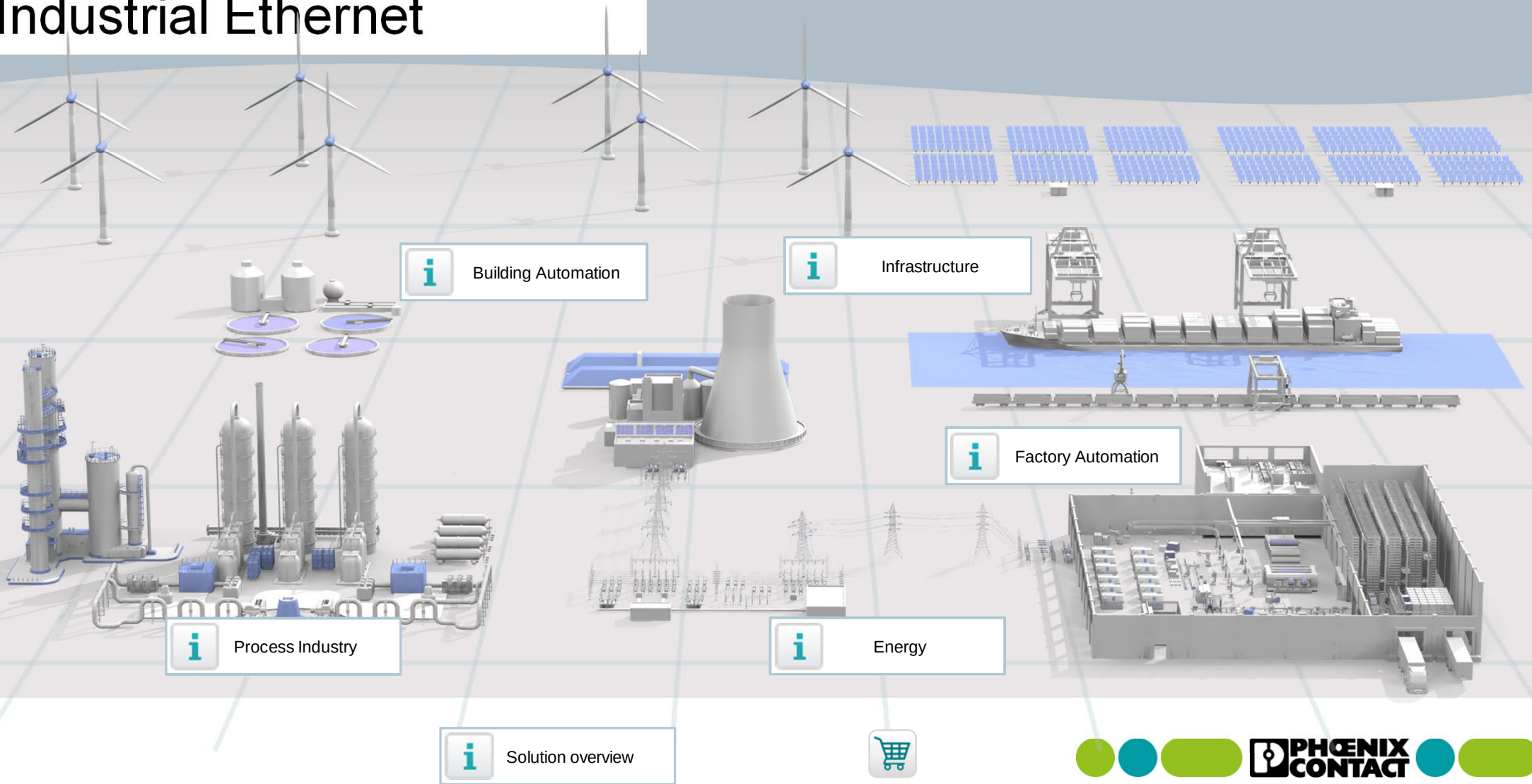
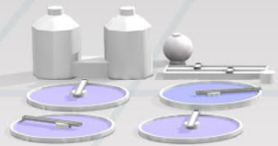


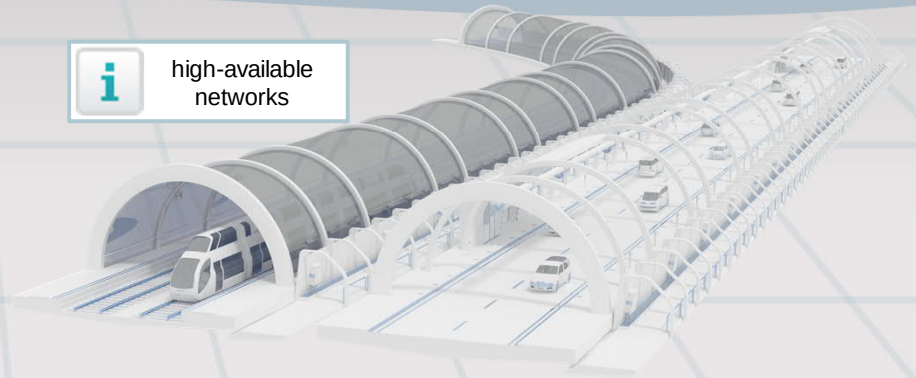
Industrial Ethernet



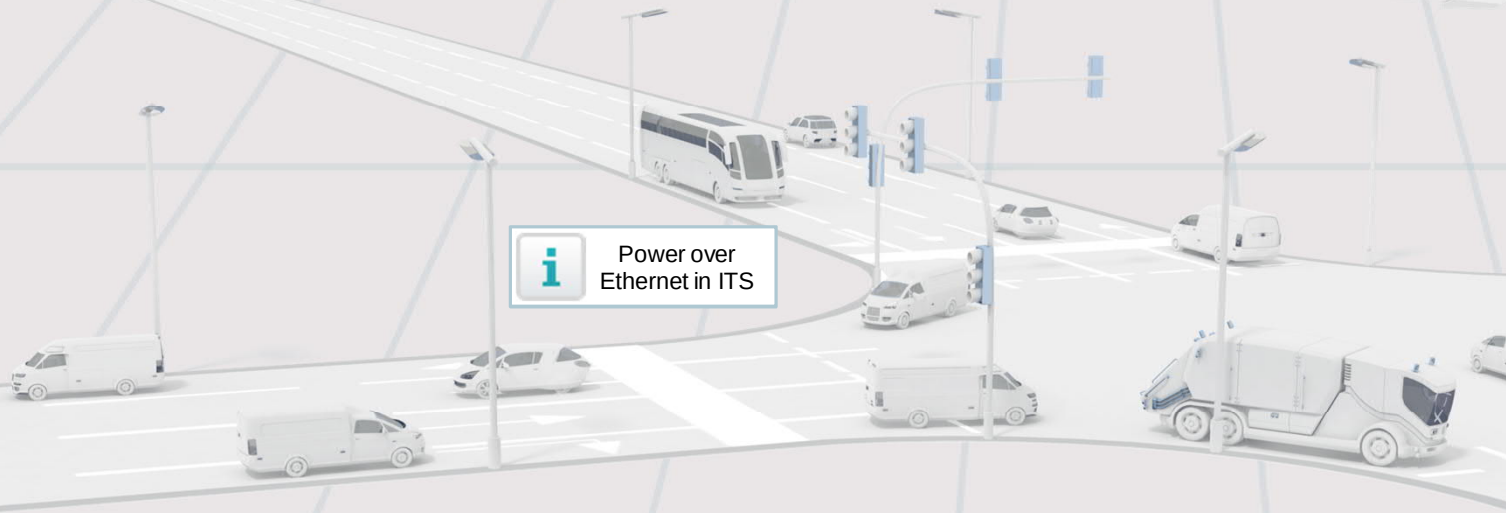
Infrastructure



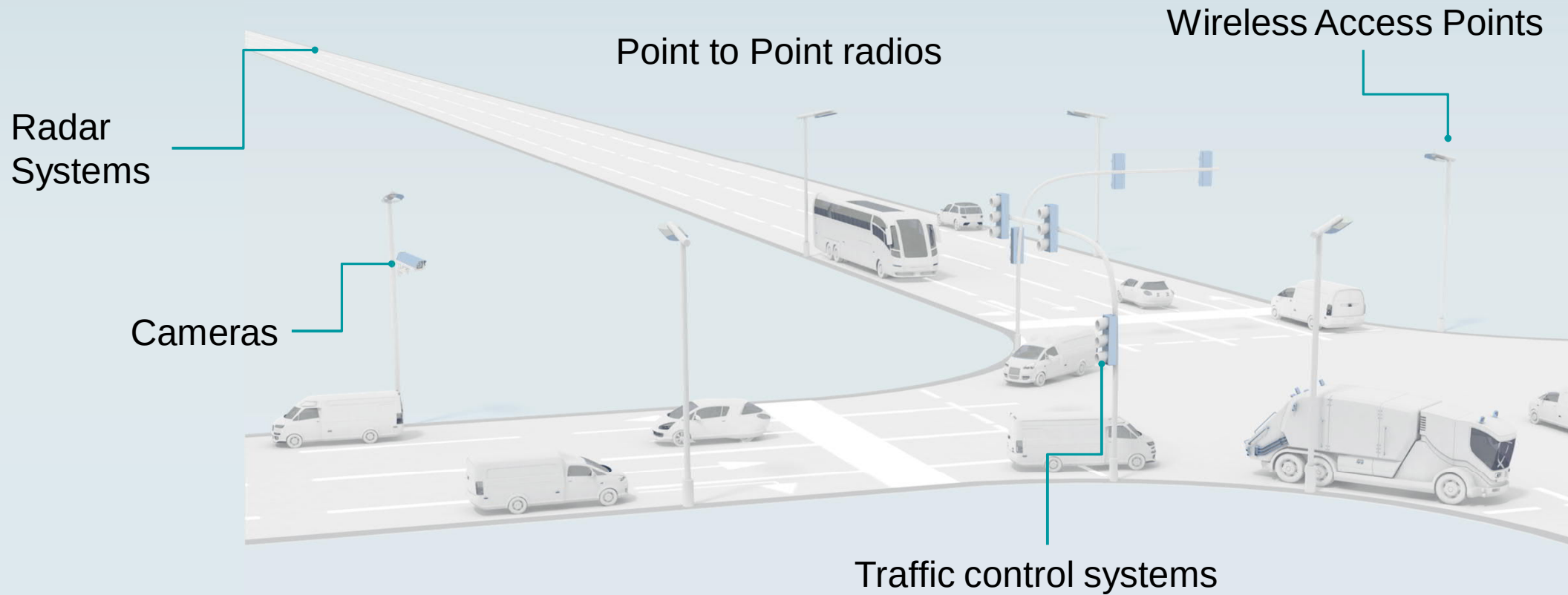
high-available
networks



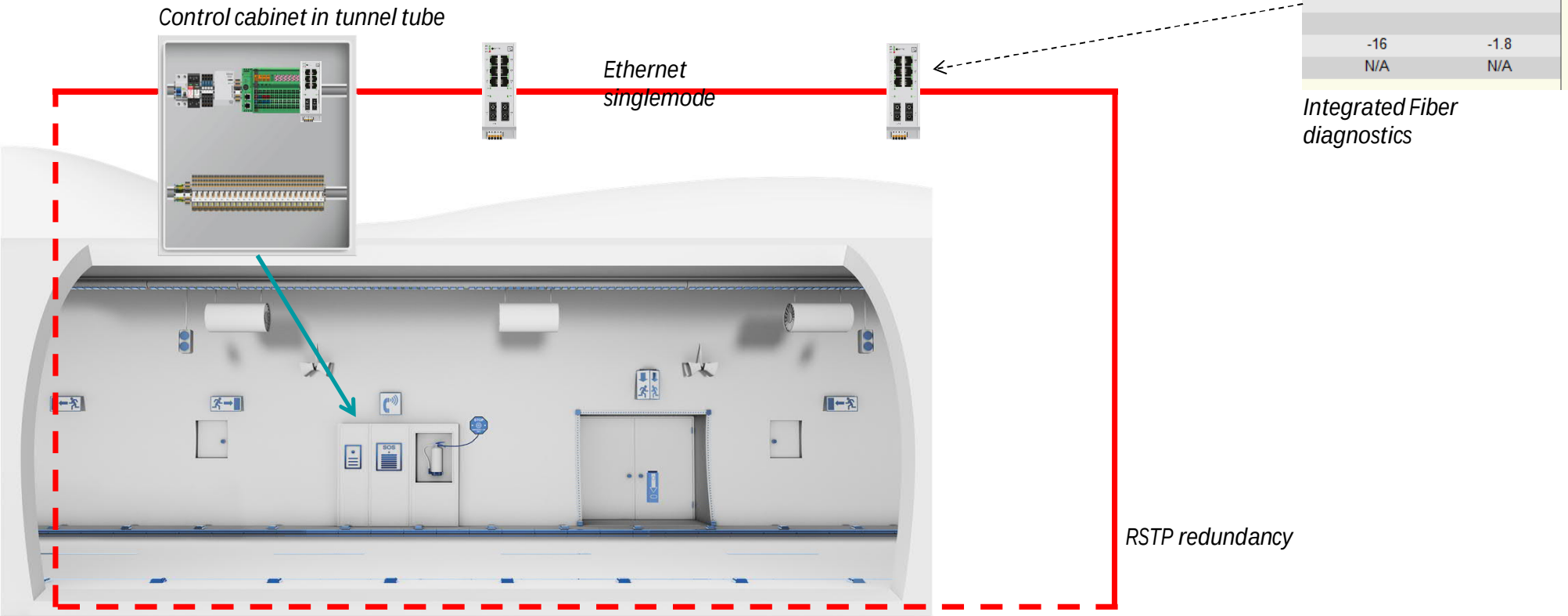
Power over
Ethernet in ITS



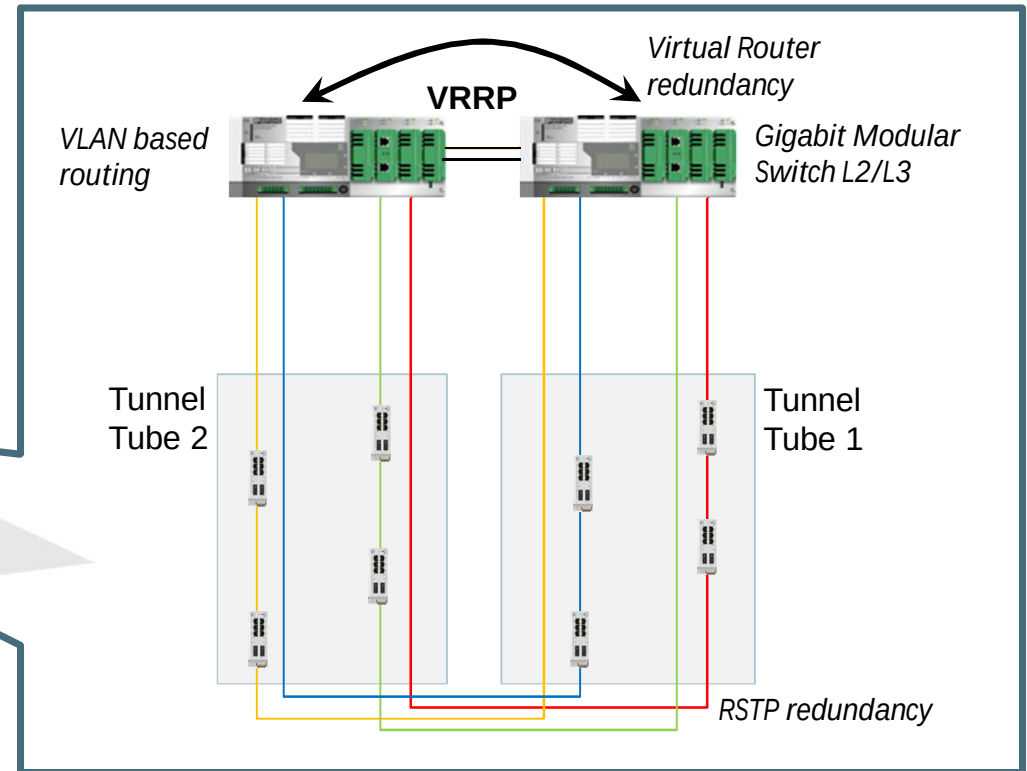
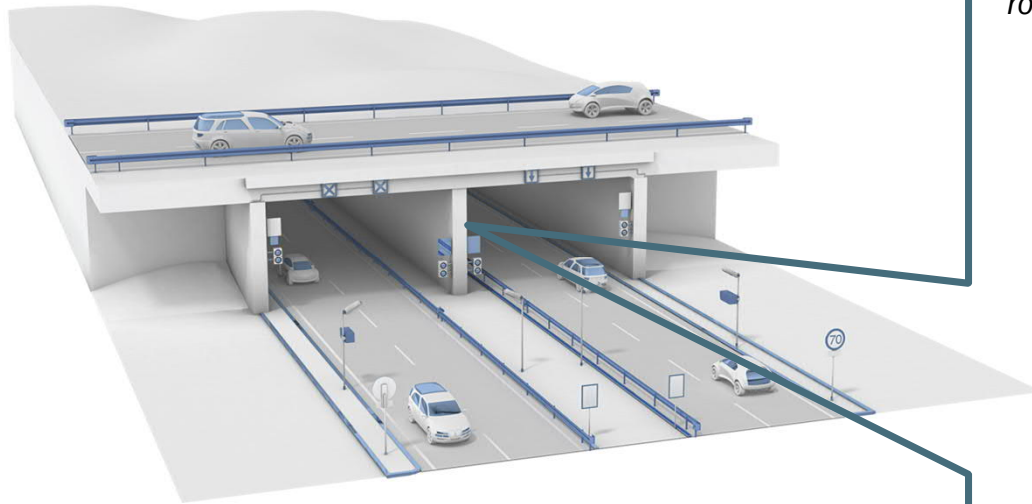
ITS – Intelligent Transportation Systems



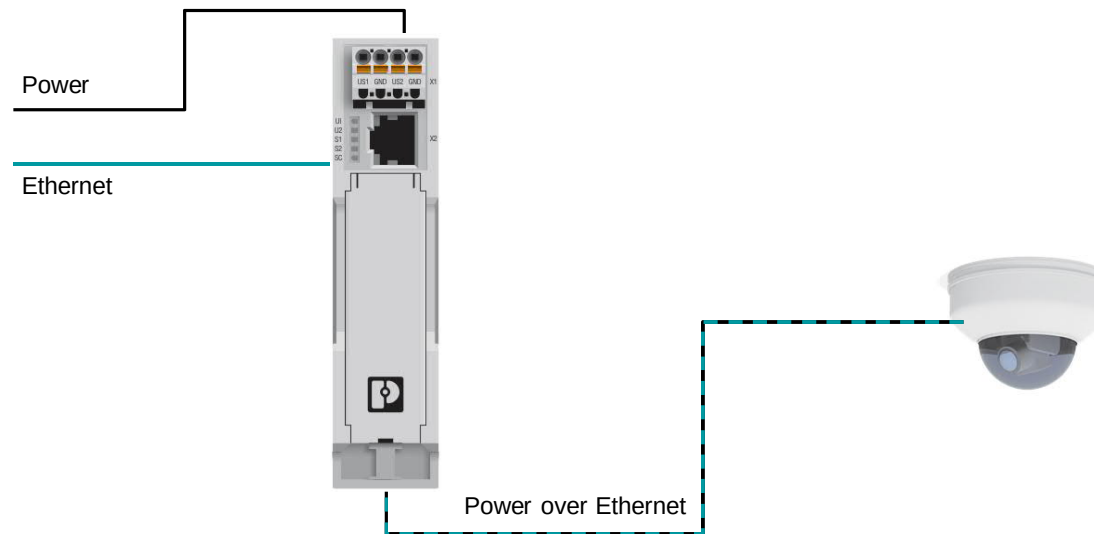
High-available infrastructure networks



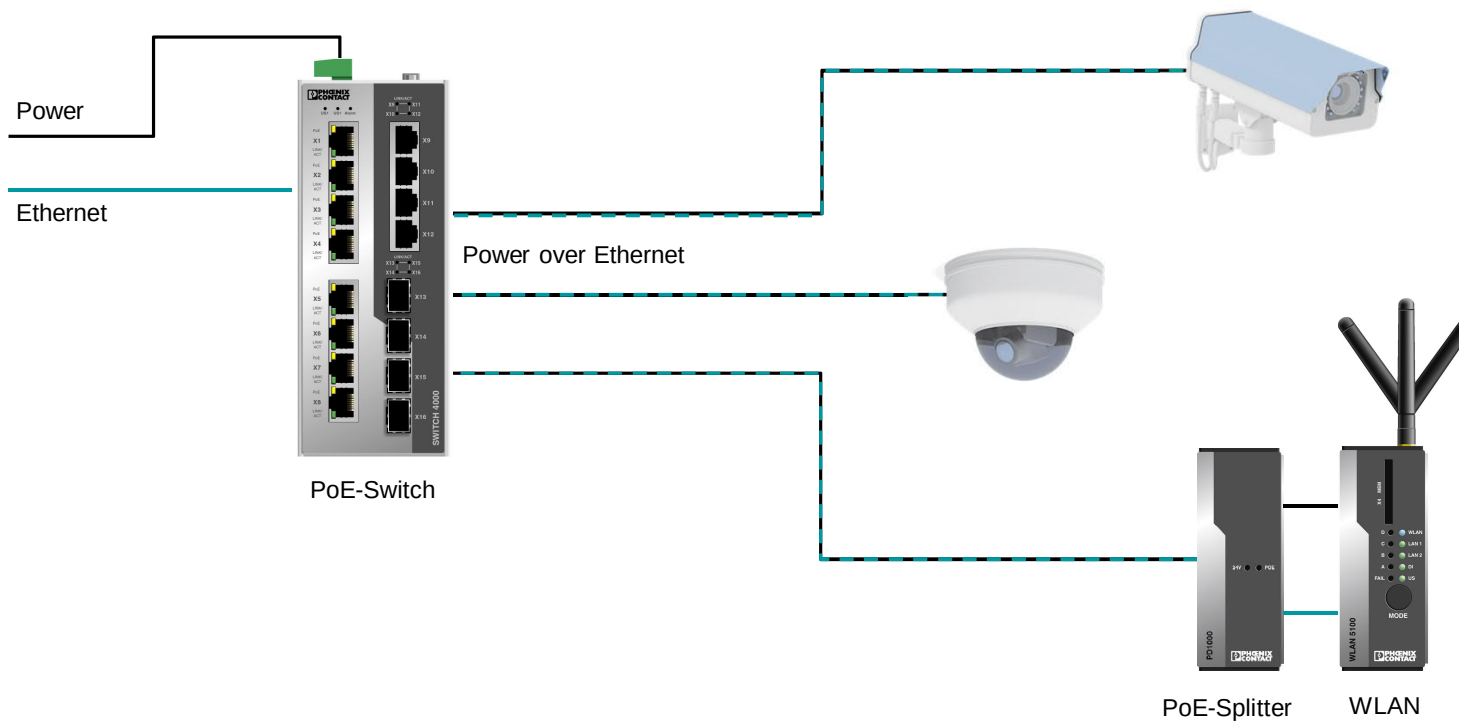
High-available infrastructure networks



Save installation costs with Power over Ethernet

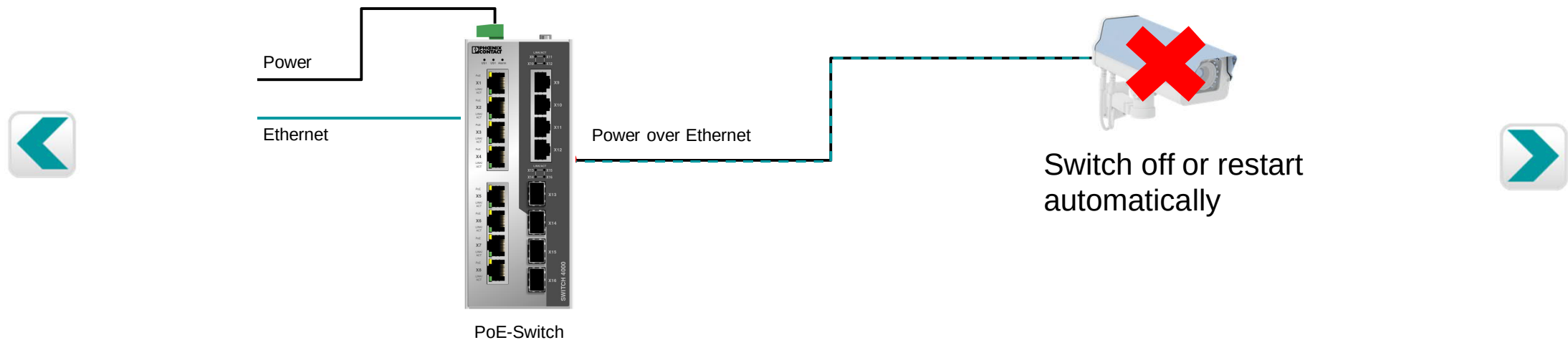


Save installation costs with Power over Ethernet



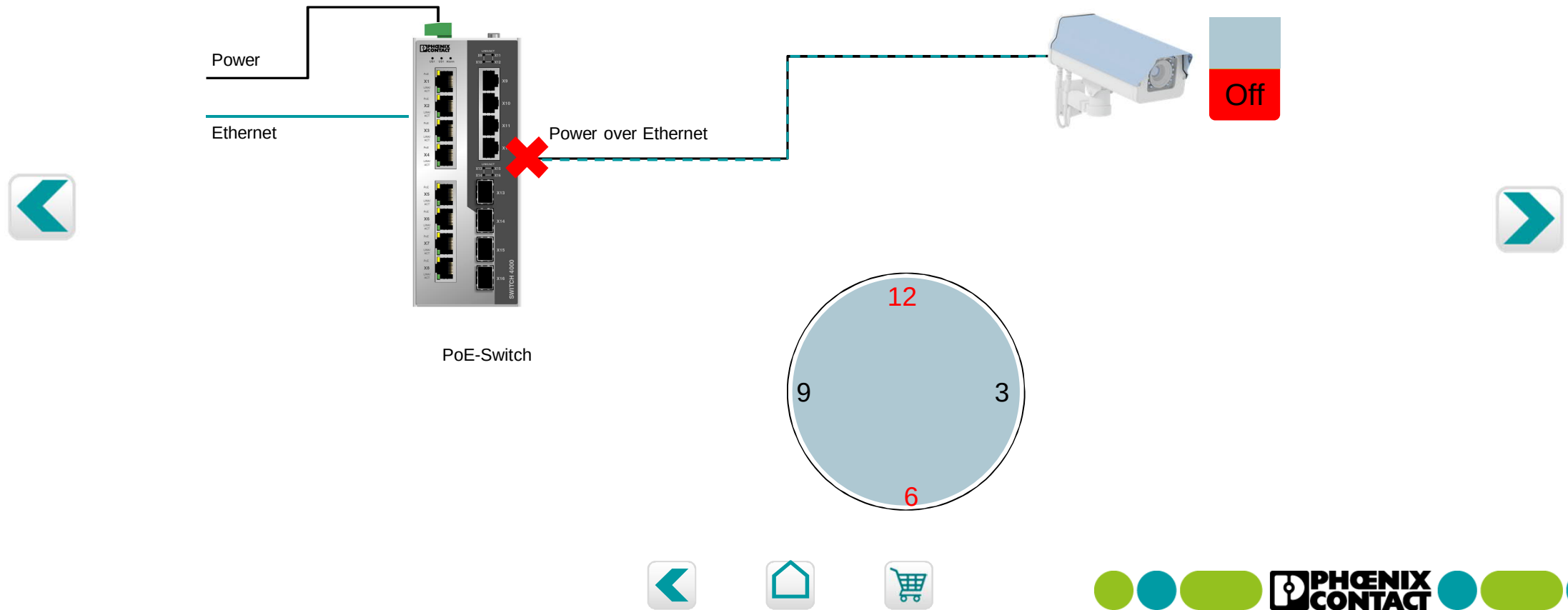
Save installation costs with Power over Ethernet

Watchdog function



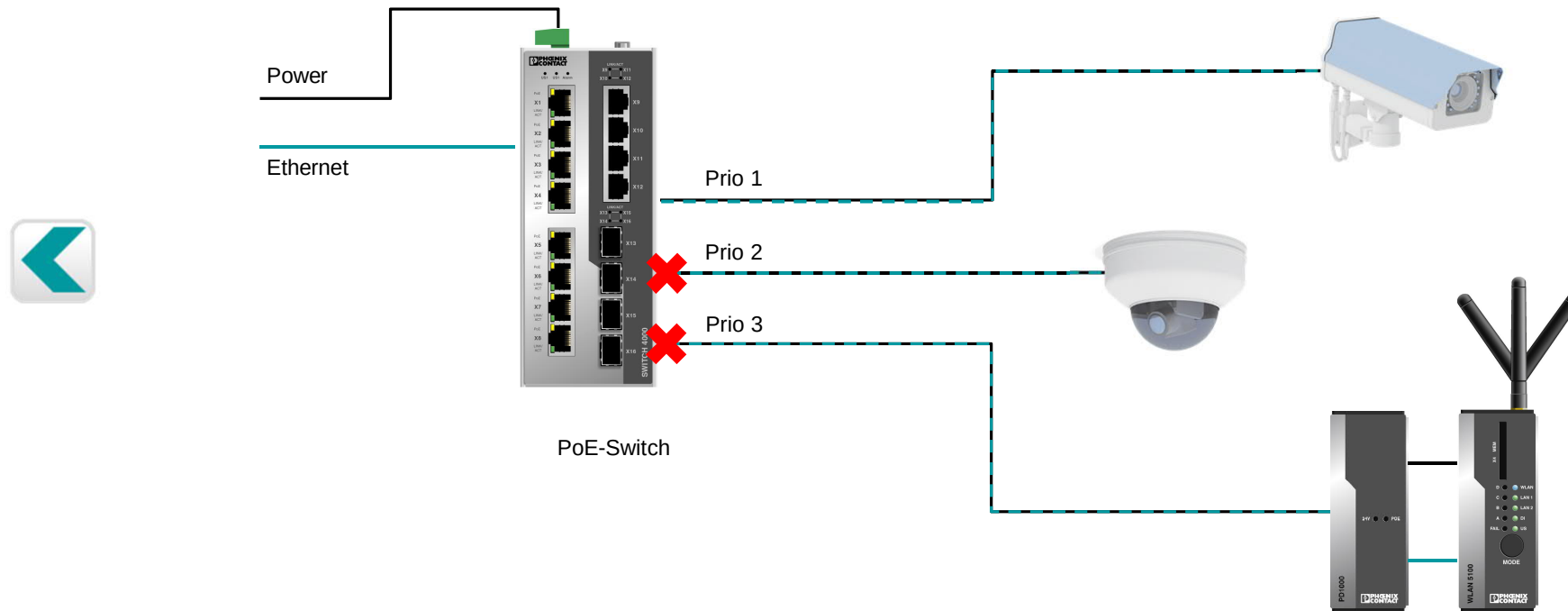
Save installation costs with Power over Ethernet

PoE Scheduler



Save installation costs with Power over Ethernet

PoE Prioritization



Infrastructure & building automation



Wireless data transfer



Securing the network



Reliable WLAN connections



Distribute network data intelligently



Switching relays remotely



Power over Ethernet



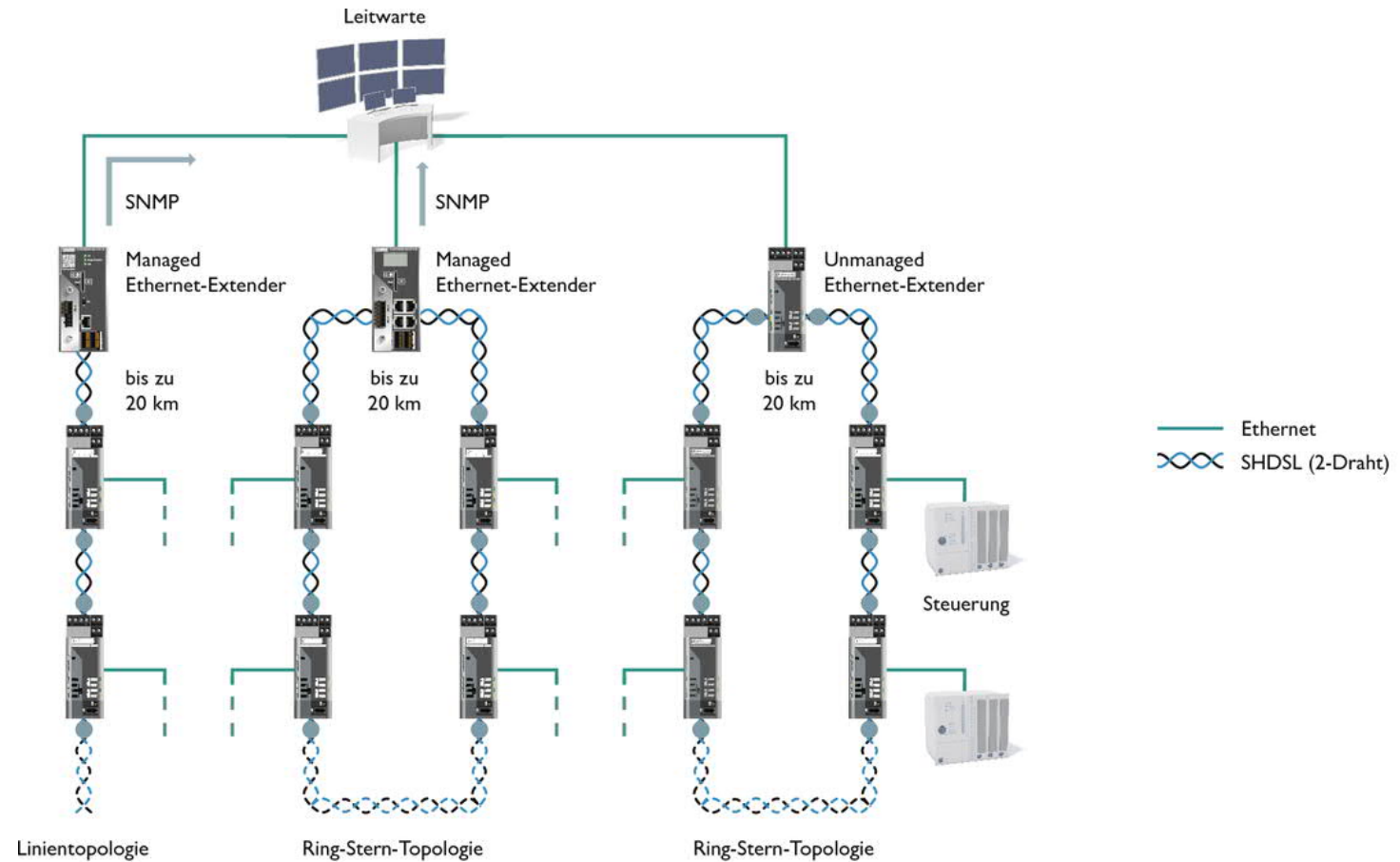
high-performance networks



networking of distant buildings



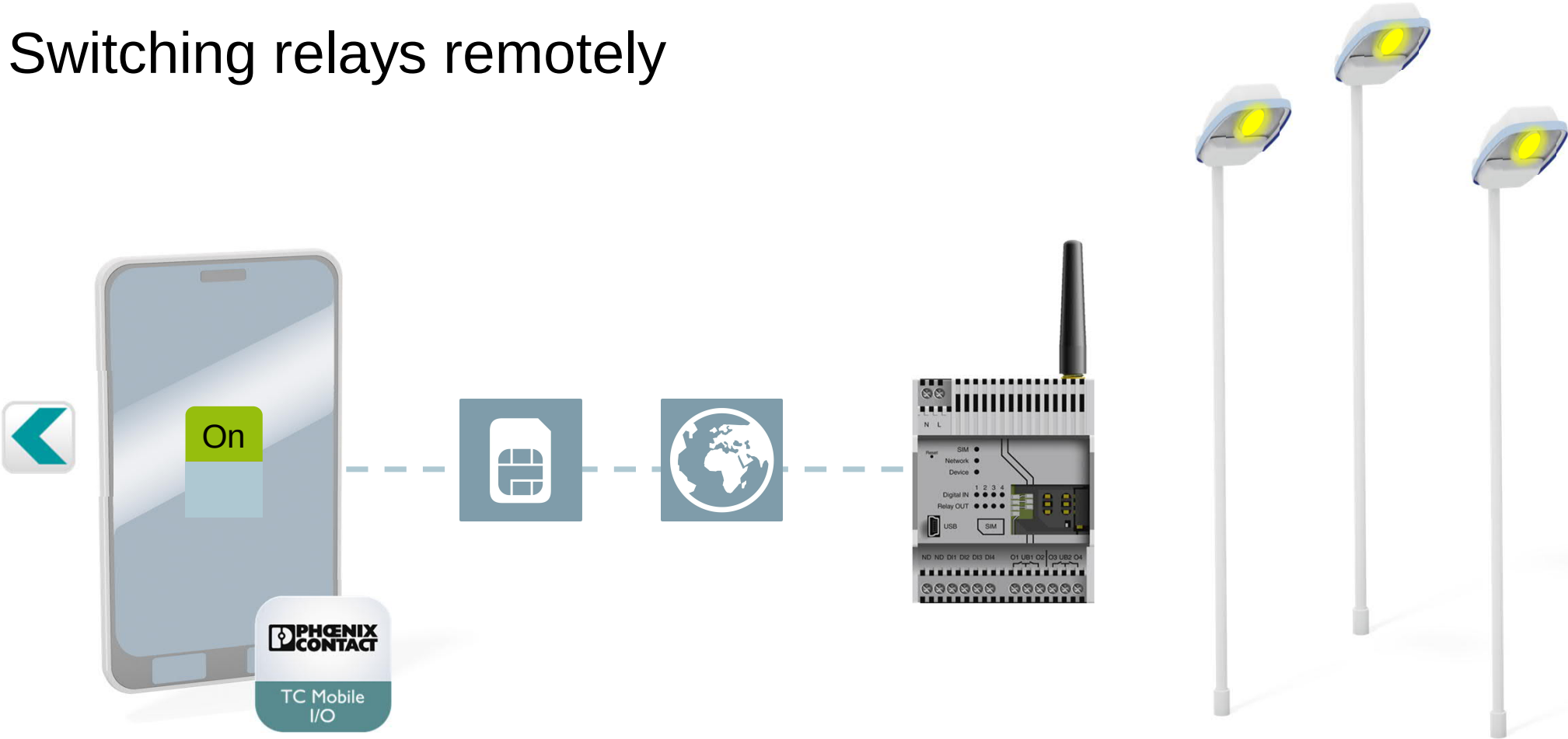
Subsequent networking of distant buildings



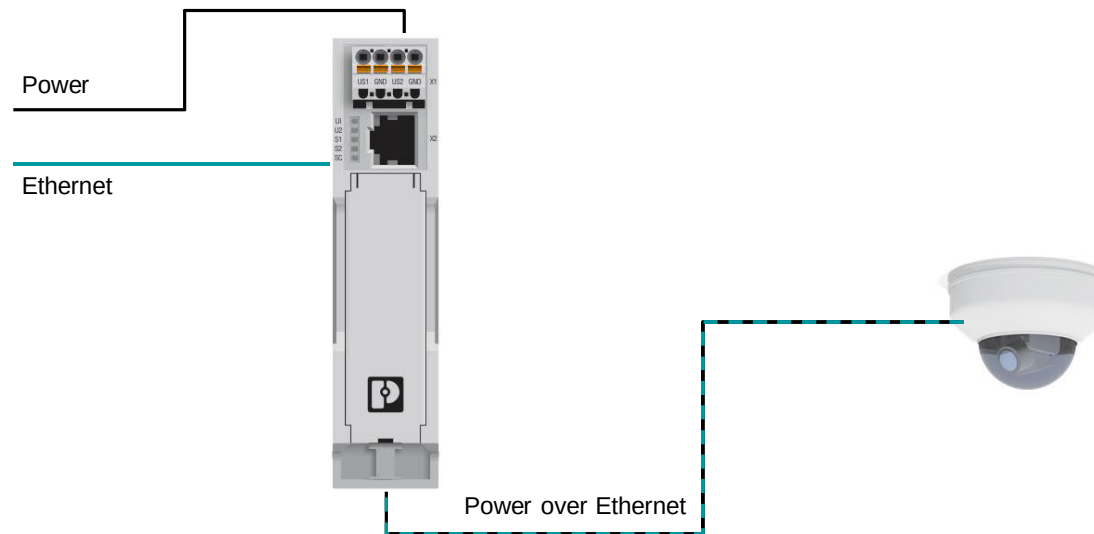
Switching relays remotely



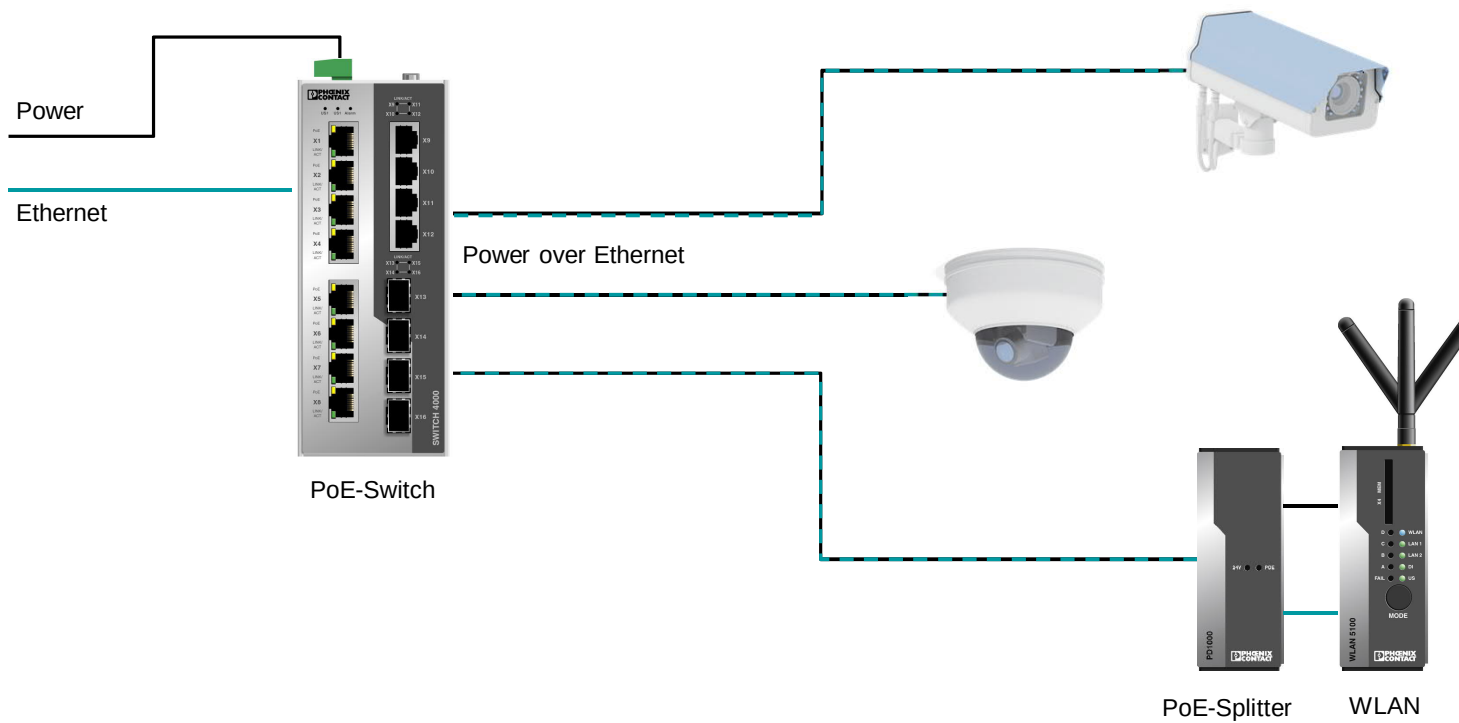
Switching relays remotely



Save installation costs with Power over Ethernet

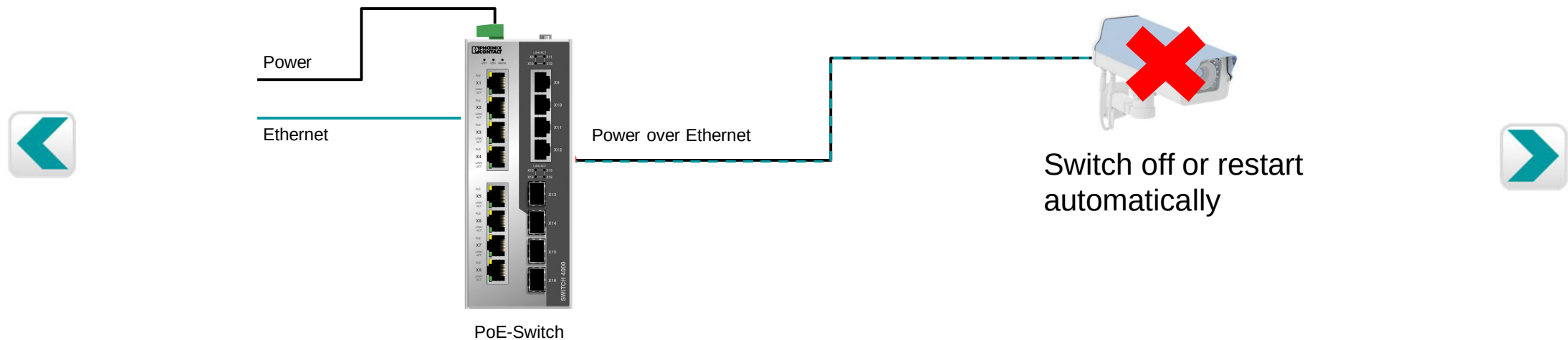


Save installation costs with Power over Ethernet



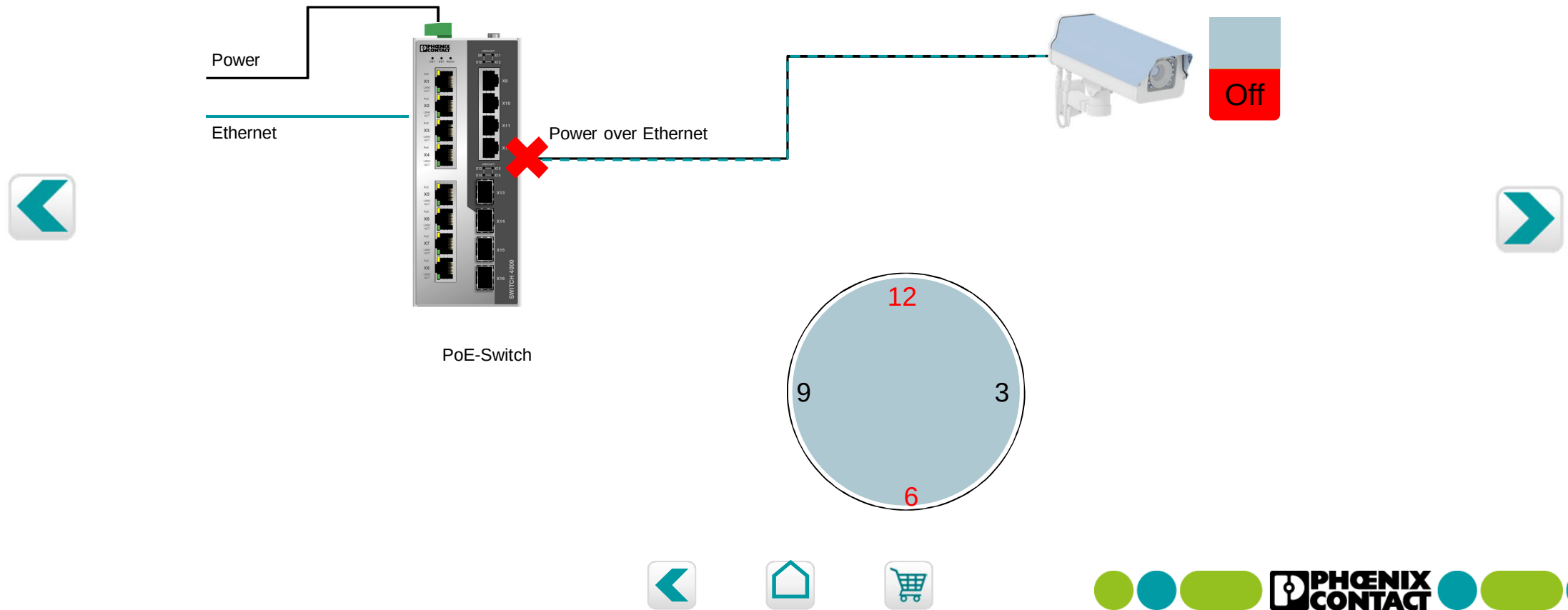
Save installation costs with Power over Ethernet

Watchdog function



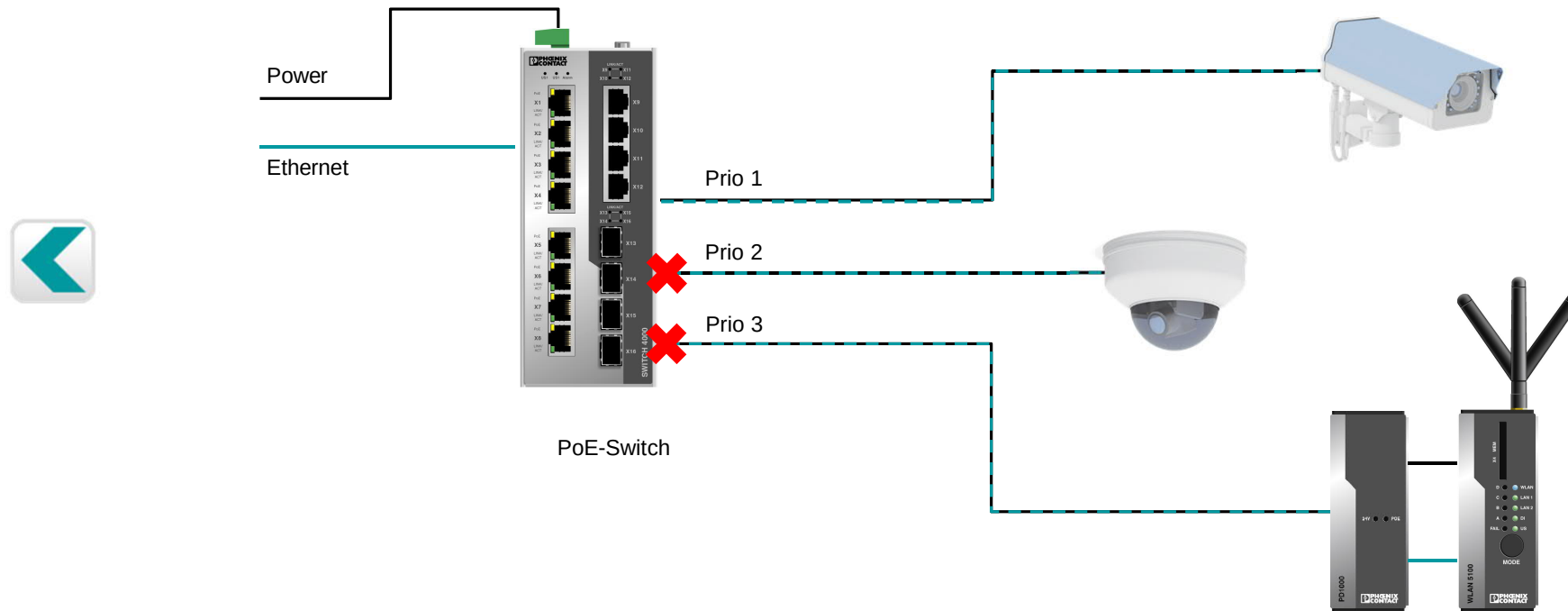
Save installation costs with Power over Ethernet

PoE Scheduler

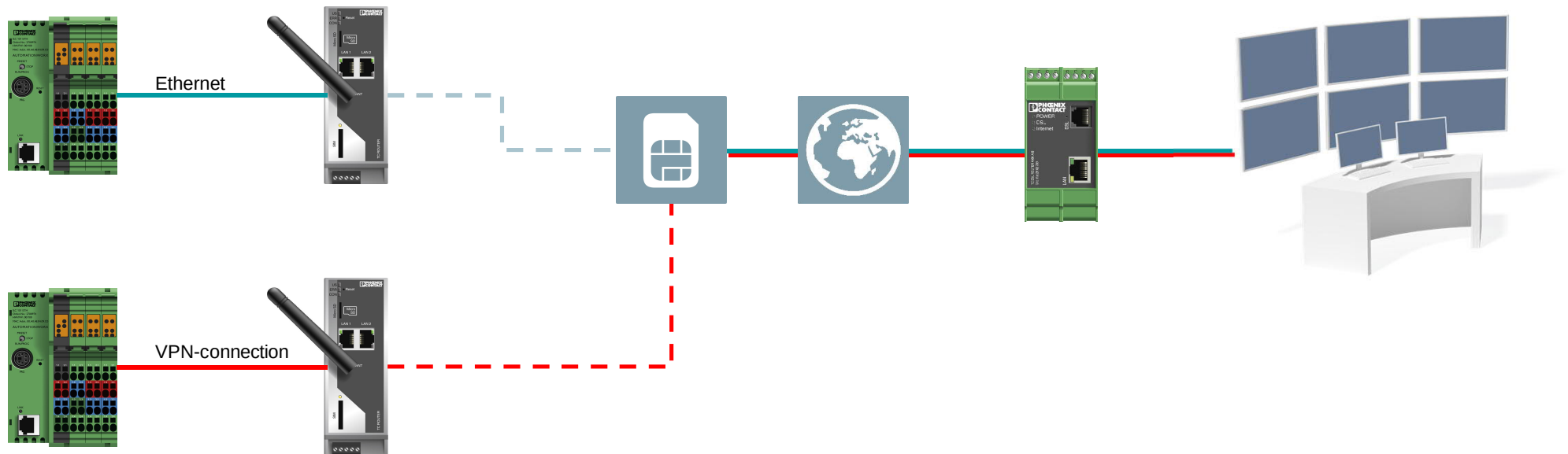


Save installation costs with Power over Ethernet

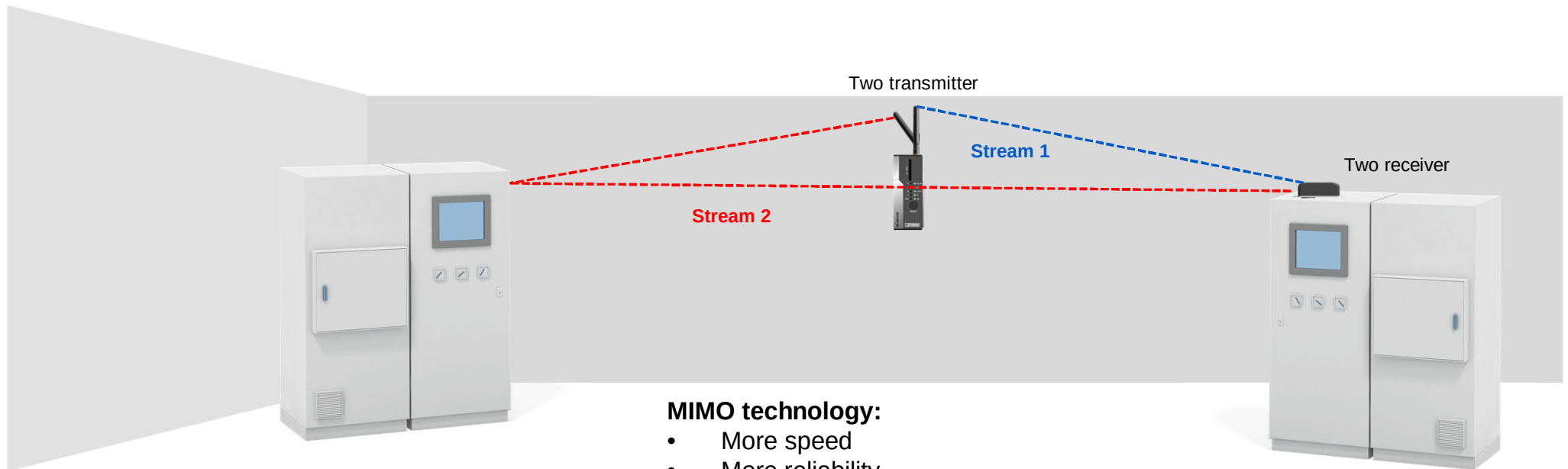
PoE Prioritization



Wireless data transfer from remote stations



Establishing reliable WLAN connections



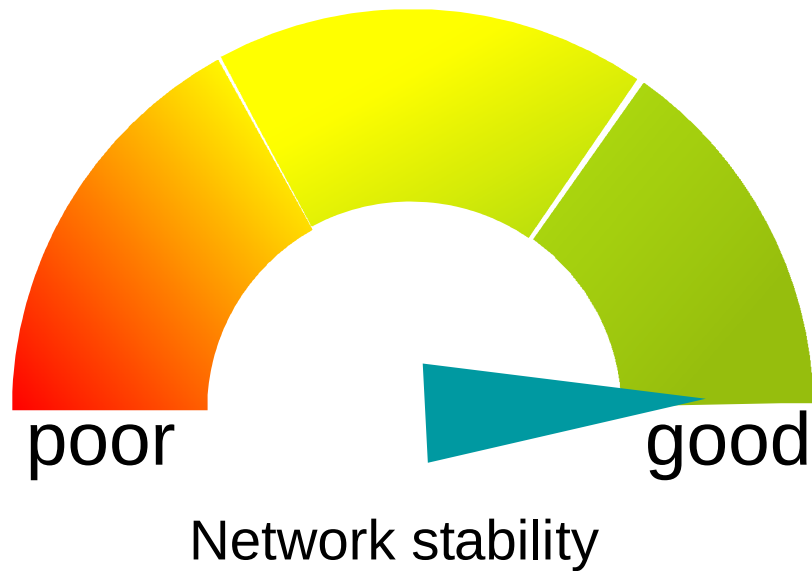
MIMO technology:

- More speed
- More reliability
- More distance
- Better coverage



Distribute network data intelligently

Typical problems in unmanaged networks: As the network grows, network stability declines



215 Network devices



High broad-and multicast-traffic in the network



Unauthorized devices



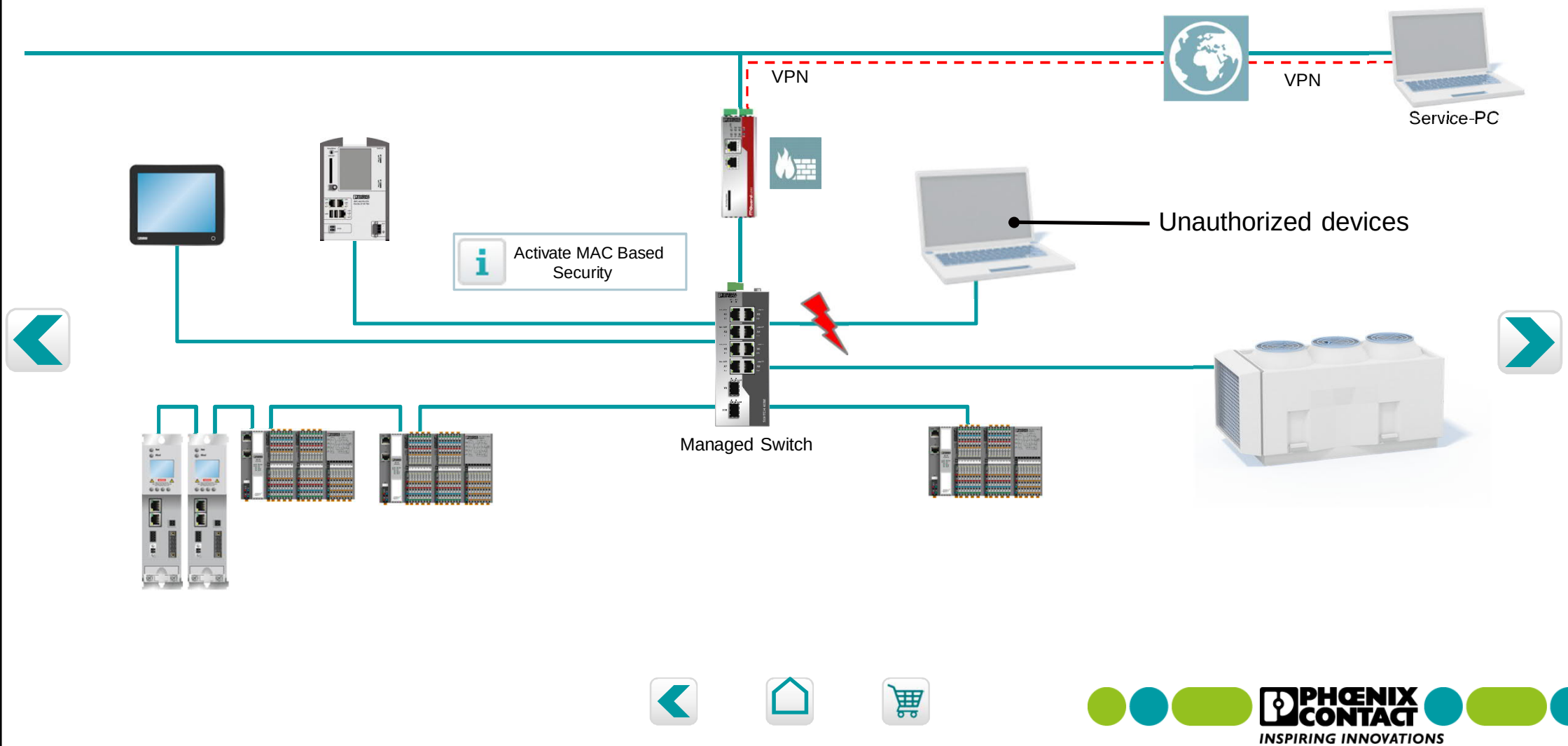
Network loop



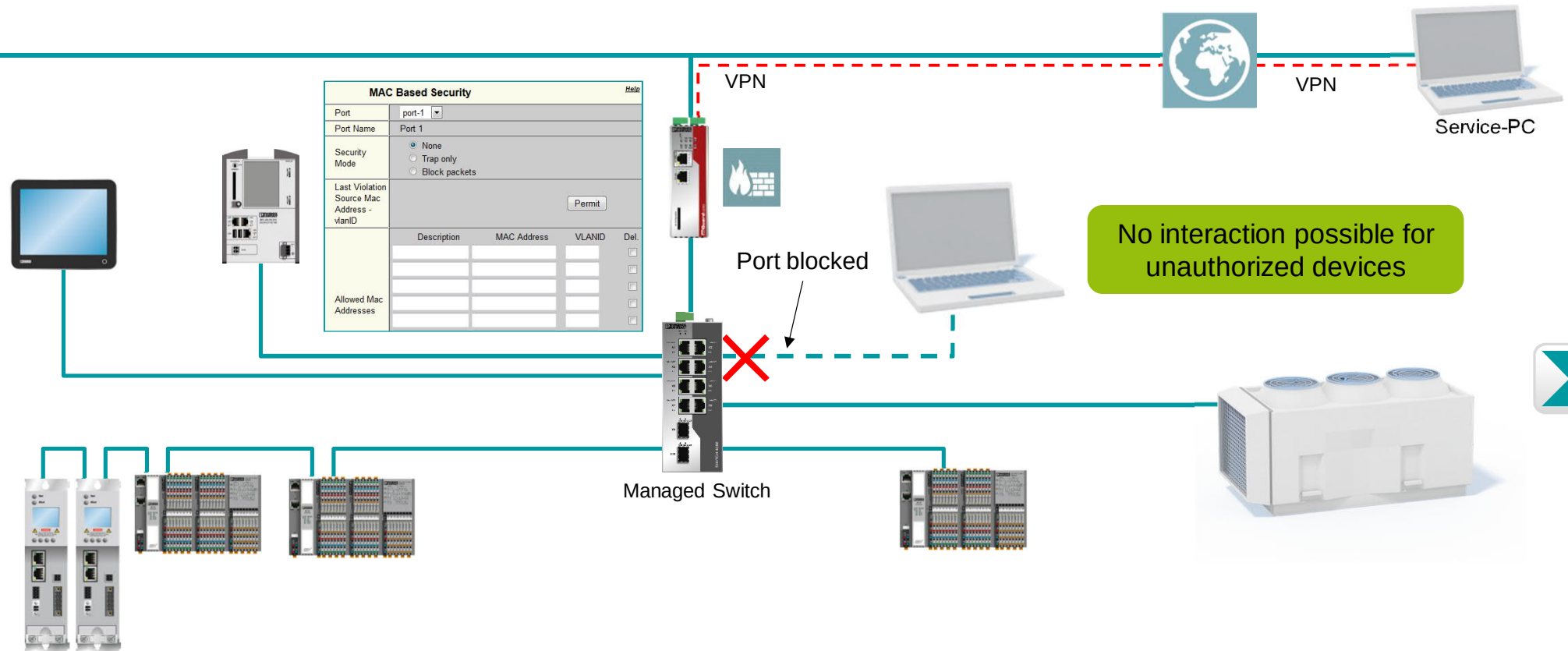
Cable and connector problems



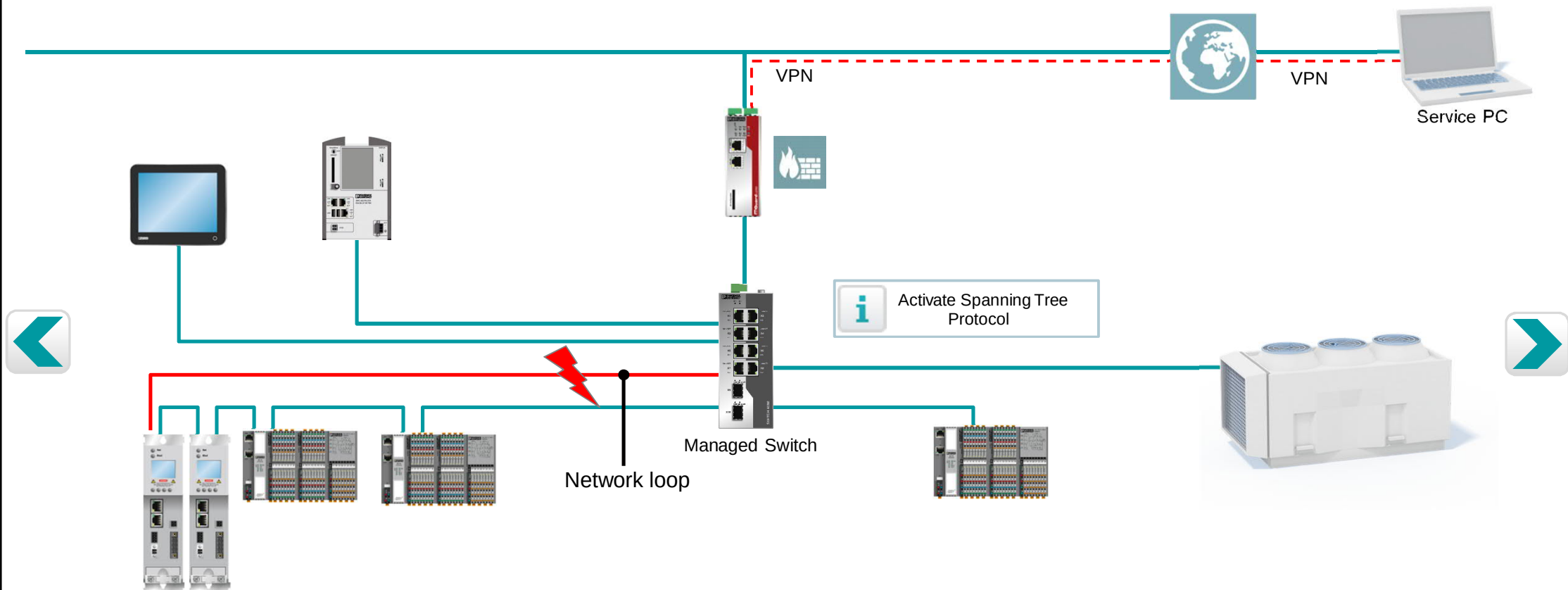
Unauthorized devices



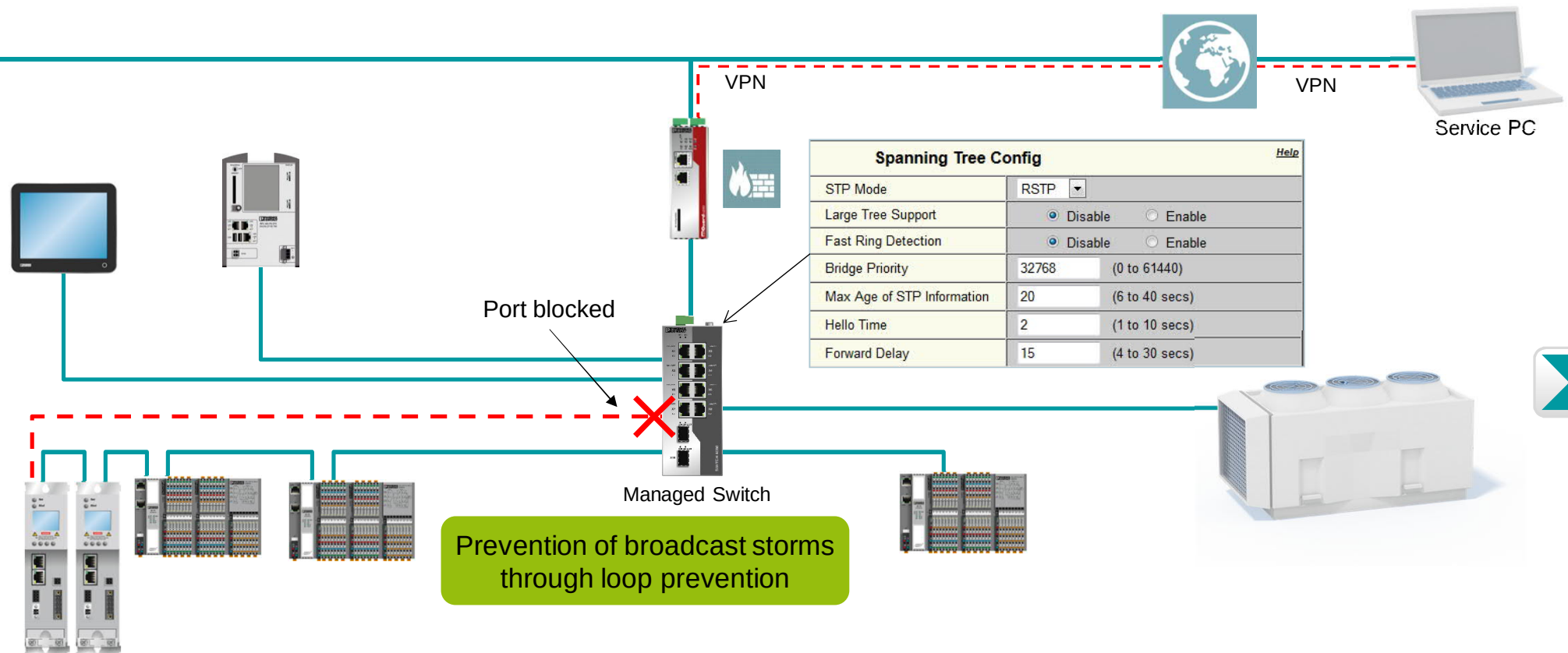
Our Solution: MAC Based Security



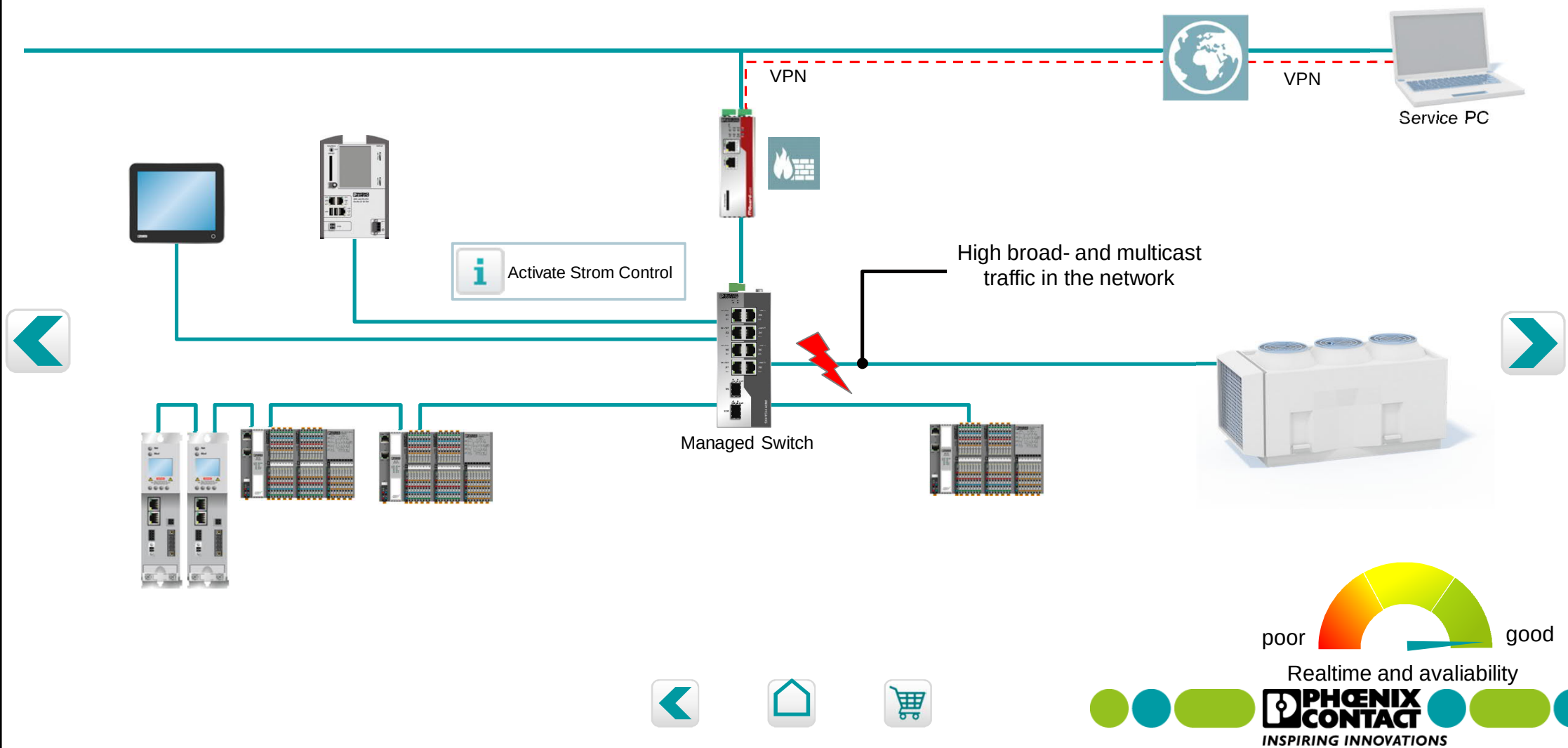
Network Loops



Our Solution: Spanning Tree Protocol



High broad- and multicast traffic



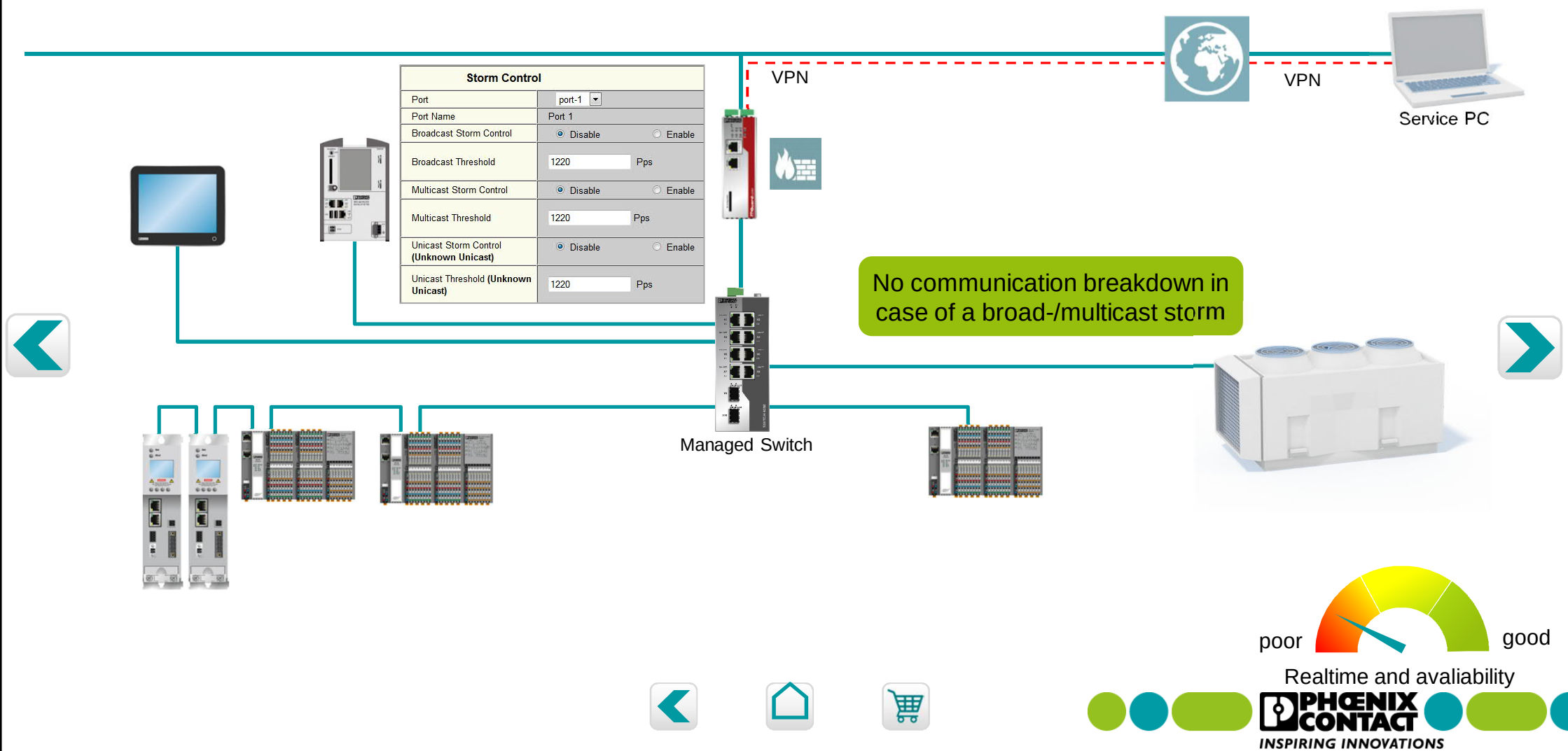
poor  good

Realtime and avaliability

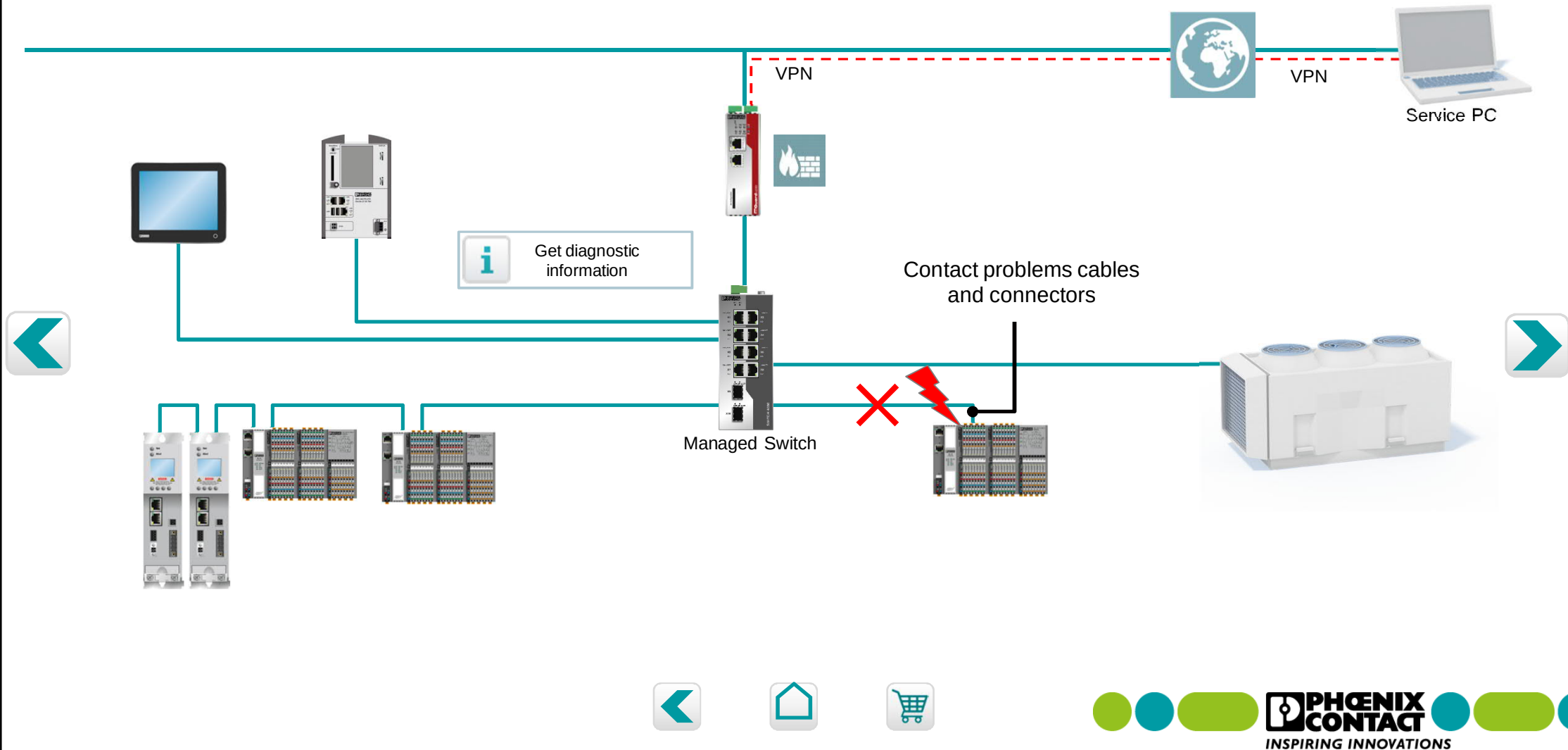
PHOENIX CONTACT
INSPIRING INNOVATIONS



Our solution: Storm control



Contact problems of cables and connectors



Our solution: Diagnostic information

Event Table	
System Up Time	22 min 50 sec
Time	Event
20 min 35 sec	LLDP recognized new neighbor at port 5
20 min 35 sec	Link up on Port: 5
20 min 19 sec	Link up on Port: 7
20 min 16 sec	LLDP recognized new neighbor at port 3
20 min 16 sec	Link up on Port: 3
20 min 13 sec	Link down on Port: 3
17 min 55 sec	Configuration has been saved.
17 min 30 sec	The configuration has been modified the first time after the last storing.
59 sec	Link up on Port: 3
55 sec	Link down on Port: 3
29 sec	Configuration has been saved.
25 sec	The configuration has been modified the first time after the last storing.
3 sec	Link up on Port: 3
3 sec	Configuration has been saved.
3 sec	Boot.
0 sec	RSTP disabled.
0 sec	Power Supply US2 lost

Port Statistics	
Port Number	3
Packets	4103
up to 64 Octets	2969
65 to 127 Octets	631
128 to 255 Octets	71
256 to 511 Octets	425
512 to 1023 Octets	1
1024 to 1518 Octets	6
Broadcast	307
Multicast	50
Octets	448306
Fragments	0
Undersized Packets	0
Oversized Packets	0
CRC Alignment Errors	1
Drop Events	0
Jabbers	0
Collisions	0
Clear counters	
You can set the statistic counters of all switch ports to zero.	
Enter password	*****
Clear	
Port Configuration of port 3: General (RSTP)	
Note: This web page will be refreshed in 23 sec automatically (change the interval at the web page 'General Configuration / User Interfaces')	

VPN



VPN

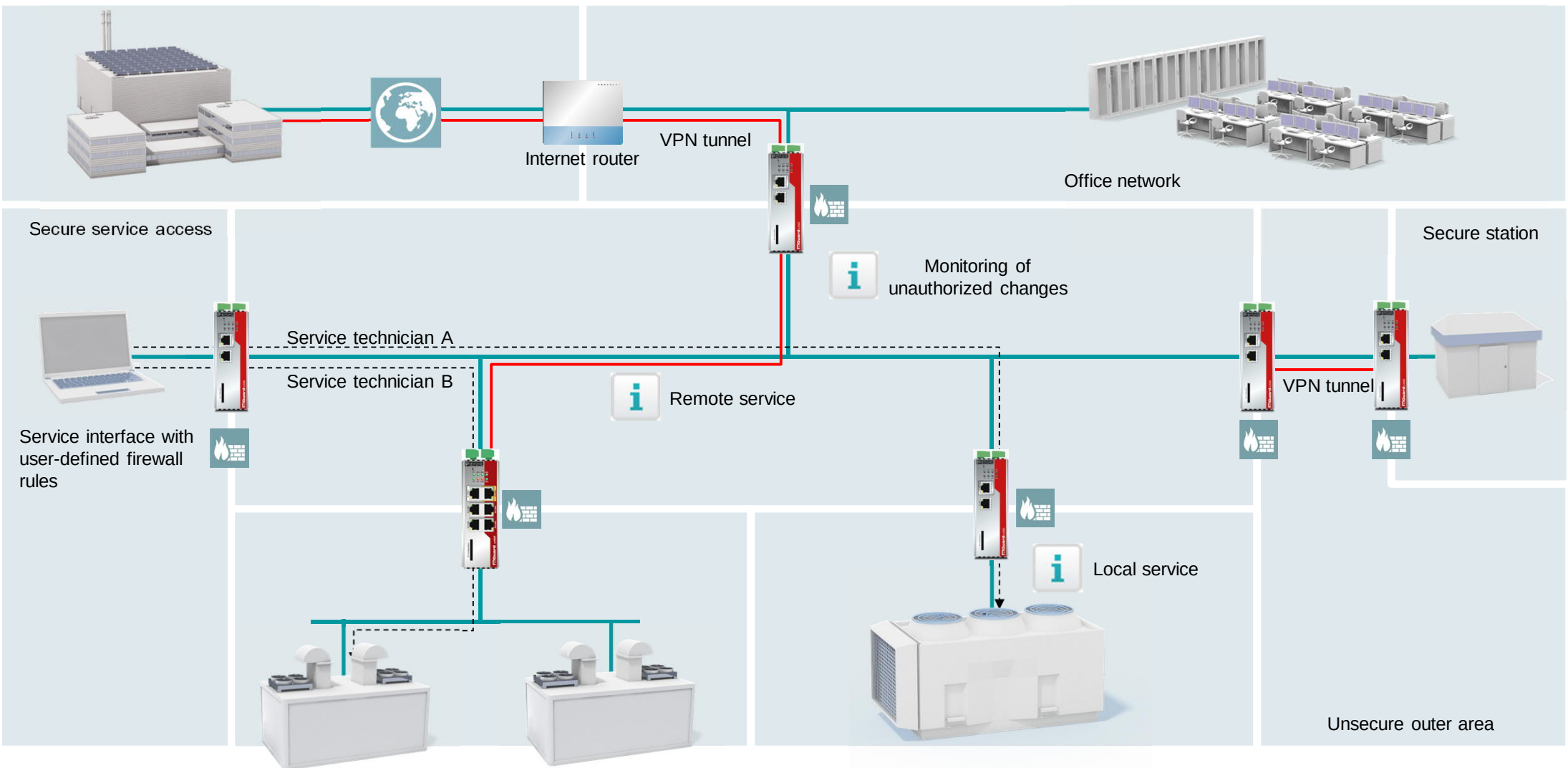


Service PC

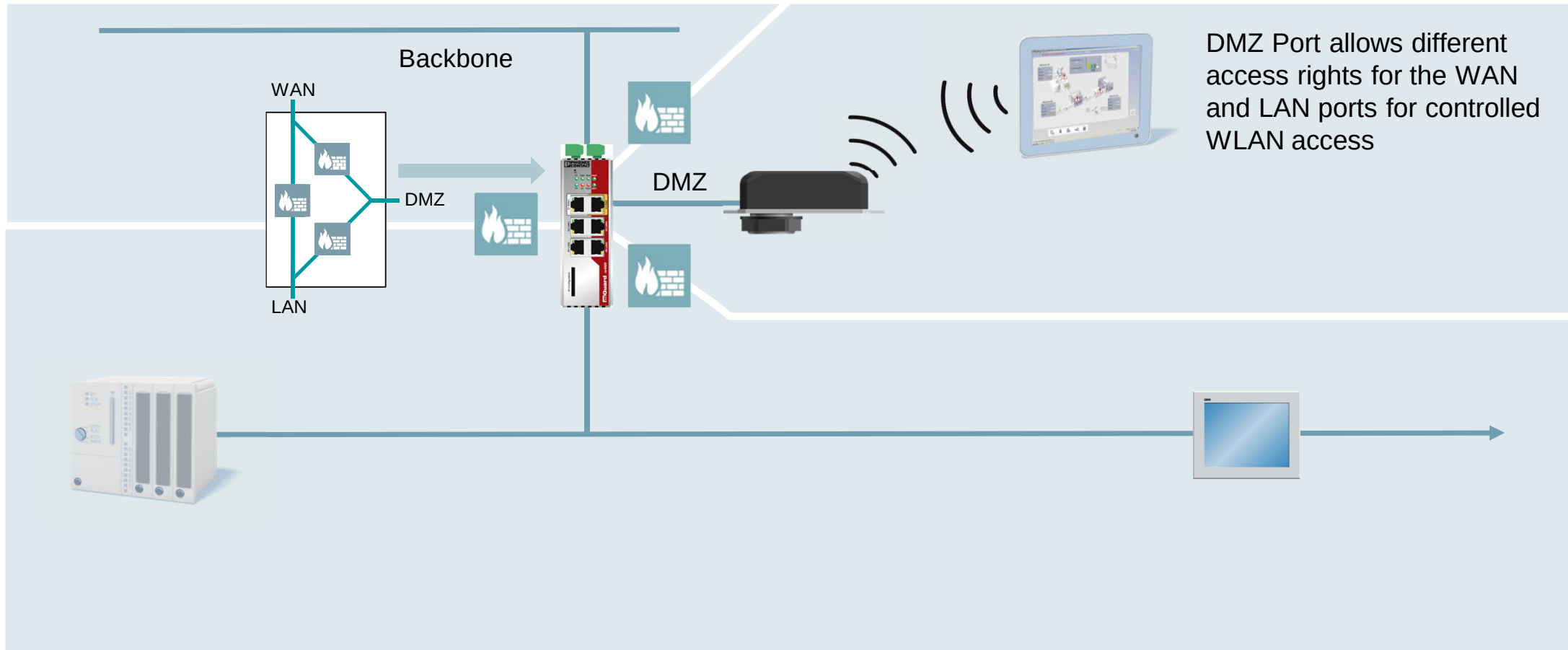
Receive diagnostic information in case of problems with cables and connectors

Managed Switch





Secure WLAN machine network





Ethernet

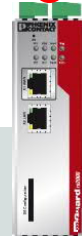


CIFS Integrity Monitoring

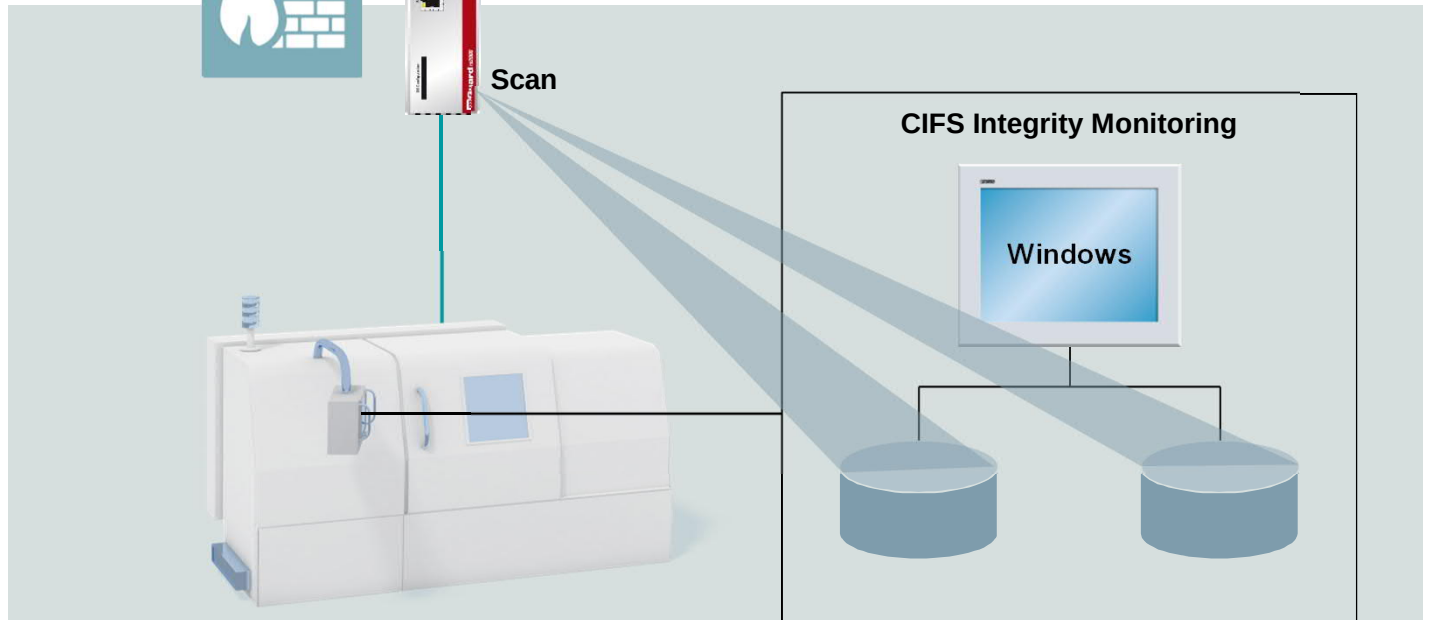
constantly monitors your file systems for unauthorized changes and alerts you if a change is detected



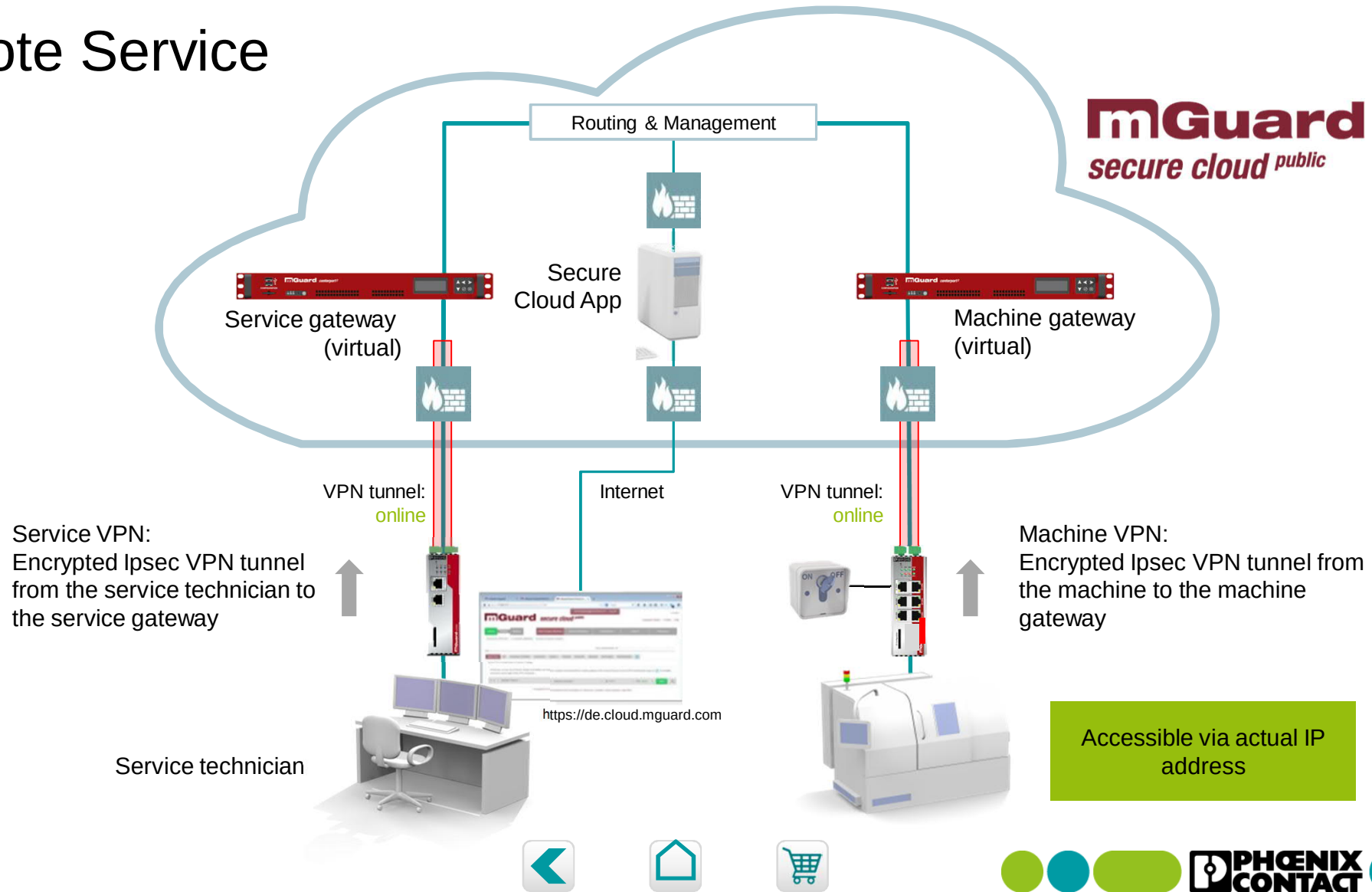
Firewall
CIFS Integrity Monitoring



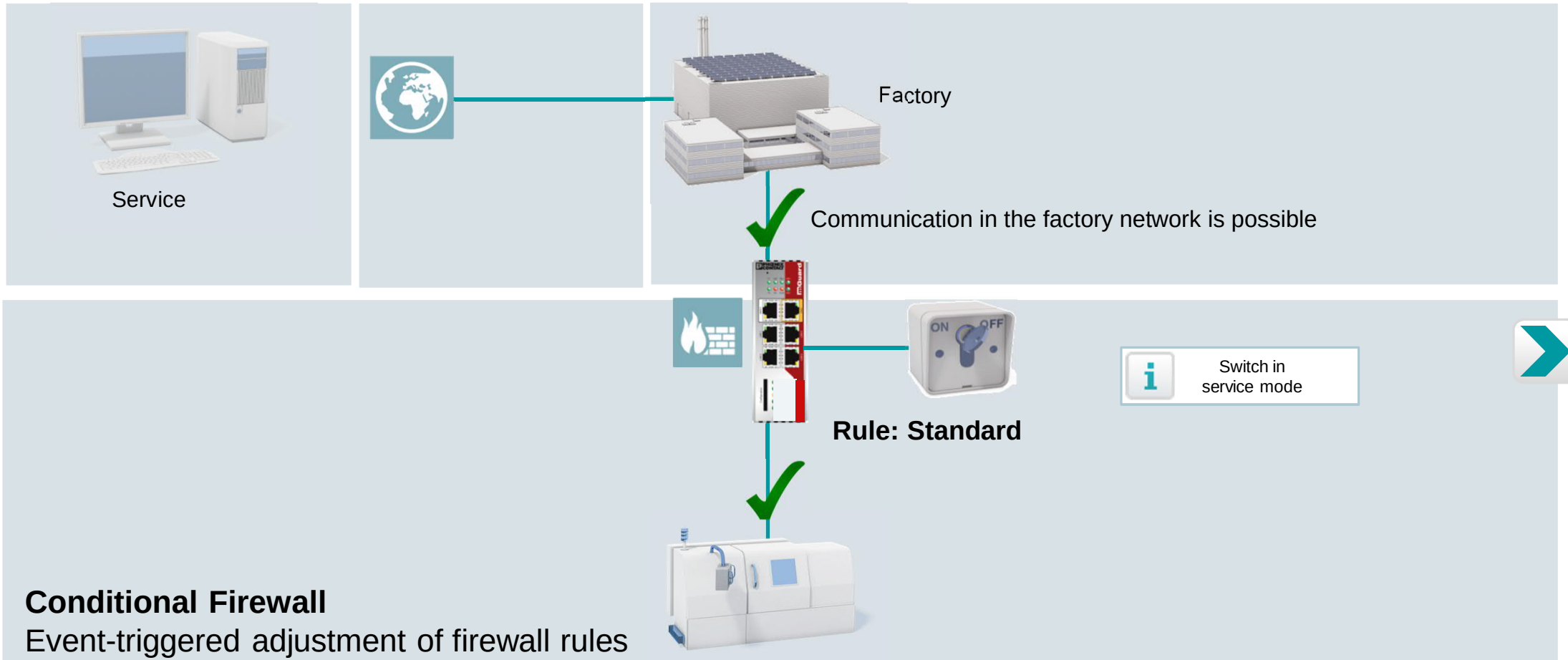
Scan



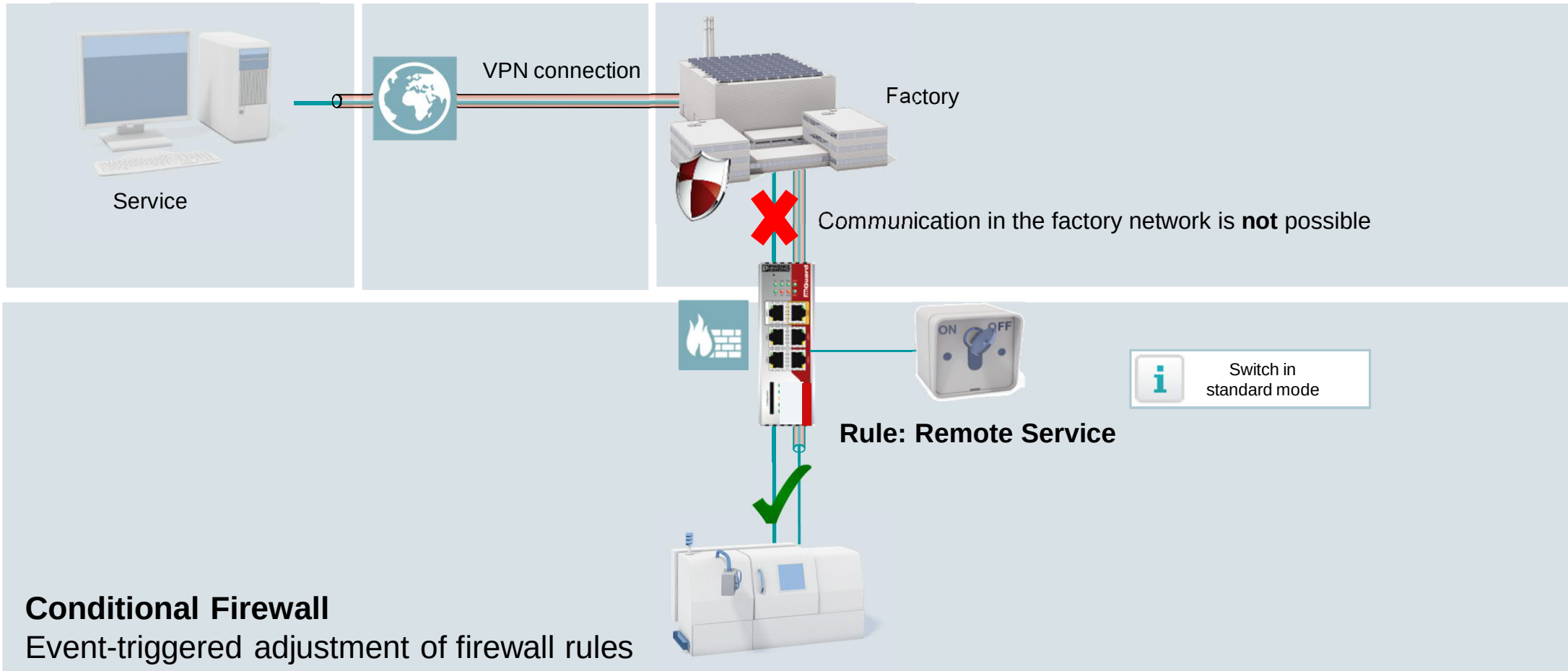
Remote Service



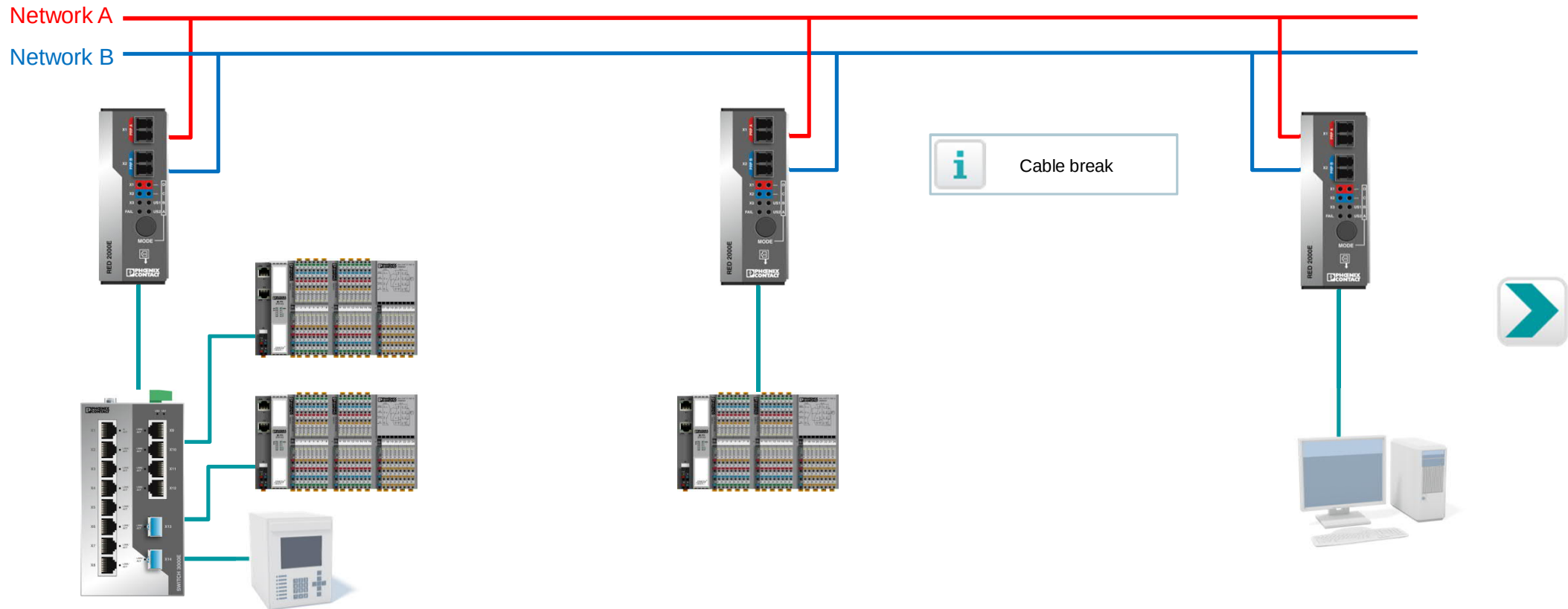
Prevention of unauthorized access



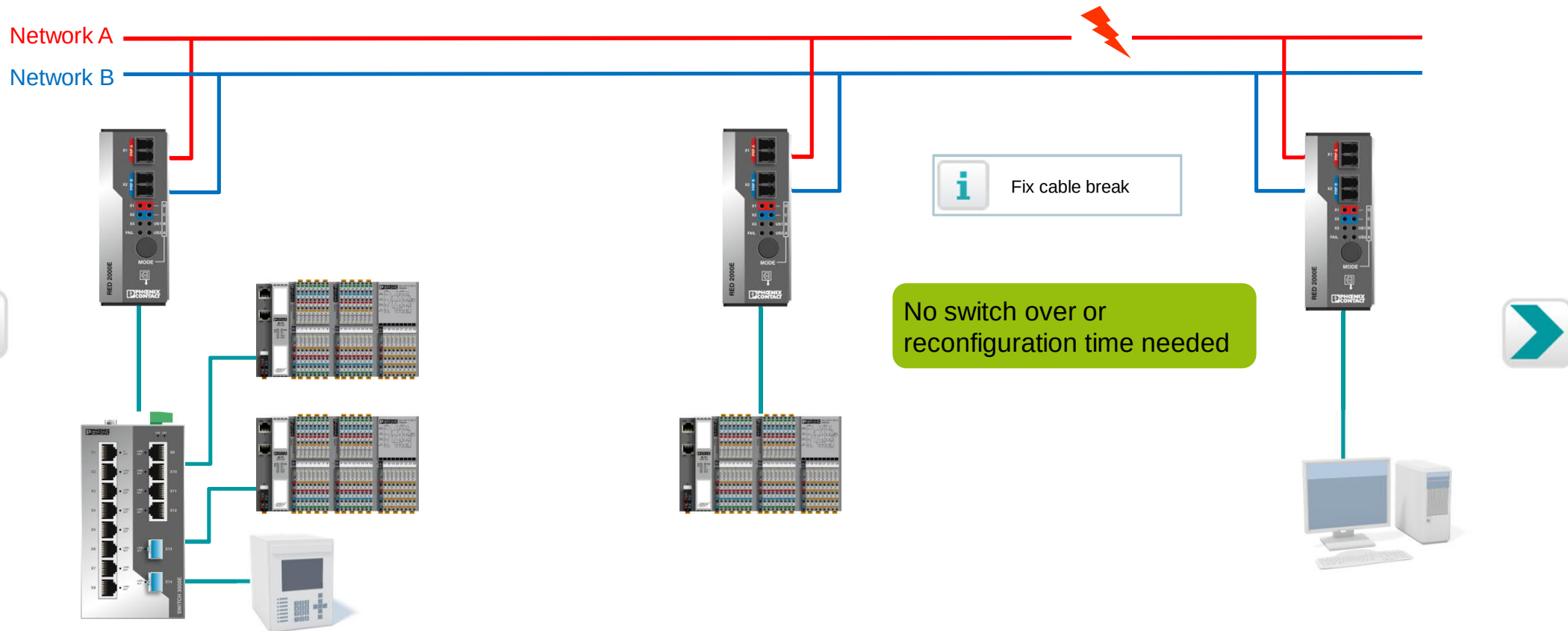
Prevention of unauthorized access



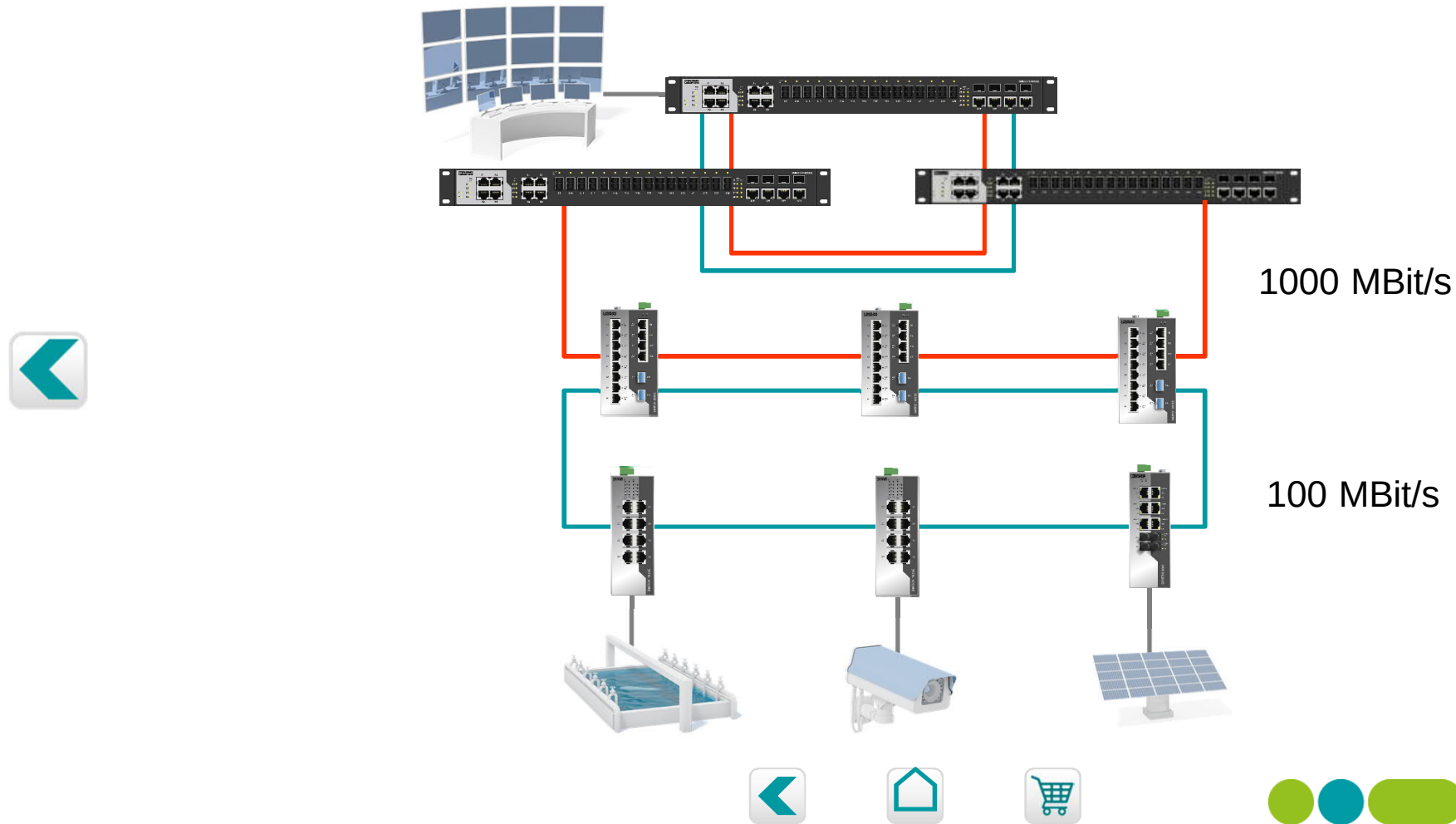
Availability through Parallel Redundancy Protocol



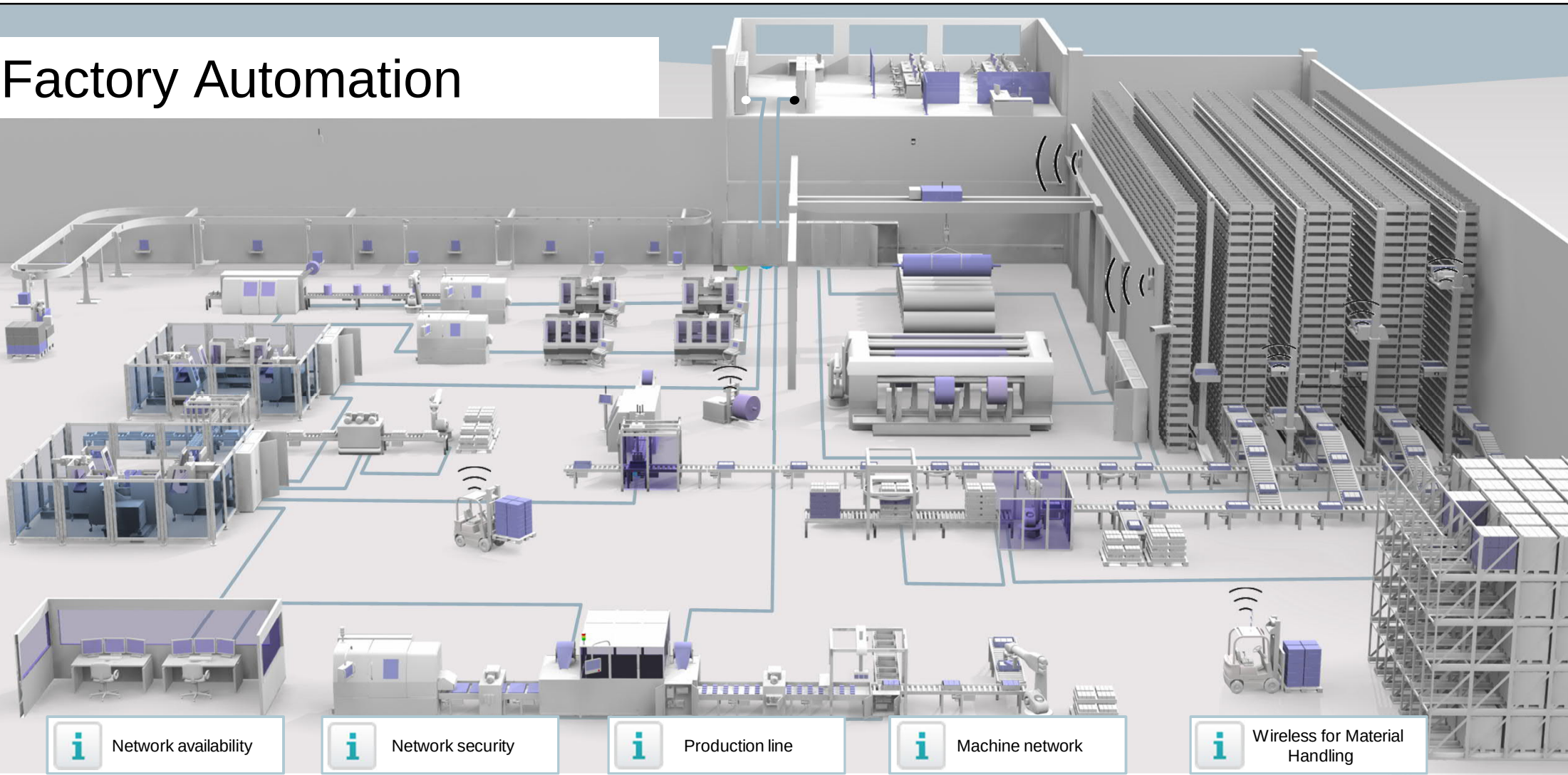
Availability through Parallel Redundancy Protocol



Availability through Extended Ring Redundancy



Factory Automation



 Network availability

 Network security

 Production line

 Machine network

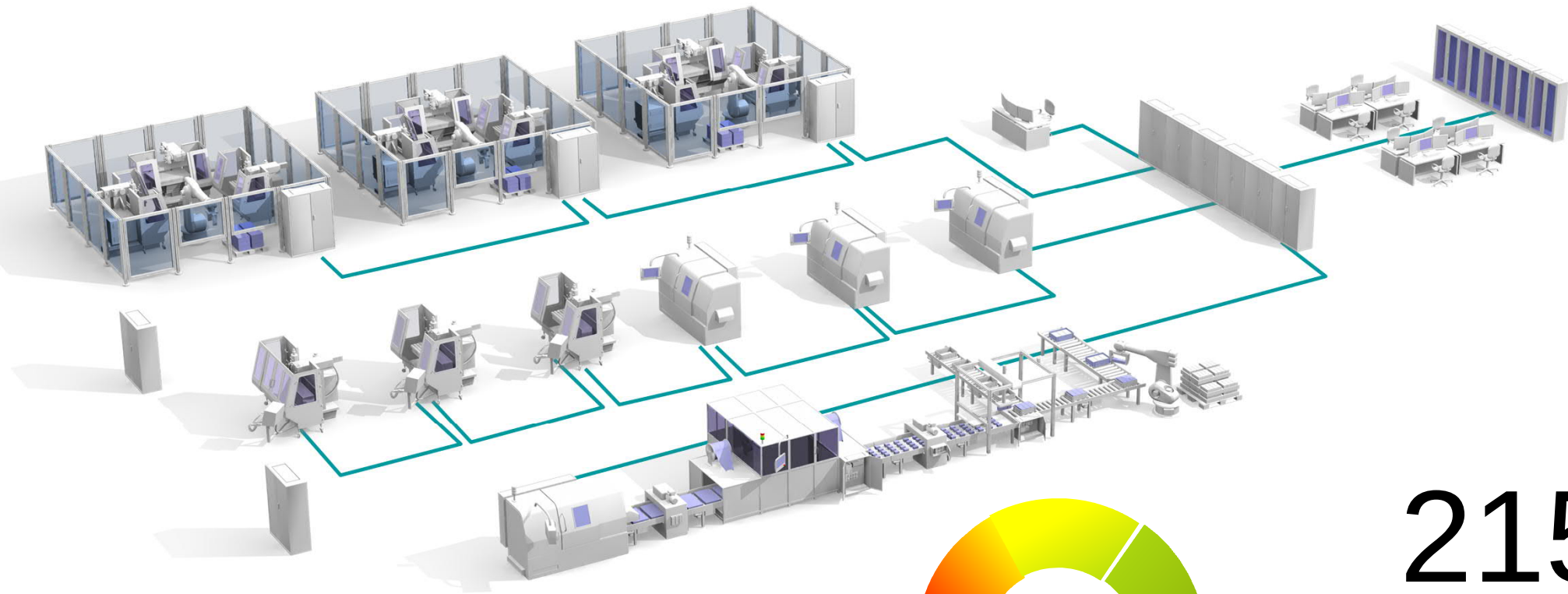
 Wireless for Material Handling

 Solution overview



Typical problems in unmanaged networks

As the network grows, network stability declines



poor



good

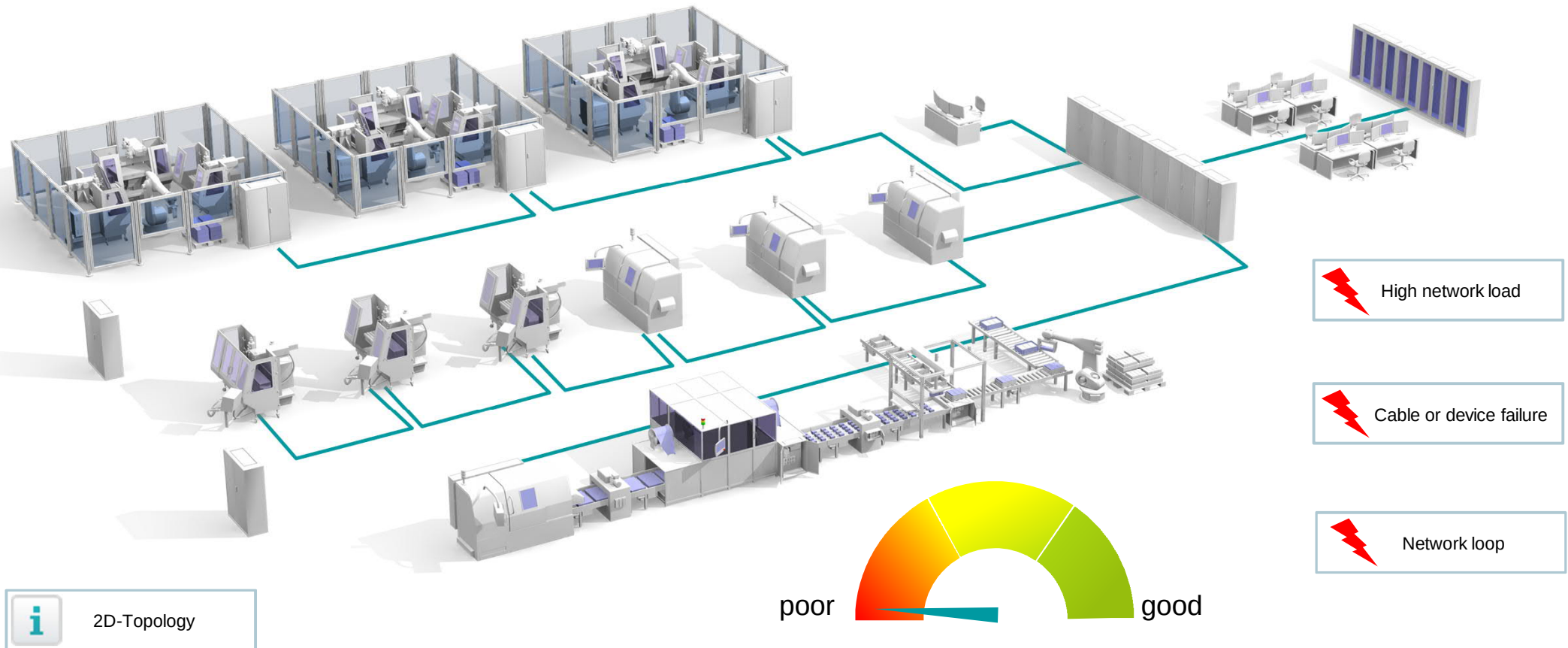
215

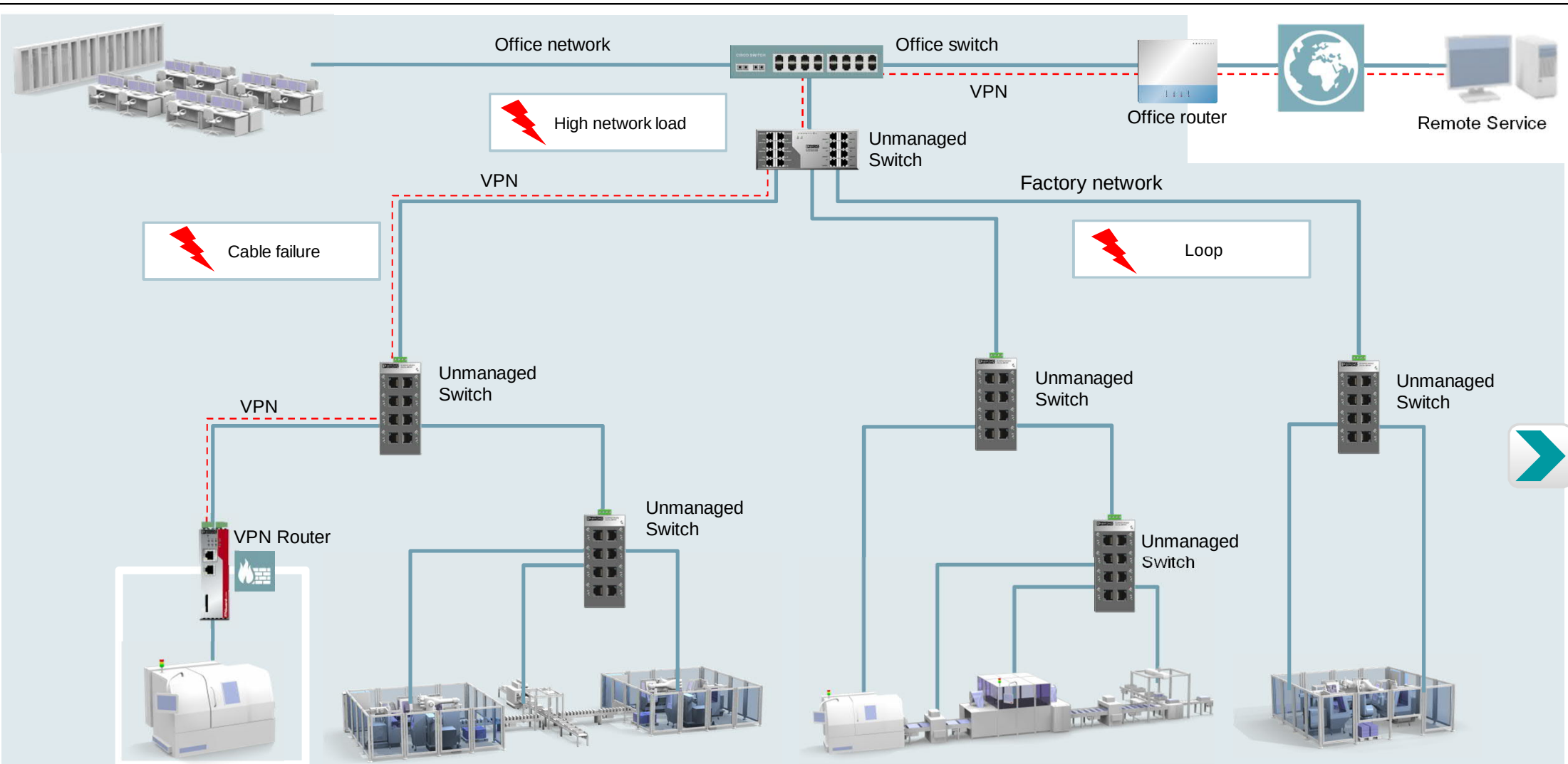
Network devices

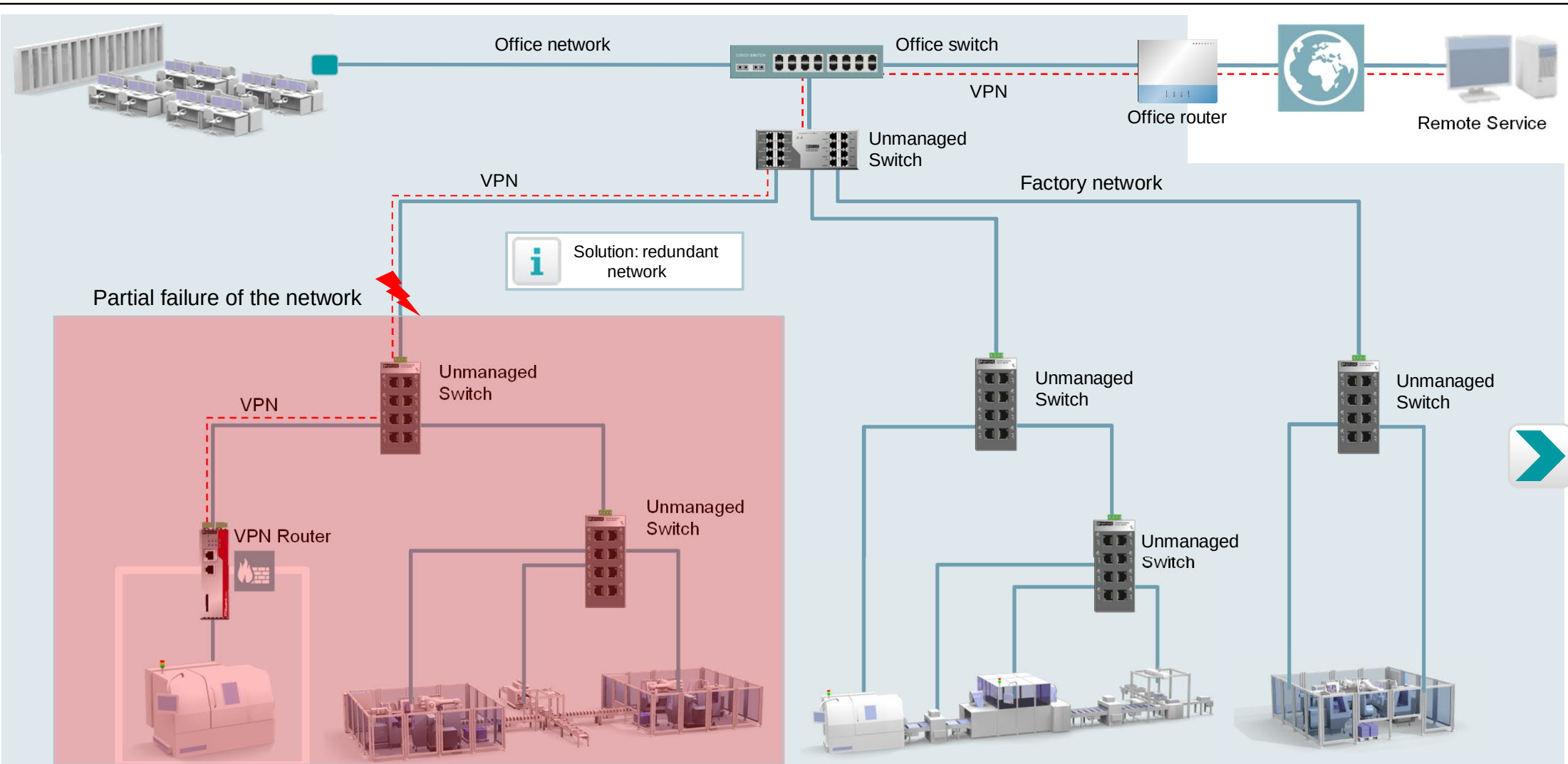


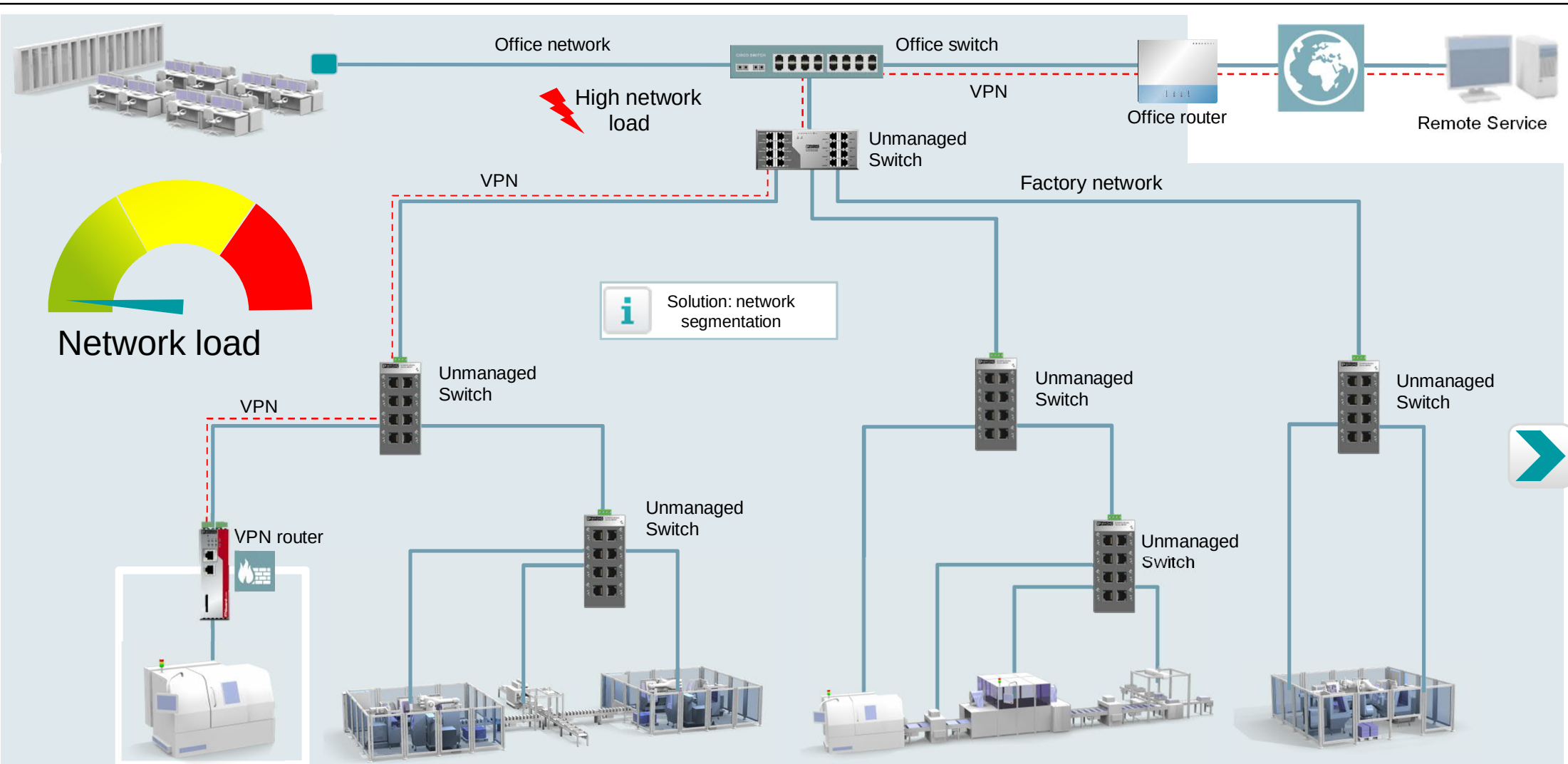
Typical problems in unmanaged networks

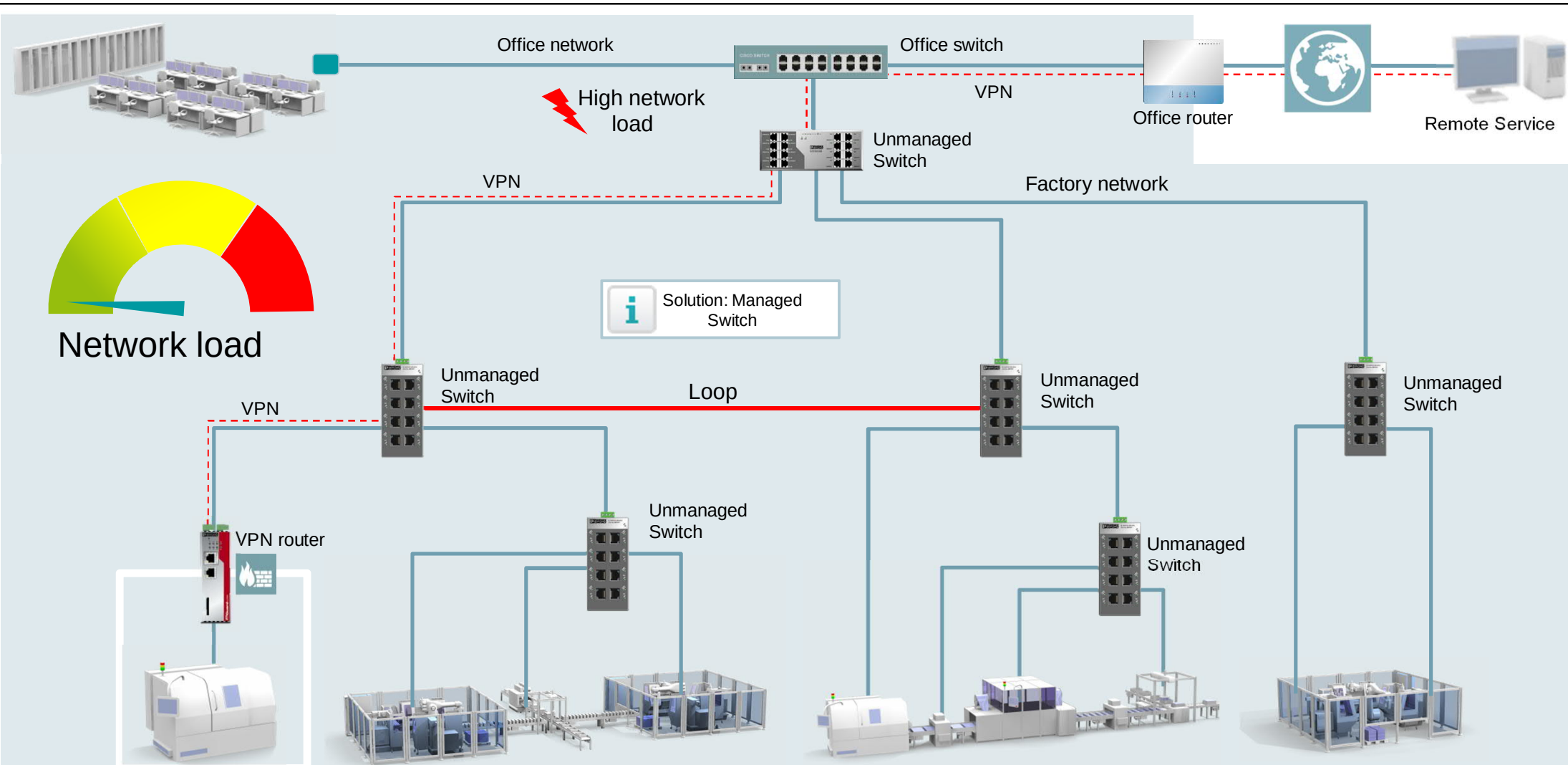
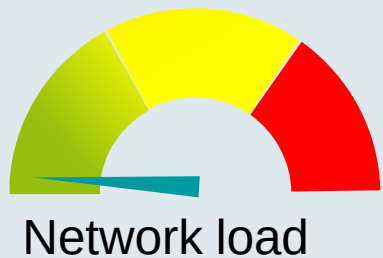
As the network grows, network stability declines





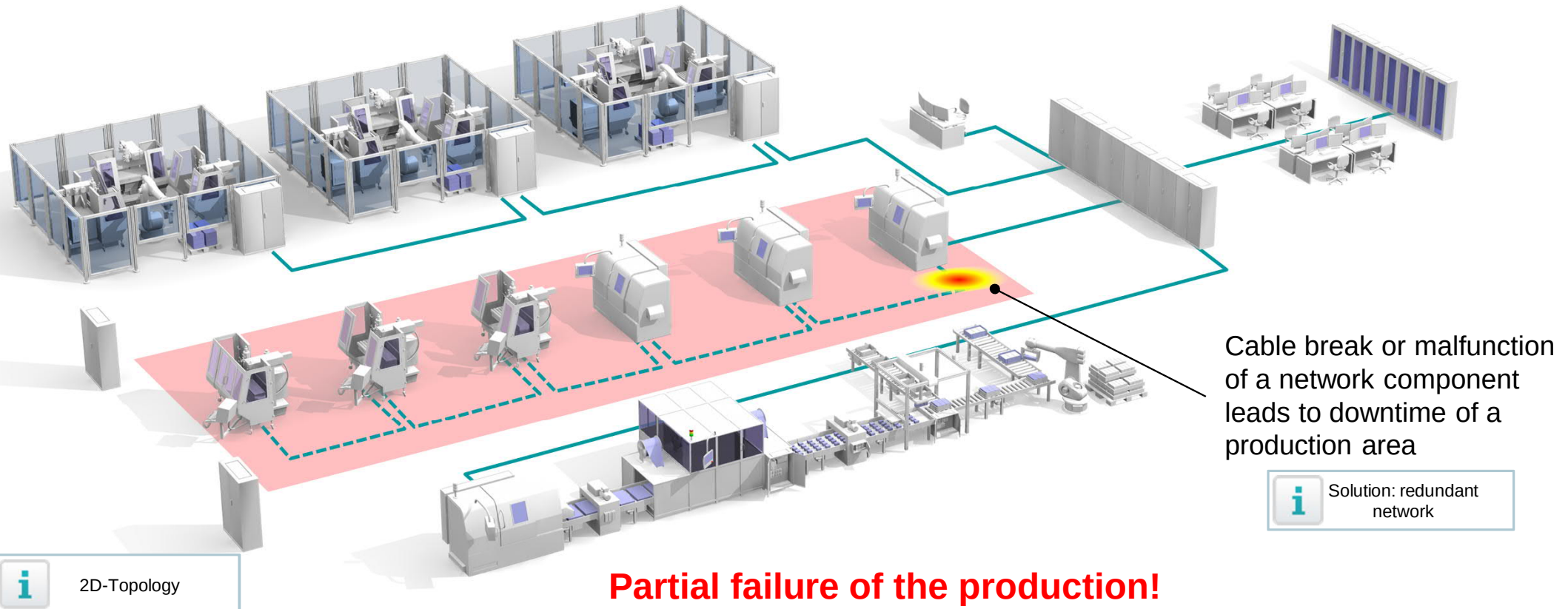






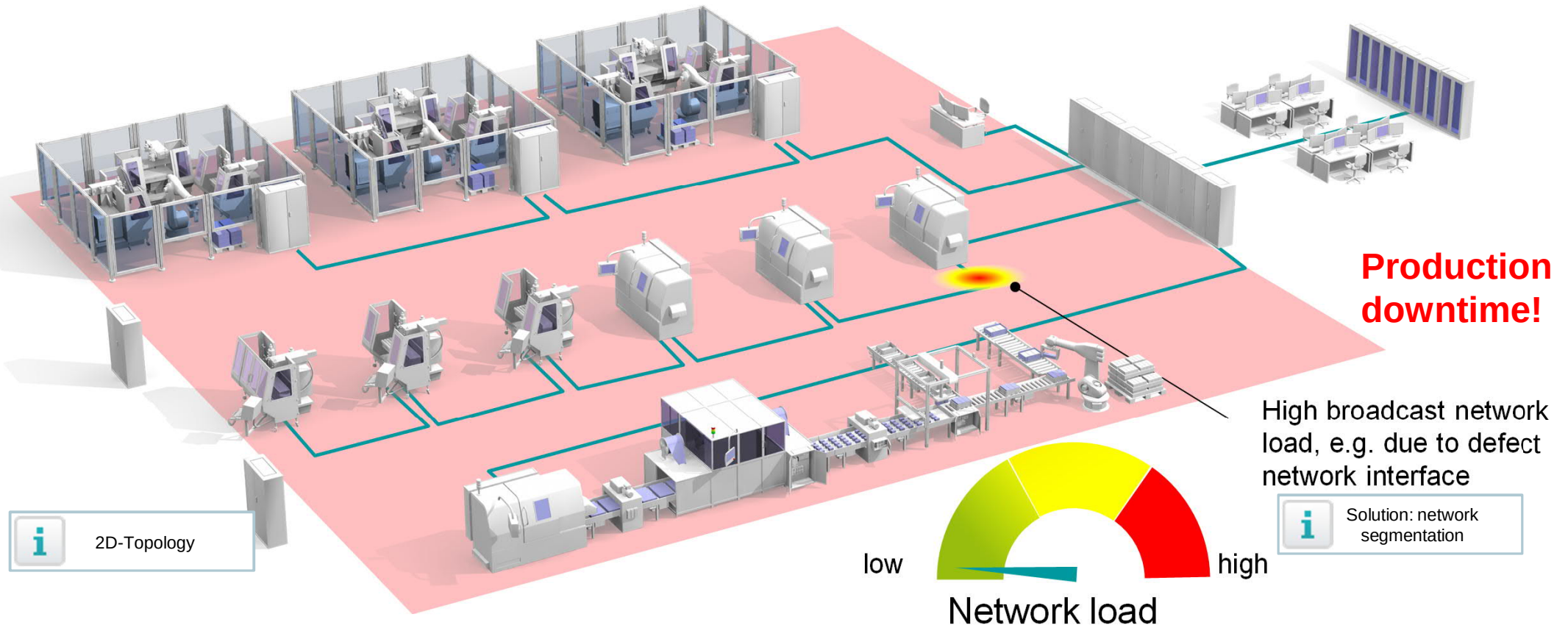
Typical problems in unmanaged networks

Cable or device faults



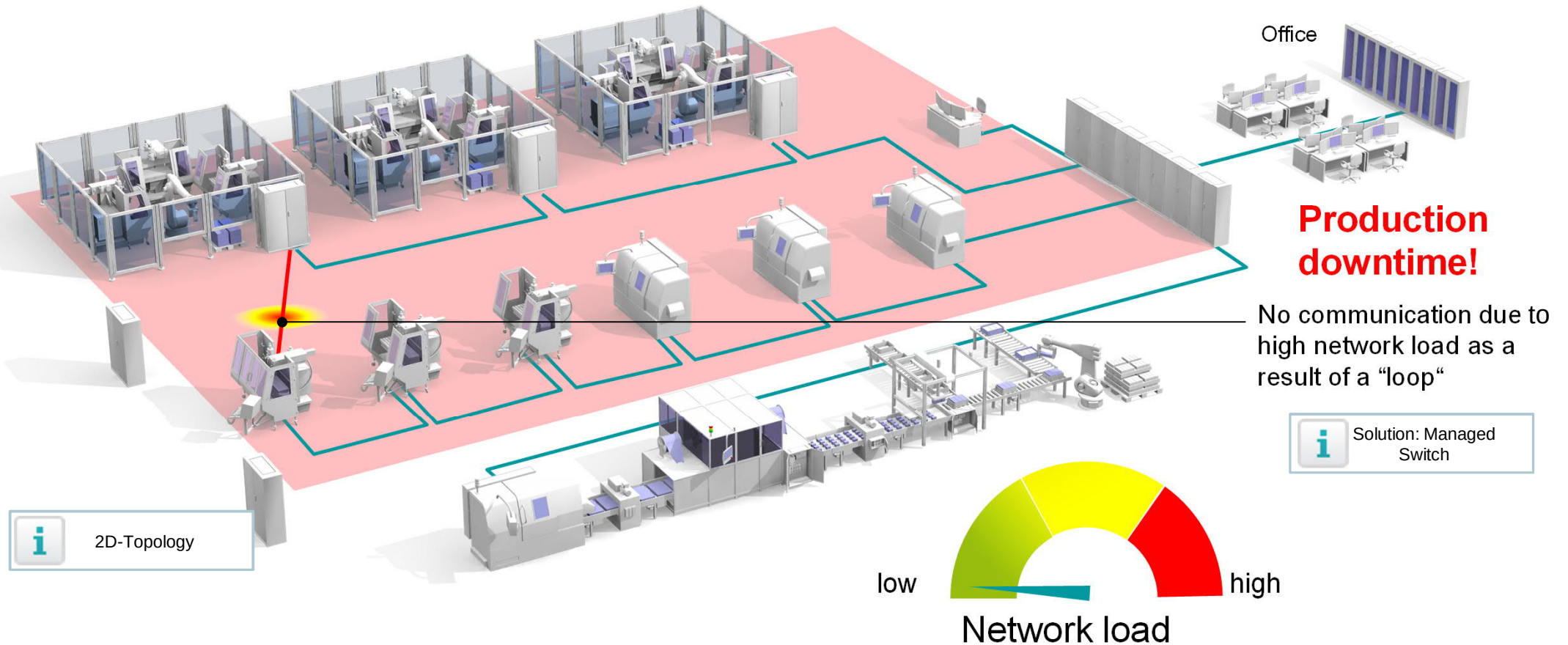
Typical problems in unmanaged networks

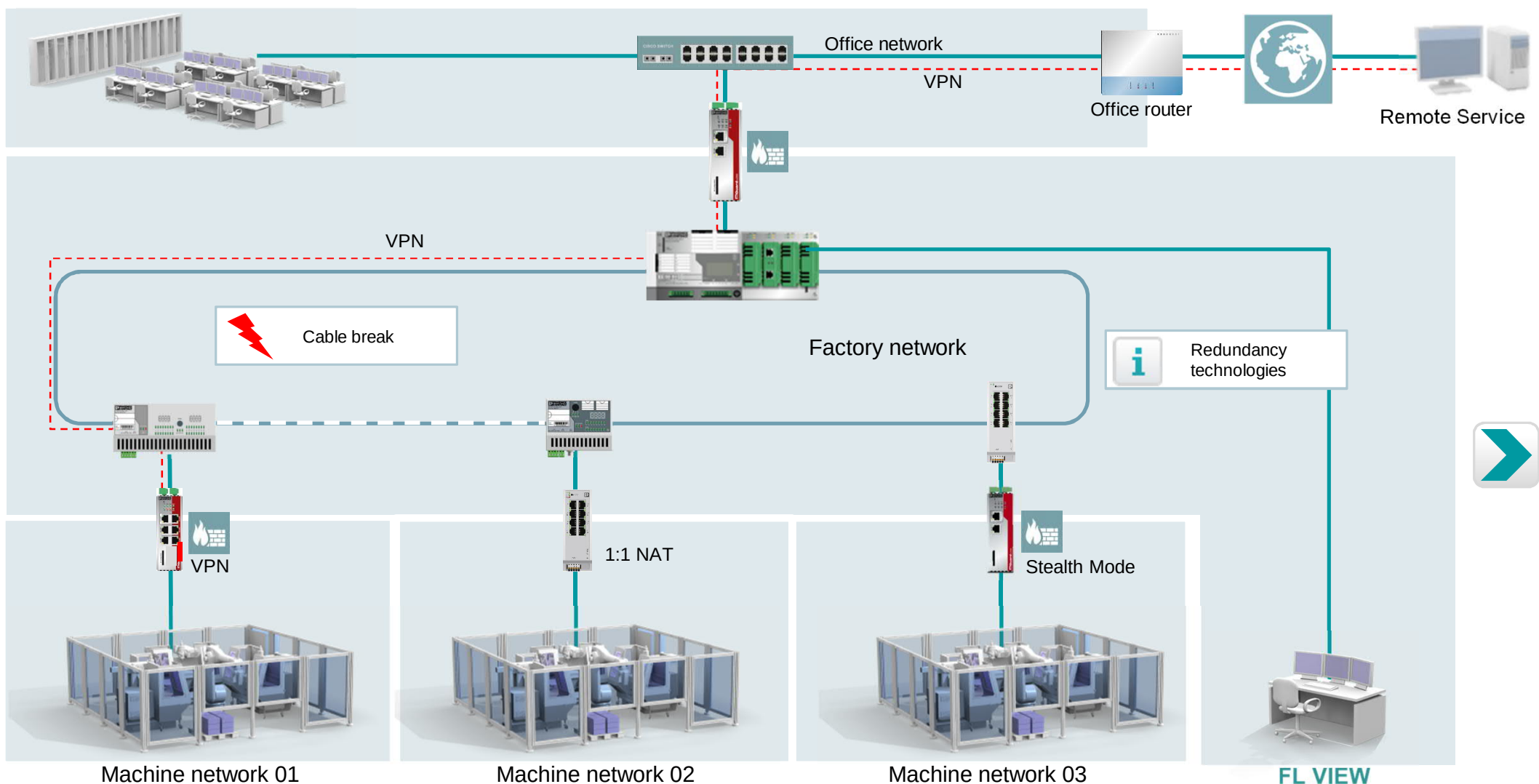
High network load

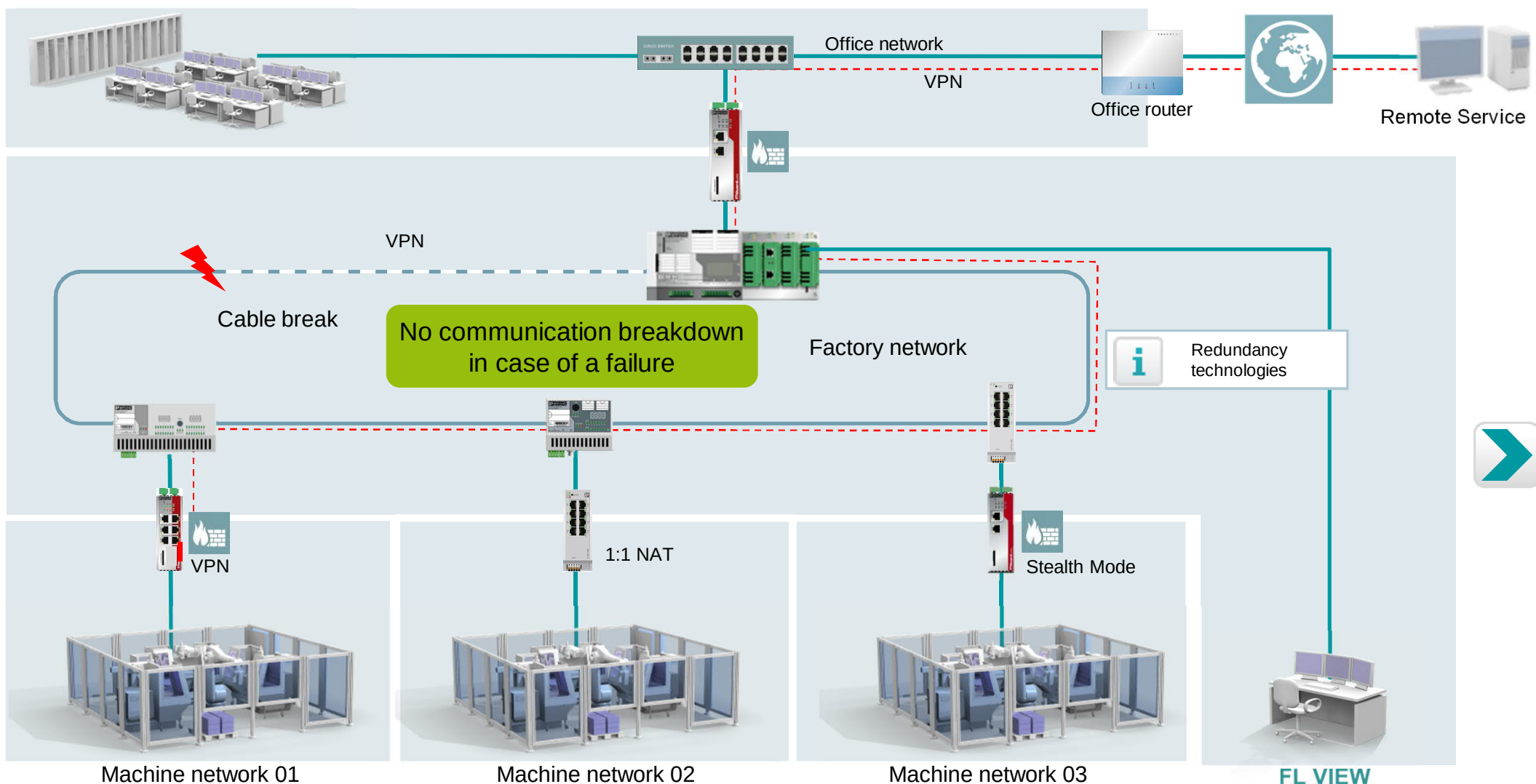


Typical problems in unmanaged networks

Network loop







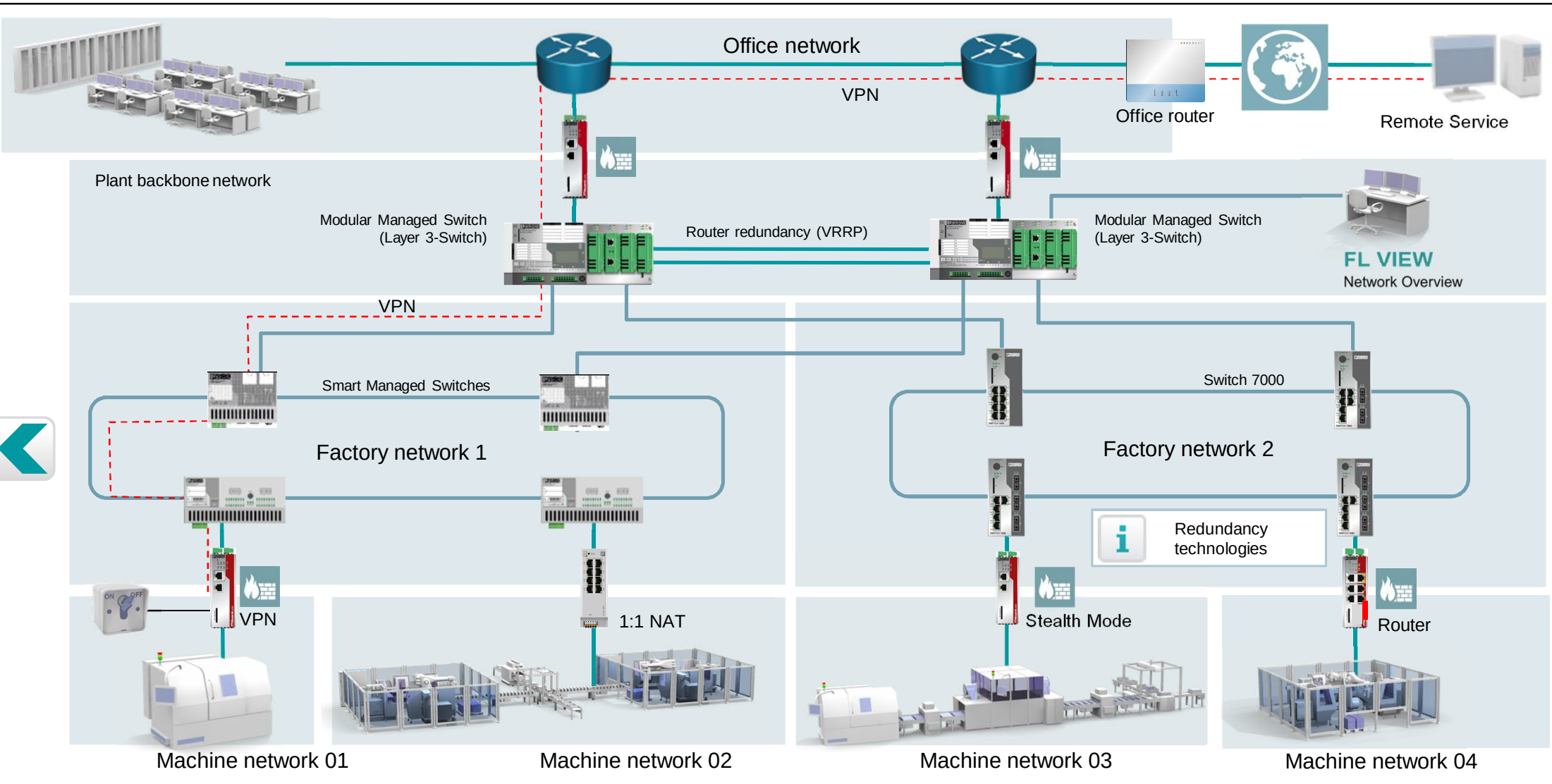
Machine network 01

Machine network 02

Machine network 03

FL VIEW
Network Overview



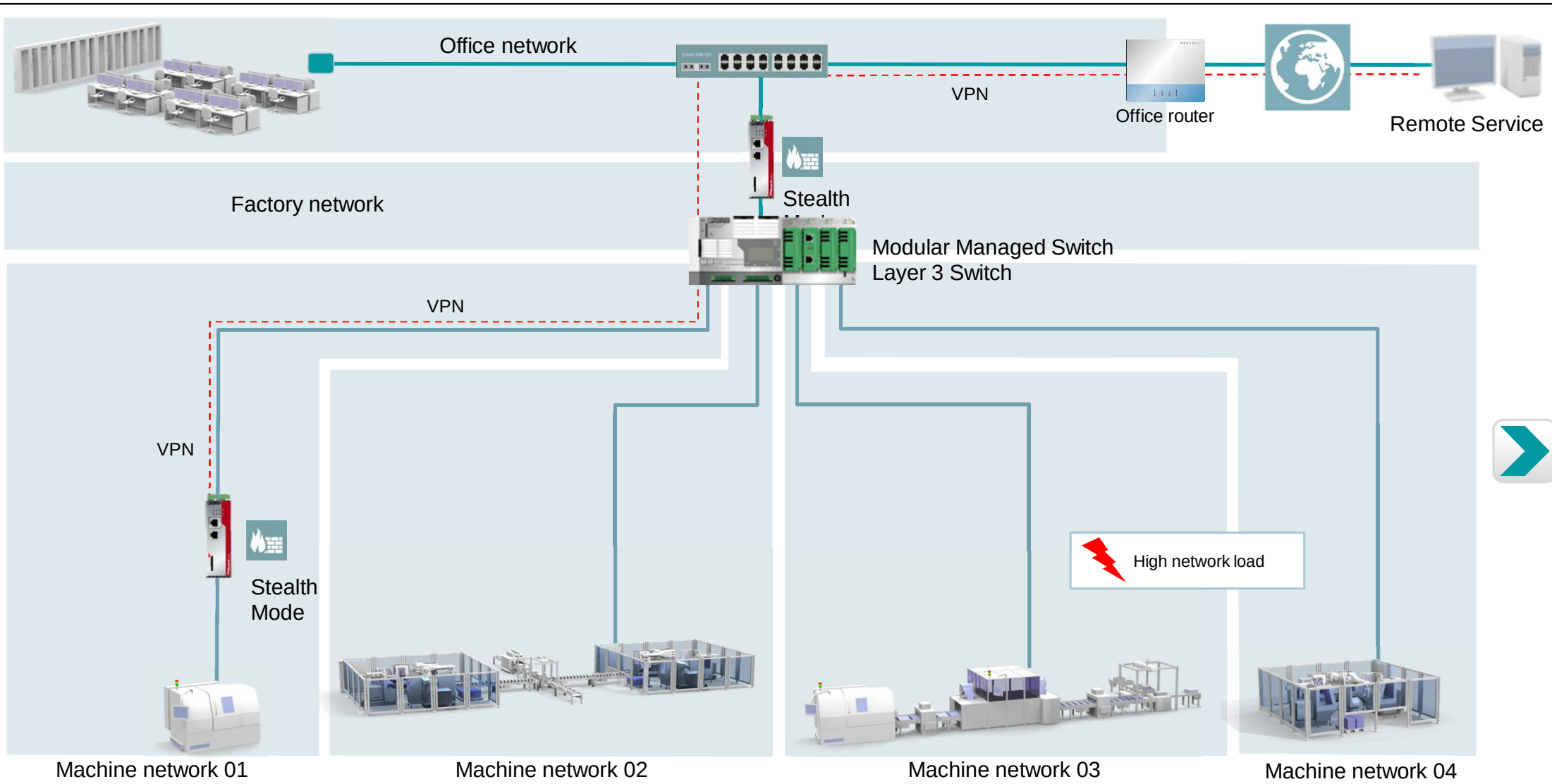


FL VIEW
Network Overview

Redundancy
technologies

Standard	Products	Standard	Reconfiguration time	Topologies	Max. devices	Ring coupling	Applications
RSTP/STP Rapid Spanning Tree Protocol	Lean/Smart/Modular/Standard Managed	IEEE 802.1D-2004	Up to several seconds	Ring, meshed structures, star, tree	15 (for ring structure)	Yes	IT and automation networks
RSTP Fast ring detection + Large Tree Support	Lean/Smart/Switch 7000, GHS	-	100 to 500 ms	Ring, meshed structures, star, tree	57 (for ring structure)	Yes	Automation networks
MRP Media Redundancy Protocol	Smart Managed and Modular Managed Switch	IEC 62439-2	200 ms	Ring	50	No	PROFINET automation networks
DLR Device Level Ring	Switch 7000	-	3 ms	Ring	50	No	EtherNet/IP automation networks
PRP Parallel Redundancy Protocol	RED 2000E	IEC 62439-3	Bumpless	Double networks in line, star or tree formation	Any	-	Energy systems. Infrastructure
ERR Extended Ring Redundancy	Switch 3000/4000	-	15 ms	Ring	200	Yes	Infrastructure
VRRP Virtual Router Redundancy Protocol	RFC 3768	-	Up to several seconds	Double and multiple routers	Any	-	Connection to the company network





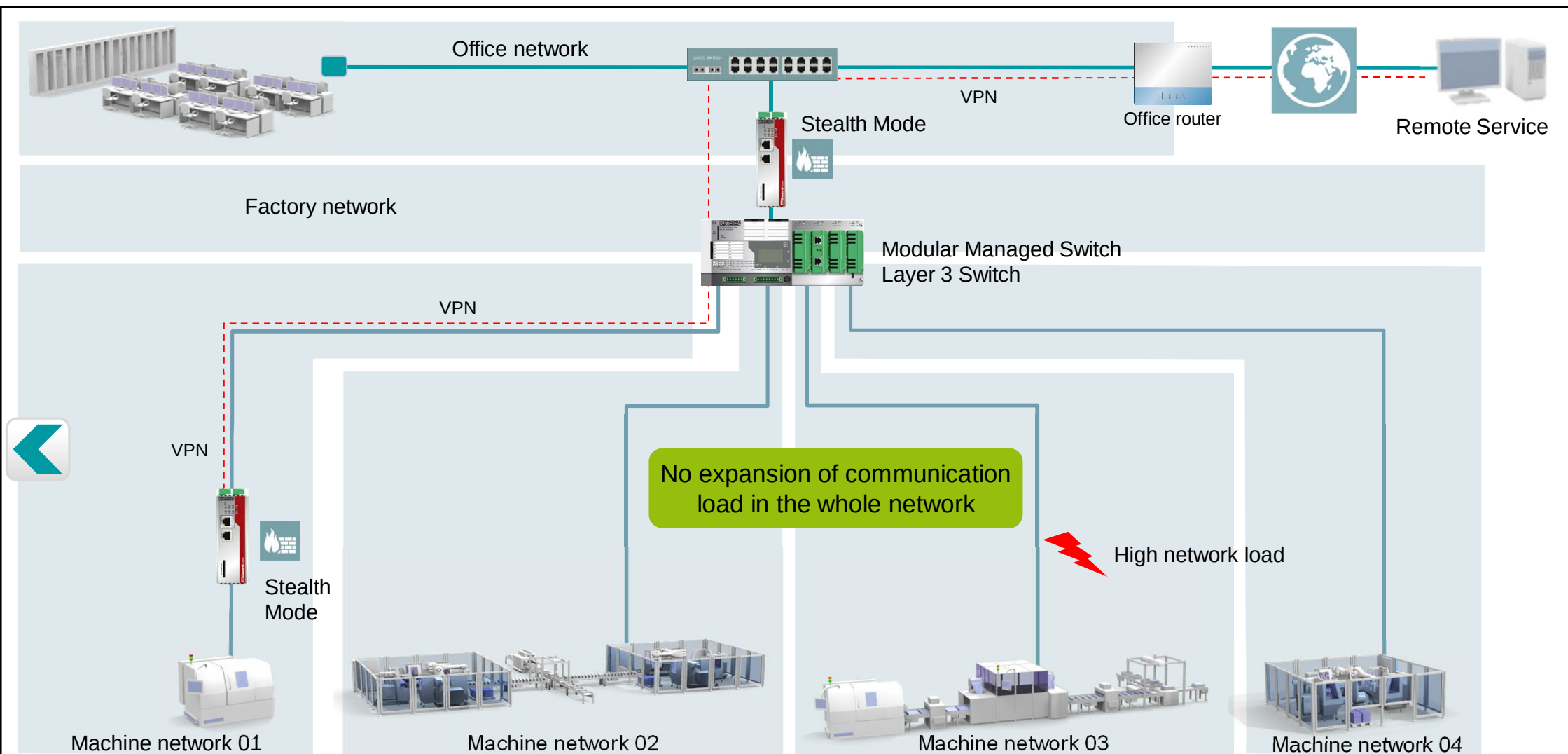
Machine network 01

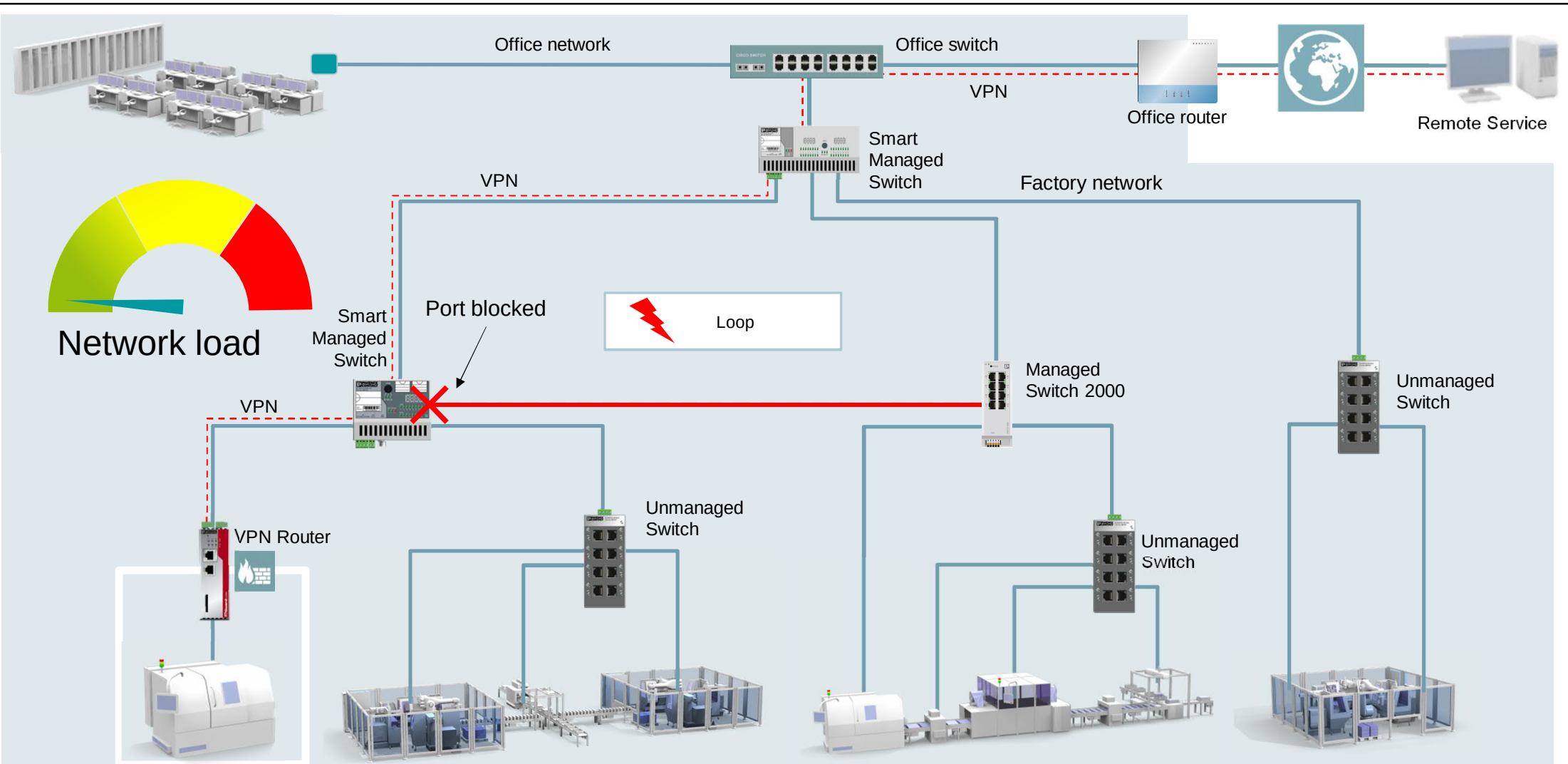
Machine network 02

Machine network 03

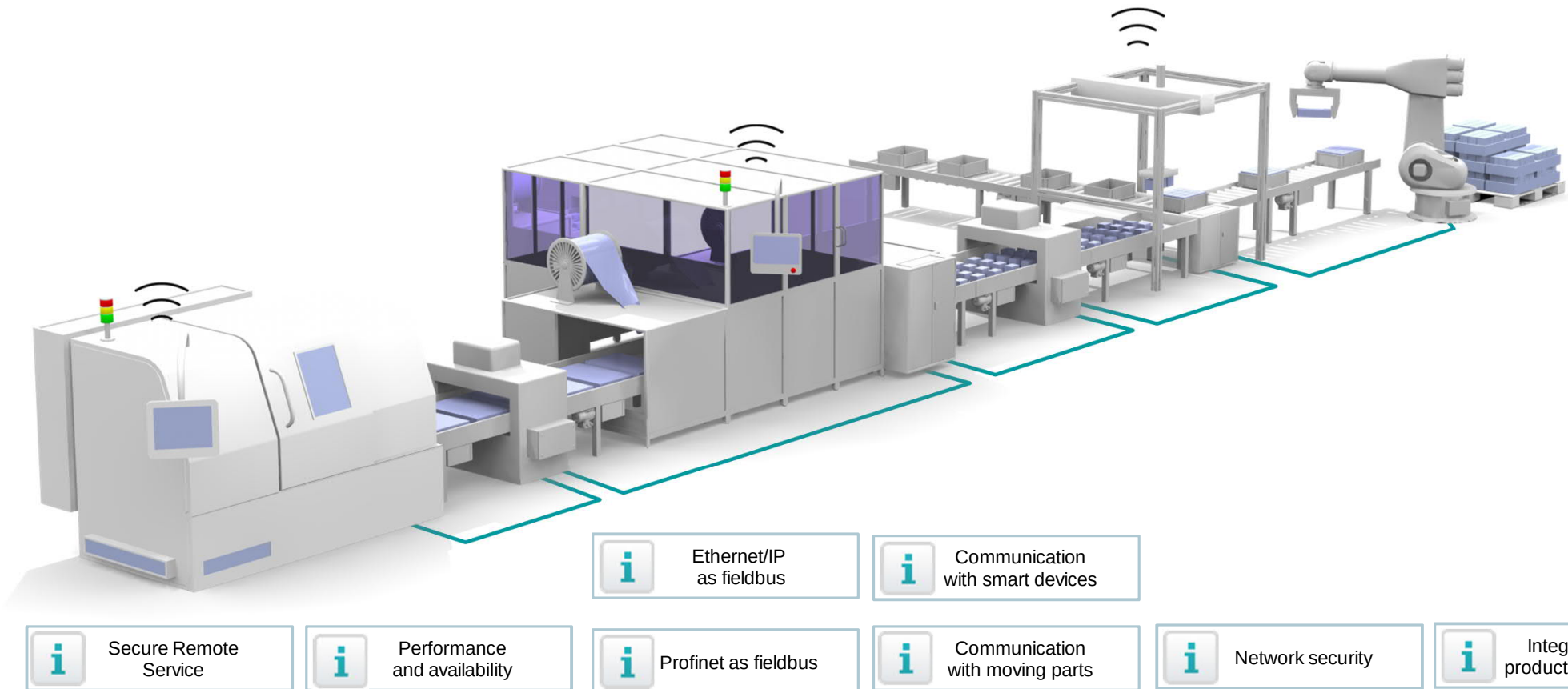
Machine network 04







Typical problems in machine networks



Factory network

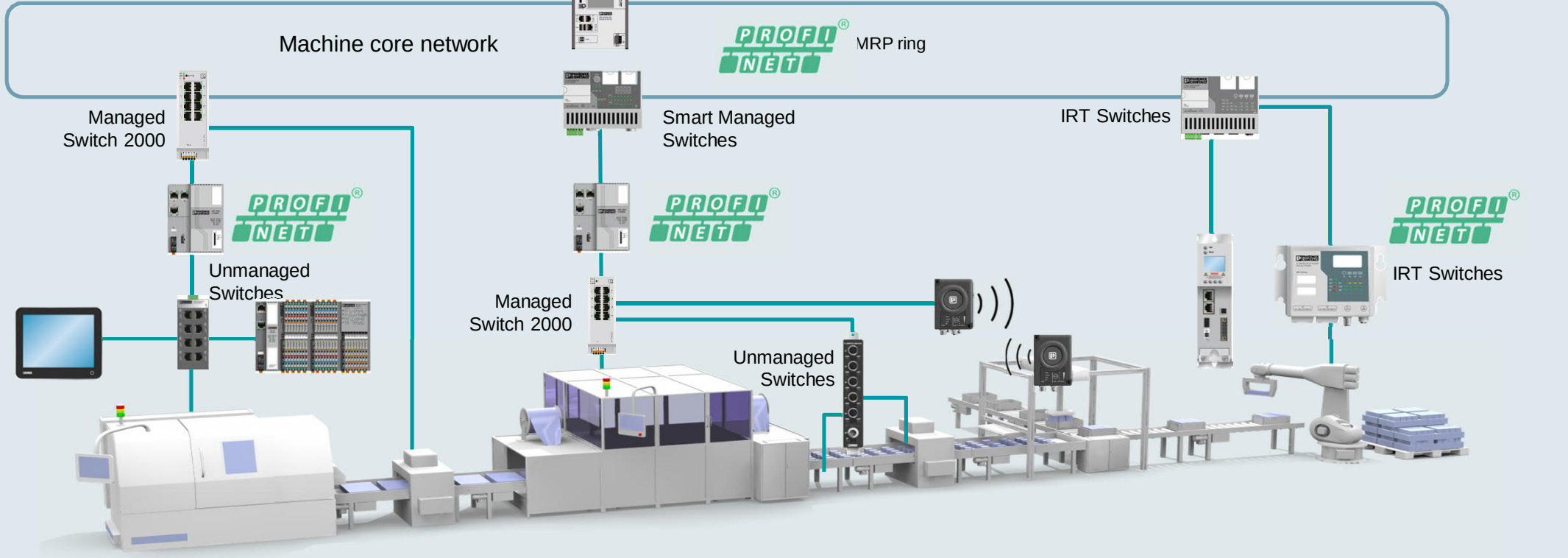


Remote Service



Firewall, 1:1 NAT. Router

Machine network



Factory network



Remote Service

Machine network



Firewall, 1:1 NAT. Router



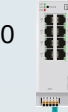
Advanced Managed Switches



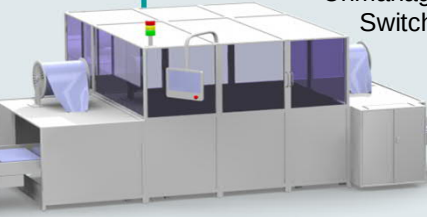
Unmanaged Switches



Switch 2000



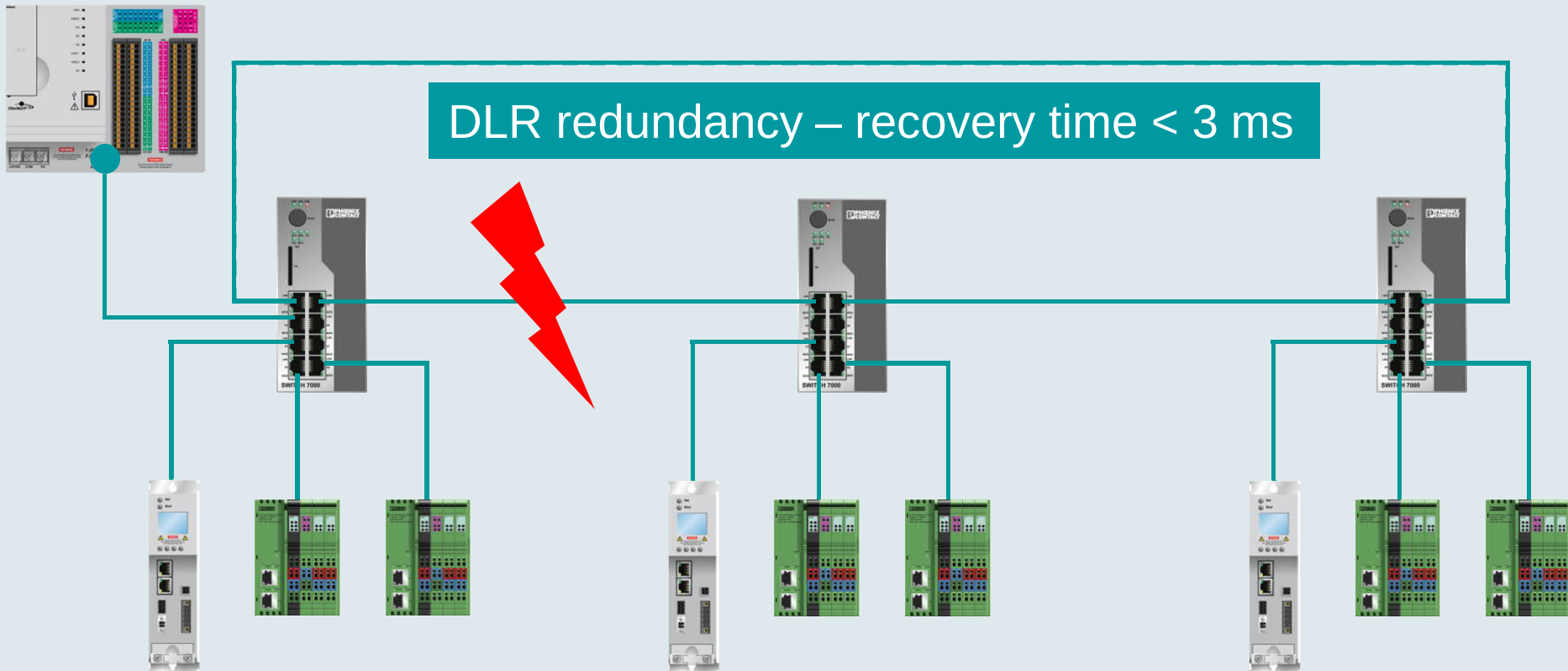
Unmanaged Switches

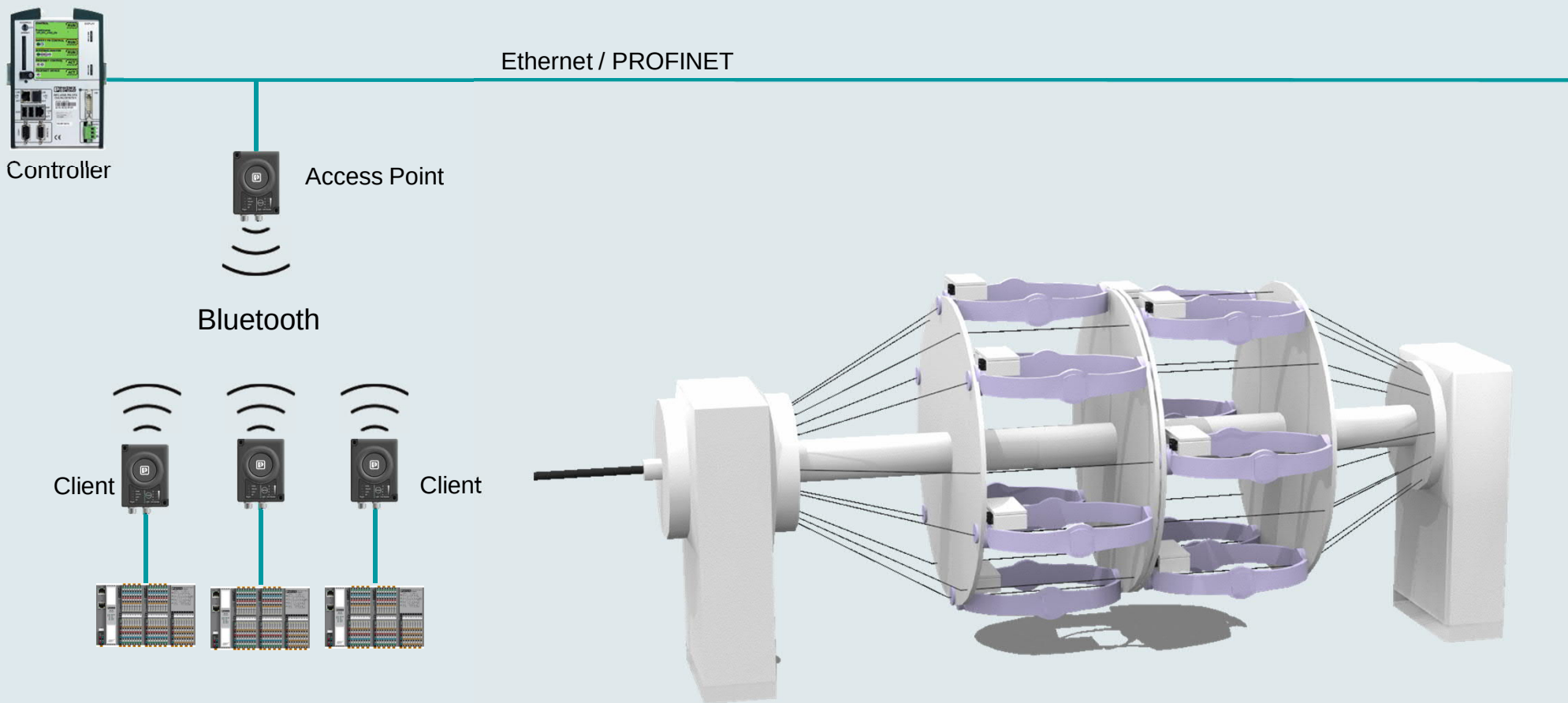


Advanced Managed Switches

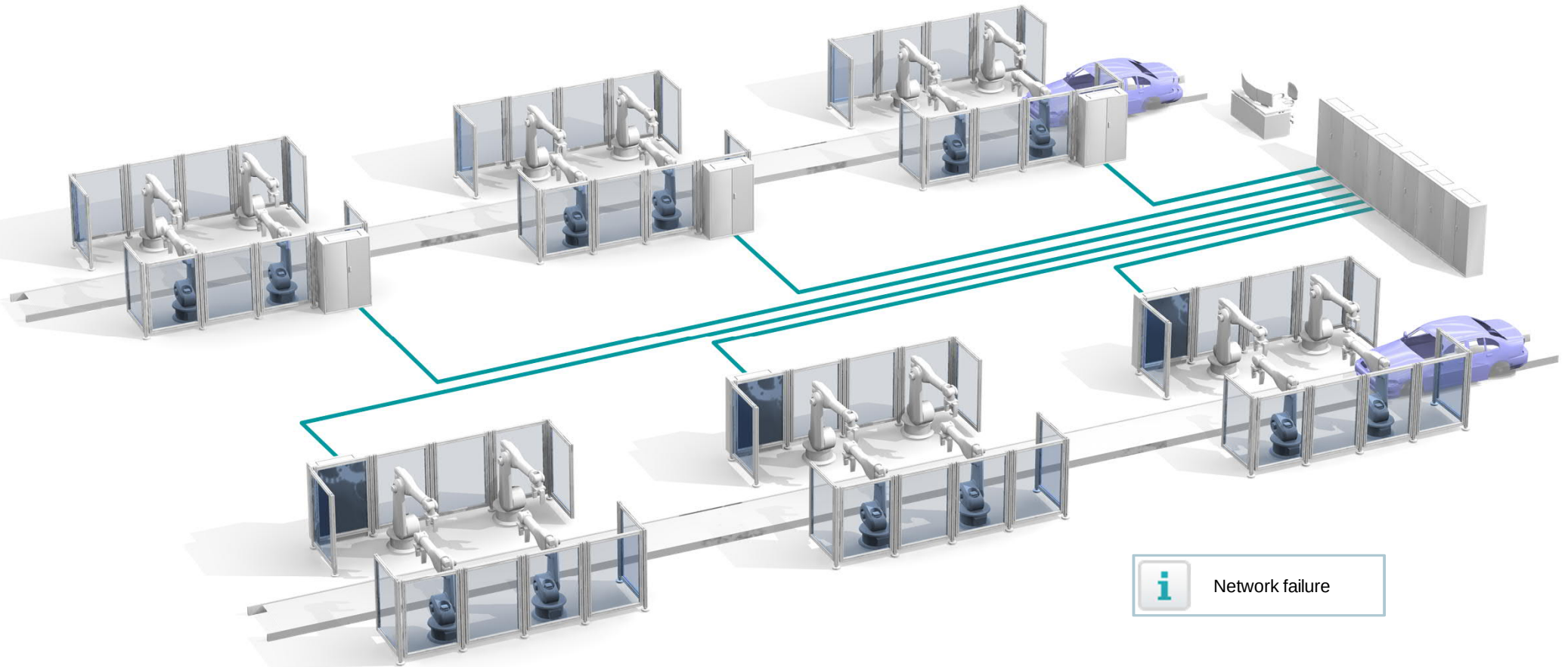


DLR redundancy – recovery time < 3 ms

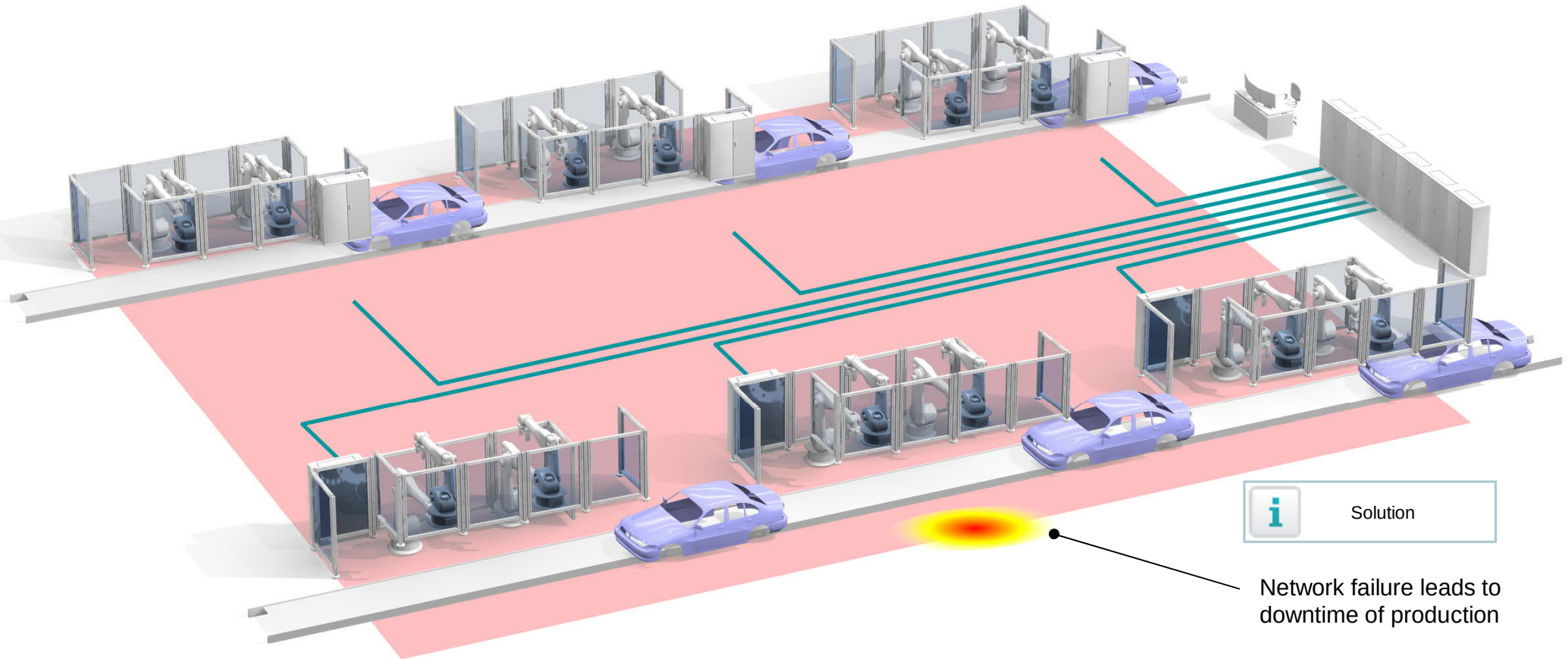




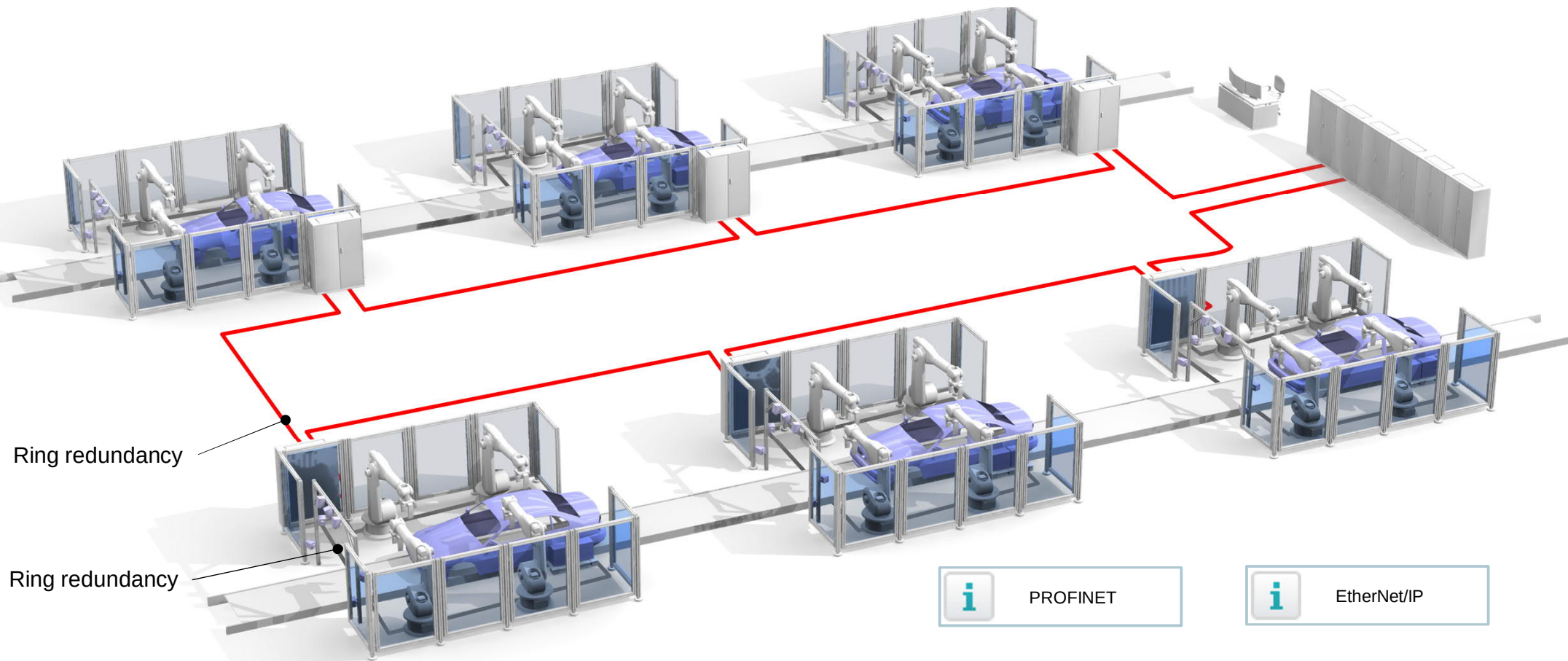
Production line

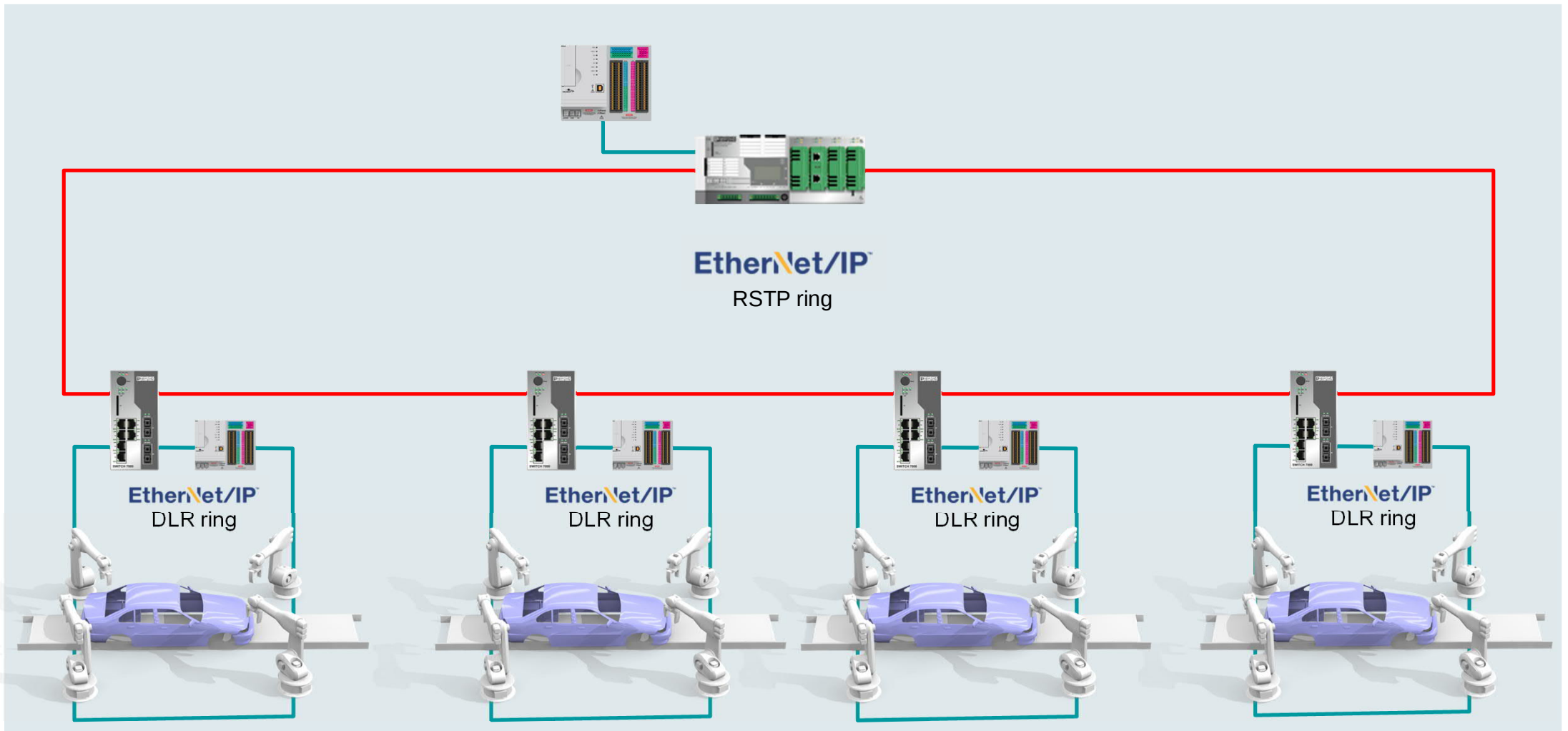


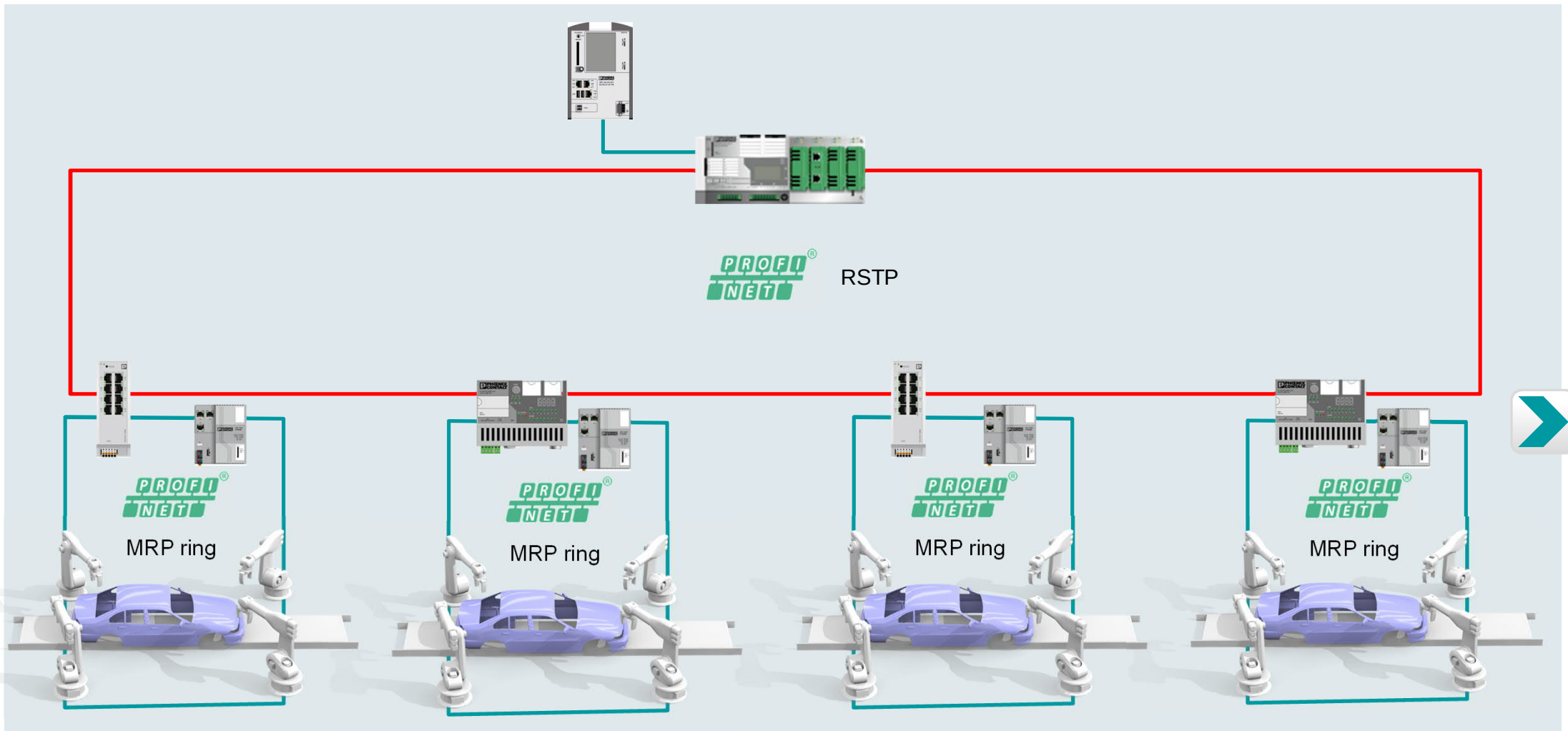
Production line

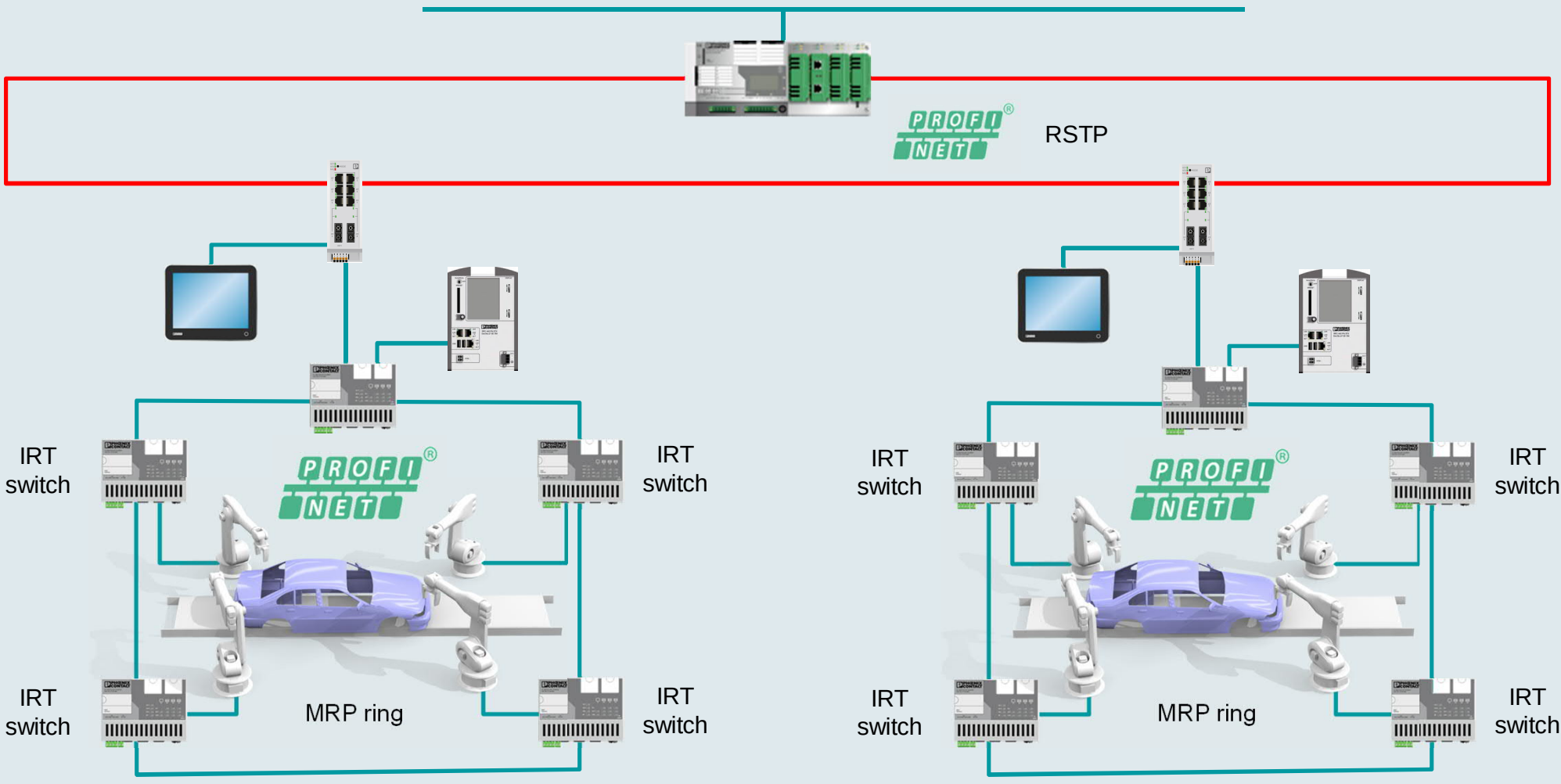


Reliable production line network structure



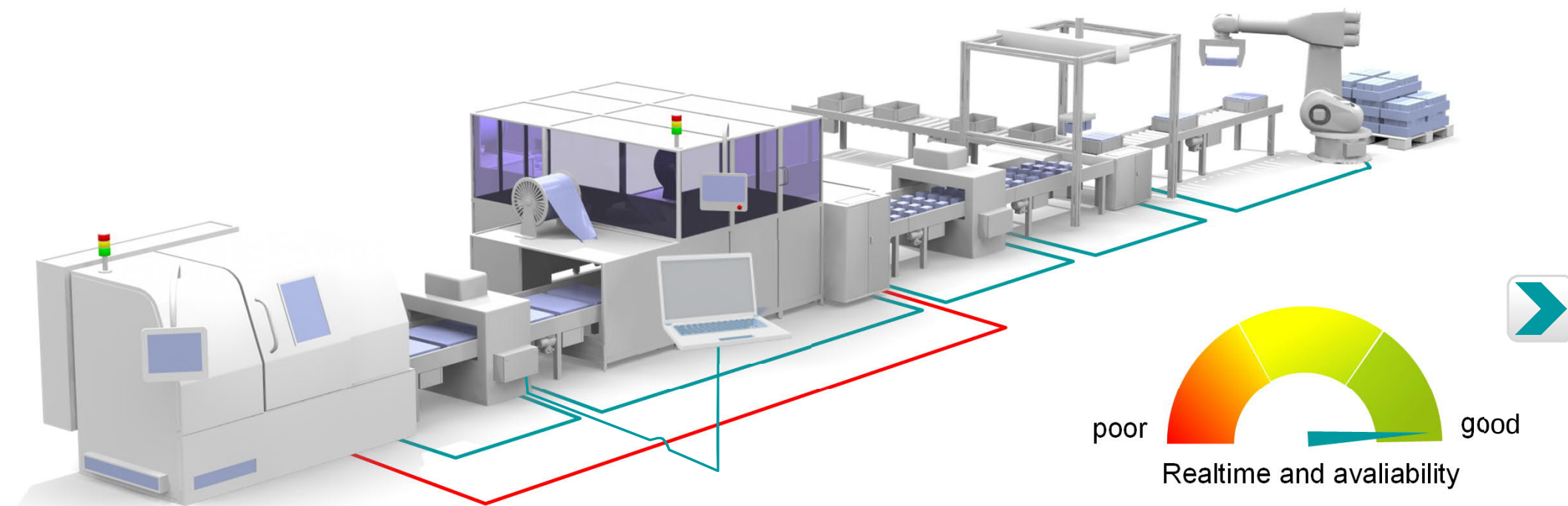






Typical problems in unmanaged machine networks

Performance and availability



⚡ High broad-and multicast-traffic in the network

⚡ Protocol issues

⚡ Unauthorized devices

⚡ Network loop

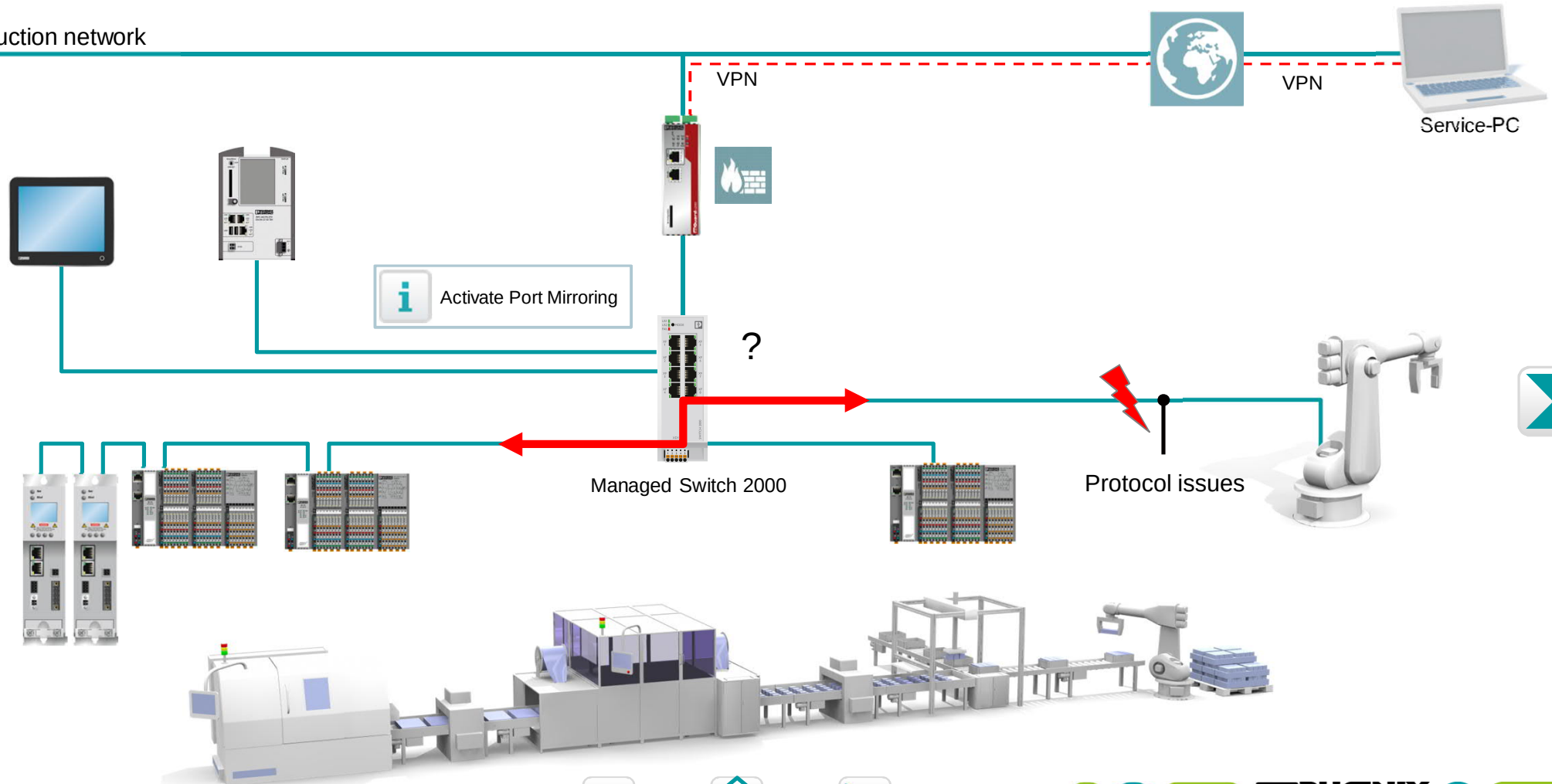
⚡ Cable and connector problems

⚡ Device failure



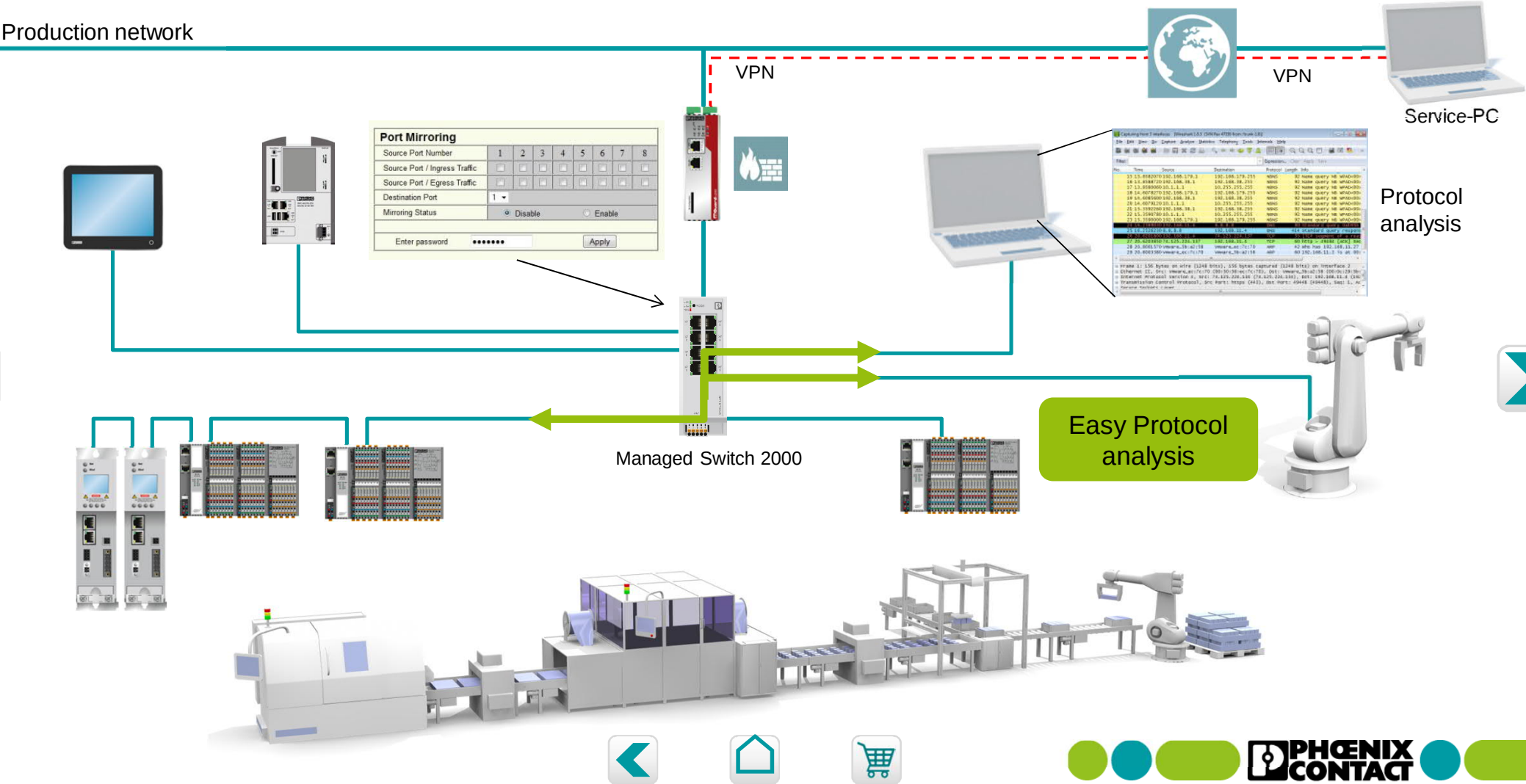
Protocol issues

Production network



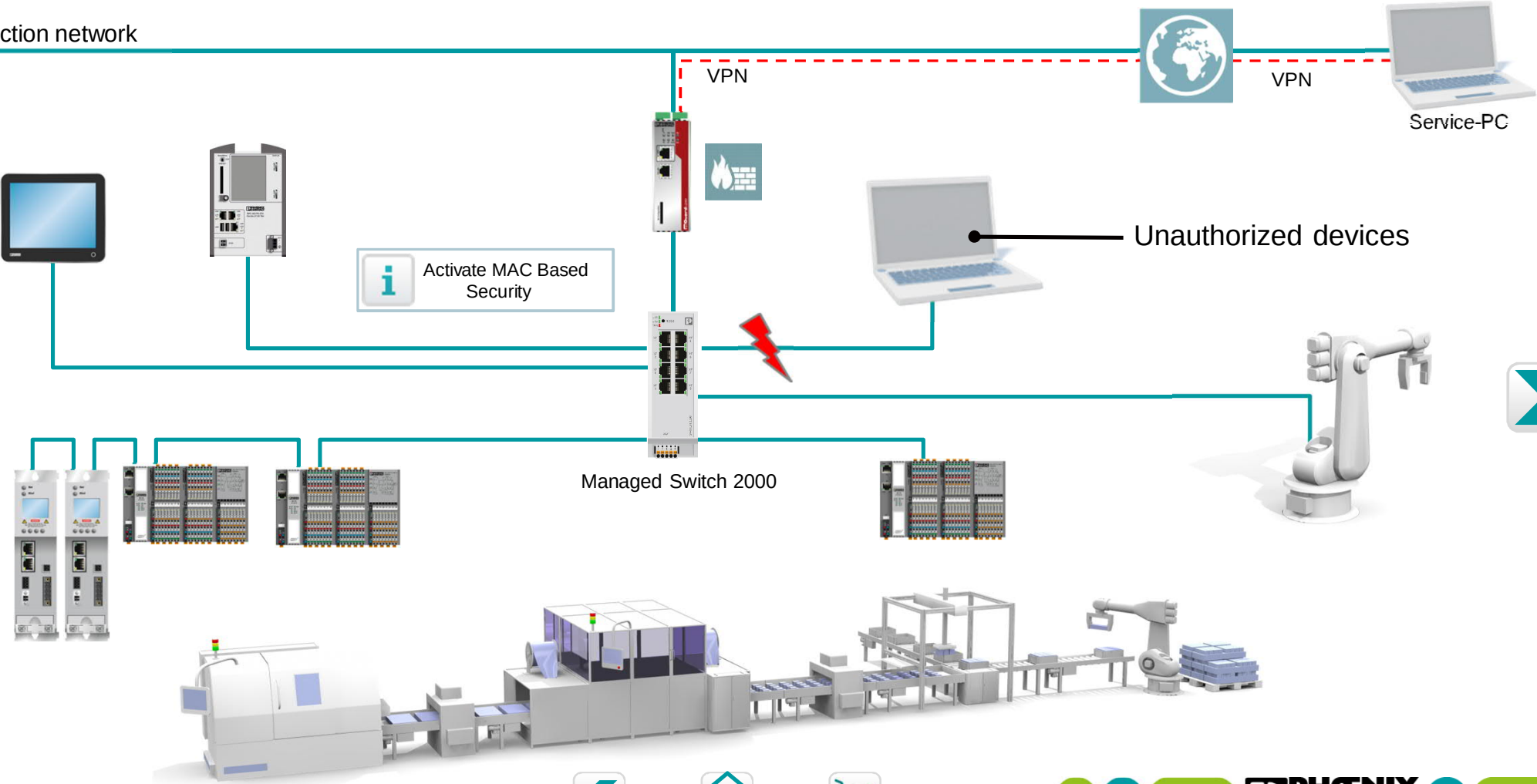
Our solution: Port Mirroring

Production network



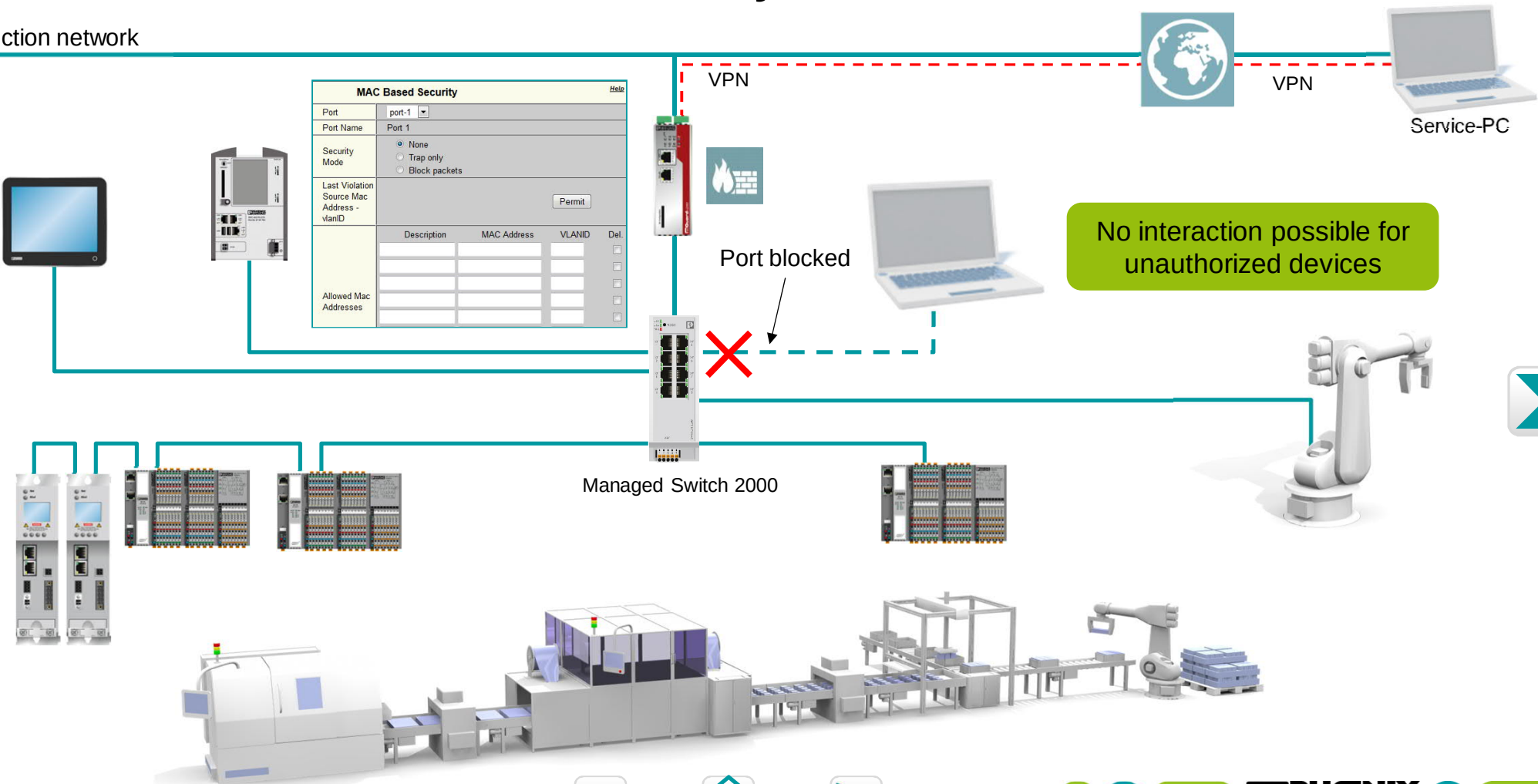
Unauthorized devices

Production network



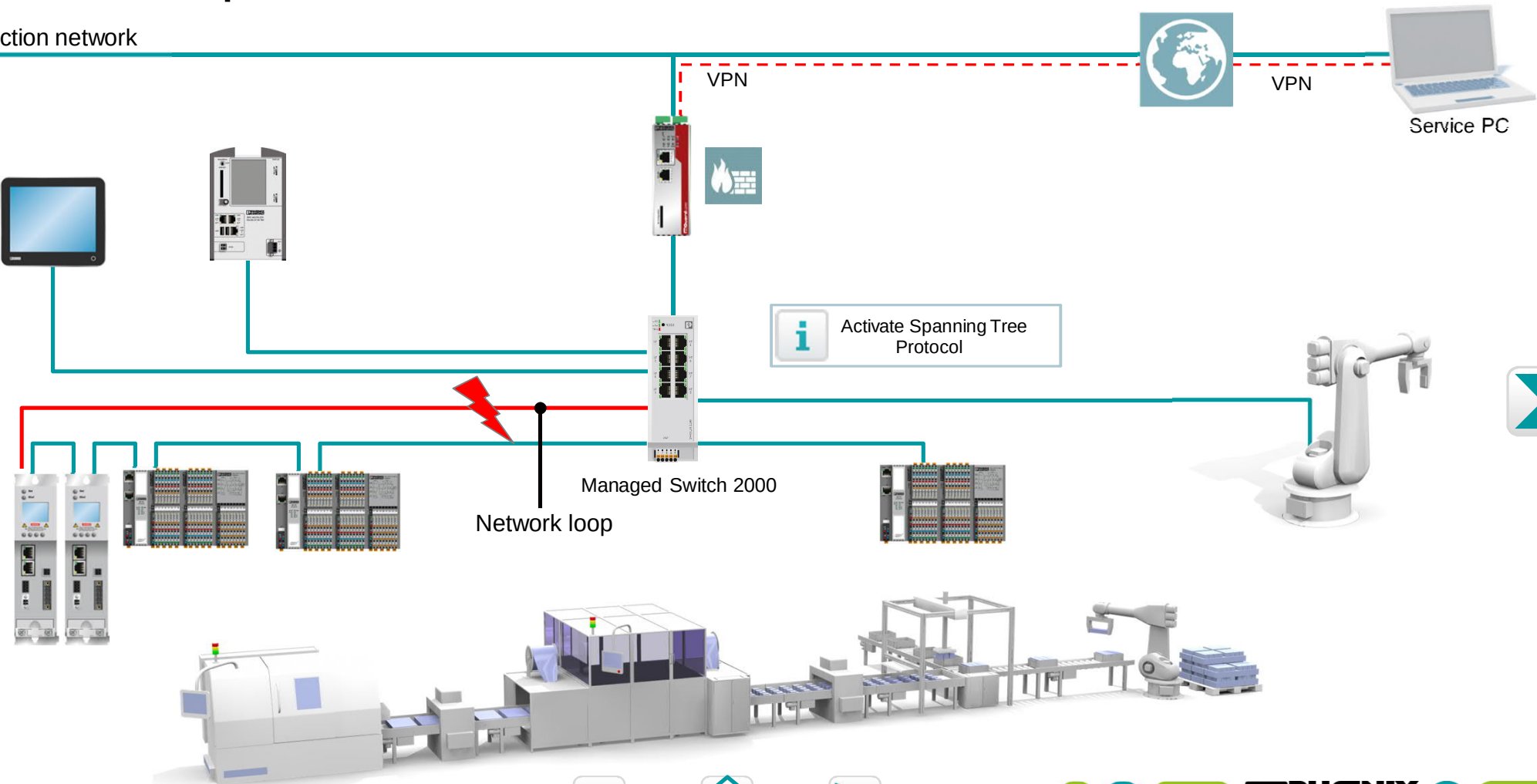
Our Solution: MAC Based Security

Production network



Network Loops

Production network



Our Solution: Spanning Tree Protocoll

Production network

VPN

VPN

Service PC

Port blocked

Spanning Tree Config			Help
STP Mode	RSTP		
Large Tree Support	☒ Disable	☐ Enable	
Fast Ring Detection	☒ Disable	☐ Enable	
Bridge Priority	32768	(0 to 61440)	
Max Age of STP Information	20	(6 to 40 secs)	
Hello Time	2	(1 to 10 secs)	
Forward Delay	15	(4 to 30 secs)	

Managed Switch 2000

Prevention of broadcast storms
through loop prevention

Profinet simple device replacement

Production network



VPN

VPN



Service PC



LLDP (Link Layer Discovery Protocol) and
SNMP (Simple Network Management Protocol)
support required

Managed Switch 2000

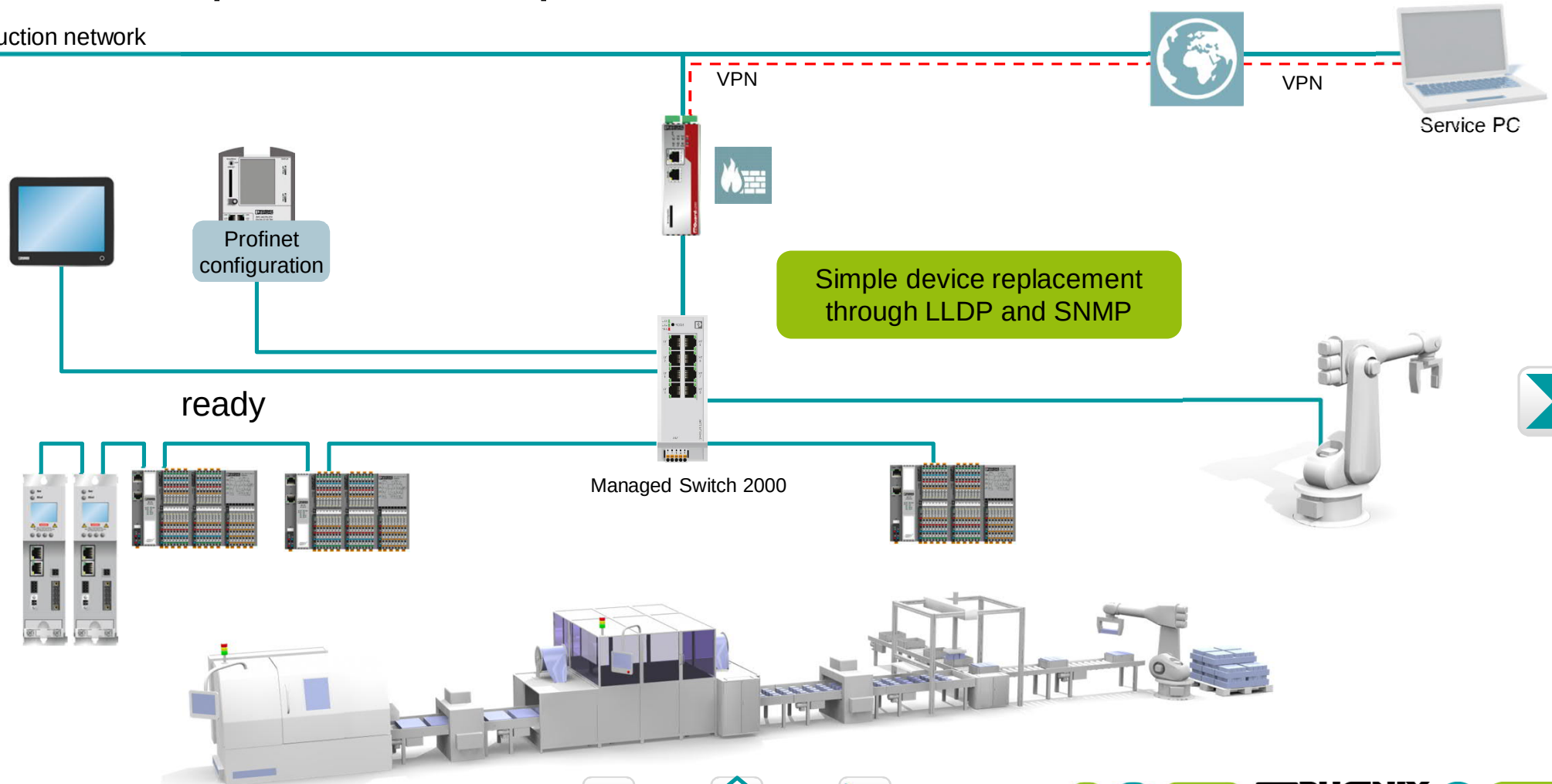


Change device

Device failure

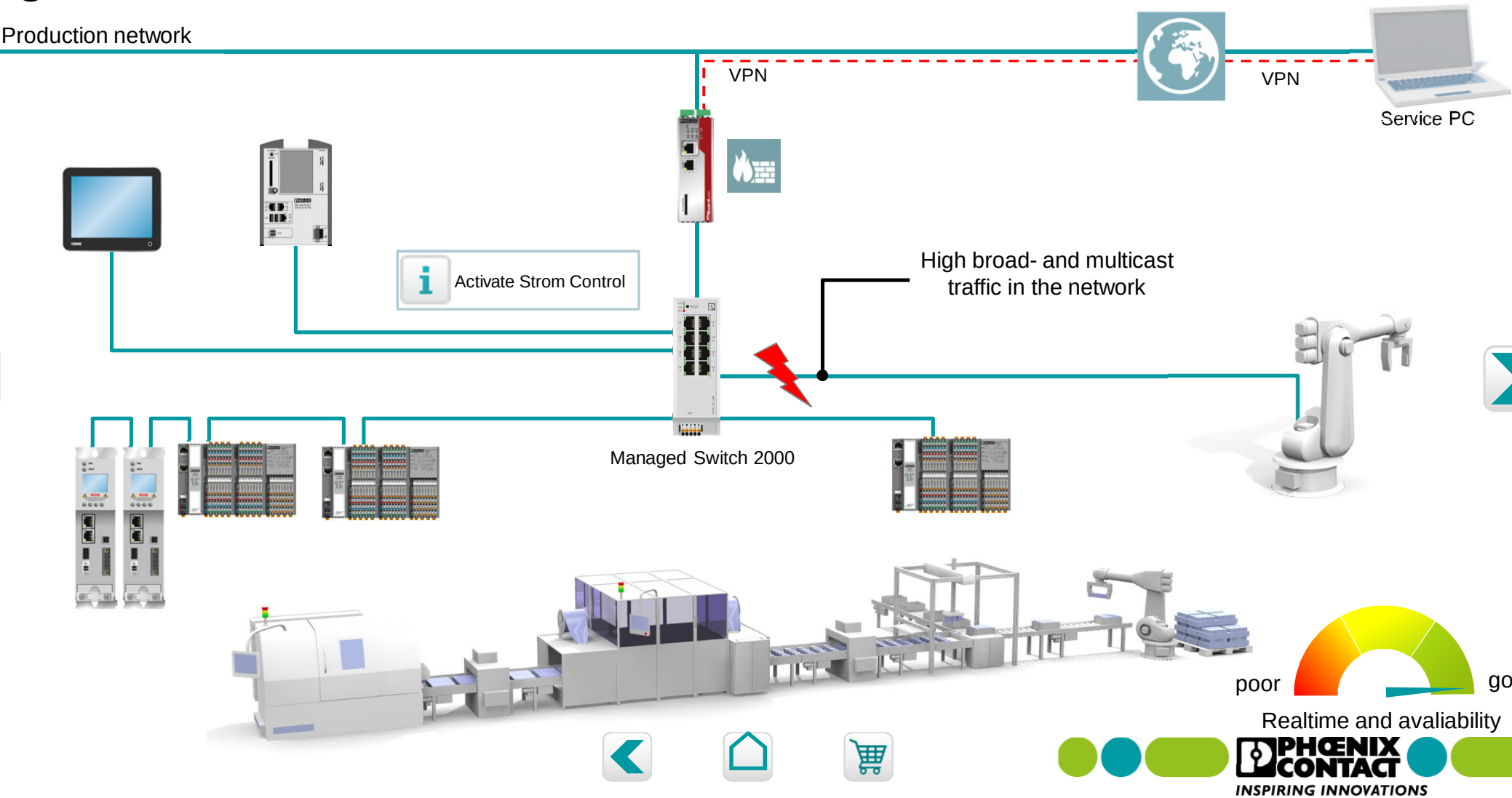
Profinet simple device replacement

Production network



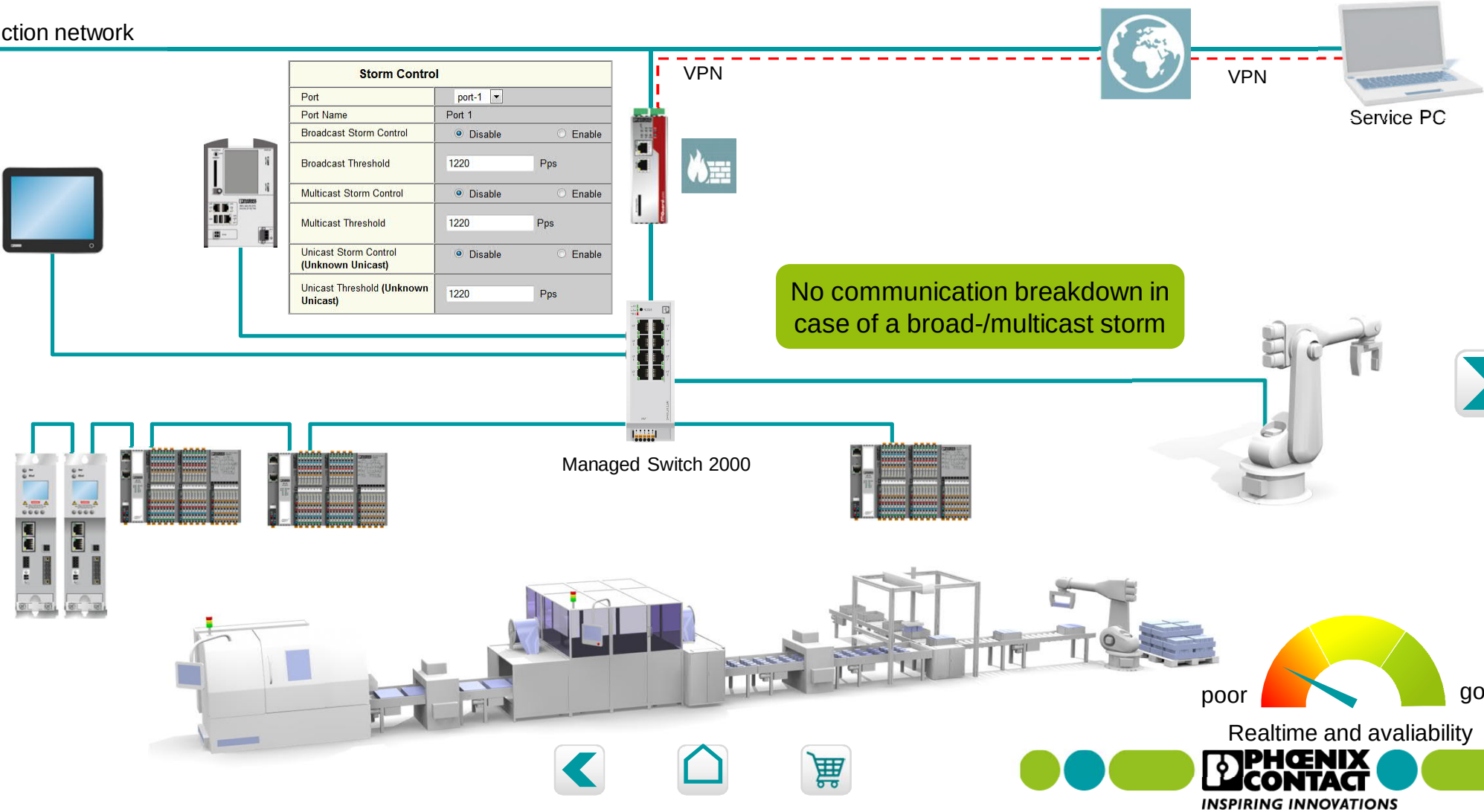
High broad- and multicast traffic

Production network



Our solution: Storm control

Production network



Contact problems of cables and connectors

Production network

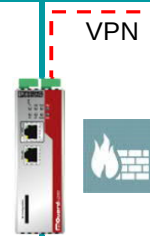


VPN

VPN

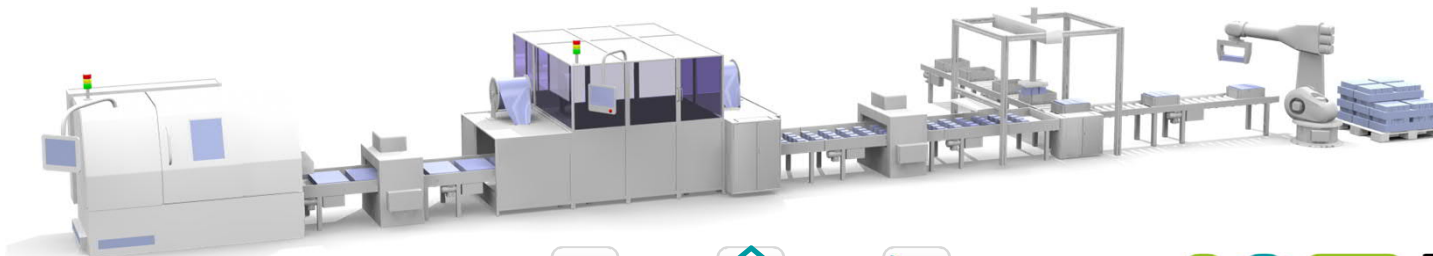
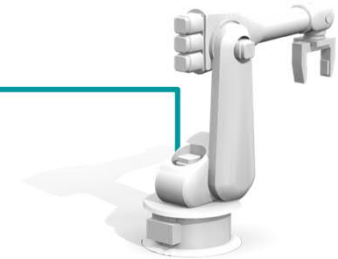
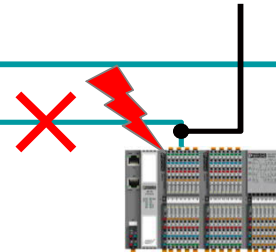


Service PC



Contact problems cables and connectors

Managed Switch 2000



Our solution: Diagnostic information

Production network

Event Table	
System Up Time	22 min 50 sec
Time	Event
20 min 35 sec	LLDP recognized new neighbor at port 5
20 min 35 sec	Link up on Port: 5
20 min 19 sec	Link up on Port: 7
20 min 16 sec	LLDP recognized new neighbor at port 3
20 min 16 sec	Link up on Port: 3
20 min 13 sec	Link down on Port: 3
17 min 55 sec	Configuration has been saved.
17 min 30 sec	The configuration has been modified the first time after the last storing.
59 sec	Link up on Port: 3
55 sec	Link down on Port: 3
29 sec	Configuration has been saved.
25 sec	The configuration has been modified the first time after the last storing.
3 sec	Link up on Port: 3
3 sec	Configuration has been saved.
3 sec	Boot
0 sec	RSTP disabled.
0 sec	Power Supply US2 lost
Enter password: ***** Clear	

Port Statistics	
Port Number	3
Packets	4103
up to 64 Octets	2969
65 to 127 Octets	631
128 to 255 Octets	71
256 to 511 Octets	425
512 to 1023 Octets	1
1024 to 1518 Octets	6
Broadcast	307
Multicast	50
Octets	448306
Fragments	0
Undersized Packets	0
Oversized Packets	0
CRC Alignment Errors	1
Drop Events	0
Jabbers	0
Collisions	0
Clear counters	
You can set the statistic counters of all switch ports to zero.	
Enter password: *****	Clear
Port Configuration of port 3: General (R)STP	
Note: This web page will be refreshed in 23 sec automatically (change the interval at the web page 'General Configuration / User Interfaces')	

Managed Switch 2000

VPN

VPN

Service PC

Receive diagnostic information in case of problems with cables and connectors





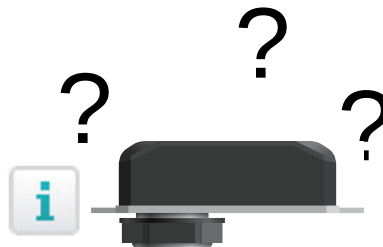
Unlimited service access into machine network

- Access on all devices

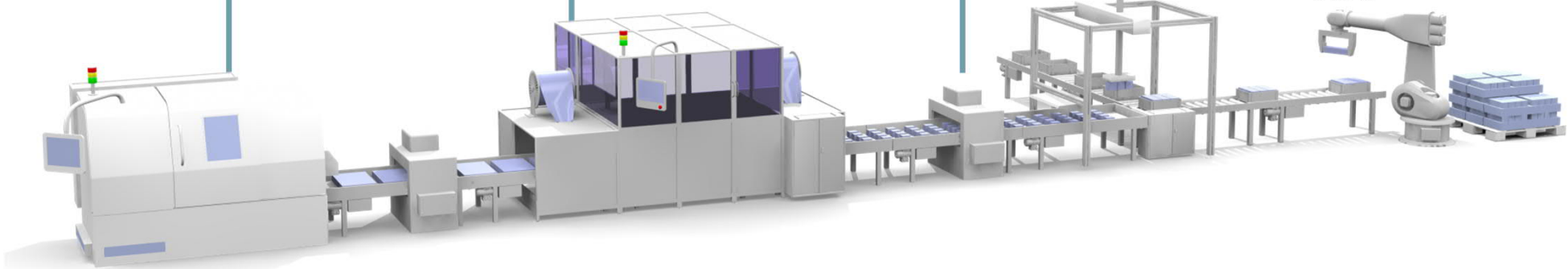


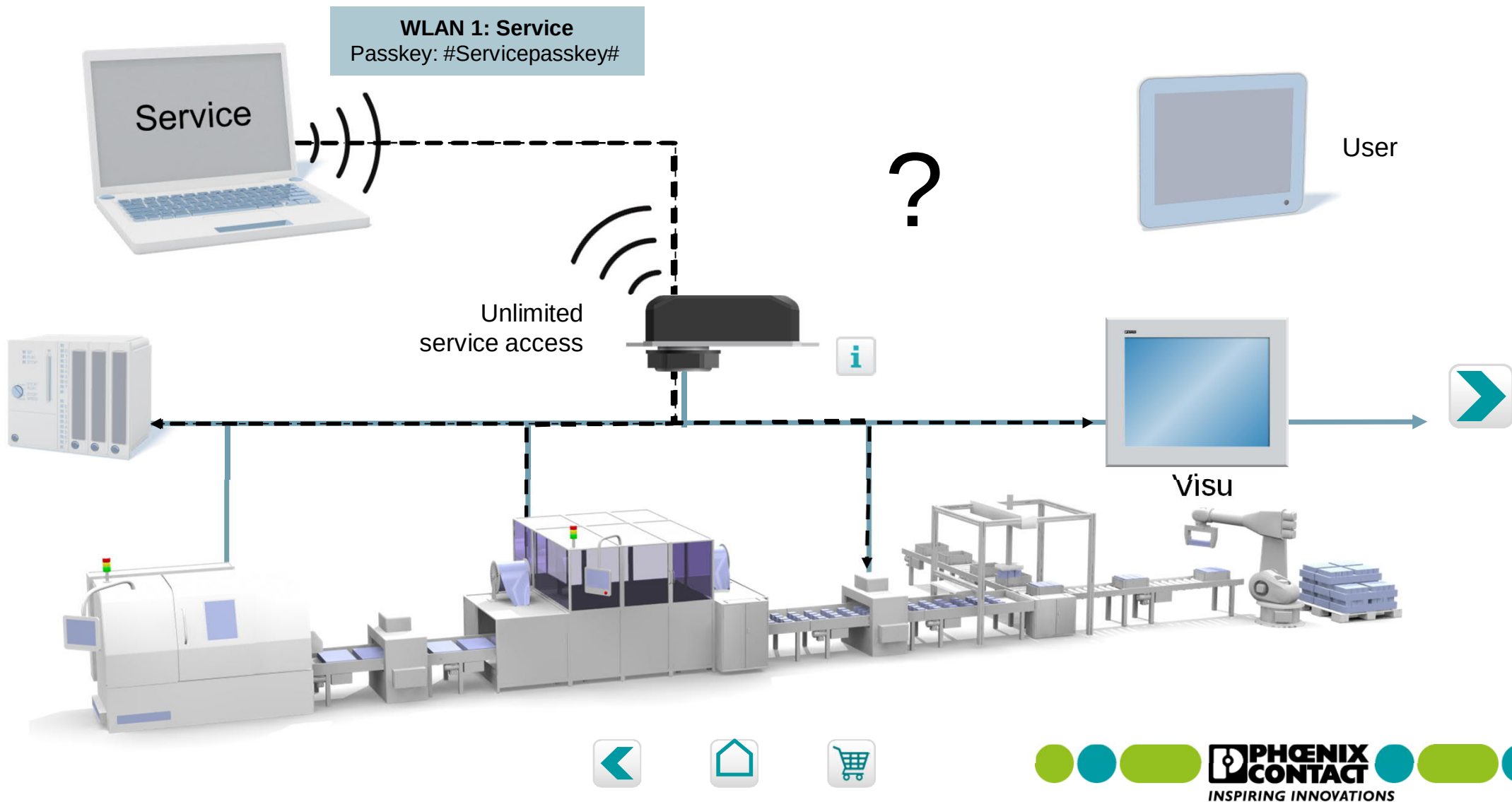
Restricted, temporary user access into machine network

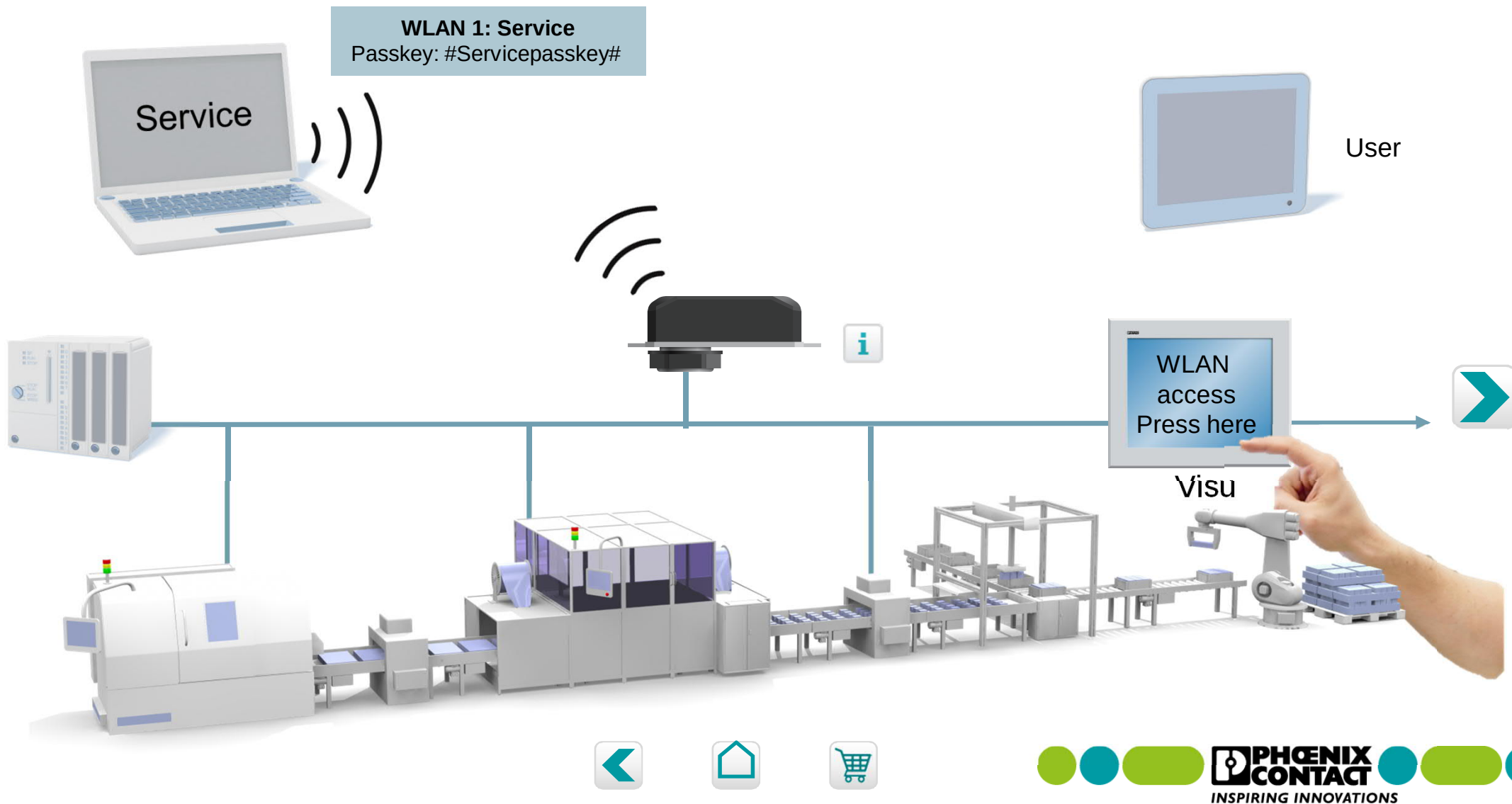
- Access only on authorized devices, e.g. visualization
- Simple use of one-time passkeys for the WLAN

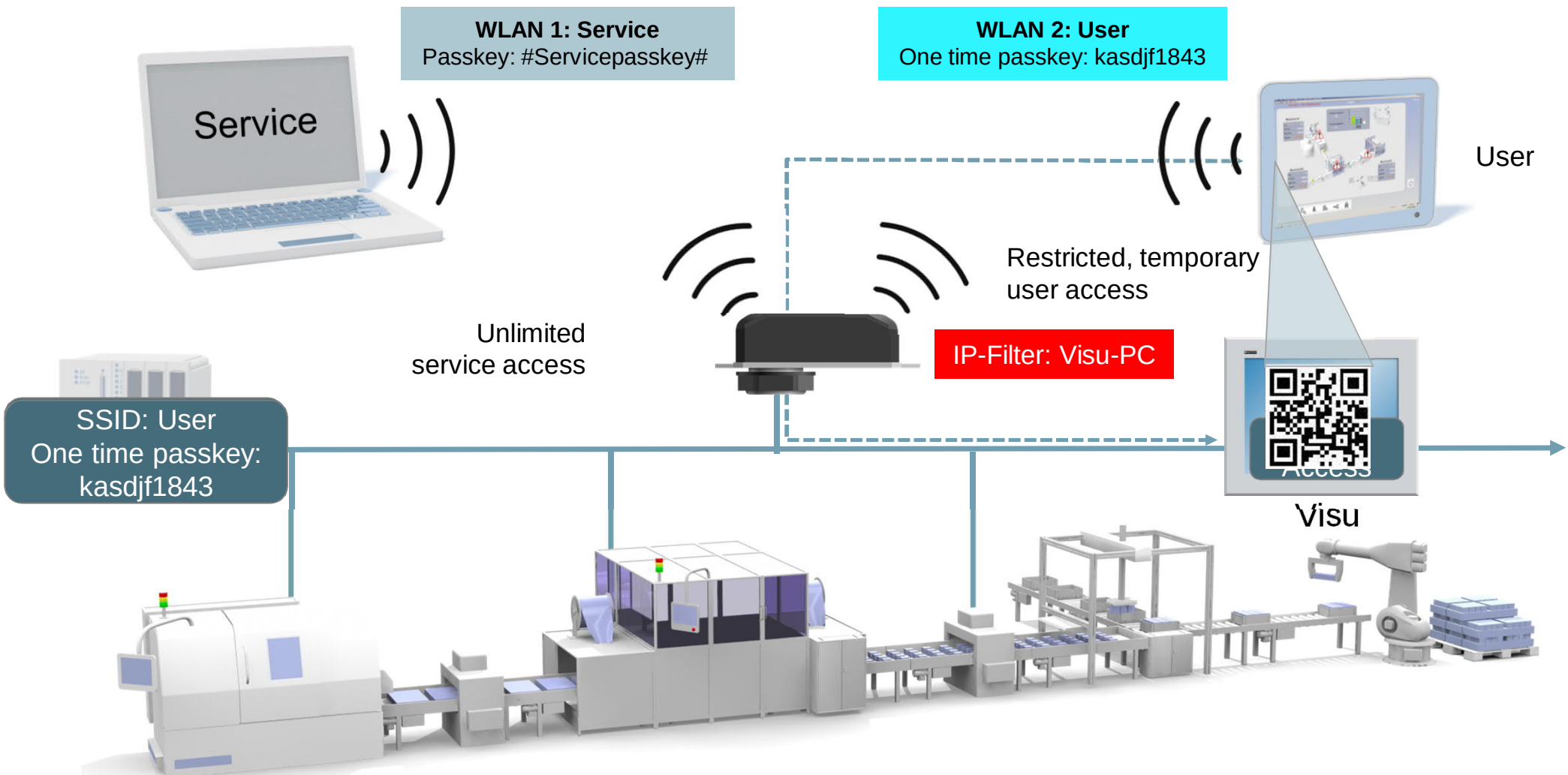


Visu

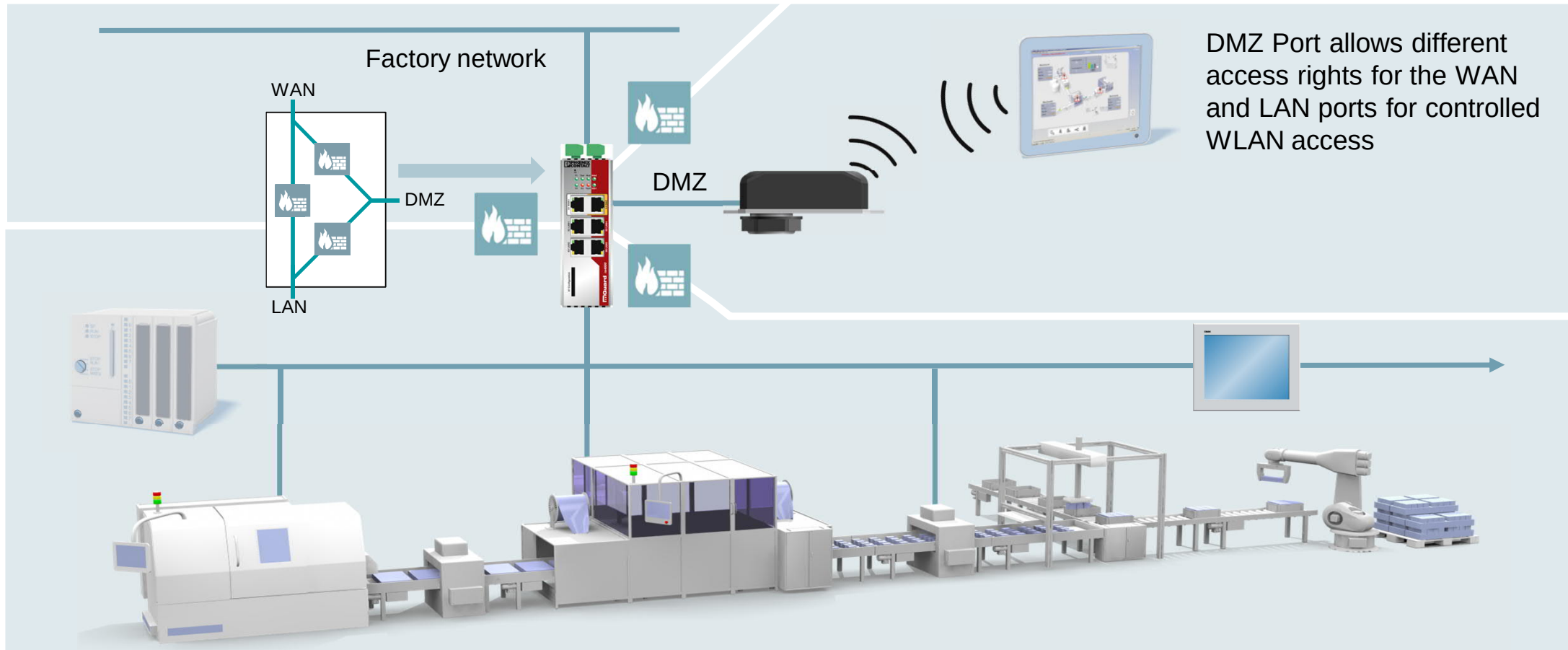








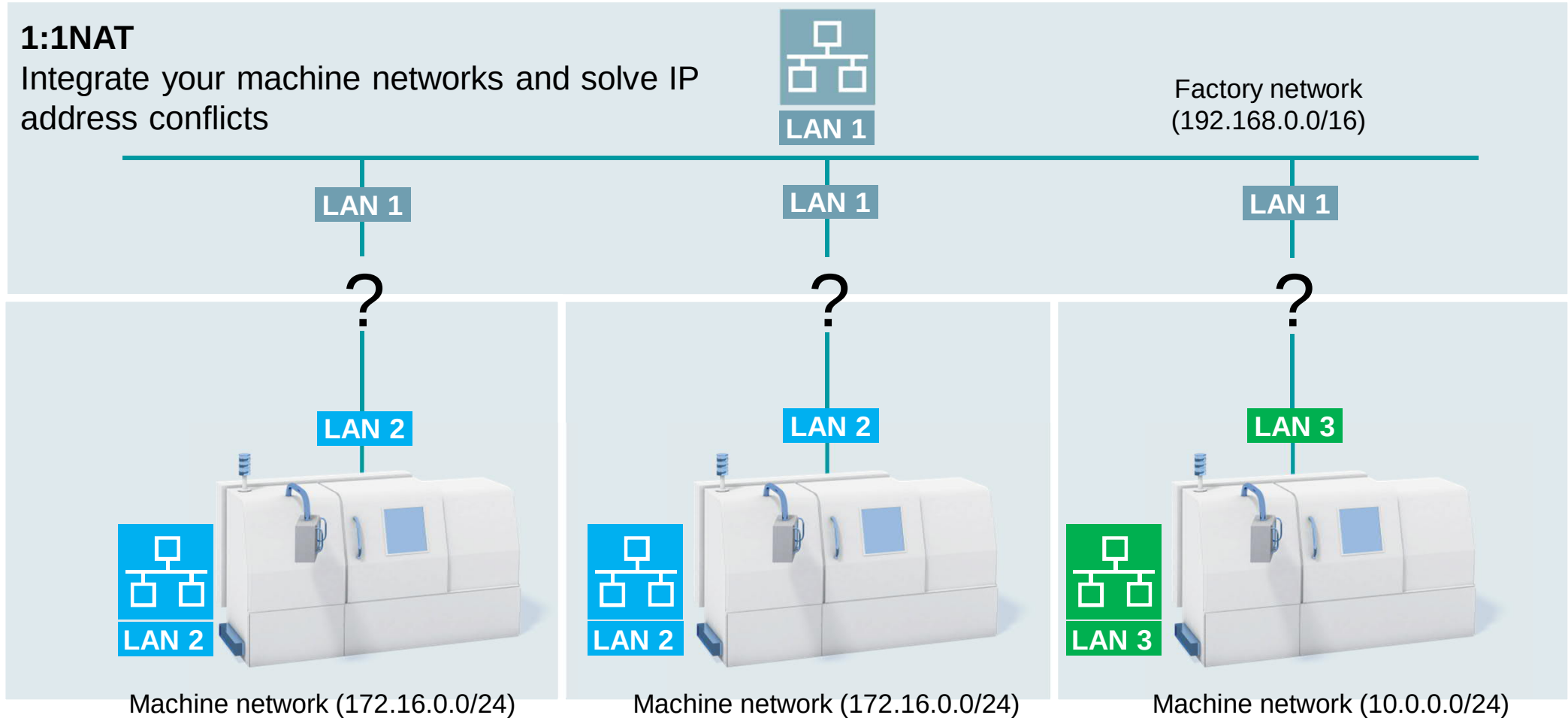
Secure WLAN machine network



Integration in production network

1:1NAT

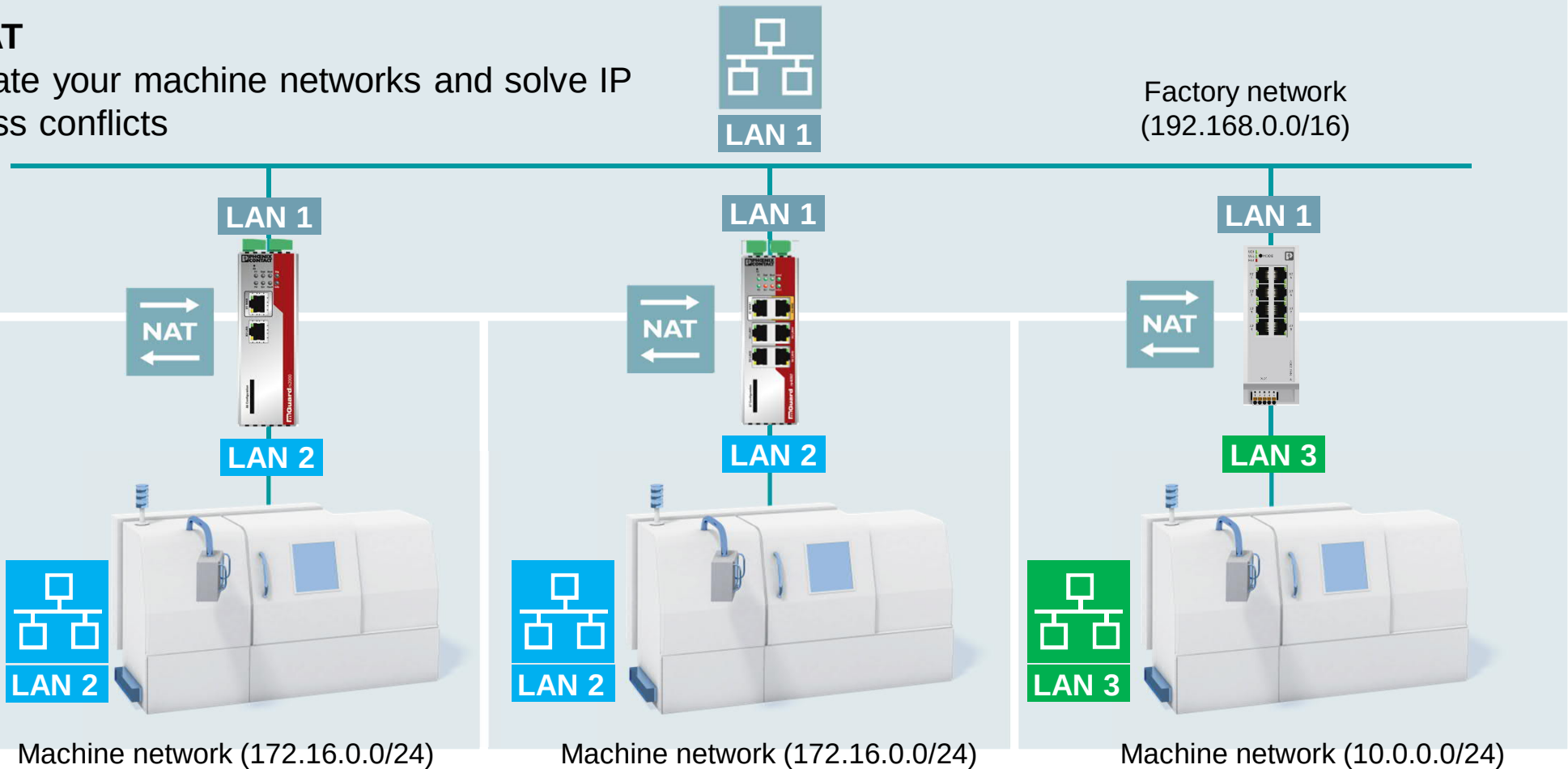
Integrate your machine networks and solve IP address conflicts



Integration in production network

1:1NAT

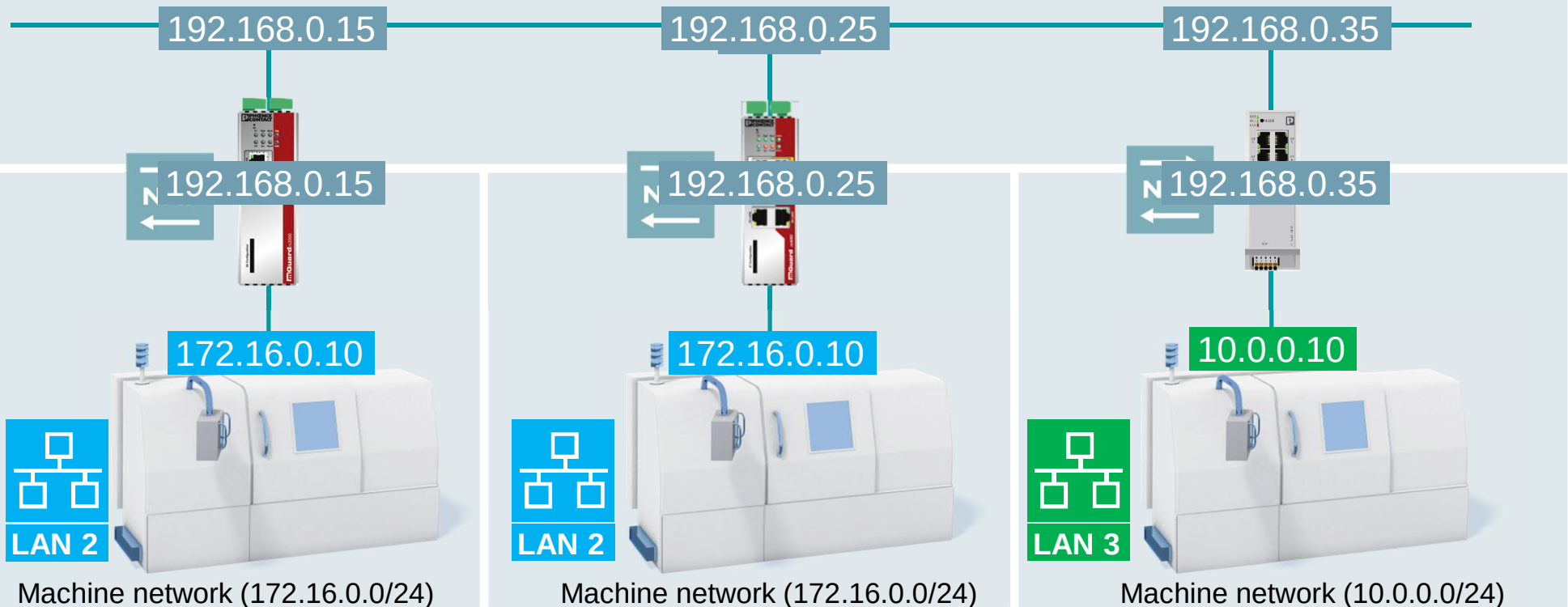
Integrate your machine networks and solve IP address conflicts



Integration in production network

1:1NAT

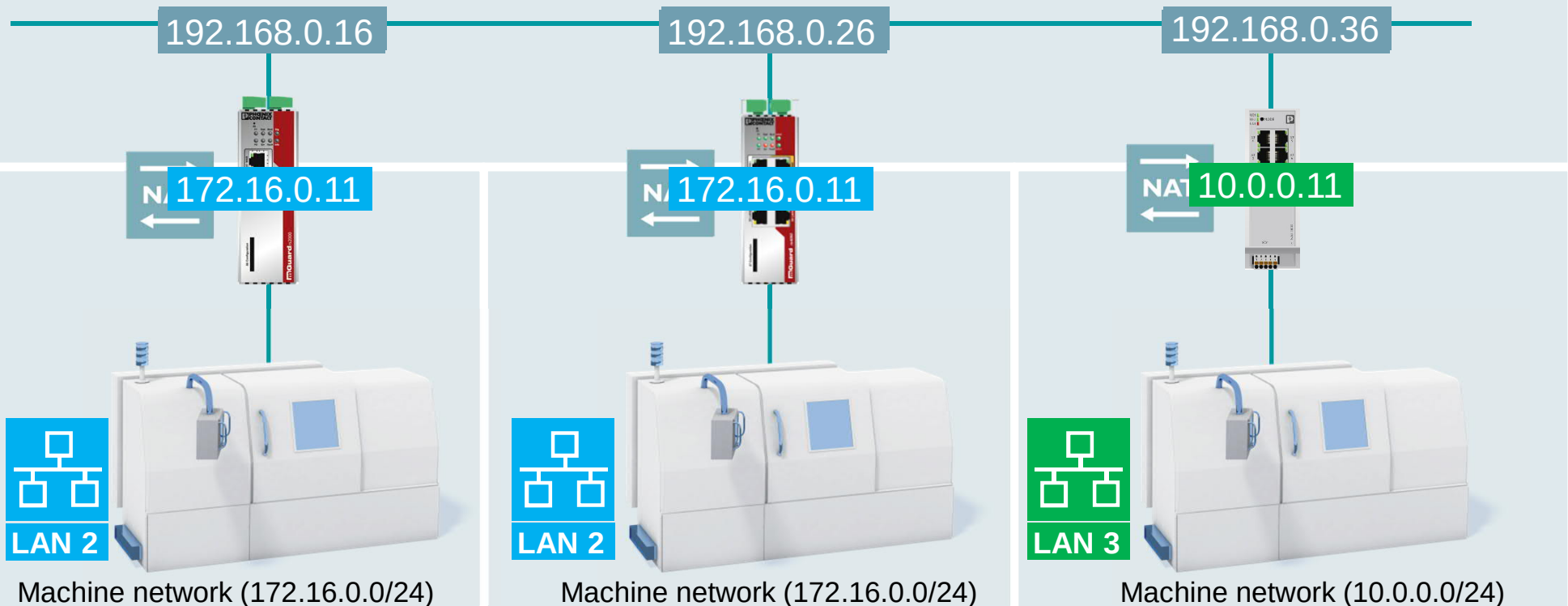
Integrate your machine networks and solve IP address conflicts



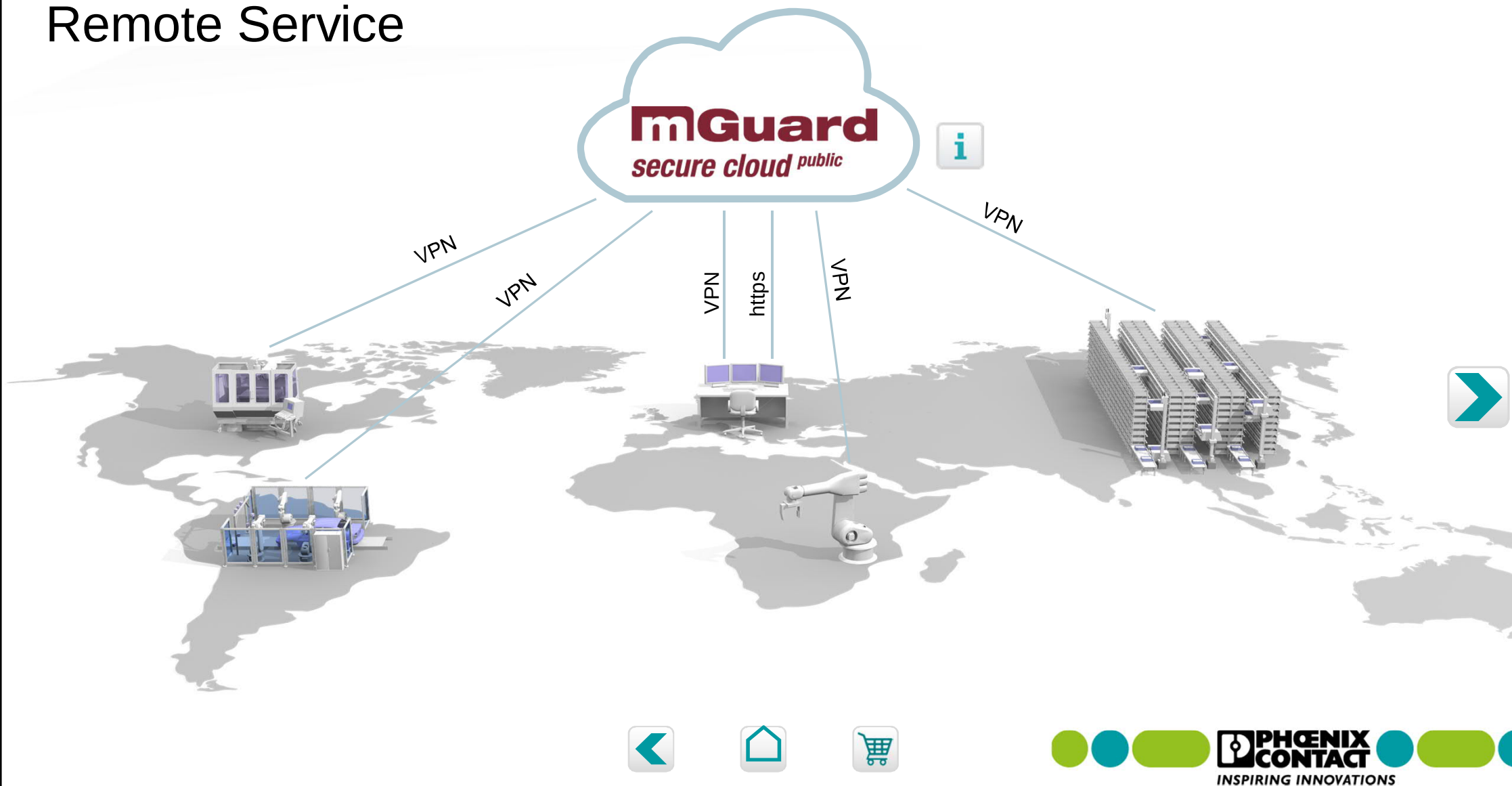
Integration in production network

1:1NAT

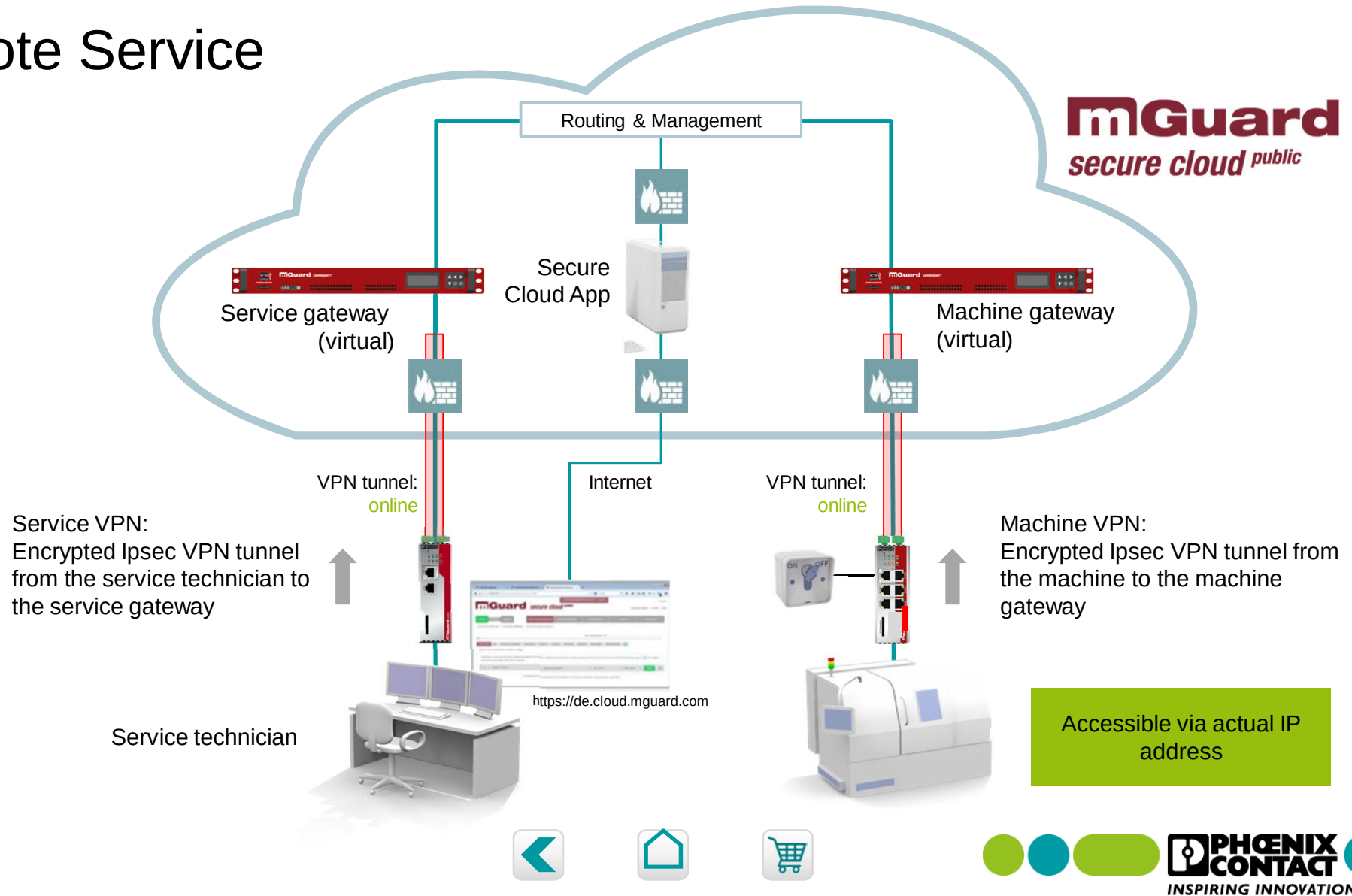
Integrate your machine networks and solve IP address conflicts



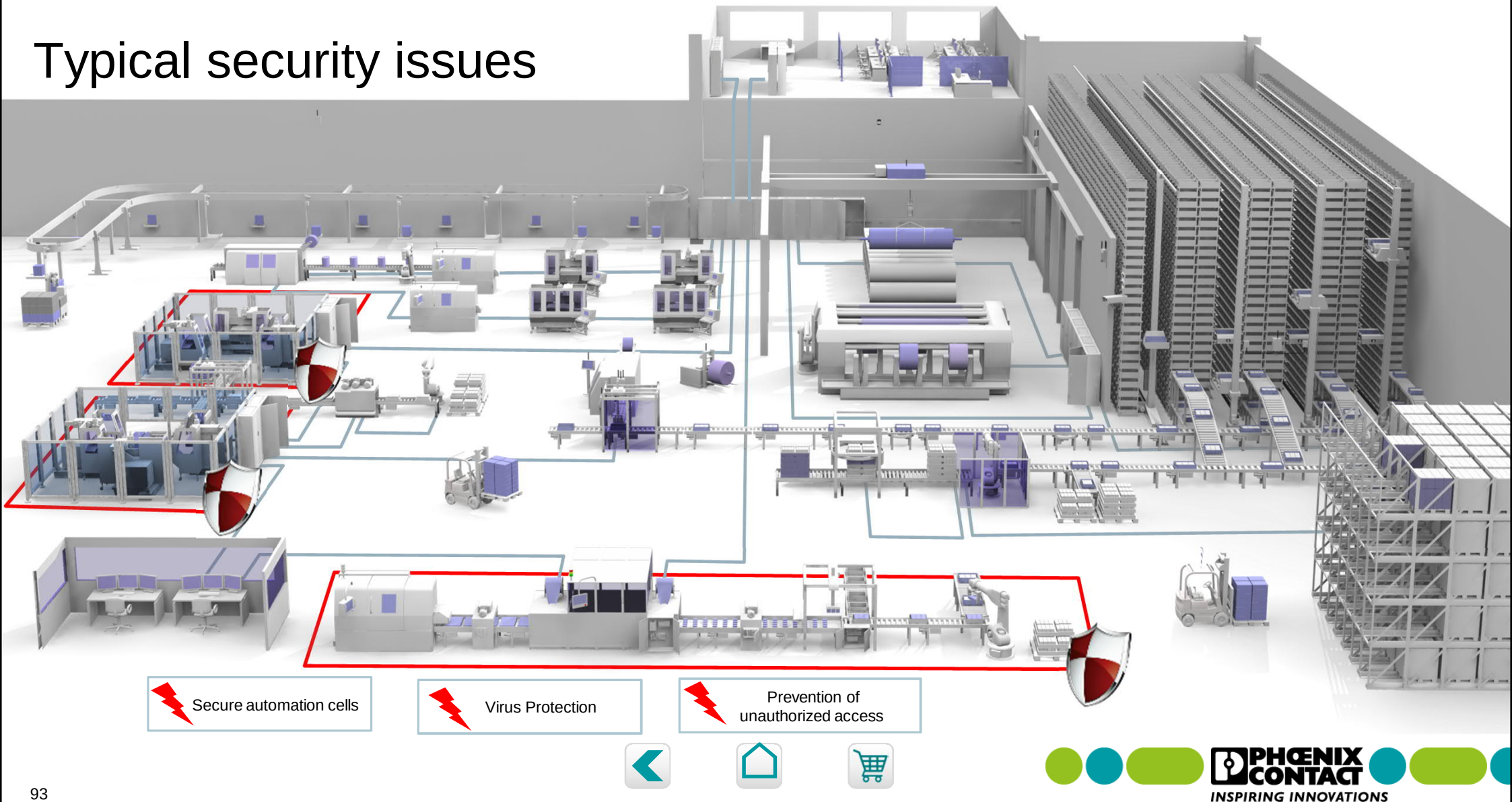
Remote Service

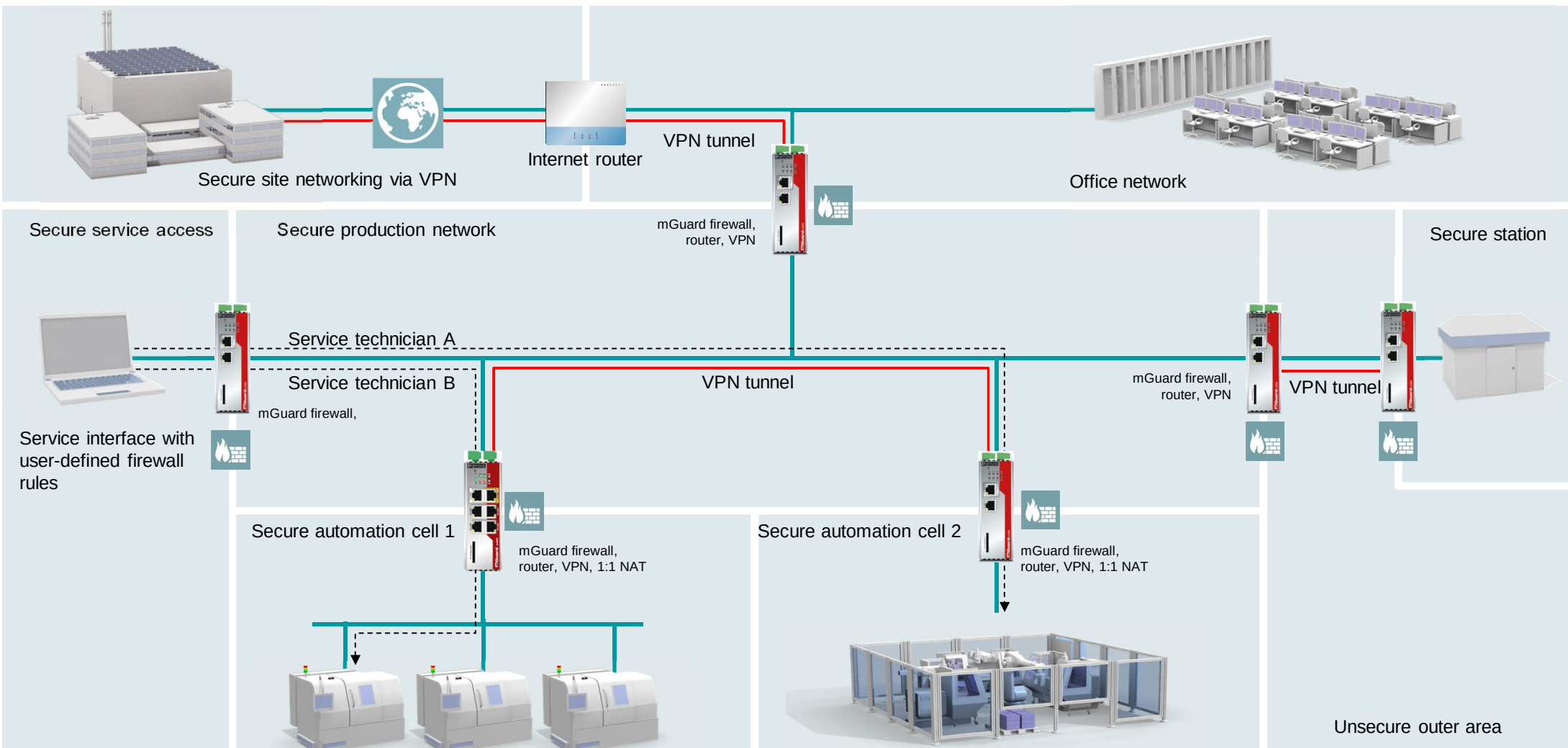


Remote Service



Typical security issues





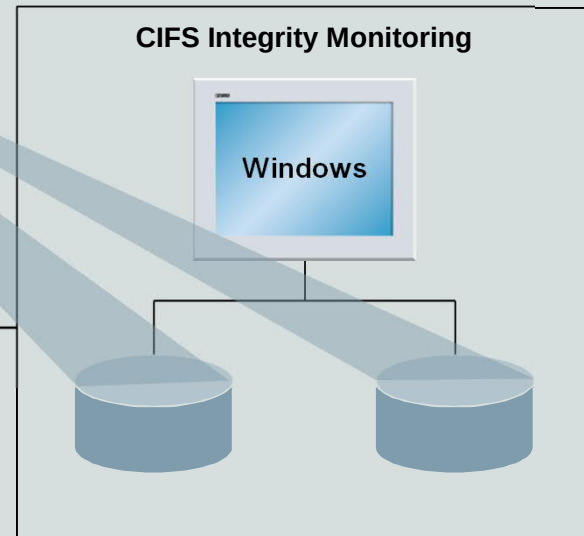
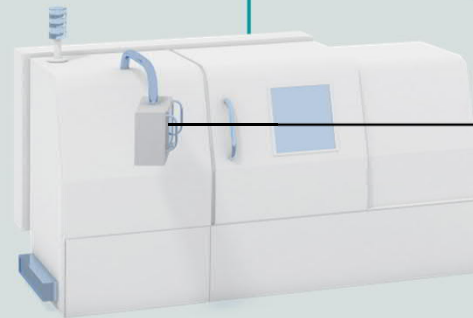


Ethernet



Firewall
CIFS Integrity Monitoring

Scan

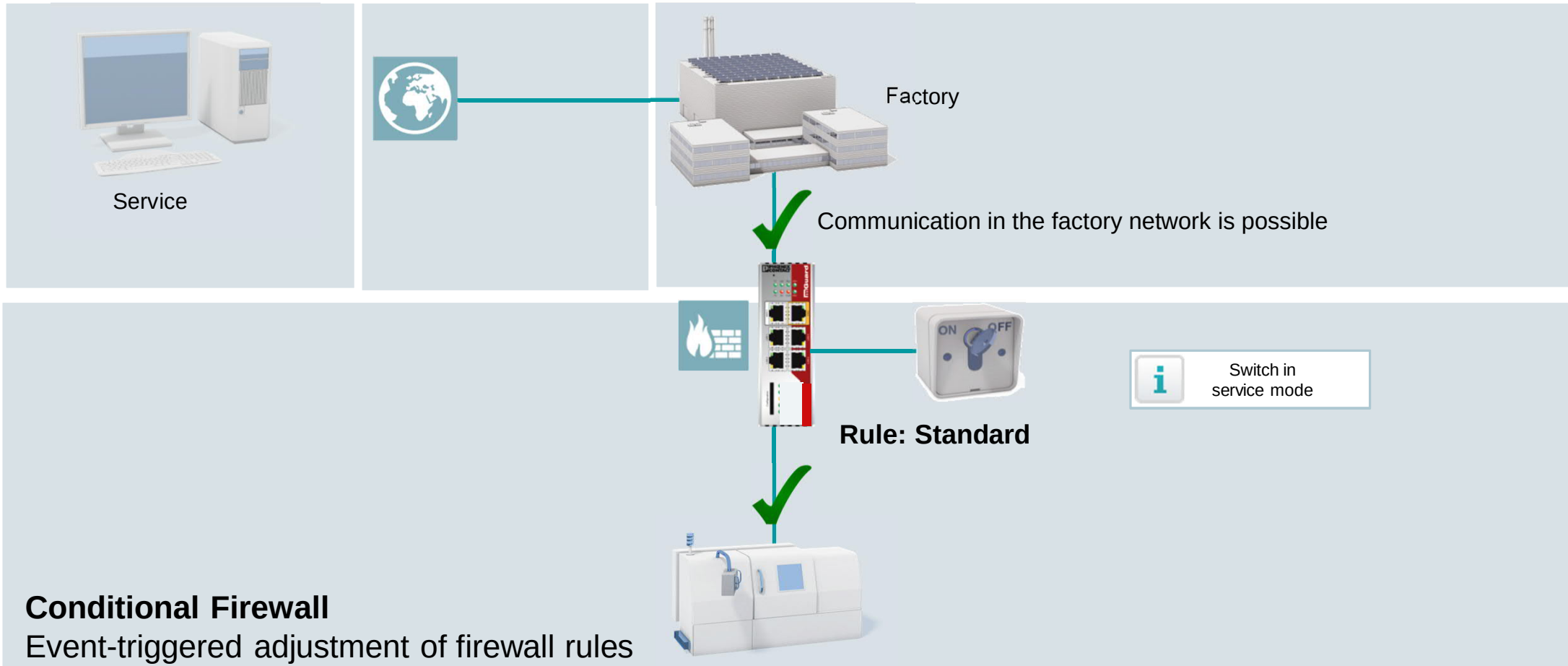


CIFS Integrity Monitoring

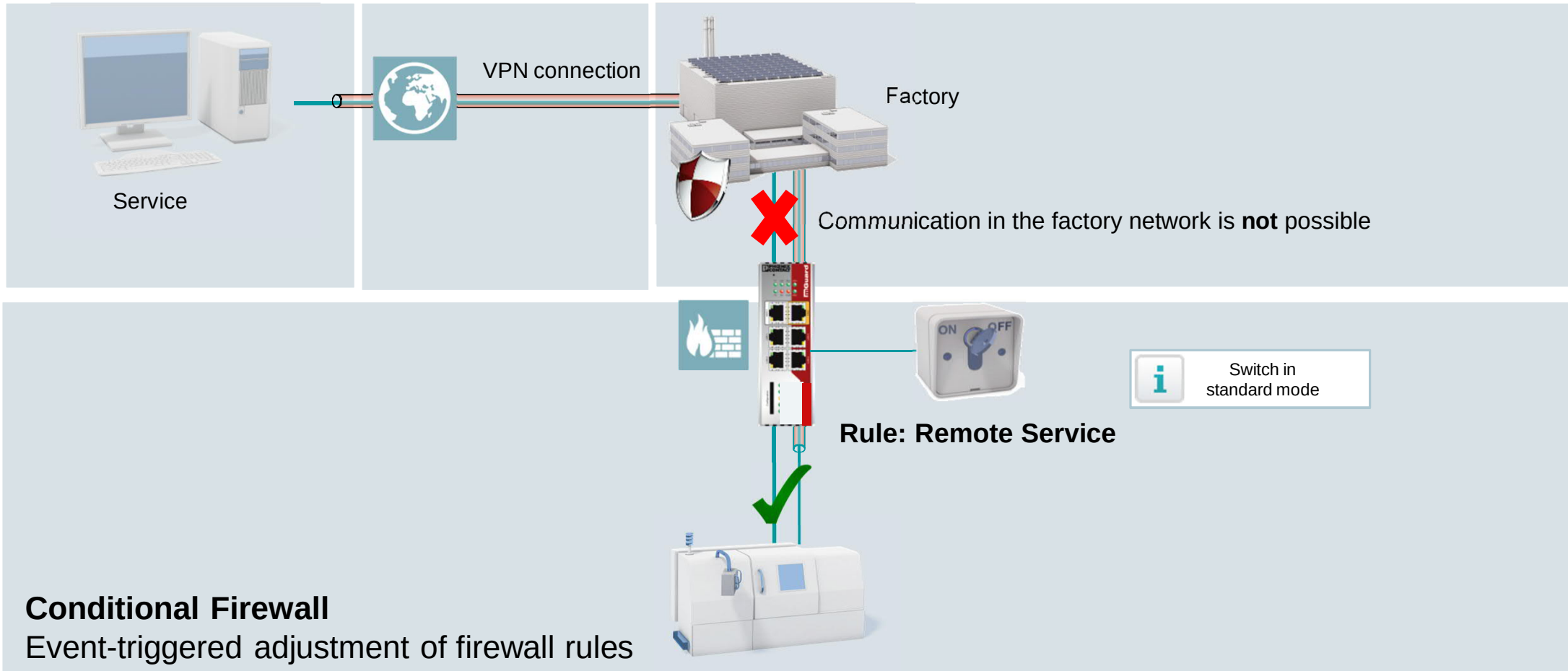
constantly monitors your file systems for unauthorized changes and alerts you if a change is detected



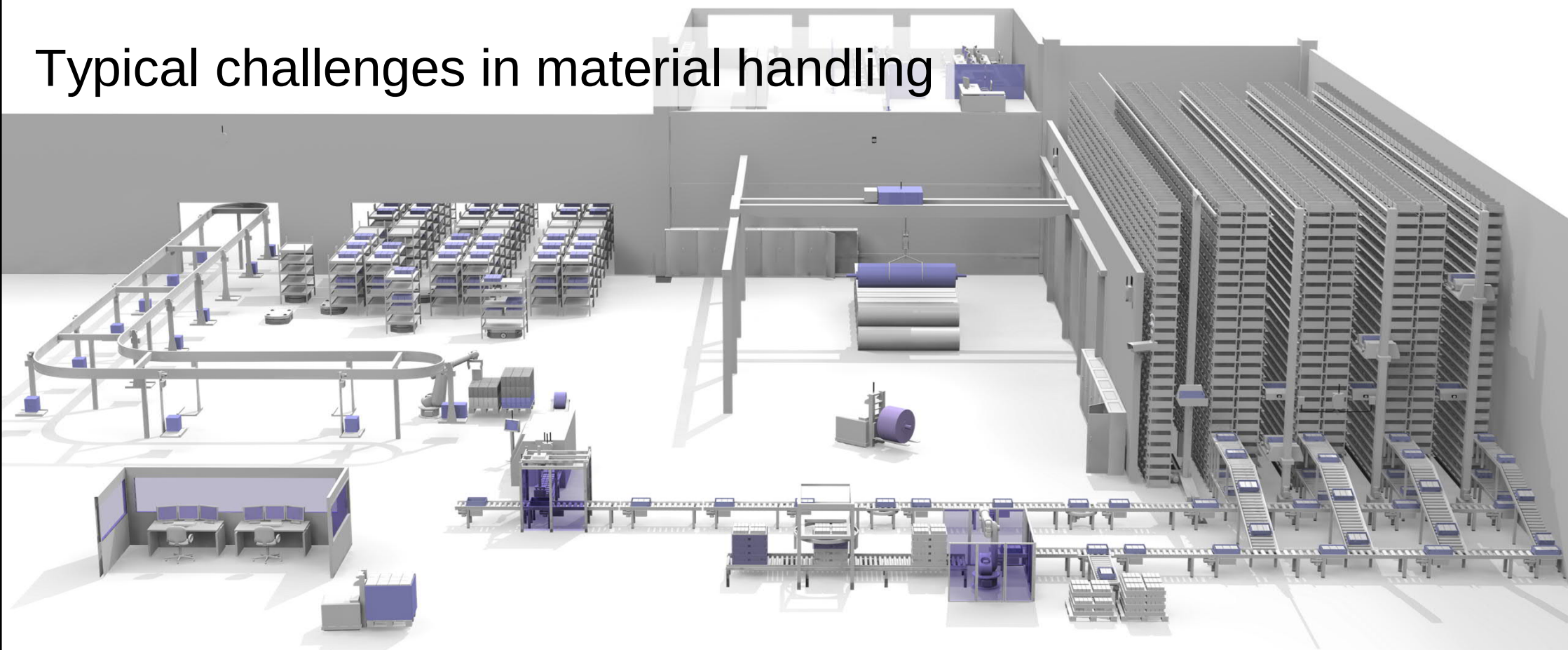
Prevention of unauthorized access



Prevention of unauthorized access



Typical challenges in material handling



Automated guided vehicle



Typical WLAN network structure



Electric monorail conveyor



Moving parts

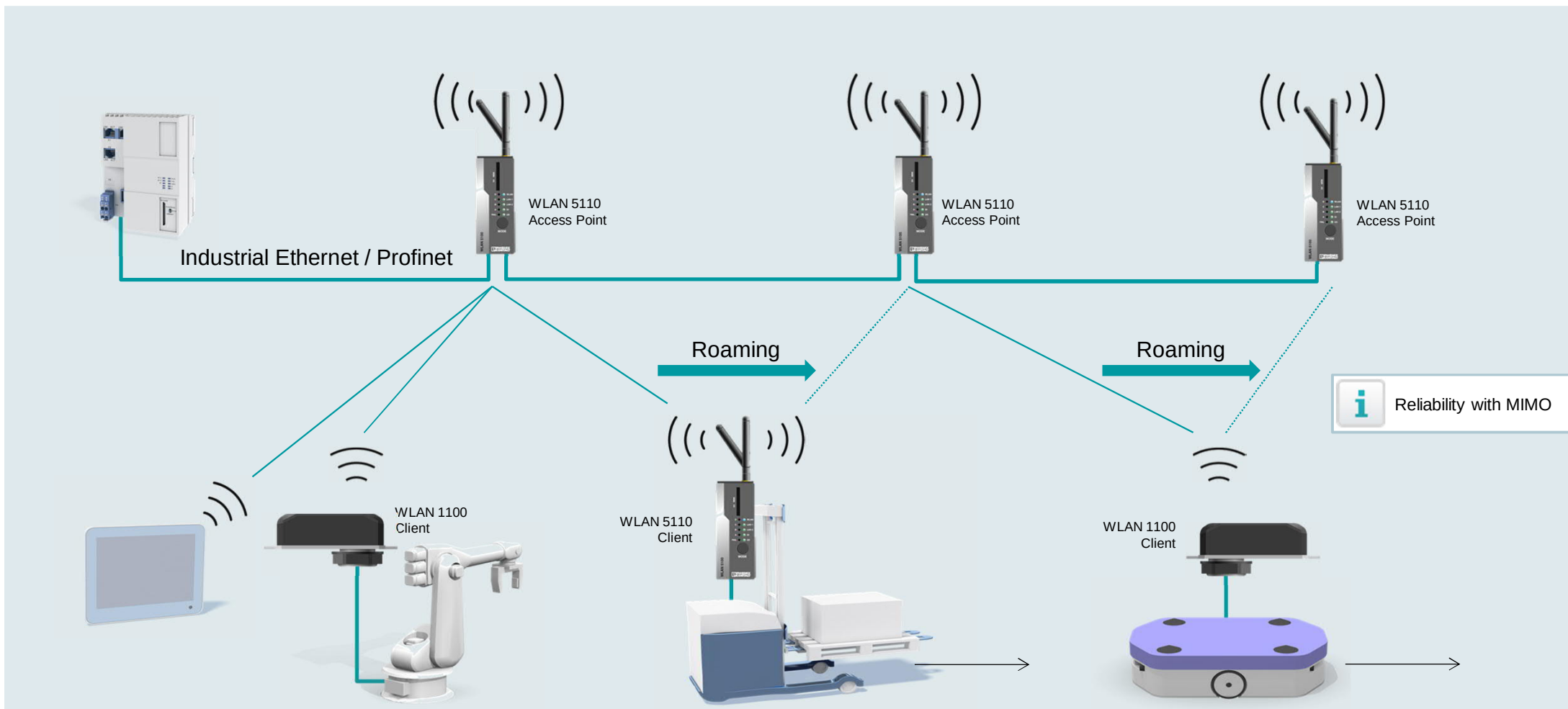


Automatic shuttle warehouse

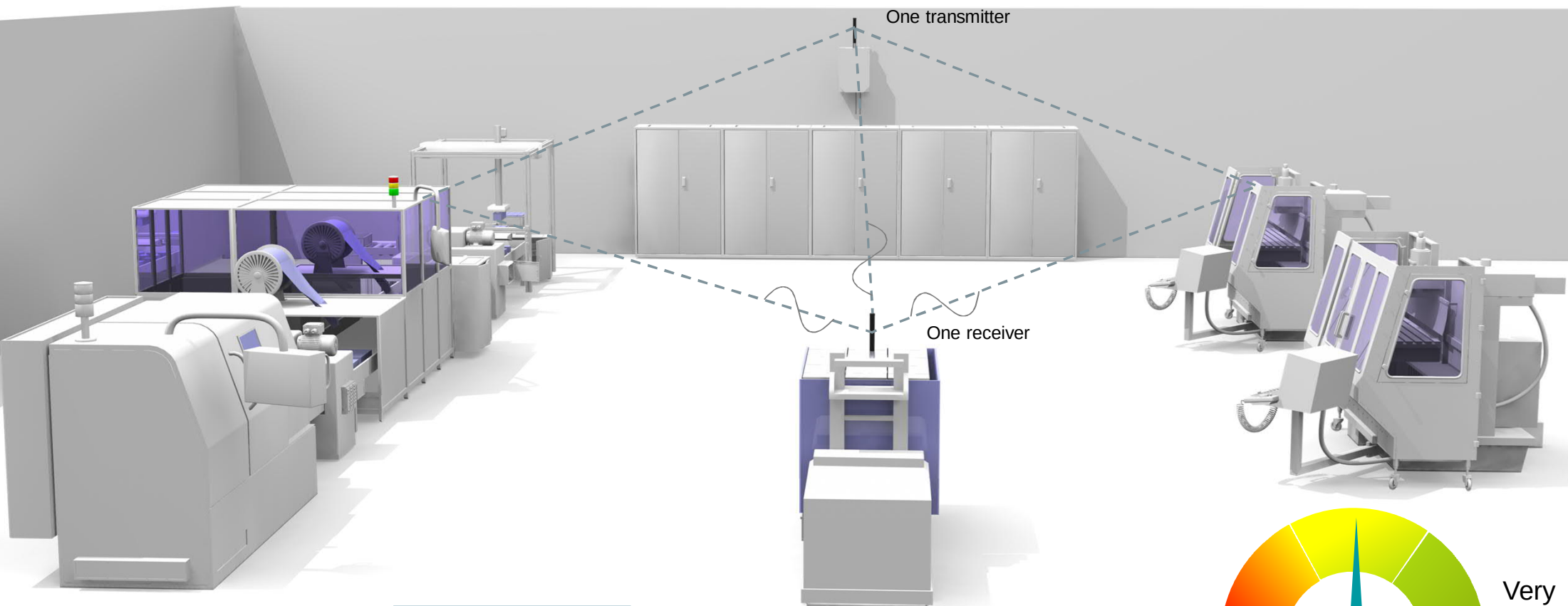


Wireless for cranes

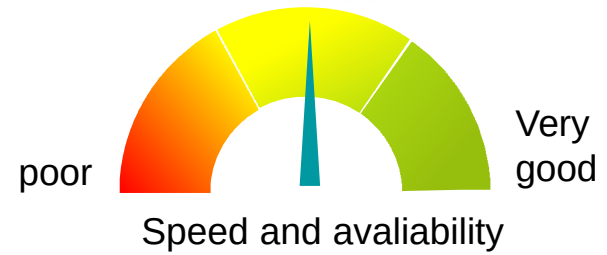




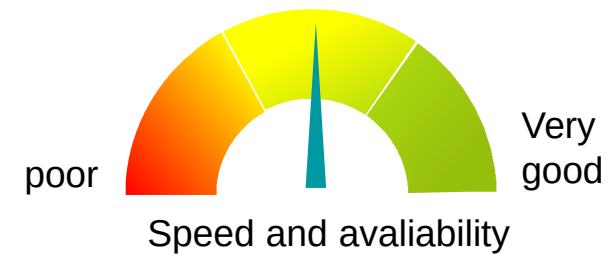
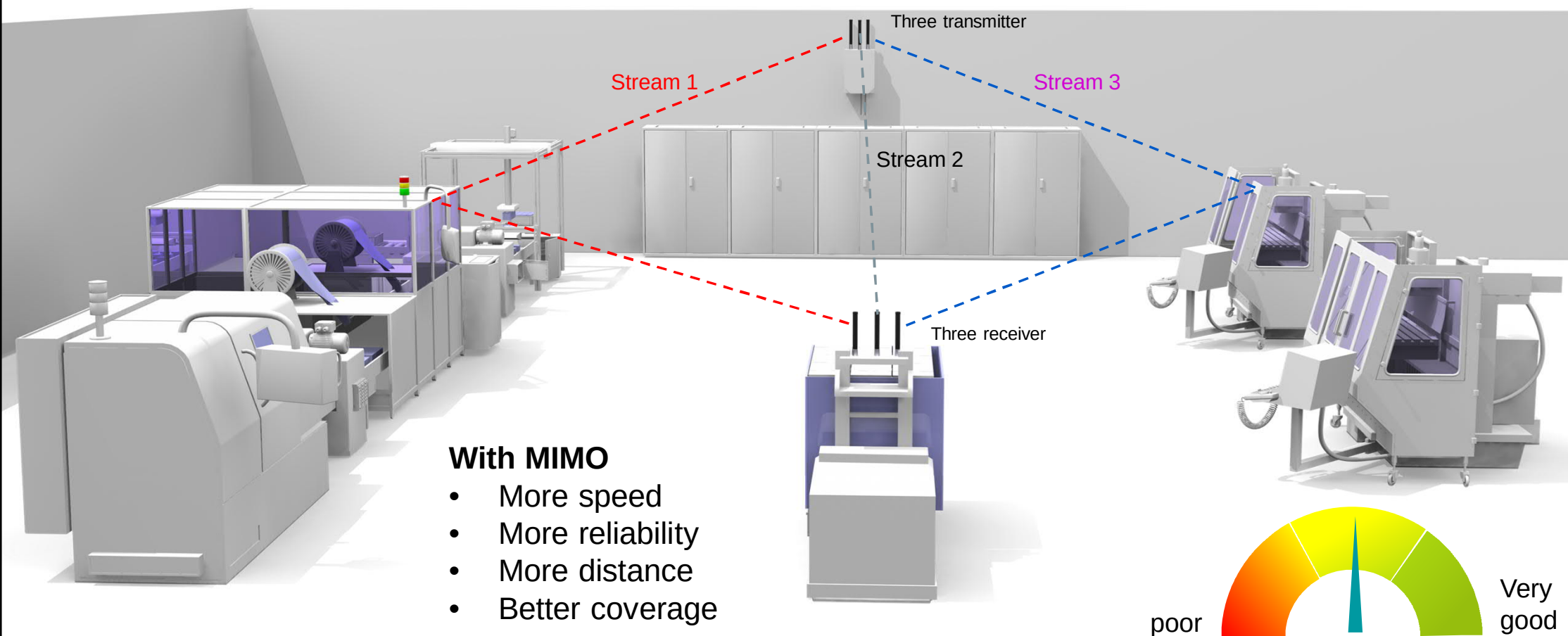
Standard antenna technology

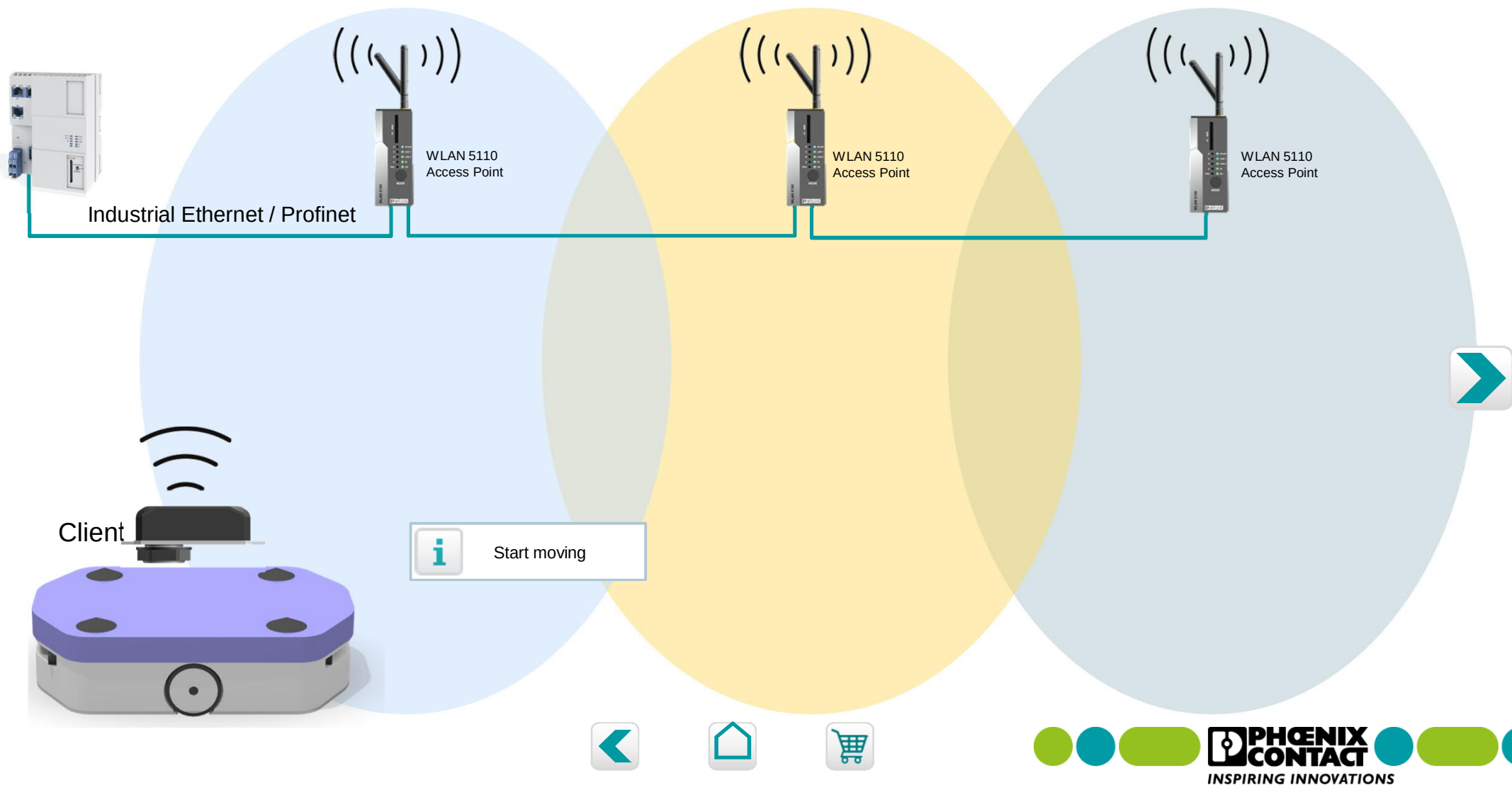


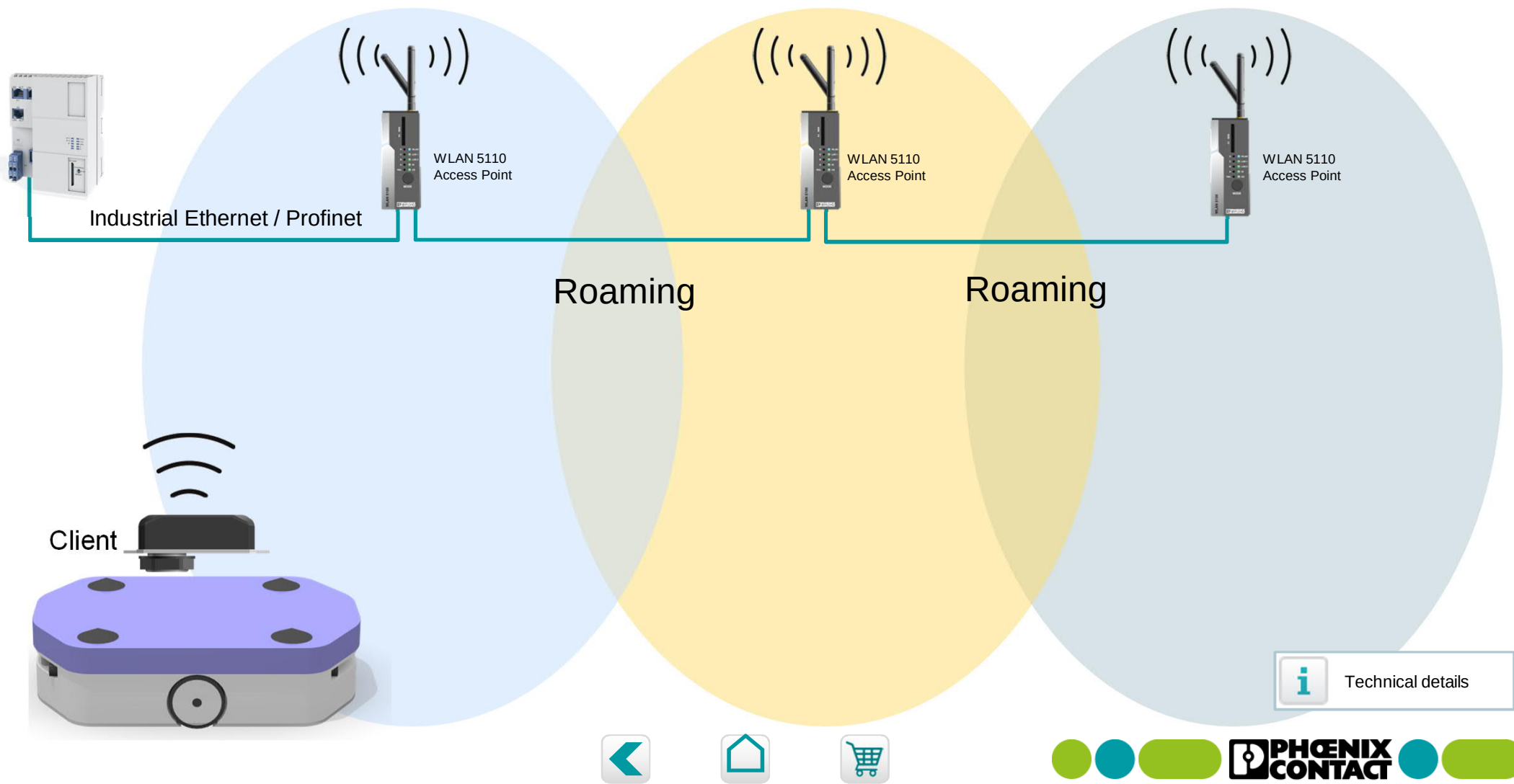
 With MIMO

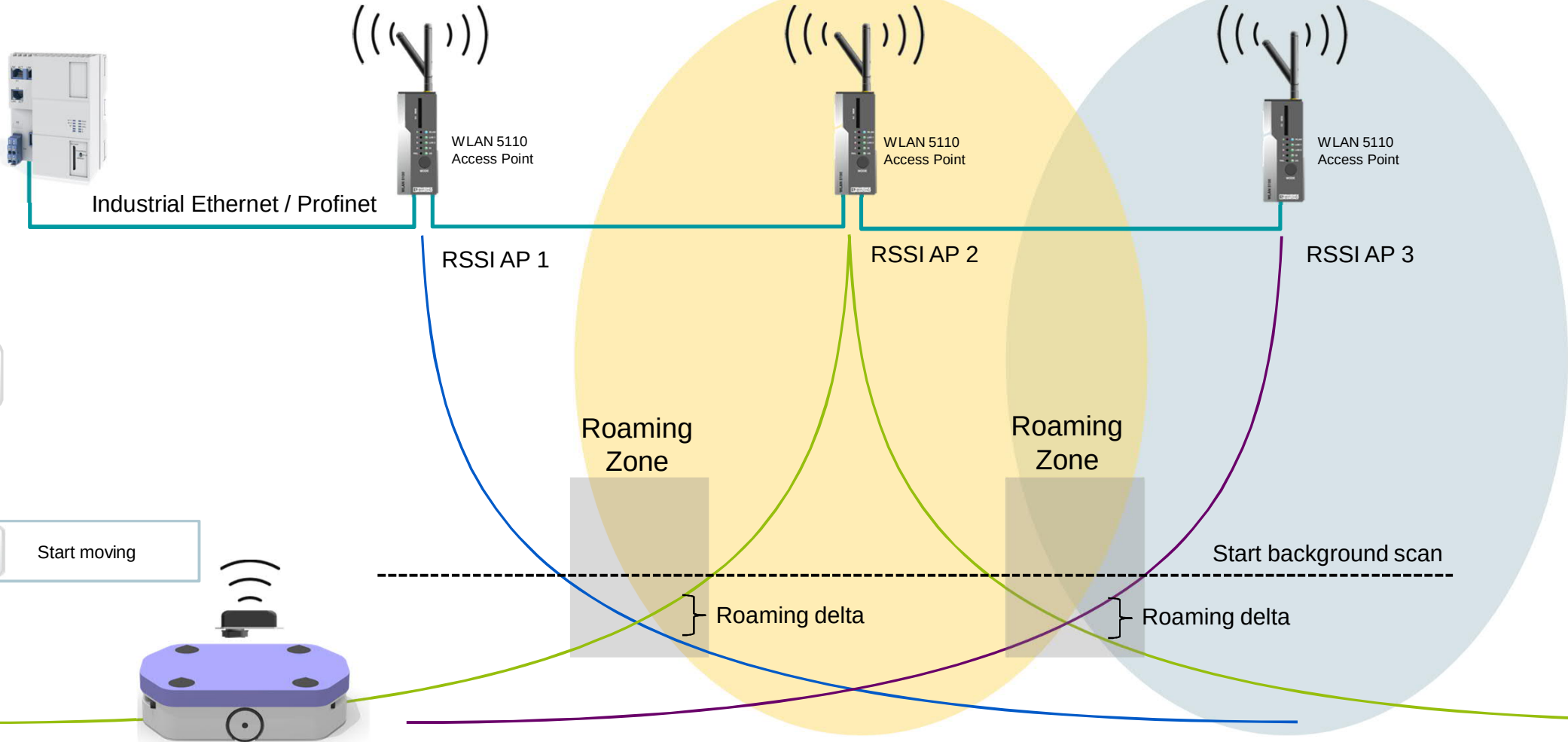


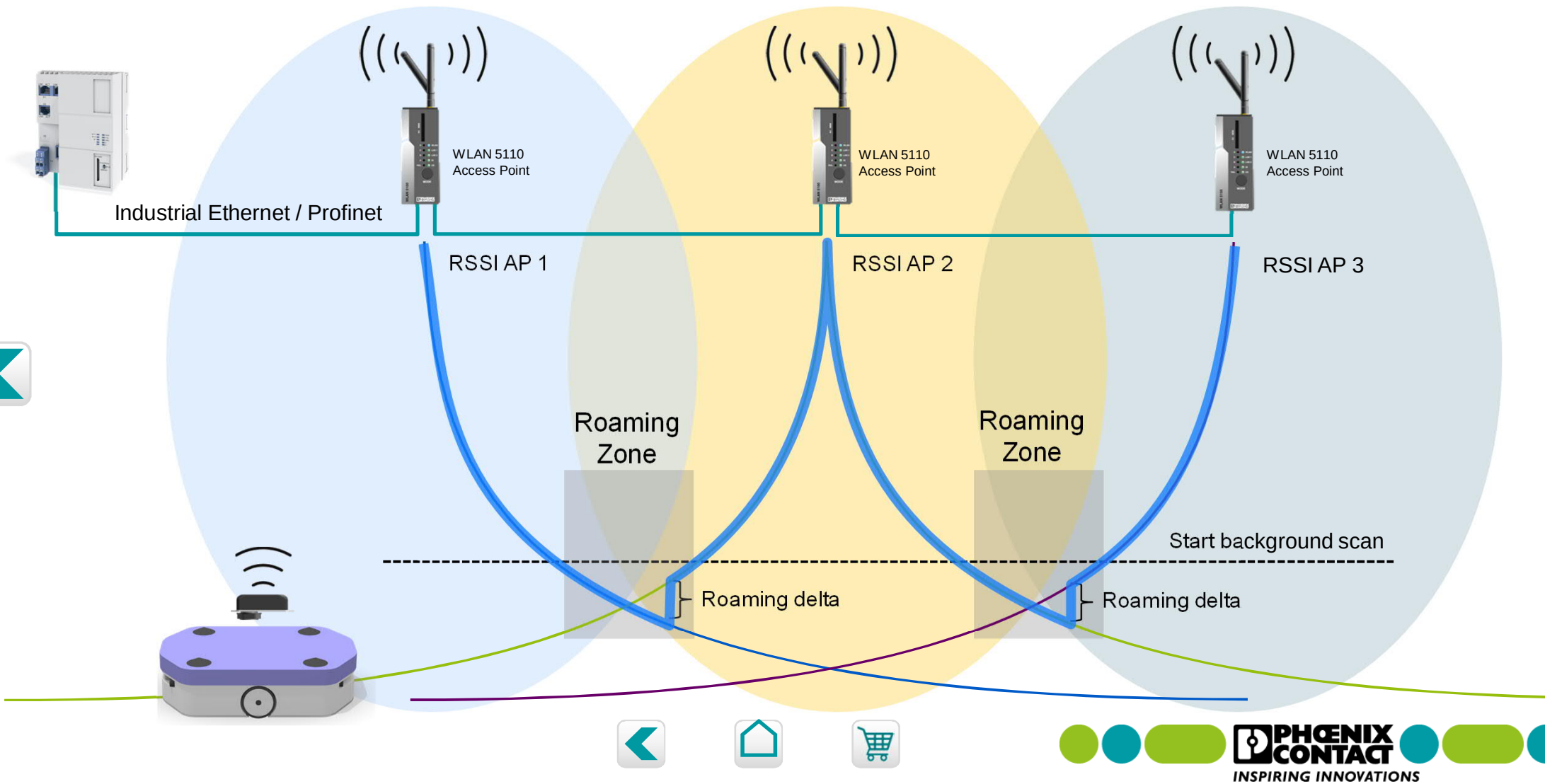
MIMO antenna technology

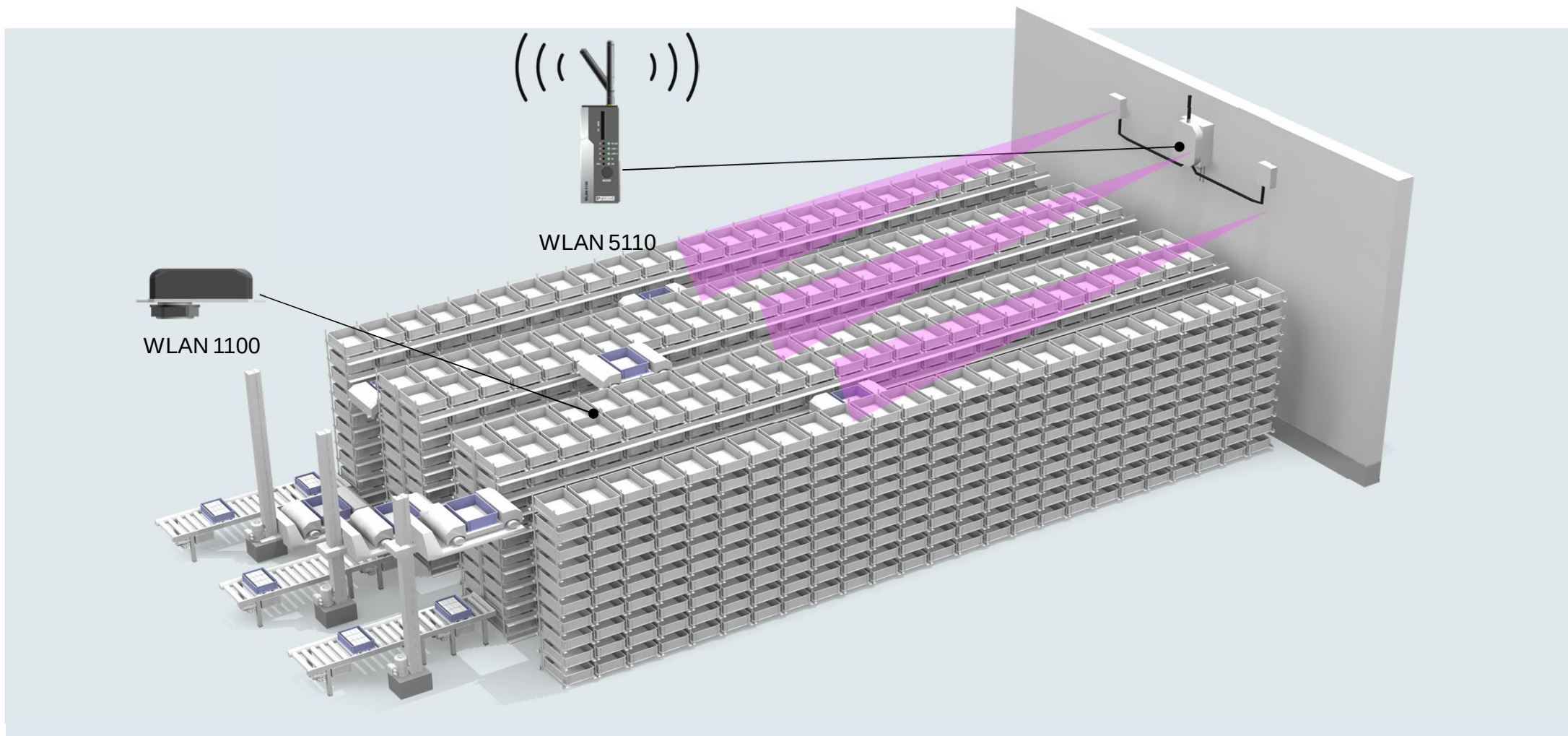














Access Point

Ethernet

PROFINET



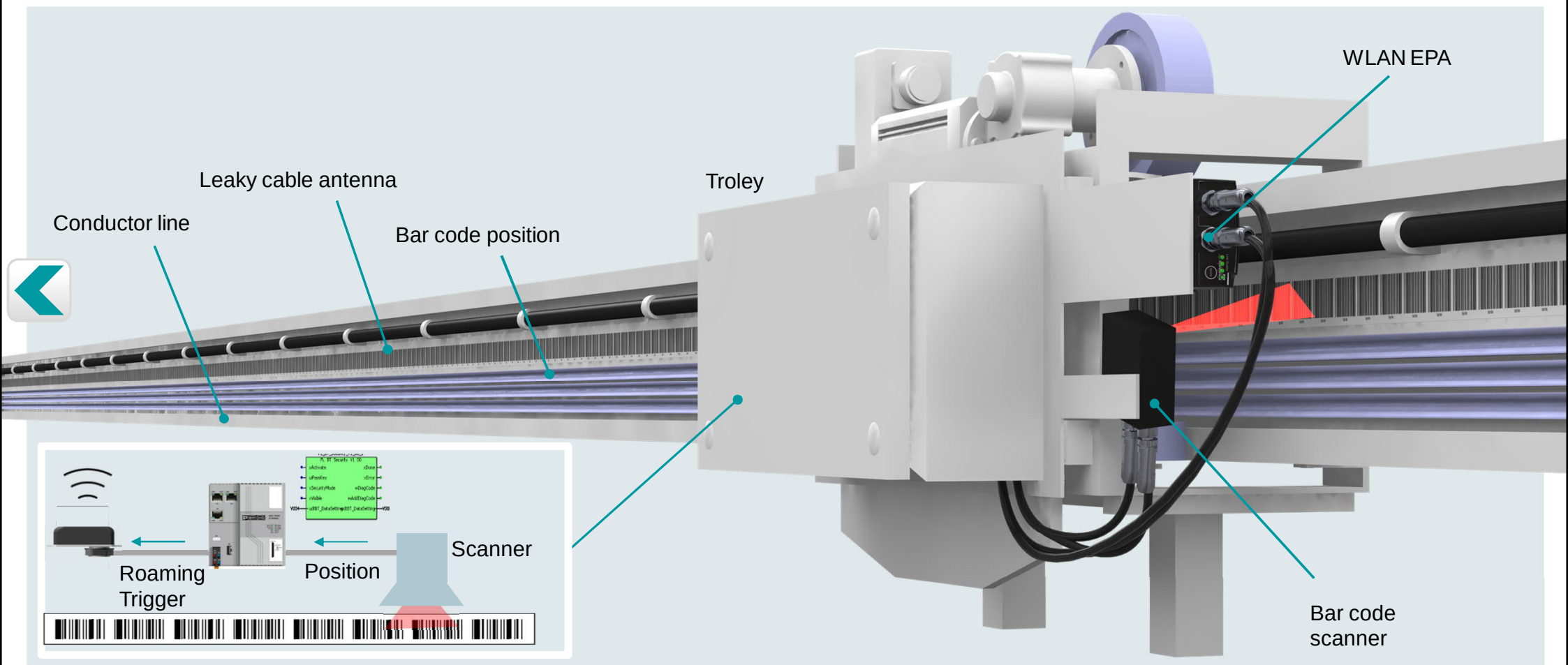
Controller

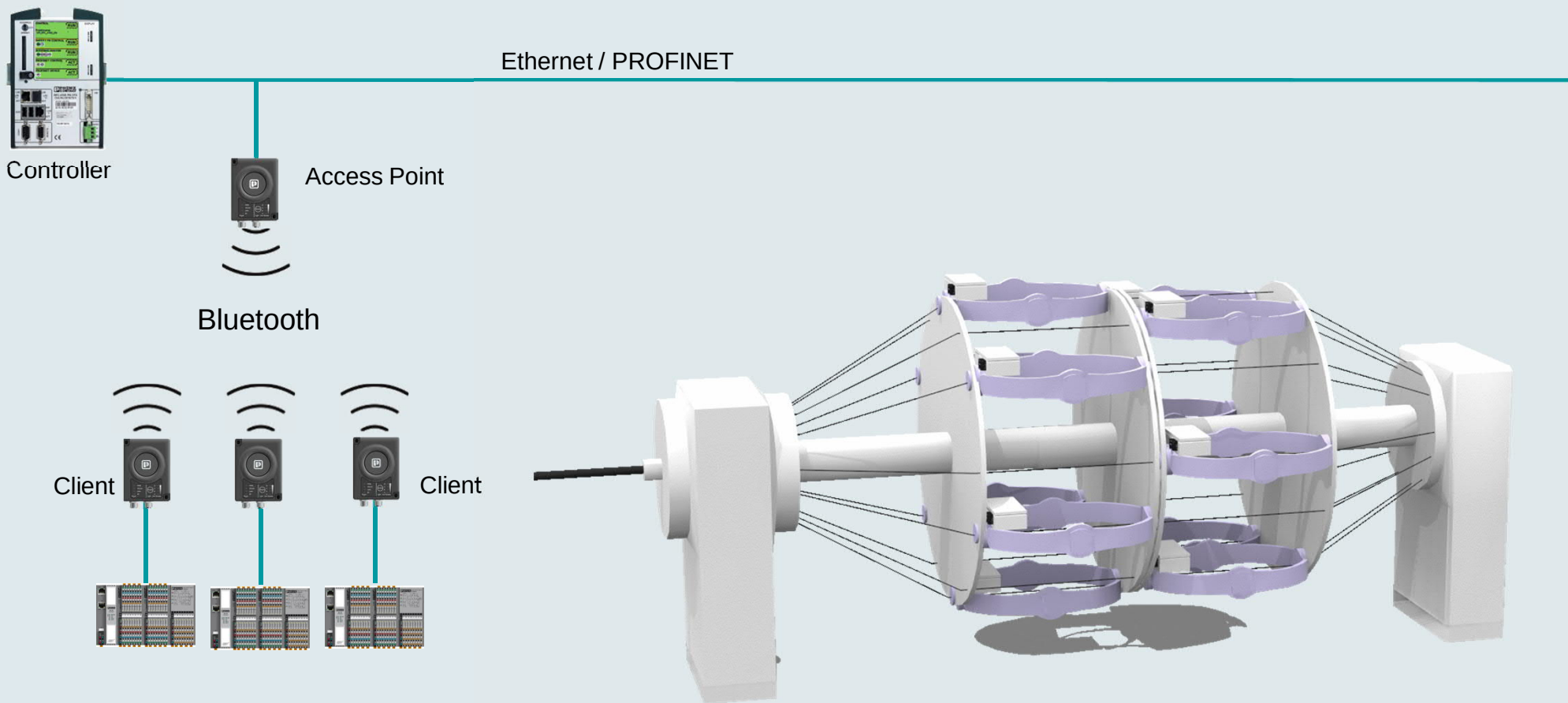
Wireless LAN

Leaky cable antenna



Controlled roaming depending on position

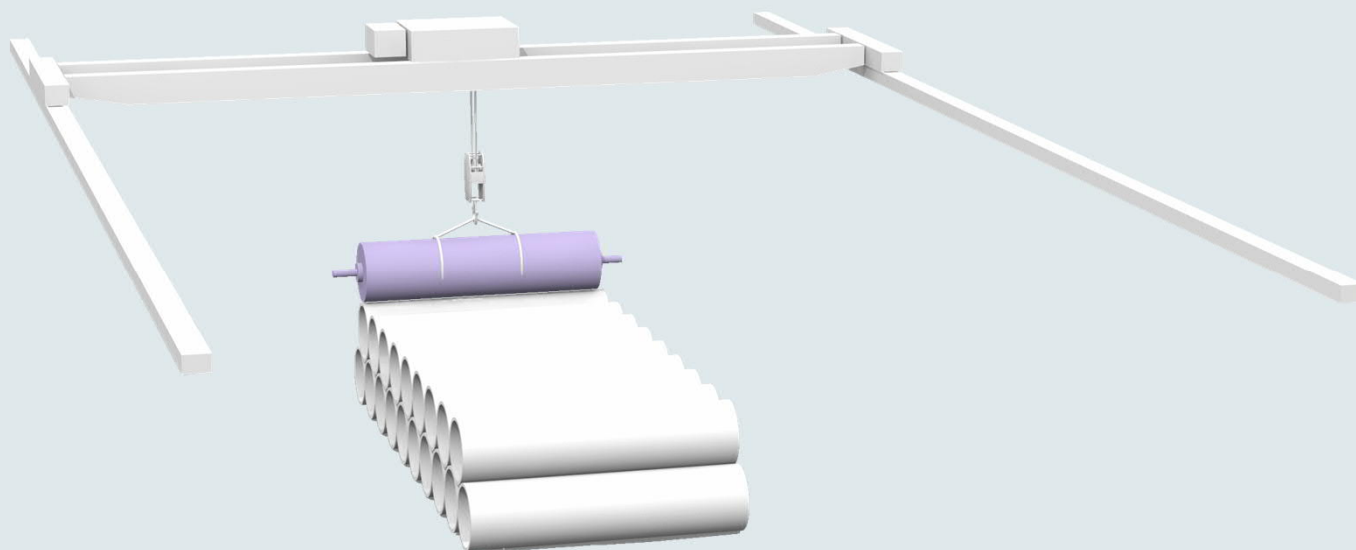






Controller

Ethernet / PROFINET



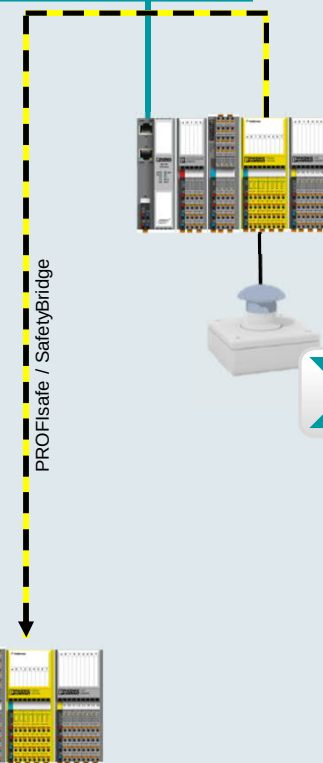
Client

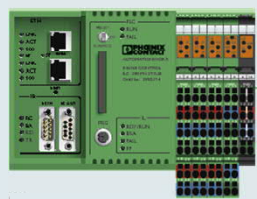


Bluetooth



Client





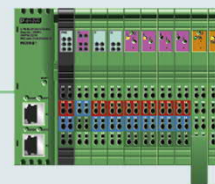
Controller



Bluetooth
Access Point



Scraper bridge



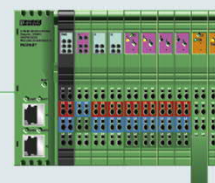
Bus coupler



Motor starter



Drive
motor



Bus coupler



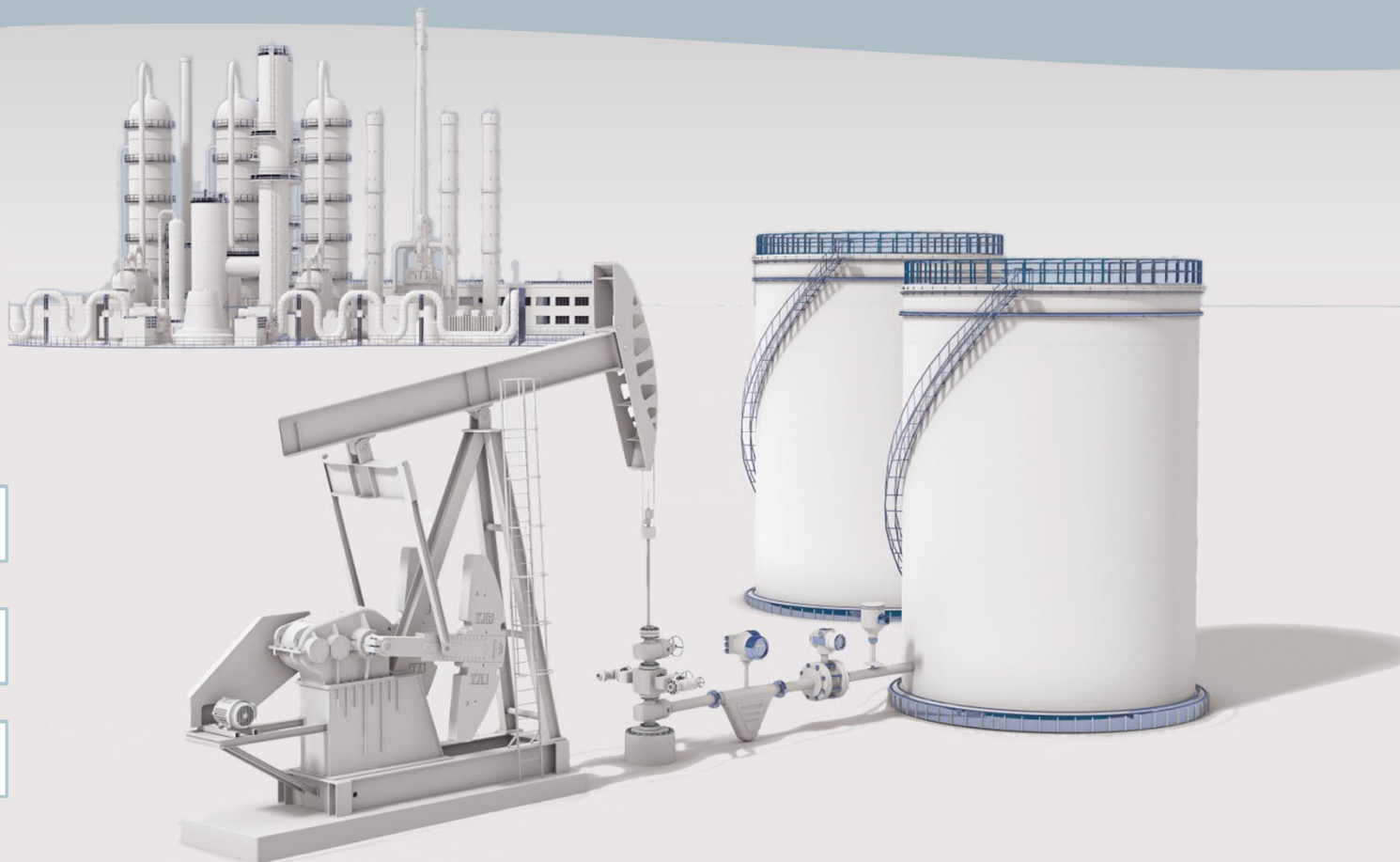
Motor starter



Drive
motor



Process Industry



Network security



Remote communication



Typical network structure



Availability

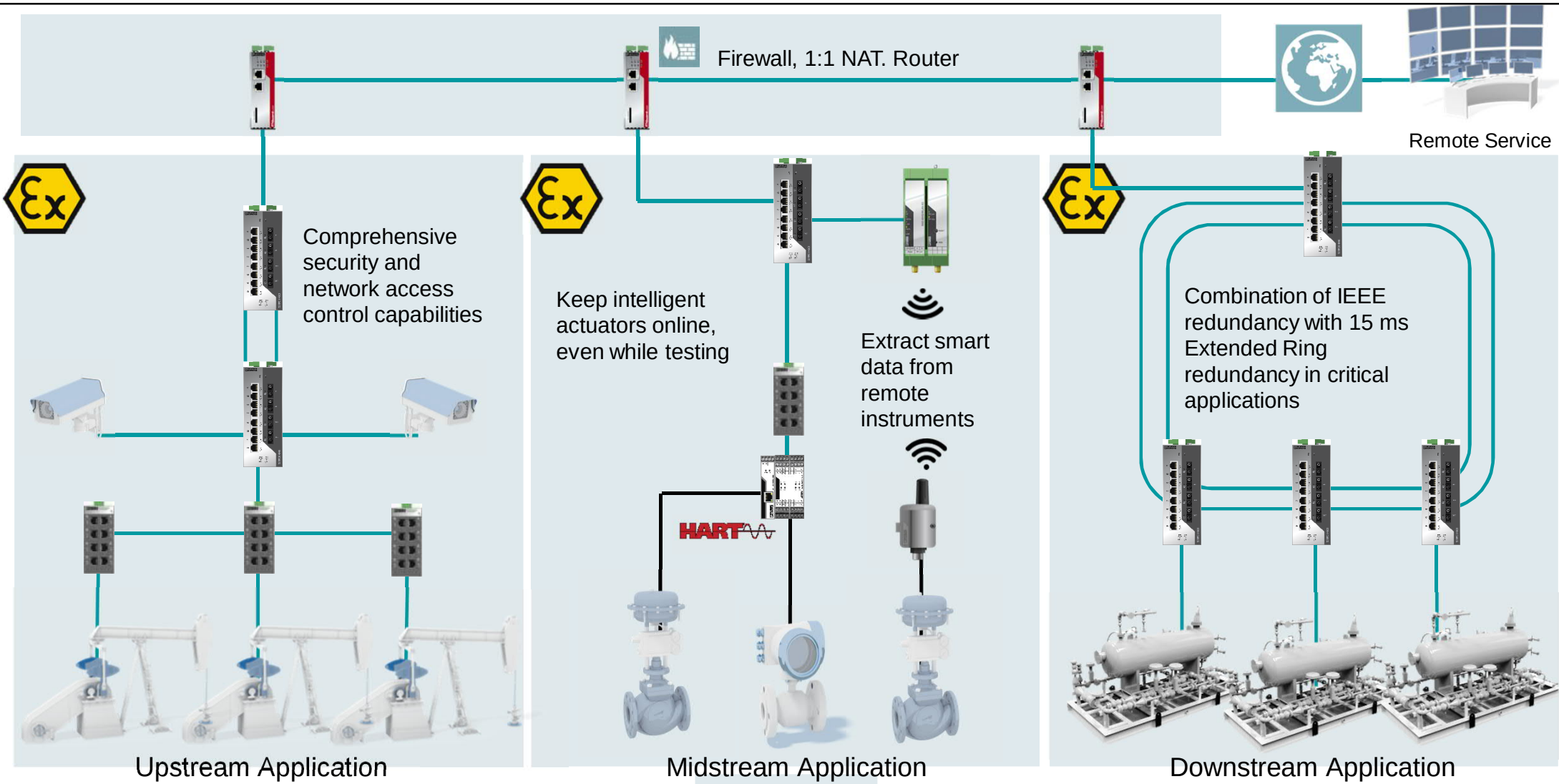


Secure OPC connection

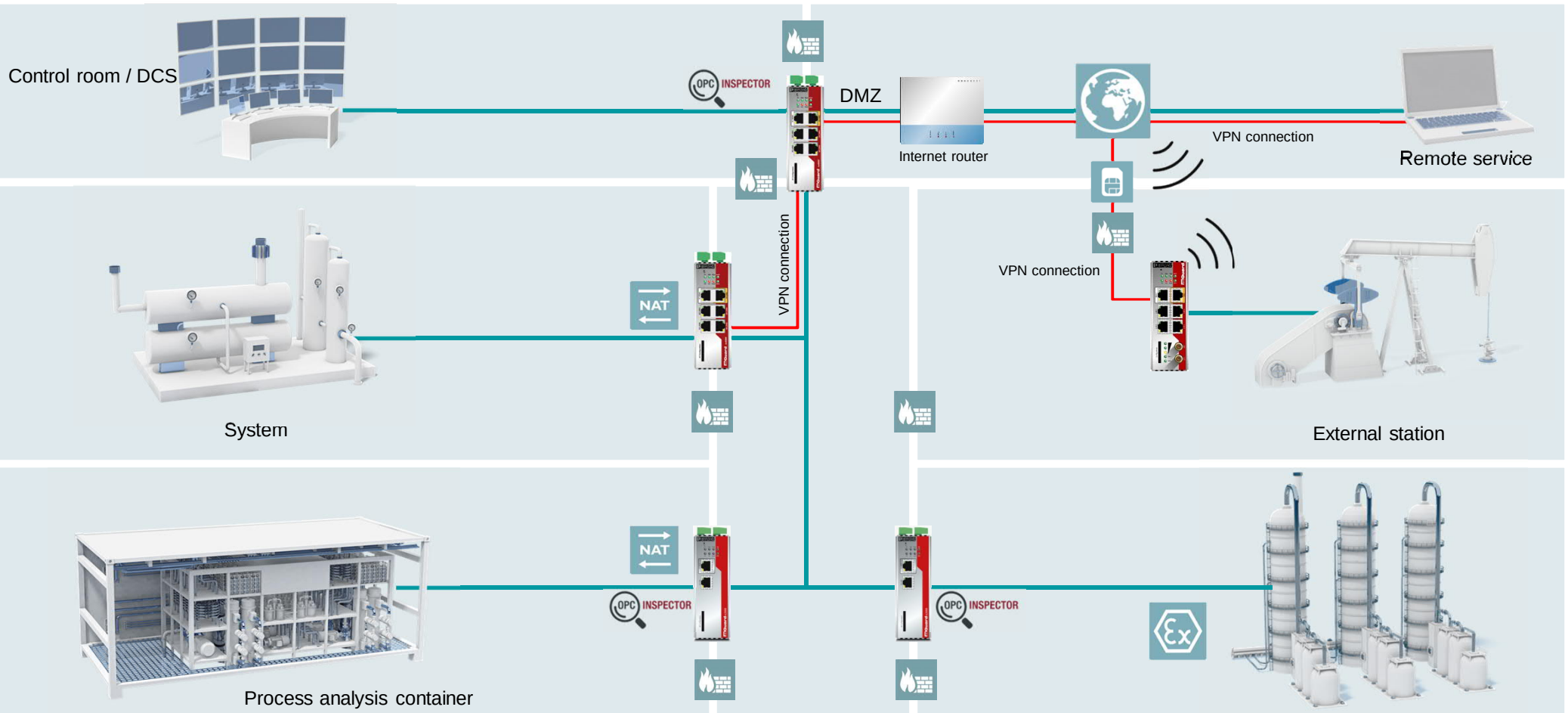


Station integration

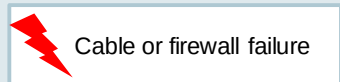




Secure network structure



Availability



Availability



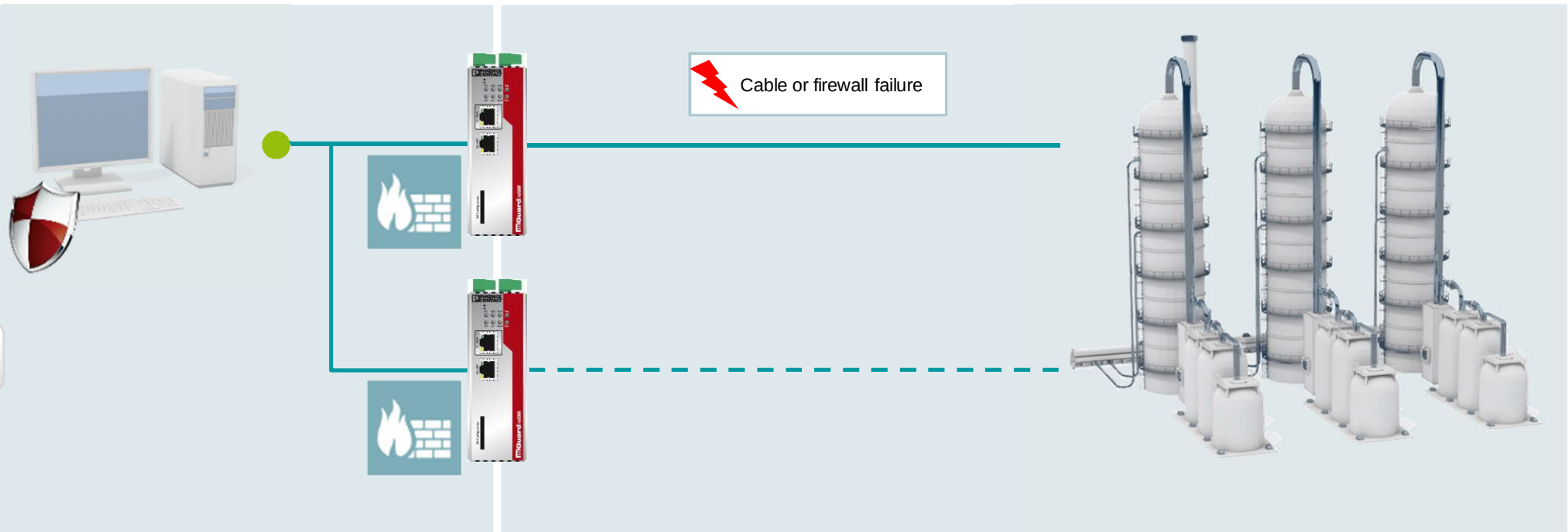
Cable break or failure of the firewall



Solution



Availability

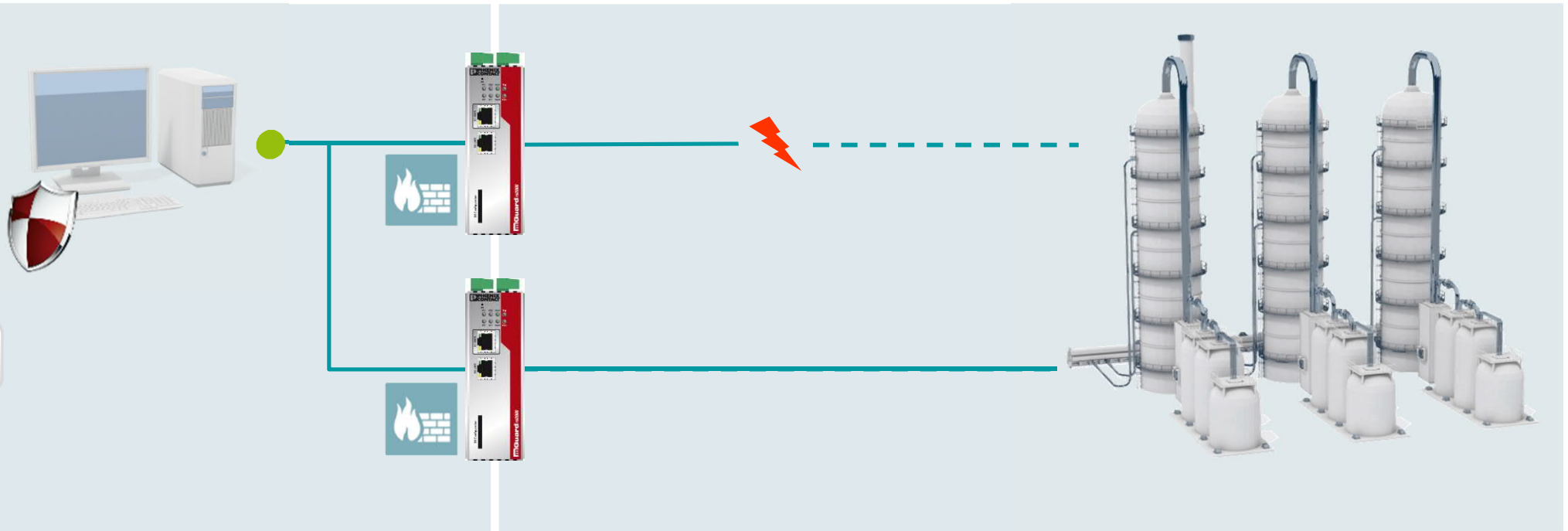


Redundant firewall

for increased security and availability: Use an additional FL MGuard as a redundant firewall without having to configure a second default gateway.



Availability

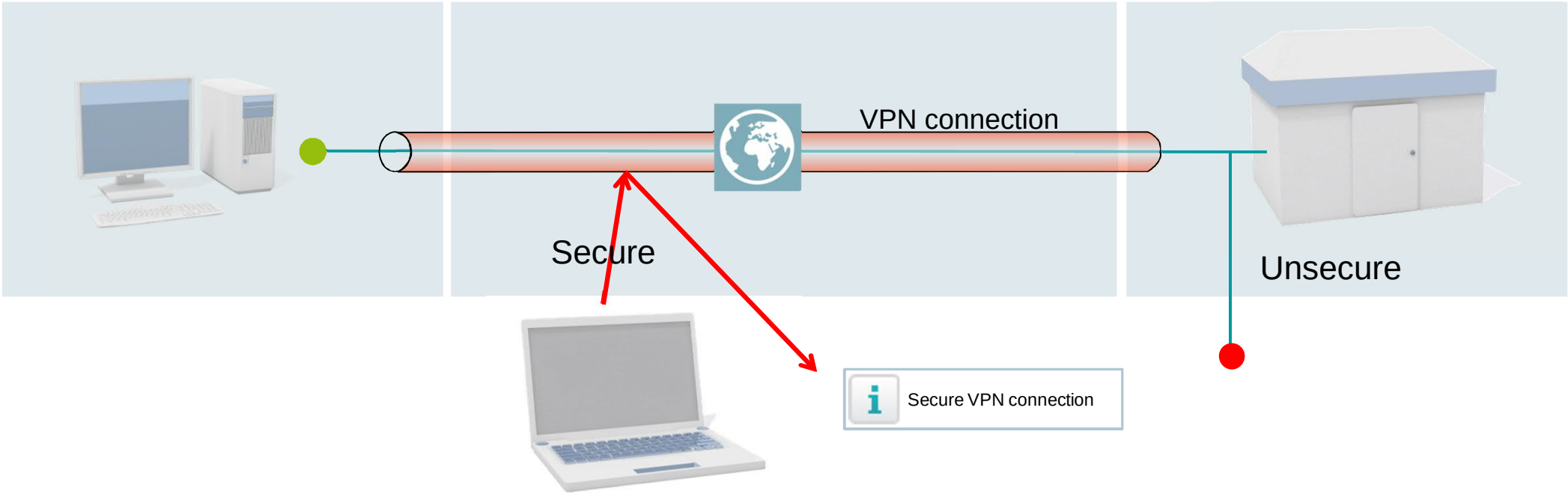


Redundant firewall

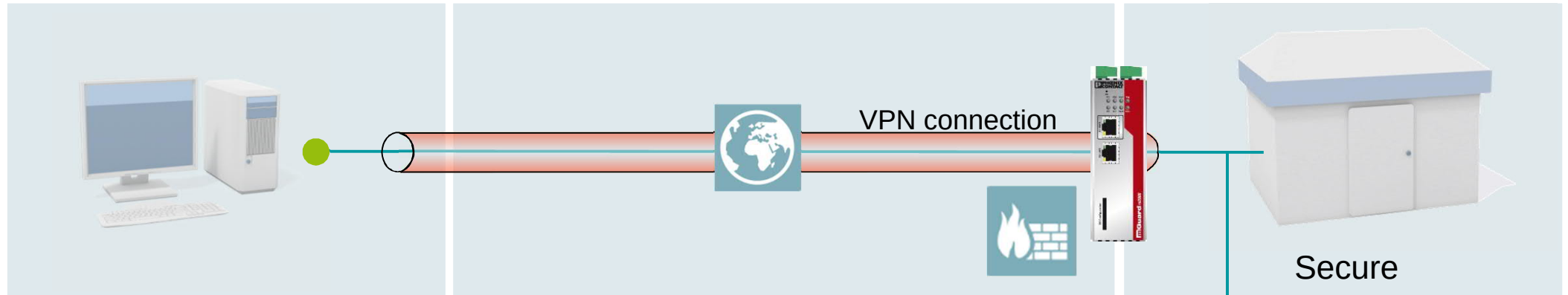
for increased security and availability: Use an additional FL MGuard as a redundant firewall without having to configure a second default gateway.



Secure remote communication



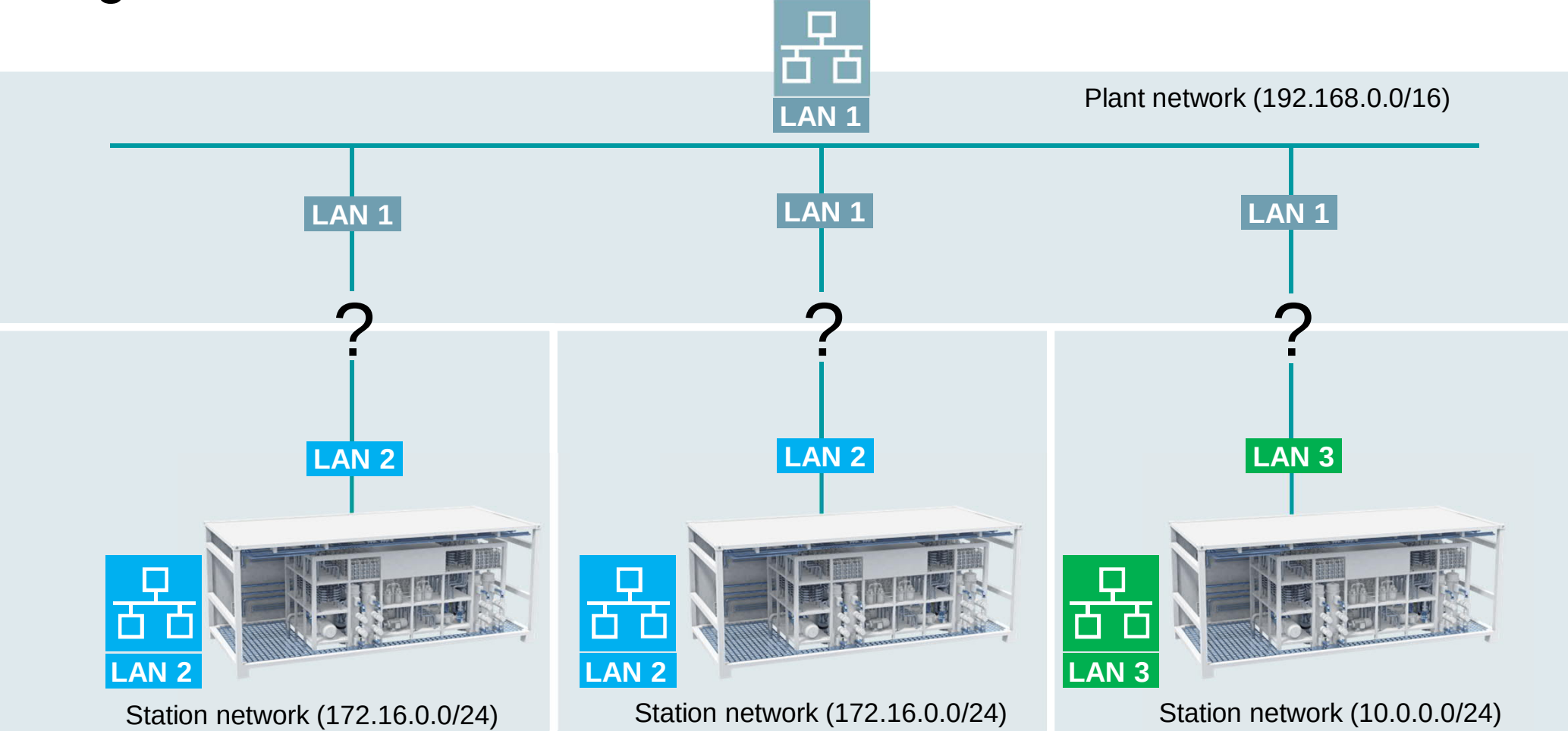
mGuard firewall secures VPN connections



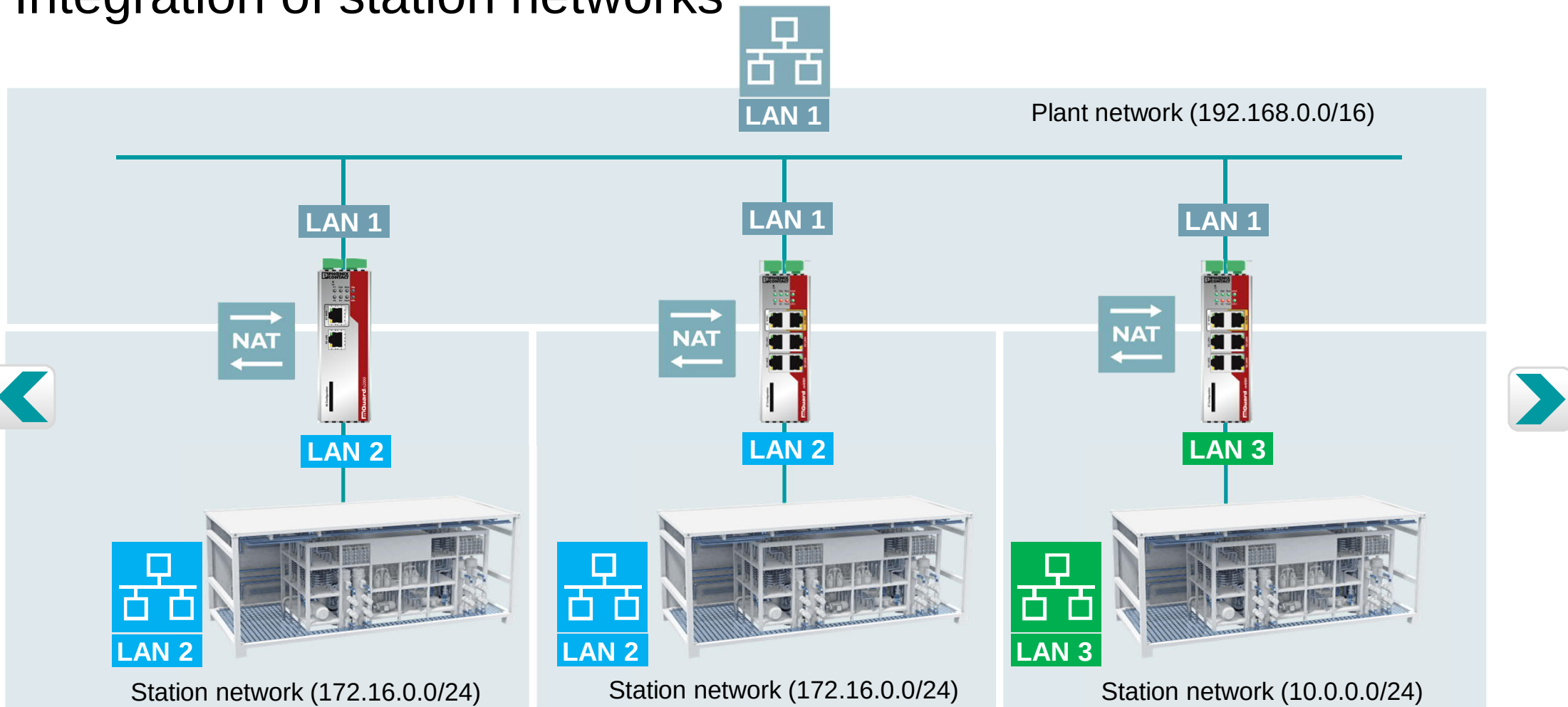
mGuard firewall secures VPN connections
protects both communicating parties if one of them is attacked



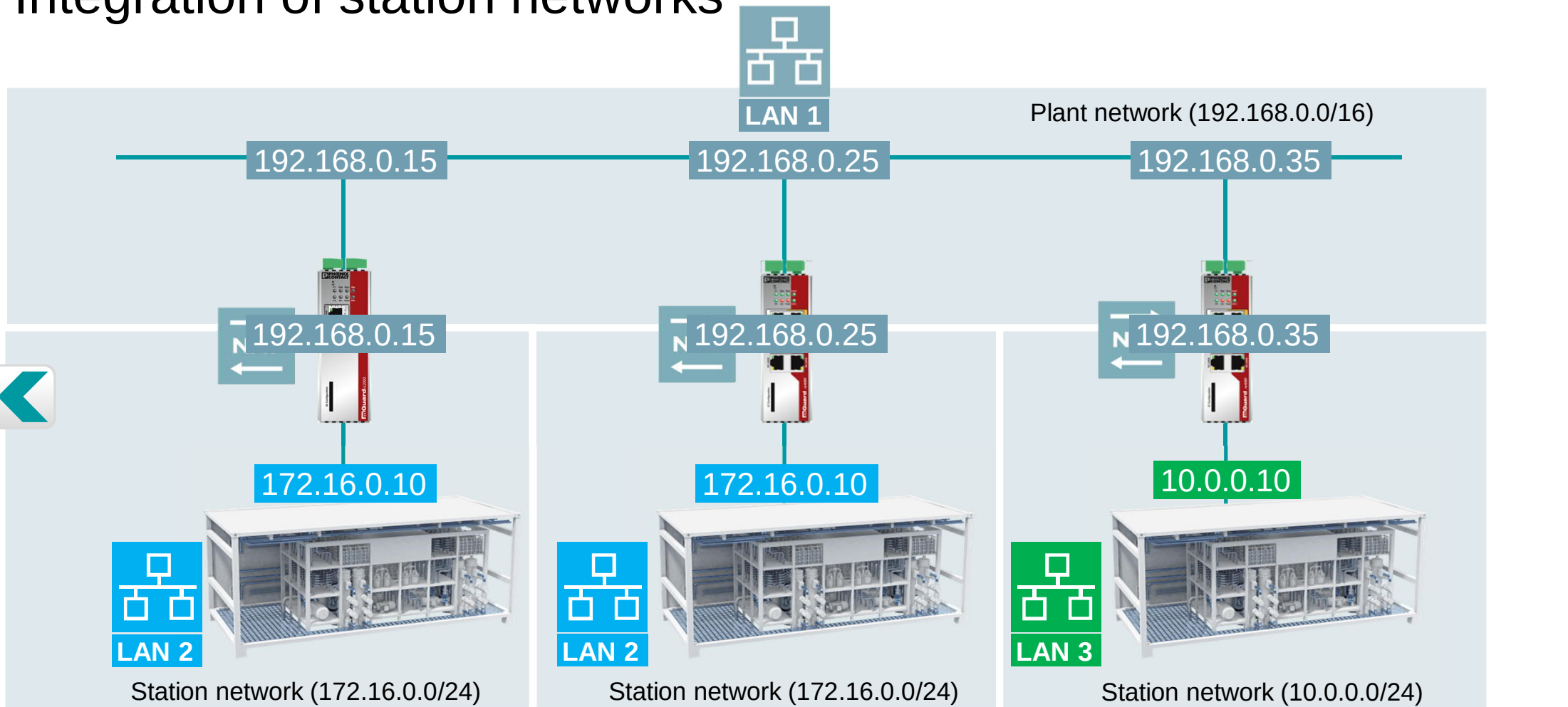
Integration of station networks



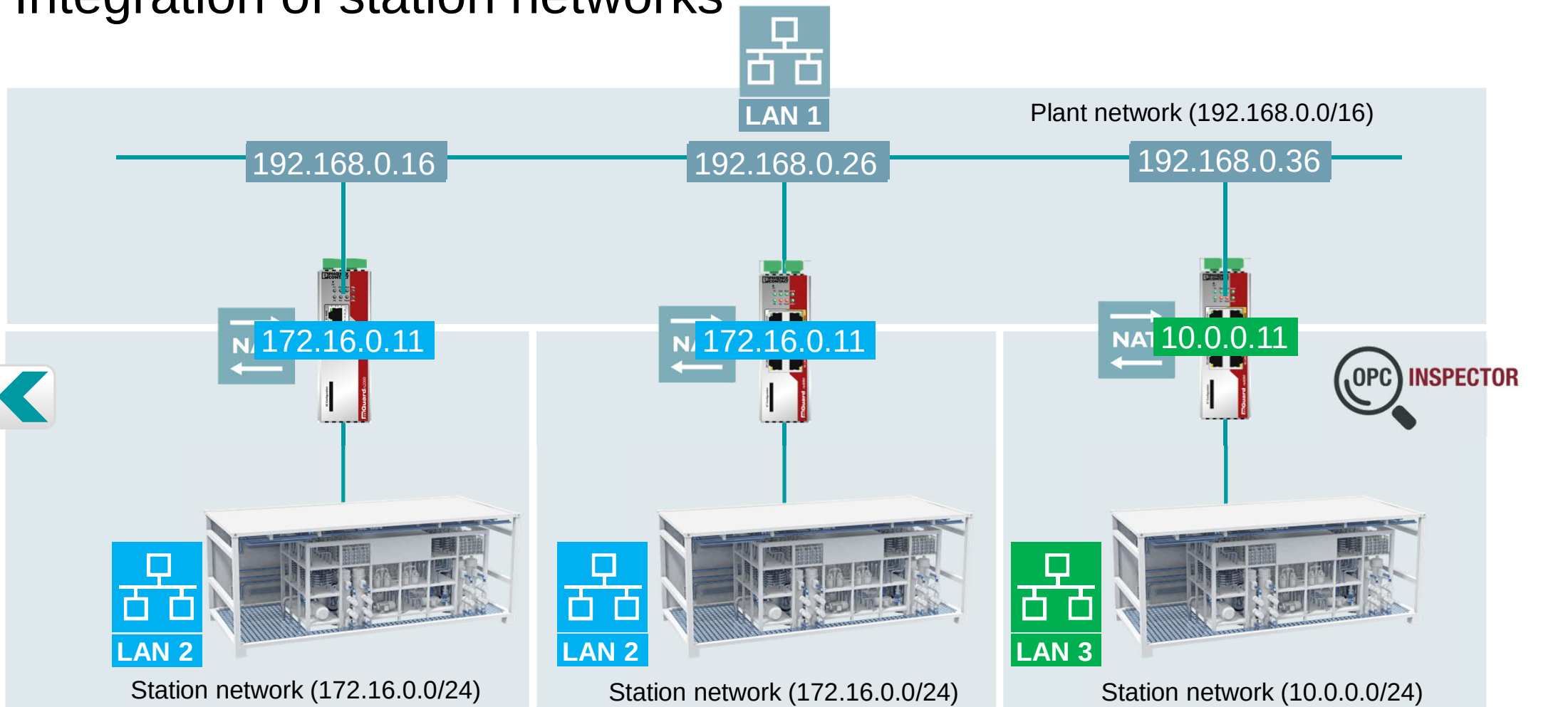
Integration of station networks



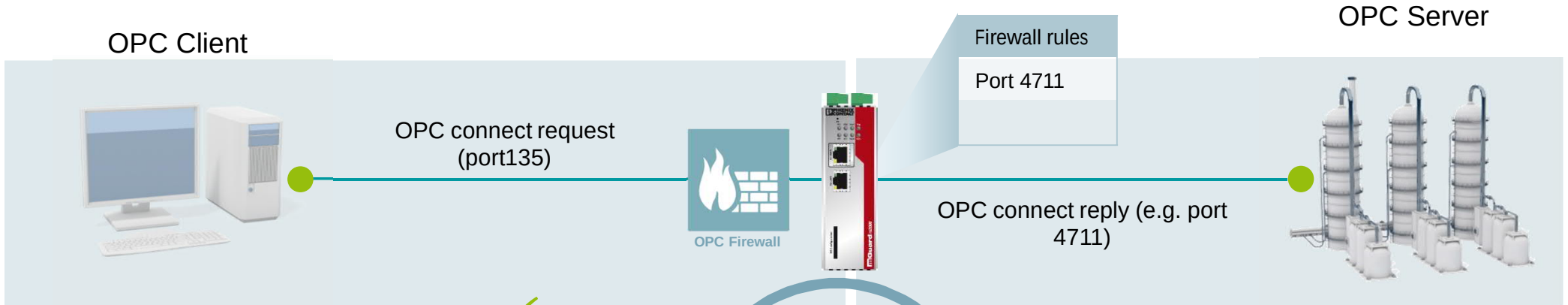
Integration of station networks



Integration of station networks



Secure OPC connection



✓ Authorized connection, valid OPC request

Header OPC Port 4711

✓ Valid OPC response use port 4711 for OPC traffic



INSPECTOR

OPC Inspector with Deep Packet Inspection

- analyzes the OPC frame and automatically adjusts the used ports
- Intelligent Deep Packet Inspection allows masquerading and 1:1 NAT for OPC (OLE for Process Control)



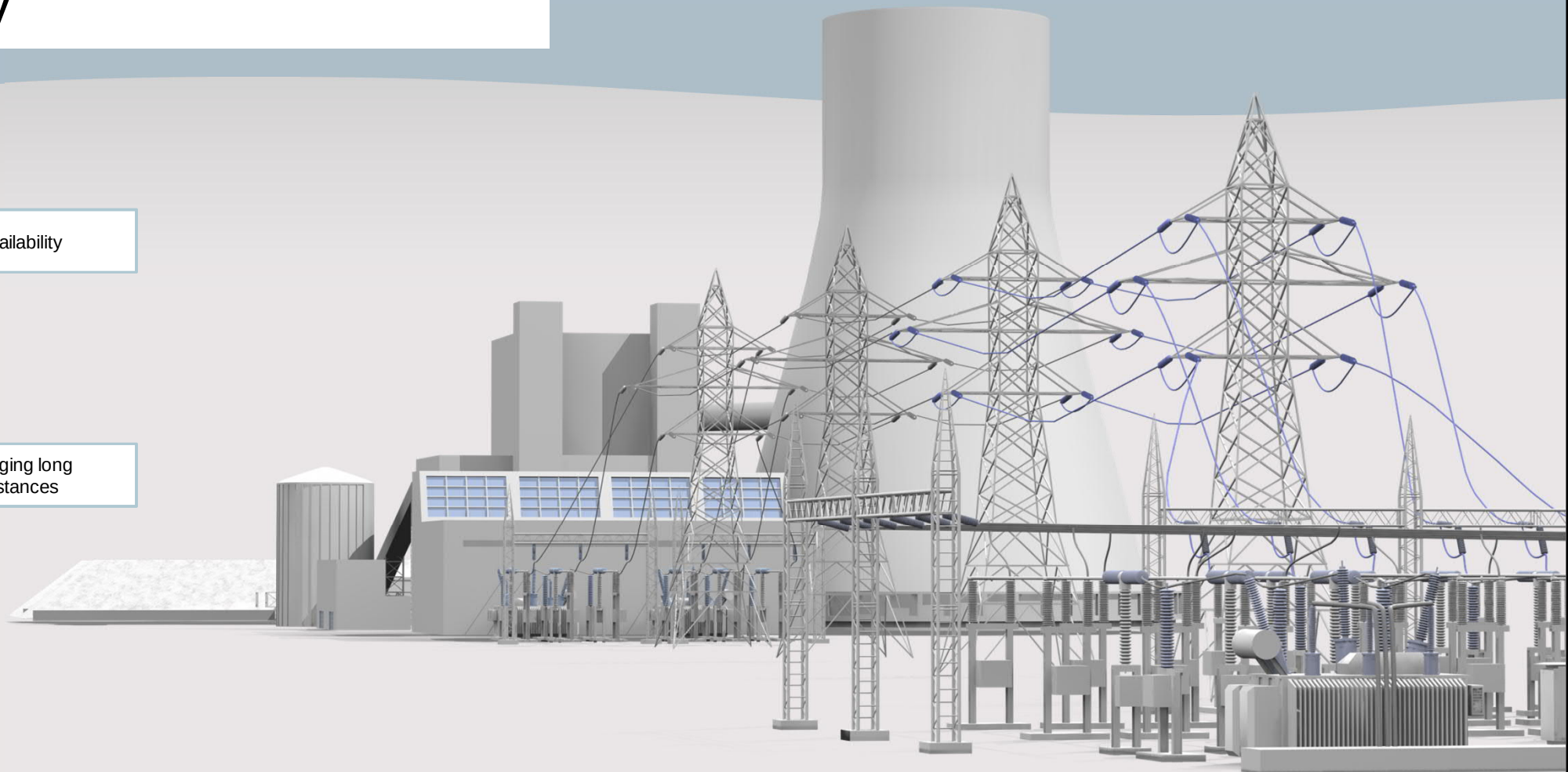
Energy



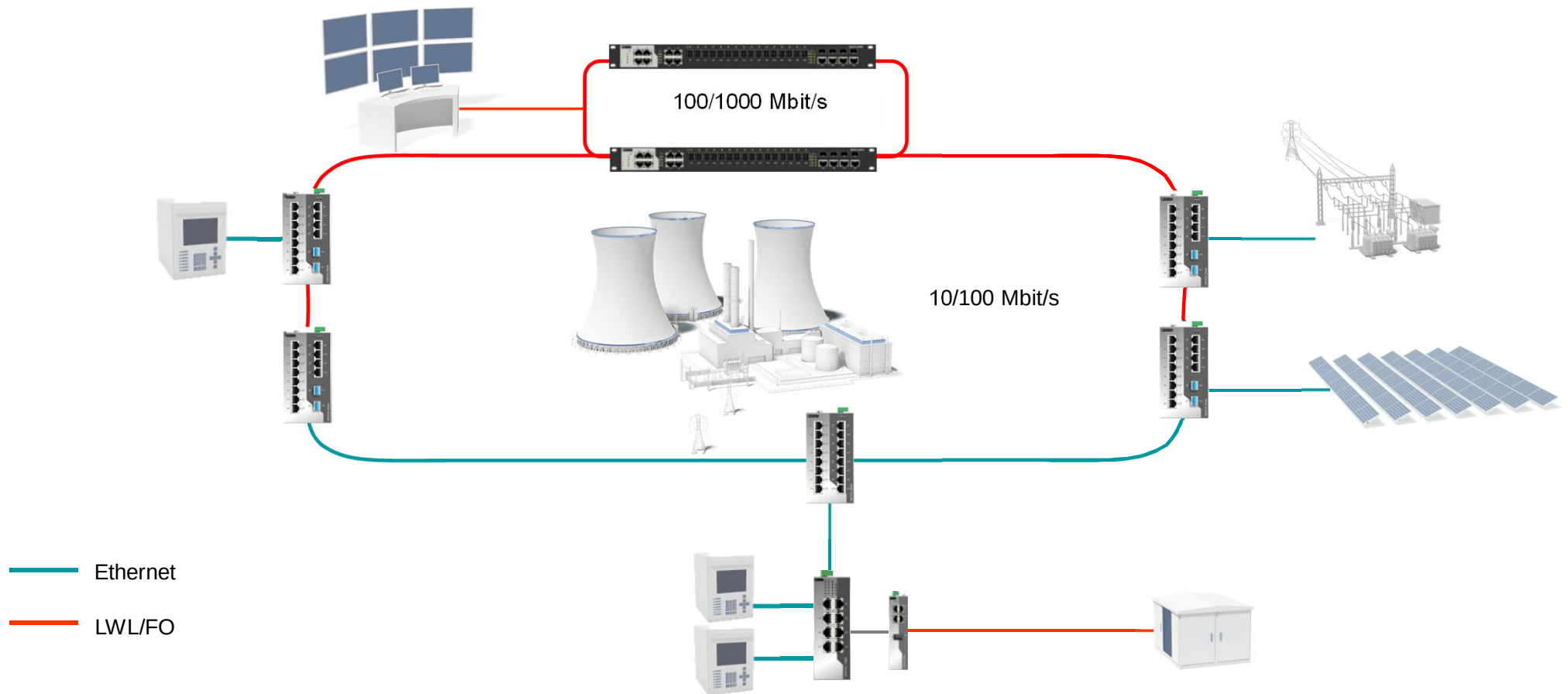
Availability



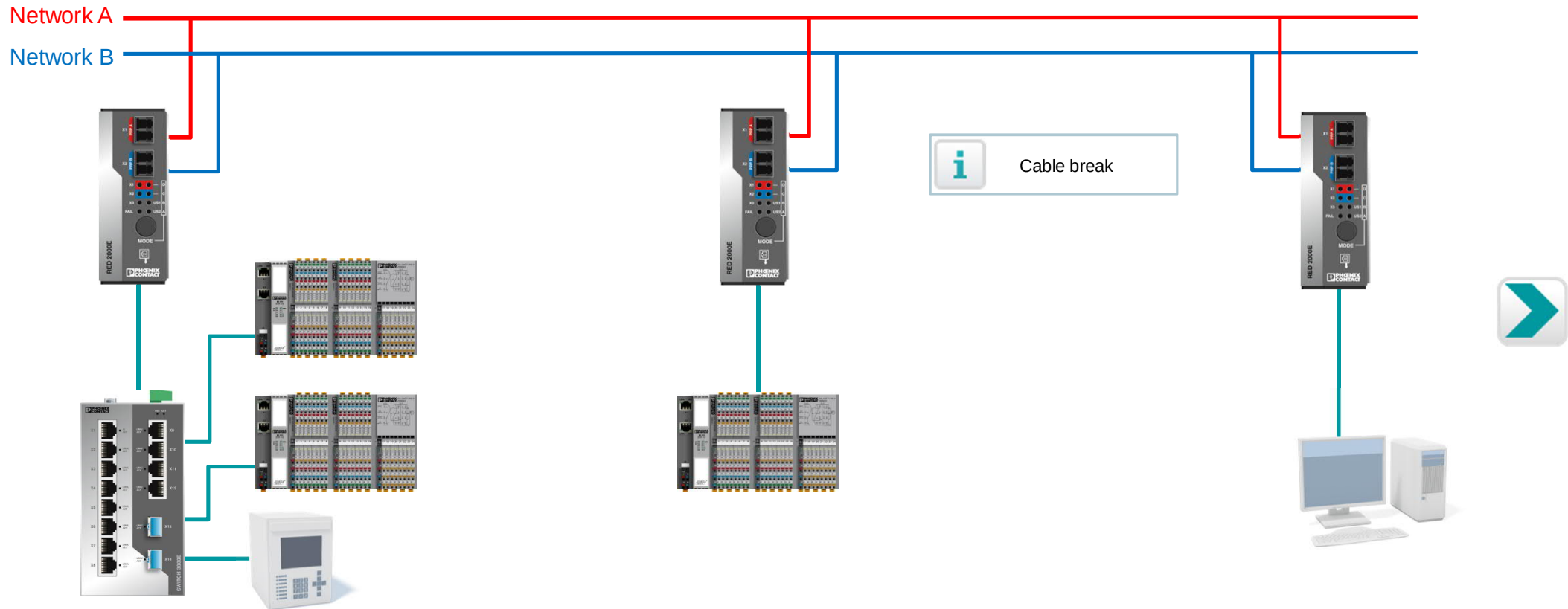
Bridging long
distances



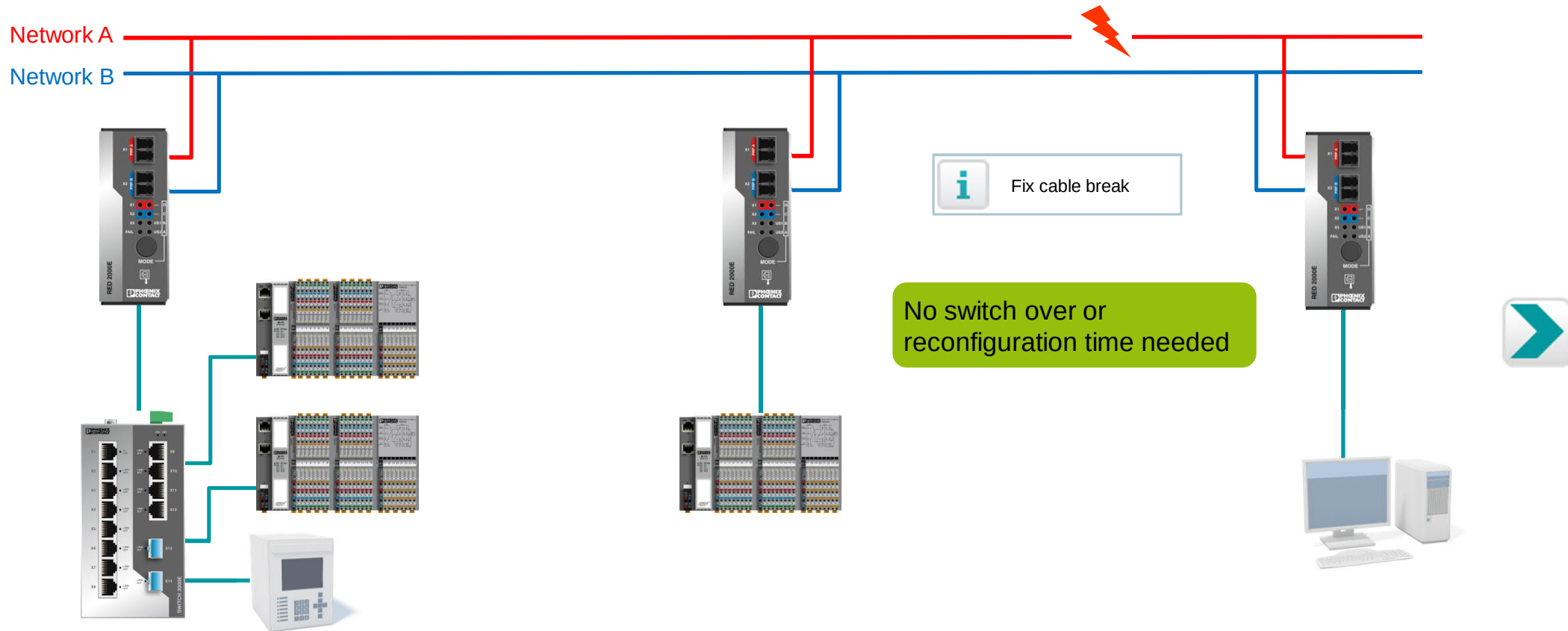
Bridging long distances



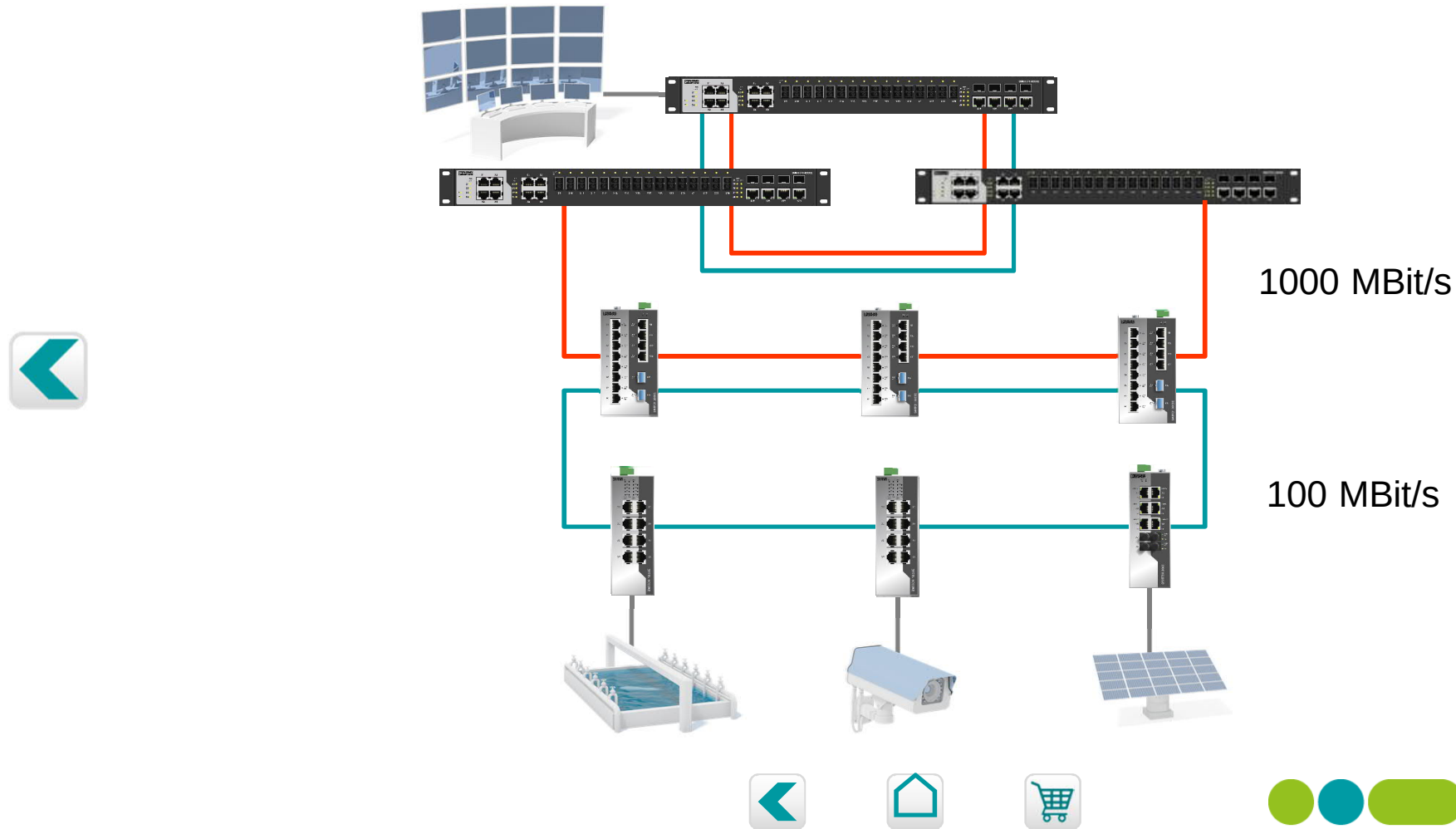
Availability through Parallel Redundancy Protocol

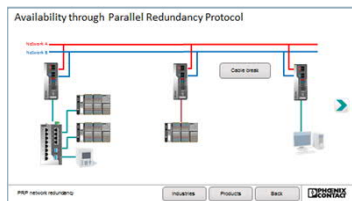
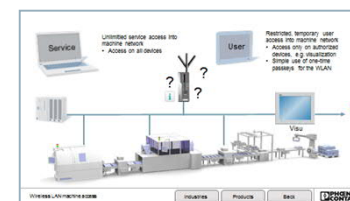
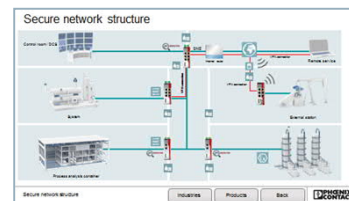
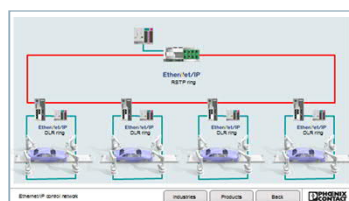
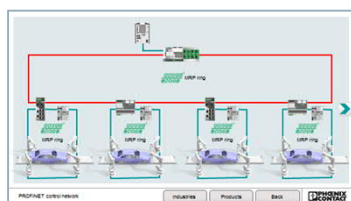
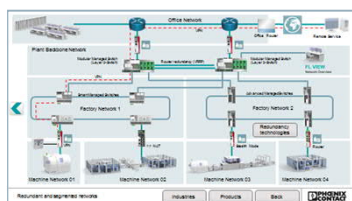
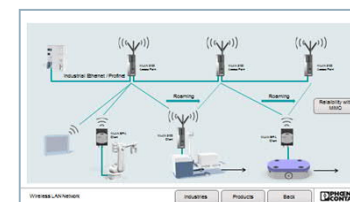
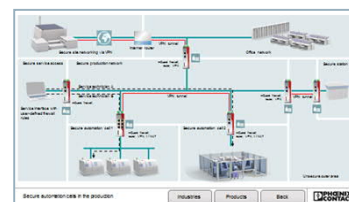
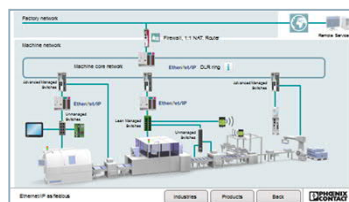
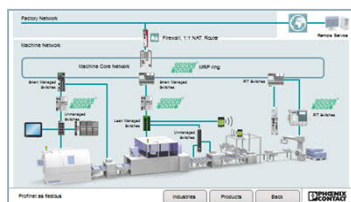
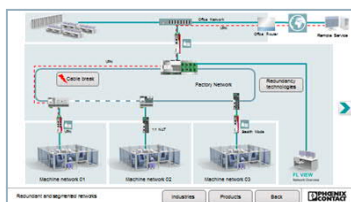
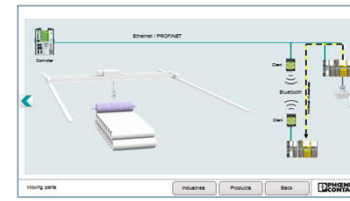
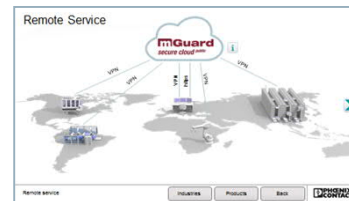
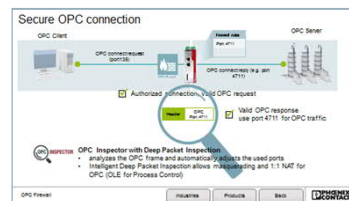
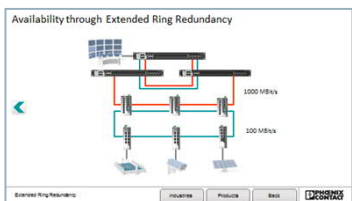
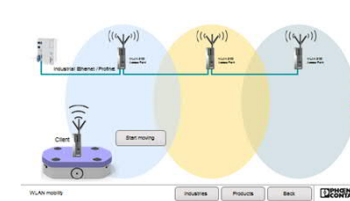
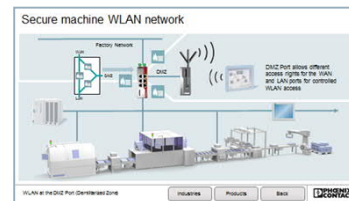
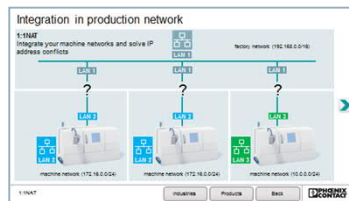


Availability through Parallel Redundancy Protocol



Availability through Extended Ring Redundancy



[illegible]

Our product portfolio



Managed Switches



Cyber Security



Power over Ethernet



Serial Device Server, Gateways



Unmanaged Switches



Remote communication



Network installation



Timeserver



Wireless Ethernet



Media conversion



Software



Our product portfolio



Managed Switches



Cyber Security



Power over Ethernet



Unmanaged Switches



Remote communication



Network installation



Wireless Ethernet



Media conversion



Software



Switch 2000



Switch 3000/4000



Switch SMCS



Switch 7000



Profinet IRT



Modular Managed



NAT-Switches



Automation protocols



Our product portfolio



Managed Switches



Cyber Security



Power over Ethernet



Unmanaged Switches



Remote communication



Network installation



Wireless Ethernet



Media conversion



Software



Mounting rail devices and PCI cards



Other designs



Extended functionalities



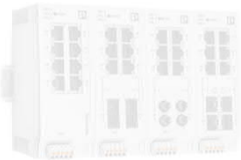
Central management software



Automation protocols



Our product portfolio

 Managed Switches	 Cyber Security	 Power over Ethernet	 PoE Injectors
 Unmanaged Switches	 Remote communication	 Network installation	 PoE Switches
 Wireless Ethernet	 Media conversion	 Software	 PoE Splitters

 Automation protocols



Our product portfolio



Managed Switches



Cyber Security



Power over Ethernet



Unmanaged Switches



Remote communication



Network installation



Wireless Ethernet



Media conversion



Software



Secure remote control



Remote control via cloud



Remote access via internet and mobile phone network



Extension of complex IP networks



Automation protocols



Our product portfolio



Managed Switches



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Remote communication



Network installation



Wireless Ethernet



Media conversion



Software



Copper-based network installation



Fiber optic-based network installation



Patch panels



PRP-redundancy modules



SFP modules



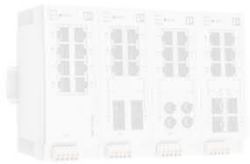
Memory media



Automation protocols



Our product portfolio



Managed Switches



Cyber Security



Power over Ethernet



Unmanaged Switches



Remote communication



Network installation



Wireless Ethernet



Media conversion



Software



Industrial Bluetooth



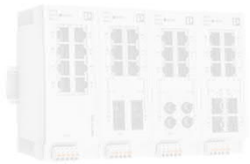
Industrial WLAN



Automation protocols



Our product portfolio



Managed Switches



Cyber Security



Power over Ethernet



Unmanaged Switches



Remote communication



Network installation



Wireless Ethernet



Media conversion



Software



Industrial Bluetooth



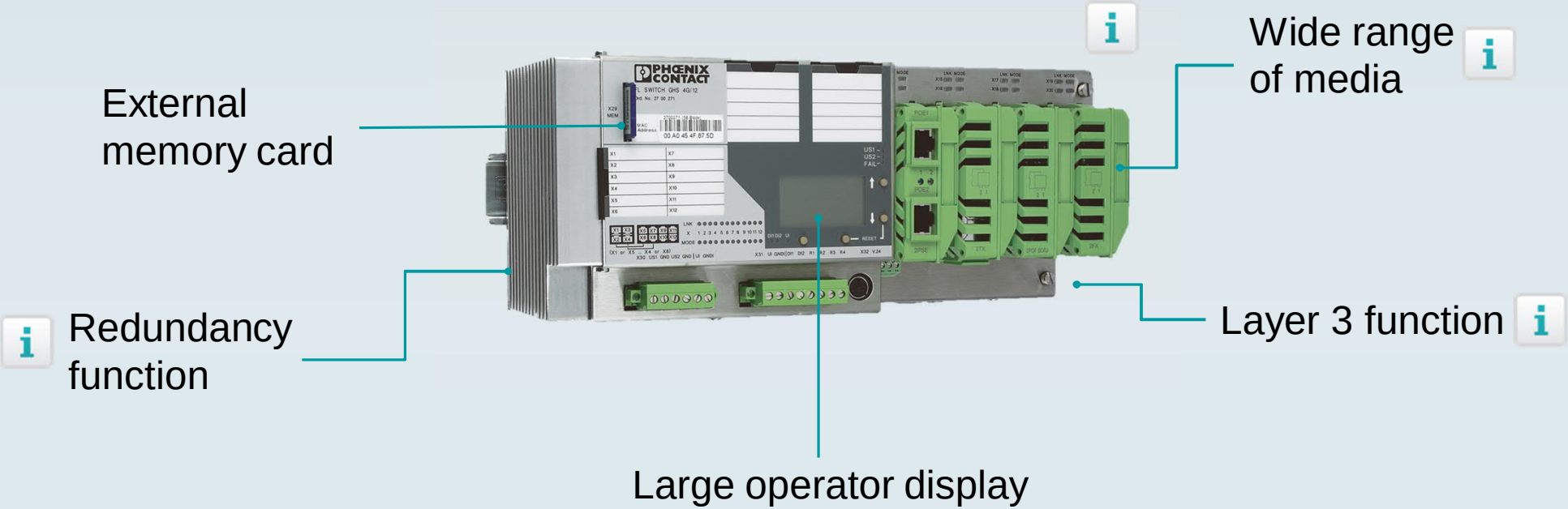
Industrial WLAN



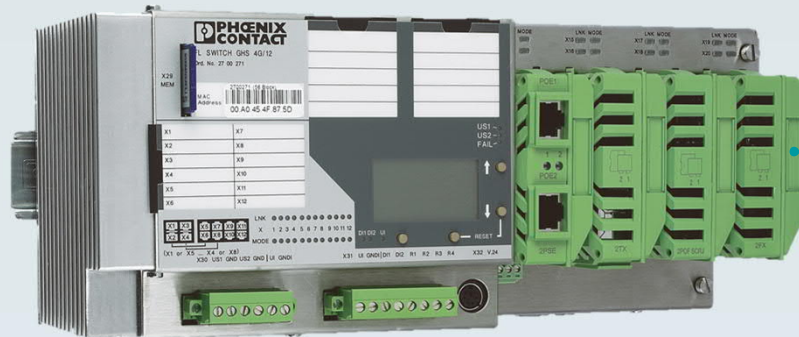
Automation protocols



Modular Managed Switches

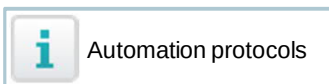
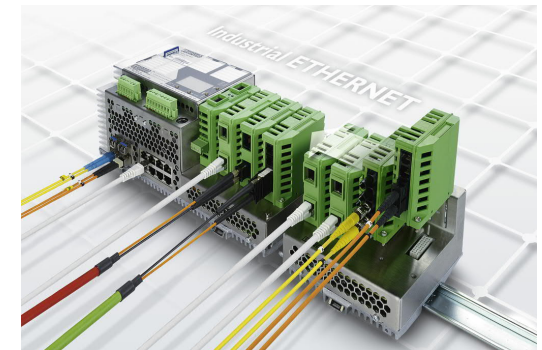


Modular Managed Switches



Wide range of media

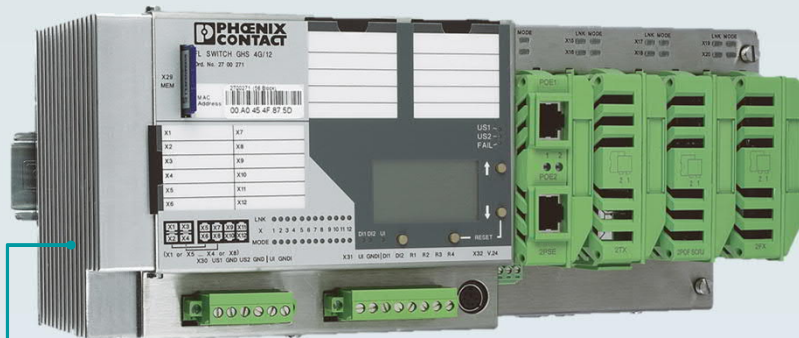
- Up to 12 integrated Gigabit ports
- 4 SFP Gigabit slots
- Different fiber optic connections (SC, ST, POF)
- Power over Ethernet



Automation protocols

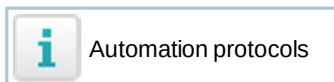


Modular Managed Switches



Redundancy
function

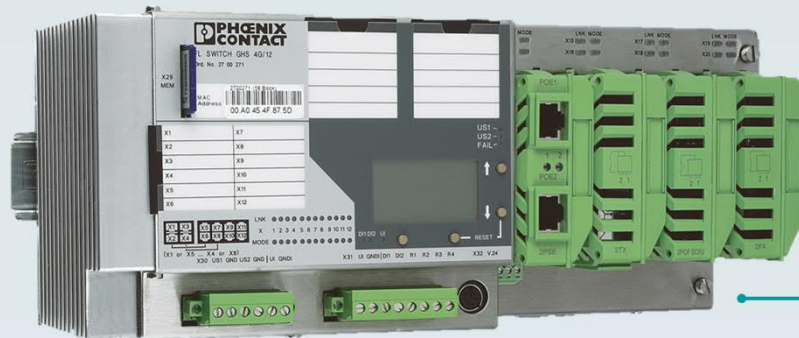
- Meshed structures with RSTP
- Media Redundancy protokoll (MRP) according to IEC 62439
- Large Tree Support
- Fast Ring Detection
- Router redundancy with VRRP



Automation protocols

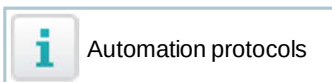
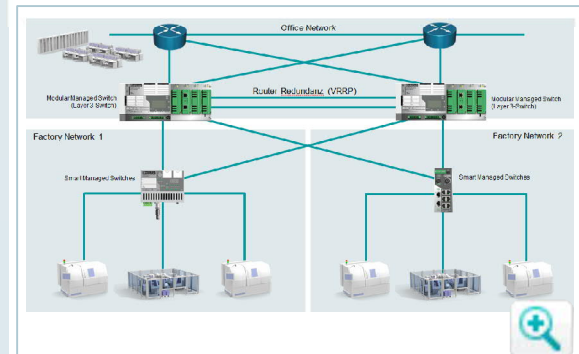


Modular Managed Switches



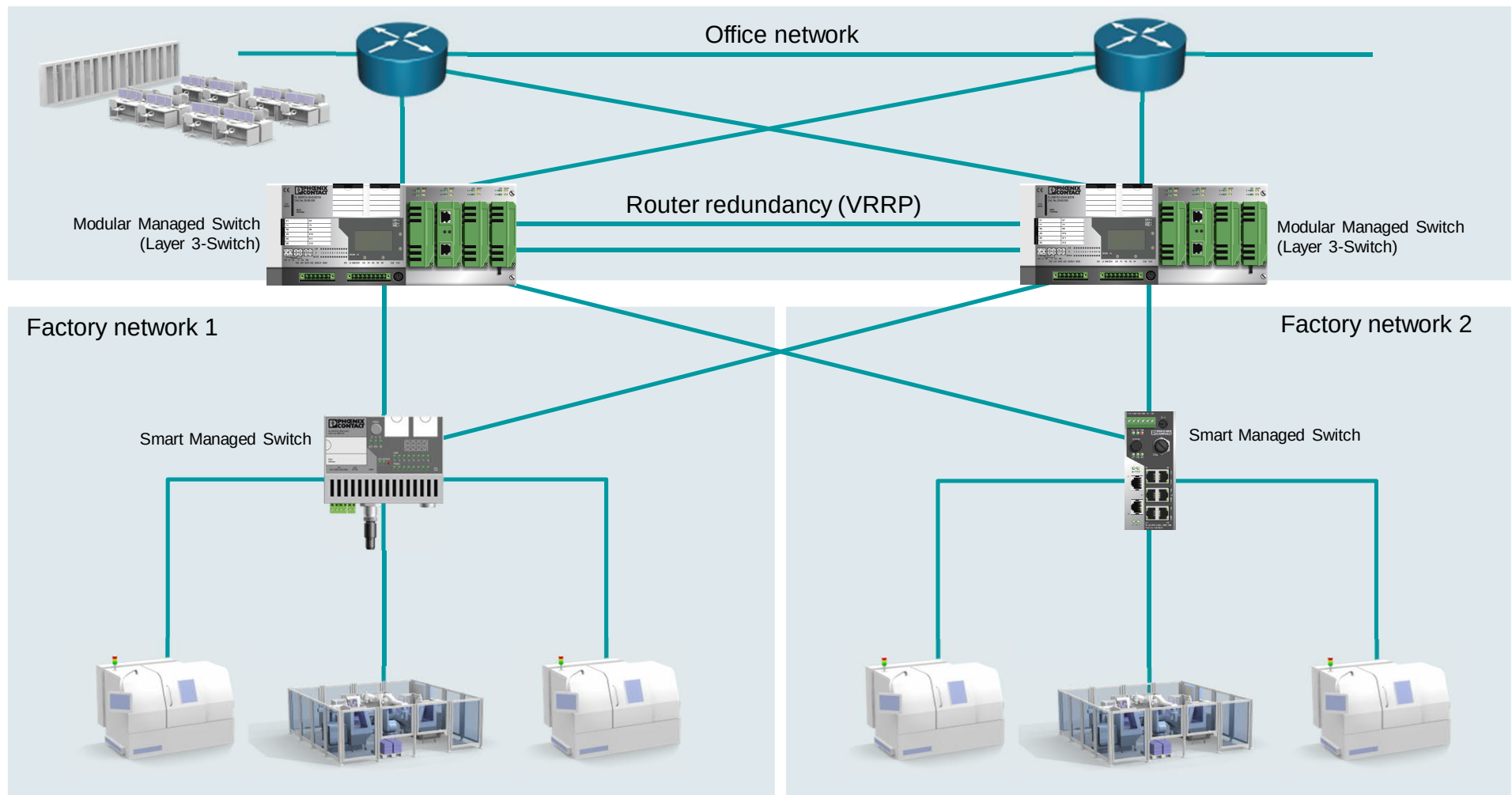
Layer 3
function

- Port-specific routing up to 28 times
- Static and dynamic routing
- Routing VLANs
- Run Several routers via VRRP



Automation protocols

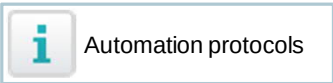




Modular Managed Switches



	FL SWITCH GHS 4G/12	FL SWITCH GHS 12G/8	FL SWITCH GHS 4G/12-L3	FL SWITCH GHS 12G/8-L3	FL FXT
Ports	4x Combo ports 4x RJ45 ports Expandable up to 24 Ports	4x SFP Gigabit slots 8x RJ45 Gigabit ports Expandable up to 28 Ports	4x Combo ports 4xRJ45 ports Expandable up to 24 Ports	4x SFP Gigabit slots 8x RJ45 Gigabit ports Expandable up to 28 Ports	Extension modulefor up to 8 Ethernet ports
Layer 3 fuction	No	No	Yes	Yes	-
Order number	2700271	2989200	2700787	2700786	2989307

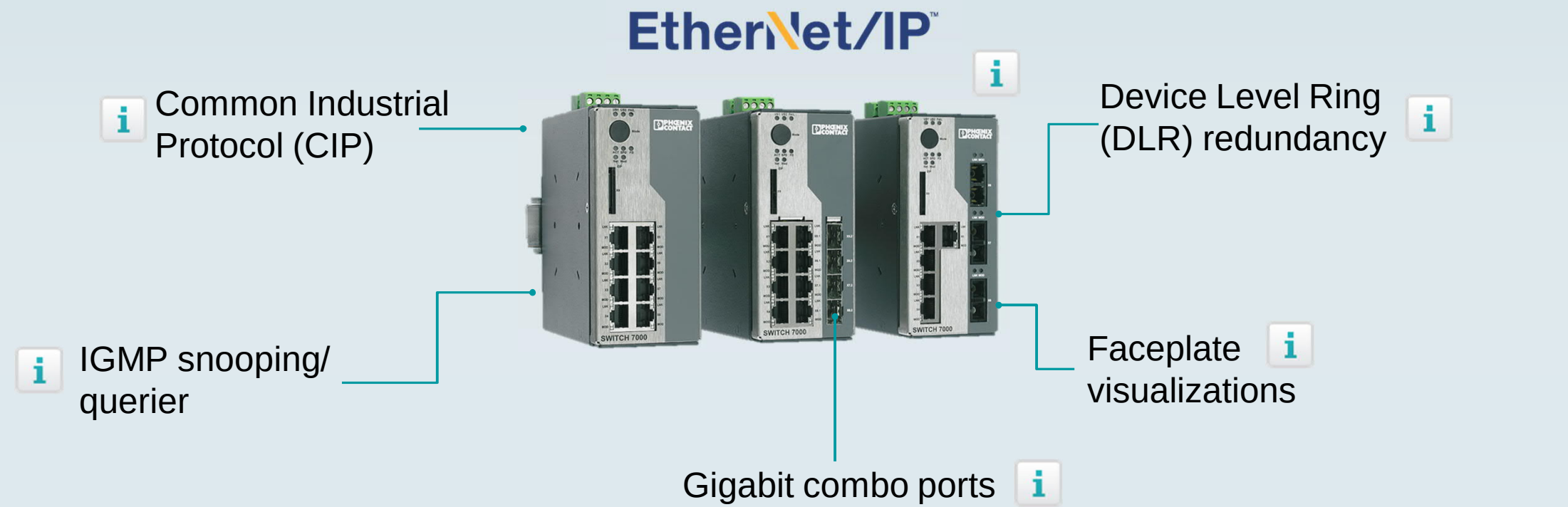


Media modules



	FL IF 2TX VS-RJ-D	FL IF 2TX VS-RJ-F	FL IF 2PSE-F	FL IF 2FX SC-D	FL IF 2FX SC-F	FL IF 2FX SM SC-D	FL IF 2FX ST-D	FL IF 2POF SCRJ-D
Ports	RJ45, connection direction downward	RJ45, connection direction forward	PoE- RJ45, connection direction forward	SC, connection direction downward	SC, connection direction forward	SC, connection direction downward	ST, connection direction downward	SC-RJ, connection direction downward
Fiber type	-	-	-	Multimode fiber optics (1300 nm)	Multimode fiber optics (1300 nm)	Singlemode fiber optics (1300 nm)	Multimode fiber optics (1300 nm)	POF/PCF fiber (650 nm)
Order number	2832357	2832344	2832904	2832425	2832412	2832205	2884033	2891084

Managed Switches 7000



Switch 7000

EtherNet/IP™

Common
Industrial
Protocol (CIP)



- Integration into EtherNet/IP control systems



Automation protocols





Diagnosis

EtherNet/IP™

**Common Industrial Protocol
(CIP)**

Configuration



Automation protocols



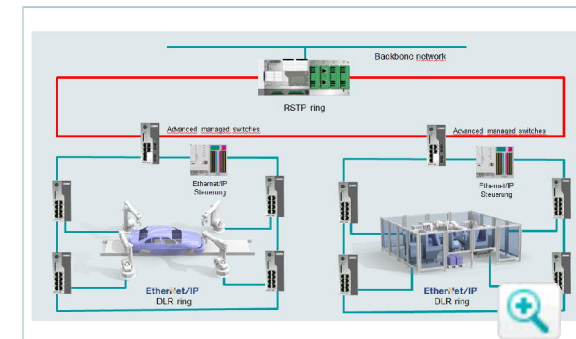
Switch 7000

EtherNet/IP™



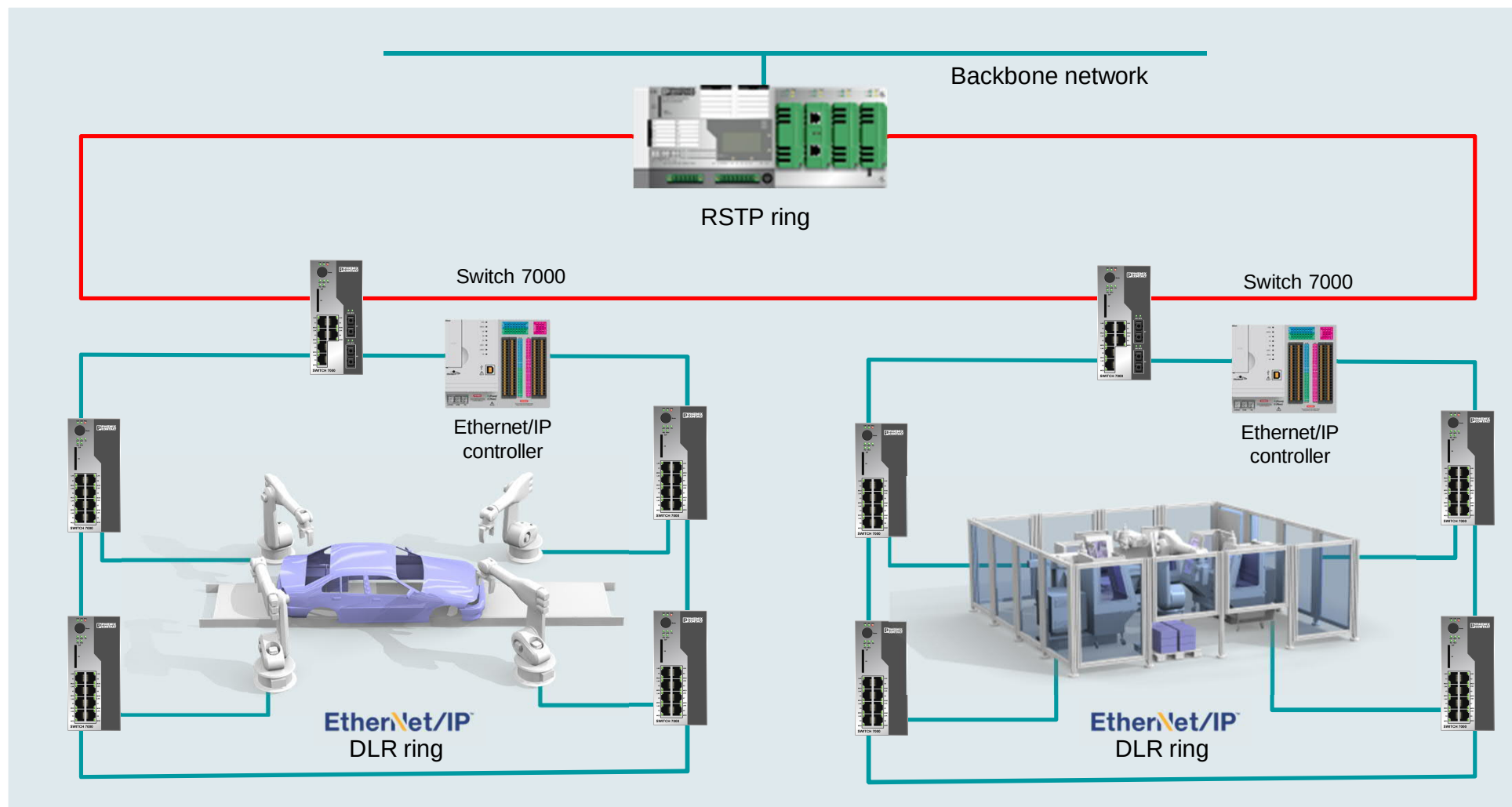
Device Level
Ring (DLR)
redundancy

- Multivendor redundancy mechanism for EtherNet/IP
- Recovery time < 3ms



Automation protocols





Switch 7000

EtherNet/IP™



Faceplate visualizations

- Pre-configured visualization for Rockwell control systems
- Diagnostic information
- Port configuration



Automation protocols

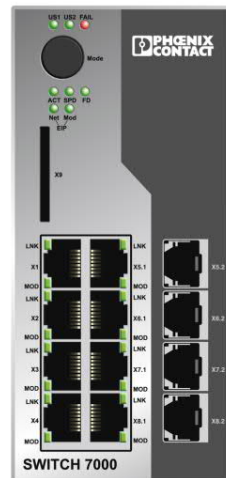




Device Status	DLR Status	Port Status	Port Configuration	CIP Status	X
---------------	------------	-------------	--------------------	------------	---

Device Type: FL SWITCH 7004-4GC-EIP
Device Name: FL SWITCH 7004-4GC-EIP

IP Address: 192.168.10.110
MAC Address: 00:A0:45:AA:16:6E



Node Status: Device Is Active Ring Supervisor
Ring Status: Ring Fault
Active Supervisor: 192.168.10.110
Active Precedence Value: 0
Ring Fault Count: 1
Clear Fault Counter: [Clear](#)
Verify Fault Location: [Start](#)
Last Node Port 1: 192.168.10.110
Last Node Port 2: 192.168.10.110

[DLR Node Table](#)



Automation protocols



Switch 7000

EtherNet/IP™



Gigabit combo ports

- Flexible choice of the transmission medium (copper or fiber) and fiber (singlemode or multimode)
- Cable length up to 80km (depending on the SFP module)



Automation protocols



Switch 7000

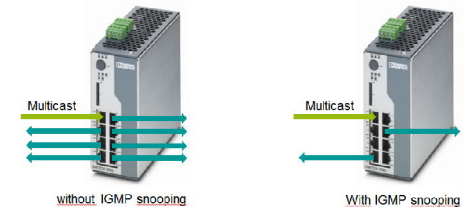
EtherNet/IP™



IGMP snooping/
querier

- Analysis of incoming multicast packets
- Packet forwarding only to ports, who need them
- Reduction of the network traffic

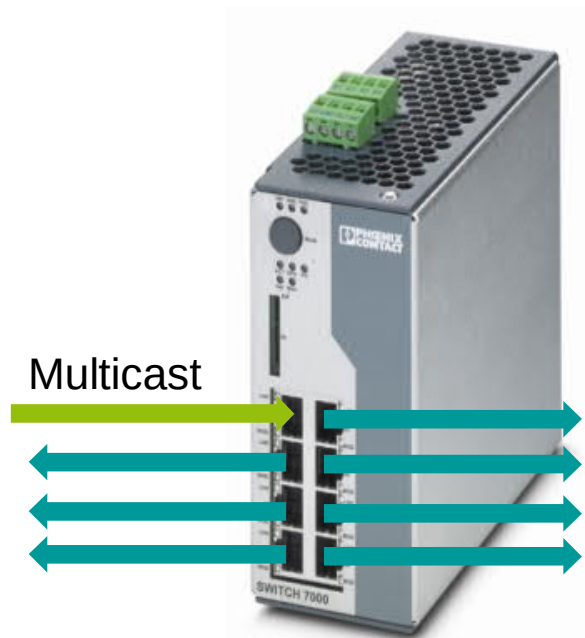
Reduction of network load: Multicast packages are only forwarded to those ports who need them



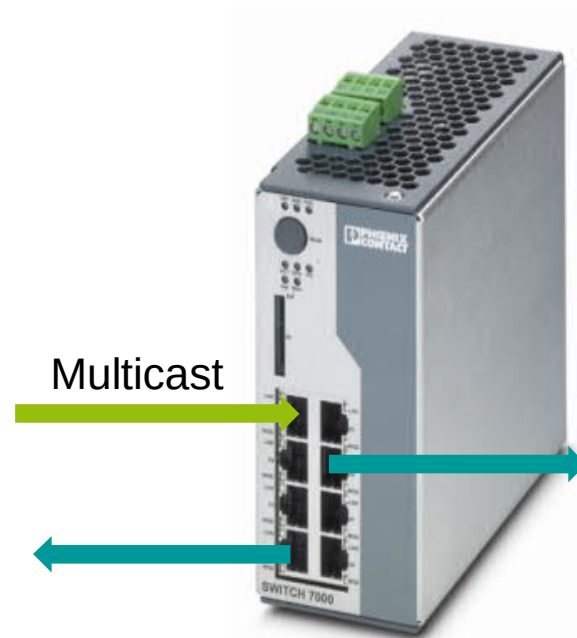
Automation protocols



Reduction of network load: Multicast packages are only forwarded to those ports who need them



without IGMP snooping

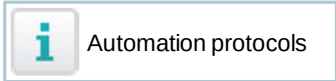


with IGMP snooping

Switch 7000



	FL SWITCH 7008-EIP	FL SWITCH 7006/2FX-EIP	FL SWITCH 7005/FX- 2FXSM-EIP	FL SWITCH 7006-2GC-EIP	FL SWITCH 7004-4GC-EIP	FL SWITCH 7004-2TC- 2GC-EIP
Ports	8x RJ45	6x RJ45 2x SC-MM	5x RJ45 1x SC-MM, 2x SC-SM	6x RJ45 2 x Gigabit combo	4x RJ45 4 x Gigabit combo	4x RJ45 2x Fast Ethernet combo 2 x Gigabit combo
Transmission speed	10/100 MBit/s	10/100 MBit/s	10/100 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s
Order number	2701418	2701419	2701420	2701554	2701553	2702175



Managed Switches SMCS



Ideal for use in PROFINET-RT or EtherNet/IP environment



Redundancy functions



Copper and fiber optic ports

Different designs

Easy monitoring and configuration



Automation protocols



INSPIRING INNOVATIONS

Smart Managed Switches



Easy monitoring and
configuration

- Web-based management
- SNMP
- PROFINET device functions



Automation protocols

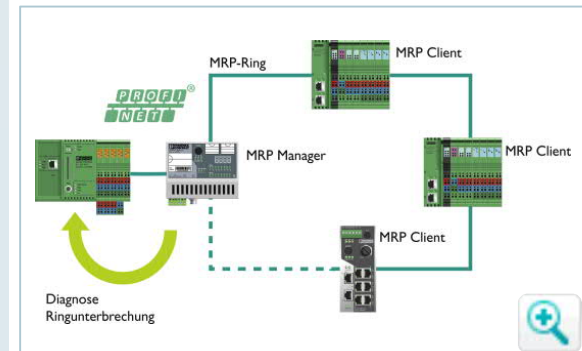


Smart Managed Switches



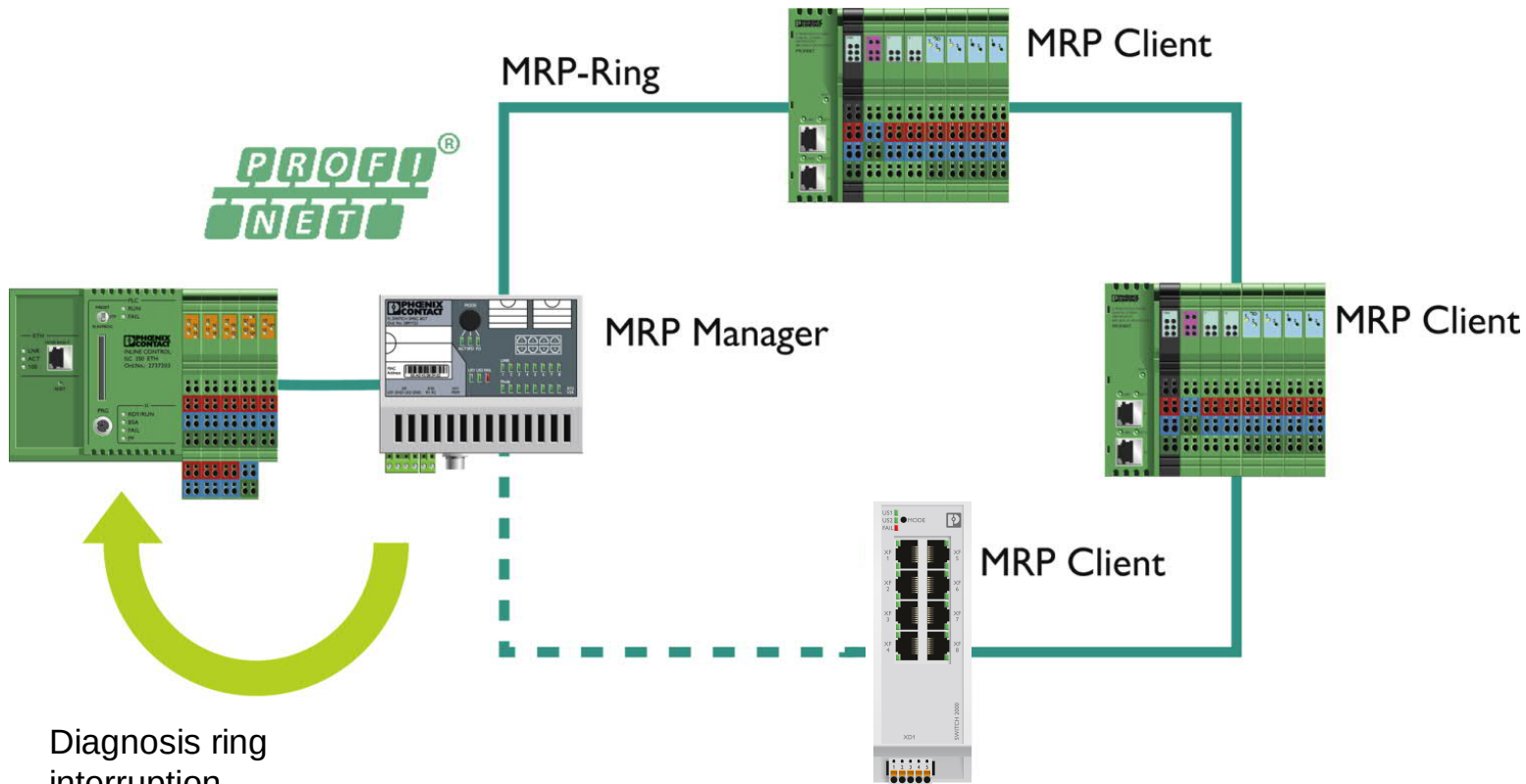
Redundancy functions

- Media redundancy protocol MRP according to IEC 62439
- Optional: MRP-Manager
- Meshed structures with RSTP
- Large Tree Support
- Fast Ring Detection



Automation protocols





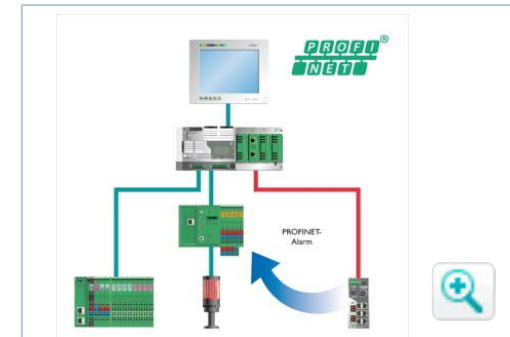
- Media redundancy protocol (MRP) according to IEC 62439
- MRP Client
- Optional: MRP Manager
- Profinet alarms

Smart Managed Switches

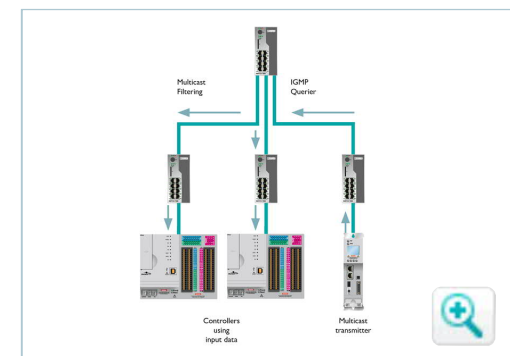
Ideal for use in
PROFINET-RT or
EtherNet/IP
environment



- PROFINET
conformance class B

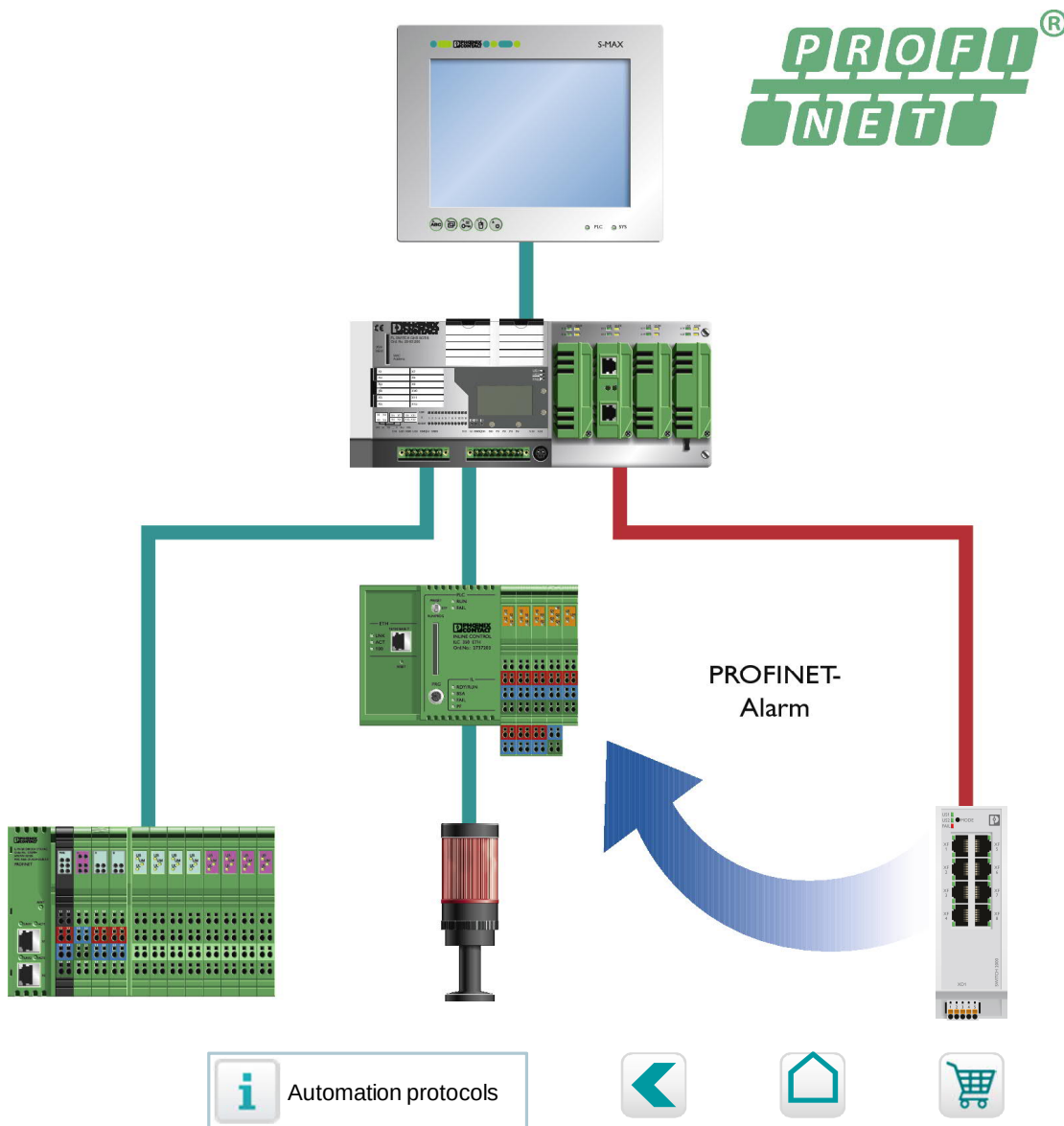


- EtherNet/IP networks

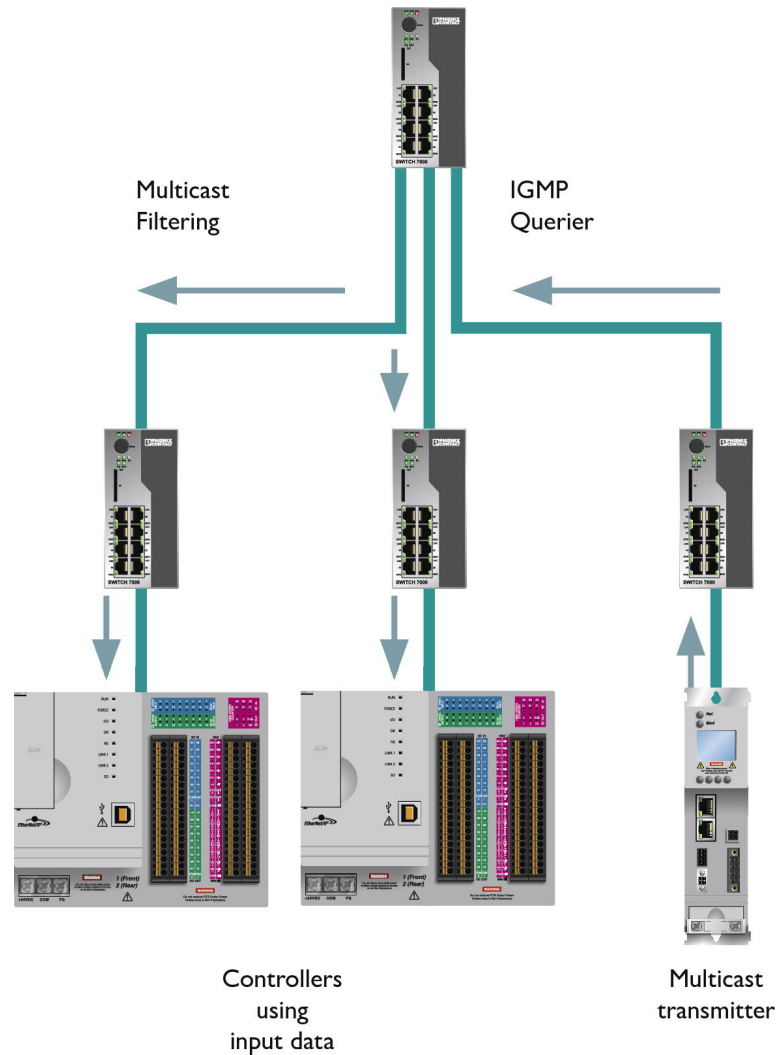


Automation protocols

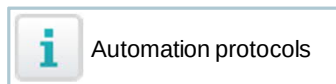




- Full configuration and diagnose via STEP 7 and PC Worx
- Media Redundancy Protocol (MRP)
- Link Layer Discovery Protocol (LLDP)
- Configuration via I/O controller (ILC, S7)
- DCP support
- Diagnostics via the control program
- PROFINET alarm function



- Optimized multicast filter functions for EtherNet/IP
- IGMP snooping and querier
- Extended Filtering
- Auto Querier Port



Smart Managed Switches



FL SWITCH SMCS 4TX-PN

FL SWITCH SMCS 6TX/2SFP

FL SWITCH SMCS 6GT/2SFP

Design	flat	flat	flat
Ports (Transmission speed)	4x RJ45 (10/100 MBit/s)	6x RJ45 (10/100 MBit/s) 2x SFP slots (1000 Mbit/s)	6x RJ45 (10/100/1000 MBit/s) 2xSFP slots (1000 Mbit/s)
Presetting	PROFINET	-	-
Order number	2989093	2989323	2891479



Smart Managed Switches



FL SWITCH SMCS 8TX



FL SWITCH SMCS 8GT



FL SWITCH SMCS 8TX-PN



Design	flat	flat	flat
Ports (Transmission speed)	8x RJ45 (10/100 MBit/s)	8x RJ45 (10/100/1000 MBit/s)	8x RJ45 (10/100 MBit/s)
Presetting	-	-	PROFINET
Order number	2989226	2891123	2989103



Smart Managed Switches



	FL SWITCH SMCS 14TX/2FX-SM	FL SWITCH SMCS 14TX/2FX	FL SWITCH SMCS 16TX
Design	flat	flat	flat
Ports (Transmission speed)	14x RJ45 (10/100MBit/s) 2x FX-SC-Singlemode (100MBit/s)	14x RJ45 (10/100MBit/s) 2x FX-SC-Multimode (100MBit/s)	16x RJ45 (10/100MBit/s)
Presetting	-	-	-
Order number	2701466	2700997	2700996



Automation protocols



Managed Switches 2000

 Easy configuration

 Redundancy

Security 

Profinet and
EtherNet/IP™ support 

 Unmanaged mode 

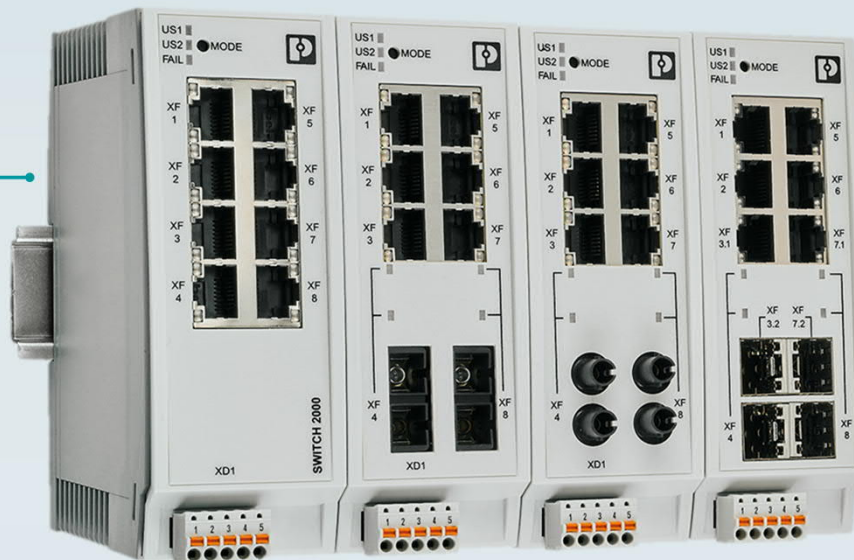
DHCP server 

 Automation protocols

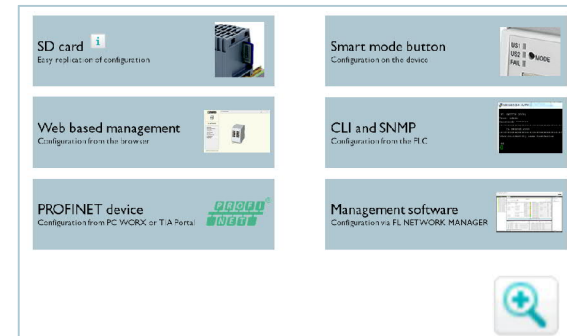


Managed Switches

Easy configuration



- Several options for easy configuration



SD card



Easy replication of configuration



Smart mode button

Configuration on the device



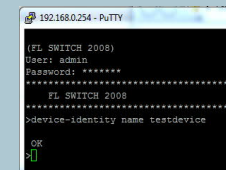
Web based management

Configuration from the browser



CLI and SNMP

Configuration from the PLC



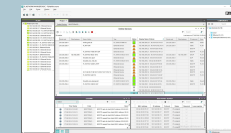
PROFINET device

Configuration from PLCnext Engineer
or TIA Portal



Management software

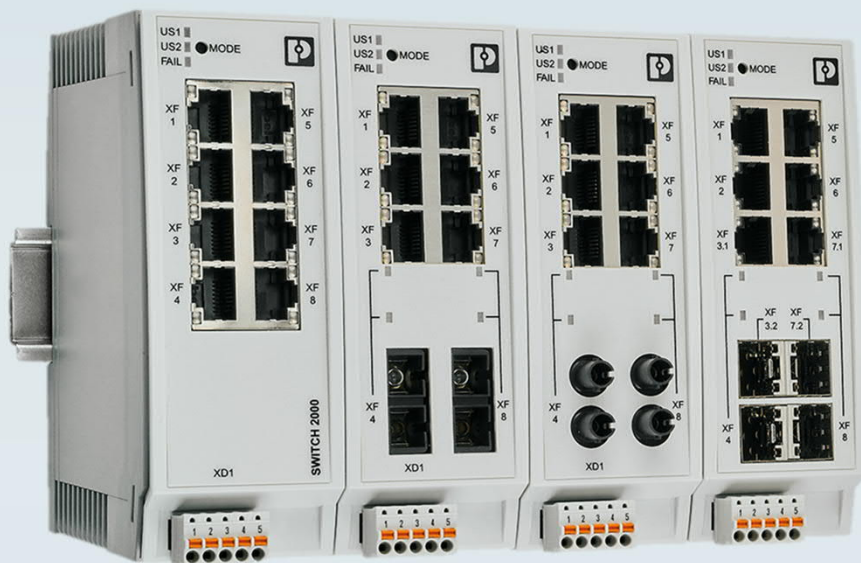
Configuration via FL NETWORK MANAGER



Automation protocols

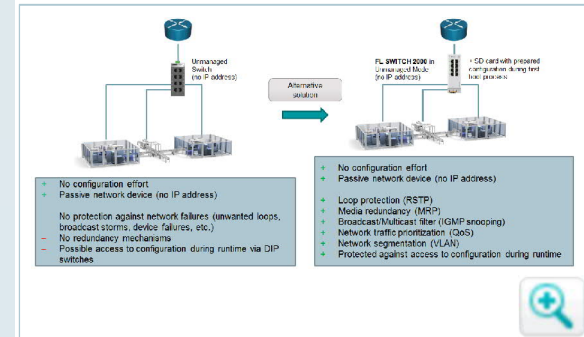


Managed Switches



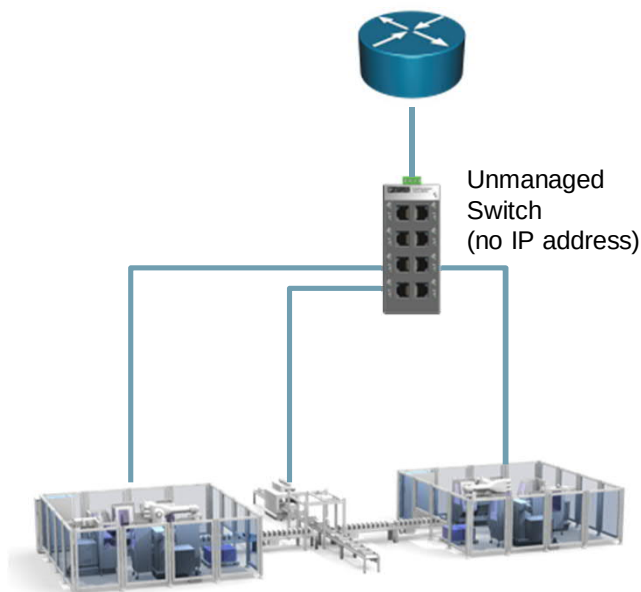
Unmanaged mode

- Operation like unmanaged switch
- No IP configuration
- Enabled management features



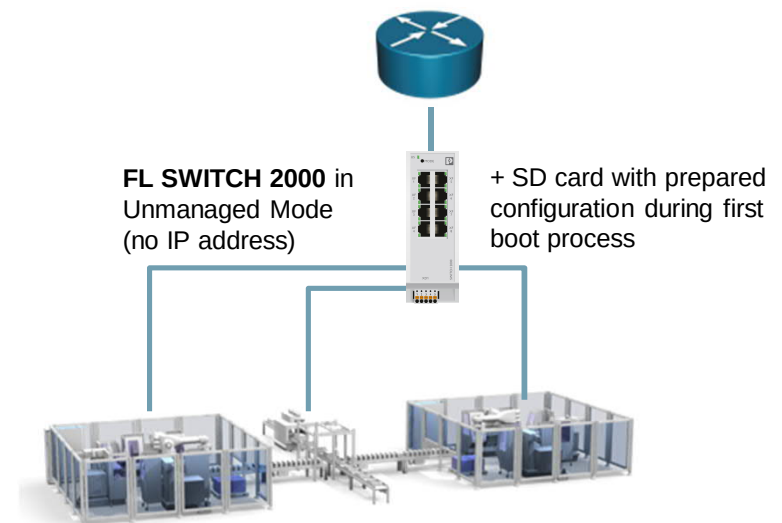
Automation protocols





- + No configuration effort
- + Passive network device (no IP address)
- No protection against network failures (unwanted loops, broadcast storms, device failures, etc.)
- No redundancy mechanisms
- Possible access to configuration during runtime via DIP switches

Alternative
solution



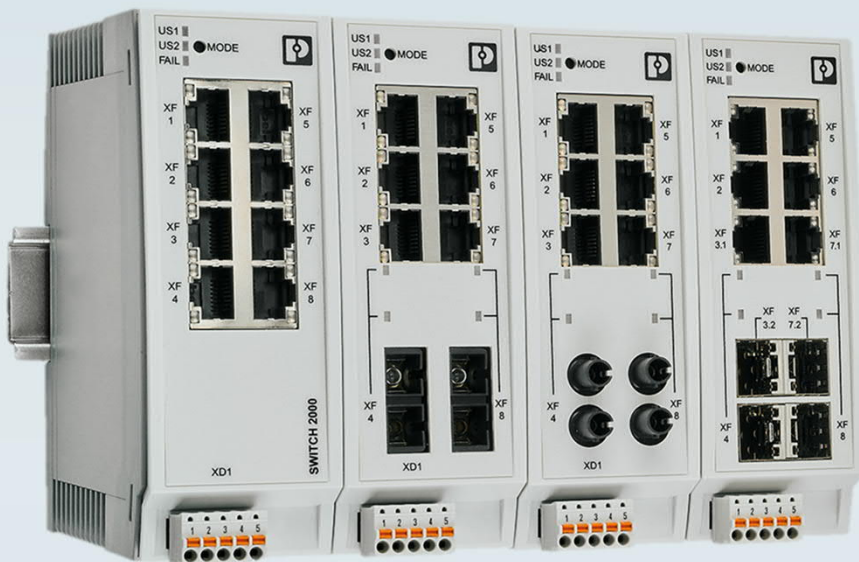
- + No configuration effort
- + Passive network device (no IP address)
- + Loop protection (RSTP)
- + Media redundancy (MRP)
- + Broadcast/Multicast filter (IGMP snooping)
- + Network traffic prioritization (QoS)
- + Network segmentation (VLAN)
- + Protected against access to configuration during runtime



Automation protocols

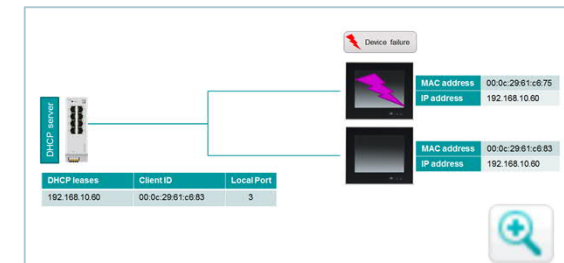


Managed Switches

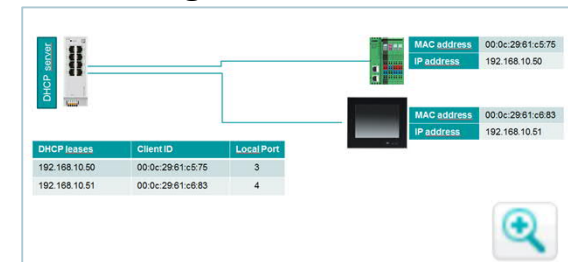


DHCP server

- Device replacement without IP reconfiguration of the network



- Easy IP address assignment*



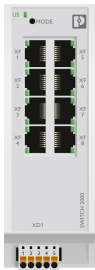
*Only for models 22xx and 23xx



Automation protocols



DHCP server



 Device failure



MAC address 00:0c:29:61:c6:75

IP address 192.168.10.60



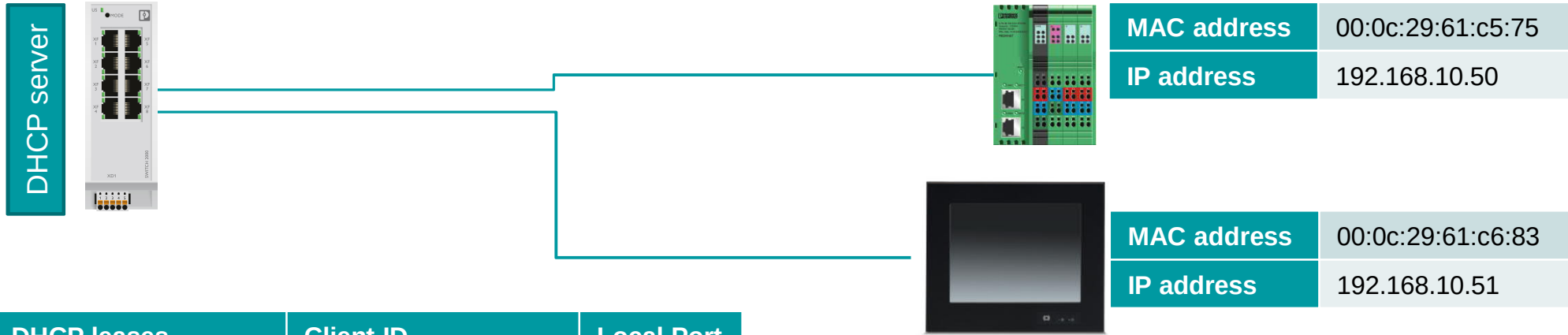
MAC address 00:0c:29:61:c6:83

IP address 192.168.10.60

DHCP leases	Client ID	Local Port
192.168.10.60	00:0c:29:61:c6:83	3

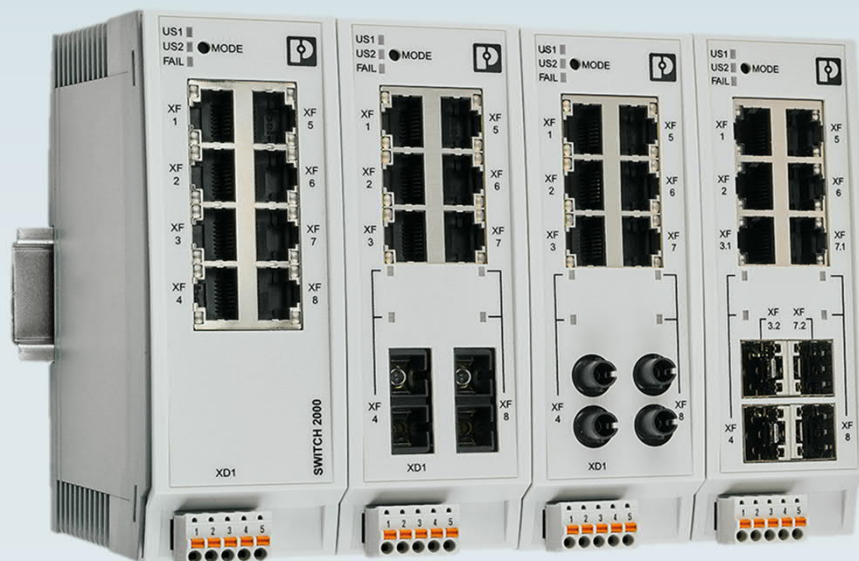
 Automation protocols





DHCP leases	Client ID	Local Port
192.168.10.50	00:0c:29:61:c5:75	3
192.168.10.51	00:0c:29:61:c6:83	4

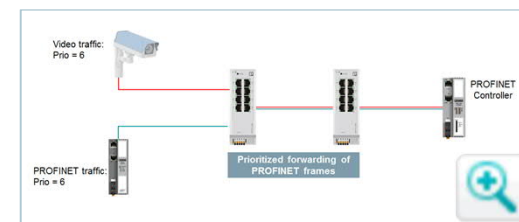
Managed Switches



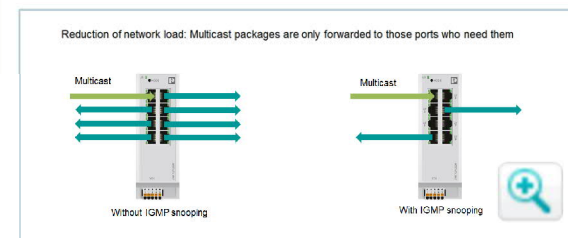
Profinet and
EtherNet/IP™ support



- PROFINET device
- Link Layer Discovery Protocol (LLDP)
- MRP redundancy
- PROFINET prioritization



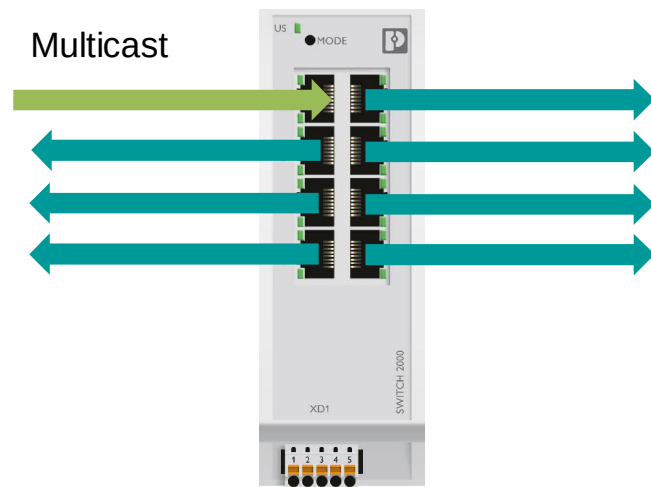
- Extended multicast filtering (IGMP snooping/querier)



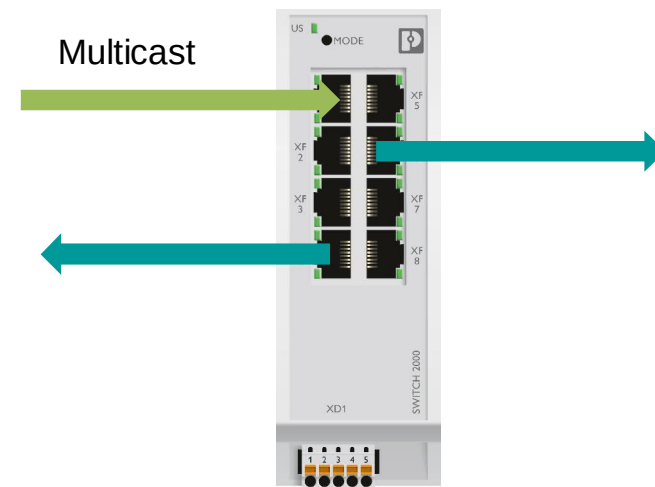
Automation protocols



Reduction of network load: Multicast packages are only forwarded to those ports who need them



Without IGMP snooping

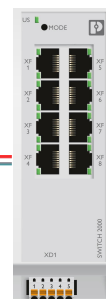


With IGMP snooping

Video traffic:
Prio = 6



PROFINET traffic:
Prio = 6



PROFINET
Controller

Prioritized forwarding of
PROFINET frames



Automation protocols



Managed Switches

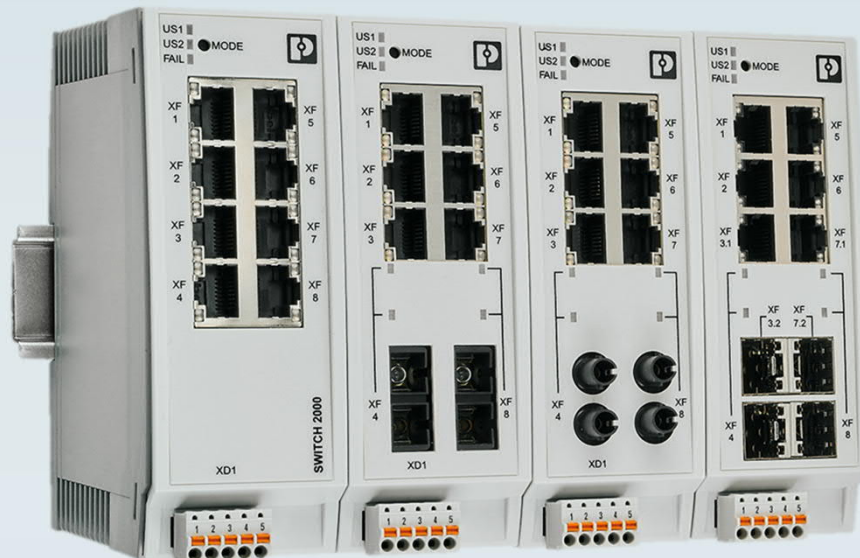
Redundancy



- Media Redundancy Protocol (MRP)
 - Client
 - Manager (optional)*
- Rapid Spanning Tree Protocol (RSTP)
- RSTP Extensions*
 - Fast Ring Detection
 - Large Tree Support

*Only for models 22xx and 23xx

Managed Switches



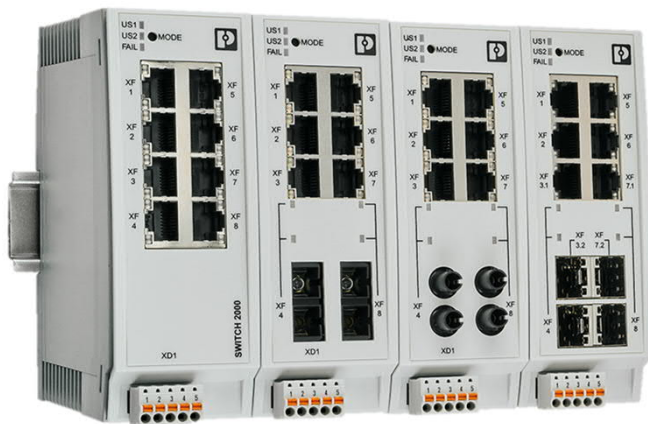
Security

- Secure Interfaces
 - HTTPS
 - SSH
- MAC-based port security*
- RADIUS authentication (IEEE 802.1x)*

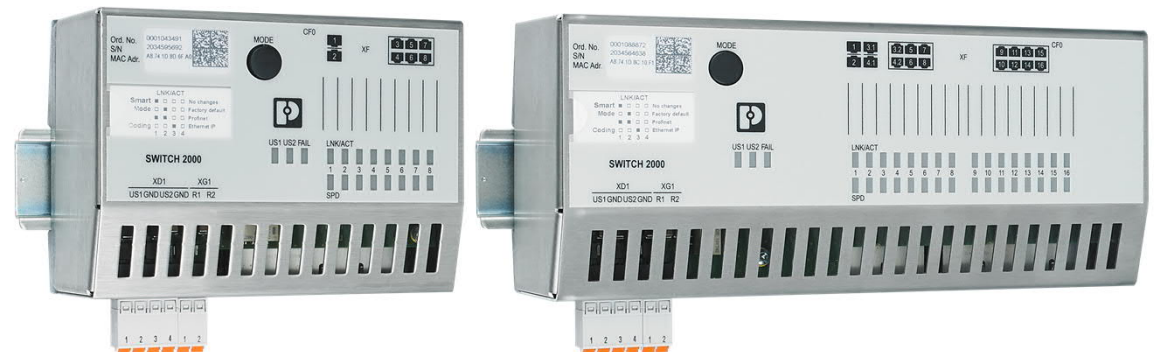
*Only for models 22xx and 23xx

Managed Switches 2000

FL SWITCH 20xx/21xx/22xx/23xx *Varianten in schmaler Bauform*



FL SWITCH 24xx/25xx *Varianten in flacher Bauform*



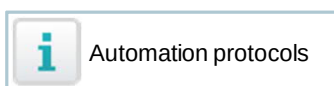
Automation protocols



Managed Switches



	FL SWITCH 2005	FL SWITCH 2008	FL SWITCH 2016	FL SWITCH 2105	FL SWITCH 2108	FL SWITCH 2116
Ports	5 x RJ45	8 x RJ45	16 x RJ45	5 x RJ45	8 x RJ45	16 x RJ45
Transmission speed	10/100 MBit/s	10/100 MBit/s	10/100 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s
Operating temperature	0 °C...60 °C	0 °C...60 °C	0 °C...60 °C	0 °C...60 °C	0 °C...60 °C	0 °C...60 °C
Presetting	-	-	-	-	-	-
Order number	2702323	2702324	2702903	2702665	2702666	2702908



Managed Switches



**FL SWITCH
2205**

**FL SWITCH
2208**

**FL SWITCH
2208 PN**

**FL SWITCH
2207-FX**

**FL SWITCH
2207-FX SM**

Ports

5 x RJ45

8 x RJ45

8 x RJ45

7 x RJ45
1 x SC-MM

7 x RJ45
1 x SC-SM

Transmission
speed

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

Operating
temperature

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

Presetting

-

-

PROFINET

-

-

Order number

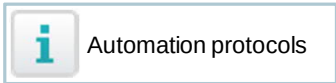
2702326

2702327

1044024

2702328

2702329



Managed Switches



	FL SWITCH 2206-2FX	FL SWITCH 2206-2FX SM	FL SWITCH 2206-2FX ST	FL SWITCH 2206-2FX SM ST
Ports	6 x RJ45 2 x SC-MM	6 x RJ45 2 x SC-SM	6 x RJ45 2 x ST-MM	6 x RJ45 2 x ST-SM
Transmission speed	10/100 MBit/s	10/100 MBit/s	10/100 MBit/s	10/100 MBit/s
Operating temperature	-40 °C...70 °C	-40 °C...70 °C	-40 °C...70 °C	-40 °C...70 °C
Presetting	-	-	-	-
Order number	2702330	2702331	2702332	2702333

Managed Switches



**FL SWITCH
2206-2SFX**

**FL SWITCH
2206-2SFX PN**

**FL SWITCH 2204-2TC-
2SFX**

**FL SWITCH
2216**

**FL SWITCH
2216 PN**

Ports

6 x RJ45
2 x SFX

6 x RJ45
2 x SFX

4 x RJ45
2 x Fast Ethernet combo
2 x SFX

16 x RJ45

16 x RJ45

Transmission
speed

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

Operating
temperature

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

Presetting

-

PROFINET

-

-

PROFINET

Order number

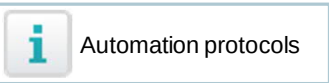
2702969

1044028

2702334

2702904

1044029



Managed Switches



**FL SWITCH
2214-2FX**

**FL SWITCH
2214-2SFX**

**FL SWITCH
2214-2SFX PN**

**FL SWITCH
2214-2FX SM**

**FL SWITCH 2212-2TC-
2SFX**

Ports

14 x RJ45
2 x SC MM

14 x RJ45
2 x SFX

14 x RJ45
2 x SFX

14 x RJ45
2 x SC SM

12 x RJ45
2 x SFX
2 x Fast Ethernet combo

Transmission
speed

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

Operating
temperature

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

-40 °C...70 °C

Presetting

-

-

PROFINET

-

-

Order number

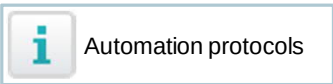
2702905

1006188

1044030

2702906

2702907



Managed Switches



	FL SWITCH 2308	FL SWITCH 2308 PN	FL SWITCH 2304-2GC-2SFP	FL SWITCH 2306-2SFP	FL SWITCH 2306-2SFP PN
Ports	8 x RJ45	8 x RJ45	4 x RJ45 2 x Gigabit combo 2 x SFP	6 x RJ45 2 x SFP	6 x RJ45 2 x SFP
Transmission speed	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s
Operating temperature	-40 °C...70 °C	-40 °C...70 °C	-40 °C...70 °C	-40 °C...70 °C	-40 °C...70 °C
Presetting	-	PROFINET	-	-	PROFINET
Order number	2702652	1009220	2702653	2702970	1009222



Managed Switches



FL SWITCH 2316

FL SWITCH
2316 PN

FL SWITCH
2314-2SFP

FL SWITCH
2314-2SFP PN

FL SWITCH
2312-2GC-2SFP



Ports	16 x RJ45	16 x RJ45	14 x RJ45 2 x SFP	14 x RJ45 2 x SFP	12 x RJ45 2 x Gigabit combo 2 x SFP
Transmission speed	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s
Operating temperature	-40 °C...70 °C	-40 °C...70 °C	-40 °C...70 °C	-40 °C...70 °C	-40 °C...70 °C
Presetting	-	PROFINET	-	PROFINET	-
Order number	2702909	1031673	1006191	1031683	2702910

Automation protocols



Managed Switches



FL SWITCH 2408

**FL SWITCH
2406-2SFX**

**FL SWITCH 2404-2TC-
2SFX**

**FL SWITCH
2408 PN**

**FL SWITCH
2406-2SFX PN**

Ports

8 x RJ45

6 x RJ45
2 x SFX

4 x RJ45
2 x Fast Ethernet Combo
2 x SFX

8 x RJ45

6 x RJ45
2 x SFX

Transmission
speed

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

10/100 MBit/s

Operating
temperature

-40°C – 70°C

-40°C – 70°C

-40°C – 70°C

-40°C – 70°C

-40°C – 70°C

Presetting

-

-

-

Profinet

Profinet

Order number

1043412

1043414

1088853

1089133

1089126



Automation protocols



Managed Switches



	FL SWITCH 2416	FL SWITCH 2414-2SFX	FL SWITCH 2412-2TC- 2SFX	FL SWITCH 2416 PN	FL SWITCH 2414-2SFX PN
Ports	16 x RJ45	14 x RJ45 2 x SFX	12 x RJ45 2 x Fast Ethernet Combo 2 x SFX	16 x RJ45	14 x RJ45 2 x SFX
Transmission speed	10/100 MBit/s	10/100 MBit/s	10/100 MBit/s	10/100 MBit/s	10/100 MBit/s
Operating temperature	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C
Presetting	-	-	-	Profinet	Profinet
Order number	1043416	1043423	1088875	1089150	1089139

Managed Switches

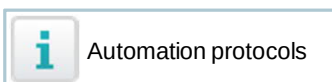


	FL SWITCH 2508	FL SWITCH 2506-2SFP	FL SWITCH 2504-2GC-2SFP	FL SWITCH 2508 PN	FL SWITCH 2506-2SFP PN
Ports	8 x RJ45	6 x RJ45 2 x SFP	4 x RJ45 2 x Gigabit Combo 2 x SFP	8 x RJ45	6 x RJ45 2 x SFP
Transmission speed	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s
Operating temperature	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C
Presetting	-	-	-	Profinet	Profinet
Order number	1043484	1043491	1088872	1089134	1089135

Managed Switches



	FL SWITCH 2516	FL SWITCH 2514-2SFP	FL SWITCH 2512-2GC-2SFP	FL SWITCH 2516 PN	FL SWITCH 2514-2SFP PN
Ports	16 x RJ45	14 x RJ45 2 x SFP	12 x RJ45 2 x Gigabit Combo 2 x SFP	16 x RJ45	14 x RJ45 2 x SFP
Transmission speed	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s	10/100/1000 MBit/s
Operating temperature	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C	-40°C – 70°C
Presetting	-	-	-	Profinet	Profinet
Order number	1043496	1043499	1088856	1089205	1089154



Switch 3000/4000

Easy configuration
and diagnostics

 Comprehensive
security functions



Variants for
IEC 61850

 Fast redundancy
mechanisms for
large networks 

Wide temperature
range

Switch 3000/4000



Fast
redundancy
mechanisms
for large
networks

- Combination of IEEE functions and extended ring redundancy
- Switch-over times of 15 ms with several hundred switches in the ring
- Coupling of multiple rings



Automation protocols



Switch 3000/4000



Variants for
IEC 61850

- Particularly high immunity to electromagnetic and electrostatic interference
- Extended temperature range
- Extreme shock and vibration resistance
- Redundant, replaceable power supply and special operating voltages (optional)



Automation protocols

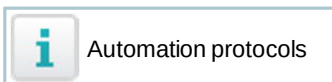


Switch 3000/4000

Comprehensive
security functions



- Secure interfaces
- SNMPv3
- HTTPS
- MAC-based port security
- RADIUS Authentication (802.1x)



Automation protocols



Switch 3000/4000



	FL SWITCH 3005	FL SWITCH 3005T	FL SWITCH 3008	FL SWITCH 3008T	FL SWITCH 3016	FL SWITCH 3016T	FL SWITCH 3016E
Ports (Transmission speed)	5x RJ45 (10/100 Mbit/s)	5x RJ45 (10/100 Mbit/s)	8x RJ45 (10/100 Mbit/s)	8x RJ45 (10/100 Mbit/s)	16x RJ45 (10/100 Mbit/s)	16x RJ45 (10/100 Mbit/s)	16x RJ45 (10/100 Mbit/s)
Temperature range	-10 °C ... +60 °C	-40 °C ... +75 °C	-10 °C ... +60 °C	-40 °C ... +75 °C	-10 °C ... +60 °C	-40 °C ... +75 °C	-40 °C ... +75 °C
IEC61850-3/ IEEE1613	No	No	No	No	No	No	Yes
Special features	-	-	-	ATEX approval	-	-	-
Order number	2891030	2891032	2891031	2891035	2891058	2891059	2891066

Switch 3000/4000



	FL SWITCH 3004T-FX	FL SWITCH 3004T-FX ST	FL SWITCH 3006T-2FX	FL SWITCH 3006T-2FX ST	FL SWITCH 3006T-2FX SM
Ports (Transmission speed)	4x RJ45 (10/100 Mbit/s) 1x FX-SC-Multimode	4x RJ45 (10/100 Mbit/s) 1x FX-ST-Multimode	6x RJ45 (10/100 Mbit/s) 2x FX-SC-Multimode	6x RJ45 (10/100 Mbit/s) 2x FX-ST-Multimode	6x RJ45 (10/100 Mbit/s) 2x FX-SC-Singlemode
Temperature range	-40 °C ... +75 °C	-40 °C ... +75 °C	-40 °C ... +75 °C	-40 °C ... +75 °C	-40 °C ... +70 °C
IEC61850-3/ IEEE1613	No	No	No	No	No
Special features	-	-	ATEX approval	-	-
Order number	2891033	2891034	2891036	2891037	2891060

Switch 3000/4000



	FL SWITCH 3012E-2SFX	FL SWITCH 3012E-2SFX	FL SWITCH 3012E-2FX	FL SWITCH 3012E-2FX SM
Ports (Transmission speed)	12x RJ45 (10/100 Mbit/s) 2x SFP slots (100MBit/s)	12x RJ45 (10/100 Mbit/s) 2x SFP (100 Mbit/s)	12x RJ45 (10/100 Mbit/s) 2x MM FX-SC (100 Mbit/s)	12x RJ45 (10/100 Mbit/s) 2x SM FX-SC (100 Mbit/s)
Temperature range	-40 °C ... +70 °C	-40 °C ... 70 °C	-40 °C ... 70 °C	-40 °C ... 70 °C
IEC61850-3/ IEEE1613	Yes	Yes	Yes	Yes
Special features	-	-	-	-
Order number	2891067	2891067	2891120	2891119

Switch 3000/4000



	FL SWITCH 4008T-2SFP - Ex	FL SWITCH 4008T-2GT-3FX SM	FL SWITCH 4008T-2GT-4FX SM	FL SWITCH 4012T-2GT-2FX	FL SWITCH 4012T-2GT-2FX ST
Ports (Transmission speed)	8x RJ45 (10/100 Mbit/s) 2x SFP slots (1000 Mbit/s)	10x RJ45 (8x 10/100 Mbit/s und 2x 10/100/1000 MBit/s) 3x FX-SC-D (100 Mbit/s)	10x RJ45 (8x 10/100 Mbit/s und 2x 10/100/1000 MBit/s) 4x FX-SC-D (100 Mbit/s)	14x RJ45 (12x 10/100 Mbit/s und 2x 10/100/1000 MBit/s) 2x FX-SC-D (100 Mbit/s)	14x RJ45 (12x 10/100 Mbit/s und 2x 10/100/ 1000 MBit/s) 2x FX-ST (100 Mbit/s)
Temperature range	-40 °C ... +75 °C	-40 °C ... +75 °C	-40 °C ... +75 °C	-40 °C ... +75 °C	-40 °C ... +75 °C
IEC61850-3/ IEEE1613	No	No	No	No	No
Special features	ATEX approval				
Order number	2891062	2891160	2891061	2891063	2891161



Automation protocols



INSPIRING INNOVATIONS

Switch 3000/4000



**FL SWITCH
4808E-16FX LC-
4GC**

**FL SWITCH
4808E-16FX SM-
4GC**

**FL SWITCH
4808E-16FX-4GC**

**FL SWITCH
4808E-16FX SM
LC-4GC**

**FL SWITCH
4824E-4GC**

Ports
(Transmission
speed)

8x RJ45
(10/100 Mbit/s)
16x LC-MM
(100 Mbit/s)
4x Gigabit combo
(1000MBit/s)

8x RJ45
(10/100 Mbit/s)
16x SC-D SM
(100 Mbit/s)
4x Gigabit combo
(1000MBit/s)

8x RJ45
(10/100 Mbit/s)
16x SC-D MM
(100 Mbit/s)
4x Gigabit combo
(1000MBit/s)

8x RJ45
(10/100 Mbit/s)
16x LC-MM
(100 Mbit/s)
4x Gigabit combo
(1000MBit/s)

24x RJ45
(10/100 Mbit/s)

4x Gigabit combo
(1000MBit/s)

Temperature
range

-40 °C ...
+70 °C

-40 °C ...
+70 °C

-40 °C ...
+70 °C

-40 °C ...
+70 °C

-40 °C ...
+70 °C

IEC61850-3/
IEEE1613

Yes

Yes

Yes

Yes

Yes

Special features

Order number

2891073

2891080

2891079

2891074

2891072



Automation protocols



**PHOENIX
CONTACT**
INSPIRING INNOVATIONS

Switch 3000/4000



	FL SWITCH 4808E-16FX ST- 4GC	FL SWITCH 4808E-16FX SM ST-4GC	FL SWITCH 4800E-24FX-4GC	FL SWITCH 4800E-24FX SM- 4GC
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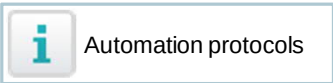
Ports (Transmission speed)	8x RJ45 (10/100 Mbit/s) 16x ST-MM (100 Mbit/s) 4x Gigabit combo (1000MBit/s)	8x RJ45 (10/100 Mbit/s) 16x ST SM (100 Mbit/s) 4x Gigabit combo (1000MBit/s)	24x SC MM (100 Mbit/s) 4x Gigabit combo (1000MBit/s)	24x SC SM (100 Mbit/s) 4x Gigabit combo (1000MBit/s)
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Temperature range	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C
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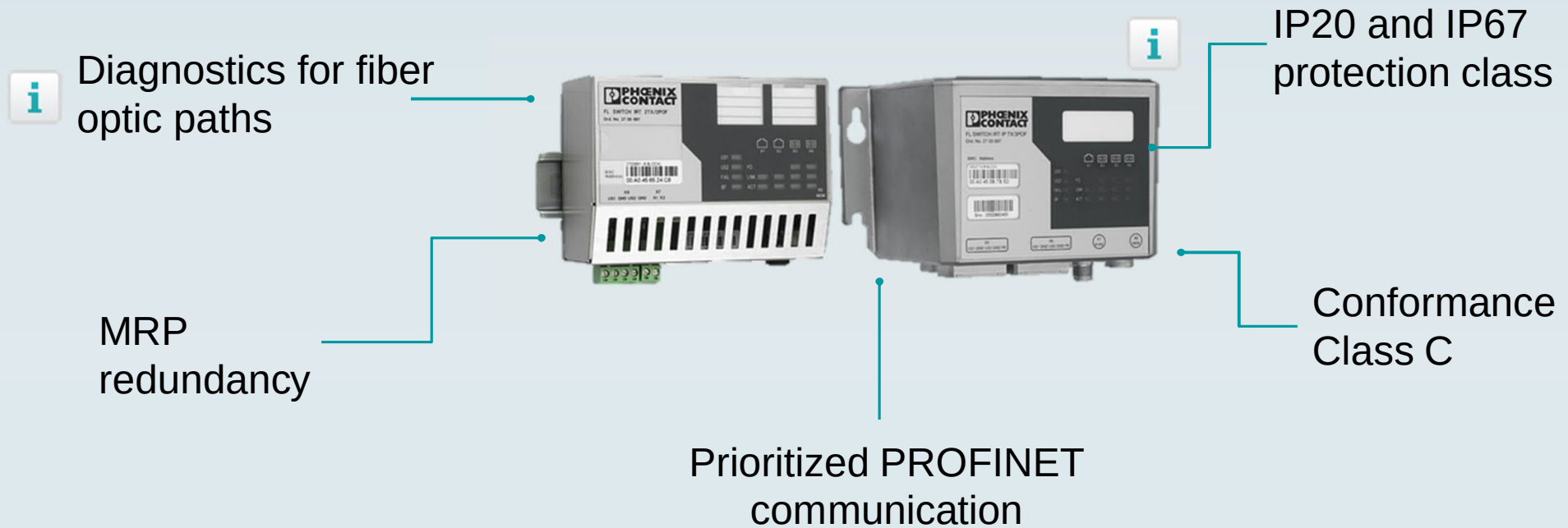
IEC61850-3/ IEEE1613	Yes	Yes	Yes	Yes
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Special features

Order number	2891085	2891086	2891102	2891104
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Switches für PROFINET IRT



Automation protocols

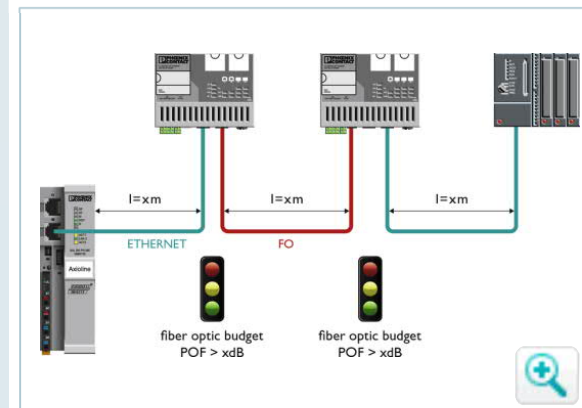


Switches für PROFINET IRT

Diagnostics
for fiber optic
paths

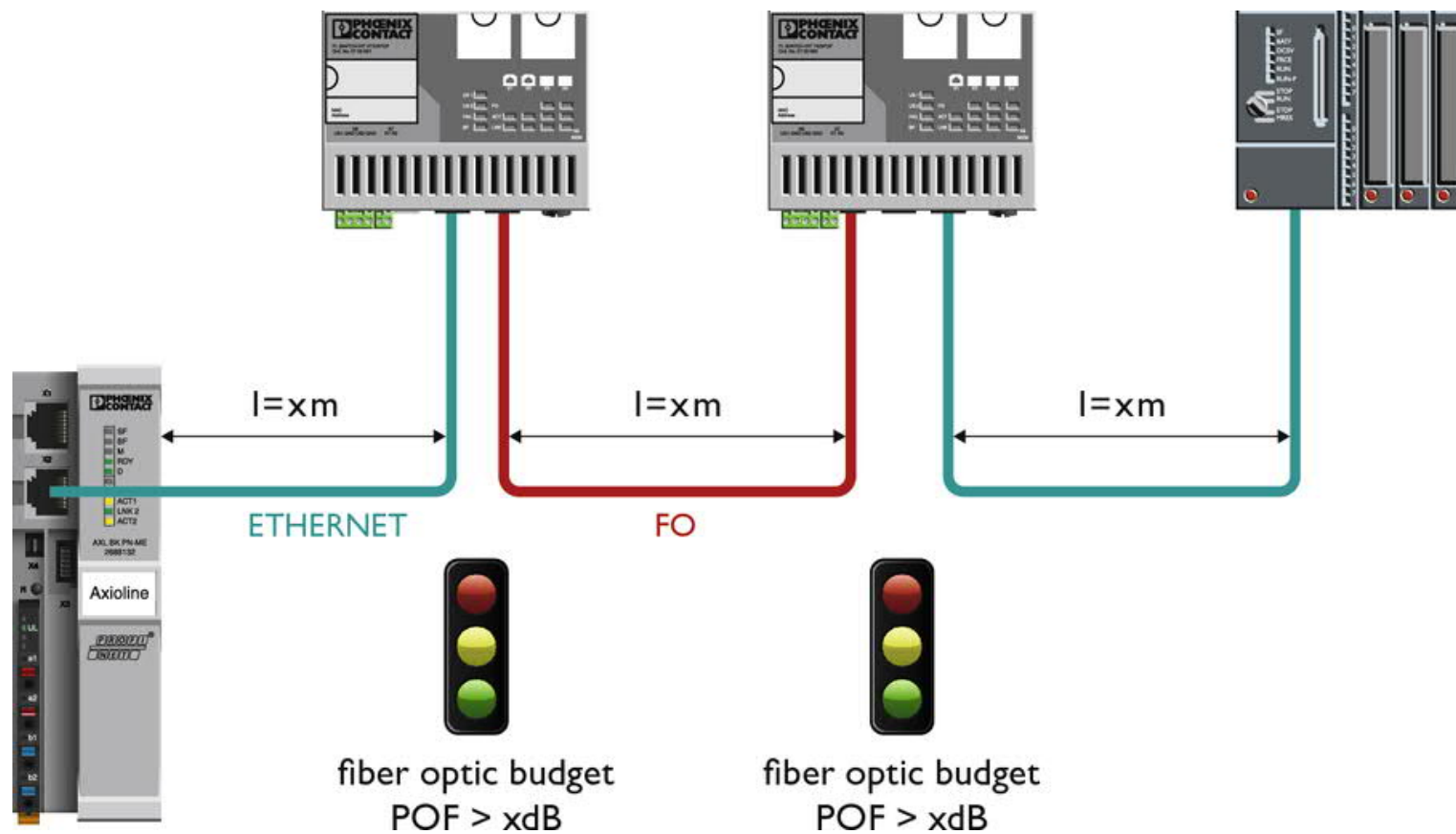


- Proactive maintenance for increased availability and less downtime
- Improved assessment of the path quality through simultaneous length measurement



Automation protocols





Automation protocols



Switches für PROFINET IRT



FL SWITCH IRT 4TX



**FL SWITCH IRT 2TX
2POF**



**FL SWITCH IRT TX
3POF**



**FL SWITCH IRT IP
TX/3POF**

Ports
(Transmission
speed)

4x RJ45
(10/100 Mbit/s)

2x RJ45
(10/100 Mbit/s)
2x POF SC-RJ
(100 Mbit/s)

1x RJ45
(10/100 Mbit/s)
3x POF SC-RJ
(100 Mbit/s)

1x RJ45 Push Pull
(10/100 Mbit/s)
3x POF SC-RJ Push
Pull (100 Mbit/s)

Degree of
protection

IP20

IP20

IP20

IP67

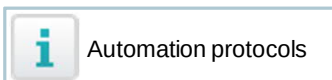
Order number

2700689

2700691

2700692

2700697



NAT Switch

 IP-Masquerading

Flexible WAN/LAN
port configuration

L3-Routing and
L2-Switching



1:1 NAT 

 Cost-effective integration
into higher-level networks

Virtual NAT 

Port Forwarding 

 Automation protocols

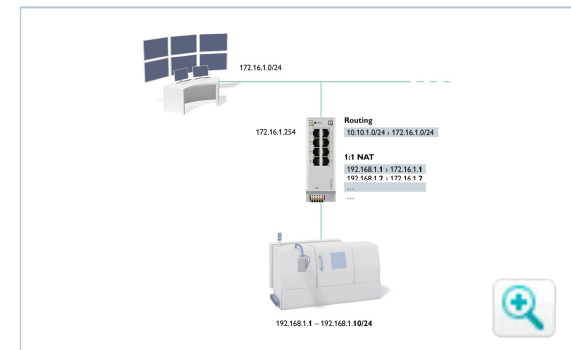


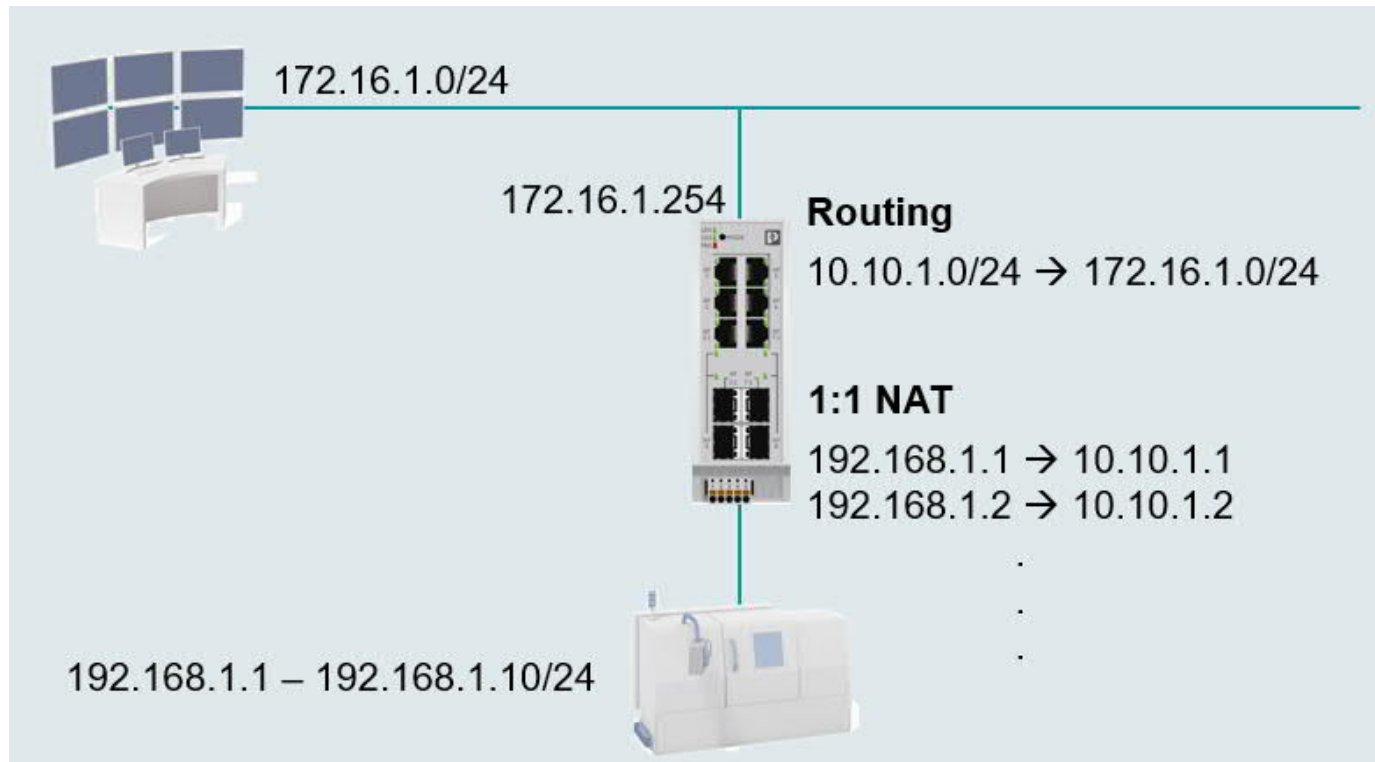
NAT Switch



Virtual NAT

- Integration of machines with the same IP address into higher-level networks
- Thanks to a virtual intermediate level, only one IP address is needed in the higher-level network



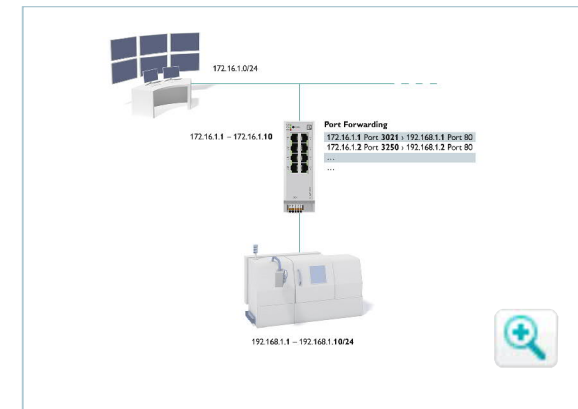


NAT Switch



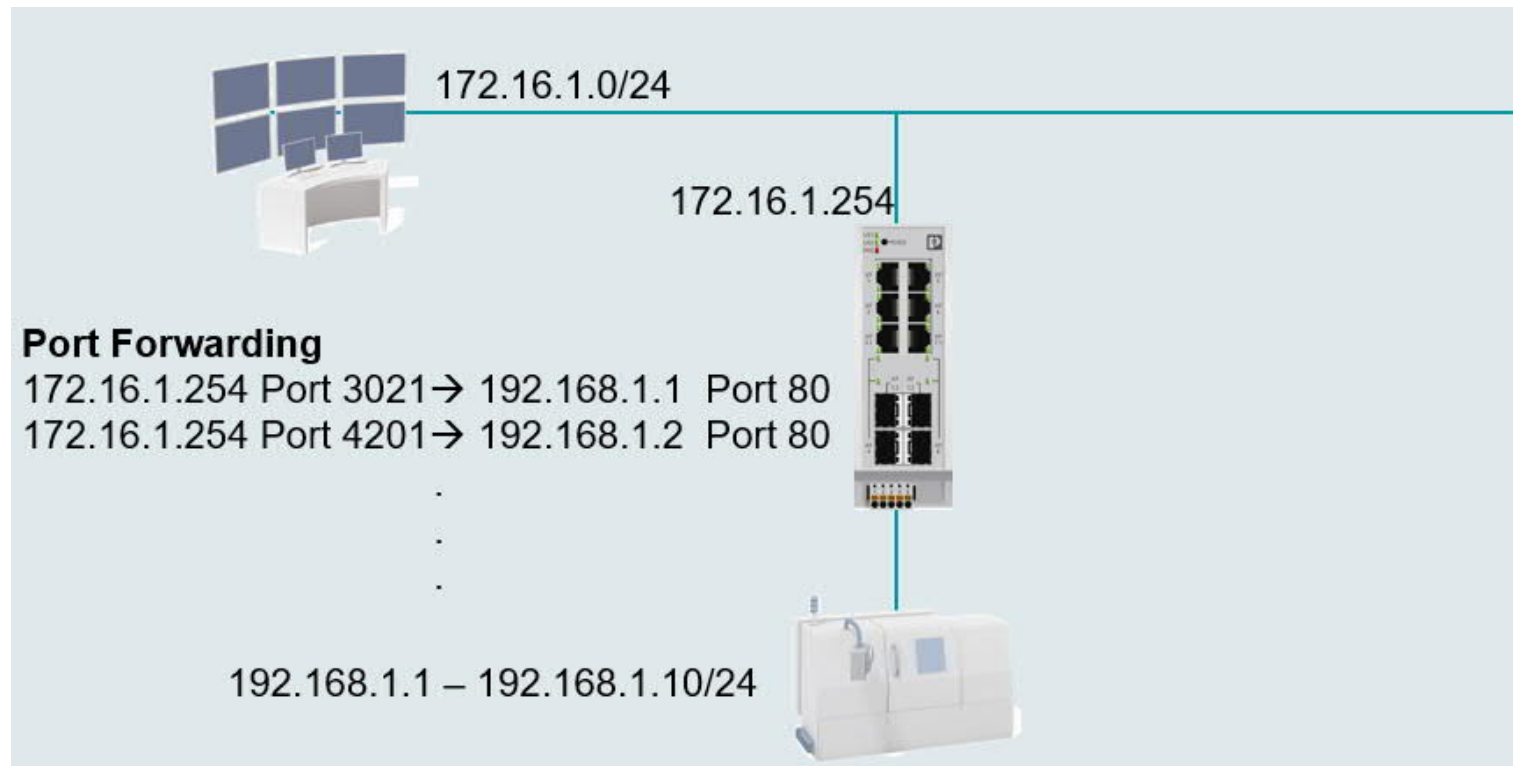
Port Forwarding

- Makes services of LAN devices reachable from WAN network



Automation protocols



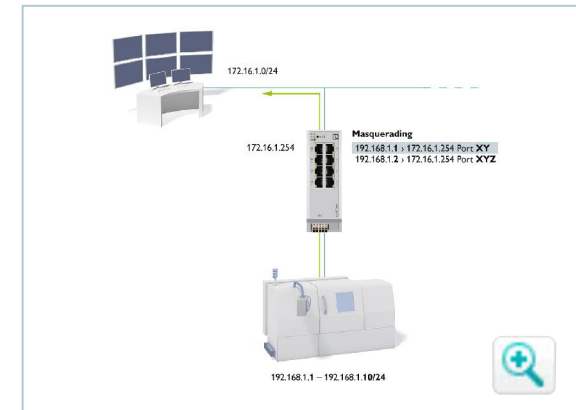


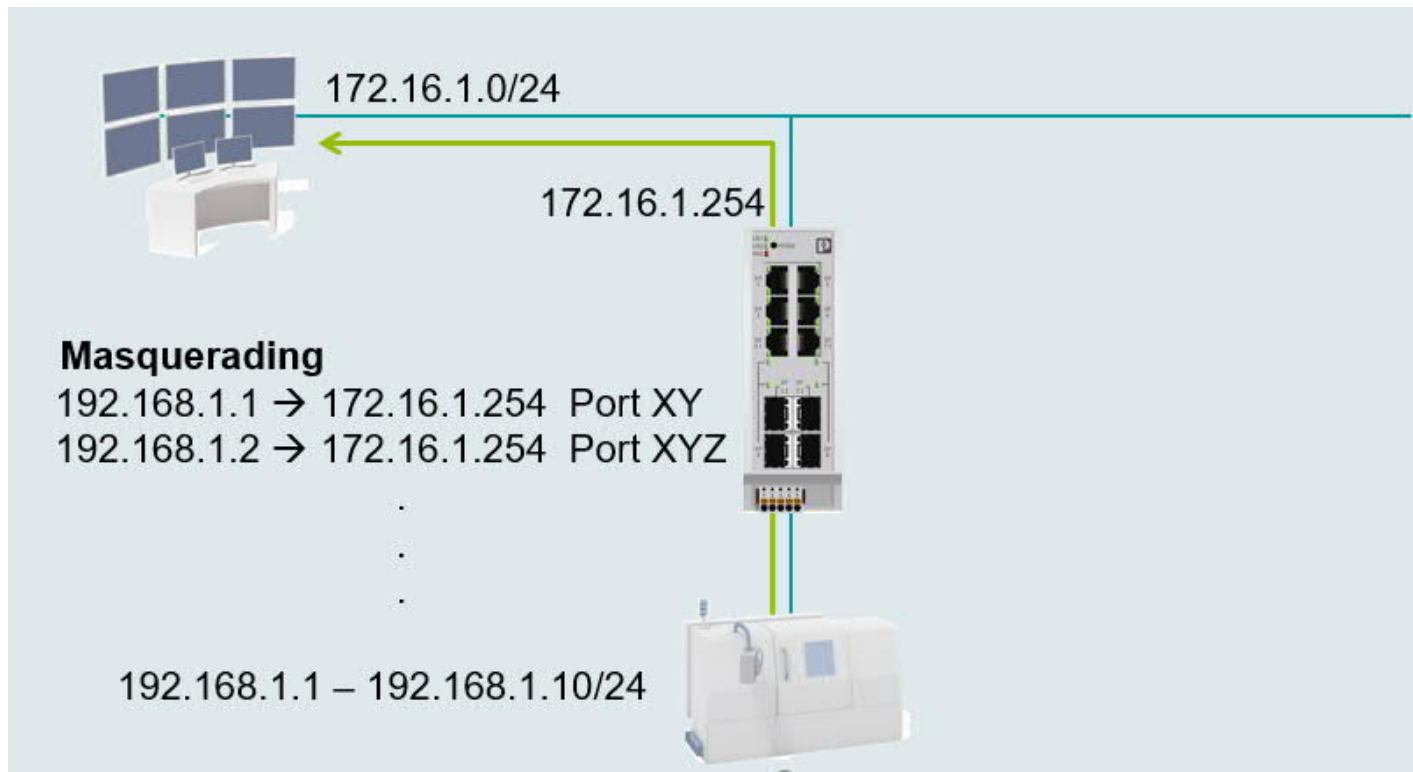
NAT Switch

IP Masquerading



- NAT device works as a representative for LAN devices
- Differentiation of LAN members via different TCP/UDP ports



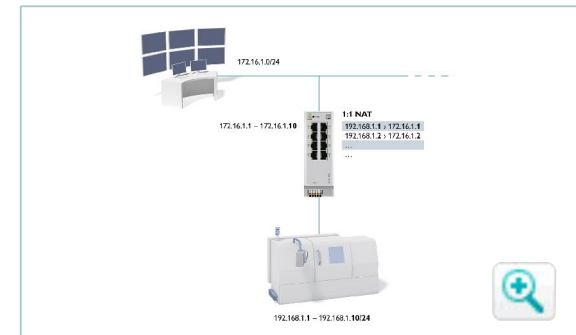


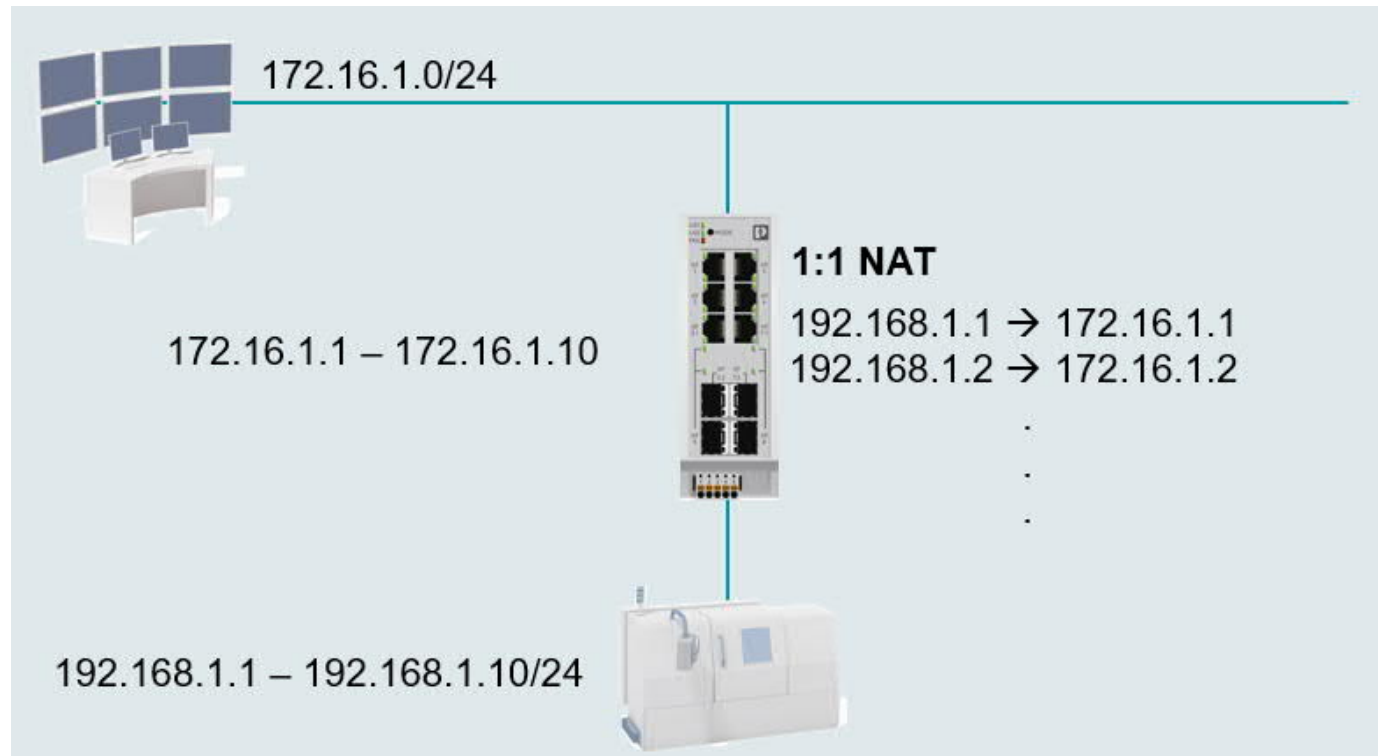
NAT Switch



1:1 NAT

- Parallel operation of identical machines in one network
- Save configuration time





NAT Switch



FL NAT 2008

FL NAT 2208

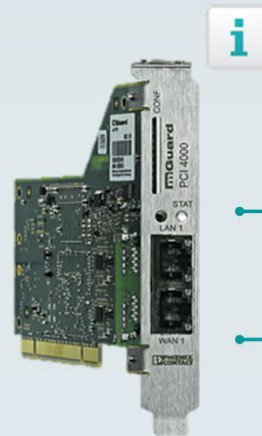
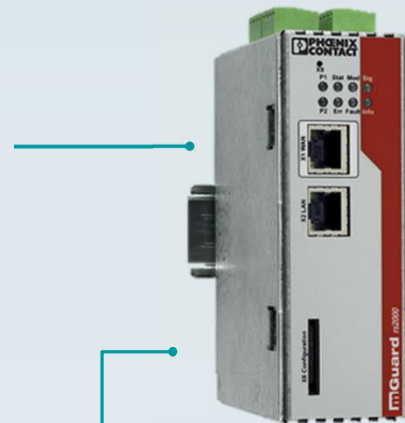
FL NAT 2304-2GC-2SFP

Ports	8 x RJ45	8 x RJ45	4 x RJ45 2 x Gigabit combo 2 x SFP
Transmission speed	10/100 MBit/s	10/100 MBit/s	10/100/1000 MBit/s
Operating temperature	0 °C...60 °C	-40 °C...70 °C	-40 °C...70 °C
Feature set	Basic	Extended	Extended
Order number	2702881	2702882	2702981

Mounting rail devices and PCI cards

Optimized designs for
different industrial
applications 

Quick and easy
configuration 



 Firewall and VPN

Functions especially tailored
to industrial applications 



Mounting rail devices and PCI cards

Optimized designs
for different
industrial
applications



- Slim



- Flat



- PCI(E)



Mounting rail devices and PCI cards

Quick and easy
configuration



- Web interface
- Optional configuration memory on SD card



Mounting rail devices and PCI cards



Functions
especially
tailored to
industrial
applications

- Conditional firewall
- User firewall
- DPI (OPC Inspector)
- Firewall and VPN redundancy
- Switchable via I/Os



Mounting rail devices and PCI cards



	FL MGuard RS2000 TX/TX-B	FL MGuard RS2000 TX/TX VPN	FL MGuard RS2005 TX VPN	TC MGuard RS2000 3G VPN
VPN tunnel	-	2	2	2
optionally expandable	-	-	-	-
Firewall	2-Click-Firewall	2-Click-Firewall	2-Click-Firewall	2-Click-Firewall
Integrated switch			5-Port unmanaged	4-Port unmanaged
Special features	-	-	-	Mobilfunk
Extended functionalities	No	No	No	No
Order number	2702139	2700642	2701875	2903441



Mounting rail devices and PCI cards



**FL MGuard
RS4000 TX/TX
VPN**

**FL MGuard
RS4000 TX/TX
VPN-M**

**FL MGuard
RS4000 TX/TX-P**

**FL MGuard
RS4004 TX/
DTX**

**FL MGuard
RS4004 TX/
DTX VPN**

**TC MGuard
RS4000 3G
VPN**

VPN tunnel optionally expandable	- up to 250	10 up to 250	10 up to 250	10 up to 250	- up to 250	10 up to 250	10 up to 250
Firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall
Integrated switch	-	-	-	-	4-Port managed	4-Port managed	4-Port managed
Special features	-	-	Maritime approvals	ATEX, IECex approvals	DMZ-Port	DMZ-Port	WAN, mobile phone network
Extended functionalities	Optional	Optional	Optional	Optional	Optional	Optional	Optional
Order number	2700634	2200515	2702465	2702259	2701876	2701877	2903440



Mounting rail devices and PCI cards



	FL MGuard GT/GT	FL MGuard GT/GT VPN	FL MGuard PCI4000	FL MGuard PCI4000 VPN	FL MGuard PCIE4000	FL MGuard PCIE4000 VPN
VPN tunnel optionally expandable	- up to 250	10 up to 250	- up to 250	10 up to 250	- up to 250	10 up to 250
Firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall
Integrated switch	-	-	-	-	-	-
Special features	Gigabit, SFP, maritime Zulassung	Gigabit, SFP, maritime Zulassung	PCI-Format	PCI-Format	PCIE-Format	PCIE-Format
Extended functionalities	Optional	Optional	Optional	Optional	Optional	Optional
Order number	2700197	2700198	2701274	2701275	2701277	2701278



Other Designs



Optimized designs for different industrial applications



Firewall and VPN



Functions especially tailored to industrial applications



Quick and easy configuration



Other Designs

Optimized
designs for
different
industrial
applications



- Portable use



- Desktop applications



- Installation in a 19" rack



Other Designs



Quick and easy
configuration

- Web interface
- Optional configuration memory on SD card



Other Designs



Functions
especially tailored
to industrial
applications

- Conditional firewall
- User firewall
- DPI (OPC Inspector)
- Firewall and VPN redundancy



Other Designs



**FL MGuard
SMART2**



**FL MGuard
SMART2 VPN**



**FL MGuard
DELTA TX/TX**



**FL MGuard
DELTA TX/TX
VPN**

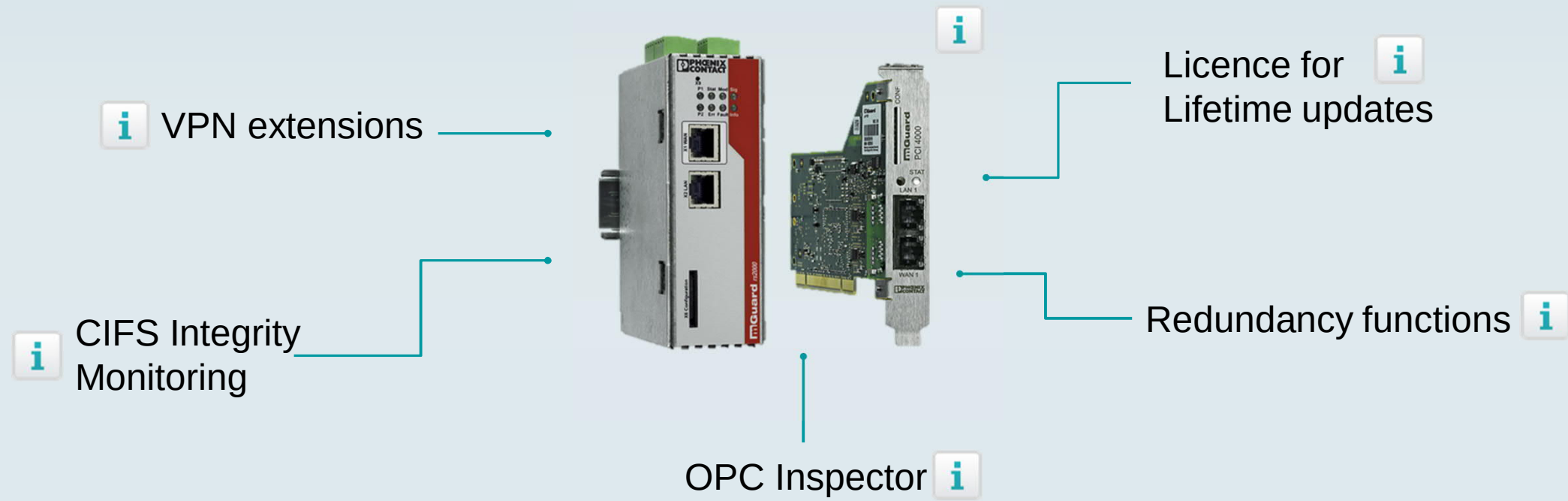


**FL MGuard
CENTERPORT**

Application area	Mobile	Mobile	Desktop	Desktop	19" rack
VPN-Tunnel optionally expandable	- up to 250	10 up to 250	- up to 250	10 up to 250	- up to 3000
Firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall	Multifunction firewall
Special features	USB	USB	230 V	230 V	High performance
Extended functionalities	Optional	Optional	Optional	Optional	Optional
Order number	2700640	2700639	2700967	2700968	2702547



Extended functionalities



Extended functionalities



Licence for
Lifetime
updates

- Lifetime licence for actualization of the software
- Ideal protection for your network



Extended functionalities



Redundancy
functions

- Higher availability
- For Firewall or for Firewall & VPN

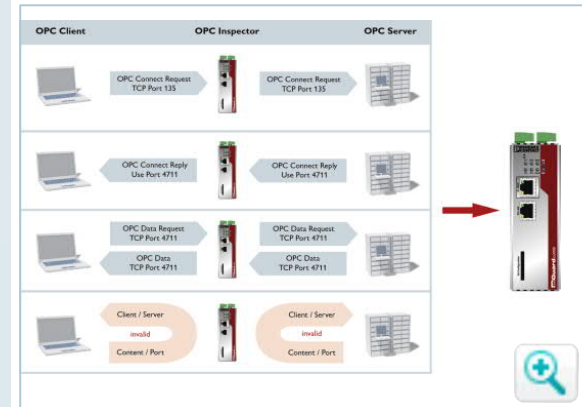


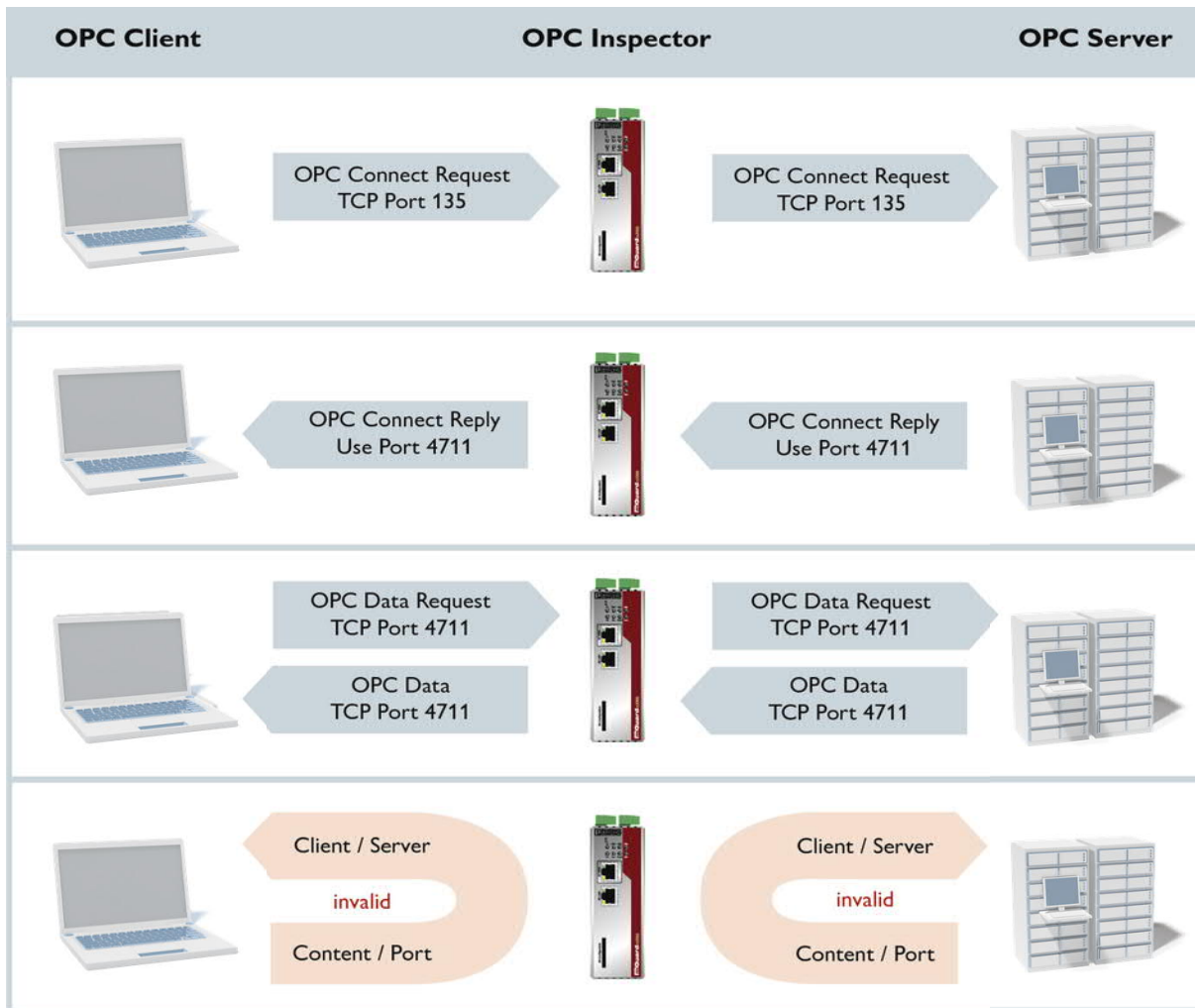
Extended functionalities



OPC Inspector

- Deep Package Inspection for OPC Classic
- Stateful Inspection Firewall for OPC Classic



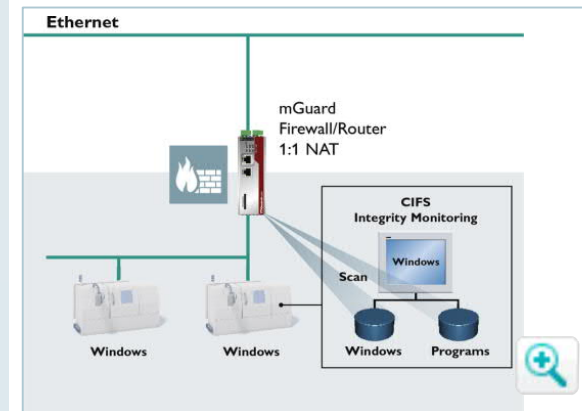


Extended functionalities

CIFS Integrity Monitoring

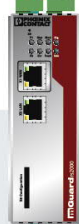


- Ideal for non patchable systems
- Detection of system changes



Ethernet

mGuard
Firewall/Router
1:1 NAT



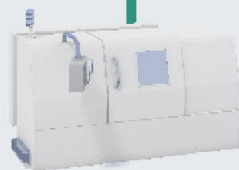
CIFS
Integrity Monitoring

Scan



Windows

Programs



Windows



Windows



Extended functionalities

VPN
extensions



- For all mGuard security appliances
- Extension in steps of 10, 100 und 250 simultaneous connections



Extended functionalities

	FL MGuard LIC Lifetime FW	FL MGuard LIC FW RD	FL MGuard FW/VPN RD	FL MGuard LIC OPC INSP	FL MGuard LIC CIM
Function	Lifetime software update	Firewall/router redundancy function	Firewall/router and VPN redundancy function	OPC-Inspector function	CIFS Integrity Monitoring (CIM)
Order number	2700184	2701356	2702193	2702191	2701083

	FL MGuard LIC VPN-10	FL MGuard LIC VPN-100	FL MGuard LIC VPN-250
Function	up to 10 additional VPN online connections	Up to 100 additional VPN online connections	Up to 250 additional VPN online connections
Order number	2700194	2702546	2700193



Central device management software

 Free start-up support

Flexibly
upgradeable 



Efficient device
management 



Central device management software



Efficient
device
management

- Central creation and administration of all mGuard settings
- Selective or overall transmission on all remote mGuards
- Roll-out of firmware upgrades and licence extensions



Central device management software

Free start-up
support



- For an easy start-up of the software, a remote support with a Phoenix Contact employee is included



Central device management software



Flexibly
upgradeable

- Scalable up to several thousand devices



Central device management software



	FL MGuard DM UNLIMITED	FL MGuard DM UPD
Function	Central device management software for any number of MGuards	Software update of the device managment software (FL MGuard DM...)
Order number	2981974	2700222



Power over Ethernet Injectors

Surge protection
and shield current
monitoring on the
field cable side



Multiple connection
technologies and
covered wiring space



Different performance
standards and electrical
isolation



Tool-free shield
connection



Power over Ethernet Injectors



Different performance standards and electrical isolation

- IEEE 802.3 at
- IEEE 802.3 af up to 30 watts
- IEEE 802.3 bt Up to 60 watts will be supported
- supply voltage and Power over Ethernet port are electrically isolated in certain versions



Power over Ethernet Injectors

Surge protection
and shield current
monitoring on the
field cable side



- integrated surge protection protects devices and application against sudden high voltages in the data cables
- An LED indicates differences in potential or other shield currents caused by the effects of EMC



Power over Ethernet Injectors

Multiple
connection
technologies
and covered
wiring space



- IDC, Push-in, screw, and RJ45 connections.
- Covered cable wiring space

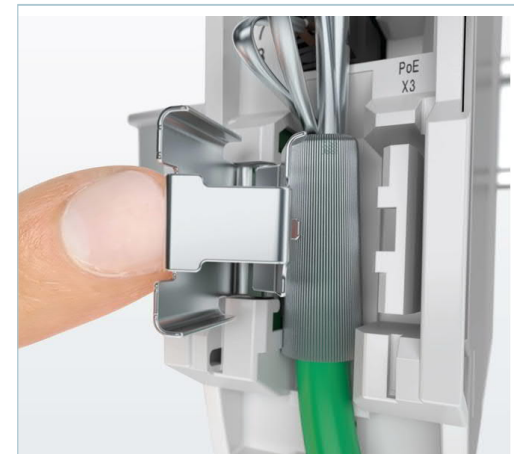


Power over Ethernet Injectors



Tool-free shield connection

- Quick and easy connection of the cable shielding without tools
- strain relief is assured
- Simply lay the cable in the shaft provided and close the shroud



Power over Ethernet Injectors



	INJ 1000 INJ 1010	INJ 1000-T INJ 1010-T	INJ 1100-T INJ 1110-T	INJ 2102-T INJ 2112-T	INJ 2103-T INJ 2113-T	INJ 2101-T INJ 2111-T	FL PSE 2TX
Connection technology	RJ45 / RJ45	RJ45 / RJ45	RJ45 / RJ45	RJ45 / IDC	RJ45 / Push-In	RJ45 / Screw	2 x RJ45/RJ45
Temperatur range	0°C ... +60°C	-40 °C ... +75 °C					0°C ... +55°C
Galvanic isolation	No			Yes			
Overvoltage protection, shield current diagnosis	No			Yes			No
Order number PoE af*/at, 15*/30W	2703005	2703006	2703009	2703012	1004065	2703011	*2891013
Order number PoE bt, 60W	2703007	2703008	2703010	2703014	1004066	2703013	-



Power over Ethernet Switches



Reduced cabling efforts



Installation in field



Managed features



Applicable across manufacturers: conform to IEEE 802.3



Installation in control cabinet

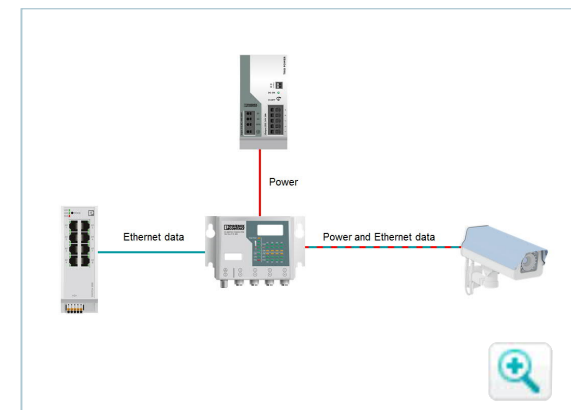


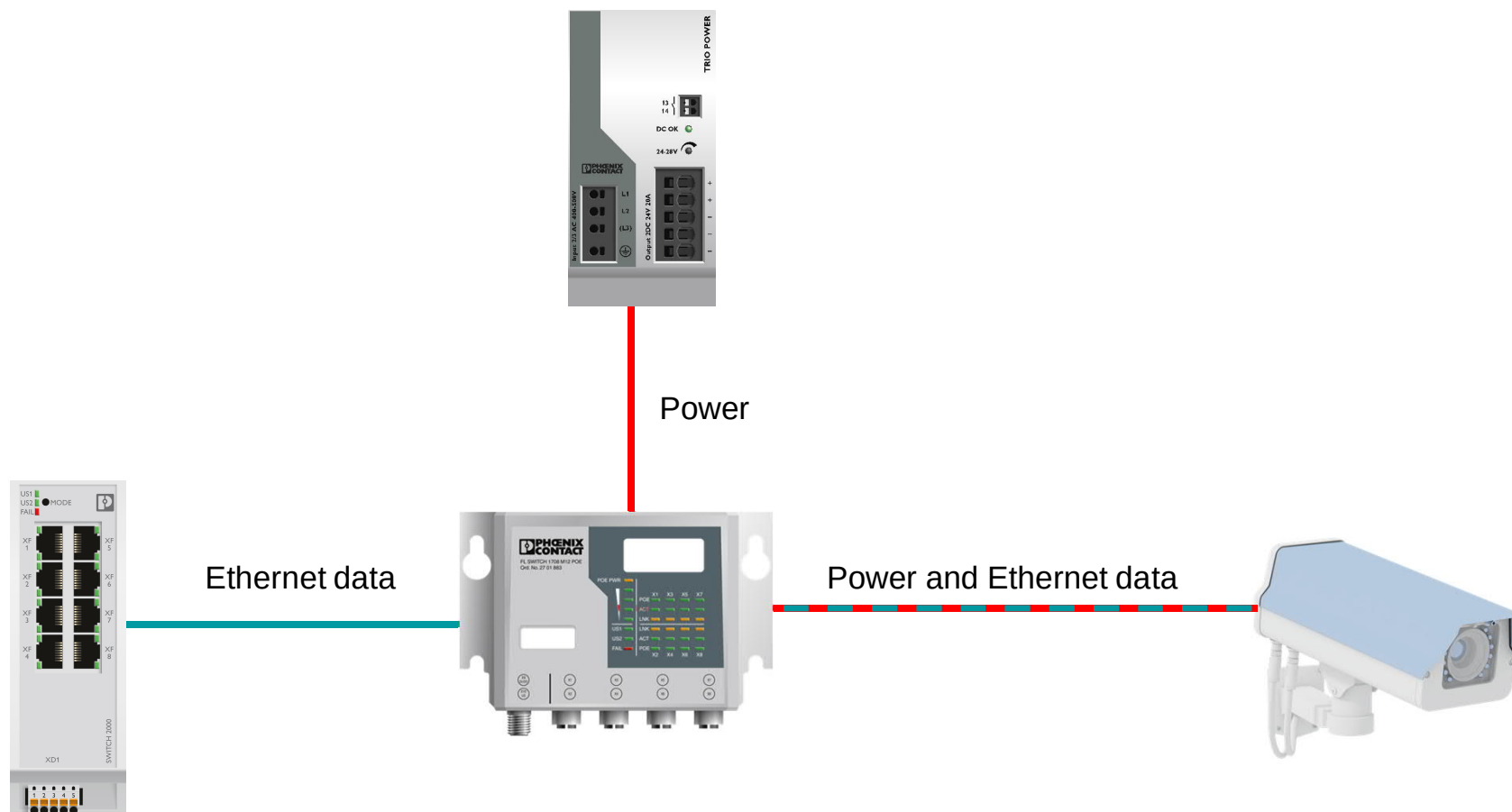
Power over Ethernet Switches

Reduced
cabling efforts



- Installation of cameras, IP phones or WLAN access points with only one cable
- Saving of power supply and related installation costs





Power over Ethernet Switches

Installation
in field



- Gigabit und Jumboframe support
- IEEE 802.3at (30W)
- Typically used in industrial image processing

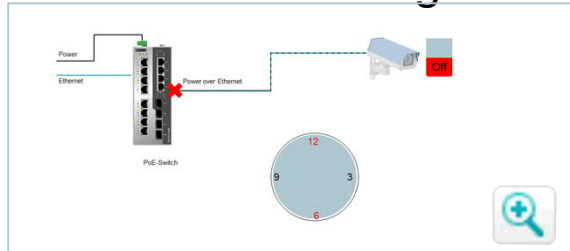


Power over Ethernet Switches

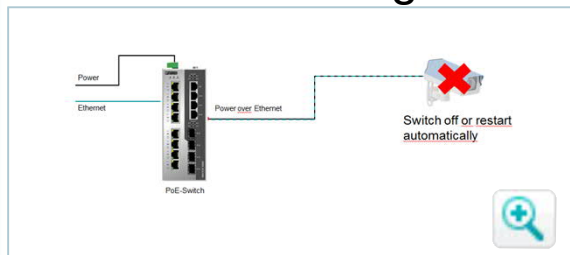


Managed features

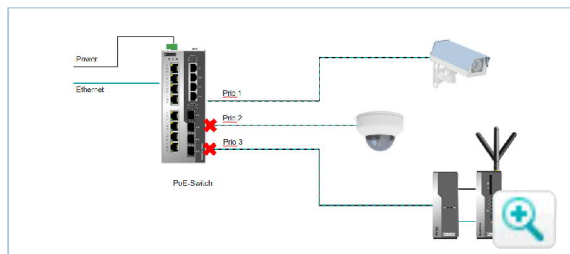
PoE Scheduling

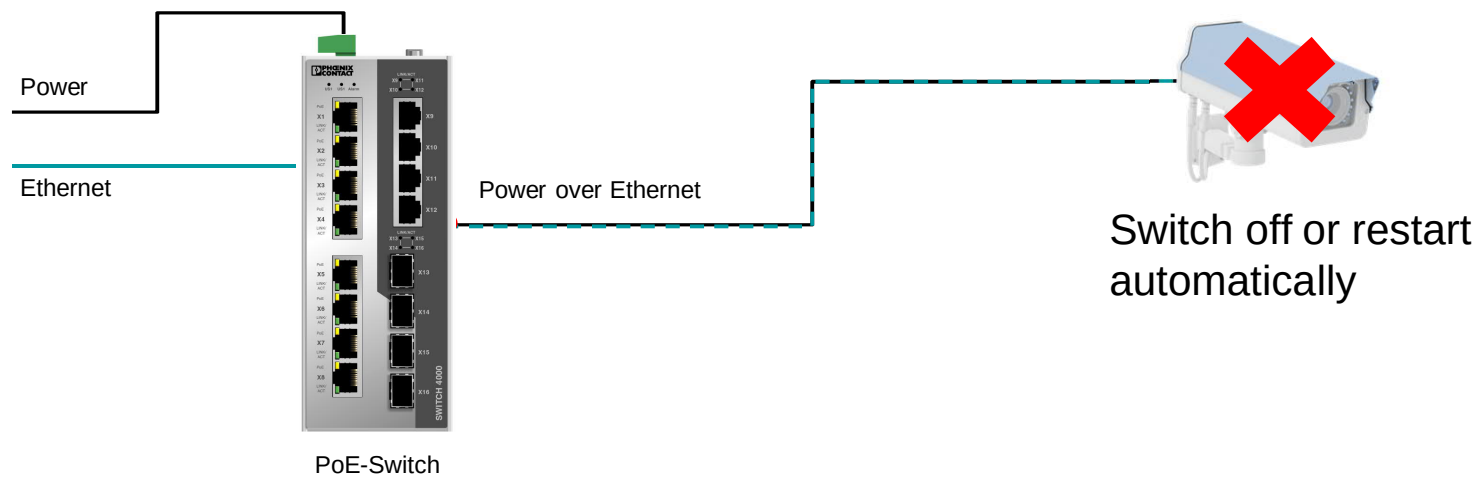


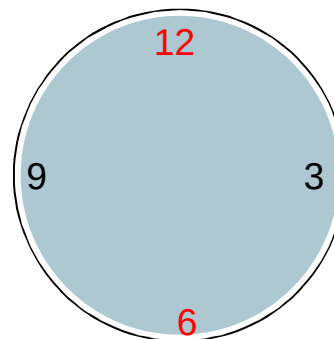
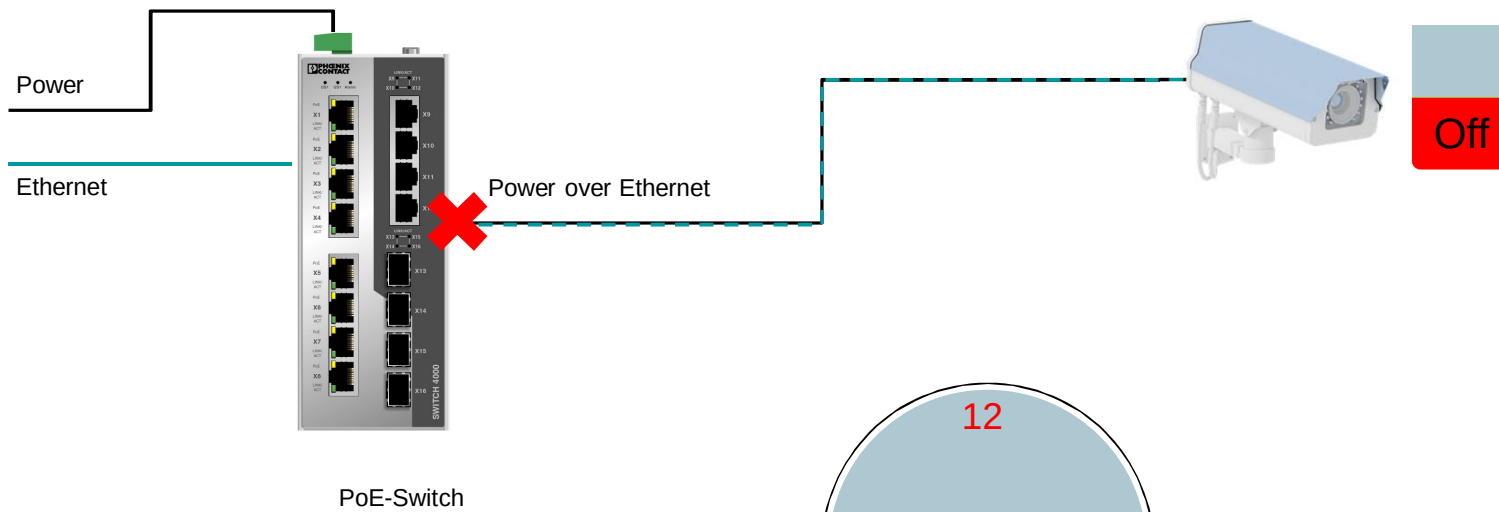
PoE Watchdog

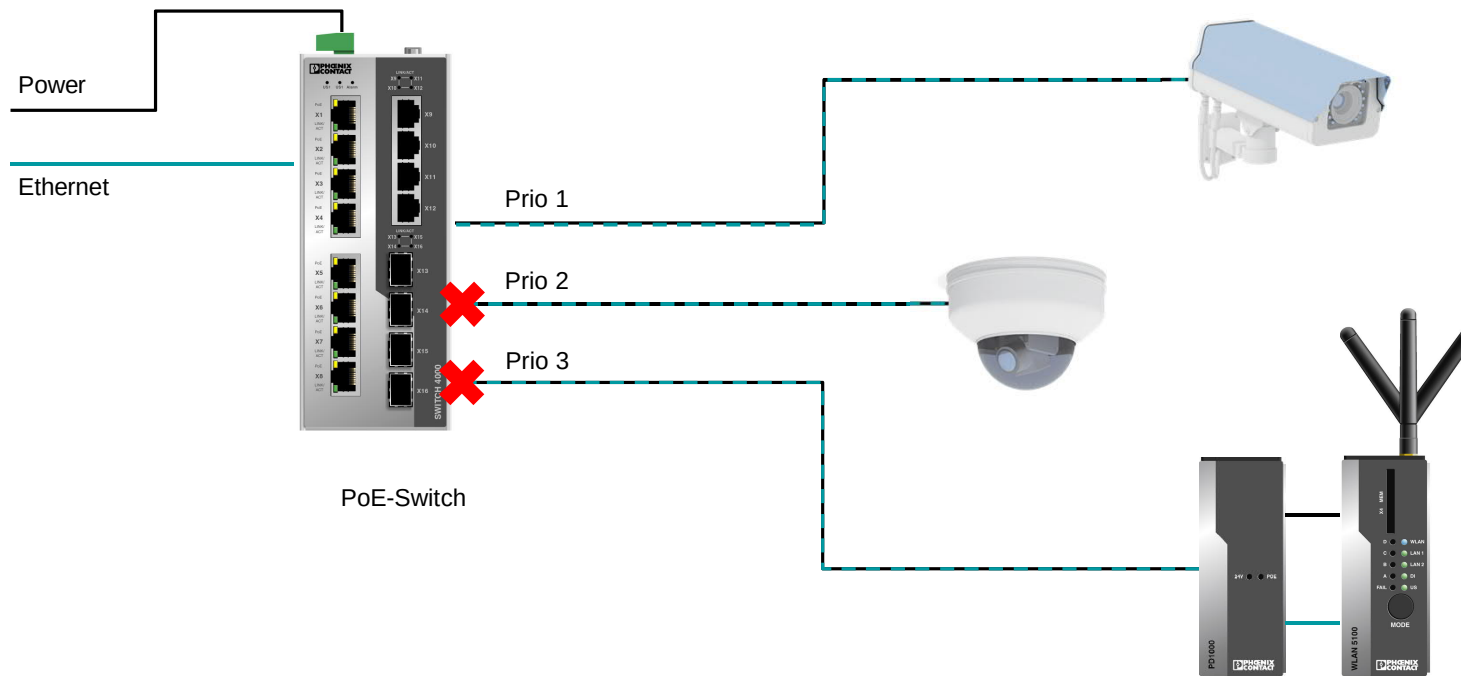


PoE Prioritization









Power over Ethernet Switches



Installation in
control
cabinet

- Easy integrable in control cabinet
- 24 V DC supply
- IEEE 802.3 af/at/bt (15 W/ 30 W/ 60 W)
- Endspan and Midspan



Power over Ethernet Switches



	FL SWITCH 1001T-4POE	FL SWITCH 1708 M12 POE	FL SWITCH 1000T-2POE- 2SFP	FL SWITCH 1001T-4POE- GT-SFP	FL SWITCH 1001T-4POE-GT	FL SWITCH 1000T-8POE-GT- 2SFP
Function	Unmanaged Switch					
Ports	4x RJ45 1x RJ45	8x M12	2 x RJ45 2 x SFP	4 x RJ45 1 x RJ45 1 x SFP	4 x RJ45 1 x RJ45	8 x RJ45 2 x SFP
Transmission speed	10/100 Mbit/s	10/100/1000 Mbit/s				
Power budget	30 W per port, max. 120 W	30 W per port, max. 200 W	30 W per port max. 60 W	30 W per port max. 120 W		
PoE-Standard	IEEE 802.3 af/at (PoE+)					
Order nr.	2891064	2701883	1026765	1026932	1026937	1026929



Power over Ethernet Switches



	FL SWITCH 4000T-4POE-SFP	FL SWITCH 4000T-8POE- 2SFP	FL SWITCH 4004T-8POE- 4SFP	FL IF 2PSE-F
Function	Managed Switch			Media module for Modular Managed Switch
Ports	4 x RJ45 1 x SFP	8 x RJ45 2 x SFP	8 x RJ45 4 x RJ45, 4 x SFP	2 x RJ45
Transmission Speed	10 /100 / MBit/s (RJ45) 1000 MBit/s (SFP)		10/100/1000 MBit/s	10/100 Mbit/s
Power budget	60 W per port, max. 180 W		60 W per port, max. 240 W	15 W
Standard	IEEE 802.3 af/at (PoE+), prepared for PoE bt (PoE ++)			IEEE 802.3af (PoE)
Order number	1026924	1026923	1026922	2832904



Power over Ethernet Splitter

Robust metal housing
and extended
temperature range

Output power
up to 21 W

24 V DC output voltage
suitable for the control
cabinet



Gigabit transmission

Compliant with
IEEE 802.3af/at



Power over Ethernet Splitter



FL PD 1001 T GT

Function	PoE splitter
Ports	1x RJ45 PoE (output) 1x RJ45 (data input)
Transmission speed	10/100/1000 Mbit/s
Power budget	30 W
PoE-Standard	IEEE 802.3 af/at (PoE+)
Order number	2891042



Unmanaged Switches



Wide range of applications

Mechanical cable locking or ports that can be blocked



PROFINET versions



Reliable operation

Robust and powerful



Automation protocols

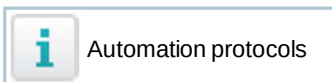


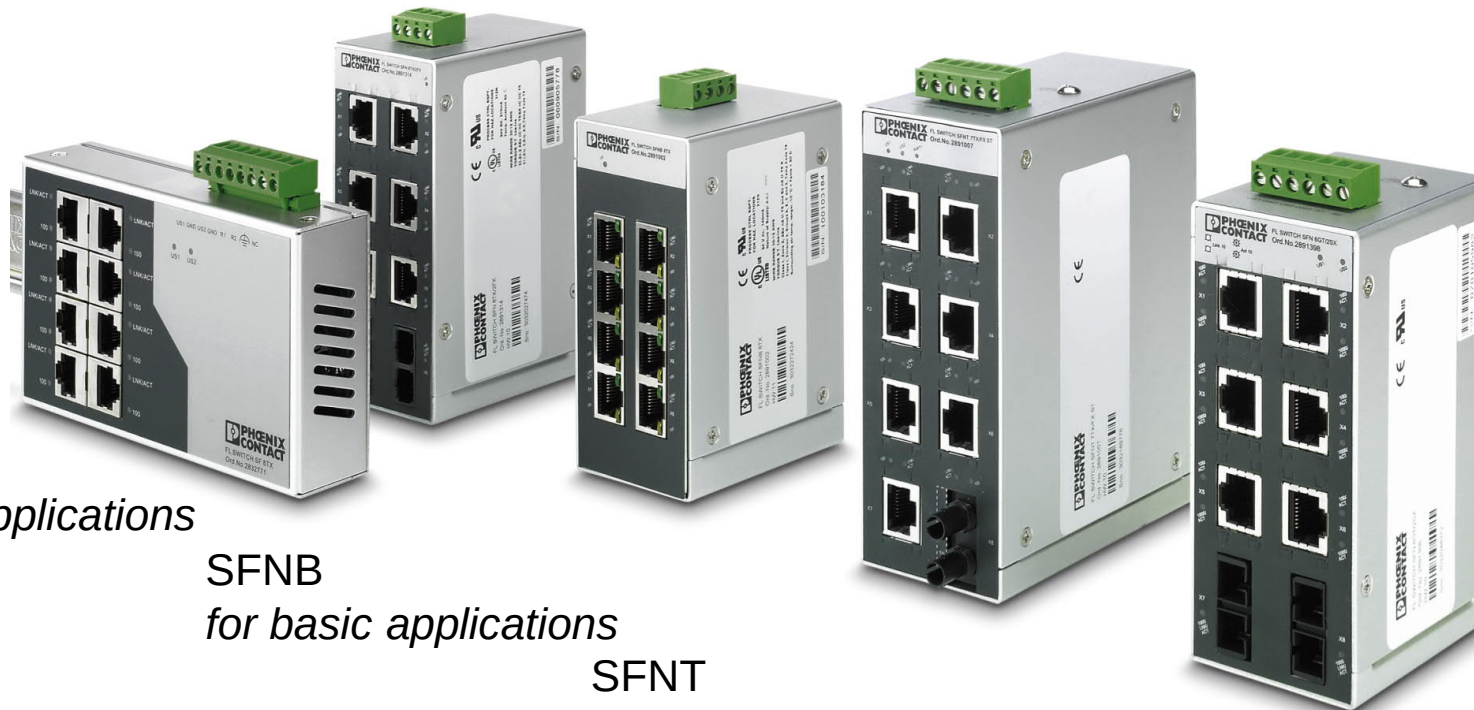
Unmanaged Switches

Wide range of applications



- Standard applications (SF- und SFN-Switches)
- Basic applications (SFNB-Switches)
- Extreme ambient conditions (SFNT-Switches)
- Gigabit applications (SFN-Gigabit-Switches)





SF(N)
for standard applications

SFNB
for basic applications

SFNT
for extreme ambient conditions

SFN-Gigabit
for Gigabit applications



Automation protocols



SFNB-Switches



	FL SWITCH SFNB 5TX	FL SWITCH SFNB 8TX	FL SWITCH SFNB 4TX/FX	FL SWITCH SFNB 4TX/FX ST	FL SWITCH SFNB 4TX/FX SM20
Application area	Basic	Basic	Basic	Basic	Basic
Design	Slim	Slim	Slim	Slim	Slim
Ports	5x TP-RJ45 (10/100 Mbit/s)	8x TP-RJ45 (10/100 Mbit/s)	4x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	4x TP-RJ45 (10/100 Mbit/s) 1x ST-D MM (100 Mbit/s)	4x TP-RJ45 (10/100 Mbit/s) 1x SC-D SM (100 Mbit/s)
Quality of Service	No	No	No	No	No
Temperature range	-10 °C ... 60 °C	-10 °C ... 60 °C	-10 °C ... 60 °C	-10 °C ... 60 °C	-10 °C ... 60 °C
Special features	-	-	-	-	-
Order number	2891001	2891002	2891027	2891028	2891029




Automation protocols



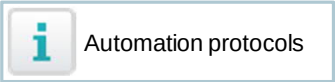
SFNB-Switches



**FL SWITCH
SFNB 5TX-PNE**

**FL SWITCH
SFNB 8TX-PNE**

Application area	Basic	Basic
Design	Slim	Slim
Ports	5x TP-RJ45 (10/100 Mbit/s)	8x TP-RJ45 (10/100 Mbit/s)
Quality of Service	Yes	Yes
Temperature range	-10 °C ... 60 °C	-10 °C ... 60 °C
Special features	PROFINET & EtherNet/IP prioritization, PTCP filtering	PROFINET & EtherNet/IP prioritization, PTCP filtering
Order number	1071801	1071800



SF-Switches



	FL SWITCH SF 8TX	FL SWITCH SF 16TX	FL SWITCH SF 7TX/FX	FL SWITCH SF 7TX/FX ST	FL SWITCH SF 15TX/FX
Application area	Standard	Standard	Standard	Standard	Standard
Design	Flat	Flat	Flat	Flat	Flat
Ports	8x TP-RJ45 (10/100 Mbit/s)	16x TP-RJ45 (10/100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 1x ST-D MM (100 Mbit/s)	15x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)
Quality of Service	No	No	No	No	No
Temperature range	0°C ... 55°C	0°C ... 55°C	0°C ... 55°C	0°C ... 55°C	0°C ... 55°C
Special features	-	-	-	-	-
Order number	2832771	2832849	2832726	2832577	2832661

SF-Switches



	FL SWITCH SF 6TX/2FX	FL SWITCH SF 6TX/2FX ST	FL SWITCH SF 14TX/2FX	FL SWITCH SF 4TX/3FX ST
Application area	Standard	Standard	Standard	Standard
Design	Flat	Flat	Flat	Flat
Ports	7x TP-RJ45 (10/100 Mbit/s) 2x SC-D MM (100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 2x ST-D MM (100 Mbit/s)	14x TP-RJ45 (10/100 Mbit/s) 2x SC-D MM (100 Mbit/s)	4x TP-RJ45 (10/100 Mbit/s) 3x ST-D MM (100 Mbit/s)
Quality of Service	No	No	No	No
Temperature range	0°C ... 55°C	0°C ... 55°C	0°C ... 55°C	0°C ... 55°C
Special features	-	-	-	-
Order number	2832933	2832674	2832593	2832603

SFN-Switches



	FL SWITCH SFN 5TX	FL SWITCH SFN 5TX-PN	FL SWITCH SFN 5TX-24VAC	FL SWITCH SFN 8TX	FL SWITCH SFN 8TX-PN
Application area	Standard	Standard	Standard	Standard	Standard
Design	Slim	Slim	Slim	Slim	Slim
Ports	5x TP-RJ45 (10/100 Mbit/s)	5x TP-RJ45 (10/100 Mbit/s)	5x TP-RJ45 (10/100 Mbit/s)	8x TP-RJ45 (10/100 Mbit/s)	8x TP-RJ45 (10/100 Mbit/s)
Quality of Service	Yes	Yes	Yes	Yes	Yes
Temperature range	0°C ... 60 °C /	0°C ... 60 °C	0°C ... 60 °C	0°C ... 60 °C	0°C ... 60 °C
Special features	-	Optimized for PROFINET	24 V AC/DC supply voltage	-	Optimized for PROFINET
Order number	2891152	2891151	2891021	2891929	2891018

SFN-Switches



	FL SWITCH SFN 8TX-24VAC	FL SWITCH SFN 16TX	FL SWITCH SFN 4TX/FX	FL SWITCH SFN 4TX/FX ST	FL SWITCH SFN 7TX/FX
Application area	Standard	Standard	Standard	Standard	Standard
Design	Slim	Slim	Slim	Slim	Slim
Ports	8x TP-RJ45 (10/100 Mbit/s)	16x TP-RJ45 (10/100 Mbit/s)	4x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	4x TP-RJ45 (10/100 Mbit/s) 1x ST-D MM (100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)
Quality of Service	Yes	No	Yes	Yes	Yes
Temperature range	0°C ... 60 °C	0°C ... 60 °C	0°C ... 60 °C/	0°C ... 60 °C	0°C ... 60 °C
Special features	24 V AC/DC supply voltage	-	-	-	-
Order number	2891020	2891933	2891851	2891453	2891097

SFN-Switches



	FL SWITCH SFN 7TX/FX-NF	FL SWITCH SFN 7TX/FX ST	FL SWITCH SFN 15TX/FX	FL SWITCH SFN 6TX/2FX	FL SWITCH SFN 6TX/2FX-NF
Application area	Standard	Standard	Standard	Standard	Standard
Design	Slim	Slim	Slim	Slim	Slim
Ports	7x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 1x ST-D MM (100 Mbit/s)	15x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	6x TP-RJ45 (10/100 Mbit/s) 2x SC-D MM (100 Mbit/s)	6x TP-RJ45 (10/100 Mbit/s) 2x SC-D MM (100 Mbit/s)
Quality of Service	Yes	Yes	No	Yes	Yes
Temperature range	0°C ... 60 °C	0°C ... 60 °C	0°C ... 60 °C	0°C ... 60 °C	0°C ... 60 °C
Special features	flow control disabled	-	-	-	flow control disabled
Order number	2891023	2891110	2891934	2891314	2891024

SFN-Switches



**FL SWITCH
SFN 6TX/2FX
ST**

**FL SWITCH
SFN 14TX/ 2FX**

Application area	Standard	Standard
Design	Slim	Slim
Ports	6x TP-RJ45 (10/100 Mbit/s) 2x ST-D MM (100 Mbit/s)	14x TP-RJ45 (10/100 Mbit/s) 2x SC-D MM (100 Mbit/s)
Quality of Service	Yes	No
Temperature range	0°C ... 60 °C	0°C ... 60 °C
Special features	-	-
Order number	2891411	2891935

SFN-Gigabit-Switches



**FL SWITCH
SFN 5GT**

**FL SWITCH
SFN 8GT**

**FL SWITCH
SFN 7GT/SX**

**FL SWITCH
SFN 6GT/2SX**

**FL SWITCH
SFN 6GT/2LX**

**FL SWITCH
SFN
6GT/2LX-20**

Application area	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Design	Slim	Slim	Slim	Slim	Slim	Slim
Ports	5x RJ45 (10/100/1000 Mbit/s)	8x RJ45 (10/100/1000 Mbit/s)	7x RJ45 1x SC-D MM (10/100/1000 Mbit/s)	7x RJ45 2x SC-D MM (10/100/1000 Mbit/s)	6x RJ45 2x SC-D SM, 10 km (10/100/ 1000 Mbit/s)	6x RJ45 2x SC-D SM, 20 km (10/100/ 1000 Mbit/s)
Quality of Service	Yes	Yes	Yes	Yes	Yes	Yes
Temperature range	-25 °C ... 75 °C	-25 °C ... 75 °C	-25 °C ... 75 °C	-25 °C ... 75 °C	-25 °C ... 75 °C	-25 °C ... 75 °C
Special features	-	-	-	-	-	-
Order number	2891444	2891673	2891518	2891398	2891987	2891563



Automation protocols



SFNT-Switches



	FL SWITCH SFNT 5TX	FL SWITCH SFNT 5TX-C	FL SWITCH SFNT 8TX	FL SWITCH SFNT 8TX-C	FL SWITCH SFNT 16TX
Application area	Harsh environment	Harsh environment	Harsh environment	Harsh environment	Harsh environment
Design	Slim	Slim	Slim	Slim	Slim
Ports	5x TP-RJ45 (10/100 Mbit/s)	5x TP-RJ45 (10/100 Mbit/s)	8x TP-RJ45 (10/100 Mbit/s)	8x TP-RJ45 (10/100 Mbit/s)	16x TP-RJ45 (10/100 Mbit/s)
Quality of Service	Yes	Yes	Yes	Yes	No
Temperature range	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C
Special features	ATEX approval	Conformal coating	ATEX approval	Conformal coating	ATEX approval
Order number	2891003	2891043	2891005	2891045	2891952

SFNT-Switches



**FL SWITCH
SFNT 4TX/ FX**

**FL SWITCH
SFNT 4TX/ FX-
C**

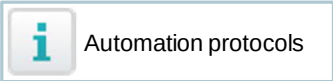
**FL SWITCH
SFNT 7TX/ FX**

**FL SWITCH
SFNT 7TX/ FX-
C**

**FL SWITCH
SFNT 7TX/ FX
ST**

**FL SWITCH
SFNT 7TX/ FX
ST-C**

Application area	Harsh environment	Harsh environment	Harsh environment	Harsh environment	Harsh environment	Harsh environment
Design	Slim	Slim	Slim	Slim	Slim	Slim
Ports	4x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	4x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 1x ST-D MM (100 Mbit/s)	7x TP-RJ45 (10/100 Mbit/s) 1x ST-D MM (100 Mbit/s)
Quality of Service	Yes	Yes	Yes	Yes	Yes	Yes
Temperature range	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C
Special features	ATEX approval	Conformal coating	ATEX approval	Conformal coating	-	Conformal coating
Order number	2891004	2891044	2891006	2891046	2891007	2891047



SFNT-Switches



**FL SWITCH
SFNT
15TX/FX**

**FL SWITCH
SFNT 6TX/
2FX**

**FL SWITCH
SFNT
6TX/2FX-C**

**FL SWITCH
SFNT 6TX/
2FX ST**

**FL SWITCH
SFNT
6TX/2FX ST-C**

**FL SWITCH
SFNT
14TX/2FX**

Application area	Harsh environment	Harsh environment	Harsh environment	Harsh environment	Harsh environment	Harsh environment
Design	Slim	Slim	Slim	Slim	Slim	Slim
Ports	15x TP-RJ45 (10/100 Mbit/s) 1x SC-D MM (100 Mbit/s)	6x TP-RJ45 (10/100 Mbit/s) 2x SC-D MM (100 Mbit/s)	6x TP-RJ45 (10/100 Mbit/s) 2x SC-D MM (100 Mbit/s)	6x TP-RJ45 (10/100 Mbit/s) 2x ST-D MM (100 Mbit/s)	6x TP-RJ45 (10/100 Mbit/s) 2x ST-D MM (100 Mbit/s)	14x TP-RJ45 (10/100 Mbit/s) 2x SC-D MM (100 Mbit/s)
Quality of Service	No	Yes	Yes	Yes	Yes	No
Temperature range	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 75°C
Special features	-	-	Conformal coating	-	Conformal coating	-
Order number	2891953	2891025	2891048	2891026	2891049	2891954



Automation protocols



SFNT-Gigabit-Switches



	FL SWITCH SFNT 5GT	FL SWITCH SFNT 5GT-C
Application area	Harsh environment	Harsh environment
Design	Slim	Slim
Ports	5x TP-RJ45 (10/100/1000 Mbit/s)	5x TP-RJ45 (10/100/1000 Mbit/s)
Quality of Service	Yes	Yes
Temperature range	-40°C ... 75°C	-40°C ... 75°C
Special features	-	Conformal coating
Order number	2891390	2891391

Further variants



FL SWITCH 1824

FL SWITCH 1924

**FL SWITCH
1001T-POE**

FL SWITCH 1008E

**FL SWITCH 1605
M12**

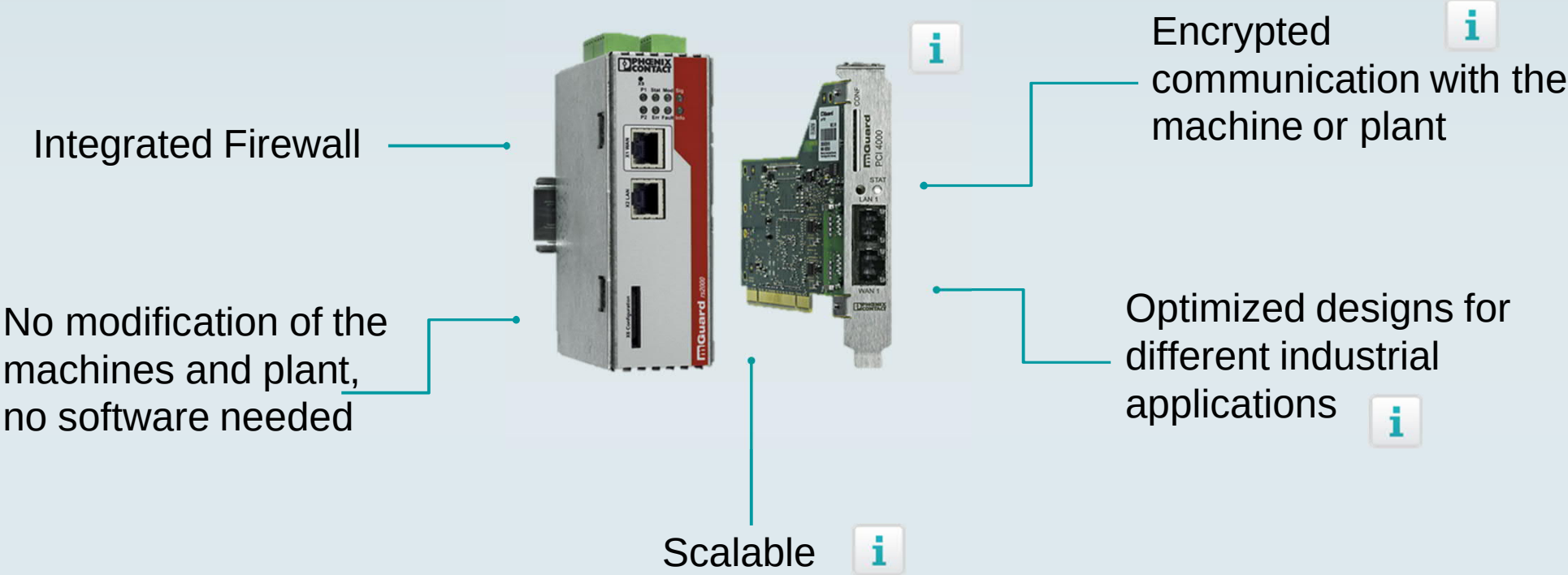
Application area	Standard	Gigabit	Harsh environmenr	Harsh environment	Field
Design	19"	19"	Slim	Slim	Wall mounting
Ports	24x TP-RJ45 (10/100 Mbit/s)	24x RJ45 (10/100/1000 Mbit/s)	4x PoE+ 1x RJ45 (10/100 Mbit/s)	8x RJ45 (10/100 Mbit/s)	5x M12 (10/100 Mbit/s)
Quality of Service	Yes	Yes	No	No	Yes
Temperature range	0°C ... 55°C	-25 °C ... 75 °C	-40°C ... 75°C	-40°C ... 75°C	-40°C ... 70°C
Special features	-	-	PoE IEEE802.3at	IEC61850-3 IEEE 1613	Degree of protection IP67
Order number	2891041	2891057	2891064	2891065	2700200



Automation protocols



Secure remote maintenance



Secure remote maintenance



Encrypted communication with the machine or plant

- VPN connection
- Ipsec protocol
- Encryption according to Advanced Encryption Standard (AES)



Automation protocols



Secure remote maintenance



Optimized
designs for
different
industrial
applications

- Slim



- Flat



- PCI(E)



Automation protocols



Secure remote maintenance



Scalable

- From one temporary VPN tunnel up to several thousand simultaneous VPN connections
- From a simple VPN router up to a professional security appliance with intelligent diagnose, alert and firewall functions



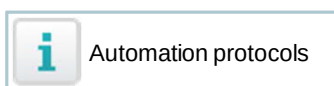
Automation protocols



Secure remote maintenance



	FL MGuard RS2000 TX/TX VPN	FL MGuard RS2005 TX VPN	TC MGuard RS2000 3G VPN	FL MGuard RS4000 TX/TX VPN	FL MGuard RS4000 TX/TX- P
VPN tunnel optionally expandable	2 No	2 No	2 No	10 up to 250	10 up to 250
Firewall	2-Click-Firewall	2-Click-Firewall	2-Click-Firewall	Multifunction firewall	Multifunction firewall
Integrated switch		5-Port unmanaged	4-Port unmanaged	-	-
Special features	-	-	Mobilfunk	-	ATEX, IECex approvals
Extended functionalities	No	No	No	Optional	Optional
Order number	2700642	2701875	2903441	2200515	2702259



Secure remote maintenance



**FL MGuard
RS4004 TX/ DTX
VPN**

**TC MGuard
RS4000 3G VPN**

**FL MGuard
GT/GT VPN**

**FL MGuard
PCI4000 VPN**

**FL MGuard
PCIE4000 VPN**

VPN tunnel
optionally expandable

10
up to 250

10
up to 250

10
up to 250

10
up to 250

10
up to 250

Firewall

Multifunction
firewall

Multifunction
firewall

Multifunction
firewall

Multifunction
firewall

Multifunction
firewall

Integrated switch

4-Port managed

4-Port managed

-

-

-

Special features

DMZ-Port

WAN, mobile
phone network

Gigabit, SFP,
maritime approval

PCI format

PCIE format

Extended functionalities

Optional

Optional

Optional

Optional

Optional

Order number

2701877

2903440

2700198

2701275

2701278



Automation protocols



Remote access via internet and mobile phone network



Remote access via internet and mobile phone network



Long range and
high data
throughput

- Mobile highspeed data links up to 150 Mbit/s via 4G LTE networks
- Mobile data links up to 21 Mbit/s via 3G networks
- Industrial ADSL broadband connections according to Annex A, B and J with up to 25 Mbit/s



TC Router



	TC ROUTER 3002T-4G	TC ROUTER 3002T-3G	TC ROUTER 2002T-4G	TC ROUTER 2002T-3G	TC ANT MOBILE WALL 5M
Function	Industrial 4G router European version	Industrial 3G router European version	Industrial 4G router European version	Industrial 3G router European version	Multiband mobile phone antenna with mounting bracket for outdoor installation, 5m antenna cable (SMA)
Mobile radio Interface	4G	3G	4G	3G	
Transmission speed	150 Mbit/s LTE Downlink	21 Mbit/s HSPA Downlink	150 Mbit/s LTE Downlink	21 Mbit/s HSPA Downlink	
Switching inputs and outputs	2 digital Inputs, 1 digital output	2 digital Inputs, 1 digital output	2 digital Inputs, 1 digital output	2 digital Inputs, 1 digital output	
General	Firewall, NAT, IPsec, OpenVPN SMS and e-mail transmission	Firewall, NAT, IPsec, OpenVPN SMS and e-mail transmission	Firewall, NAT SMS and e-mail transmission	Firewall, NAT SMS and e-mail transmission	
Order number	2702528	2702529	2702530	2702531	2702273



TC Router



verizon



AT&T



	TC ROUTER 3002T-4G VZN	TC ROUTER 3002T-4G ATT	TC ANT MOBILE WALL 5M
Function	Industrial 4G router USA For communication in Verizon Wireless mobile network	Industrial 4G router USA For communication in AT&T Wireless mobile network	Multiband mobile phone antenna with mounting bracket for outdoor installation, 5m antenna cable (SMA)
Mobile radio Interface	4G	4G	
Transmission speed	150 Mbit/s LTE Downlink	150 Mbit/s LTE Downlink	
Switching inputs and outputs	2 digital Inputs, 1 digital output	2 digital Inputs, 1 digital output	
General	Firewall, NAT, IPsec, OpenVPN SMS and e-mail transmission	Firewall, NAT, IPsec, OpenVPN SMS and e-mail transmission	
Order number	2702532	2702533	2702273



Extension of complex IT networks

Status and
diagnostics
display

Remote diagnostics of
all devices and paths

Replaceable
surge protection

Economical Ethernet
communication

Managed and
unmanaged extenders in
one network



Extension of complex IT networks



Economical
Ethernet
communication

- Distances up to 20 kilometers
- Using existing two-wire cables
- Expanding the system during operation



Extension of complex IT networks



Managed and unmanaged extenders in one network

- Easy installation via Plug-and-Play
- Automatic topology and data rate recognition
- Diagnostics of all devices and paths via IP







- Multi-stage signaling and remote signaling of the protective devices via SNMP, e.g.
- Performance limit reached, replacement recommended
- Overloaded, replacement required



Extension of complex IT networks

Remote
diagnostics of all
devices and
paths



- Automatic alarming via SNMP
- Point-to-point, line and ring topologies
- Data rates up to 30 Mbit/s



Extension of complex IT networks



	TC EXTENDER 2001 ETH-2S	TC EXTENDER 4001 ETH-1S	TC EXTENDER 6004 ETH-2S
Function	Unmanaged Ethernet-Extender	Managed Ethernet-Extender	Managed Ethernet-Extender
Topologies	Ring, line, point-to-point	Point-to-point	Ring, line, point-to-point
Replaceable surge protection	No	Yes	Yes
Diagnostic indicators	LEDs	LEDs	Display
Ports	2x SHDSL, 1x Ethernet	1x SHDSL, 1x Ethernet	2x SHDSL, 4x Ethernet
Order number	2702409	2702253	2702255



Industrial Bluetooth



Interference-free parallel operation with WLAN networks

Integrated special antennas for reliable wireless connections

Optimized for operation in PROFINET networks



Various application areas



Quick and easy startup

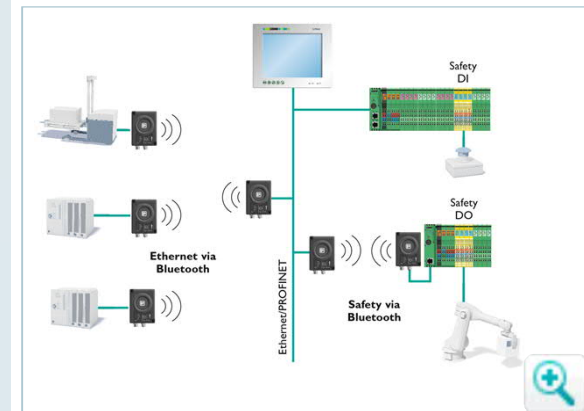


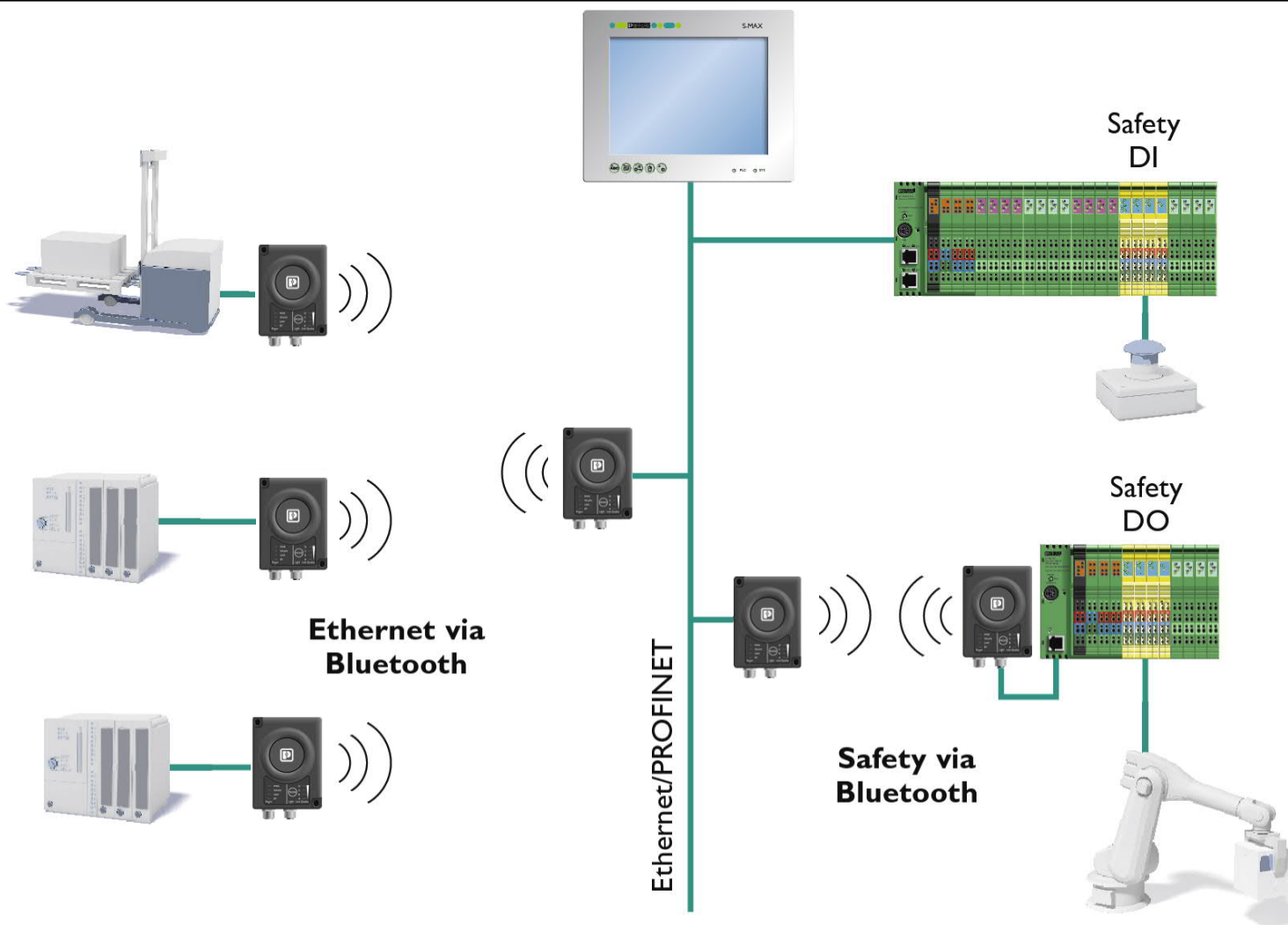
Industrial Bluetooth



Various
application areas

- Point-to-point connection (Cranes, traveling bridge collectors, robots)
- Multipoint connection (I/O components, scanners, PCs)





Industrial Bluetooth

Interference-free
parallel operation with
WLAN networks



- Adaptive frequency hopping (AFH)
- Low emission mode (LEM)
- Black channel list (BCL)



Industrial Bluetooth



	FL EPA 2 (BT Mode)	FL EPA 2 RSMA (BT Mode)	FL BT EPA 2
Function	Bluetooth Ethernet Client Adapter	Bluetooth Access Point	Bluetooth Ethernet Client Adapter
Antenna	Internal panel antenna	Omnidirectional antenna supplied as standard	Internal panel antenna
Frequency band	2,4 GHz	2,4 GHz	2,4 GHz
Connection type	M12 connection	M12 connection	M12 connection
Degree of protection	IP65	IP65	IP65
Temperature range	-40 °C ... 65 °C	-40 °C ... 65 °C	-40 °C ... 65 °C
Order number	1005955	1005957	1005869



Industrial WLAN



Reliable communication thanks to MIMO technology



All-in-one-solution



Compatible with standards IEEE 802.11 a/b/g/n



Quick and easy startup

Optimized for operation in PROFINET and EtherNet/IP networks

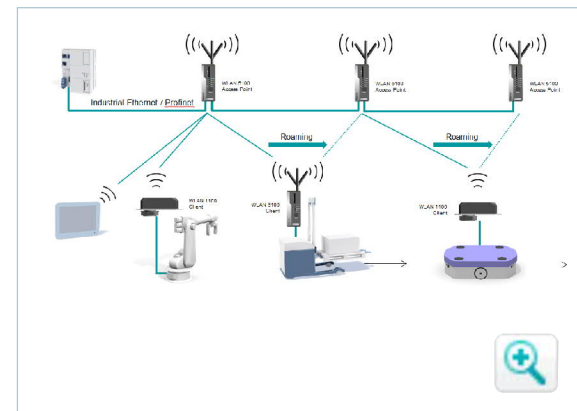


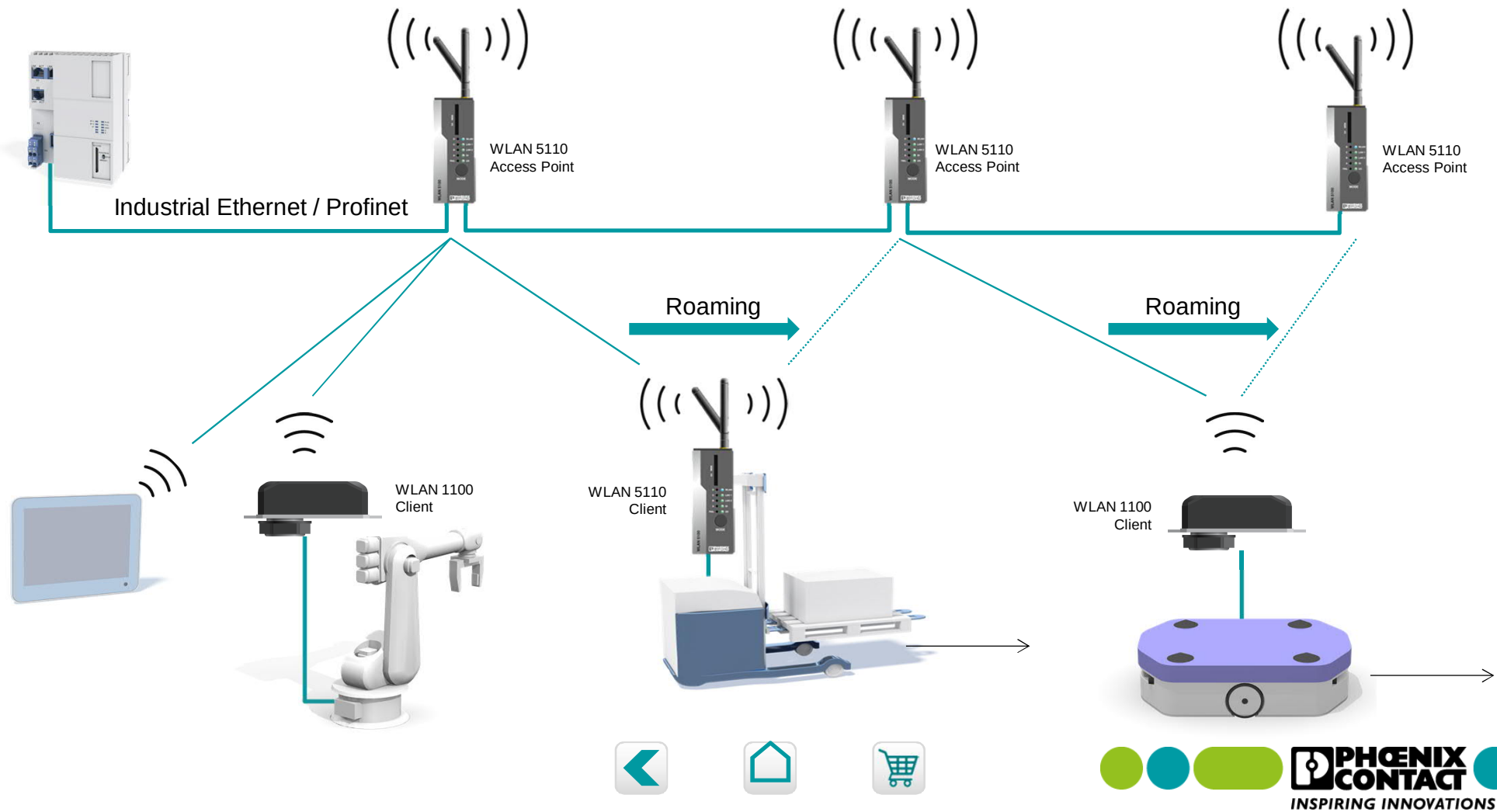
Industrial WLAN

Reliable
communication
thanks to MIMO
technology



- Interruption-free roaming



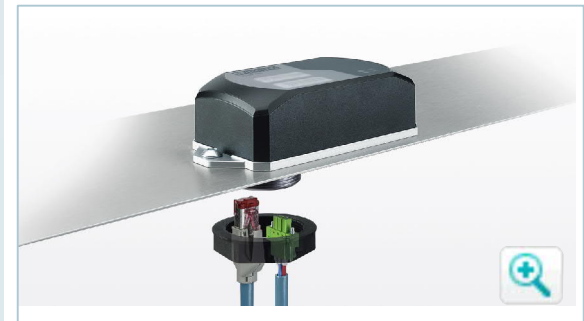


Industrial WLAN

All-in-one-
solution

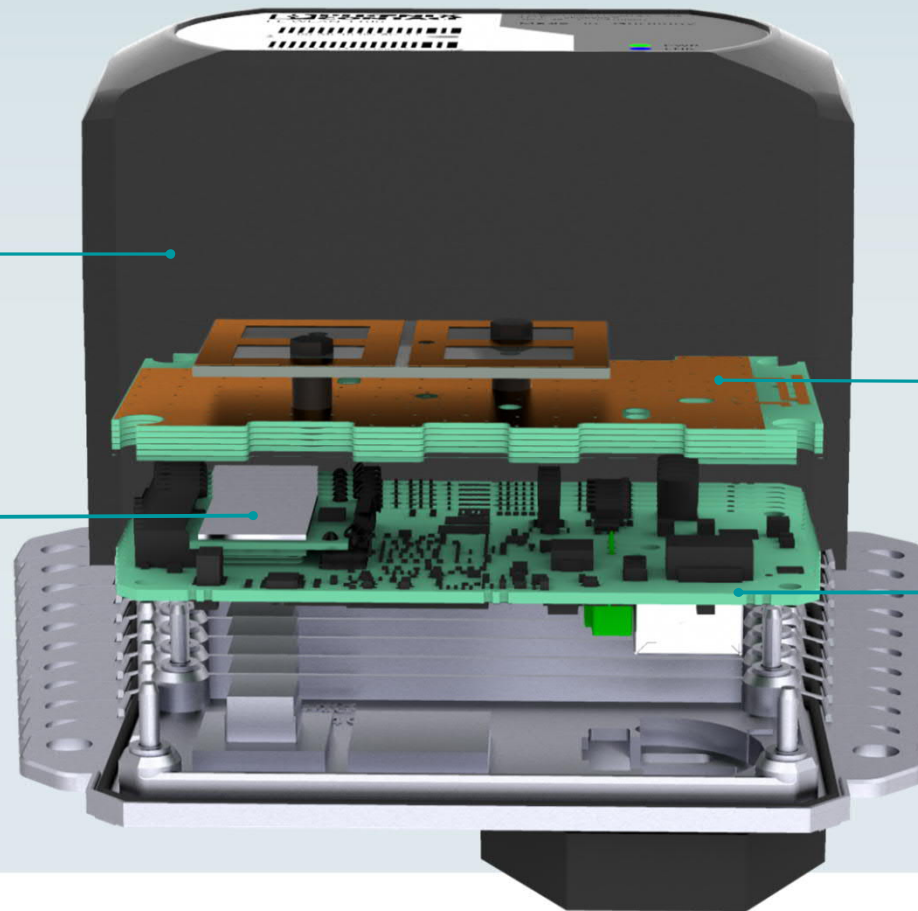


- Integrated antennas and wireless module on one single device
- Single-hole mounting directly on machines, mobile vehicles or control cabinets
- Shockproof according to IK08



Industrial WLAN

Extremely robust housing, shockproof in accordance with IK08, 7 Joule at -50°C
Protection Class IP 54
Powerful WLAN Board
802.11a/b/g/n
Dual band, 2,4 & 5 GHz



Special antennas
For fast and reliable communication

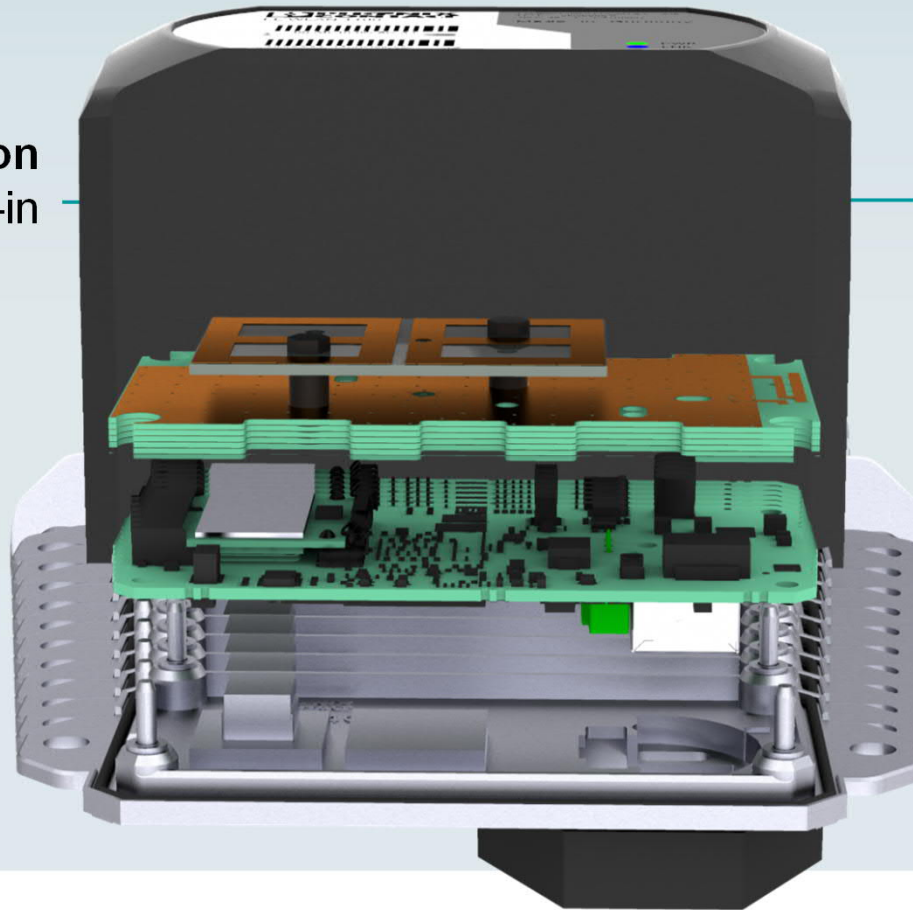
Powerful Access Point
Linux operating system



Industrial WLAN

Power connection
Push-in

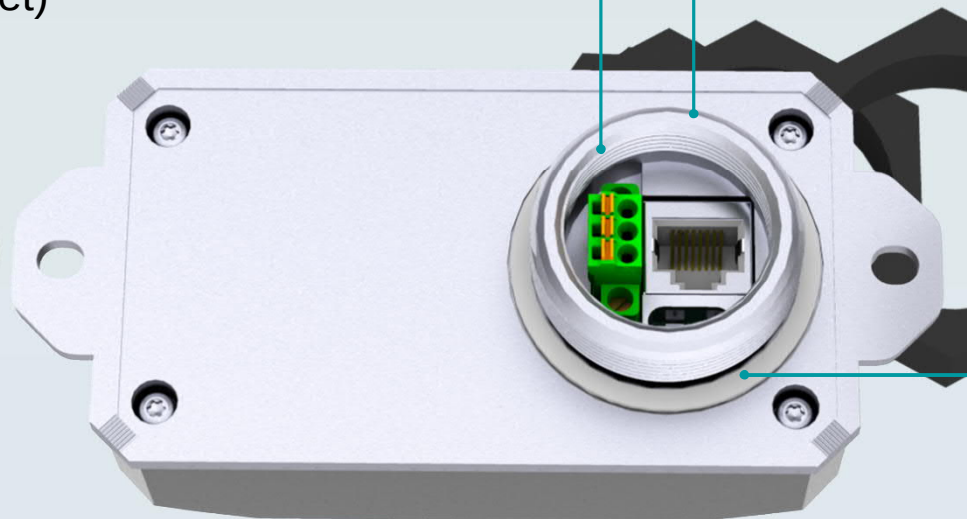
Ethernet connection
Standard RJ45



Industrial WLAN

M32 inside thread
For optional IP67-connection
adapter
(if not mounted on cabinet)

M40 external thread
for mounting



Seal
up to IP67



Industrial WLAN

Fast and easy connection
thanks to single-hole
mounting



**PHOENIX
CONTACT**
INSPIRING INNOVATIONS

Industrial WLAN

Fast and easy connection
thanks to single-hole
mounting

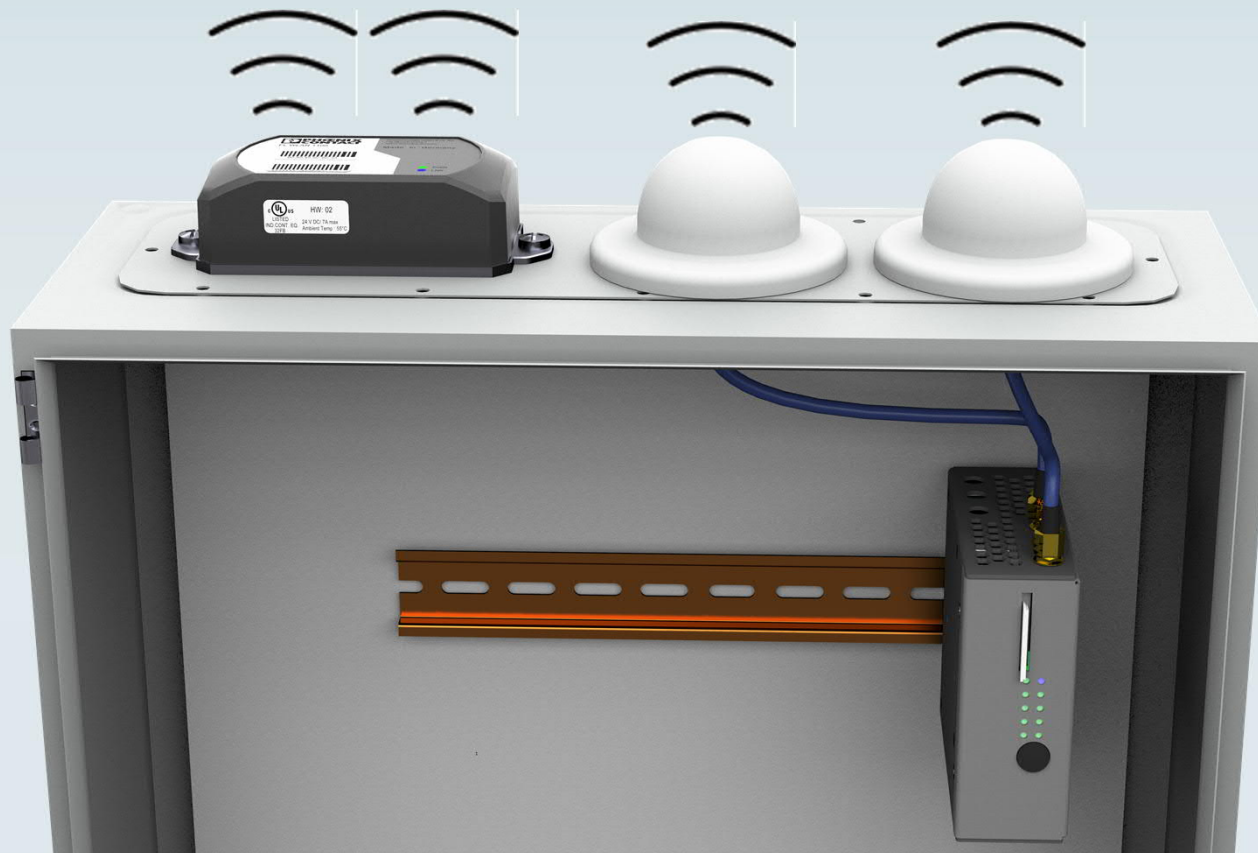
Quick fastening



Industrial WLAN



Industrial WLAN

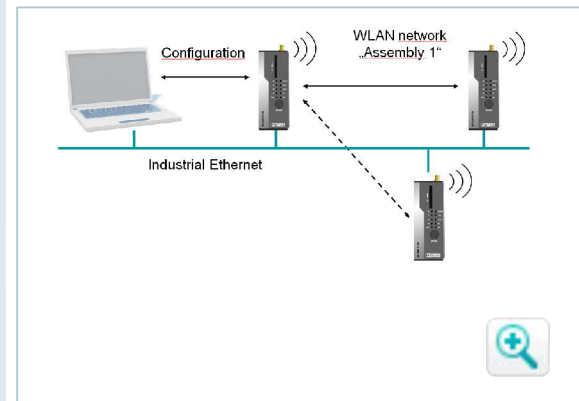


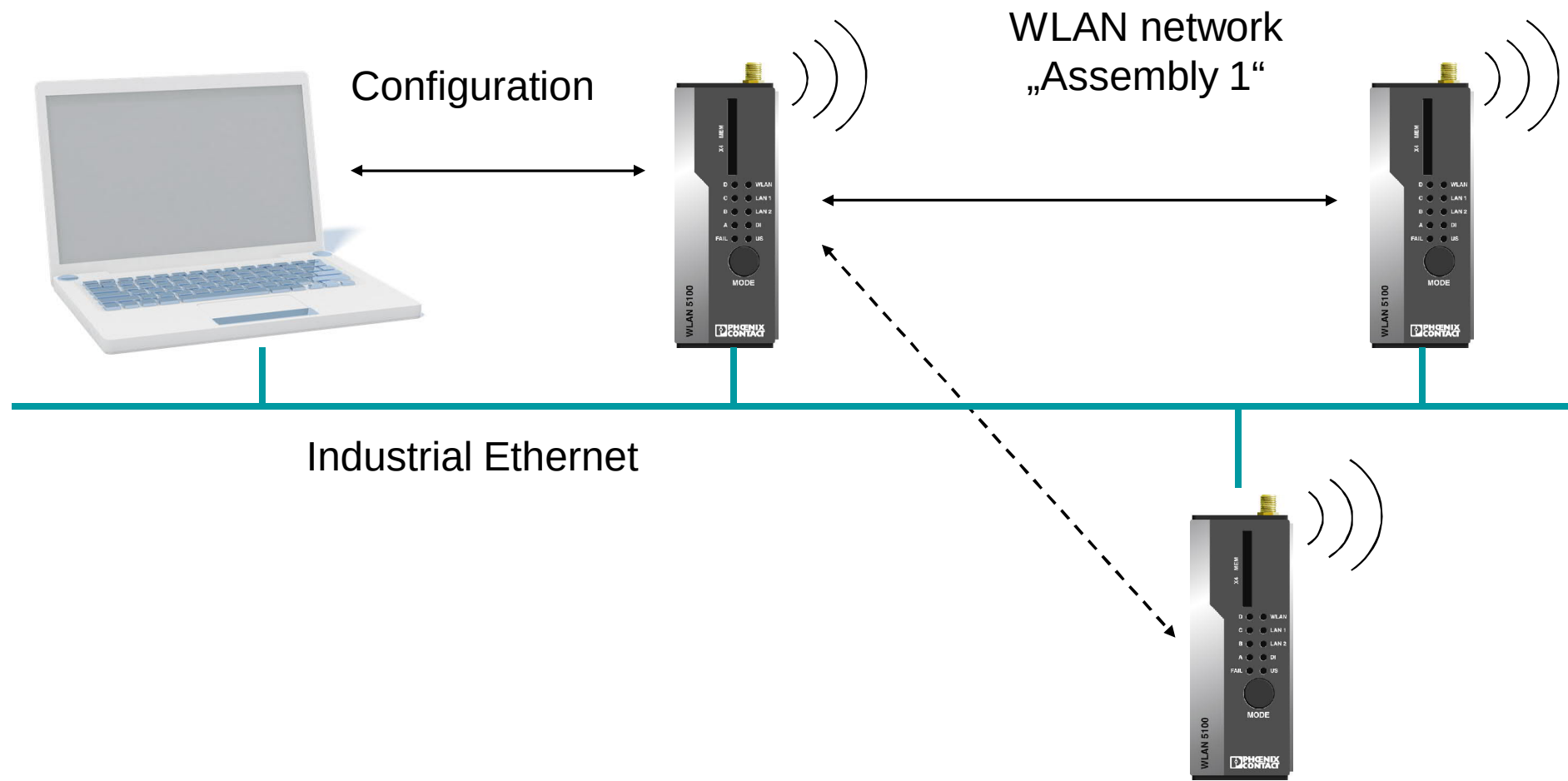
Industrial WLAN



Quick and
easy startup

Cluster Management





Industrial WLAN



	FL WLAN 1100 (Europe)	FL WLAN 1101 (USA, Canada)	FL WLAN 2100 (Europe)	FL WLAN 2101 (USA, Canada)
Function	Wireless access point and client		Wireless access point and client	
Antenna	2 x integrated Antennas with MIMO technology		2 x integrated Antennas with MIMO technology	
Wireless standard	IEEE 802.11 a/b/g/n		IEEE 802.11 a/b/g/n	
Frequency band	2,4 and 5 GHz		2,4 and 5 GHz	
Connection type	RJ45		RJ45	
Degree of protection	IP54 above, IP20 below		IP66/68 above, IP20 below	
Temperature range	0 °C ... 60 °C		-40 °C ... 60 °C	
Order number	2702534	2702538	2702535	2702540



Industrial WLAN



**FL WLAN 5110
(Europe)**

**FL WLAN 5111
(USA, Canada)**

Function	Wireless access point an client	
Antenna	2 x external Antennas (not included in scope of supply) with MIMO technology	
Wireless standard	IEEE 802.11 a/b/g/n	
Frequency band	2,4 and 5 GHz	
Connection type	RJ45	
Degree of protection	IP20	
Temperature range	-40 °C ... 60 °C	
Order number	1043193	1043201



Industrial Bluetooth



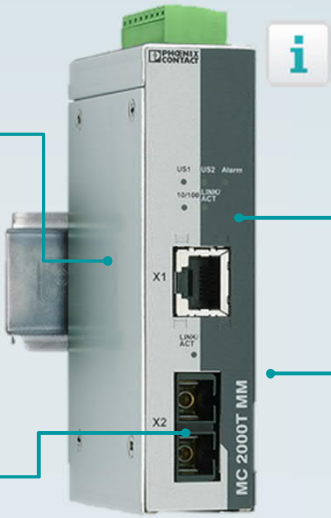
	FL EPA 2 (WLAN Mode)	FL EPA 2 RSMA (WLAN Mode)
Function	Bluetooth Ethernet Client Adapter	Bluetooth Access Point
Antenna	Internal antenna	Omnidirectional antenna supplied as standard
Frequency band	2,4 and 5 GHz	2,4 and 5 GHz
Connection type	M12 connection	M12 connection
Degree of protection	IP65	IP65
Temperature range	-40 °C ... 65 °C	-40 °C ... 65 °C
Order number	1005955	1005957



Media conversion

Maximum interference immunity,

FOT: Maximum transmission distances with an extremely high data rate



The image shows a Phoenix Contact MC 2000T MM media converter. It is a vertical, grey metal unit with a green terminal block on top. On the front panel, there are two RJ45 ports labeled X1 and X2. Above X1 are status LEDs for US1, US2, and Alarm, and a label for 10/100/1000 ACT. Below X1 is a label for LINK ACT. Above X2 is a label for 1000 ACT. A small blue 'i' icon is located to the right of the unit. The model name 'MC 2000T MM' is printed vertically on the right side of the unit.

Link-fault-pass-through function: constant connection monitoring

approved for zone 2



Media conversion



	FL MC 1000 SC	FL MC 1000 ST	FL MC 2000T SC	FL MC 2000T ST	FL MC 2000T SM20 SC	FL MC 2000T SM40 SC
Transmission	Multimode fiberglass				Singlemode fiberglass	
Connection method	SC duplex	B-FOC (ST*)	SC duplex	B-FOC (ST*)	SC duplex	
Temperature range	0°C...+60°C		-40°C...+75°C			
Range	Up to 9.6 km				Up to 20 km	Up to 40 km
Light wavelength	1310 nm					
Special features	Auto negotiation and MDI (x)		Store-and-forward or pass through mode can be selected via DIP switch with a short latency time of 835 ns. They can therefore be used for realtime Ethernet protocols			
Order number	2891320	2891321	2891315	2891316	2891317	2891318



Media conversion



	FL MC EF 1300 MM SC	FL MC EF 1300 MM ST	FL MC EF 1300 SM SC	FL MC 2000E	FL MC 2000E SM40 LC
Transmission	Multimode fiberglass		Singlemode fiberglass	Multimode fiberglass	Singlemode fiberglass
Connection method	SC duplex	B-FOC (ST*)	SC duplex	LC duplex	
Temperature range	-40°C...+65°C			-40°C...+75°C	
Range	Up to 10 km		Up to 36 km	Up to 9.6 km	Up to 40 km
Light wavelength	1310 nm				
Special features	LFPT and FEF diganostic functions, auto negotiation and auto MDI (x), backplane bus for redundant or alternative power supply			Accordance to IEC 61850/IEEE1613 4 kV insulation voltage, high EMC protection	
Order number	2902853	2902854	2902856	2891056	2891156



Media conversion



**FL MC EF
WDM-SET SC**

**FL MC EF WDM-A
SC**

**FL MC EF WDM-
B SC**

**FL MC ETH/FO
660 T**

**FL MC EF 660
SCRJ**



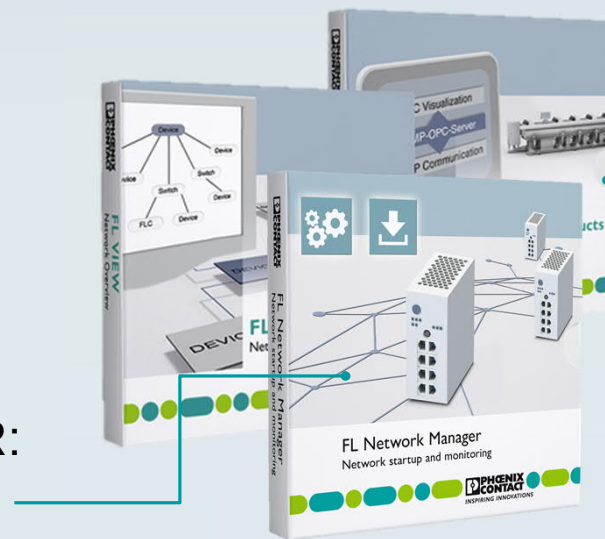
Transmission	Multimode and single mode fiberglass			Polymer fiber PCF	
Connection method	SC simplex			SC-RJ	
Temperature range	-40°C...+65°C			-20 °C ... 55 °C	
Range	Up to 38 km			Up to 100 m	
Light wavelength	1310/1550 nm			660 nm	
Special features	Converters A and B	Converter A	Converter B	T-coupler with two FO connections and two RJ45 sockets	Single-port media converter
Order number	2902660	2902658	2902659	2313164	2702944



Software



FL NETWORK MANAGER:
Network startup and
monitoring



SNMP OPC Products:
Linking of standardized
protocol types



Initial IP assignment

Via BootP, DHCP, DCP

Multi Device Configuration

Quick configuration of same parameters for different devices in parallel

SNMP based Scripting

SNMP configuration and information independent of device vendor

Multi Device Firmware Update

Easy Firmware update for many devices in parallel, thanks to the integrated TFTP server

Configuration File Handling

Simple up- and download of configuration files for back up and reconfiguration

Topology overview

Static topology overview with focus on redundancy systems (RSTP, MRP,...)



Initial IP assignment

BOOTP/DHCP SERVER						
192.168.0.111 Ethernet 2						
Options						
Search						
MAC address	IP address	Protocol	Status	Reserved	Lease expires	
00:A0:45:0B:7E:6D	192.168.0.1	BOOTP	IP assigned	☒		

BOOTP/DHCP Reservations				
Search				
MAC address	IP address	Subnet mask	Default gateway	
00:A0:45:0B:7E:6D	192.168.0.1	255.255.255.0		
Enter MAC address	Enter IP address	Enter subnet mask	Enter default gateway	

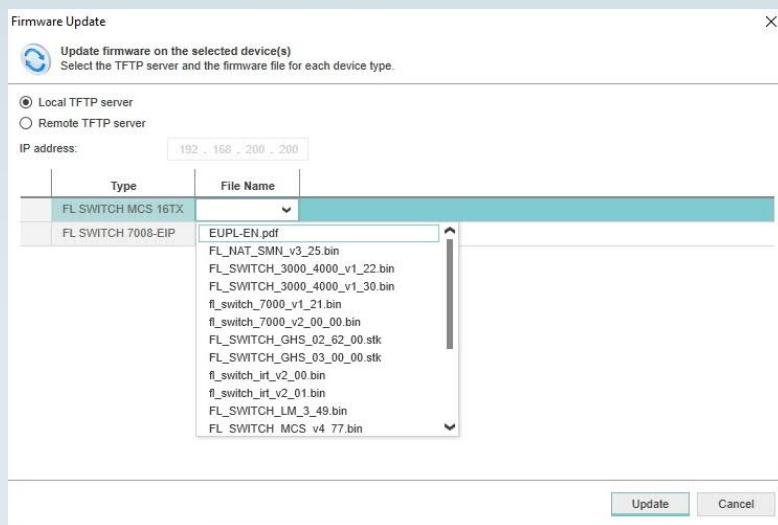
LOGGING			
Online			
	Time Stamp	Code	Description
i	27.09.2016 13:22:42	BOOTPDHC...	BOOTP reply to client (MAC address: 00:A0:45:27:AD:6F) with IP address 192.168.200.14 sent.
i	27.09.2016 13:23:19	BOOTPDHC...	BOOTP request from client (MAC address: 00:A0:45:27:AD:6F) received.
i	27.09.2016 13:23:20	BOOTPDHC...	BOOTP reply to client (MAC address: 00:A0:45:27:AD:6F) with IP address 192.168.200.15 sent.
i	27.09.2016 13:24:01	BOOTPDHC...	BOOTP request from client (MAC address: 00:A0:45:08:55:F7) received.
i	27.09.2016 13:24:02	BOOTPDHC...	BOOTP reply to client (MAC address: 00:A0:45:08:55:F7) with IP address 192.168.200.14 sent.
i	27.09.2016 13:24:11	BOOTPDHC...	BOOTP request from client (MAC address: 00:A0:45:5F:F6:69) received.
i	27.09.2016 13:24:12	BOOTPDHC...	BOOTP reply to client (MAC address: 00:A0:45:5F:F6:69) with IP address 192.168.200.191 sent.

Initial IP assignment via BootP/DHCP/DCP

- All needed server integrated
- IP address, subnet mask and gateway
- Detailed status information
- Detailed logging



Multiple Firmware Update



	Time Stamp	Code	Description
i	27.09.2016 14:05:07	UPD0003	Successfull firmware update on the device with ip-address 192.168.200.205. Old version: 4.77. New version 4.90.
i	27.09.2016 14:06:29	TFTP0007	The device 192.168.200.205 requests the local TFTP server to write the file 'C:\Users\Public\Documents\FL NETWO...
i	27.09.2016 14:06:29	TFTP0009	TFTP request from device 192.168.200.205 accepted. TFTP server started to write the file to the device...
i	27.09.2016 14:06:34	TFTP0012	Transfer of file 'FL_SWITCH_MCS_v4_77.bin' completed.
i	27.09.2016 14:08:27	UPD0003	Successfull firmware update on the device with ip-address 192.168.200.205. Old version: 4.90. New version 4.77.

Easy update for different Switches at the same time

- Needed server integrated
- No need to think about topology
- Roll picker to choose the right firmware
- One click to start all updates
- Progress bar for firmware transmission



Configuration file handling

Read Configuration

Read configuration from the selected device(s)
Select the TFTP server and start reading the configuration files.

☒ Local TFTP server
☐ Remote TFTP server

IP address: 192.168.0.111

Read Cancel

Write Configuration

Write configuration to the selected device(s)
Select the TFTP server and the configuration file for each device.

☒ Local TFTP server
☐ Remote TFTP server

IP address: 192.168.1.111

Type	File name
192.168.1.9 (FL SWITCH 2005)	192.168.1.3_08-15_102922.fcg
192.168.1.7 (FL SWITCH 2206-2FX-ST)	192.168.1.4_08-15_102922.fcg
192.168.1.6 (FL SWITCH 2207-FX SM)	192.168.1.6_08-15_102922.fcg
192.168.1.3 (FL SWITCH 2005)	192.168.4.3_09-19_092213.fcg
	192.168.4.4_09-19_092213.fcg
	192.168.10.150_01-11_135256.fcg
	192.168.10.150_06-20_105721.fcg
	192.168.10.151_01-11_135256.fcg
	192.168.10.151_06-20_105721.fcg
	192.168.10.152_06-20_105721.fcg
	FL_SWITCH_2000_v2_01_withBL110.bin
	FL SWITCH_GHS_03_30_00.stk

Write Cancel

Comfortable mechanism for up and download of configuration files

- Back up the configuration
- Timestamping
- The up or download will be executed with a few clicks



MDC for easy network start up

Multi Device Configuration (MDC)

- Clearly arranged parameter categories
- Set of single parameters (e.g.. RSTP activation) for several devices at the same time
- Suffix and Prefix for easy naming
- Consecutive numbering for IP-parameter

(Rapid) Spanning Tree	Fast Ring Detection	Large Tree Support	Status
activated			
activated			
activated			

Category
Default
Alarm Contacts
Network Redundancy
SNMP trap settings

Systemname	Typ	Status	Anzeigenname
EthExpMeeting2017	EL SWITCH 2005		102.169.10.15
EthExpMeeting2017			
EthExpMeeting2017			

Subnetzmaske	Standard-Gateway	Systemname	Typ
255.255.255.0			
255.255.255.0	A 255.0.0.0		
255.255.255.0	B 255.255.0.0		
	C 255.255.255.0		



SNMP based Scripting for SNMP devices

Extensive functions

- Configuration and diagnostic for every SNMP device
- SET and GET command
- Loops and branches
- Call script in script command
- Command for structuring the output

```
1 |
2 // writes the value systemname (administratively-assigned name) for the device
3 SET('1.3.6.1.2.1.1.5.0', OctetString, 'EthExpMeeting2017');
4
5 // writes a simple text into the output window
6 WRITECONSOLE('Device Name:');
7
8 // reads the value systemname (administratively-assigned name) for the device
9 GET('1.3.6.1.2.1.1.5.0', OctetString);
```

OUTPUT CONSOLE

Options

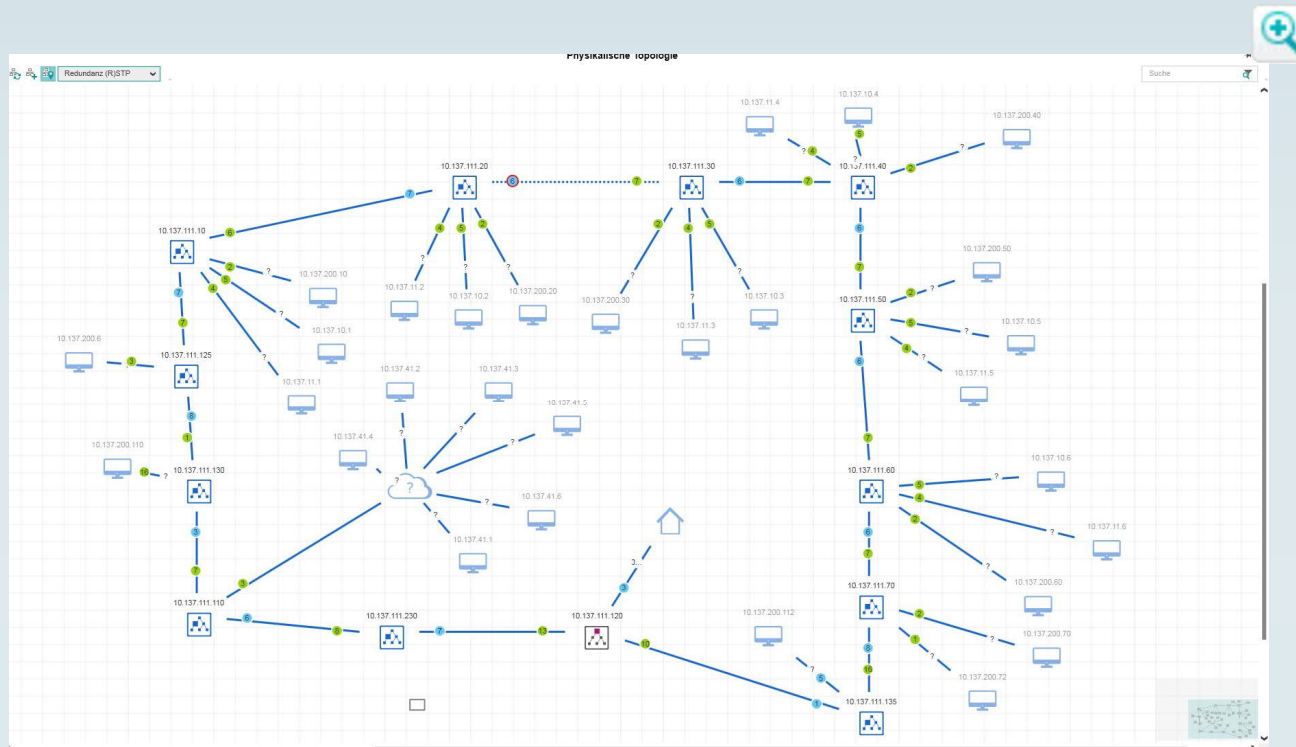
192.168.10.150 x 192.168.10.152 x 192.168.10.151 x

04.10.2017 10:38:22: The script Script Devicename is started.
04.10.2017 10:38:22: SET OK. OID: 1.3.6.1.2.1.1.5.0. Value: EthExpMeeting2017
04.10.2017 10:38:22: Device Name:
04.10.2017 10:38:22: GET OK. OID: 1.3.6.1.2.1.1.5.0. Value: EthExpMeeting2017
04.10.2017 10:38:22: The script Script Devicename completed successfully.

Kopieren Strg+C
Export console tabs to *.txt files...



Topology Overview



Static Network Topology

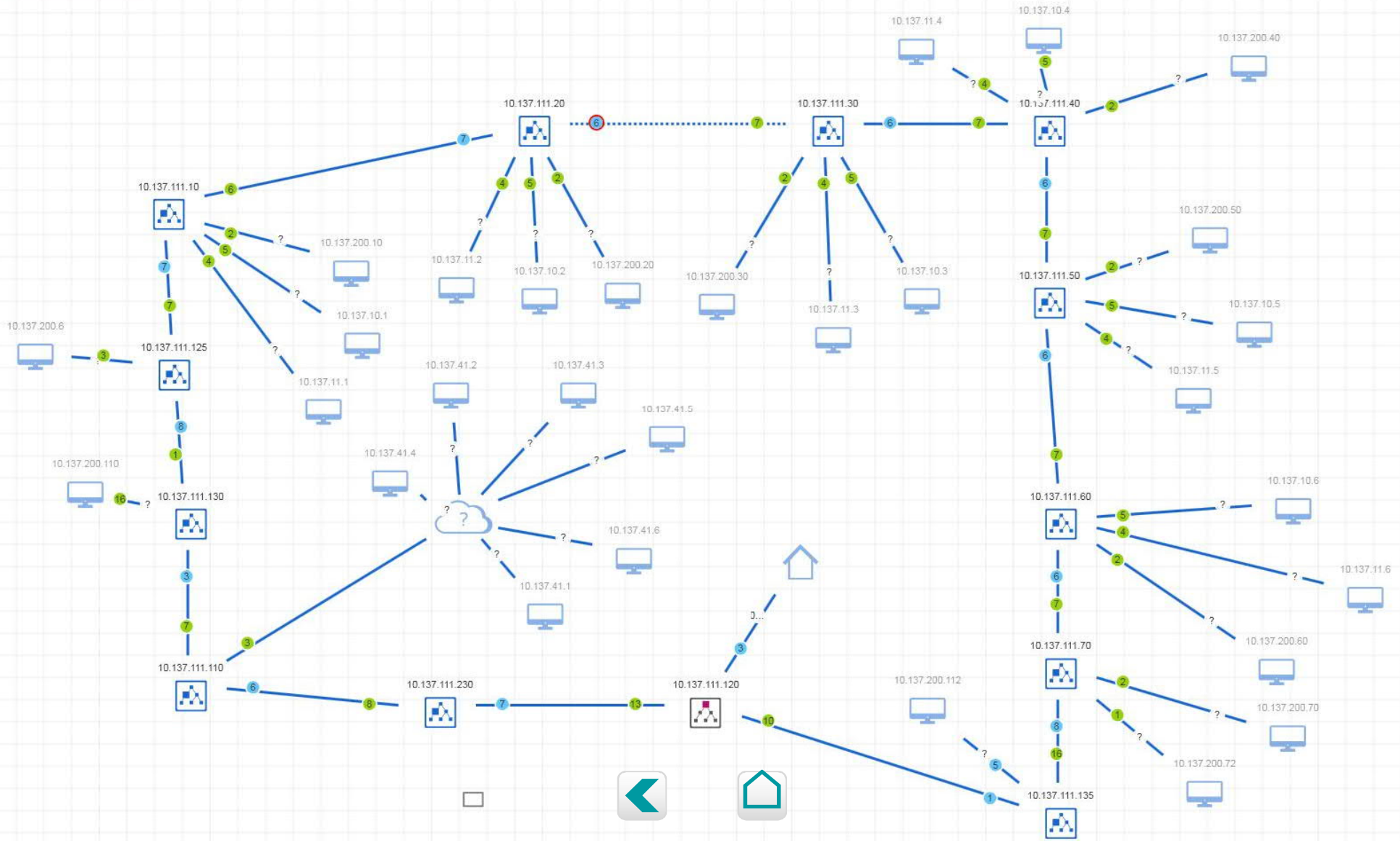
- Graphical overview
- Detection of switches and end devices
- Views for different redundancy mechanisms with graphical detail information
- Easy topology comparison between saved and online topology, thanks to different colours



Physikalische Topologie

Redundanz (R)STP

Suche



FL NETWORK MANAGER BASIC - FLNetMan.netm*

File Edit Extras Window Help

PLANT

- Project (20 of 20)
 - 192.168.200.233 : Ethernet Device
 - 192.168.200.17 : Ethernet Device
 - 192.168.200.237 : FL SWITCH MM HS
 - 192.168.200.238 : FL SWITCH MCS 16TX
 - 192.168.200.20 : Ethernet Device
 - 192.168.200.10 : FL SWITCH MCS 16TX
 - 192.168.200.205 : FL SWITCH MCS 16TX
 - 192.168.200.7 : FL SWITCH GHS 12G
 - 192.168.200.1 : FL SWITCH SMCS 8GT
 - 192.168.200.6 : Ethernet Device
 - 192.168.200.15 : Ethernet Device
 - 192.168.200.16 : Ethernet Device
 - 192.168.200.4 : Ethernet Device
 - 192.168.200.3 : FL SWITCH 7008-EIP
 - 192.168.200.13 : Ethernet Device
 - 192.168.200.19 : Ethernet Device
 - 192.168.200.18 : Ethernet Device
 - 192.168.200.21 : Ethernet Device
 - 192.168.200.22 : Ethernet Device
 - 192.168.200.2 : FL SWITCH MCS 16TX

Project x

Online Devices BOOTP/DHCP...

Online Devices

24 entries

Last scan on 27.09.2016 13:57:22

IP mask	Default gateway	Name of station	Type	Status	Display Name (Online)	Subnet mask	Default
255.255.0		mnhis.gerd.de	FL SWITCH MM HS		Select online device here		
255.255.0		mcs.gerd	FL SWITCH MCS 16TX		Select online device here		
255.255.0		fl-switch-mcs-14tx-2tx	FL SWITCH MCS 16TX		192.168.200.2 : 00:A0:45:05:6E:FE	255.255.255.0	
255.255.0		fl-switch-irt-bx-3pof	Ethernet Device		192.168.200.20 : 00:A0:45:03:03:04	255.255.255.0	
					192.168.178.200 : 00:0E:0C:50:C7:30	255.255.255.0	149.21
255.255.0		fl-switch-mcs-stempunkt	FL SWITCH MCS 16TX		192.168.200.10 : 00:A0:45:07:8F:A9	255.255.255.0	
255.255.0	192.168.200.1	FL SWITCH MCS 16TX	FL SWITCH MCS 16TX		192.168.200.205 : 00:A0:45:03:89:55	255.255.255.0	192.11
255.255.0		FL SWITCH SMCS 8GT	FL SWITCH SMCS 8GT		192.168.200.1 : 00:A0:45:0A:02:D5	255.255.255.0	
255.255.0		FL NAT SM	Ethernet Device		192.168.200.233 : 00:A0:45:AD:2A:FC	255.255.255.0	
255.255.0	192.168.200.1	FL MGUARD RS 2000	Ethernet Device		192.168.200.6 : 00:A0:45:D6:62:EB	255.255.255.0	192.11
		45 74 68 65 72 6E 65 74 2D 47 65 72 E4 74	Ethernet Device		192.168.200.16 : 00:A0:45:08:55:F7		
		FL SWITCH LM 5TX	Ethernet Device		192.168.200.15 : 00:A0:45:27:AD:6F		
		FL SWITCH 7008-EIP	FL SWITCH 7008-EIP		192.168.200.3 : 00:A0:45:CA:D9:65		
255.255.0		FL SWITCH 3008	Ethernet Device		192.168.200.4 : 00:A0:45:61:C1:59	255.255.255.0	
			Ethernet Device		192.168.200.18 : 00:A0:45:D8:35:72		
			Ethernet Device		192.168.200.17 : 00:A0:45:D8:31:9A		
			Ethernet Device		192.168.200.22 : 00:A0:45:B3:AF:BE		
		FL SWITCH 7006-2FX-EIP	Ethernet Device		192.168.200.21 : 00:A0:45:AD:1F:C1		

Scan options

SNMP scan

☒ Enable ⓘ

Timeout (ms): ⓘ 3000

Network adapter: ⓘ 192

DGP scan

☒ Enable ⓘ

Network adapter: ⓘ Flv

Ping scan

☒ Enable ⓘ

Timeout (ms): ⓘ

Maximum concurrent requests: ⓘ

IsEnabled Sta

☒ 192.168.200.2

☐ Enter IP address

BOOTP/DHCP scan

LOGGING

Online

Time Stamp	Code	Message
27.09.2016 14:03:24	TFTP0012	Transfer of file 'fl_switch_7000_v2_00_00.b
27.09.2016 14:03:36	UPD0001	Firmware image fl_switch_7000_v2_00_00.
27.09.2016 14:05:07	UPD0003	Successful firmware update on the device
27.09.2016 14:06:29	TFTP0007	The device 192.168.200.205 requests the fi
27.09.2016 14:06:29	TFTP0009	TFTP request from device 192.168.200.205
27.09.2016 14:06:34	TFTP0012	Transfer of file 'FL_SWITCH_MCS_v4_77.b

TFTP SERVER

192.168.200.200 FM Next Test

IP address	File name	Progress	Action
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Windows aktivieren

Webcam Sie zu den Einstellungen

References

TFTP BOOTP

14:13 27.09.2016



Software



Linking of
standardized protocol
types

- Easy converting of SNMP in OPC
- Converting of SNMP variables and alarms
- Easy start-up thanks to preconfigured profiles





SNMP-OPC-Server



Software



FL Network Manager Basic

Function	Configuration and monitoring of network components
Language	English
Base	SNMP
Order number	2702889



Software



FL SNMP OPC SERVER V3 -

FL SNMP OPC SERVER V3 LIC 100

Function	Monitoring and configuration of SNMP-capable equipment in HMI and SCADA systems	Extension license for 100 devices for the SNMP OPC server
Language	German and English	-
Base	Conversion of SNMP in OPC	-
Order number	2701139	2701138



Device server

Connects devices with an RS-232, RS-422 or RS-485 serial interface to a LAN

User authentication to prevent unauthorized access



Simple configuration and built-in diagnostics

256-bit AES encryption for secure transfer of sensitive data



Serial Device Server



	FL COMSERVER BASIC	FL COMSERVER BASIC-T	GW DEVICE SERVER 1E/1DB9	GW DEVICE SERVER 1E/2DB9	GW DEVICE SERVER 2E/2DB9	GW DEVICE SERVER 2E/4DB9
Protocol	Protocol transparent					
Ethernet interface	1x RJ45		1x RJ45		2x RJ45	
Serial interface (RS-232/422/485)	1x D-SUB 9		1x D-SUB 9	2x D-SUB 9		4x D-SUB 9
Special features	ATEX, UL (Class I, Division 2)		ATEX, IECEx, UL (Class I, Division 2)			
Order number	2313478	2904681	2702758	2702760	2702761	2702763



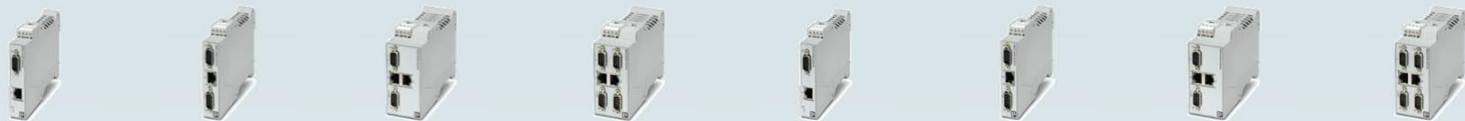
Gateways



FL COMSERVER UNI	FL COMSERVE R UNIT	GW MODBUS TCP/RTU 1E/1DB9	GW MODBUS TCP/RTU 1E/2DB9	GW MODBUS TCP/RTU 2E/2DB9	GW MODBUS TCP/RTU 2E/4DB9	GW MODBUS TCP/ASCII 1E/1DB9	GW MODBUS TCP/ASCII 1E/2DB9	GW MODBUS TCP/ASCII 2E/2DB9	GW MODBUS TCP/ASCII 2E/4DB9
Modbus/RTU to Modbus/TCP						RAW, ASCII to Modbus/TCP			
1x RJ45		1x RJ45		2x RJ45		1x RJ45		2x RJ45	
1x D-SUB 9		1x D-SUB 9	2x D-SUB 9		4x D-SUB 9	1x D-SUB 9	1x D-SUB 9		4x D-SUB 9
ATEX, UL (Class I, Divisson 2)		ATEX, IECEX, UL (Class I, Division 2)							
2313452	2904817	2702764	2702765	2702766	2702767	2702768	2702769	2702770	2702771



Gateways



GW PN/ASCII
1E/1DB9

GW PN/ASCII
1E/2DB9

GW PN/ASCII
2E/2DB9

GW PN/ASCII
2E/4DB9

GW EIP/ASCII
1E/1DB9

GW EIP/ASCII
1E/2DB9

GW EIP/ASCII
2E/2DB9

GW EIP/ASCII
2E/4DB9

Protocol	RAW, ASCII to PROFINET				RAW, ASCII to EtherNet/IP			
Ethernet interface	1x RJ45		2x RJ45		1x RJ45		2x RJ45	
Serial interface (RS-232/422/485)	1x D-SUB 9	2x D-SUB 9	2x D-SUB 9	4x D-SUB 9	1x D-SUB 9	2x D-SUB 9	2x D-SUB 9	4x D-SUB 9
Special features	ATEX, IECEx, UL (Class I, Division 2)							
Order number	1021080	1021058	1021056	1020882	2702772	2702773	2702774	2702776



Gateways

new



EtherNet/IP 

	GW PN/ASCII 1E/1DB9	GW PN/ASCII 1E/2DB9	GW PN/ASCII 2E/2DB9	GW PN/ASCII 2E/4DB9
Protocol	Modbus to Ethernet/IP			
Ethernet interface	1x RJ45		2x RJ45	
Serial interface (RS-232/422/485)	1x D-SUB 9	2x D-SUB 9	2x D-SUB 9	4x D-SUB 9
Special features	ATEX, IECEx, UL (Class I, Division 2)			
Order no.	1062540	1062423	1062380	1062388



TIMESERVER NTP

 Receives accurate time and geo-location information

 Supports Power over Ethernet for one cable operation

Alternatively external 10 to 30 V DC supply



Fast and easy connection



TIMESERVER NTP

Receives accurate time and geo-location information



- GNSS receiver for GPS, Galileo and GLONASS
- NTP time server for Ethernet networks
- Precise position determination via web-based management, SNMP, NMEA or JSON streaming



TIMESERVER NTP



TIMESERVER NTP

Type	FL TIMESERVER NTP
Temperature range	-40°C...+70°C
Order number	1107132
Description	NTP timeserver with GNSS receiver



Modular Ethernet HART multiplexer

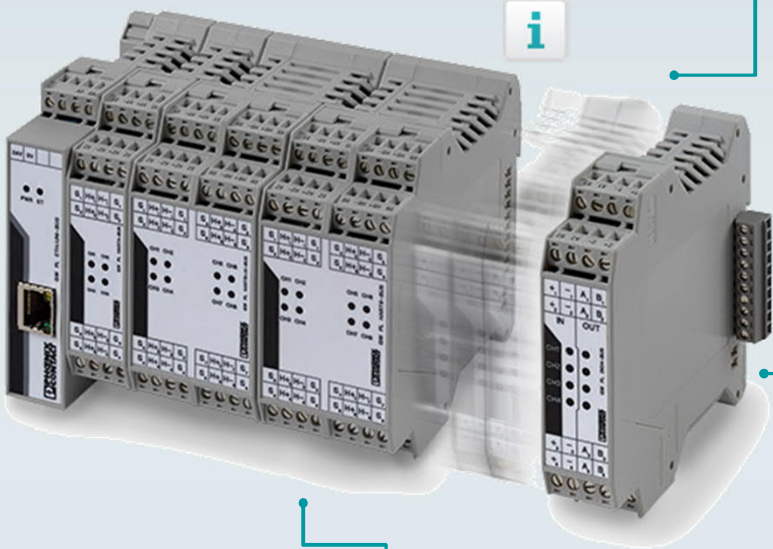
Transmit critical HART
process data over
Ethernet

Environmental 

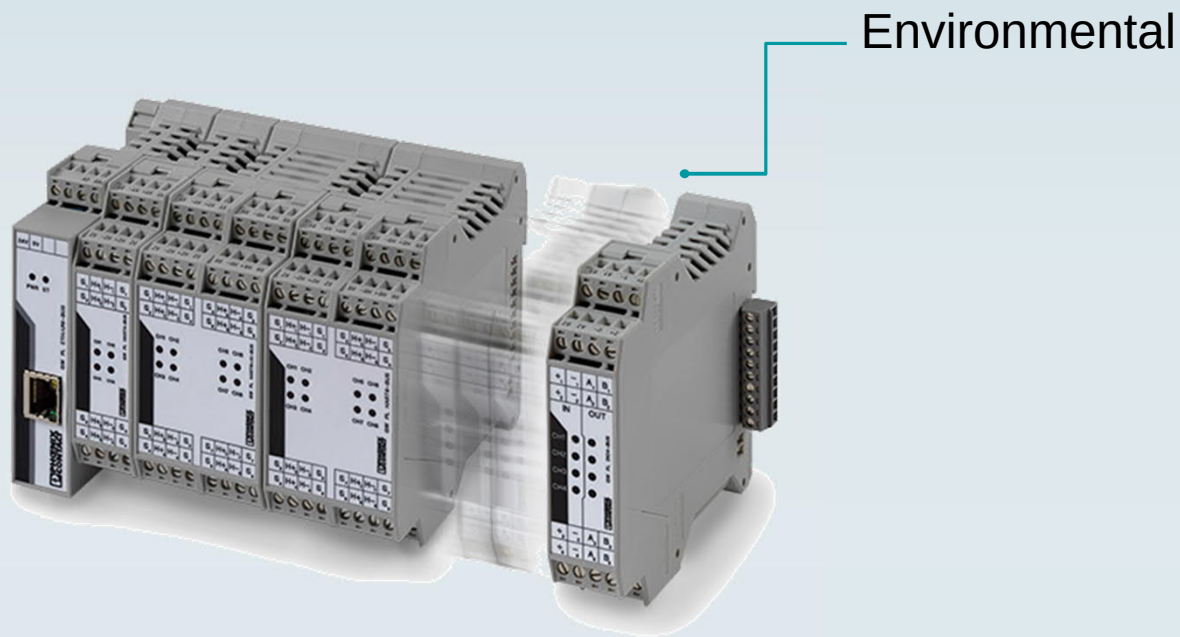
1 HART master per
channel ensures
maximum update rate

Connect expansion
 modules

Access process data via 



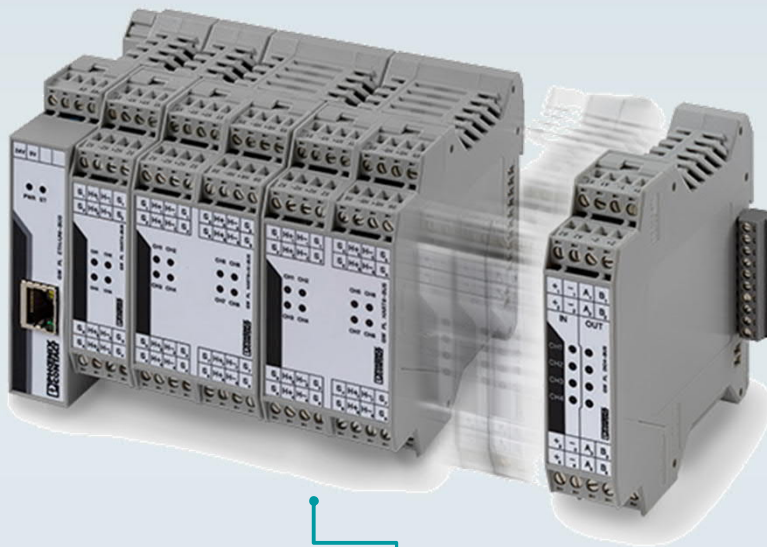
Modular Ethernet HART multiplexer



- -40...+70°C
- ATEX, IECEx, UL Zone 2



Modular Ethernet HART multiplexer

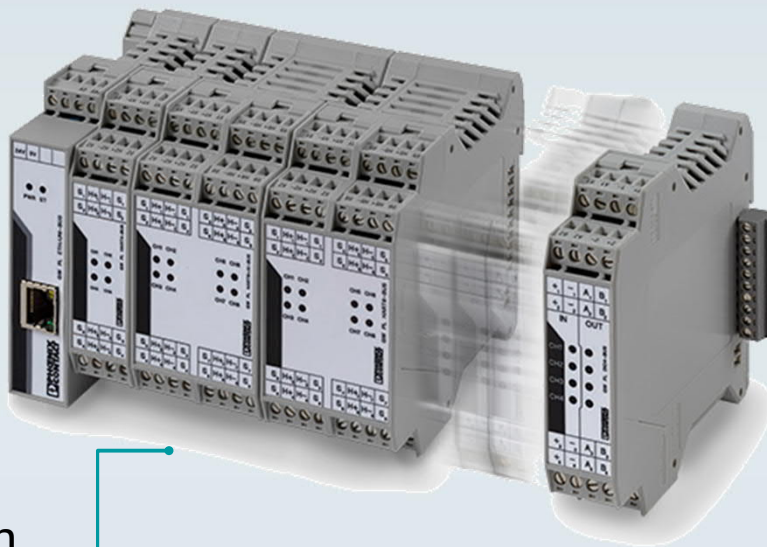


Access process data via

- Modbus TCP
- HART/IP
- Profinet
- FDT/DTM configure with a web browser



Modular Ethernet HART multiplexer



Connect expansion modules

- 4 channel HART
- 8 channel HART
- 8 channel HART with loop supply
- 4 channel digital in/ 4channel digital out



Modular Ethernet HART multiplexer



	Modular gateway Ethernet head station		Expansion modules			
Type	GW PL ETH/BASIC- BUS	GW PL ETH/UNI- BUS	GW PL HART8- BUS	GW PL HART4- BUS	GW PL HART8+AI-BUS	GW PL DIO4- BUS
Order number	2702321	2702233	2702235	2702234	2702236	2702237
Description	Head station with Modbus TCP, HART IP, FDT/DTM	Head station with Profinet, Modbus TCP, HART IP, FDT/DTM	8 channel HART module	4 channel HART module	8 channel HART module with analog loop supply	4 channel digital I/O



Remote control via Cloud

Cost-effective entry into cloud-based remote maintenance

Simple startup due to configuration assistants in the mGuard secure remote service



Intuitive operation of web interface

Flexible communication with the cloud via operator or 4G LTE networks



Remote control via Cloud



verizon



AT&T

	TC CLOUD CLIENT 1002-4G	TC CLOUD CLIENT 1002-TX/TX	TC CLOUD CLIENT 1002-4G VZW	TC CLOUD CLIENT 1002-4G ATT
Transmission medium	4G LTE	Operator's network	4G LTE Verizon, US	4G LTE AT&T, US
Description	Industrial VPN gateway for mGuard Secure remote service, Cloud communication via 4G LTE, European version	Industrial VPN gateway for mGuard Secure remote service, cloud communication via operator network,	Industrial VPN gateway for mGuard Secure remote service, cloud communication via 4G LTE, Verizon (US)	Industrial VPN gateway for mGuard Secure remote service, cloud communication via 4G LTE, AT&T (US)
Special features	Device configuration in mGuard secure remote service, simplified Web-Interface			
Firewall	No	No	No	No
VPN Tunnel	1 VPN tunnel to the mGuard Secure remote service			
Order number	2702886	2702885	2702887	2702888



Copper-based network installation



Fast data transmission



360° shielding concepts



Solutions from IP20 to IP69K

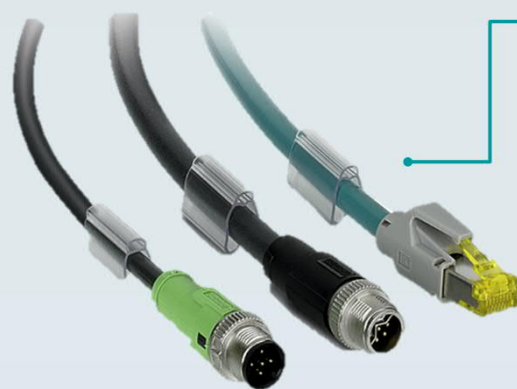
Fast assembly



Wide range of plugs

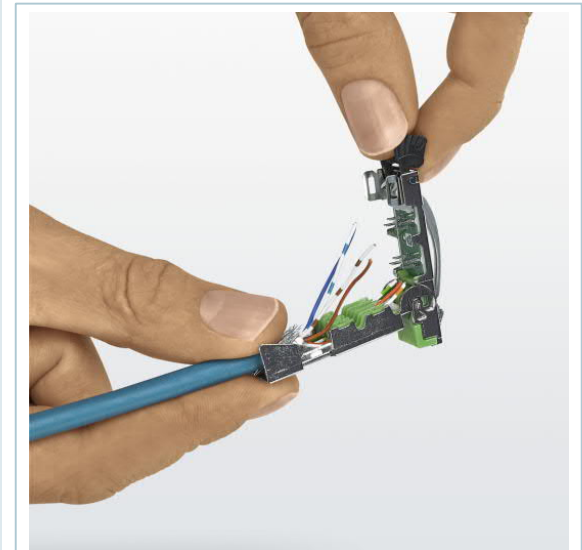


Copper-based network installation



Fast assembly

- No special tools needed
- IDC und pierce fast connection



Copper-based network installation



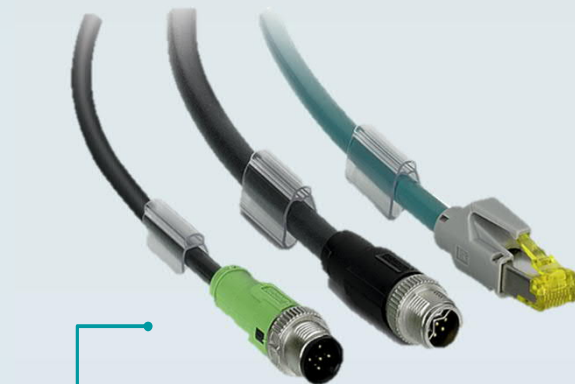
Wide range of
plugs

- From RJ45 to M12

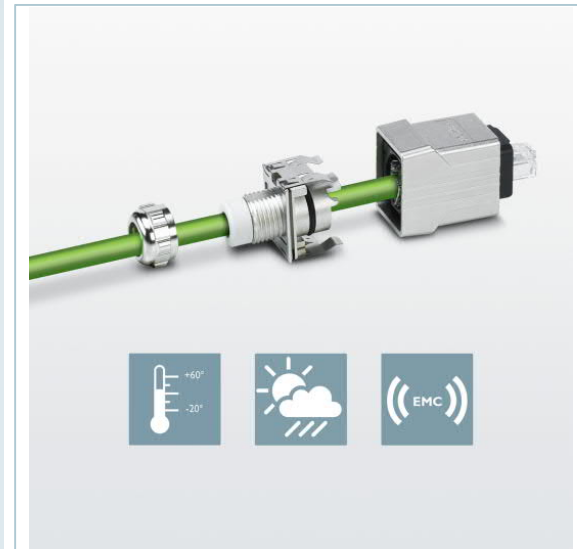


Copper-based network installation

360° shielding
concepts



- 360° EMC shielding
- High level of resistance to EMI and ESD



Copper-based network installation

Fast data
transmission



- Data rates up to 10 Gbps
- Components that meet the CAT6_A standard



Fiber optic-based network installation



Fiber optic-based network installation



Wide choice of versions

Connection types:

- SC-RJ
- LC
- SC
- FSMA
- ST

Fiber types:

- POF
- PCF
- GOF

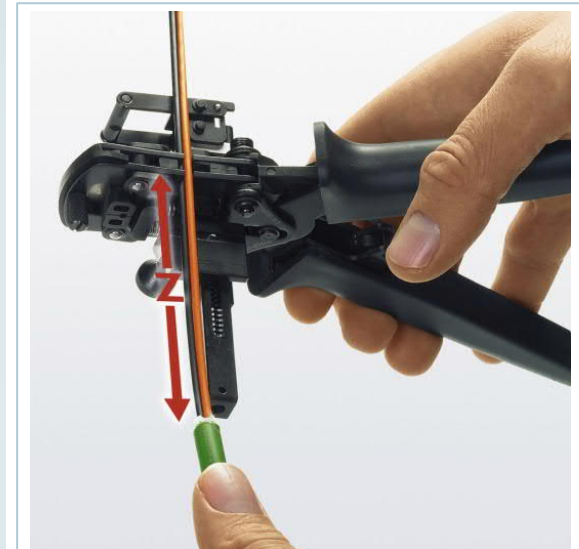


Fiber optic-based network installation

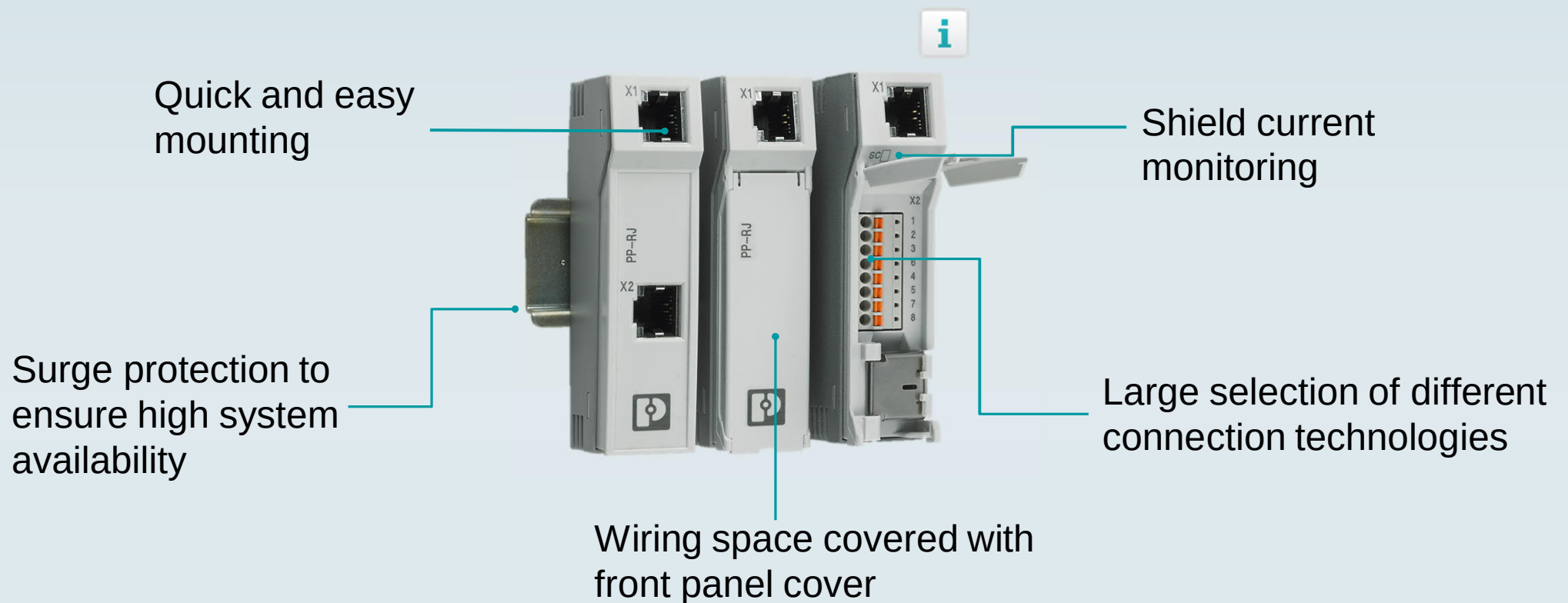


Fast assembly in
the field

- Professional tools



Patch panels



Patch panels



	PP-RJ-RJ(-F)	PP-RJ-SC(-F)	PP-RJ-SCC(-F)	PP-RJ-IDC(-F)
Connection type	RJ45/RJ45	RJ45/Screw	RJ45/Push-In	RJ45/IDC
Description	8-pole, 10/100/1000 MBit/s			
Shielding	Directly on the DIN-rail			
Shield connection	Via RJ45 socket	Tool-free via shield current contact		
Order number	2703015	2703016	2703018	2703019
With Surge protection and Shield current diagnosis	2703020	2703021	2703022	2703023



Patch panels



	FL CAT5 TERMINAL BOX	FL-PP-RJ45-SC	FL-PP-RJ45-SCC	FL-PP-RJ45-LSA
Connection type	RJ45/Screw	RJ45/Screw	spring-cage connection	LSA-connection
Description	4-pole, 10/100 MBit/s	8-pole, 10/100/1000 MBit/s		
Shielding	Directly on the DIN-rail	directly on the DIN rail or optionally via RC combination		
Shield connection	Bracket clamp with screws			
Order number	2744610	2901643	2901642	2901645



Patch panels



	FL-PP-RJ45/RJ45	FL-PP-RJ45/RJ45-B	FL-PP-RJ45-SCC/SC041	FL-PP-RJ45-SCC/SC045
Connection type	RJ45/Screw	RJ45/Screw	spring-cage connection	LSA-connection
Description	8-pole, 10/100/1000 MBit/s	Extended temperature range -40 °C ... 85 °C, narrow width	Cable sharing module with cable outlet to the front	Cable sharing module with cable outlet upwards
Shielding	Directly on the DIN rail or optionally via RC combination	Continuous shield	Directly on the DIN rail or optionally via RC combination	
Shield connection	Via RJ45 port		Bracket clamp with screws	
Order number	2901646	2904933	2903532	2904577



PRP redundancy modules

Easy setup of high-availability network infrastructure without configuration

No switching times for uninterrupted operation in the event of an error

No loss of packets in the event of network failure



Integration of non-PRP-capable devices in parallel networks for maximum availability



according to IEC 61850-3 and IEEE 1613

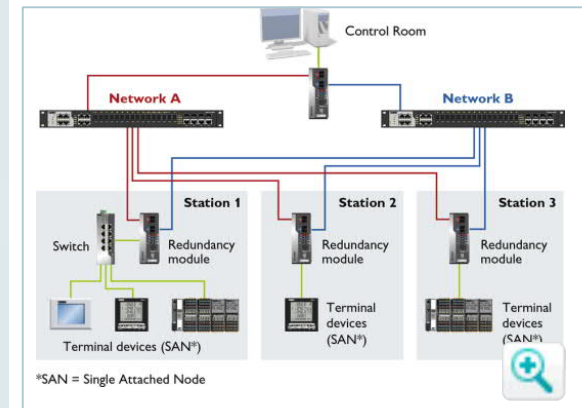


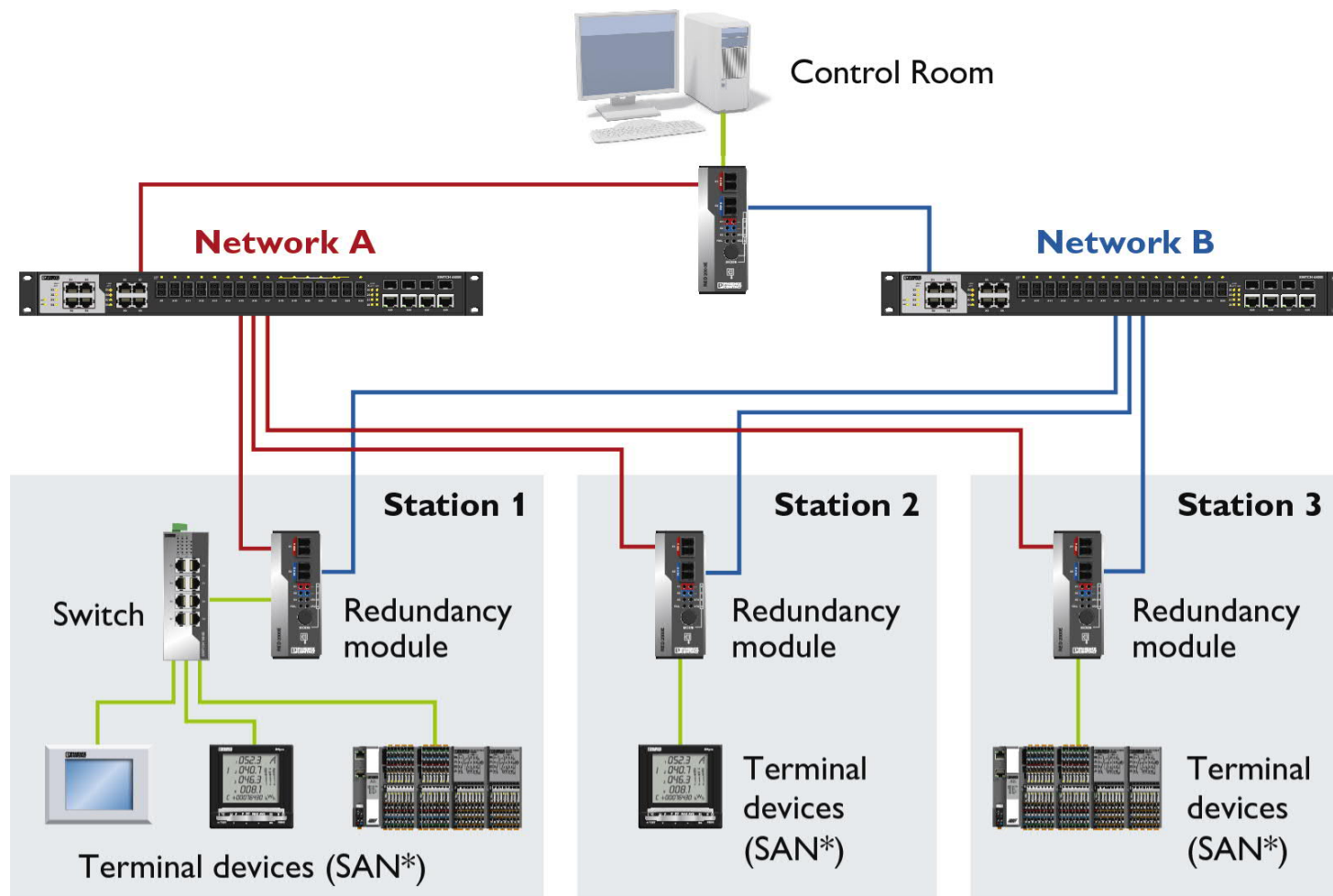
PRP redundancy modules



Integration of non-PRP-capable devices in parallel networks for maximum availability

- Parallel Network Redundancy Protocol (PRP)
- Standardized according to IEC62439-3
- No switch-over time





*SAN = Single Attached Node



PRP redundancy modules



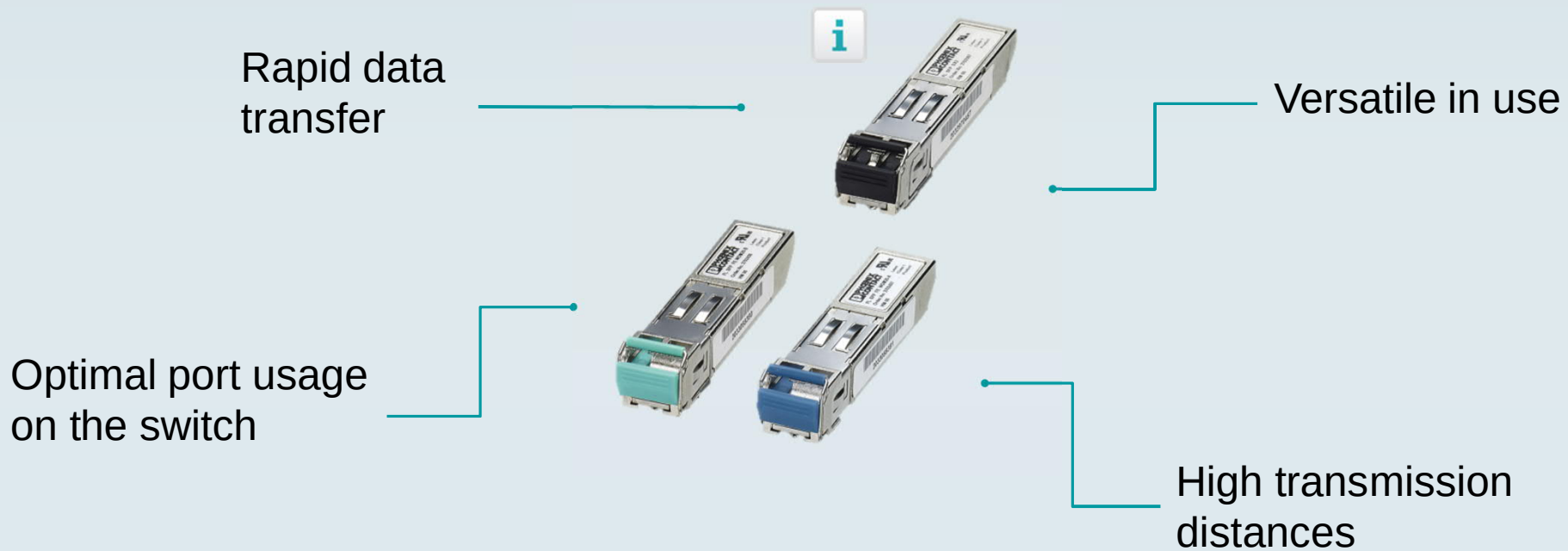
**FL RED 2003E
PRP**

**FL RED 2001E
PRP 2LC**

Function	Redundancy module	Redundancy module
Design	Slim	Slim
Ports (Transmission speed)	3x RJ45 (10/100 Mbit/s)	1x RJ45 (10/100 Mbit/s) 2x LC MM (100 Mbit/s)
Special features	-	-
Temperature range	-40 °C ... 70 °C	-40 °C ... 70 °C
Order number	2701863	2701864



SFP modules



SFP modules



	FL SFP SX	FL SFP FX	FL SFP LX10-B	FL SFP LX	FL SFP FX SM
Function	SFP module	SFP module	SFP module	SFP module	SFP module
Connection type (Transmission speed)	LC Multimode (1000 Mbit/s)	LC Multimode (100 Mbit/s)	LC Singlemode (1000 Mbit/s)	LC Singlemode (1000 Mbit/s)	LC Singlemode (100 Mbit/s)
Max. transmission length	1 km	2 km	10 km	30 km	40 km
Wavelength	850 nm	1310 nm	1310 nm	1310 nm	1300 nm
Temperature range	-40 °C ... 75 °C	-40 °C ... 85 °C	0 °C ... 60 °C	-40 °C ... 85 °C	-40 °C ... 85 °C
Order number	2891754	2891081	1025401	2891767	2891082



SFP modules



FL SFP LH

FL SFP SX2

**FL SFP
WDM10-A**

**FL SFP FE
WDM20-A**

**FL SFP
WDM10-B**



Function	SFP module	SFP module	SFP module	SFP module	SFP module
Connection type (Transmission speed)	LC Singlemode (1000 Mbit/s)	LC Multimode (1000 Mbit/s)	LC Singlemode (1000 Mbit/s)	LC Singlemode (100 Mbit/s)	LC SM (1000 Mbit/s)
Max. transmission length	80 km	2 km	10 km	20 km	10 km
Wavelength	1550 nm	1310 nm	1310/1550 nm	1310/1550 nm	1550/1310 nm
Temperature range	-40 °C ... 85 °C	-40 °C ... 75 °C	-40 °C ... 75 °C	-40 °C ... 75 °C	-40 °C ... 75 °C
Order number	2989912	2702397	2702440	2702437	2702441



SFP modules



	FL SFP FE WDM20-B	FL SFP WDM10-SET	FL SFP FE WDM20-SET	FL SFP GT
Function	SFP module	SFP module	SFP module	SFP module
Connection type (Transmission speed)	LC SM (100 Mbit/s)	LC Singlemode (1000 Mbit/s)	LC Singlemode (100 Mbit/s)	RJ45 (1000 Mbit/s)
Max. transmission length	20 km	10 km	20 km	100 m
Wavelength	1550/1310 nm	1310/1550 nm	1310/1550 nm	-
Temperature range	-40 °C ... 75 °C	-40 °C ... 75 °C	-40 °C ... 75 °C	-40 °C ... 85 °C
Order number	2702438	2702442	2702439	2989420



Memory media



	FL MEM PLUG	FL MEM PLUG/MRM	SD FLASH 512MB	SD FLASH 2GB	FL SD FLASH/MRM	FL SD FLASH/L3/MR M
Function	Exchangeable Configuration memory	Configuration memory	Program and configuration memory	Program and configuration memory	Program and configuration memory	Program and configuration memory
Special features	-	MRM functionality	-	-	MRM functionality	MRM and Layer 3 functionality
Order number	2891259	2891275	2988146	2988162	2700270	2700607



Switches for PROFINET and EtherNet/IP

	Modular Managed	Switch 7000	Profinet IRT	Smart Managed	Switch 2000	Unmanaged
PROFINET						
Class A Quality of Service, PTCP filter		X				X (Profinet Variants)
Class B Quality of Service, LLDP topology detection, Profinet device, redundancy (MRP)	X			X	X (22xx and 23xx variants)	
Class C Quality of Service, LLDP topology detection, Profinet device, redundancy (MRP), IRT (ERTEC) technology for prioritized Profinet data transmission, diagnostics for fiber optic paths			X			
EtherNet/IP						
Basic IGMP snooping, IGMP querier, Multicast source detection	X			X	X	
Basic plus IGMP snooping, IGMP querier, Multicast source detection, DLR, CIP		X				

