD soldering	THR and wave soldering	–	–	–	–
Type	SPE-T1-M8 MSM-180	SPE-T1-M8 MSM-180-SMD	SPE-T1-M8 MRM-90	SPE-T1-M8MSM/ 2,0-97B/M8FSF SPE-T1-M8FSF/ 2,0-97B/M8FSF	SPE-T1-M8MSM/ 2,0-99B/M8FSF SPE-T1-M8FSF/ 2,0-99B/M8FSF	SPE-T1-M8MSM/2,0-97B/M8MSM	SPE-T1-M8MSM/2,0-99B/M8MSM
Housing screw connection, front mounting	1412502			–	–	–	
Housing screw connection, rear mounting	1412505			–	–	–	
Item no.	1163793	1215777	1163795	2 m, 1217524 2 m, 1217530	2 m, 1150575 2 m, 1217320	2 m, 1217526	2 m, 1217316

SPE connectors, IP67 (M12 HYBRID)

new

Description	SPE M12 hybrid device connectors		SPE M12 hybrid cables	
Standard	IEC 63171-7 (coding 2)			
Version	Female	Male	Female (straight) – free cable end	Male (straight) – free cable end
Number of positions	6 (2x SPE + 4x power) + shielding			
Housing screw connection, front mounting	1420825	1108115 (incl. push-pull) 1420824	–	–
Housing screw connection, rear mounting	1420827	1108101 (incl. push-pull) 1420826	–	–
Type	SPE-T1-M12HC2FSF-180	SPE-T1-M12HC2MSM-180	SPE-T1-2,0-99H/MC2FS	SPE-T1-MC2MS/2,0-99H
Item no.	1439722	1439775	2 m, 1524235	2 m, 1524231

SPE connectors, IP67 (M12)

new

Description	SPE M12 device connectors				SPE M12 cables				
Contact connection type	Female		Male		Male – female	Female – female	Male – male	Male – free cable end	Female – free cable end
Housing screw connection, front mounting	1027678	1412079	1107999	1027679	–	–	–	–	-
Housing screw connection, rear mounting	1027662	1414021	1107993	1027661	–	–	–	–	-
Type	SPE-T1-M12FSF-180 SPE-T1-M12FRF-90	SPE-T1-M12FSF-180-SMD	SPE-T1-M12MSM-180-SMD SPE-T1-M12MRM-90	SPE-T1-M12MSM-180	SPE-T1-M12MS/2,0-99B/M12FS PUR SPE-T1-M12MS/2,0-97B/M12FS PVC	SPE-T1-M12FS/2,0-99B/M12FS PUR SPE-T1-M12FS/2,0-97B/M12FS PVC	SPE-T1-M12MS/2,0-99B/M12MS PUR SPE-T1-M12MS/2,0-97B/M12MS PVC	SPE-T1-M12MS/2,0-99B PUR	SPE-T1-2,0-99B/M12FS PUR
Item no.	1363337 (180° THR) 1363341 (90° THR)	1363344 (180° SMD)	1363342 (180° SMD) 1363338 (90° THR)	1363336 (180° THR)	2 m, 1364621 2 m, 1364626	2 m, 1364623 2 m, 1364631	2 m, 1364622 2 m, 1364629	2 m, 1478365	2 m, 1478369

IP65/67 M12 device connectors

			Wave soldering		THR soldering	
Networks			**Male**	**Female**	**Male**	**Female**
Ethernet	CAT5, 4-pos.		1456514	1456527	1552214*	1551451*
	CAT5, 4-pos., cable type 93E	2 m	–	–	–	–
	CAT5, 8-pos.		1456530	1456543	1557578	1557549
	CAT5, 8-pos., cable type 94B	5 m	–	–	–	–
	CAT5, 8-pos., cable type 94C	2 m	–	–	–	–
	CAT6$_A$, 8-pos.		–	1424177	–	1402457*
	CAT6$_A$, 8-pos., cable type 94F	0.5 m	–	–	–	–
	CAT6$_A$, 8-pos., cable type 94F	1 m	–	–	–	–
	CAT6$_A$, 8-pos., cable type 94F	2 m	–	–	–	–
	CAT6$_A$, 8-pos., cable type 94F	5 m	–	–	–	–
	CAT5, 8-pos., hybrid		–	1407503	–	1405225*
	CAT5, 8-pos., hybrid, cable type 94H	0.5 m	–	–	–	–
	CAT5, 8-pos., hybrid, cable type 94H	1 m	–	–	–	–
	CAT5, 8-pos., hybrid, cable type 94H	2 m	–	–	–	–
	CAT5, 8-pos., hybrid, cable type 94H	5 m	–	–	–	–
PROFINET	4-pos.		1456556	1456569	1552175	1542648
	4-pos., cable type 93B	0.5 m	–	–	–	–
	4-pos., cable type 93B	1 m	–	–	–	–
	4-pos., cable type 93B	2 m	–	–	–	–
	4-pos., cable type 93B	5 m	–	–	–	–
	4-pos., cable type 93C	2 m	–	–	–	–
	4-pos., cable type 93R	3 m	–	–	–	–
Sercos	4-pos.		1457979	1457966	–	–
	4-pos., cable type 93K		–	–	–	–
	4-pos., cable type 93K		–	–	–	–
	4-pos., cable type 93K		–	–	–	–
	4-pos., cable type 93K		–	–	–	–
EtherCAT®	4-pos.		1456556	1456569	–	–
	4-pos., cable type 93K		–	–	–	–
	4-pos., cable type 93K		–	–	–	–
	4-pos., cable type 93K		–	–	–	–
	4-pos., cable type 93K		–	–	–	–
M12 for fieldbuses			**Male**	**Female**	**Male**	**Female**
PROFIBUS	5-pos.	0.5 m	1456475	1456488	–	–
INTERBUS	5-pos.	0.5 m	1456572	1456585	–	–
CANopen® EtherNet/IP™	5-pos.	0.5 m	1456491	1456501	–	–
CC-Link	4-pos.		1457856	1457869	–	–
FOUNDATION Fieldbus	4-pos.		1457872	–	–	–

SMD soldering		Bulkheads, M12 to RJ45					
Male	Female	Straight	Angled	Male	Female	Male	Female
1411956*	1411950*	–	–	–	–	1411592	1411585
–	–	–	–	–	1405866	–	–
–	–	1414396	1414393	–	–	–	–
–	–	–	–	–	1407877	–	–
–	–	–	–	–	1412820	–	–
–	1411964*	1404549	1404548	–	–	–	–
–	–	–	–	–	1424135	–	–
–	–	–	–	–	1424148	–	–
–	–	–	–	–	1424151	–	–
–	–	–	–	–	1424164	–	–
–	1411965*	–	–	–	–	–	1407618
–	–	–	–	–	1407504	–	–
–	–	–	–	–	1407505	–	–
–	–	–	–	–	1407506	–	–
–	–	–	–	–	1407507	–	–
–	–	1414398	1414397	–	–	–	–
–	–	–	–	1437805	1437766	–	–
–	–	–	–	1437818	1437779	–	–
–	–	–	–	1437821	1437782	–	–
–	–	–	–	1437834	1437795	–	–
–	–	–	–	–	1416209	–	–
–	–	–	–	–	1416263	–	–
–	–	–	–	–	–	–	–
–	–	–	–	1419158	1419154	–	–
–	–	–	–	1419159	1419155	–	–
–	–	–	–	1419160	1419156	–	–
–	–	–	–	1419161	1419157	–	–
–	–	–	–	–	–	–	–
–	–	–	–	1419138	1419134	–	–
–	–	–	–	1419139	1419135	–	–
–	–	–	–	1419140	1419136	–	–
–	–	–	–	1419141	1419137	–	–
Male	Female	Straight	Angled	Male	Female	Male	Female
–	–	–	–	1534342	1534384	–	–
–	–	–	–	1534504	1534546	–	–
–	–	–	–	1534423	1534465	–	–
–	–	–	–	–	–	–	–
–	–	–	–	–	–	1431432	1431429

Corresponding housings can be found under web code **Web code:** #0214 and **Web code:** #0215

Assembled cables for Ethernet networks

	Cable structure	Conductor structure/ Signal line	Description	By the meter	100 m ring
93E					
	2 x 2 x 28 AWG	7 x 0.25 m	Ethernet cable for flexible installation. The cable is halogen-free, oil-resistant, and its transmission properties meet CAT5e.	1416415	1416305
94A					
	4 x 2 x 24 AWG	Single-strand, Twisted pair	Ethernet cable for fixed installation. The cable's transmission properties meet CAT5e.	1416415	1416305
94B					
	4 x 2 x 28 AWG	7 x 0.25 mm	Ethernet cable for flexible installation. The cable is resistant to oil and chemicals, and is flame-retardant. Its transmission properties meet CAT5e.	1417333	1416567
94D					
	4 x 2 x 26 AWG	7 x 0.18 m, Twisted pair	Ethernet cable for flexible installation. The cable is oil-resistant to a degree. It is UV-resistant in accordance with UL 1581 Section 1200 and therefore also suitable for outdoor use. The cable's transmission properties meet CAT5e.	1416444	1416334
94E					
	4 x 2 x 23 AWG	Single-strand, Twisted pair	Ethernet cable for fixed installation. The cable is resistant to oil and chemicals, and is flame-retardant. It is also halogen-free and its transmission properties meet $CAT6_A$.	1416460	1416334
94F					
	4 x 2 x 26 AWG	7 x 0.16 mm, Twisted pair	Ethernet cable for flexible installation. The cable is resistant to oil and chemicals, and is flame-retardant. It is also halogen-free and its transmission properties meet $CAT6_A$.	1417359	1416347

Assembled cables for PROFINET networks

	Cable structure	Conductor structure/ signal line	Description	By the meter	100 m ring
93A					
	4 x 22 AWG	Single-strand	PROFINET cable for fixed installation. The cable is flame-retardant and its transmission properties meet CAT5e.	1416486	1416392
93B					
	4 x 22 AWG	7 x 0.25 mm	PROFINET cable for flexible installation. The cable is oil-resistant to a degree. It is UV-resistant in accordance with UL 1581 Section 1200 and therefore also suitable for outdoor use. The cable's transmission properties meet CAT5e.	1417362	1416389
93C					
	4 x 22 AWG	7 x 0.25 mm	PROFINET cable for use in drag chains. The cable is halogen-free and oil resistant. It is UV-resistant and therefore suitable for outdoor use. The cable's transmission properties meet CAT5e.	1417491	1416376
93R					
	4 x 22 AWG	19 x 0.15 mm	PROFINET cable for robot applications. The cable is oil-resistant to a degree. It is UV-resistant in accordance with UL 1581 Section 1200 and therefore also suitable for outdoor use. The cable's transmission properties meet CAT5e.	1417388	1416363
937					
	4 x 22 AWG	7 x 0.25 mm	PROFINET cable for railway applications. The cable is oil-resistant. It meets fire safety standard BS 6853. The cable's transmission properties meet CAT5e.	1402687	1416363

FO-based data cabling for networks and fieldbuses

High transmission speed, low attenuation, resistant to electromagnetic interference: FO cables are among the modern transmission media for industrial systems and infrastructure applications. Whatever the fiber type or interface – you can choose the right connection technology from our extensive portfolio.

Web code: #0298

Wide choice of versions

Wide choice of versions from SC-RJ, LC, SC, F-SMA to ST, plus POF, PCF, and GOF fiber types.

Comprehensive range of cables

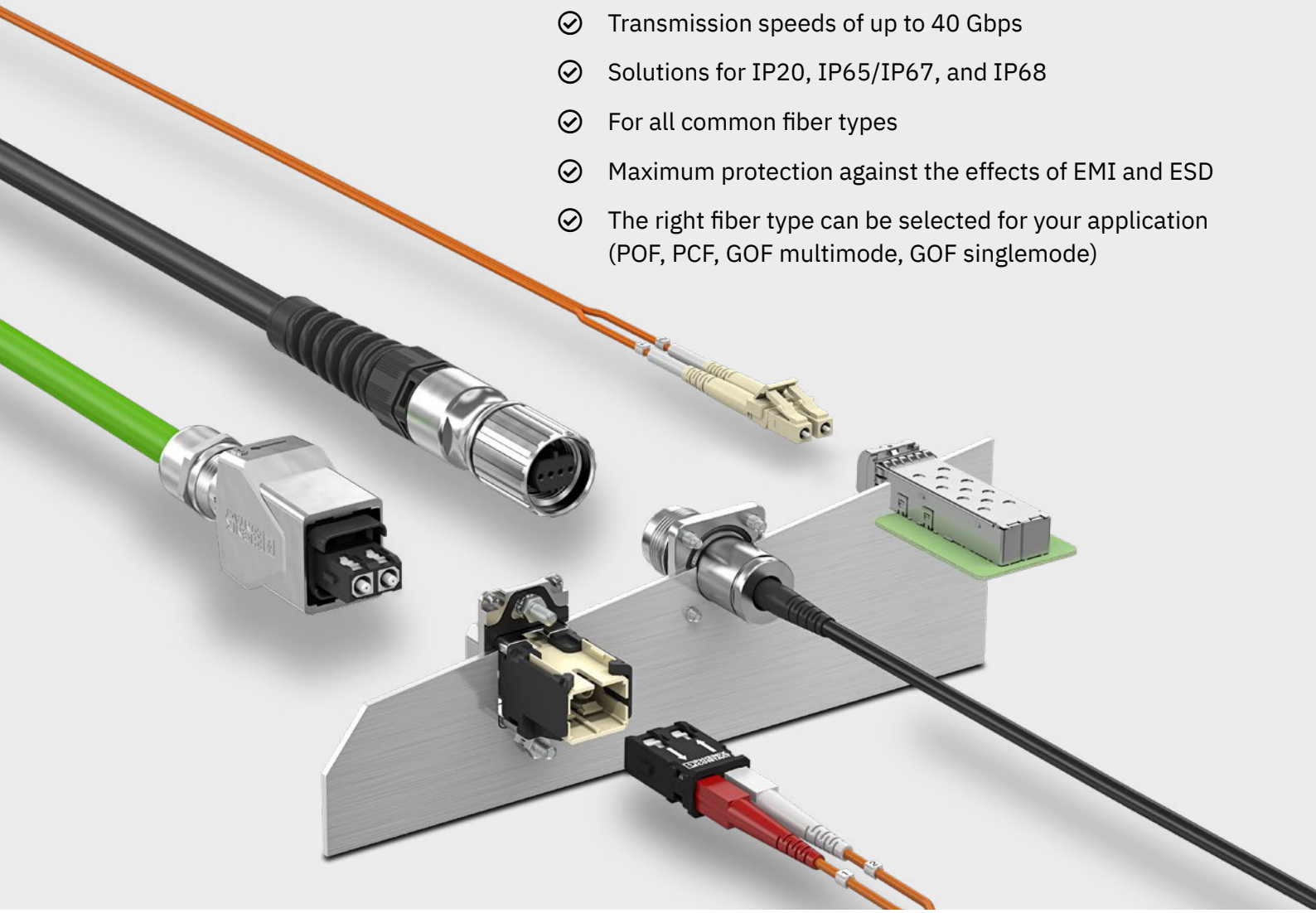
Extensive range of cables for all applications, networks, and standard interfaces.

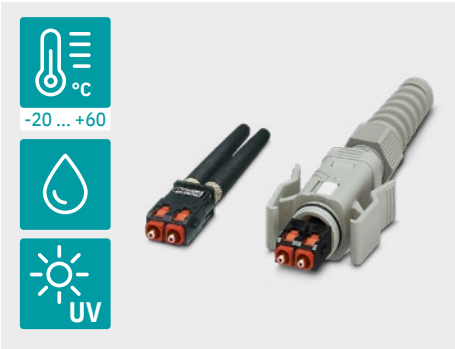
Fast assembly

Fast assembly in the field using professional tools.

Your advantages

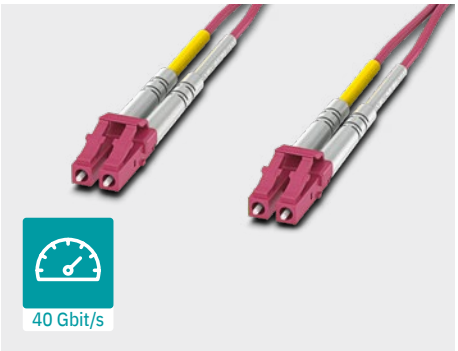
- Transmission speeds of up to 40 Gbps
- Solutions for IP20, IP65/IP67, and IP68
- For all common fiber types
- Maximum protection against the effects of EMI and ESD
- The right fiber type can be selected for your application (POF, PCF, GOF multimode, GOF singlemode)





Reliable protection

Reliable protection against extreme temperatures, liquids, and UV light.



High-quality patch cables

Large selection of patch cable versions for all typical connection methods.

High packing density

High packing density and large splice comb in splice boxes for DIN rail and 19" mounting.

SC-RJ, V14, IP65/IP67

Web code: #0334

	Cable outlet	Material	Connection method	Data rate	Specification	Item no.
Connector						
	Straight	Die-cast zinc	POF	Up to 100 Mbps	–	1407896
	Angled, bottom		POF		–	1407902
	Angled, top		POF		–	1408028
Panel-mount frame						
	–	Die-cast zinc	Round panel cutout	–	Assembled, with coupler module, for POF, PCF, and GOF	1405235
	–		Square panel cutout	–	Assembled, with coupler module, for POF, PCF, and GOF	1413964
	–			–	Unequipped, For AVAGO transceivers	1413981
Coupling						
	–	Die-cast zinc	–	–	1 x SC-RJ / 1 x SC-RJ	1405206
Tool sets						
	–	–	–	–	For POF	1658820
	–	–	–	–	For PCF	2708876

SC-RJ, snap-in locking (V6), IP65/IP67

Web code: #0334

	Material	Connection method	Data rate	Specification	Item no.
Connector					
	Plastic	POF	Up to 100 Mbps	–	1657009
Panel-mount frame					
	Plastic, gray	Round panel cutout	–	Unequipped, For Freenet modules	1653744
	Plastic, black			Unequipped, For Freenet modules	1658668
Socket insert for panel-mount frames					
	Plastic	POF, PCF, and GOF	–	Freenet coupler module	1652978
Coupling					
	Plastic	–	–	1 x SC-RJ 1 x SC-RJ	1410050
Tool sets					
	–	–	–	For POF	1658820

For further information and our video animation on FO-based data connectors:

Simply type the web code into the search field on our website.

Web code: #0298

FO, connectors designed for assembly

Web code: #0332

	Function	Fiber type	Specification	Item no.
LC				
	Connector	GOF	Multimode	1089521
			Singlemode PC	1089520
			Singlemode APC	1089519
	Coupling		Multimode	1207355
			Multimode metal	1208069
			Singlemode PC	1208073
			Singlemode APC	1208077
SC				
	Connector	GOF	Multimode	1089518
			Singlemode PC	1089517
			Singlemode APC	1089516
		PCF	–	2313779
		GOF	Multimode	1208081
			Multimode metal	1208083
			Singlemode PC	1208086
			Singlemode APC	1208088
SC-RJ				
	Connector	PCF	SC, SC-RJ (Ø 2.2 mm)	1404087
			SC-RJ (Ø 2.9 mm)	1654866
		POF	SC-RJ (Ø 2.2 mm)	1654879
	Coupling	GOF, PCF, POF	–	1652978
F-SMA				
	Connector	PCF	Ø 2.9 mm	2799487
		POF	–	2799720
	Coupling	GOF, PCF, POF	–	2799416
ST (B-FOC)				
	Connector	PCF	Ø 2.2 mm	2313782
			Ø 2.9 mm	2708481
	Coupling	GOF, PCF, POF	–	1208099
Tool sets				
	Tool set	GOF	Multimode and singlemode	1089515
		PCF	SC, SC-RJ (Ø 2.2 mm), SC-RJ (Ø 2.9 mm)	2708876
			ST (Ø 2.2 mm), ST (Ø 2.9 mm)	2708465
			F-SMA (Ø 2.9 mm)	2799526
		POF	SC-RJ	1658820
			F-SMA	2744131

FO, patch panels and socket inserts, IP20

Web code: #0336

	Mounting type	Material	Specification	Item no.
Patch panels				
	DIN rail mounting	Plastic, gray	Incl. coupler module, SC-RJ, for POF, PCF, and GOF	1658121
	19" mounting		16 installation slots, for Freenet modules, unassembled	1652994
Socket inserts, Freenet modules				
	Coupling module	–	SC-RJ, for POF, PCF, and GOF	1654358

FO, splice boxes, IP20

Web code: #0336

FO splice boxes, FDX 20 series, IP20						
	DIN rail mounting					
	6 x LC duplex	12 x LC duplex	6 x SC duplex	6 x ST duplex 6 x SC duplex	6 x ST duplex 6 x ST duplex	6 x LSH duplex
Without pigtails, multimode, polymer couplings	1019710	1019705	1019686	–	–	–
Without pigtails, multimode, metal couplings	1343385	–	1343387	1343388	1343383	–
Without pigtails, singlemode, polymer couplings	1343386	–	1084827	–	–	–
Without pigtails, singlemode, metal couplings	–	–	–	–	1343384	–
OM1 (G62.5/125 µm)	1343377	–	1343380	1019684	–	–
OM2 (G50/125 µm)	1019713	1019709	1019700	1019683	–	–
OM3 (G50/125 µm)	1343378	–	1343381	–	–	–
OM4 (G50/125 µm)	1019712	1019708	1019698	–	–	–
OS2 PC (E9/125 µm)	1019711	1019707	1019692	1019682	–	–
OS2 APC (E9/125 µm)	1083665	–	1343382	–	–	1019680

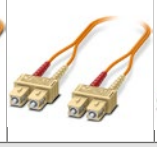
FO, fiberglass zip cords, multimode, IP20

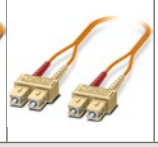
Web code: #0333, #0336

FO splice boxes, FDX 20 series, 19" mounting

Description	12 x LC duplex	24 x LC duplex	12 x SC duplex	24 x SC duplex	12 x ST duplex	24 x ST duplex
OM1 (G62.5/125 µm)	–	–	–	–	1145399	1145389
OM2 (G50/125 µm)	1145416	1145375	1145408	1145407	1145398	1145397
OM4 (G50/125 µm)	1145415	1145413	1145406	1145403	–	–
OS2 (PC) (E9/125 µm)	1145411	1145409	1143631	1145400	1145395	1145392

FO patch cables (length: 1.0 m [1])





Description	OM1				OM2			
Type	LC	SC	ST	–	LC	SC	ST	SC-RJ
LC	1146497	1146498	1146499	–	1115633	1115607	1115588	1405694 [2]
SC	1146498	1146504	1413791	–	1115607	1115536	1115574	1405700 [2]
ST	1146499	1413791	1146501	–	1115588	1115574	1115560	1405710 [2]
SC-RJ	–	–	–	–	1405694 [2]	1405700 [2]	1405710 [2]	1405703 [2]

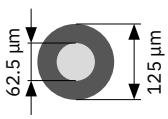
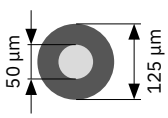
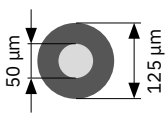
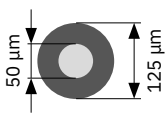
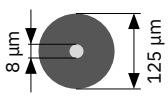
Description	OM3				OM4			
Type	LC	SC	–	SC-RJ	LC	SC	ST	SC-RJ
LC	1185473	1185480	–	1405695 [2]	1115625	1115601	1492352	1405696 [2]
SC	1185480	1185485	–	1405701 [2]	1115601	1115424	–	1405702 [2]
ST	–	–	–	–	1492352	–	–	–
SC-RJ	1405695 [2]	1405701 [2]	–	1405704 [2]	1405696 [2]	1405702 [2]	–	1405705 [2]

Description	OS2 UPC				OS2 APC			
Type	LC	SC	ST	–	LC	SC	ST	–
LC	1115636	1115618	1115596	–	1115630	1115613	–	–
SC	1115618	1115550	1115582	–	1115613	1115544	–	–
ST	1115596	1115582	1115565	–	–	–	–	–

[1] Other available length versions 0.5 m, 1 m, 2 m, 3 m, 5 m, 10 m configurable
[2] Only available as configurable versions

FO, fiberglass zip cords, singlemode, IP20

FO cables by the meter										
Type	Loose tube (new)									
Fiber category	OM1	OM2	OM3	OM4	OS2	OM1	OM2	OM3	OM4	OS2
Number of fibers	12					24				
Item no.	1286223	1286222	1286221	1286220	1286219	1286217	1286215	1286214	1286211	1286210
Type	Full breakout				Mini breakout (new)		Zip cord			
Fiber category	OM2			PCF	OM4		OM1	OM2	OM3	OM4
Number of fibers	2	2	4	2	12	24	2			
Item no.	1406429	1406430	1406431	1406432	1286209	1286208	1411566	1411561	1411563	1411564

Zip cord fiber classes					
Multimode	**Fiber structure**	**Sheath color**	**Fiber category**	**Typical range**	**Typical wavelength**
		Orange	OM1	1000Base-SX: min. 350 m 1000Base-LX: min. 550 m	850 nm 1300 nm
		Orange	OM2	1000Base-SX: min. 525 m 1000Base-LX: min. 1000 m	850 nm 1300 nm
		Aqua	OM3	1000Base-SX: min. 1000 m 1000Base-LX: min. 550 m 10GBase-SX: min. 300 m	850 nm
		Heather violet	OM4	1000Base-SX: min. 1040 m 1000Base-LX: min. 600 m 10GBase-SX: min. 550 m	850 nm
Singlemode					
		Yellow	OS2	10GBase-LR: min. 10 km 10GBase-ER: min. 40 km	1310 nm 1550 nm

Your partner for ICS security and industrial communication

You do not need to be an expert. We provide you with much more than just products. We also provide you with support whenever you need it. Phoenix Contact provides a comprehensive service portfolio for ICS security and industrial communication over the entire system life cycle, with a focus on availability, integrity, and confidentiality. We not only provide support over the phone or by email, but also directly on site, if you so desire.

Web code: #1557

Our range of services at a glance

Assessment and planning

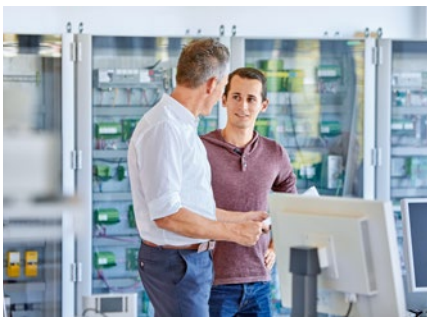
Together, we will inspect your system and analyze your individual threat and risk situation, documentation, and processes. You will receive a detailed report of vulnerabilities, recommended actions, and a list of measures required in order to provide standard protection for your system.

Based on the industry standard, we will develop solutions and concepts that are tailored to you. Whether you need failsafe network structures, concepts for the protection or remote maintenance of your machinery, or high-performance wireless networks: we will find the right solution for you.

Implementation

We implement your security and network requirements for you, so you can continue to focus on your actual core competencies. We do this by providing assistance on site or handling complete subtasks, which we will implement according to the relevant specifications.

After our analysis has been carried out, we will optimize the communication relationships in your network to increase performance and availability.



Maintenance and support

To ensure the availability of your system, updates must be installed on a regular basis, the firewall rules adapted, and messages evaluated. As a user, you have minimal administrative work. In addition, you will satisfy the burden of proof for implementing measures in accordance with state-of-the-art technology.

We focus on eliminating anomalies, such as incorrect device configurations and any security vulnerabilities that are identified.

If you have any questions about ICS security and industrial communication, do not hesitate to contact us.

Seminars

Information security concerns all employees in your company. Through security-conscious and responsible behavior, employees can avoid failures and damage, and contribute to the success of the company.

We provide awareness instructions and practical trainings that are tailored to your individual requirements.

Open communication with customers and partners worldwide

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.

You can find your local partner at

phoenixcontact.com

MNR 1958994/2026-02-10/11

3012373444