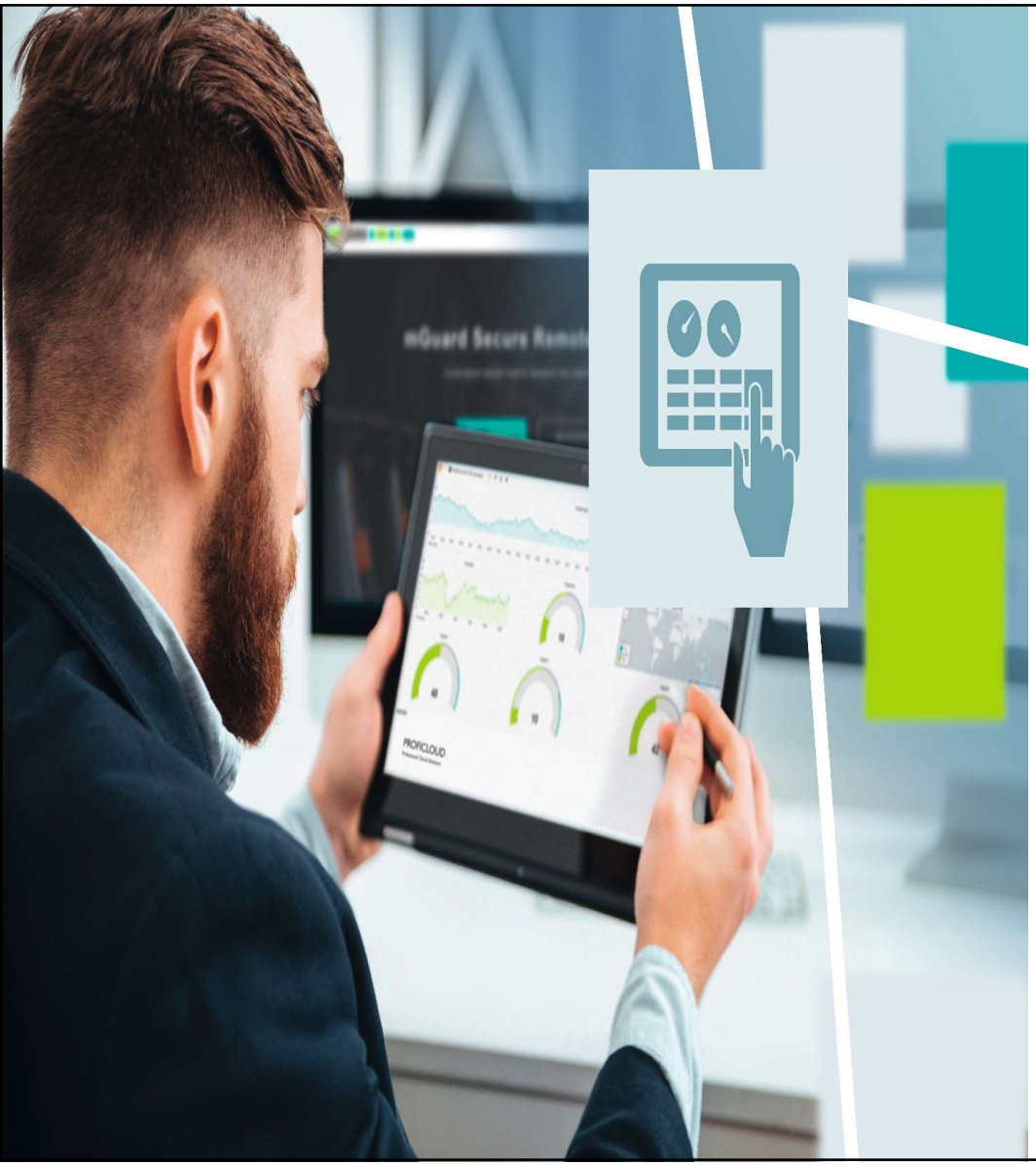


Welcome

Novedades 2021

Interfaces de comunicación

Antonio Gordillo / 5 Mayo 2021 / IMA Marketing

PHOENIX CONTACT
INSPIRING INNOVATIONS

Communication Interfaces

Agenda

- TC Router
- TC ROUTER TOM Software
- CLOUD Client
- NearFi couplers
- Surveillance and new models
- TC 5G PRIVNET ROUTER



PHOENIX CONTACT
INSPIRING INNOVATIONS

What‘s new at TC Router ?



TC Router and TOM

Mobile communication

PHOENIX CONTACT
INSPIRING INNOVATIONS

TC ROUTER

- Expanding capabilities

- Urban Infrastructure
  Water procurement and wastewater treatment
- Oil and gas industry
  Acquiring process data from pumps and pipeline monitoring
- Traffic
  Traffic lights, intelligent traffic signs and parking guiding systems
- Renewable energy
  Networking for wind generators and solar parks

Features

- 4G LTE connections up to 150 mbps, fallback to 3G and 2G
- WLAN (WiFi 4) up to 150 mbps, 2,4 GHz and 5 GHz, IEEE 802.11a/b/g/n, MIMO
- Micro-SIM and eSIM with up to 10 different profiles
- VPN support (IPsec and OpenVPN) as client and server
- Extended operating temperature range -40°C … 70°C
- 4 digital inputs and 2 digital outputs or integrated serial RS-232/RS-485
- Wide-range power supply, 10…30 VDC



TC Router

PHOENIX CONTACT
INSPIRING INNOVATIONS

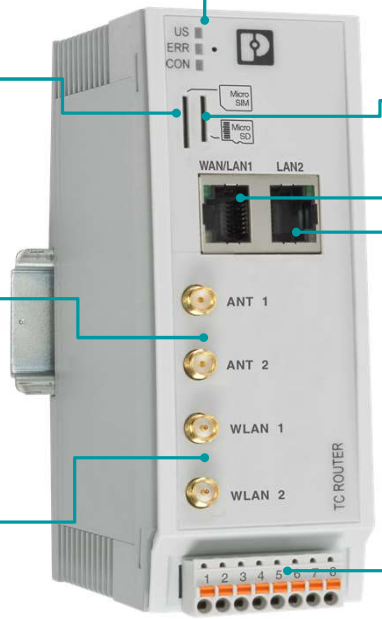
TC ROUTER 4000 - The new router platform for mobile networks

Overview

Status LEDs for instant diagnostic

Micro-SIM and **eSIM** with up to 10 different profiles

Micro SD Slot to load configuration



Adjustable **LAN/WAN** port (Fallback or redundency)

4G LTE CAT4 connections up to 150 MBit/s, fallback to 3G and 2G

LAN Ethernet port

WLAN (WiFi 4) Access Point up to 150 MBit/s, 2,4 GHz or 5 GHz, IEEE 802.11a/b/g/n, MIMO

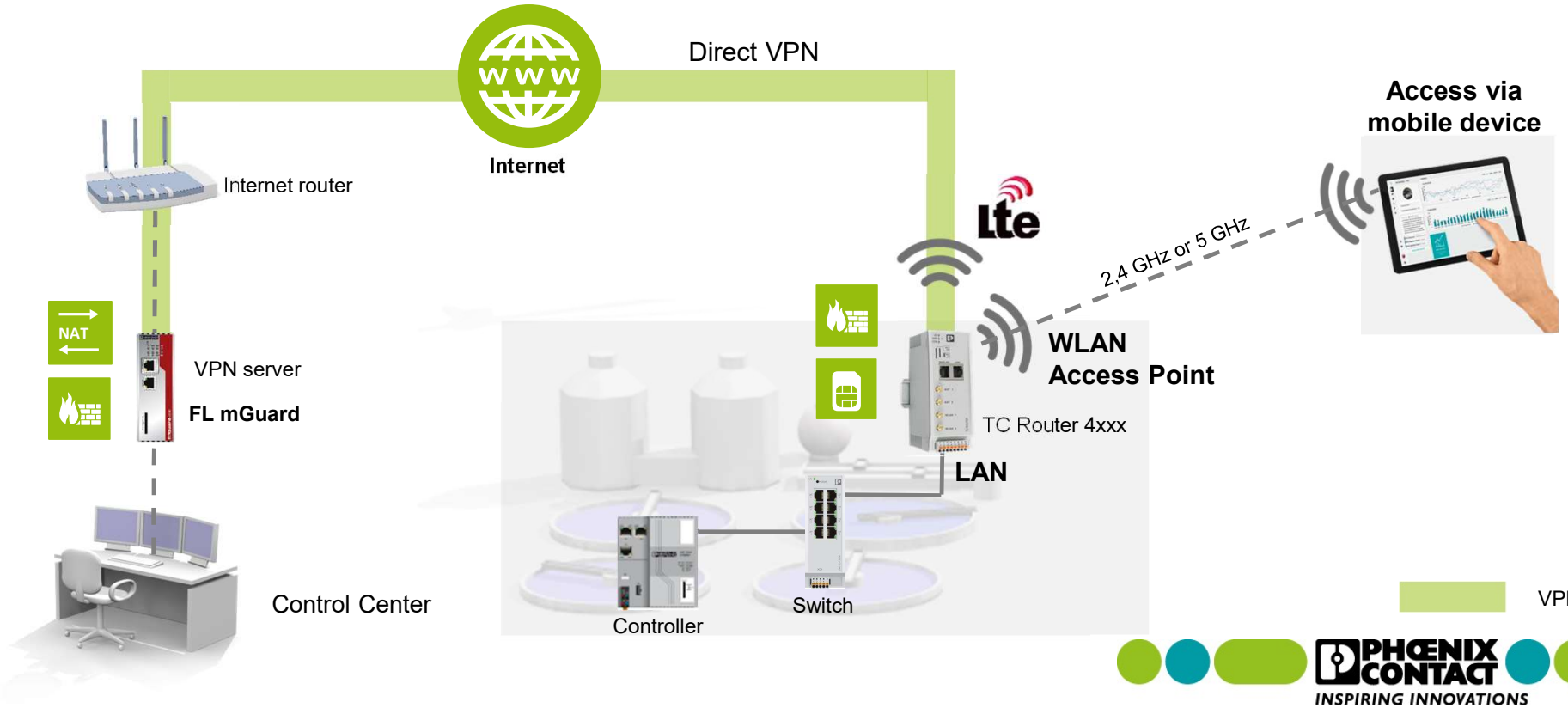
Digital **inputs** and **outputs** or **serial interface** with less IO

VPN support (IPsec and OpenVPN) as client and server
Extended operating temperature range -40°C … 70°C

PHOENIX CONTACT
INSPIRING INNOVATIONS

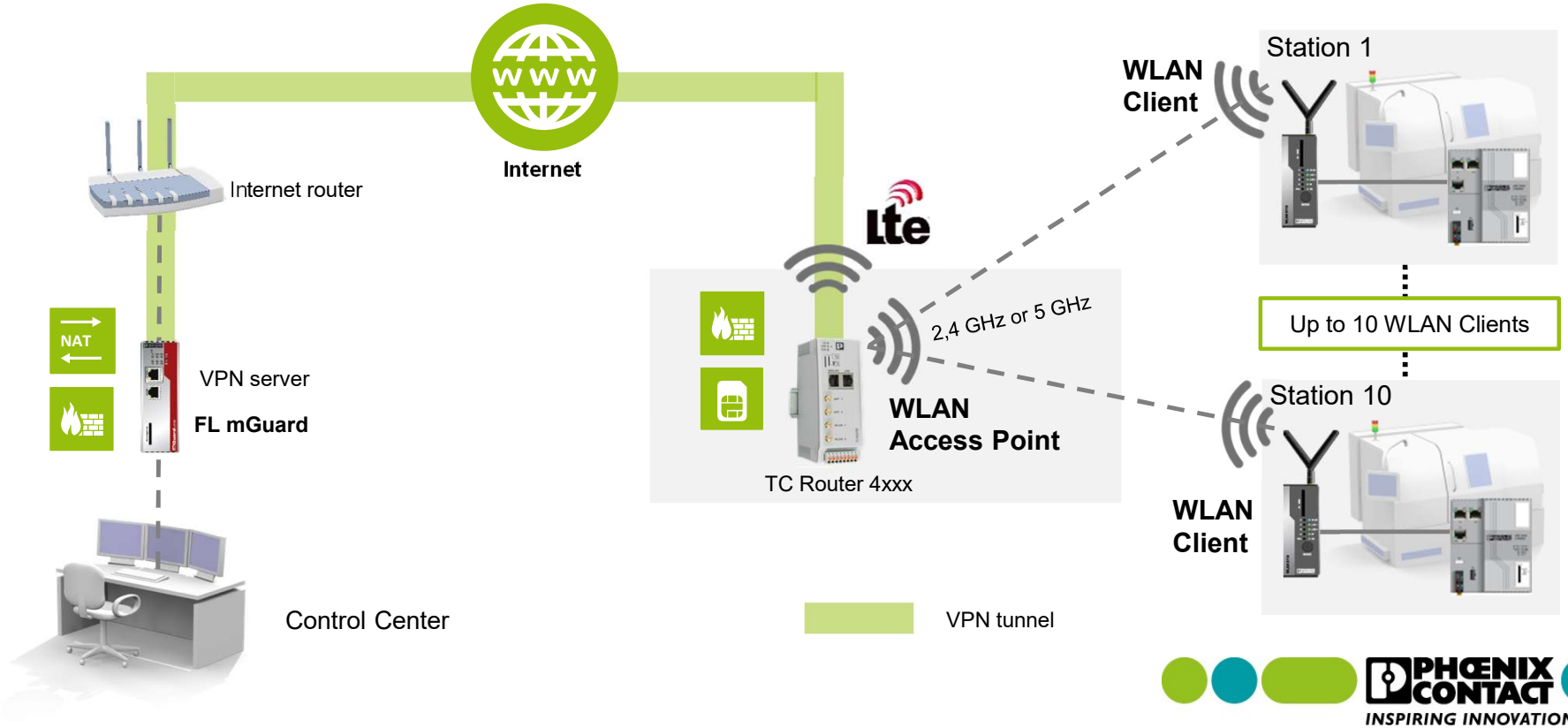
TC ROUTER 4000 - The new router platform for mobile networks

Application example: LAN and WLAN Access Point



TC ROUTER 4000 - The new router platform for mobile networks

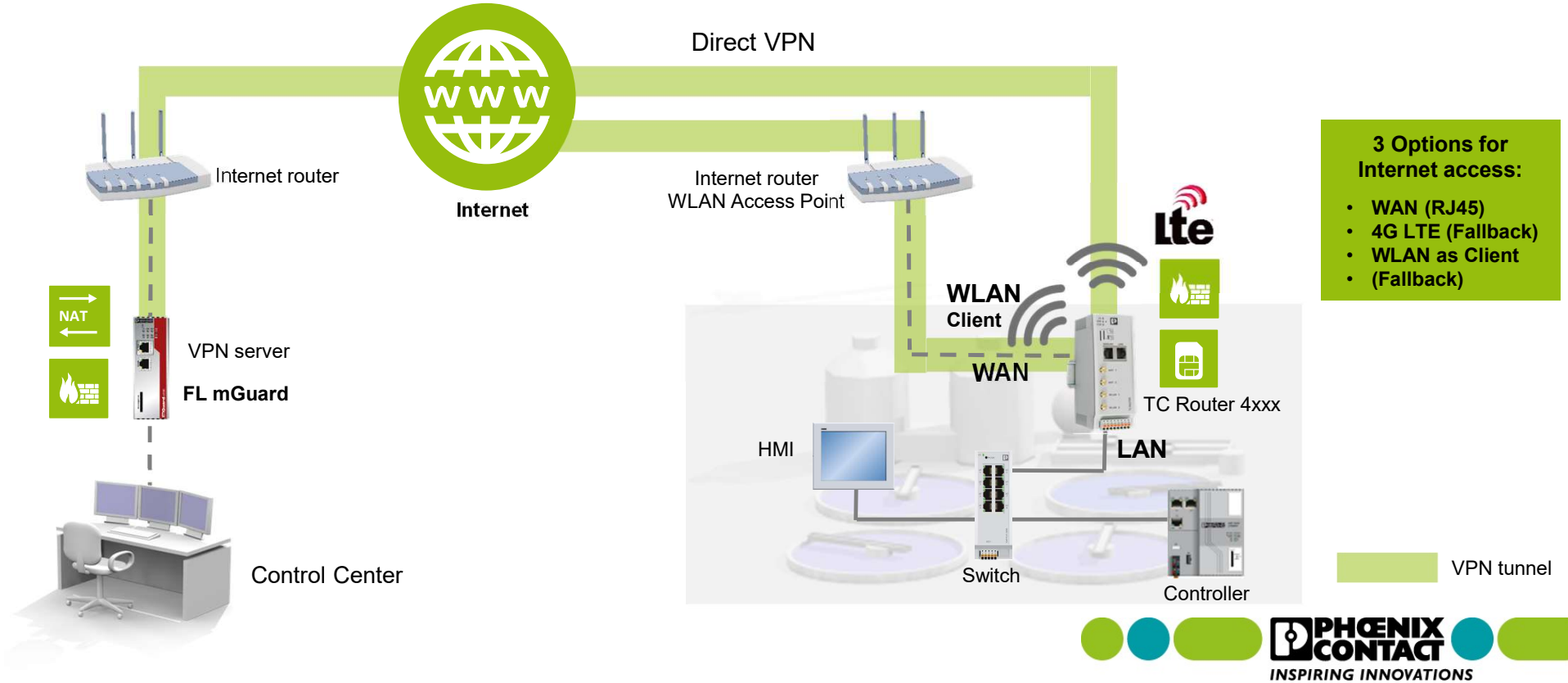
Application example: WLAN Access Point



PHOENIX CONTACT
INSPIRING INNOVATIONS

TC ROUTER 4000 - The new router platform for mobile networks

Application example: WAN, WLAN or mobile Internet access



PHOENIX CONTACT
INSPIRING INNOVATIONS

TC ROUTER 4000 - The new router platform for mobile networks

New Variants



*





*





	TC ROUTER 4002T-4G EU	TC ROUTER 4102T-4G EU WLAN	TC ROUTER 4202T-4G EU WLAN	TC ANT MOBILE WALL 5M	RAD-ISM-2400-ANT-OMNI-2-1-RSMA
Function	4G-LTE Router with 2 Ethernet-ports, 4 DI & 2 DO	4G-LTE Router with 2 Ethernet-ports, 4 DI & 2 DO and **WLAN**	4G-LTE Router with 2 Ethernet-ports, 2 DI, 1 DO, **RS-232/485 and WLAN**	Multiband cellular antenna with mounting bracket for outdoor installation, 5m antenna cable (SMA) More solutions available.	2,4 GHz WLAN antenna with mounting bracket for outdoor installation, 1,5m antenna cable (RSMA) More solutions available.
Mobile radio Interface / Interfaces	4G (Fallback 3G or 2G) EU market	4G (Fallback 3G or 2G) WLAN Client & Access Point EU market	4G (Fallback 3G or 2G) WLAN Client & Access Point RS232/485, EU market		
Transmission speed	150 Mbit/s LTE Downlink 50 Mbit/s Upload	150 Mbit/s LTE Downlink 50 Mbit/s Upload	150 Mbit/s LTE Downlink 50 Mbit/s Upload		
Switching inputs and outputs	4 digital Inputs, 2 digital output	4 digital Inputs, 2 digital output	2 digital Inputs, 1 digital output and RS-232 or RS-485		
Order number	1234352	1234353	1234354	2702273	2701362

** will be launched within 2021*

PHOENIX CONTACT
INSPIRING INNOVATIONS

Pre-Launch Information

TC ROUTER - product overview

Product key: DNC4..

	Ord.-No.	Designation			Function description
	1234352	TC ROUTER 4002T-4G EU			4G-LTE Router with 2 Ethernet-ports, 4 DI & 2 DO
*	**1234353**	**TC ROUTER 4102T-4G EU WLAN**			**4G-LTE Router with 2 Ethernet-ports, 4 DI & 2 DO and WLAN**
	1234354	TC ROUTER 4202T-4G EU WLAN			4G-LTE Router with 2 Ethernet-ports, 2 DI, 1 DO, RS-232/485 and WLAN

** **bold** marked variants to be launched at Hanover trade show 2021, all other variants to follow within 2021*

PHOENIX CONTACT
INSPIRING INNOVATIONS

TC ROUTER Online Manager

TOM



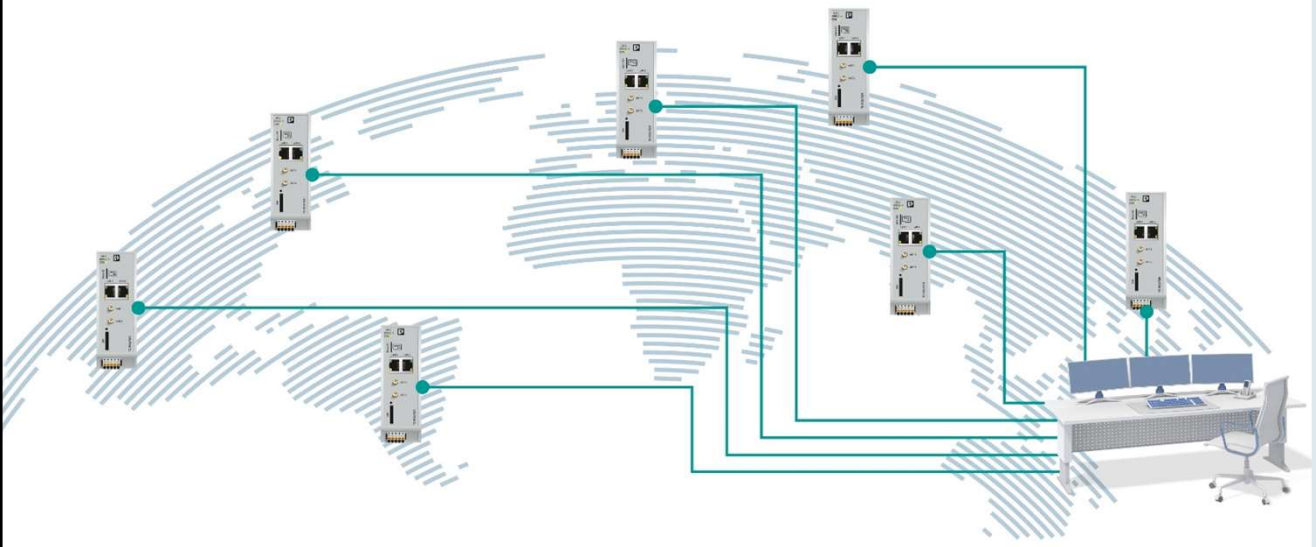


TC ROUTER TOM Software

PHOENIX CONTACT
INSPIRING INNOVATIONS

TC Router **O**nline **M**anager

Management for all TC Router

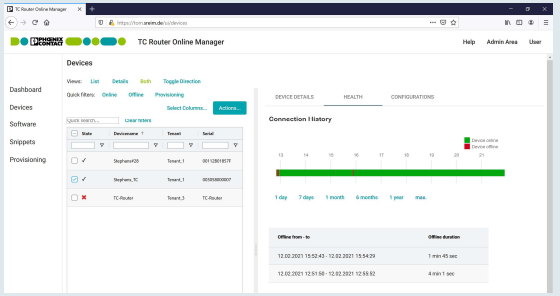


NEW

TOM



- Security and Firmware updates
- Configuration changes
- Device status
- Locally (on premise) or in a cloud.
- Up to 22500 routers can be managed.



PHOENIX CONTACT
INSPIRING INNOVATIONS

What‘s new at Cloud Clients ?

CLOUD Client

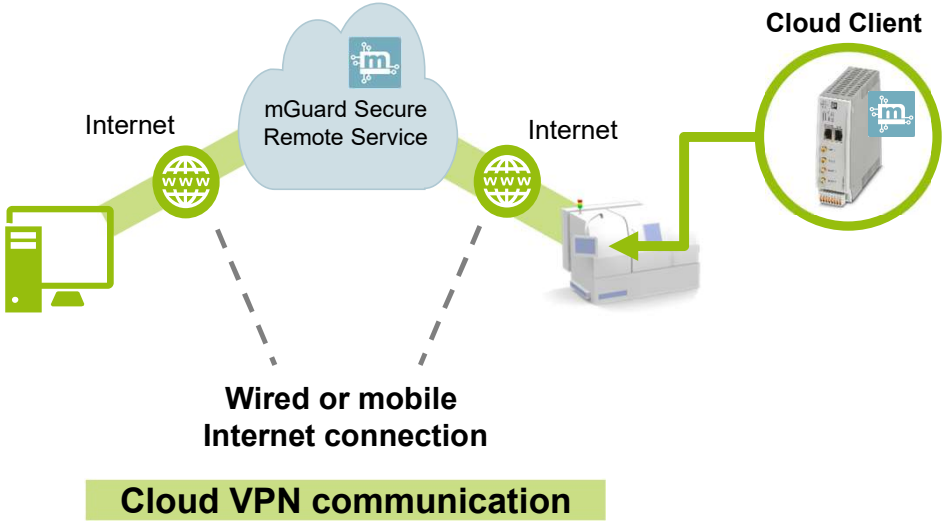


PHOENIX CONTACT
INSPIRING INNOVATIONS

Products

CLOUD CLIENT’s for mGuard Secure Remote Service

Secure transparent communication channel between the field device and the service technician, over the Internet and the mGuard Secure Cloud

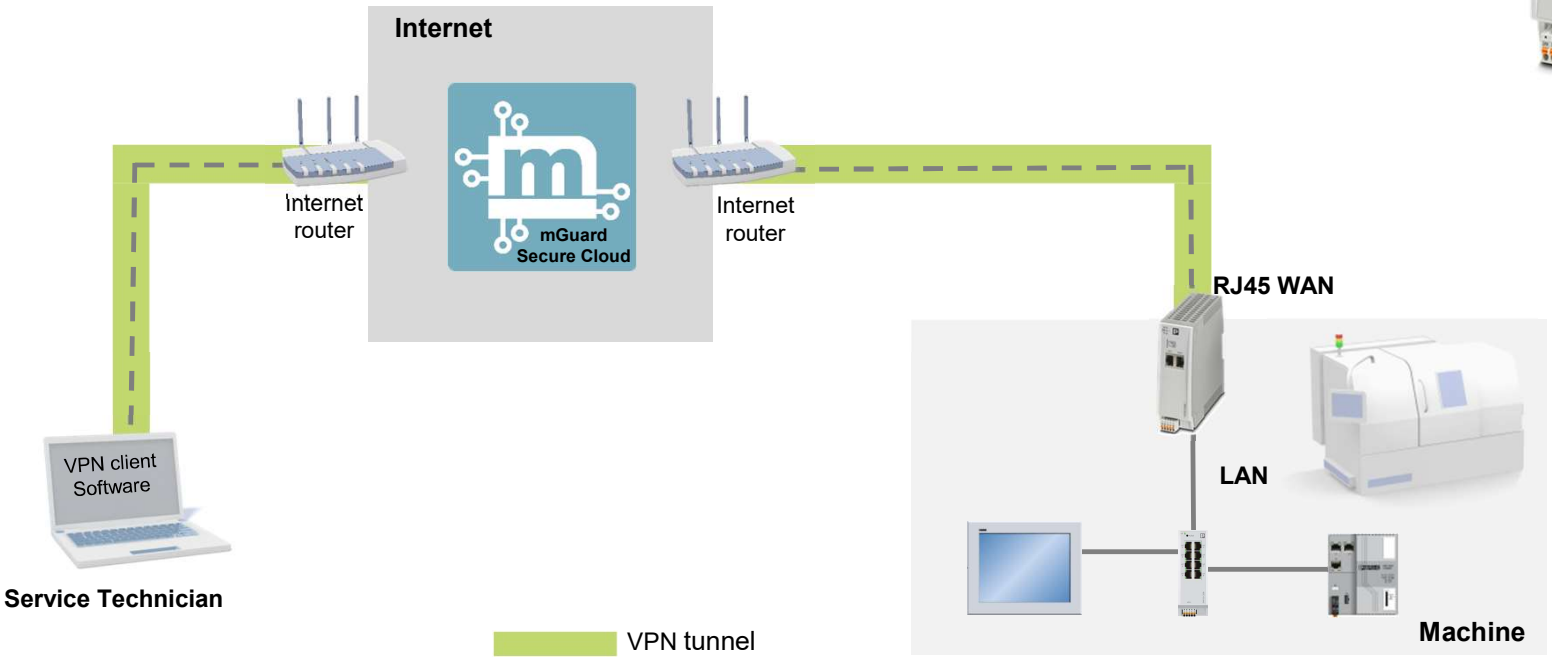


PHOENIX CONTACT
INSPIRING INNOVATIONS

Products

CLOUD CLIENT 1101-TX/TX





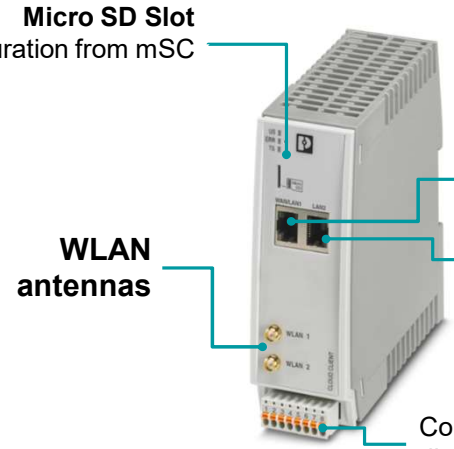
Internet access:

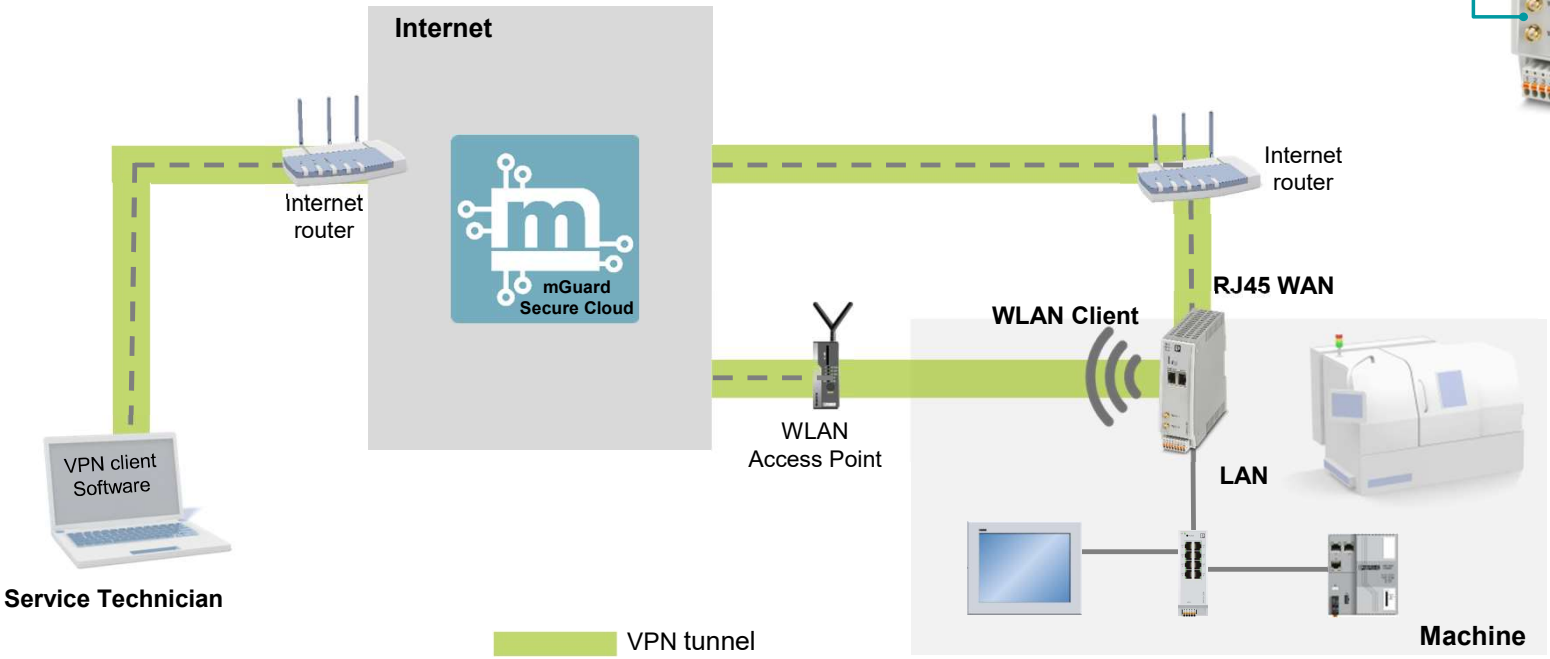
- **WAN (RJ45)**

PHOENIX CONTACT
INSPIRING INNOVATIONS

Products

CLOUD CLIENT 2002T-WLAN





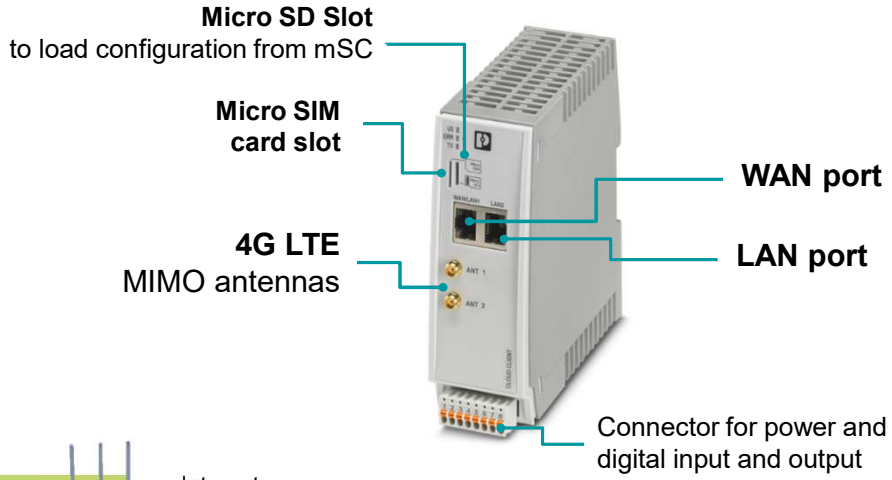
Internet access:

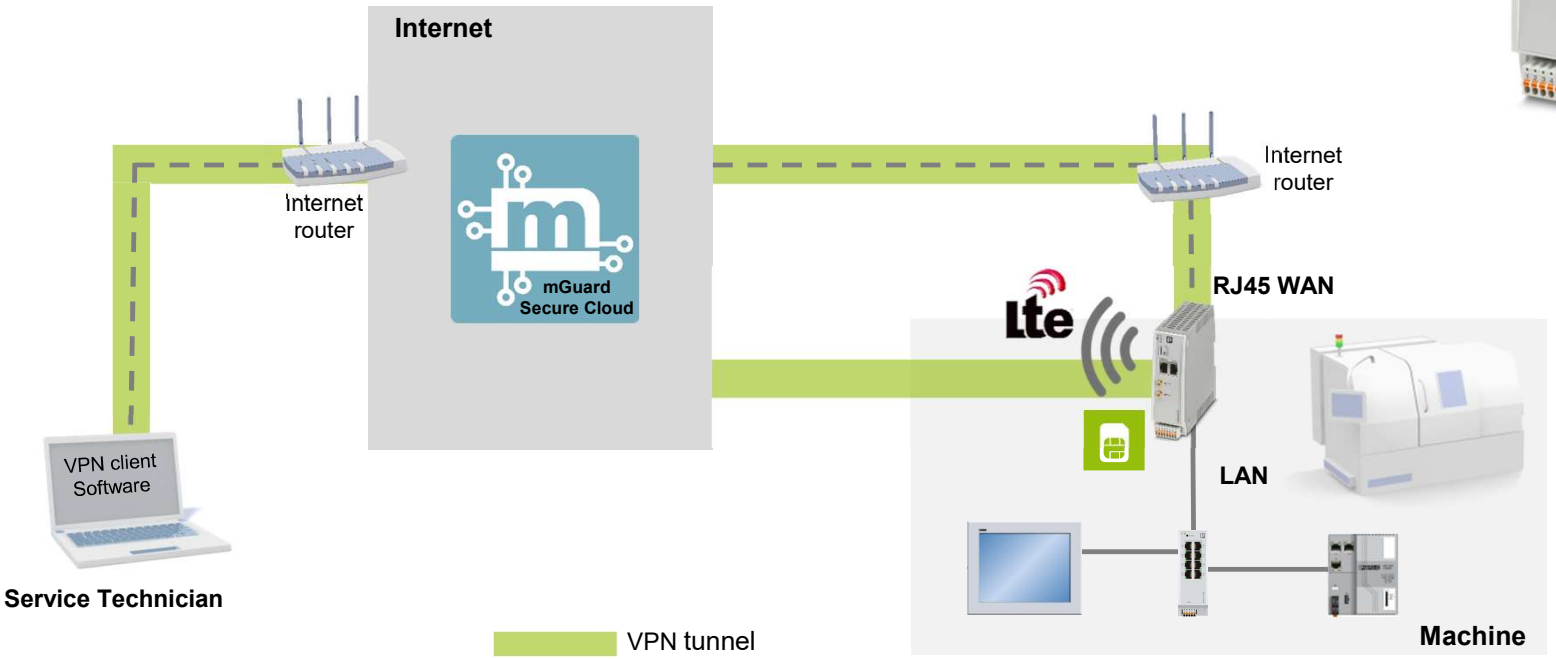
- **WAN (RJ45)**
- **WLAN as client (fallback)**

PHOENIX CONTACT
INSPIRING INNOVATIONS

Products

CLOUD CLIENT 2002T-4G EU





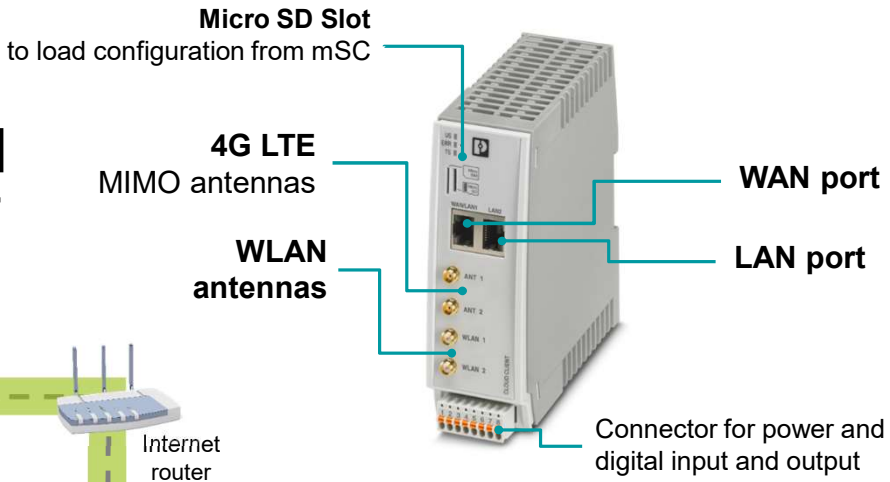
Internet access:

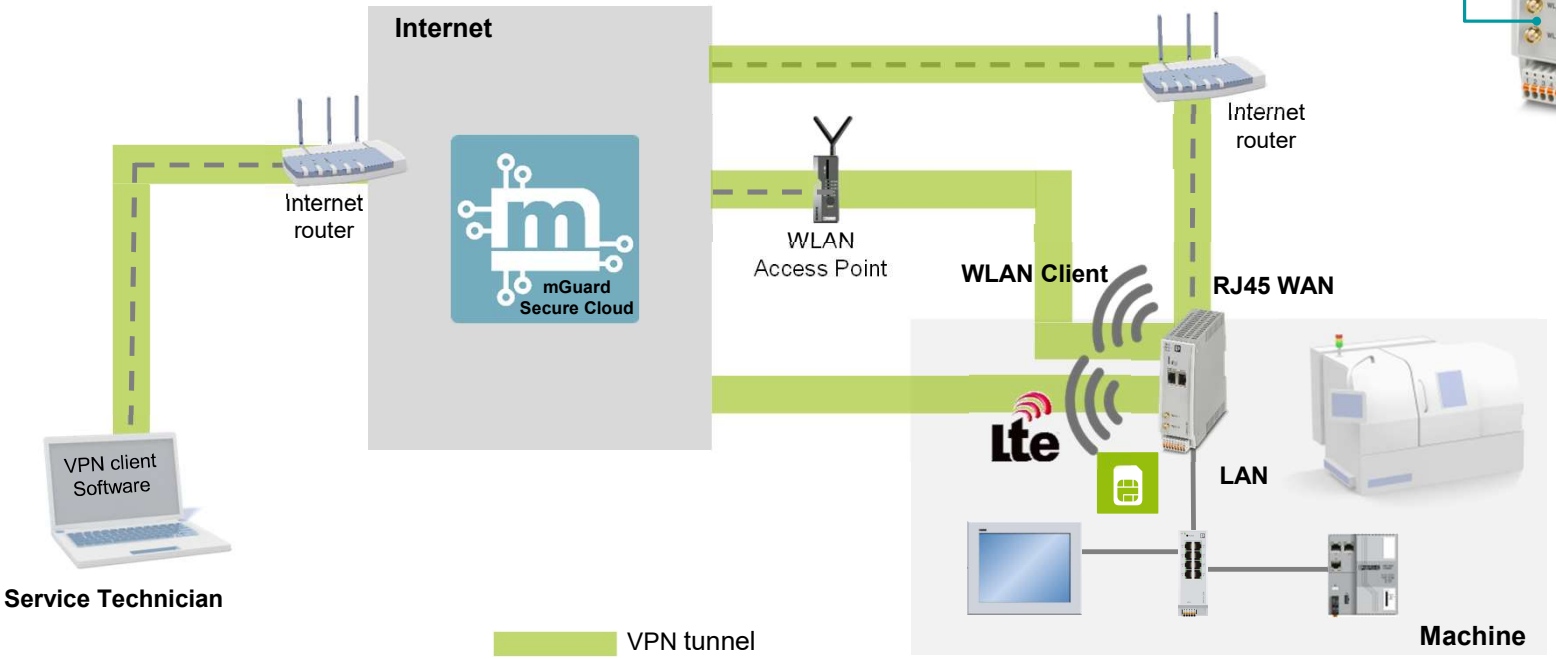
- **WAN (RJ45)**
- **4G LTE (Fallback)**

PHOENIX CONTACT
INSPIRING INNOVATIONS

Products

CLOUD CLIENT 2102T-4G EU WLAN





Internet access:

- **WAN (RJ45)**
- **4G LTE (Fallback)**
- **WLAN as Client (Fallback)**

PHOENIX CONTACT
INSPIRING INNOVATIONS

New Products 2021

CLOUD CLIENTs



available Q2/21





available Q2/21



	CLOUD CLIENT 1101-TX/TX	CLOUD CLIENT 2002T-4G EU	CLOUD CLIENT 2002T-WLAN	CLOUD CLIENT 2102T-4G EU WLAN
Transmission medium	Ethernet WAN	4G LTE Ethernet WAN	WiFi (WLAN) Ethernet WAN	4G LTE WiFi (WLAN) Ethernet WAN
Description	VPN-Router for mGuard Secure Cloud via WAN (successor of CC 1002-TX/TX)	VPN-Router for mGuard Secure Cloud via 4G or WAN	VPN-Router for mGuard Secure Cloud via WLAN or WAN	VPN-Router for mGuard Secure Cloud via 4G, WLAN or WAN
Configuration	**Device configuration in mGuard Secure Cloud, simplified Web-Interface**			
Firewall	Easy to use firewall w/ predfined rules			
VPN Tunnel	1 IPsec VPN tunnel to the mGuard Secure Cloud			
Order number	1221706	1234355	1234360	1234357

PHOENIX CONTACT
INSPIRING INNOVATIONS

Pre-Launch Information

CLOUD CLIENT - product overview

Product key: DNC4..

	Ord.-No.	Designation			Function description
	1234355	CLOUD CLIENT 2002T-4G EU			Cloud Client for mGuard Secure Cloud connections via 4G-LTE
*	**1234360**	**CLOUD CLIENT 2002T-WLAN**			**Cloud Client for mGuard Secure Cloud connections via WLAN**
	1234357	CLOUD CLIENT 2102T-4G EU WLAN			Cloud Client for mGuard Secure Cloud connections via WLAN or 4G-LTE
*	**1221706**	**CLOUD CLIENT 1101T-TX/TX**			**Cloud Client for mGuard Secure Cloud connections via LAN/WAN Ethernet ports**

** **bold** marked variants to be launched at Hanover trade show 2021, all other variants to follow within 2021*

PHOENIX CONTACT
INSPIRING INNOVATIONS

What is NearFi ?



NearFi coupler

Contactless energy & data communication

PHOENIX CONTACT
INSPIRING INNOVATIONS



Source: Zimmer Group

NearFi coupler

Example:
Tool change on the robot

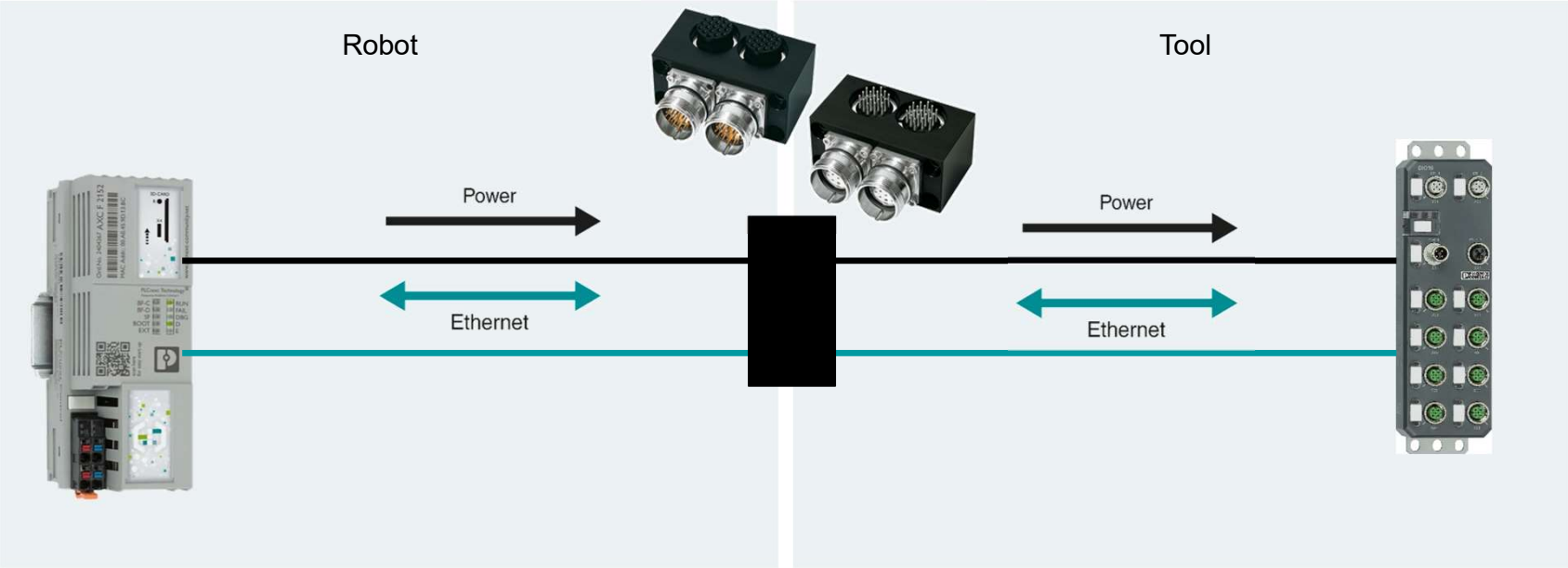
- **3** tools per robot (ø)
- **> 500** change/day (ø)
- Max. **100,000** mating cycles

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Example: Tool change on the robot

Energy transmission and Ethernet data communication from the robot to the change tool

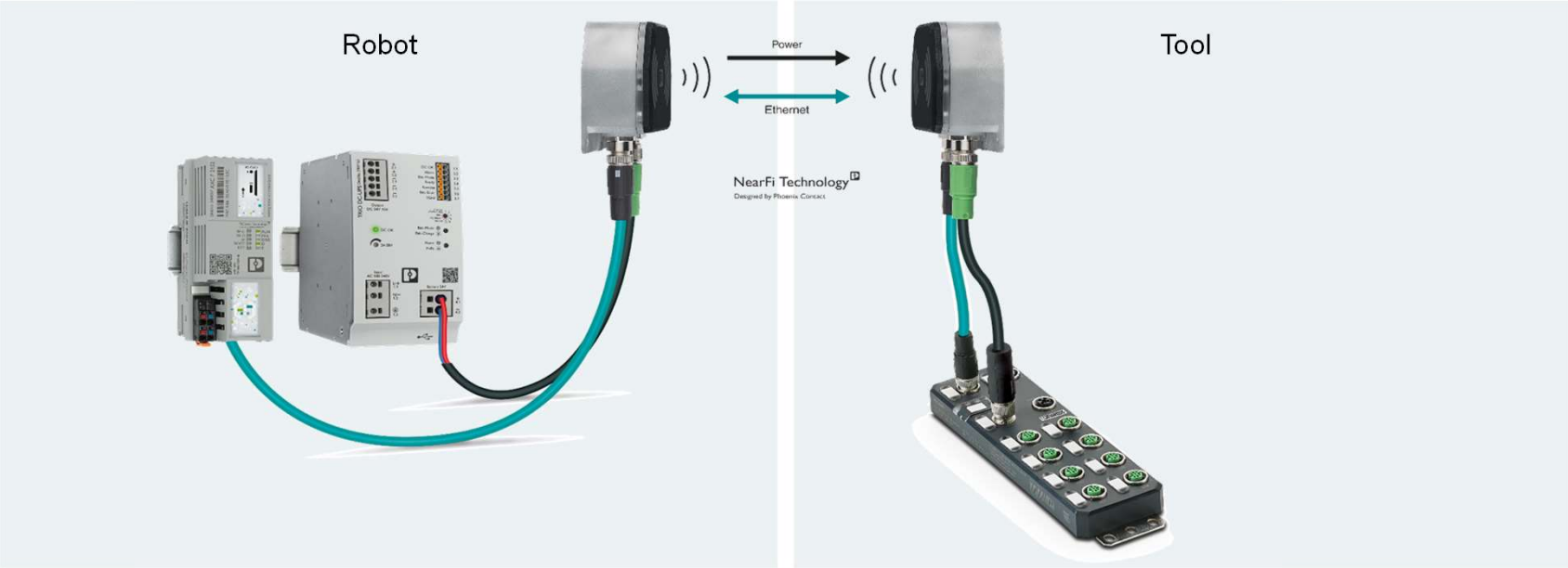


PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

The solution for connectors subject to wear and maintenance

Contactless power transmission and Ethernet data communication from the robot to the change tool

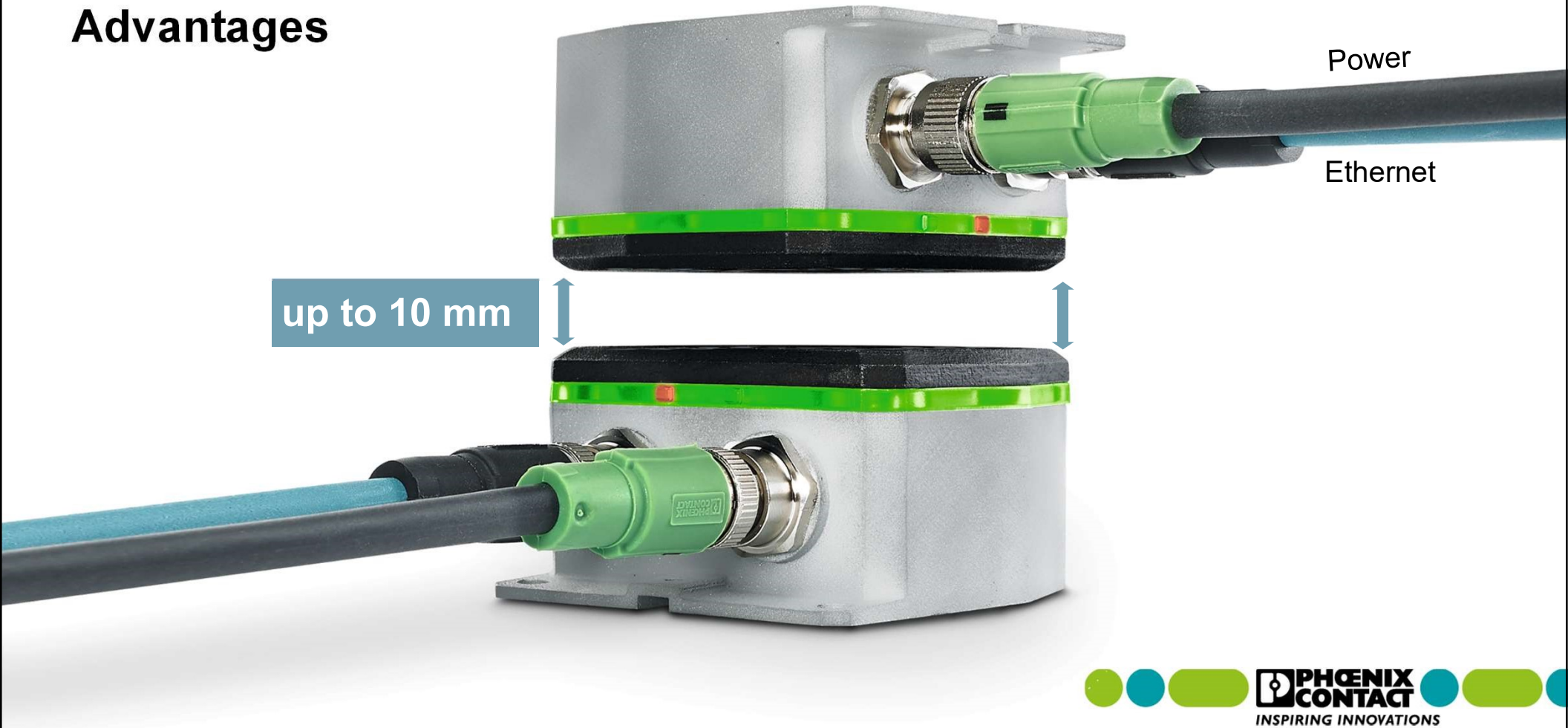


PHOENIX CONTACT
INSPIRING INNOVATIONS

Technology
NearFi

NearFi coupler

Advantages



PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

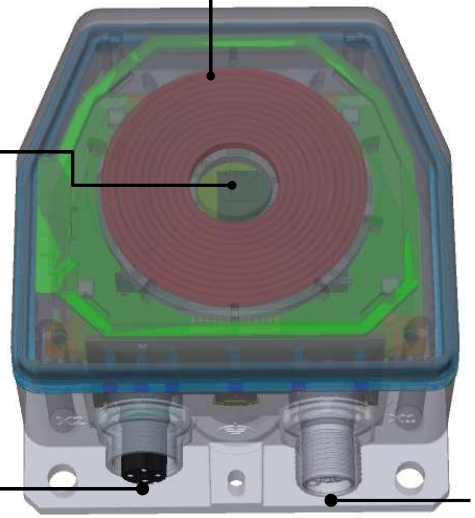
Technical structure coupler

NearFi Technology
Designed by Phoenix Contact



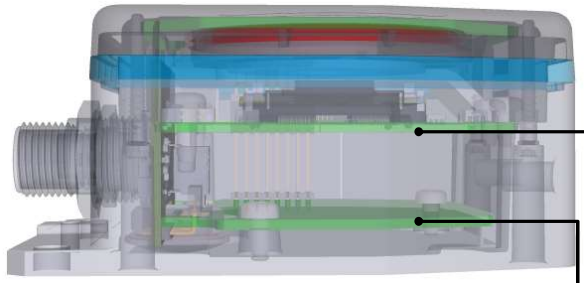
Coil
for contactless power transmission

Printed circuit board
for 60 GHz radio transmission



M12 Ethernet
D- coded
4-pole

M12 Power
A- coded
5-pole



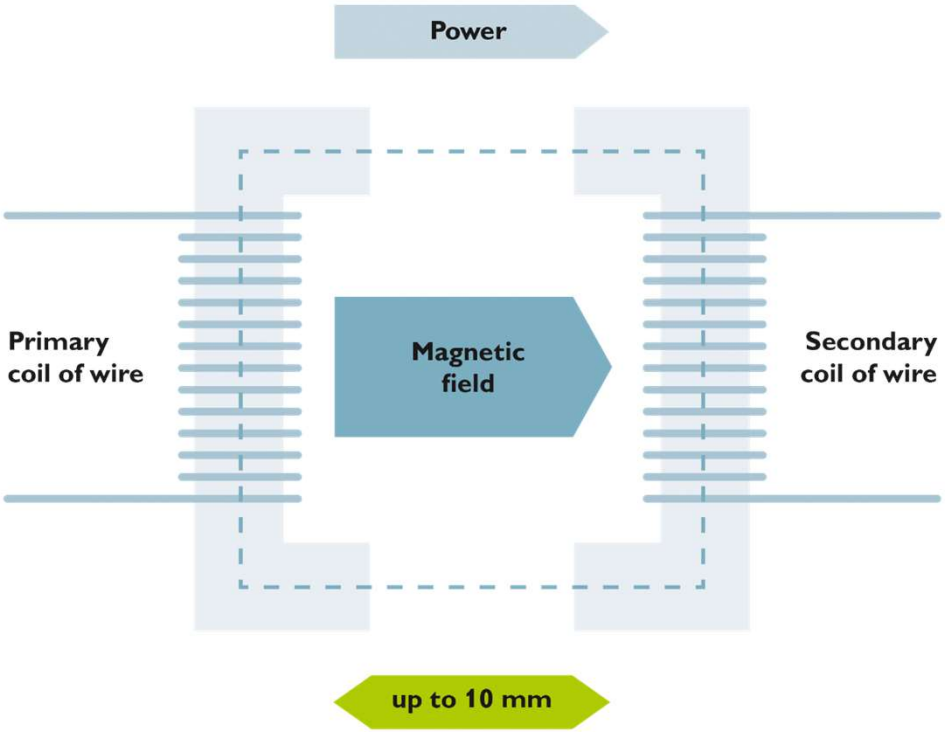
Printed circuit board
for data transmission

Printed circuit board
for power transmission

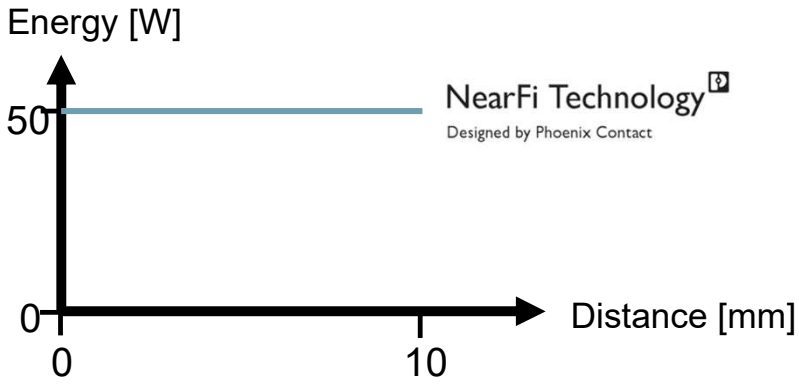
PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Inductive power transmission



- Inductive power transmission up to 50 W (24 V /2 A)
- **Constant** energy transmission over 10 mm air gap due to active control

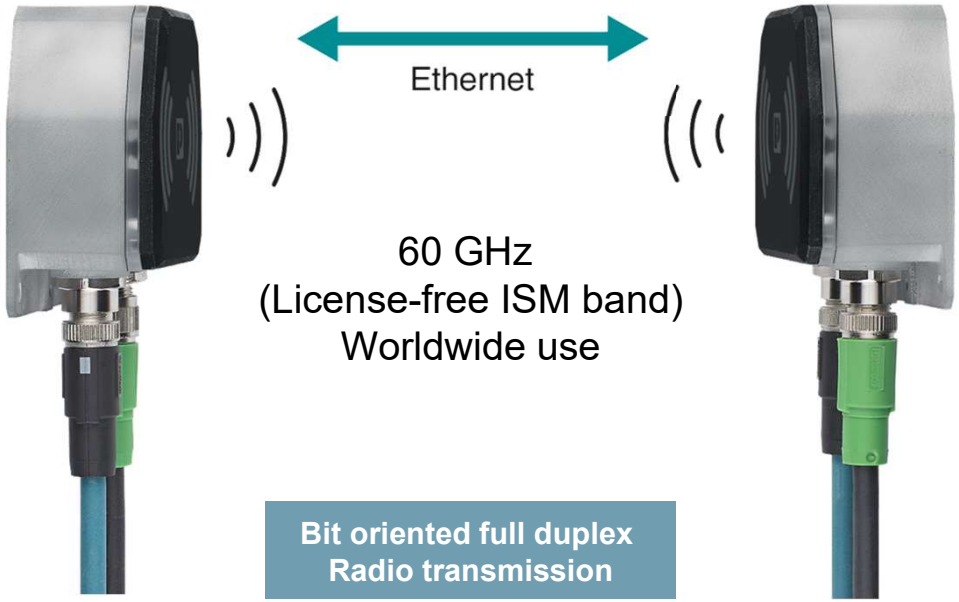


PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Contactless real-time Ethernet communication

Data transmission



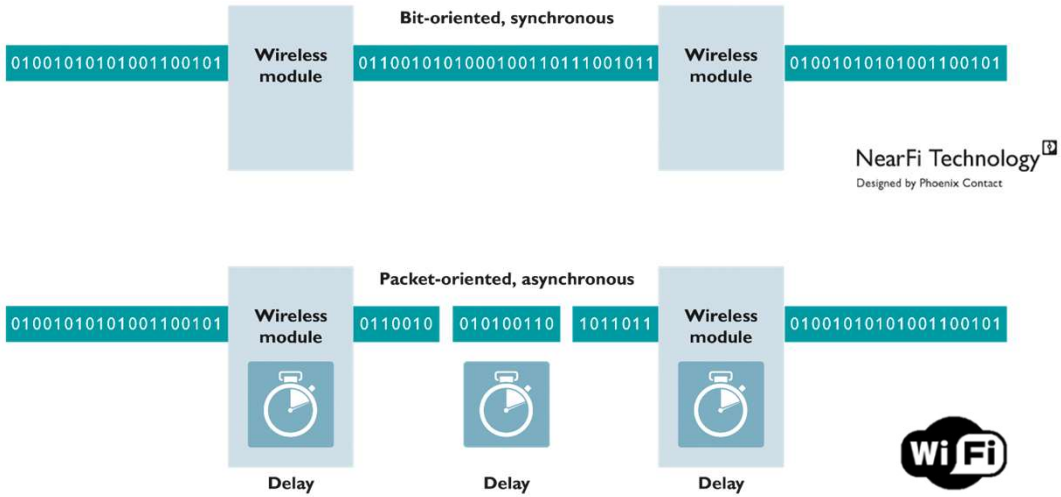
Bit oriented full duplex
Radio transmission

PROFINET EtherCAT EtherNet/IP Modbus

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Contactless real-time Ethernet communication



Bit-oriented synchronous transmission

- Bit-oriented - Immediate synchronous transfer of data
- Full duplex - Simultaneously in both directions (parallel on separate frequency bands)
- Delay typ. **2 µs**

Packet-oriented asynchronous transmission

- Packet-oriented - process includes many asynchronous and latency-causing operations
- Half duplex - alternating in both directions (one after the other on one frequency band)
- Delay typ. **16,000 µs**

PHOENIX CONTACT
INSPIRING INNOVATIONS

Features

NearFi coupler

Main features







Ethernet in real time

- 100 Mbit/s Ethernet (full duplex)
- Protocol-independent
- Latency-free

PROFINET EtherCAT EtherNet/IP Modbus

Inductive power transmission

- Up to 50 W (24 V /2 A)
- Constant output over 10 mm working range thanks to active control

Commissioning and diagnostics

- Plug & Play
- Circumferential LED ring for quick diagnosis
- Digital control input
- Digital diagnostic output

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Main features



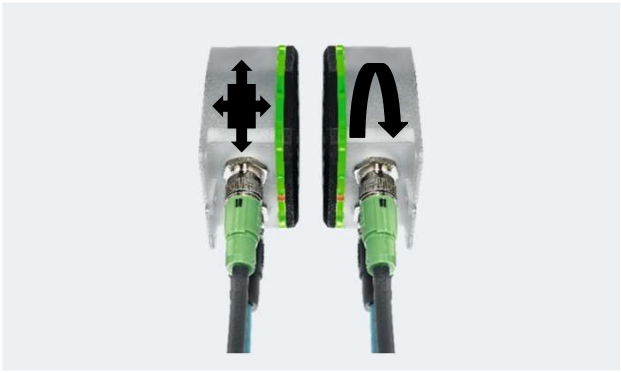
Wear and maintenance free

- Can be used in harsh conditions
- Robust housing (IP65, IK06)
- M12 connection technology



Transmission

also possible through **non-metallic obstacles**



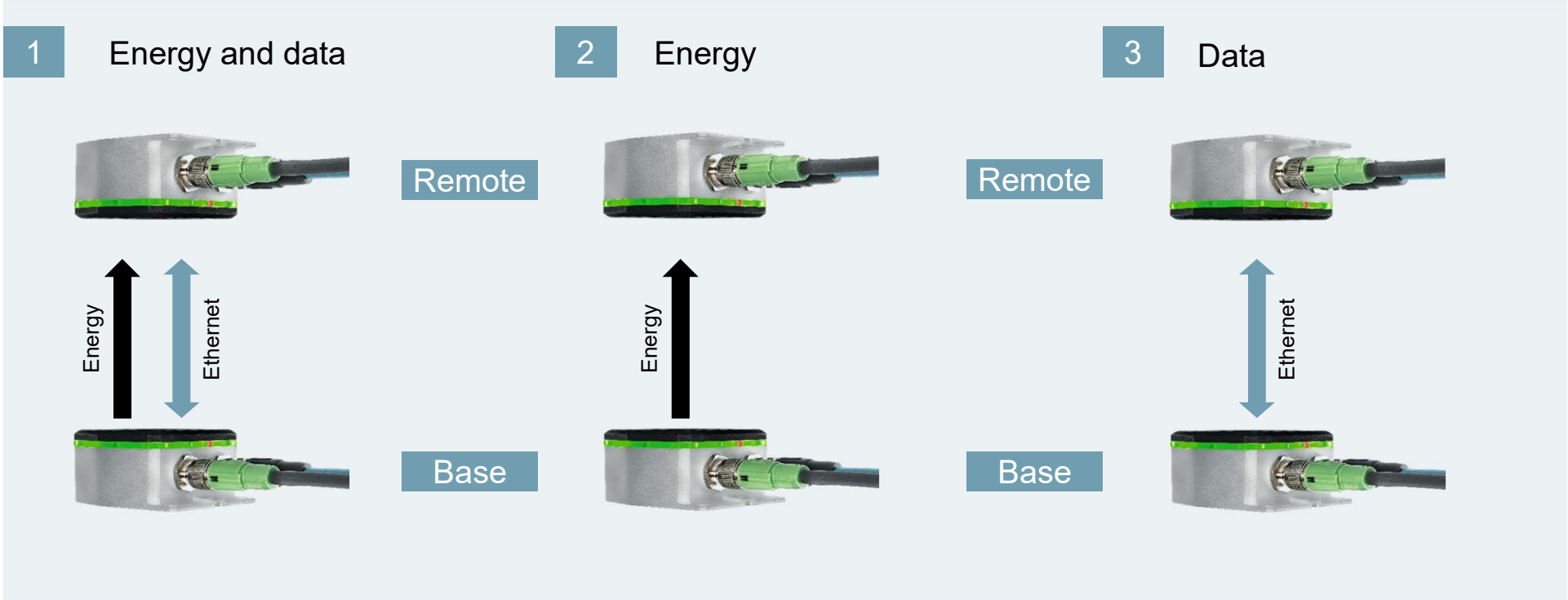
Flexible installation

- Insensitive to vibrations
- No cable break
- Rotation possible

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Product portfolio - 3 variants



NearFi coupler

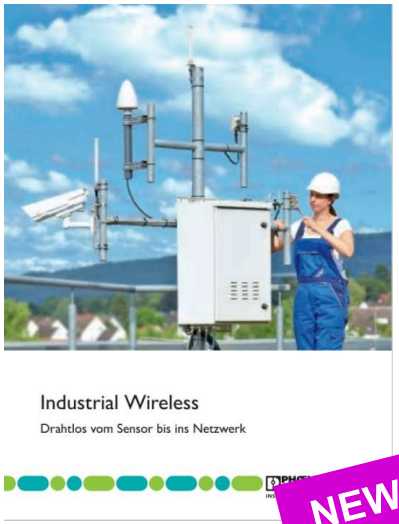
Product portfolio

Description	Variants					
Variant	Contactless Energy and data coupler		Contactless energy couplers		Contactless data coupler	
Type	Base	Remote	Base	Remote	Base	Remote
Article description	NEARFI PD 2A ETH B	NEARFI PD 2A ETH R	NEARFI P 2A B	NEARFI P 2A R	NEARFI D ETH B	NEARFI D ETH R
Item number	1234224	1234225	1234226	1234229	1234232	1234234
Product photo						
Recommended market price						

PHOENIX CONTACT
INSPIRING INNOVATIONS

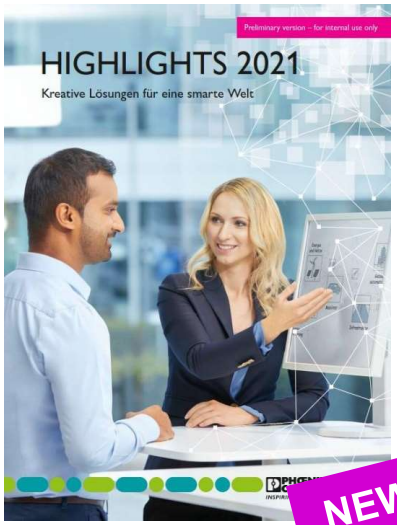
NearFi coupler

Marketing material - print



NEW

"Industrial Wireless" Brochure



NEW

"Highlights 2021" brochure



NEW

"New products 2021" brochure

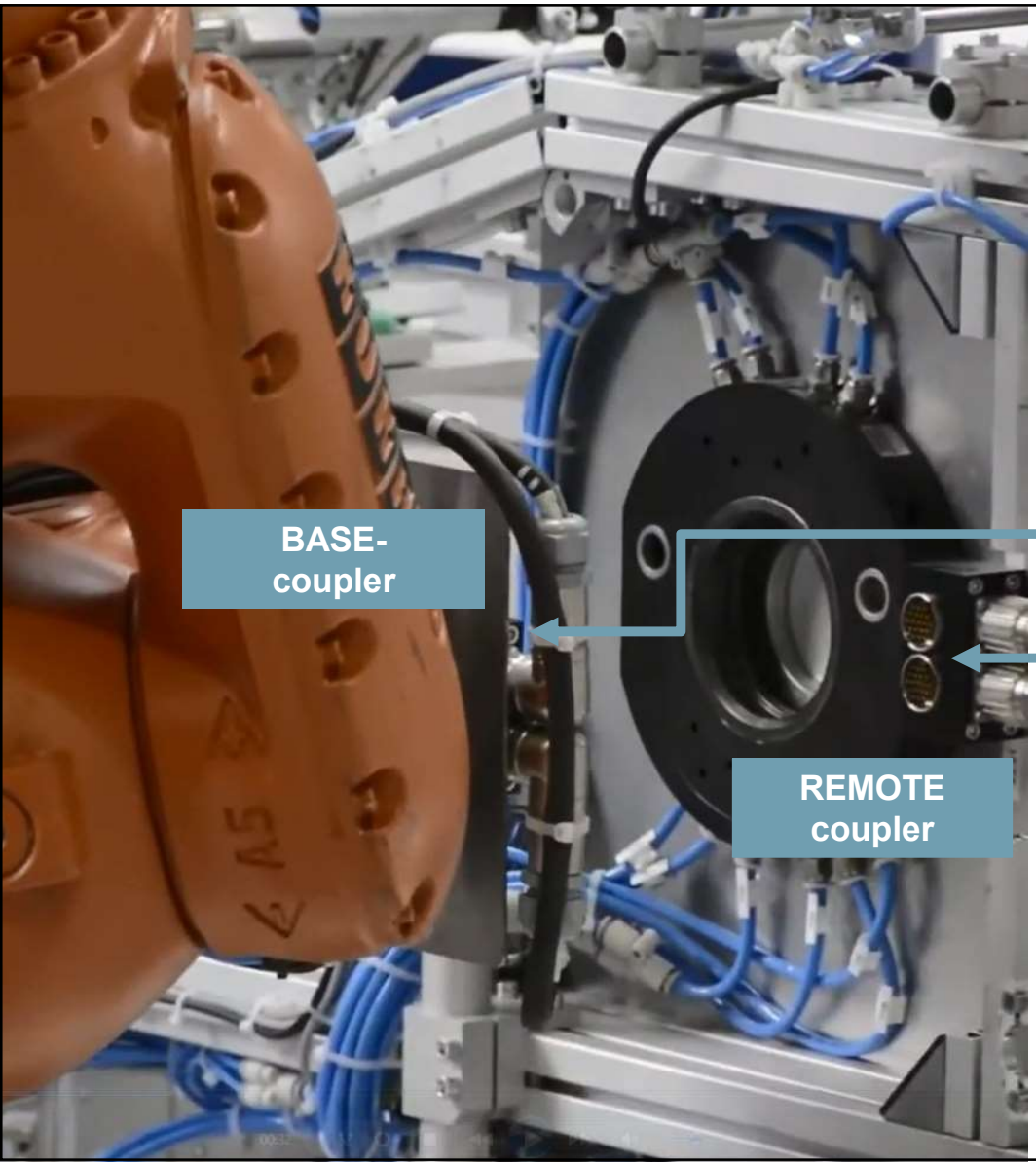


NEW

Press Info

NearFi coupler

Assembly example: Robot change tool





PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Example: Tool change on the robot



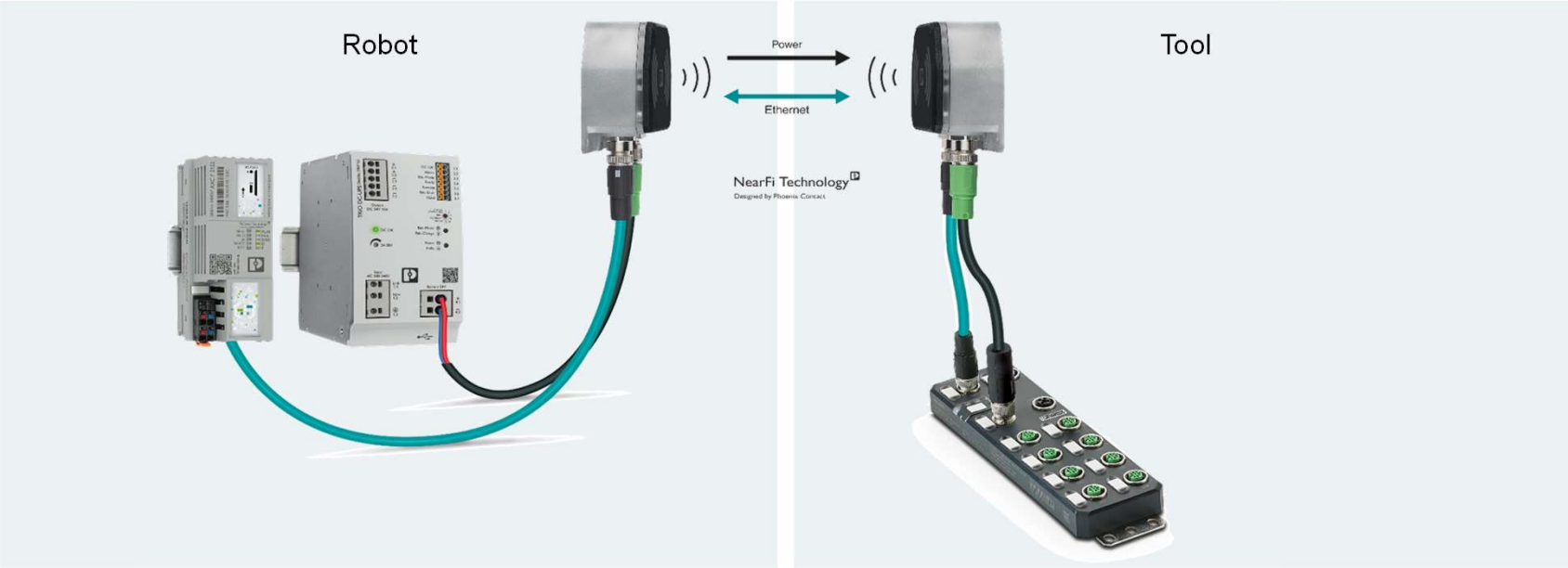
Quelle: Zimmer Group

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

The solution for connectors subject to wear and maintenance

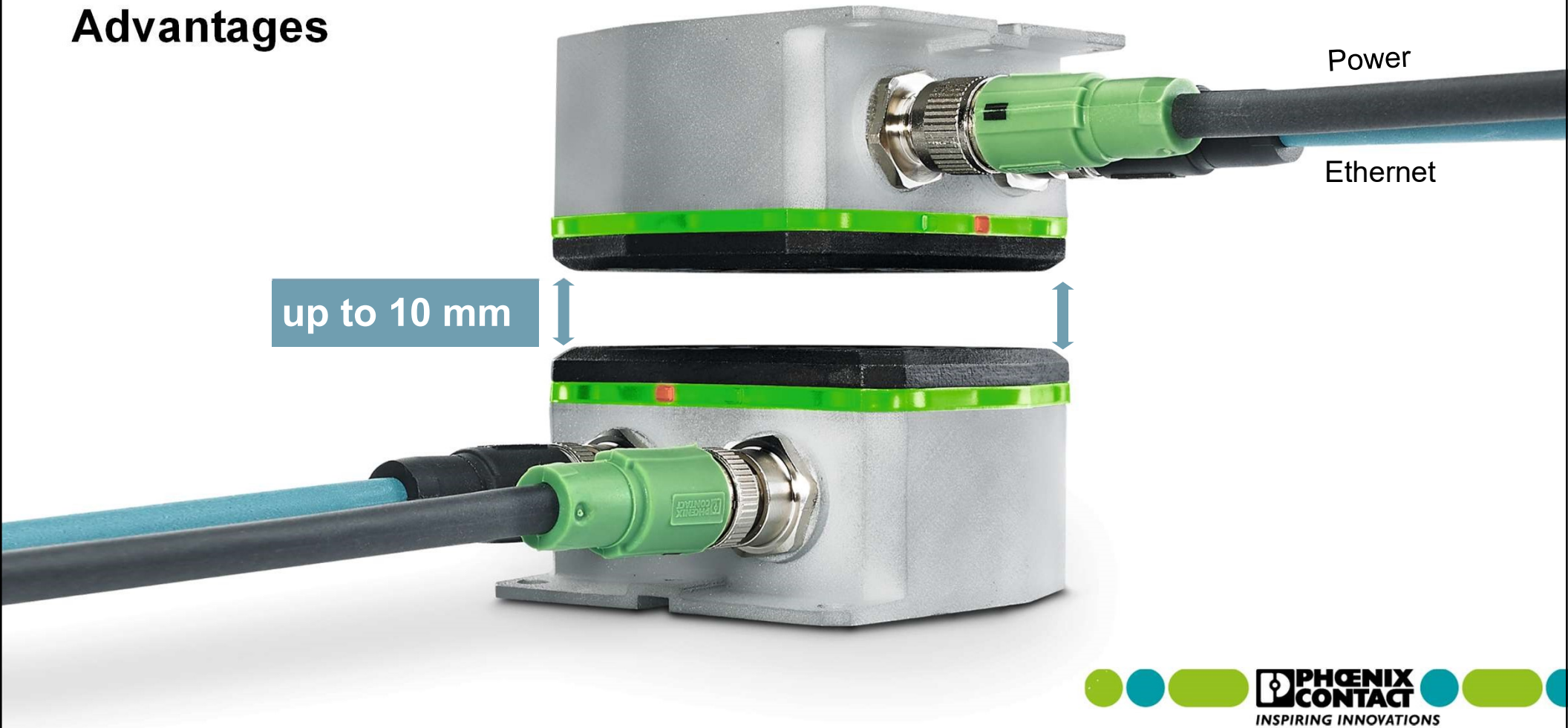
Contactless power transmission and Ethernet data communication from the robot to the change tool



PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Advantages



PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Advantages



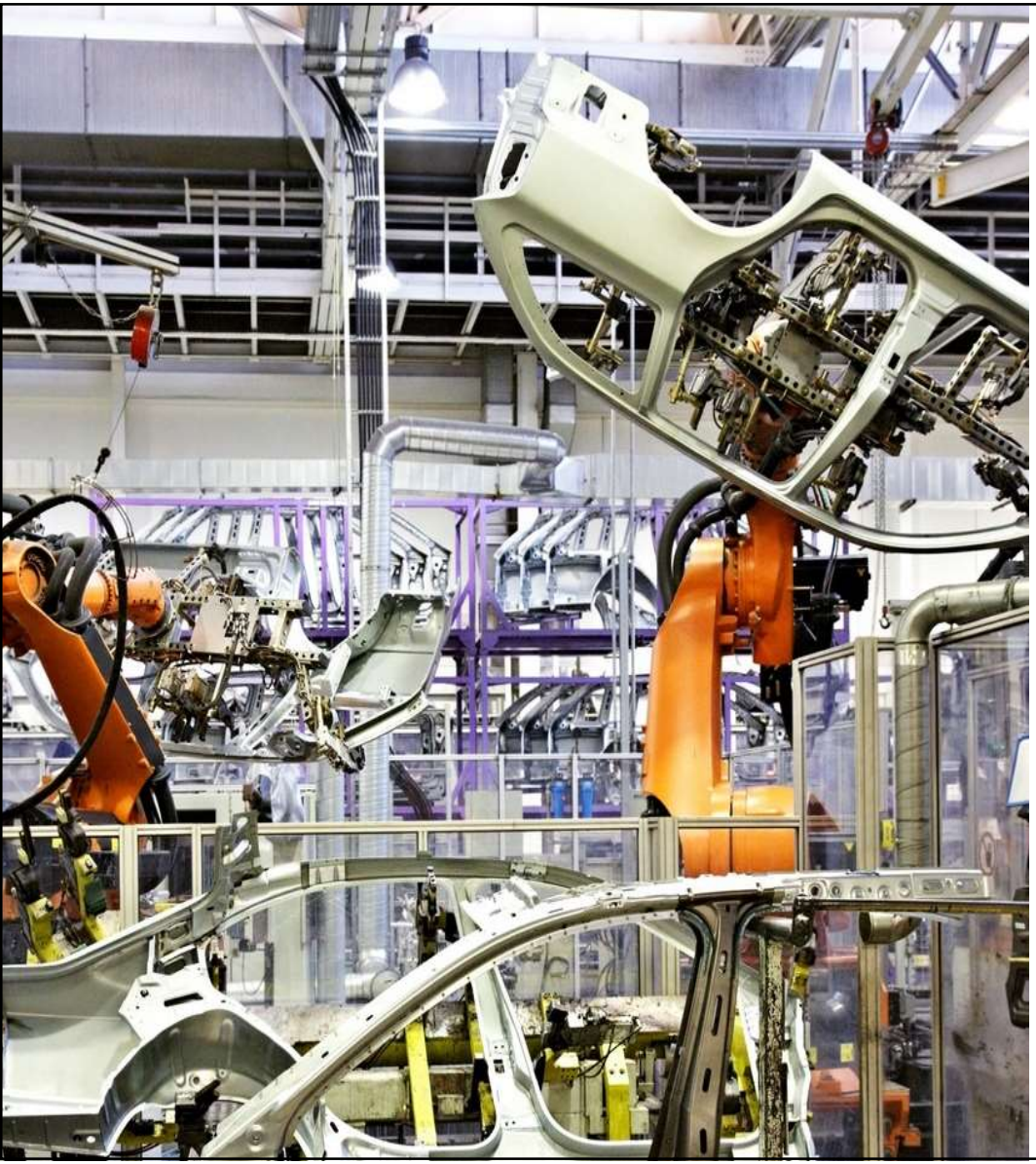
NearFi Technology

Designed by Phoenix Contact

1. Reduction of downtime
2. No mechanical wear
3. No pollution
4. No tilting during coupling
5. High mounting freedom
6. Accelerated coupling process
7. Protocol-independent real-time communication

PHOENIX CONTACT
INSPIRING INNOVATIONS

Applications



Application example

Automotive industry

Target applications:

- Robot with interchangeable tools
- Rotary tables, rotary indexing tables, presses
- Transport systems (framer)
- Load and workpiece carriers

Key Requirements:

- Real-time communication
- Fast Startup
- Coexistence with WLAN
- Robust
- Low solution costs

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Robot tool change

Target applications:

- Robot with interchangeable tools

Key Requirements:

- Coexistence with existing WLAN
- Profinet Fast Startup
- Real-time communication

Solution:

- NearFi: Profinet real-time communication in the 60 GHz band, near field (max 10 mm)

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Rotary indexing tables

Target applications:

- Slip ring replacement

Key Requirements:

- Compact design
- Real-time communication

Solution:

- NearFi: Profinet real-time communication in the 60 GHz band, near field (max 10 mm)

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Transport systems

Target applications:

- Identification of workpieces in goods distribution and material flow systems

Key Requirements:

- Coexistence with existing WLAN
- High mounting freedom due to flexible approach options

Solution:

- NearFi: Profinet real-time communication in the 60 GHz band, near field (max 10 mm)

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Mechanical and plant engineering

Target applications:

- Beverage filling machines
- Machine tools
- Packaging machines

Key Requirements:

- High performance
- Compact design
- Robust
- Real-time communication
- Low solution costs

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Machine tools

Target applications:

- Slip ring replacement

Key Requirements:

- Compact design
- Real-time communication

Solution:

- NearFi: Profinet real-time communication in the 60 GHz band, near field (max 10 mm)

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Industrial robot

Target applications:

- Human-robot collaboration
- Lightweight robot
- Regular docking at various workstations
  Workstations

Key Requirements:

- Contactless Ethernet real-time communication
- Robust housing
- High mounting freedom due to flexible approach options

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Logistics

Target applications:

- Driverless transport systems
- Identification of pallets in transport systems
- Goods distribution and material flow systems

Key Requirements:

- Real-time communication
- Coexistence with WLAN
- Compact design
- Robust
- Low solution costs

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Driverless transport vehicles

Target applications:

- Contactless transfer of transport orders between AGV and fleet control in the loading station

Key Requirements:

- Coexistence with existing WLAN
- High mounting freedom due to flexible approach options

Solution:

- NearFi: communication in the 60 GHz band, near field (max 10 mm)

PHOENIX CONTACT
INSPIRING INNOVATIONS



Application example

Cleanroom systems

Target applications:

- Medical technology, food, electrical industry
- Avoidance of particle contamionation due to plug connections
- Transmission through glass or other materials

Key Requirements:

- Real-time communication
- Coexistence with WLAN
- Robust
- Obstacle penetration

PHOENIX CONTACT
INSPIRING INNOVATIONS

Technology
NearFi

NearFi coupler

Technology comparison - data transmission

Technology	Wear	Data rate (gross)	Transmission type	Latency
Wired / Connector	---	+++ < 1,000 Mbit/s	Full duplex	+++
NearFi Technology Designed by Phoenix Contact	+++	+++ < 1,000 Mbit/s	Full duplex	++ ~ 0.002 ms
LiFi	- (pollution)	+++ < 1,000 Mbit/s	Full duplex	++ > 0.001 ms
5G	+++	++ < 1,000 Mbit/s	Half duplex	+ > 1 ms
Wi Fi	+++	+ < 600 Mbit/s	Half duplex	- > 16 ms
4G LTE	+++	- < 150 Mbit/s	Half duplex	-- > 30 ms
Bluetooth	+++	< 3 Mbit/s	Half duplex	> 30 ms

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Real-time contactless communication



PATENTED

Real-time Ethernet transmission

- Bit-oriented full duplex transmission
- Ethernet protocol independent
- Latency-free
- 500 times faster than 5G
- Fast start-up (Fast start-up)
- Worldwide use (license-free 60 GHz ISM band)
- Near-field communication in the millimeter range
- Trouble-free operation next to WLAN





Inductive power transmission

- High power density
- Constant power over large working range due to active control



Wear and maintenance free

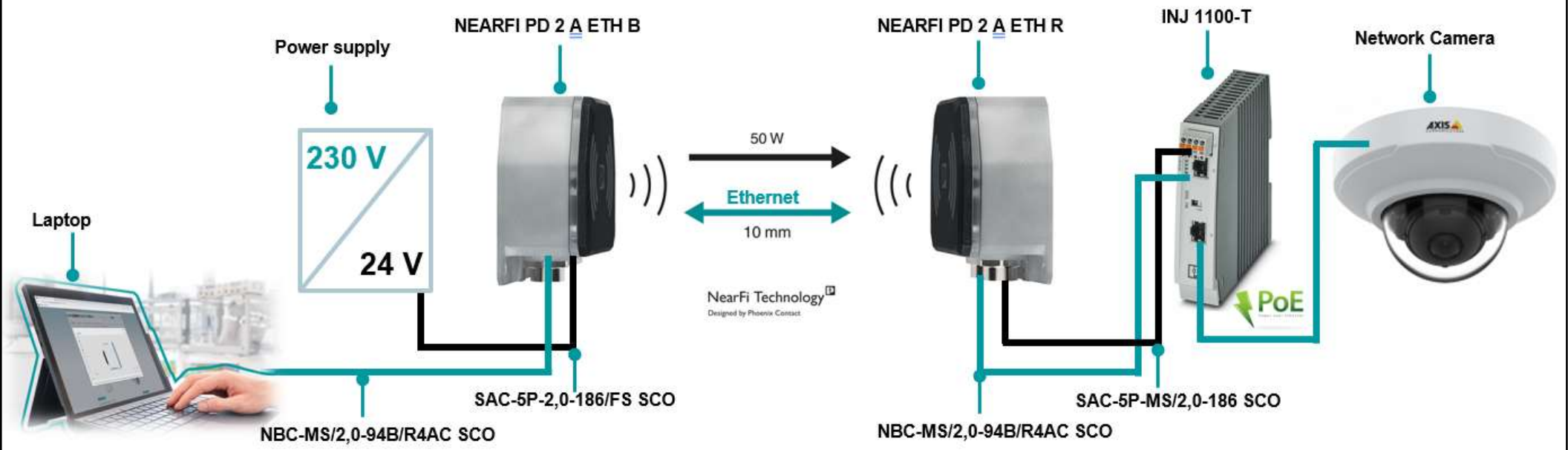
- No mechanical wear
- No bending
- No soiling
- High mounting freedom due to flexible approach options

PHOENIX CONTACT
INSPIRING INNOVATIONS

Live demo

NearFi coupler

Live Demonstration

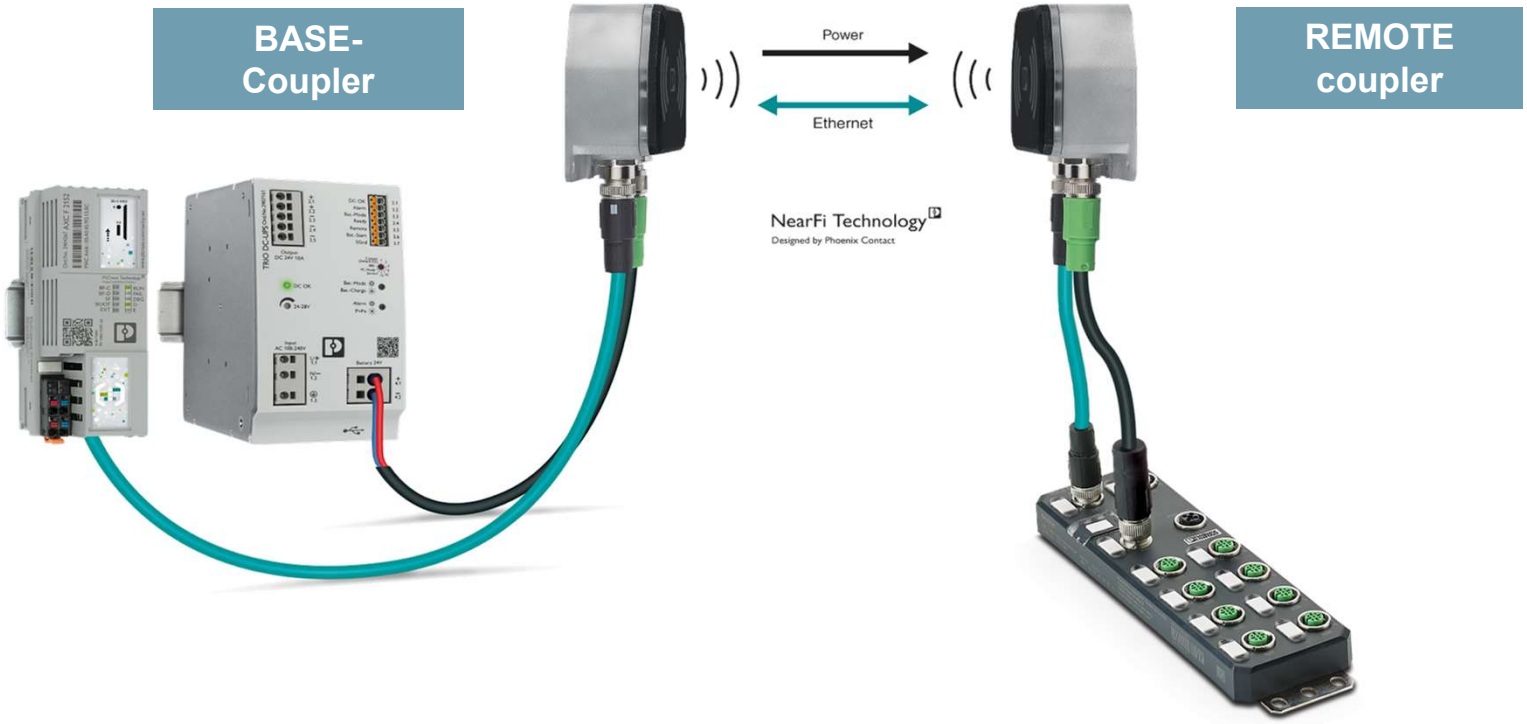


PHOENIX CONTACT
INSPIRING INNOVATIONS

Features

NearFi coupler

Installation example base and remote coupler



PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Main features







Ethernet in real time

- 100 Mbit/s Ethernet (full duplex)
- Protocol-independent
- Latency-free

Inductive power transmission

- Up to 50 W (24 V /2 A)
- Constant output over 10 mm working range thanks to active control

Commissioning and diagnostics

- Plug & Play
- Circumferential LED ring for quick diagnosis
- Digital control input
- Digital diagnostic output

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Main features



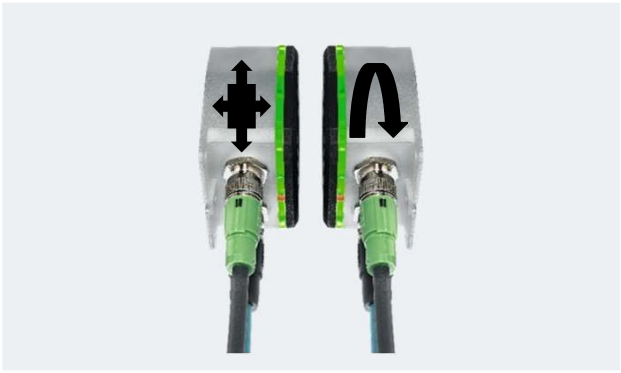
Wear and maintenance free

- Can be used in harsh conditions
- Robust housing (IP65, IK06)
- M12 connection technology



Transmission

also possible through **non-metallic obstacles**



Flexible installation

- Insensitive to vibrations
- No cable break
- Rotation possible

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

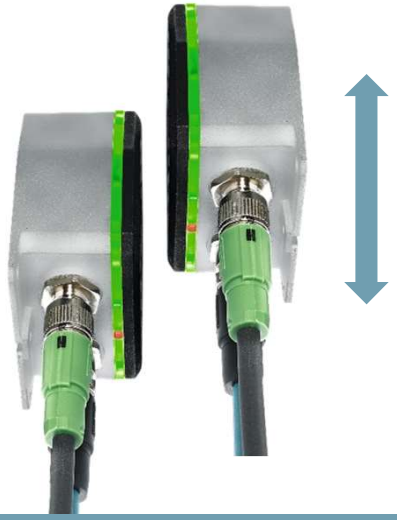
Flexible approach

Linear approach frontal



Example:
Robot tool change

Linear approach lateral



Example:
Conveyor belt, goods transport system

Rotating approach frontal



Example:
Rotating equipment

PHOENIX CONTACT
INSPIRING INNOVATIONS



NearFi coupler

Lateral offset

Transmission distance	Max. lateral offset
0-10 mm	± 5 mm

PHOENIX CONTACT
INSPIRING INNOVATIONS



NearFi coupler

Angular offset

Transmission distance	Max. Angular offset
0-10 mm	7°

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Robust housing

- Protection class IP65
- Shockproof IK06
- M12 connection technology





Dimension

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Flexible mounting

Mounting hole 5,5mm

Ground connection
for M4 screw

Mounting hole 5,5mm





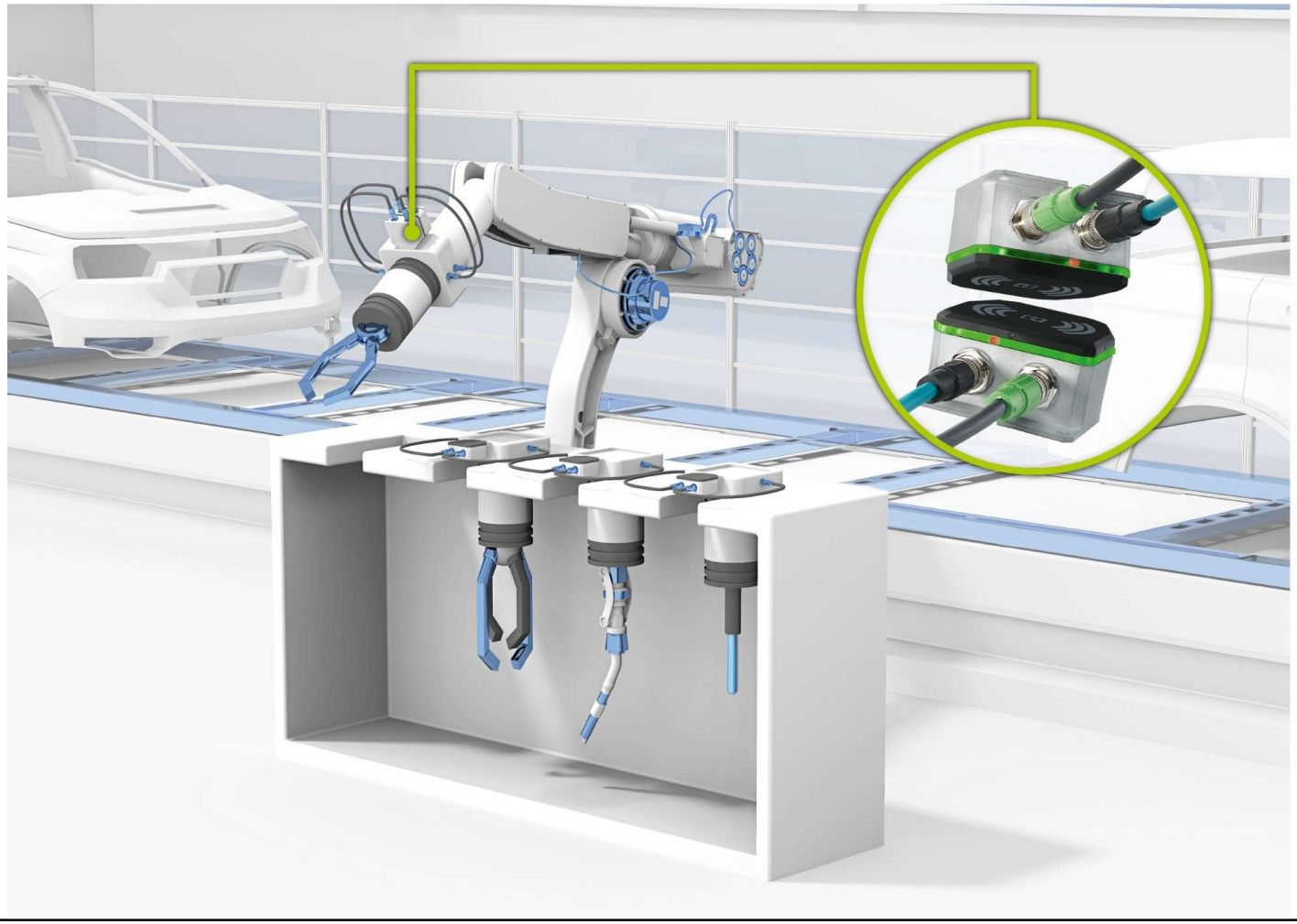
M6 thread with
8mm thread depth

Mounting

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Assembly example: robot with change tool



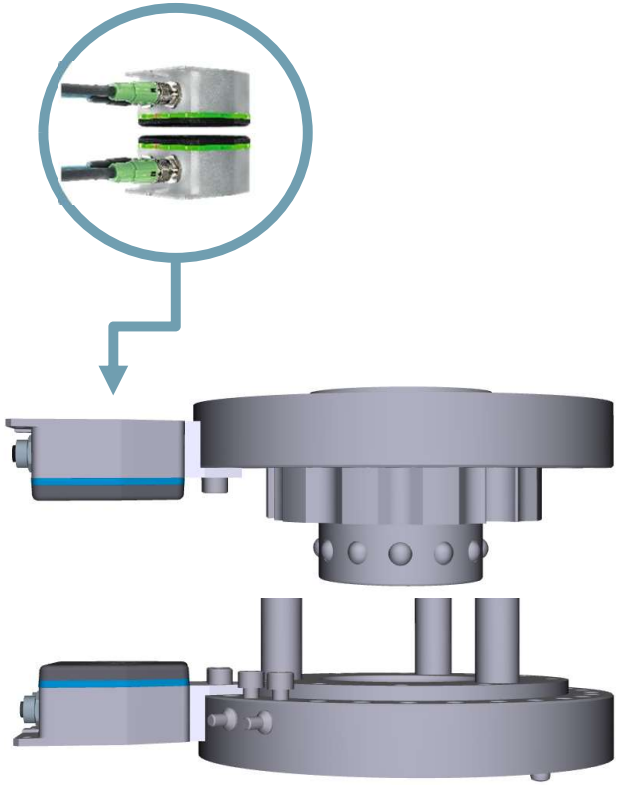
PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Mounting on robot change tools



Today



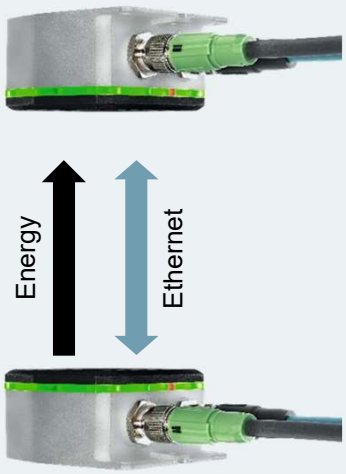
With NearFi coupler

PHOENIX CONTACT
INSPIRING INNOVATIONS

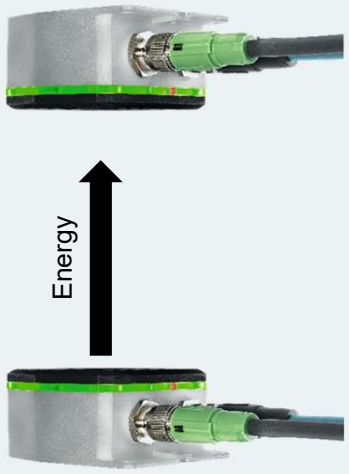
NearFi coupler

Product portfolio - 3 variants

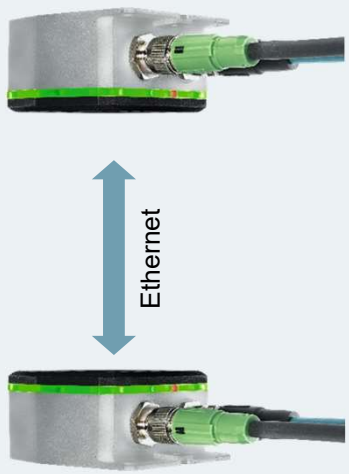
1 Energy and data



2 Energy



3 Data



PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Product portfolio

Description	Variants					
Variant	Contactless Energy and data coupler		Contactless energy couplers		Contactless data coupler	
Type	Base	Remote	Base	Remote	Base	Remote
Article description	NEARFI PD 2A ETH B	NEARFI PD 2A ETH R	NEARFI P 2A B	NEARFI P 2A R	NEARFI D ETH B	NEARFI D ETH R
Item number	1234224	1234225	1234226	1234229	1234232	1234234
Product photo						
Recommended market price						

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Device connection according to variant

1 Energy and data



Item no: 1234225

X2
Ethernet IN/OUT

X1
Power OUT



Item no: 1234224

X2
Ethernet IN/OUT

X1
Power IN

2 Energy



Item no: 1234229

X1
Power OUT



Item no: 1234226

X1
Power IN

3 Data



Item no: 1234234

X2
Ethernet IN/OUT

X1
Power IN



Item no.: 1234232

X2
Ethernet IN/OUT

X1
Power IN

PHOENIX CONTACT
INSPIRING INNOVATIONS



NearFi coupler

Diagnosis

Device status via LED ring

Light ring	State
Green - ON	Base and remote coupler coupled (energy and data transmission active)
Green - OFF	Base coupler not ready for operation or switched off via control input (DI)
Green - Flashing	Base coupler ready for operation, energy and data transmission not active, air gap/offset too large
Red - ON	Critical error - internal temperature too high, external supply voltage seriously out of nominal range
Red - OFF	No error

PHOENIX CONTACT
INSPIRING INNOVATIONS



NearFi coupler

Diagnosis

Status LED- Ethernet transmission

Ethernet Link	State
Yellow - ON	Ethernet link and radio link available
Yellow - OFF	Ethernet link or radio link not available
Yellow - Flashing	Ethernet data are transmitted

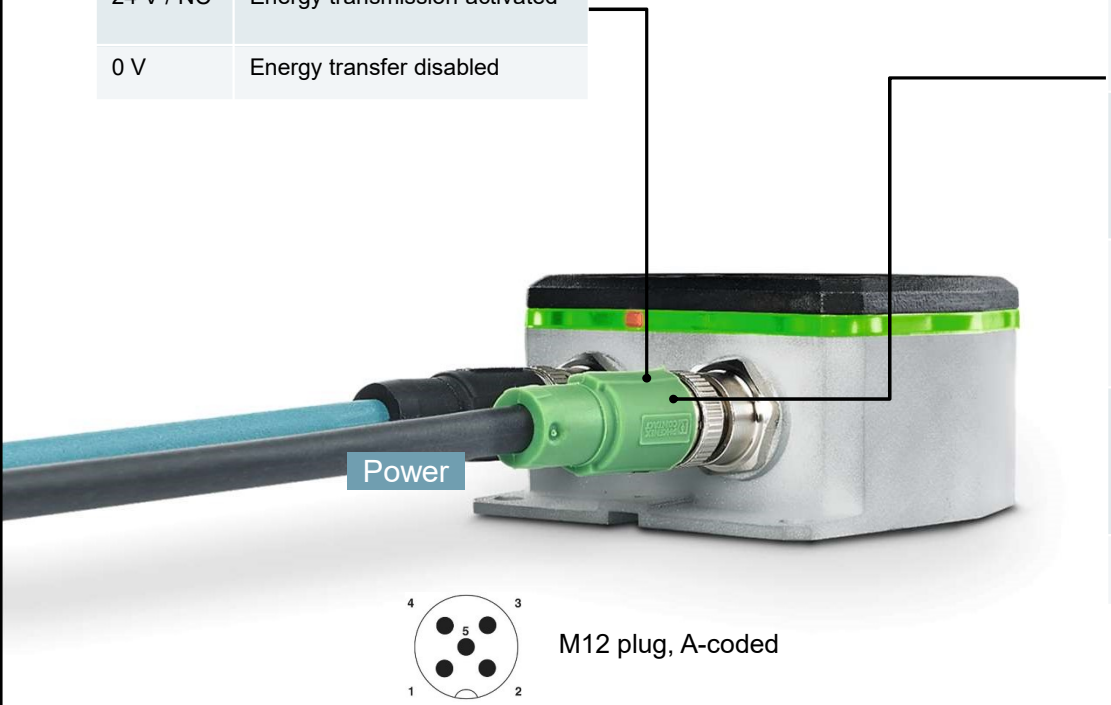
PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Diagnosis

Digital control input (pin 2)

PIN 2	State
24 V / NC	Energy transmission activated
0 V	Energy transfer disabled



M12 plug, A-coded

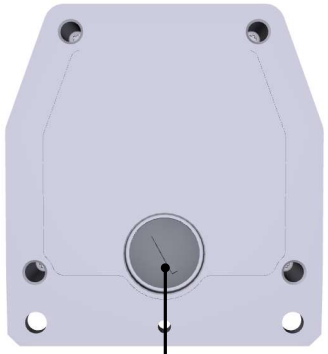
Digital status output (Pin4)

Signal code	State	Signal shape
1	Base Error: External supply voltage outside the nominal range (19-30V)	 Number of pulses: 1, pulse length: 100 ms, pause: 1000 ms,
2	Base Error: Internal supply voltage, current consumption, or temperature outside nominal range	 Number of pulses: 2, pulse length: 100 ms, pause: 1000 ms,
3	Remote Error: Output voltage outside nominal range or distance too large	 Number of pulses: 3, pulse length: 100 ms, pause: 1000 ms,
4	Remote Error: Voltage output overload/short circuit	 Number of pulses: 4, pulse length: 100 ms, pause: 1000 ms,
5	Base and remote not coupled (Energy and data transmission inactive)	 Number of pulses: 5, pulse length: 100 ms, pause: 1000 ms,
OFF	Base and Remote coupled (Energy and data transmission active)	———

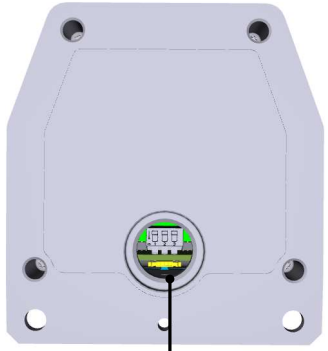
PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

Configuration (optional)

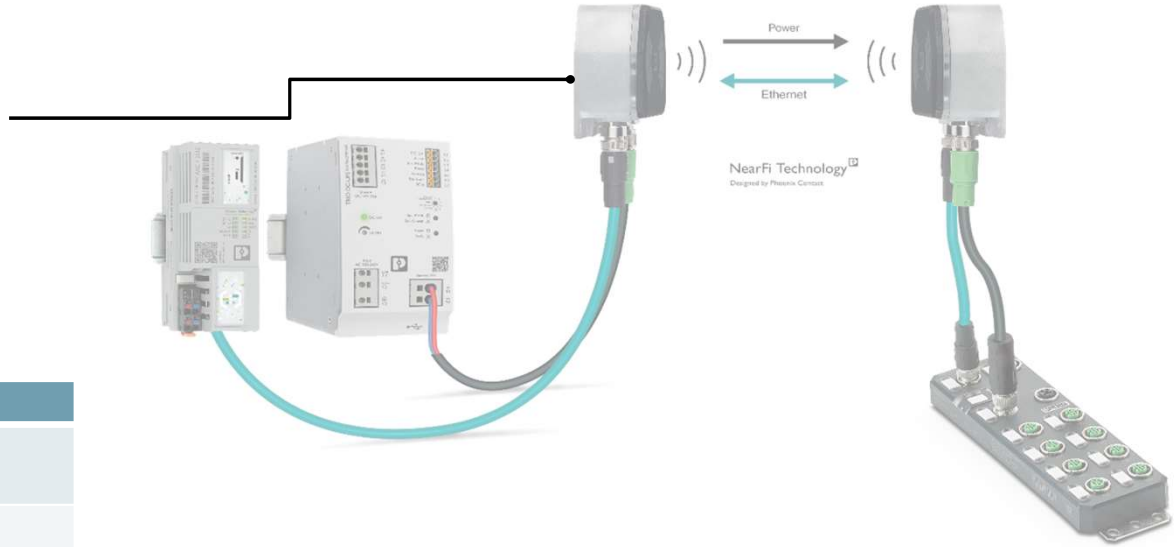


M16 screw plug



DIP switch

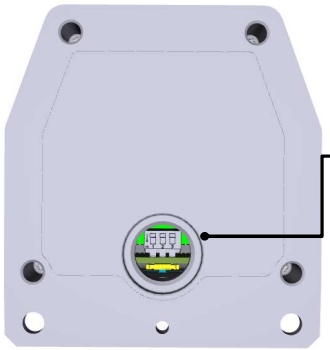
Position	Mode
DIP 1 ON OFF	Fast Power Coupling Power Polling
DIP 2 ON OFF	Ethernet Full Duplex Ethernet Autoneg



PHOENIX CONTACT
INSPIRING INNOVATIONS

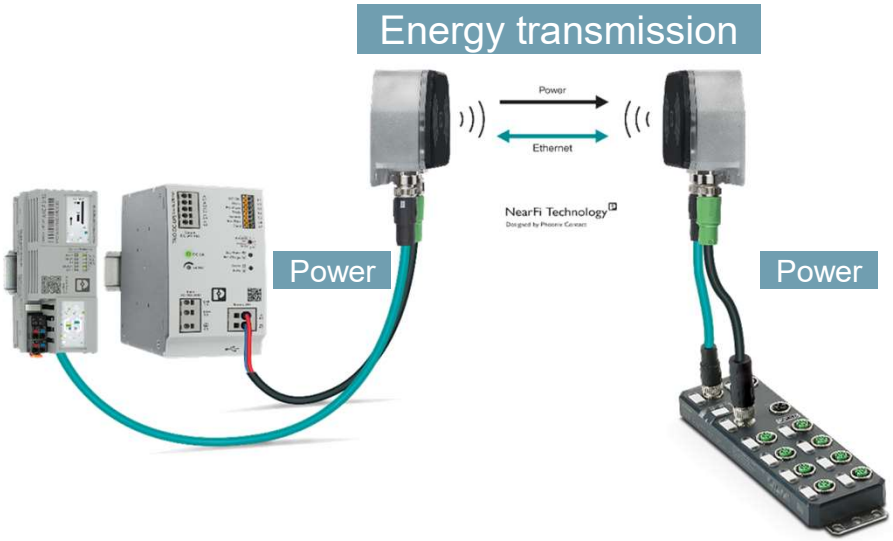
NearFi coupler

Fast Power Coupling



DIP switch

Position	Mode
DIP 1 ON	Fast Power Coupling
OFF	Power Polling
DIP 2 ON	Ethernet Full Duplex
OFF	Ethernet Autoneg



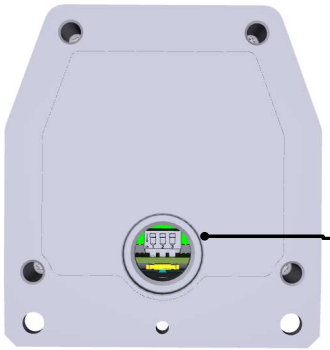
Fast Power Coupling

DIP	Position	Function
1	ON	**Fast Power Coupling enabled:** The base coupler permanently tries to establish a connection to the remote coupler. The ***energy transfer is permanently active***. **Note: Metallic foreign bodies may become hot in the air gap between the couplers.**
1	OFF (factory setting)	**Power polling enabled:** The base coupler tries to establish a connection to the remote coupler 1 time per second. ***Only when the connection is established, the energy transfer between base and remote*** coupler ***is switched active.***

PHOENIX CONTACT
INSPIRING INNOVATIONS

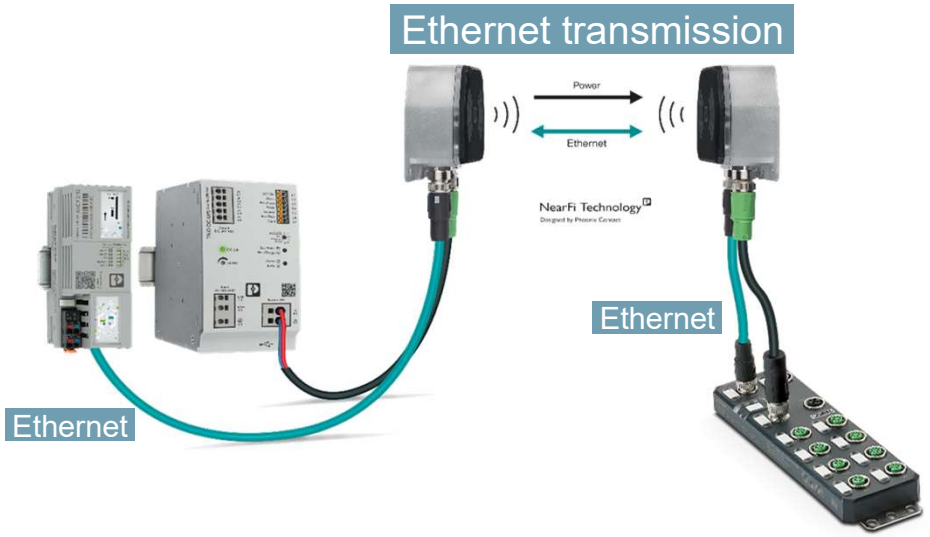
NearFi coupler

Ethernet Full Duplex / Autoneg



DIP switch

Position	Mode
DIP 1 ON OFF	Fast Power Coupling Power Polling
DIP 2 ON OFF	Ethernet Full Duplex Ethernet Autoneg



Ethernet Full Duplex / Autoneg

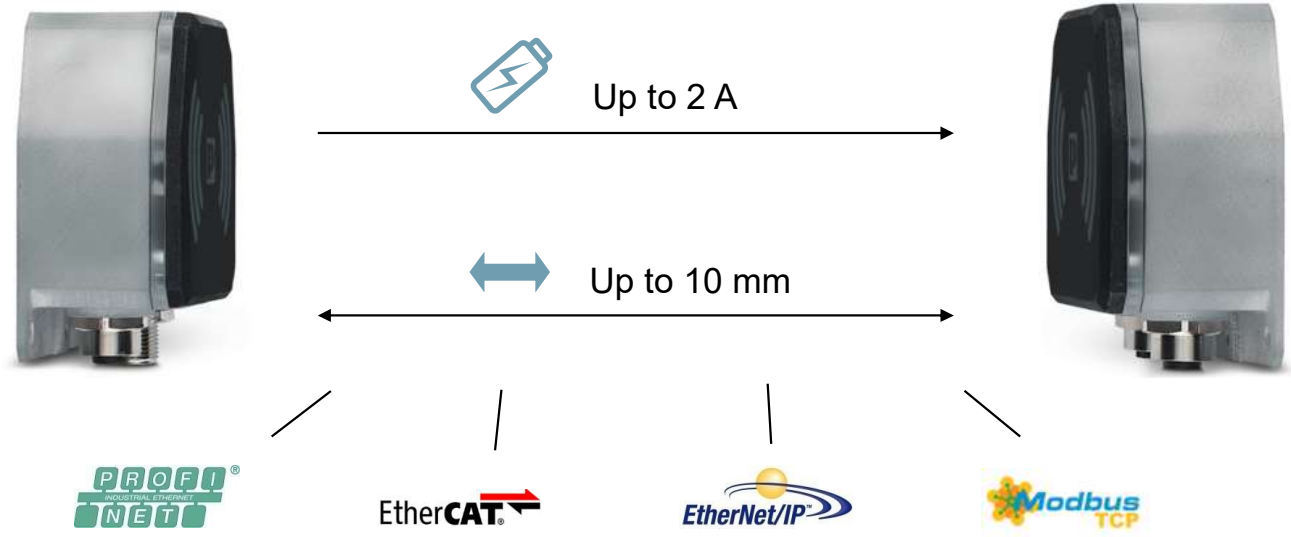
DIP	Position	Function
2	ON	**Ethernet Full Duplex:** The Ethernet connection is set with a transmission rate of ***100 MBit/s*** and the transmission type ***full duplex fixed.***
2	OFF (factory setting)	**Autoneg enabled:** The connected ***end devices negotiate the transmission rate 10/100 Mbit/s and the transmission type half/full duplex directly.*** The entire route thereby behaves like a directly connected copper cable

PHOENIX CONTACT
INSPIRING INNOVATIONS

NearFi coupler

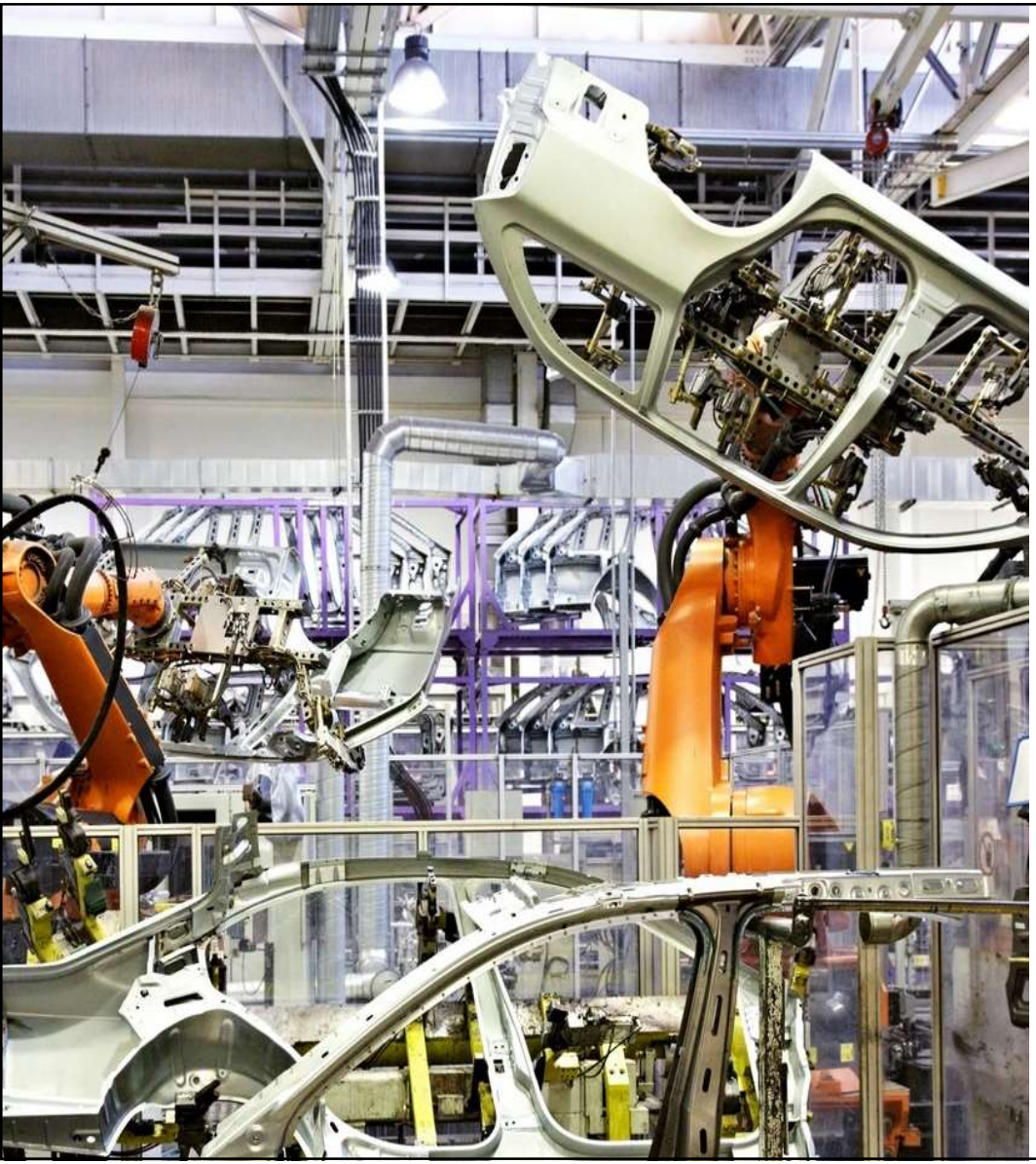
Highlight 2021





With the contactless energy and data couplers, you supply devices with energy and real-time data **without wear and maintenance**. High costs due to long downtimes are a thing of the past.

PHOENIX CONTACT
INSPIRING INNOVATIONS



Sales focus on

Factory automation
Automotive industry

Target applications:

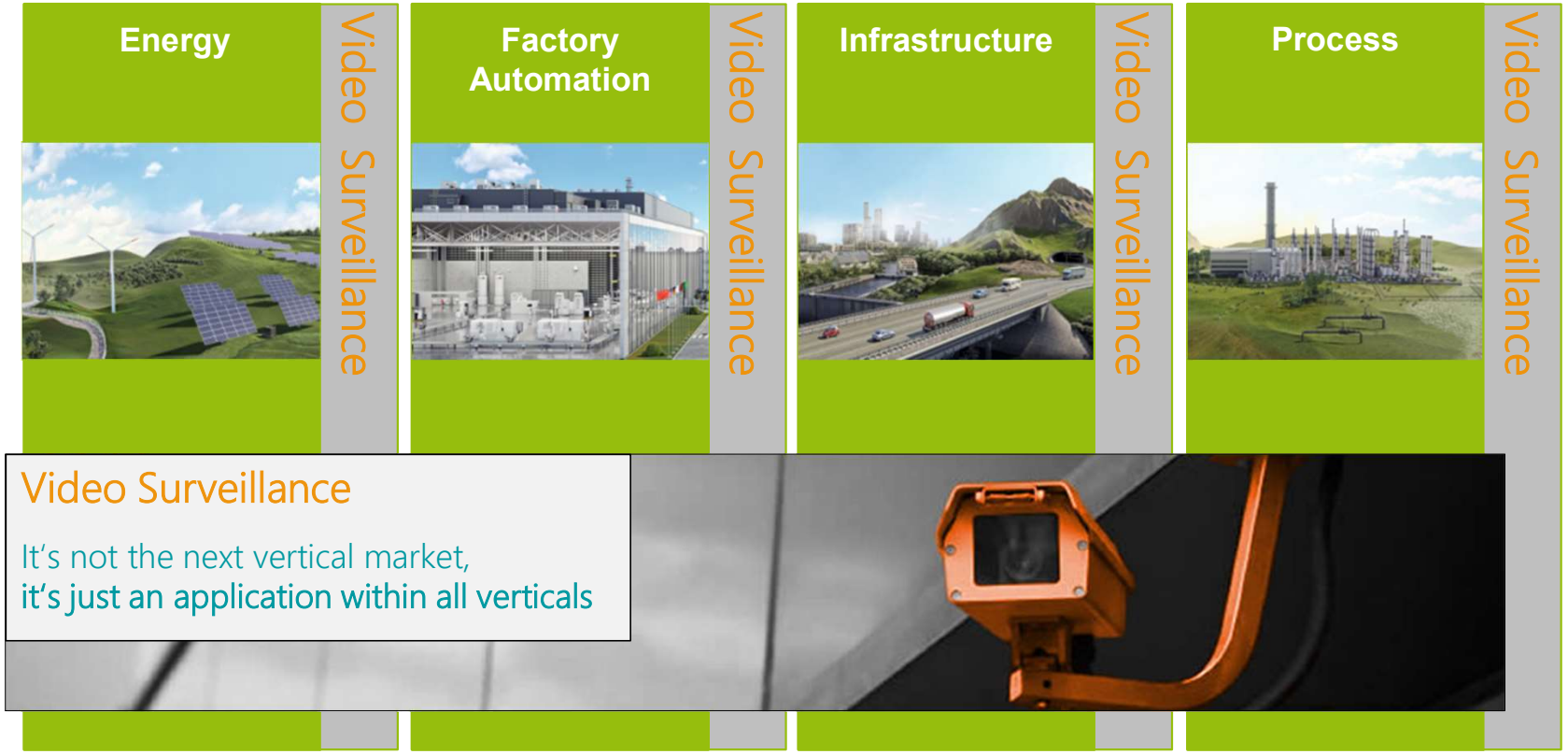
- Robot with interchangeable tools
- Rotary tables, rotary indexing tables, presses
- Transport systems (framer)
- Load and workpiece carriers

PHOENIX CONTACT
INSPIRING INNOVATIONS

PoE and Video Surveillance

Surveillance Infrastructure Campaign

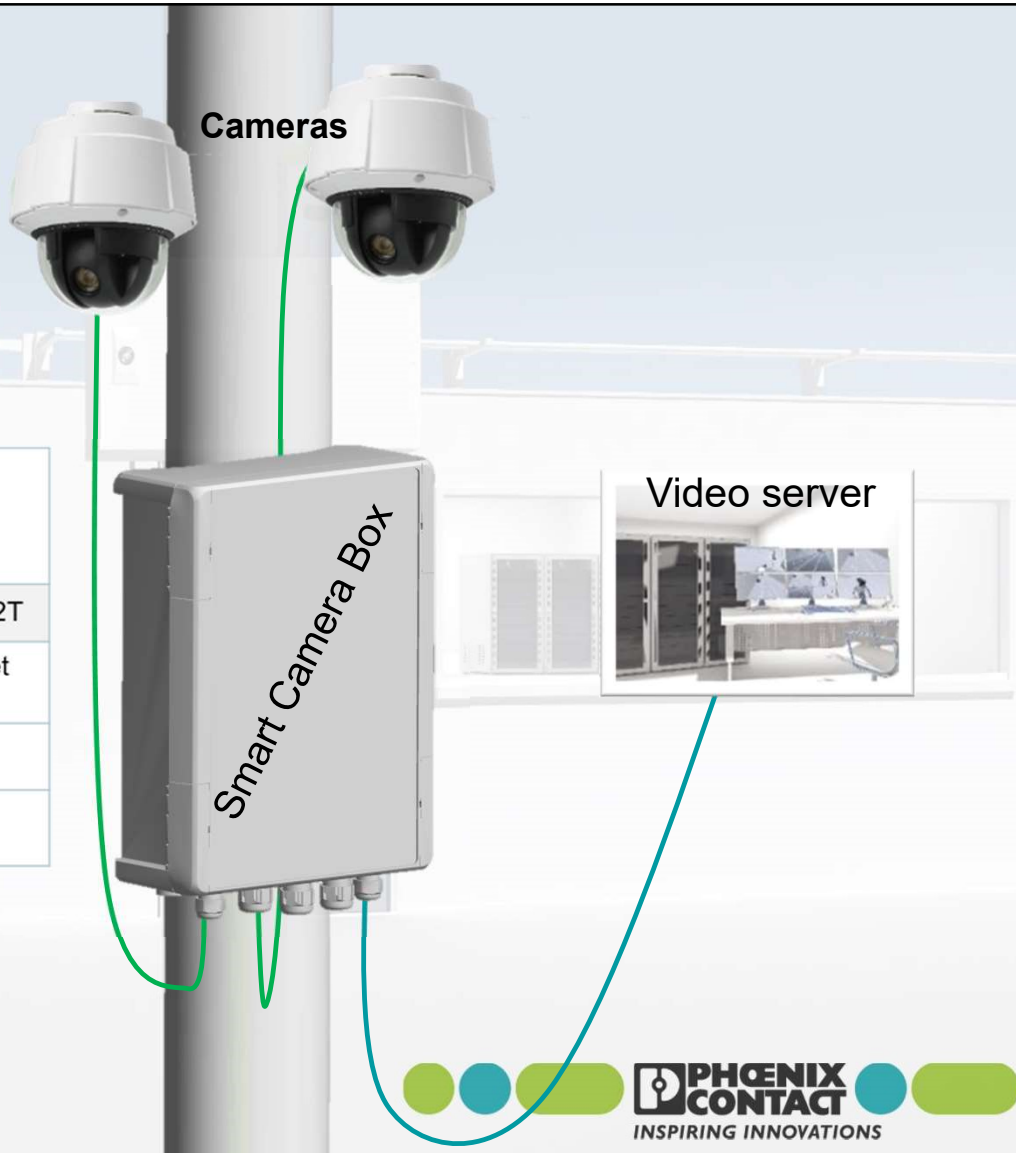
Video surveillance in all vertical markets



Smart Camera Box

All-in-one device

				
	SCX 4POE 2LX	SCX 2POE 2LX	SCX 4POE 2T	SCX 2POE 2T
Uplink ports	2 x fibre optic cable	2 x fibre optic cable	2 x Ethernet copper	2 x Ethernet copper
PoE ports	4	2	4	2
Item no.	1102626	1108543	1108542	1108544



PHOENIX CONTACT
INSPIRING INNOVATIONS

Some examples of surveillance applications



Video Surveillance & SCX



Hard



But smart

PHOENIX CONTACT
INSPIRING INNOVATIONS

Use case aviation

- **Up to 70% time saving installations in critical areas!**
- Apron, Taxiway, Runway

- **Full managed and surge protected**
- Compound, Perimeter, Fences

- **Suitable for all airport applications**
- Entry- and waiting zones, Boarding counter, Security check



PHOENIX CONTACT
INSPIRING INNOVATIONS

Use case aviation

- **Many large international airports are operating above capacity limits**
- Partially closing these areas incurs significant costs

- **the cameras are not accessible for maintenance work in regular operation**
- can be restarted from the control center

- **Monitoring the status of the camera network is assured**
- the components in the widely distributed areas are protected against overvoltage.



PHOENIX CONTACT
INSPIRING INNOVATIONS

Video surveillance in tunnels

- **Housing for harsh environments that resists liquids and gases**
- Carbon monoxide, nitrogen monoxide / dioxide, high pressure water for regularly cleaning

- **Backbone performance for high resolution video**
- Height control, wrong way drivers, counters, smoke detection

- **Easiest mounting**
- Innovative mounting adapter ensures rapid installation



PHOENIX CONTACT
INSPIRING INNOVATIONS

Video surveillance in tunnels

- **Dirty conditions are also usual when retrofitting in road traffic tunnels.**
- Inside a tunnel the conditions are typically dark, cold and loud

- **Spray water protection according IP65**
- Resistant to regular tunnel tube cleaning.

- **The ability to link different systems**
- Video, automation, and transportation technology, on a shared network.



PHOENIX CONTACT
INSPIRING INNOVATIONS

Use case traffic and transport

- Suitable for all kind of applications like roads, railroads, waterways, cable cars, etc.
- Redundant network technology is possible
- The SCX could be extended via modem
- Suitable up to 4 Cameras at 1 SCX



PHOENIX CONTACT
INSPIRING INNOVATIONS

Video surveillance in the solar industry

- **The objective of a video surveillance system**
- The technology must cover the entire area and be optimally protected against vandalism and the environmental conditions

- **Comprehensive protection of solar parks and large installations**
- Criminals are not just focusing on solar panels, but are also increasingly targeting connecting cables and even inverters



PHOENIX CONTACT
INSPIRING INNOVATIONS

Video surveillance in the solar industry

- **Backbone for intrusion detection systems**
- Can include perimeter sensors, resistance wires, intrusion detection sensors, anti-tamper devices for panels, photoelectric barriers and other equipment

- **High POE performance for high power Cam‘s**
- Support of traceable PTZ Infrared-Cams

- **Automatically Camera restart option**
- Suitable for unmaned solar parcs, integrated network monitoring



PHOENIX CONTACT
INSPIRING INNOVATIONS

Video surveillance in water management

- **Like other utilities, it is critical infrastructure**
- Video surveillance is used as a preventive measure requires for its maintenance and protection

- **Approximately 100,000 hectoliters of drinking water have been drained**
- A man's licentiousness also caused significant monetary losses

- **Monitoring inlets, screens, storage reservoirs, sewers, and service buildings**
- The combination of process control visualization with real images is a great advantage



PHOENIX CONTACT
INSPIRING INNOVATIONS

Video surveillance in water management

- **In many countries there are also strategies for monitoring wastewater treatment**
- What is needed, therefore, is connection technology that is installed outdoors, protects against vandalism, and provides years of reliable service
- **The water cycle is a mesh of many water events**
- Sewage, heavy rains, canals, rivers should be surveilled to avoid floodwaters



PHOENIX CONTACT
INSPIRING INNOVATIONS

Use case border control

- **A variety of different systems are used in divergent fields of surveillance**
- Efficient installation and constant availability are a very high priority

- **It is necessary to protect national borders from unauthorized intrusion**
- In any case it speeds up entry or transit checks

- **The possibility to use fiber optics in the uplink ports, so that significantly larger distances can be networked than the camera eye can see**



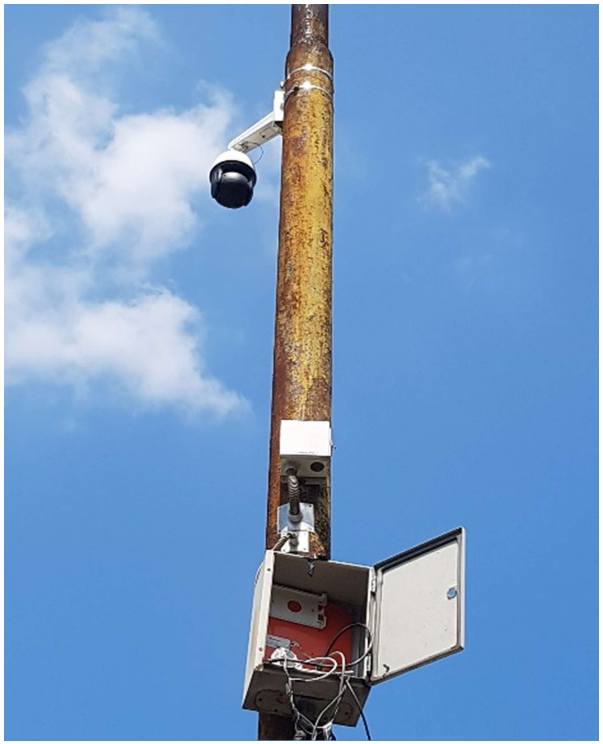
PHOENIX CONTACT
INSPIRING INNOVATIONS

Use case border control

- **The Smart Camera Box should be suitable for every environment**
- Ambient temperatures from -40° to +70° Celsius at a relative humidity of 10% to 95%

- **The Smart Camera Box uses additional features to make operation particularly safe**
- The connection boxes can be mechanically locked, have door signal contacts and are of course integrated into the control centres via SNMP

- **The Smart Camera Box neither ages, deforms or perforates and is more or less immune to mechanical influences**



PHOENIX CONTACT
INSPIRING INNOVATIONS

Use case perimeter observation

- **Capability to support up to four cameras within just one SCX**
- Combined infrared and PTZ cameras are typically for entrance areas

- **High performance backbone for easy integration into the campus network with fibre connections**
- High POE performance also for special cameras and extraordinary applications



PHOENIX CONTACT
INSPIRING INNOVATIONS

Use case mining

- Designed for extreme conditions
- Fiber Optic Uplink Ports
- Full managed Network Switches
- Backbone might be used also for distributed IO data in the field



PHOENIX CONTACT
INSPIRING INNOVATIONS

Partner initiative

Partner

Partnering with Axis in Germany

Project description

- Large Prison facility in Germany – Critical Infrastructure
- Renewal and expansion of security and video systems
- Hundreds of cameras – planning ongoing



Smart Camera Box – The door opener

- Axis A&E Manager was convinced by

… the All-in-one design

… less planning effort

… good PoE capabilities

… integrated sabotage alarm

- Smart Camera Box became part of Axis project planning

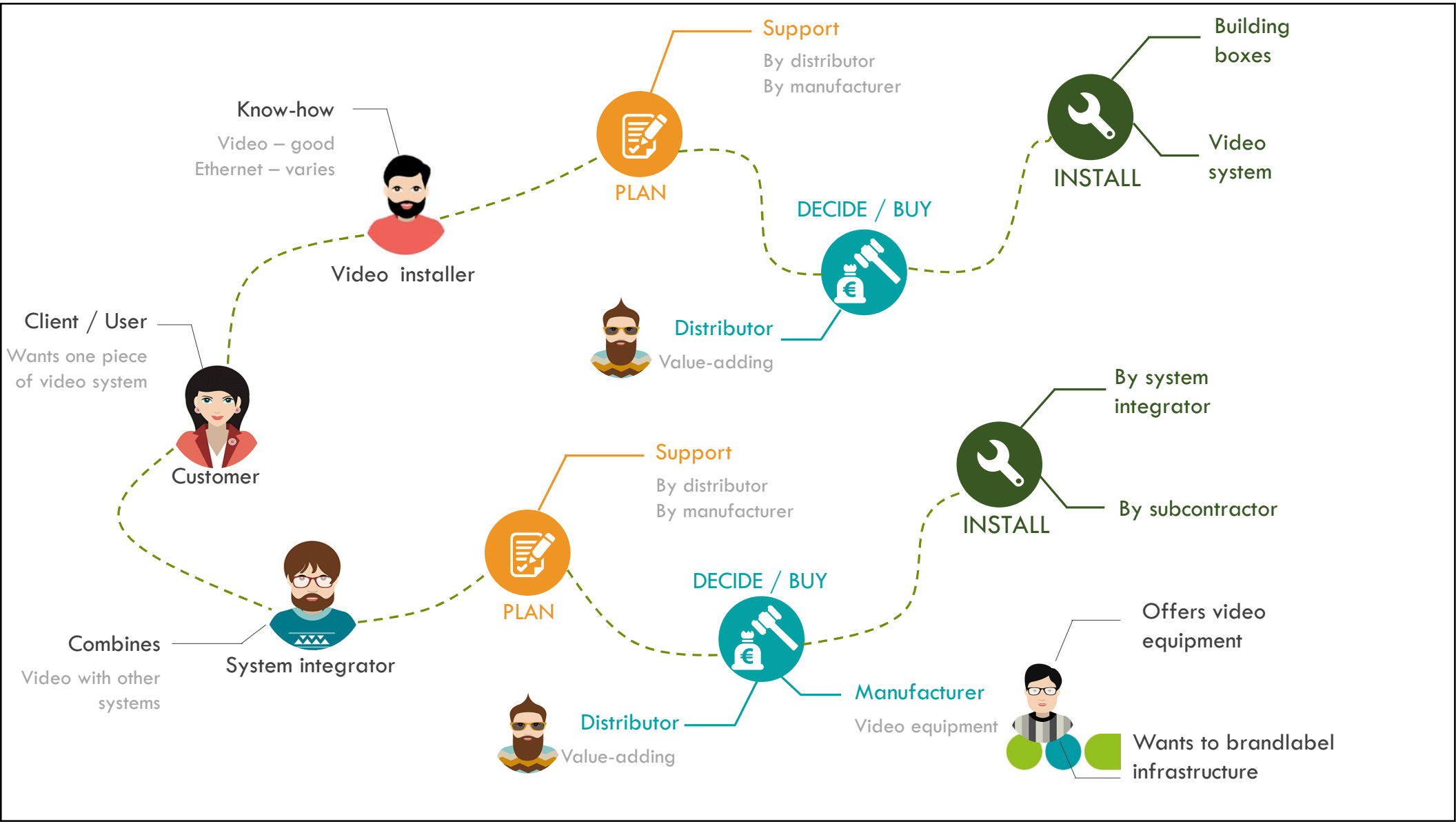
Axis introduced us to the leading project planner

- He immediately was convinced by the Smart Camera Box
- He understood Phoenix Contact is more than a manufacturer of terminal blocks…

Cross-selling

- Surge protection
- Fiber optic cables
- Connectors

Highly confidential


Support
By distributor
By manufacturer
Building boxes
Video system
INSTALL
PLAN
DECIDE / BUY
Know-how
Video – good
Ethernet – varies
Video installer
Client / User
Wants one piece of video system
Distributor
Value-adding
Customer
By system integrator
By subcontractor
INSTALL
Support
By distributor
By manufacturer
PLAN
DECIDE / BUY
Combines
Video with other systems
System integrator
Offers video equipment
Manufacturer
Video equipment
Distributor
Value-adding
Wants to brandlabel infrastructure

Partner initiative

Partnership with HIKVISION

Compound growth rate from 2010 to 2019 **36%**

Total revenue in 2019 **$8.26B**

59
International subsidiaries and branch offices

100,000+
Partners globally

150+ Our products are used in countries and regions



HIKVISION®

2001 Year founded

18+ Years steady growth

40,000+ Employees worldwide

19,000+ R&D engineers

Over 9% Annual revenue invested in R&D

PHOENIX CONTACT
INSPIRING INNOVATIONS

Partner initiative

Promotional brochure

- Partner brochure soon available

- To be posted to all HIKVISON partners to create awareness for Phoenix Contact



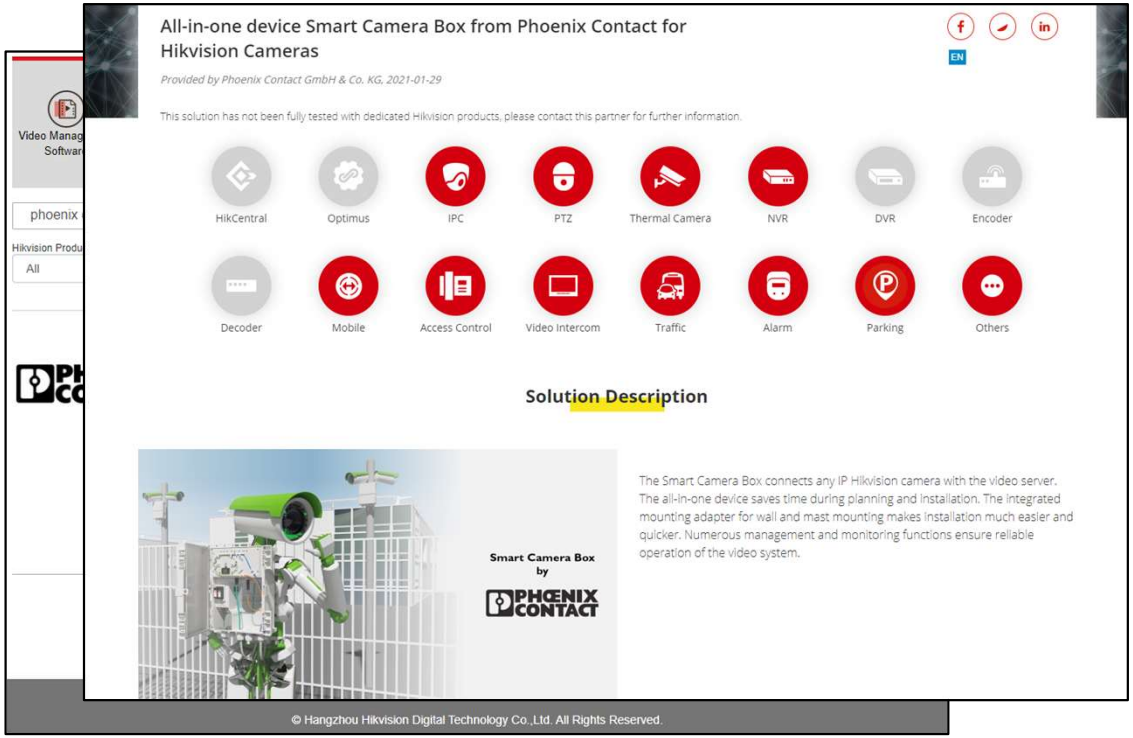
PHOENIX CONTACT
INSPIRING INNOVATIONS

Partner initiative

Technical Partner Program

- Phoenix Contact listed in HIKVISION´s public Technical Partner Program (TPP)
- Focused on our Smart Camera Box
- Linked with our solutions website



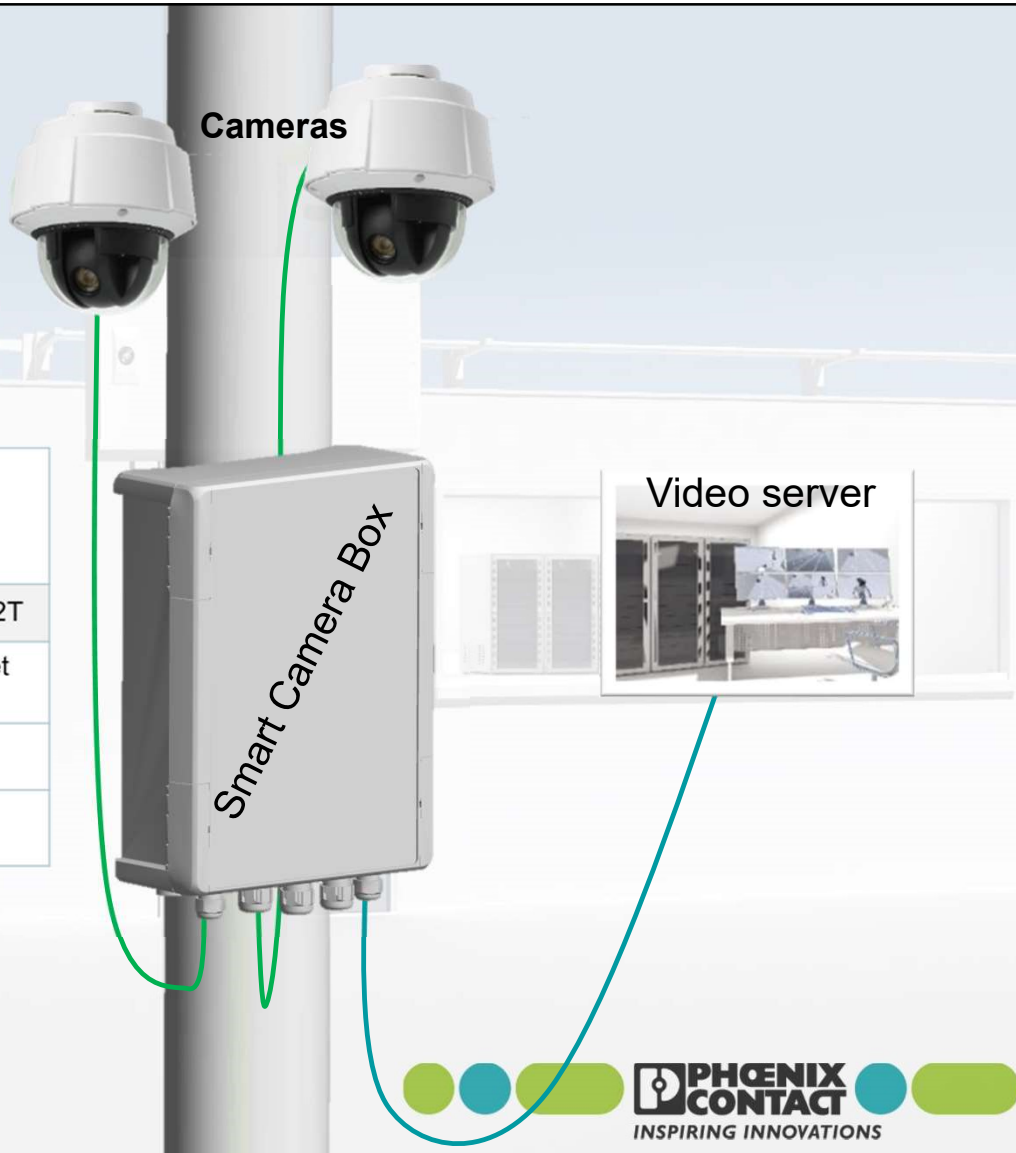


PHOENIX CONTACT
INSPIRING INNOVATIONS

Smart Camera Box

All-in-one device

				
	SCX 4POE 2LX	SCX 2POE 2LX	SCX 4POE 2T	SCX 2POE 2T
Uplink ports	2 x fibre optic cable	2 x fibre optic cable	2 x Ethernet copper	2 x Ethernet copper
PoE ports	4	2	4	2
Item no.	1102626	1108543	1108542	1108544



PHOENIX CONTACT
INSPIRING INNOVATIONS

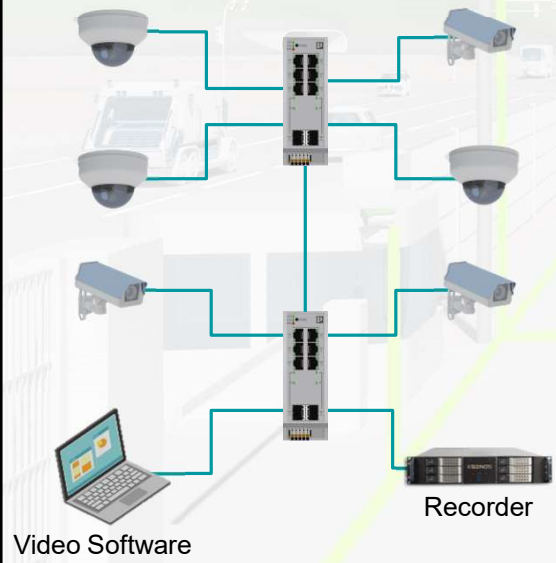
Extension Products

Application

IP Cameras

Power over Ethernet





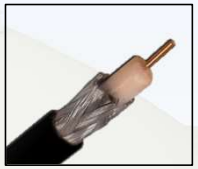
Video networks

- Standard Ethernet
- High Bandwidth
- 100 m point-to-point



Application

Analog Cameras





Coax cable

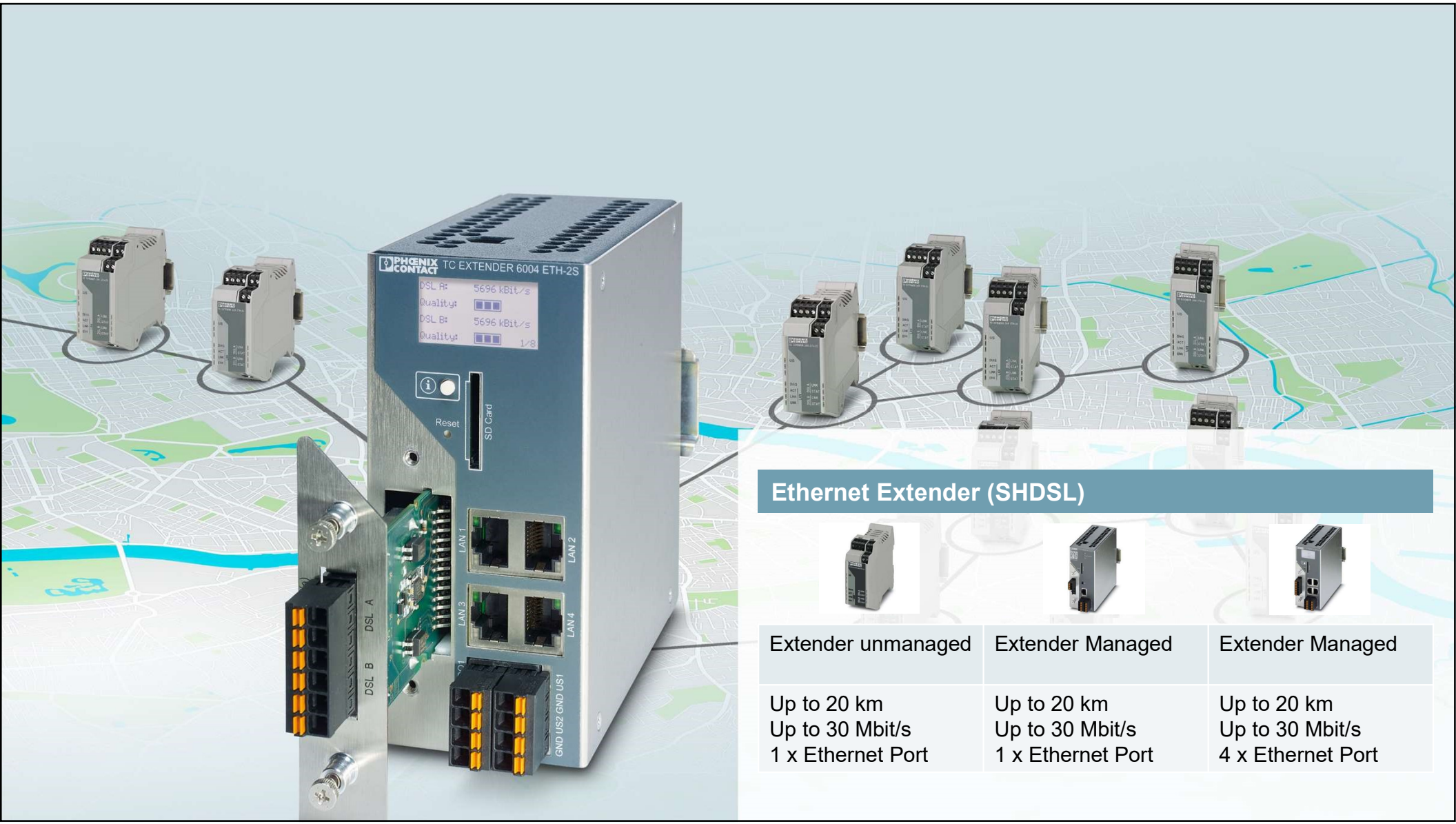
600m



Video networks

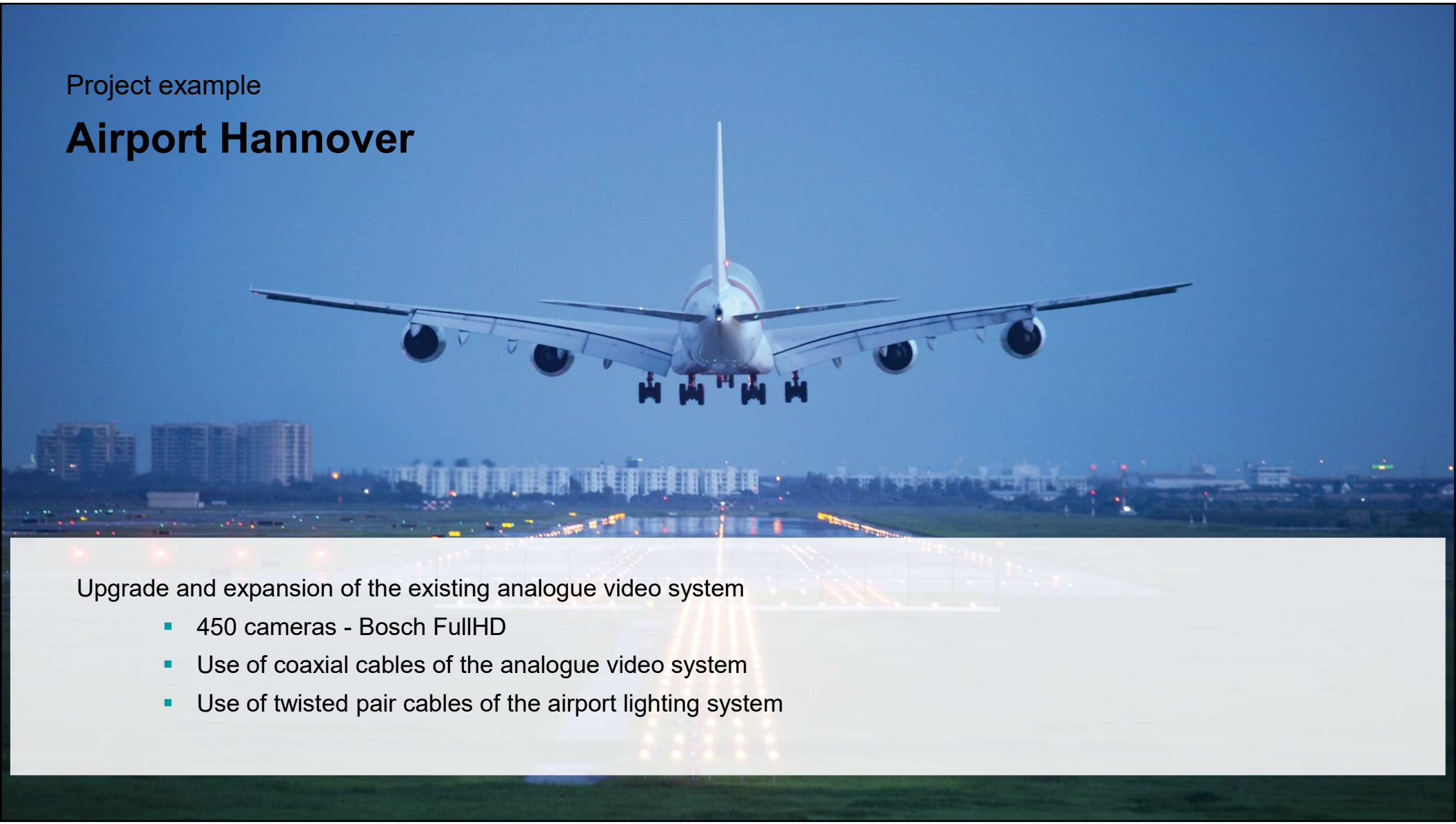
- Star topology
- Point-to-point
- Analog video signal





Ethernet Extender (SHDSL)

Extender unmanaged	Extender Managed	Extender Managed
Up to 20 km Up to 30 Mbit/s 1 x Ethernet Port	Up to 20 km Up to 30 Mbit/s 1 x Ethernet Port	Up to 20 km Up to 30 Mbit/s 4 x Ethernet Port



Project example

Airport Hannover

Upgrade and expansion of the existing analogue video system

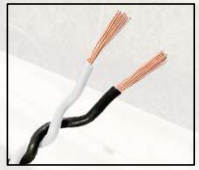
- 450 cameras - Bosch FullHD
- Use of coaxial cables of the analogue video system
- Use of twisted pair cables of the airport lighting system

Project example

Motorways Switzerland

Expansion of video systems for traffic monitoring

- Partly no power supply and data lines available
- Use of existing telephone lines required
  - Data connection
  - Power supply



Twisted Pair

Portfolio

Think about Cross Selling!



PoE Injektoren



PoE Unmanaged Switches



PoE Managed Switches



PoE Splitter



Smart Camera Box



Surge protection



Ethernet cable





SFP modules



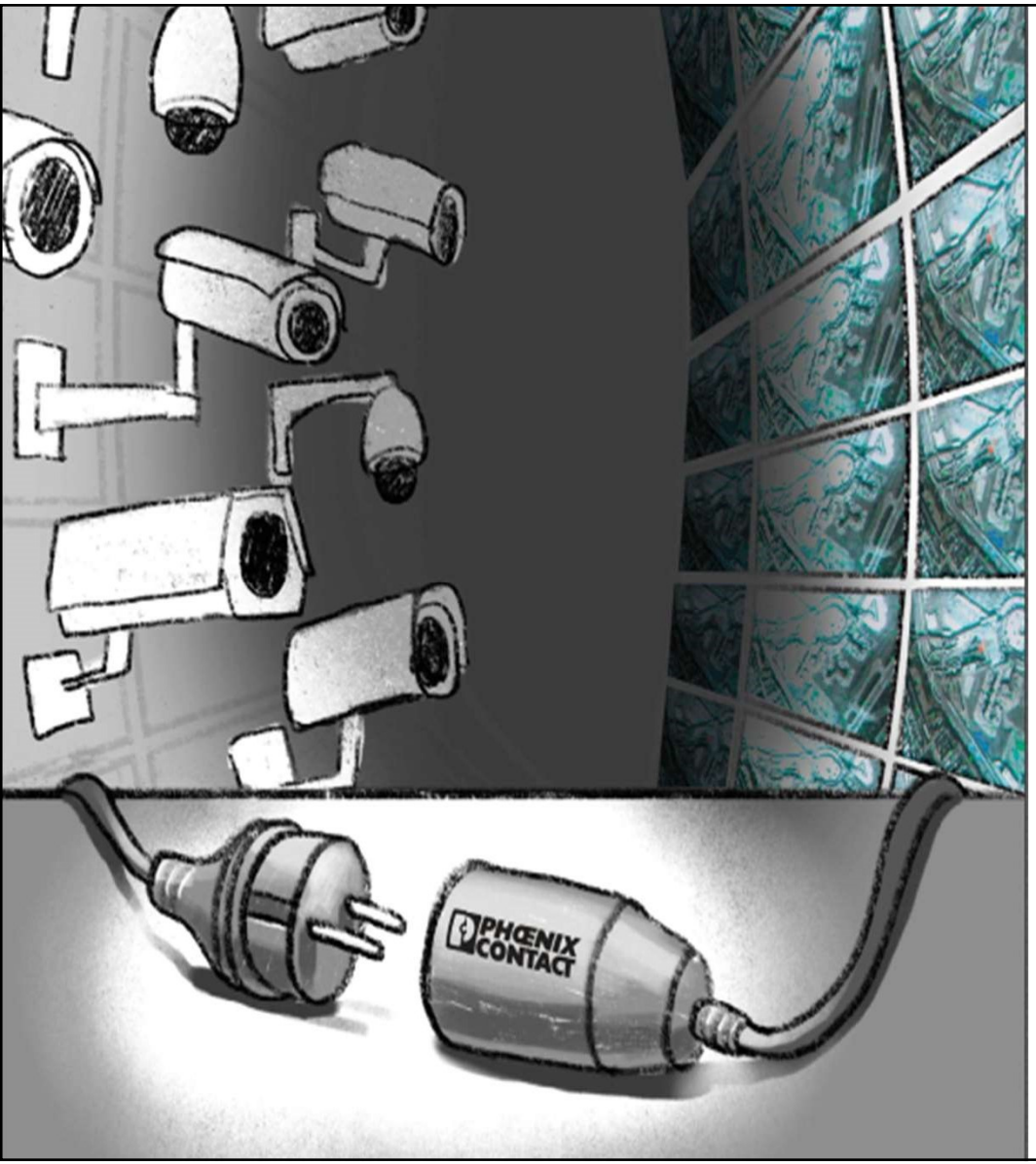
Connector





Patch Panel

PHOENIX CONTACT
INSPIRING INNOVATIONS

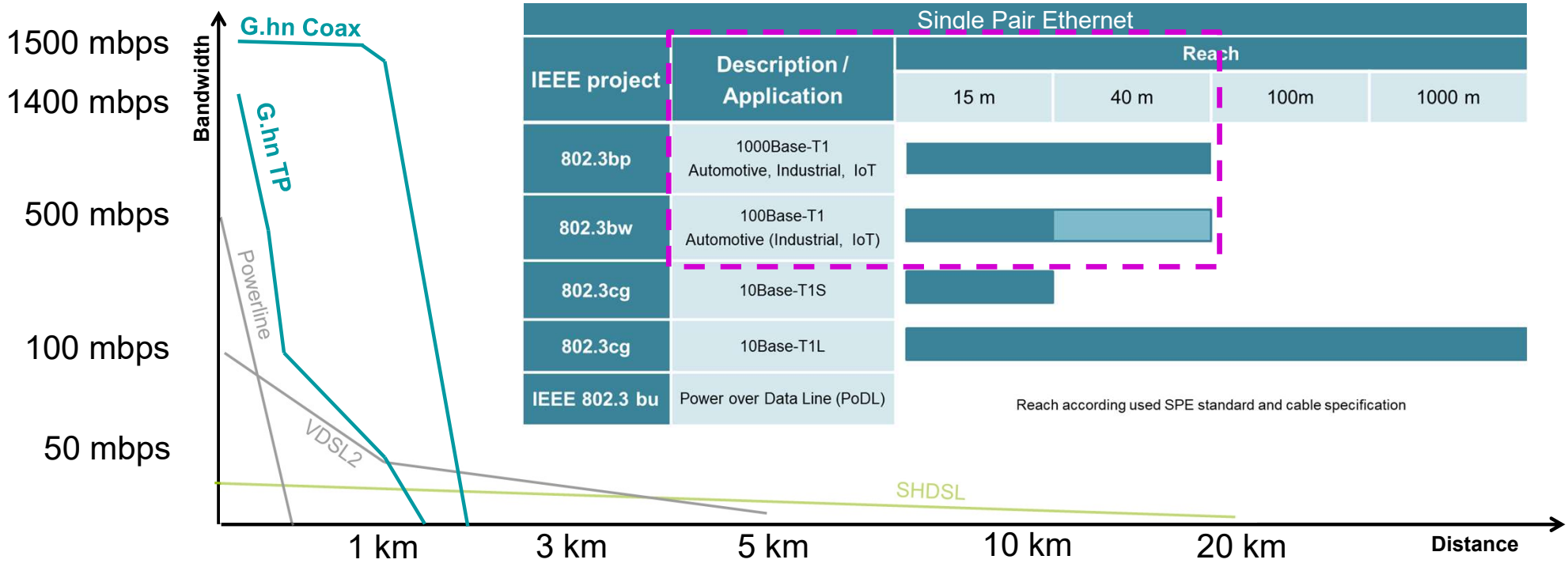


Gigabit Ethernet Extender

PHOENIX CONTACT
INSPIRING INNOVATIONS

Gbit Ethernet Extender

Technology comparison



Single Pair Ethernet						
IEEE project	Description / Application	Reach				
		15 m	40 m	100m	1000 m	
802.3bp	1000Base-T1 Automotive, Industrial, IoT					
802.3bw	100Base-T1 Automotive (Industrial, IoT)					
802.3cg	10Base-T1S					
802.3cg	10Base-T1L					
IEEE 802.3 bu	Power over Data Line (PoDL)					

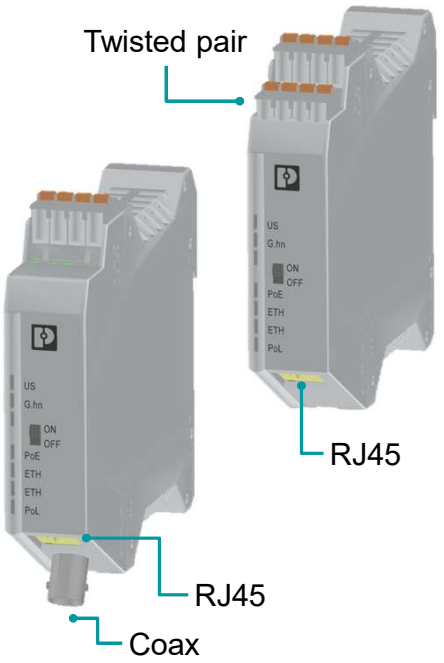
Reach according used SPE standard and cable specification

PHOENIX CONTACT
INSPIRING INNOVATIONS

Product Features

Gbit Ethernet Extender

- Coax cable and twisted pair
- Highspeed Ethernet up to 1.5 Gbit/s



Data rate up to

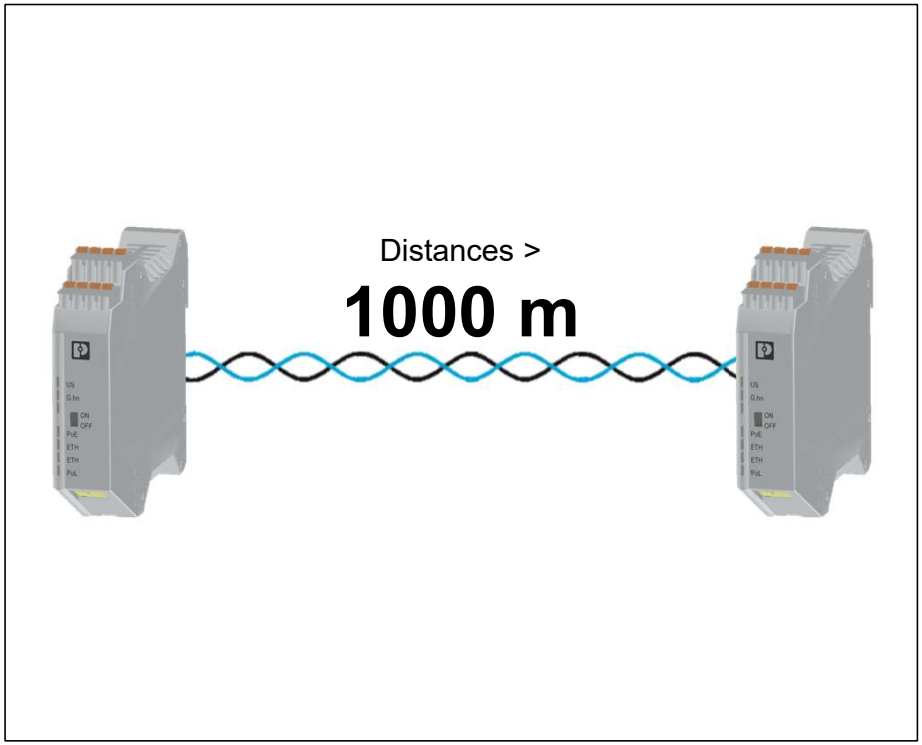
1,5 Gbit/s

PHOENIX CONTACT
INSPIRING INNOVATIONS

Product Features

Gbit Ethernet Extender

- Coax cable and twisted pair
- Highspeed Ethernet up to 1.5 Gbit/s
- Distances up to > 1000 m

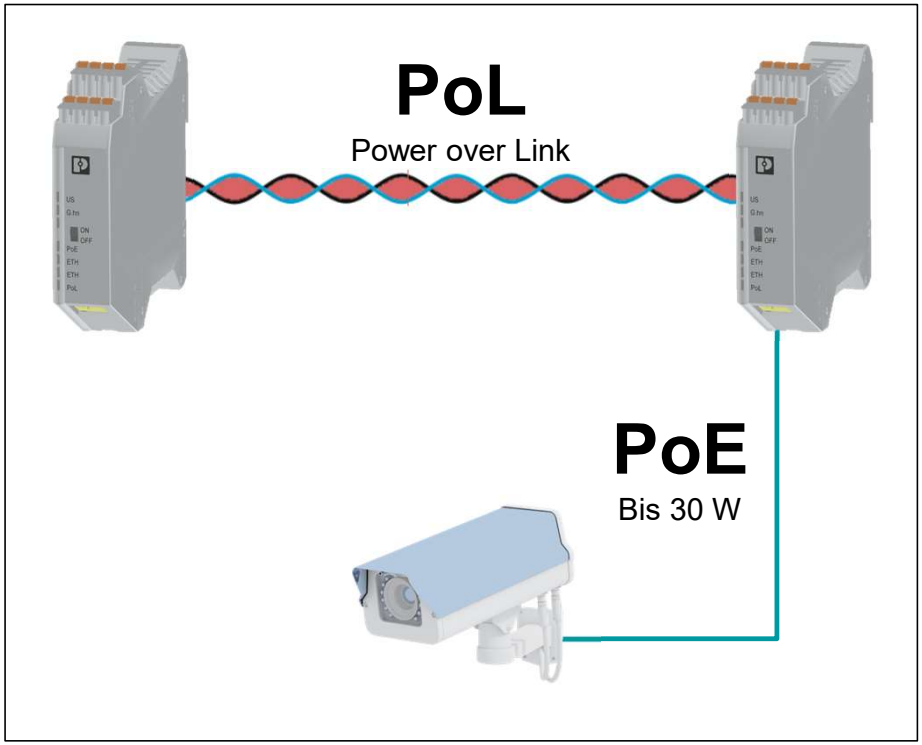


PHOENIX CONTACT
INSPIRING INNOVATIONS

Product Features

Gbit Ethernet Extender

- Coax cable and twisted pair
- Highspeed Ethernet up to 1.5 Gbit/s
- Distances up to > 1000 m
- Power over Link
- Power over Ethernet – 30 W

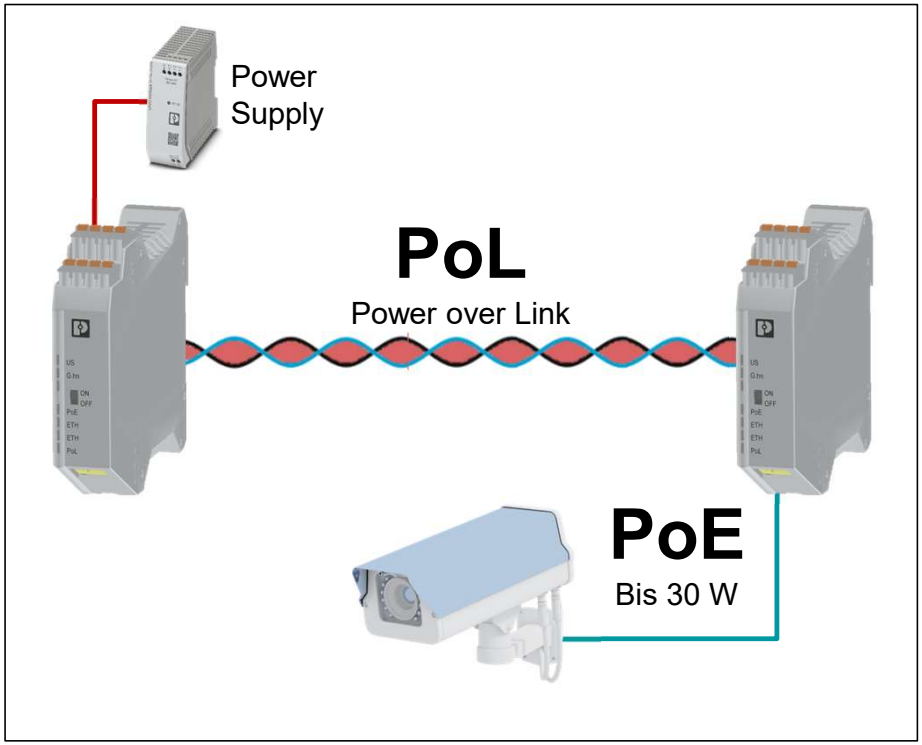


PHOENIX CONTACT
INSPIRING INNOVATIONS

Product Features

Gbit Ethernet Extender

- Coax cable and twisted pair
- Highspeed Ethernet up to 1.5 Gbit/s
- Distances up to > 1000 m
- Power over Link
- Power over Ethernet – 30 W
- Variable supply options

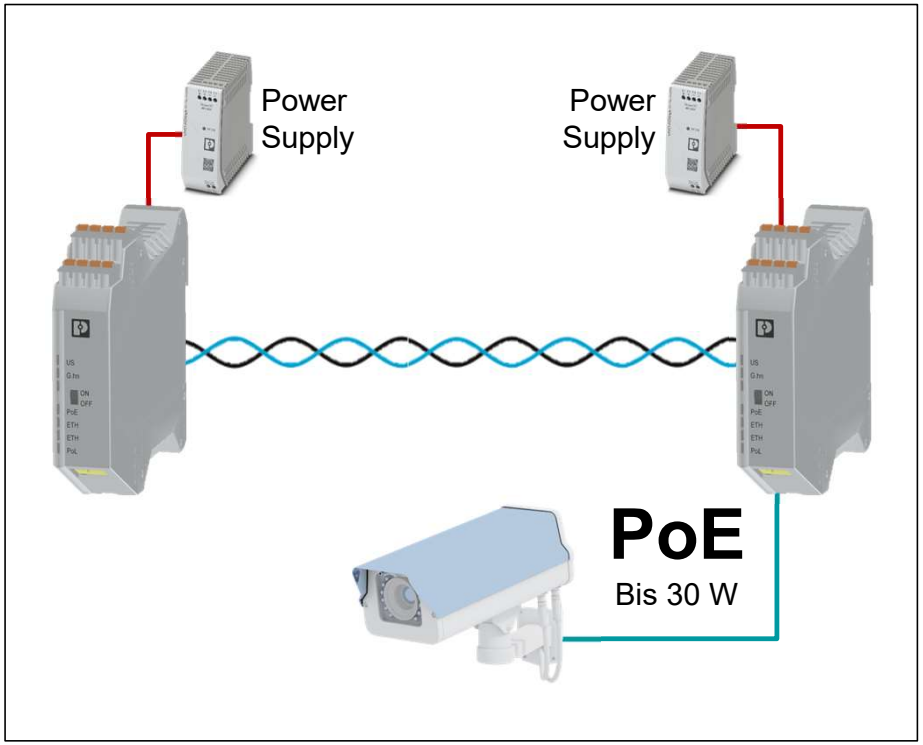


PHOENIX CONTACT
INSPIRING INNOVATIONS

Product Features

Gbit Ethernet Extender

- Coax cable and twisted pair
- Highspeed Ethernet up to 1.5 Gbit/s
- Distances up to > 1000 m
- Power over Link
- Power over Ethernet – 30 W
- Variable supply options

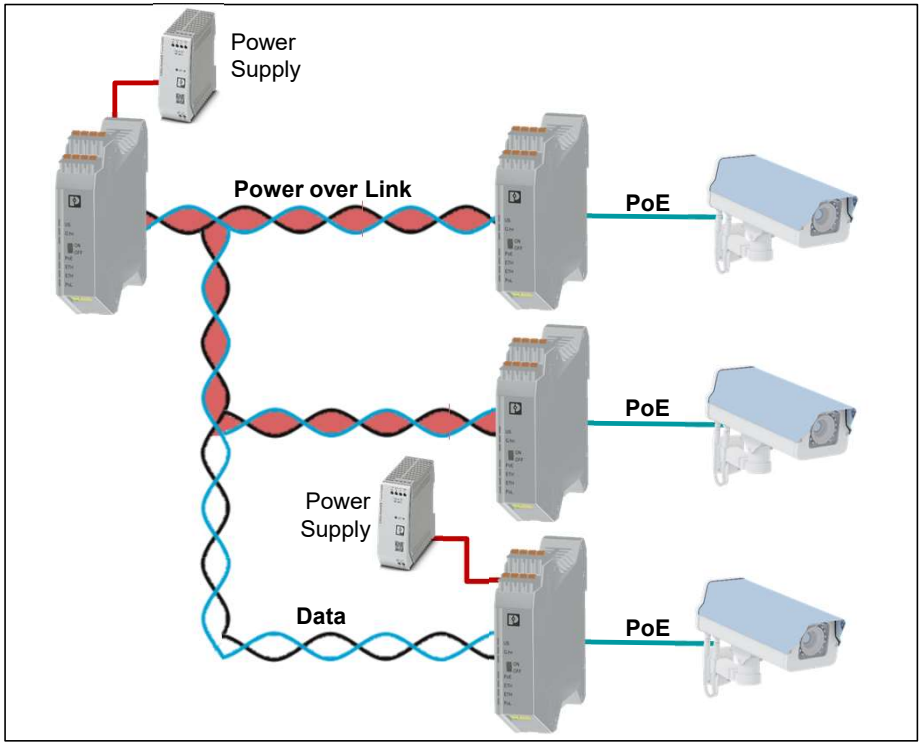


PHOENIX CONTACT
INSPIRING INNOVATIONS

Product Features

Gbit Ethernet Extender

- Coax cable and twisted pair
- Highspeed Ethernet up to 1.5 Gbit/s
- Distances up to > 1000 m
- Power over Link
- Power over Ethernet – 30 W
- Variable supply options
- Variable network setup

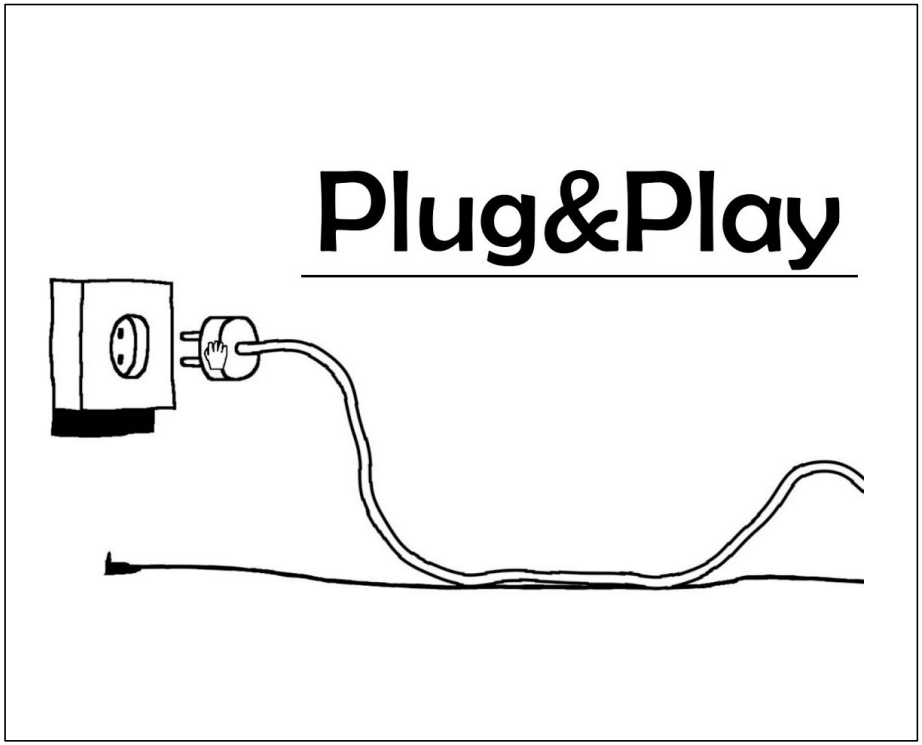


PHOENIX CONTACT
INSPIRING INNOVATIONS

Product Features

Gbit Ethernet Extender

- Coax cable and twisted pair
- Highspeed Ethernet up to 1.5 Gbit/s
- Distances up to > 1000 m
- Power over Link
- Power over Ethernet – 30 W
- Variable supply options
- Variable network setup
- Plug and Play

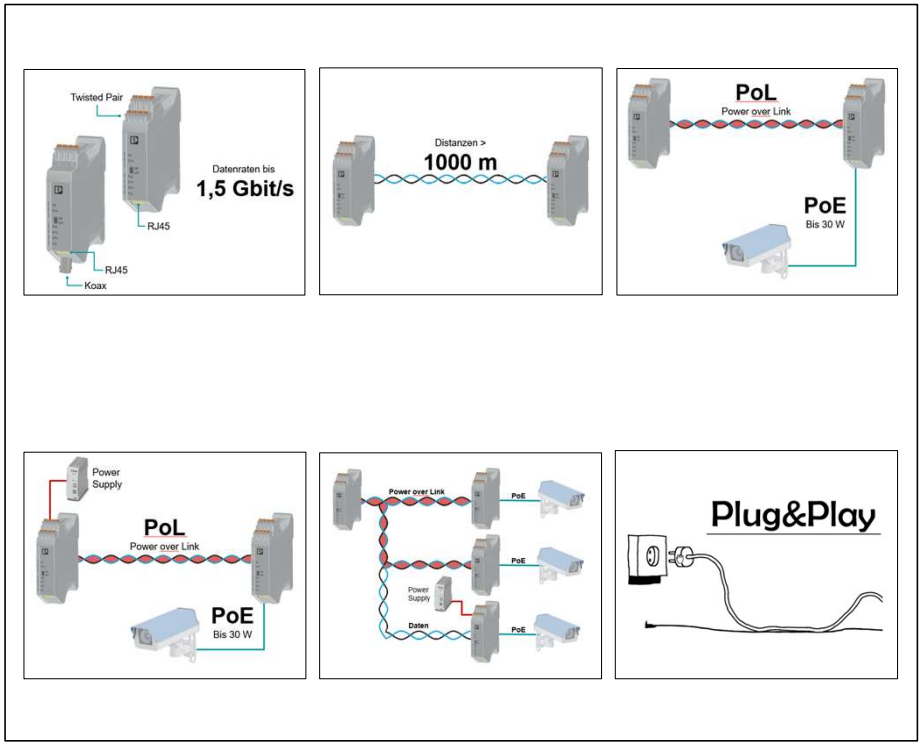


PHOENIX CONTACT
INSPIRING INNOVATIONS

Gbit Ethernet Extender

Product Advantages - Customer Benefits

- Cost savings through...
  - Use of existing cabling
  - Fewer power supplies
  - Fewer converters
- High flexibility in system design
- Easy to use



PHOENIX CONTACT
INSPIRING INNOVATIONS

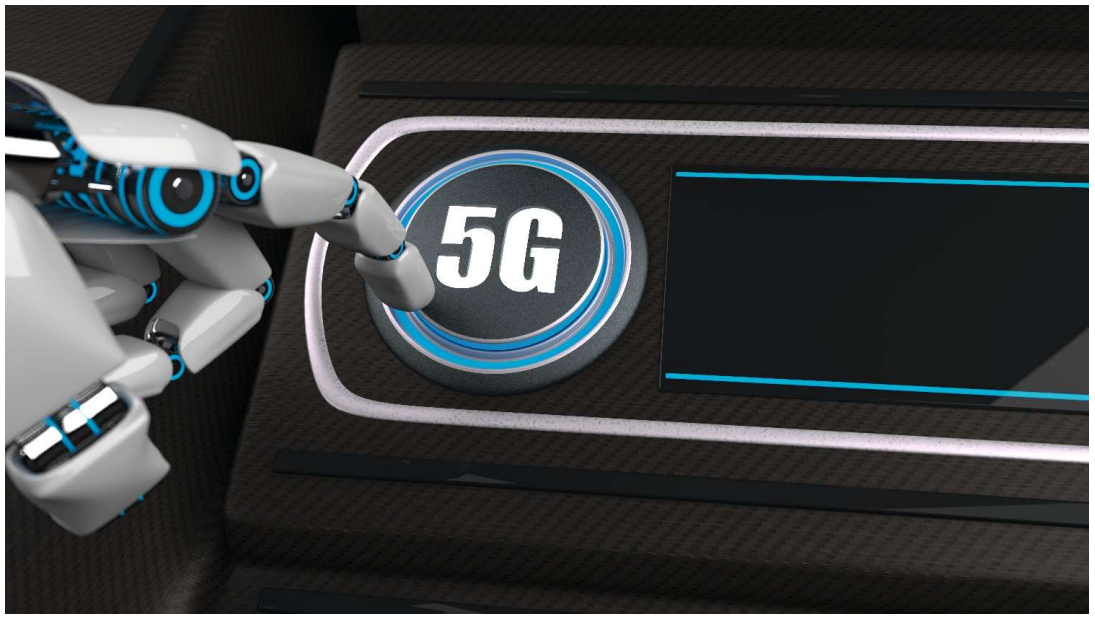
Gbit Ethernet Extender

Product portfolio

new 	new 	new 	new 
Gbit Extender TP	Gbit Extender TP	Gbit Extender Coax	Gbit Extender Coax
Up to 1 km Up to 1,5 Gbit/s 1 x Ethernet	Up to 1 km Up to 1,5 Gbit/s 1 x PoE	Up to 1 km Up to 1,5 Gbit/s 1 x Ethernet	Up to 1 km Up to 1,5 Gbit/s 1 x PoE

PHOENIX CONTACT
INSPIRING INNOVATIONS

TC ROUTER 5G



TC 5G PRIVNET ROUTER

PHOENIX CONTACT
INSPIRING INNOVATIONS

Cooperation

Phoenix Contact 5G



Phoenix Contact, Quectel and Ericsson jointly develop the first industrial 5G router for private networks

INSPIRING INNOVATIONS

Press Release

TC 5G PRIVNET ROUTER



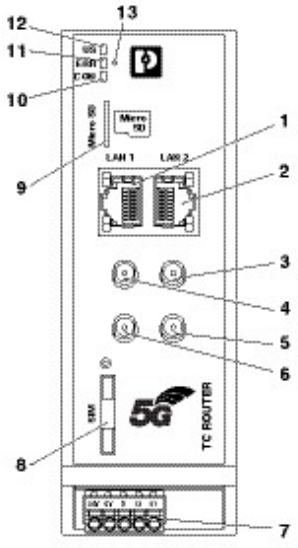
(06/20) Phoenix Contact, Quectel and Ericsson have worked together to develop and deploy the first industrial 5G router for local industrial applications in a private 5G network.

With the help of the newly developed 5G Router, industrial applications, such as machines, controls and other equipment, can now be connected to a private 5G network and thus be orchestrated in their resource usage, priority and behavior. They therefore offer a decisive advantage compared to previous mobile radio solutions, which can only use all - mostly license-free - radio bands with a best effort principle and which have to accept performance losses in equal measure when the radio spectrum is heavily occupied.

PHOENIX CONTACT
INSPIRING INNOVATIONS

TC 5G PRIVNET ROUTER

To achieve this, all three companies brought their strengths together: Phoenix Contact as the first choice supplier of WLAN, Bluetooth and mobile radio routers for industrial applications, Quectel as the leading global supplier of cellular and GNSS modules and Ericsson supporting the product development as a network supplier and a leading force of the 5G technology development. By starting to interact at an early stage, the three companies have been able to rapidly develop a solution that provides industrial-grade performance over private 5G networks. The collaboration between Quectel, Phoenix Contact and Ericsson has seen extensive interoperability testing at the Ericsson lab to ensure the reliable commercial performance of the 5G router. The experience made is highly important for Ericsson following the strategic approach offering 5G solutions jointly with mobile network operators towards the industry. In addition, all three companies cooperated closely to enable Industry 4.0 applications with this 5G standalone private network.

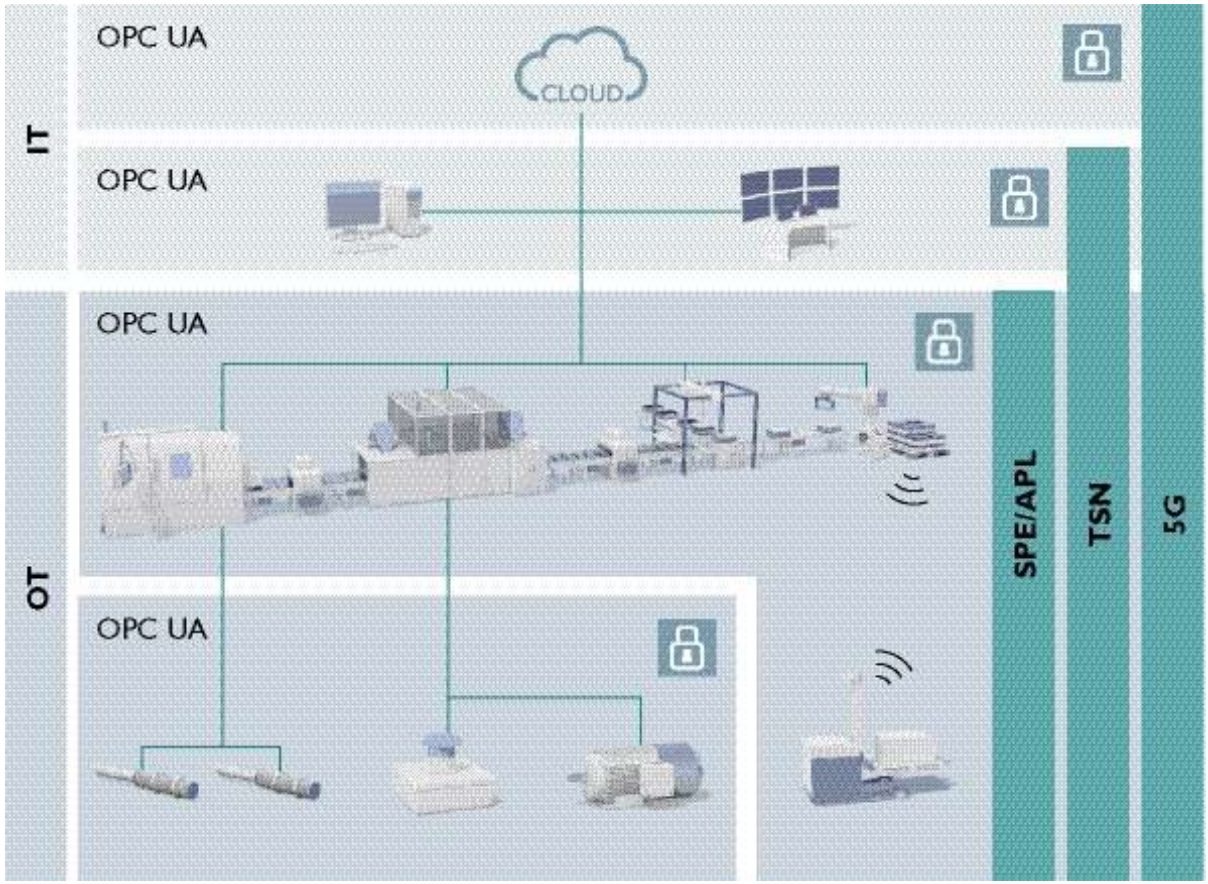




PHOENIX CONTACT
INSPIRING INNOVATIONS

Role of Mobile

5G



PHOENIX CONTACT
INSPIRING INNOVATIONS