



Welcome

Sistemas PoE y videovigilancia

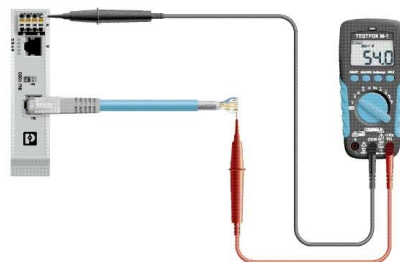
Parte 1

Webinar IMA Mayo 2021

Sistemas PoE y Videovigilancia Parte 1



PoE Power over Ethernet



Fecha	26 Mayo 2021
Hora	16:00
Hora	17:00
Duración	1 hora
Costo	gratuito

Conozca los conceptos y normas vigentes para PoE para comprender los productos más típicos existentes en el mercado.

Durante este Webinar se explicarán los conceptos, normas y definición de los productos PoE que existen, así como un panorama general de los productos Phoenix Contact relacionados con PoE.

PoE – Power over Ethernet

Agenda

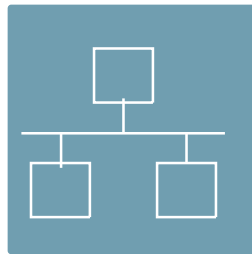
- What does **PoE** mean
- Basics
- Standards and performance classes
- Transmission modes
- Detection and classification
- Product portfolio
- IEEE 802.3 bt - the new standard
- PoE power
- Galvanic isolation
- Surge protection
- Shield current detection
- Connection of the PoE cable



What does PoE mean

PoE - Power over Ethernet

LAN –
local Ethernet network



→ Supply of PoE capable Ethernet devices
with power and data via one cable



Video surveillance



WLAN access points



IP telephony

Infraestructure Surveillance

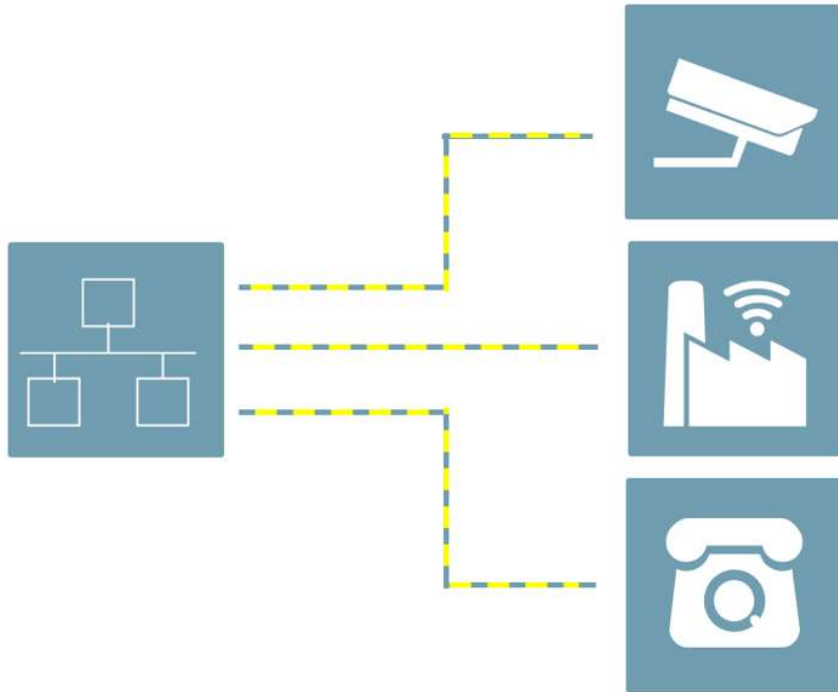
Phoenix Contact



PoE Installation PoE Cameras

What does PoE mean

Advantages



Significant cost savings

- Less cabling
- No separate power supply units for the devices to be supplied
- Easier and faster installation



why Power over Ethernet (PoE) is amazing!! // FREE CCNA // EP 12

PoE – Power over Ethernet

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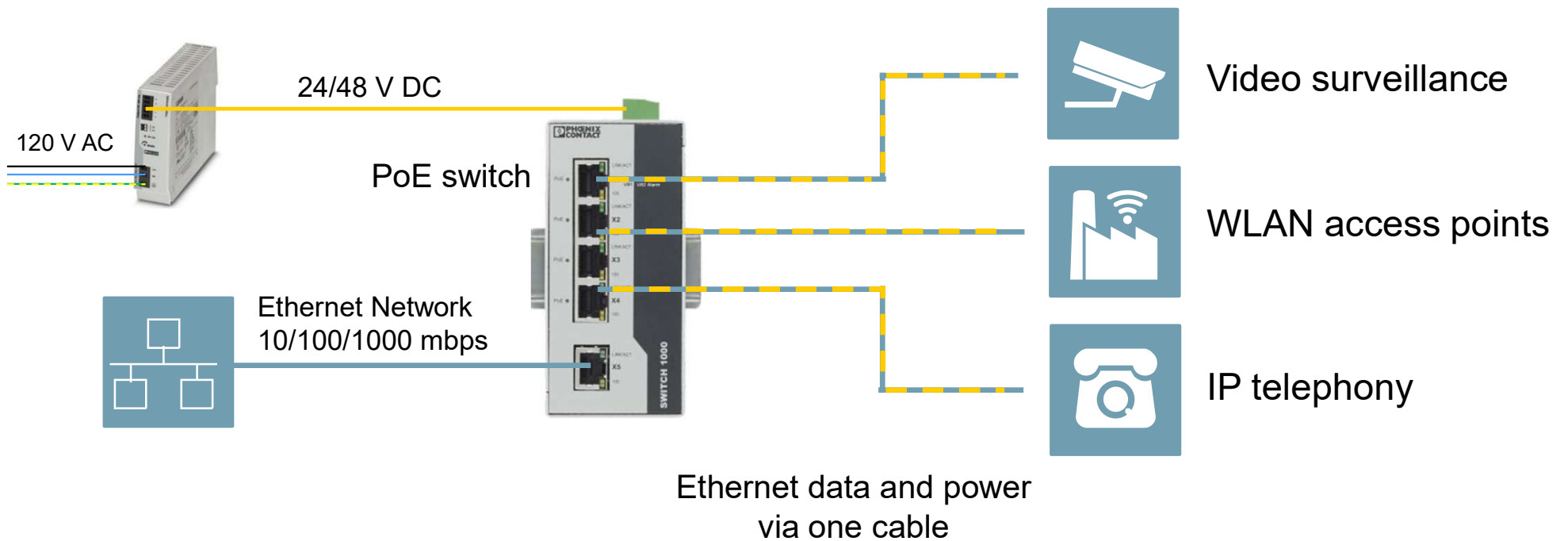
Basics

Terminology



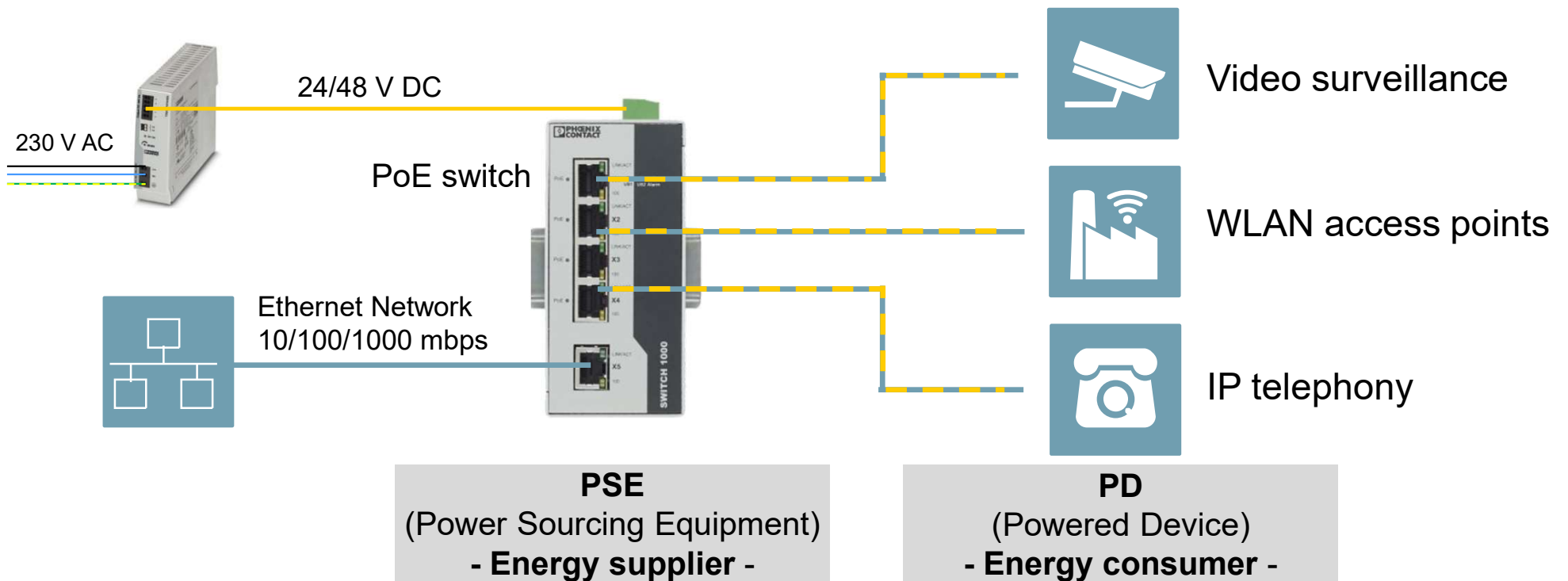
Basics

Terminology



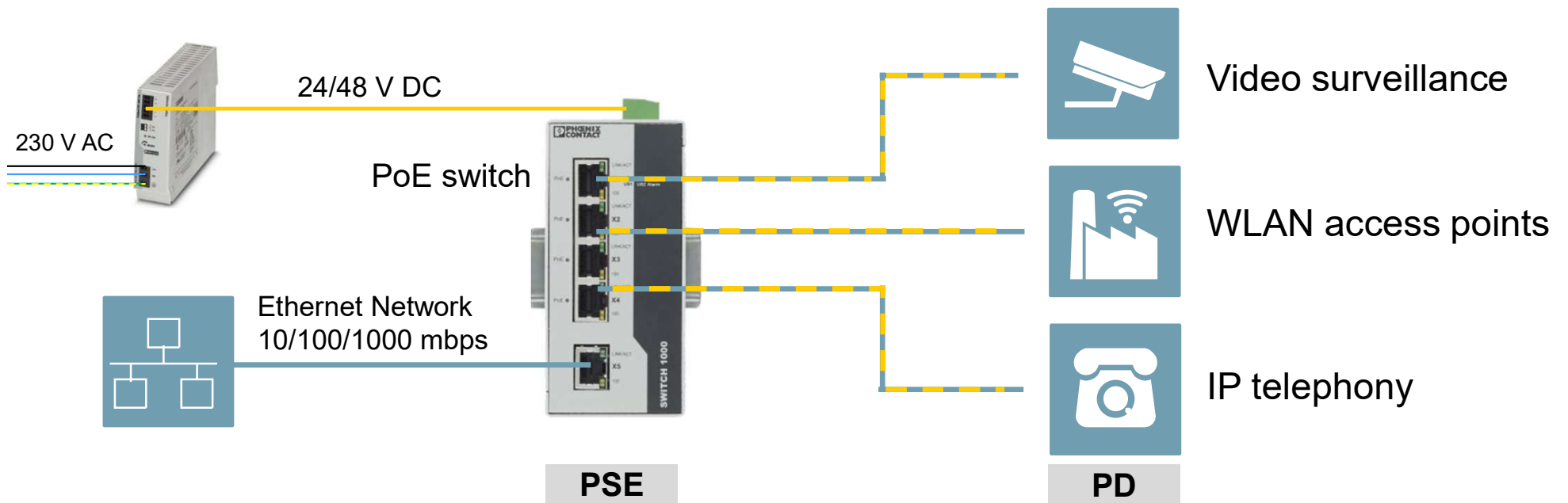
Basics

Terminology



Basics

Terminology

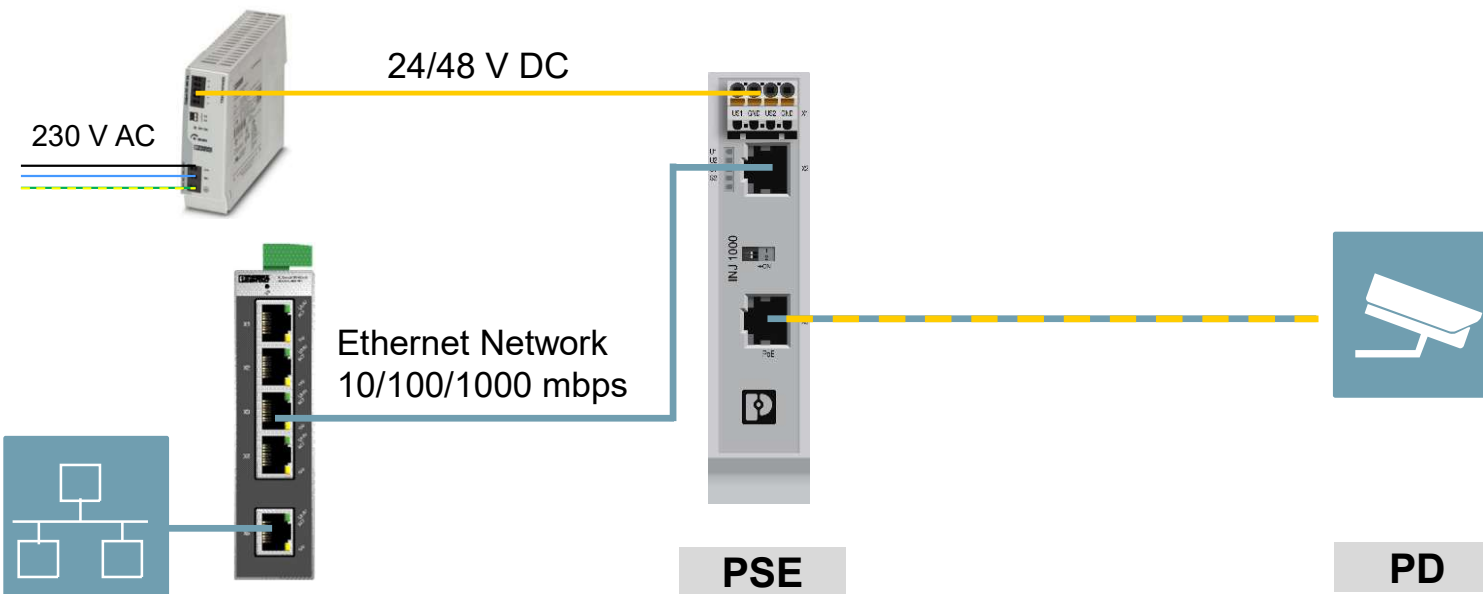


PoE Switch:
"Endspan" device

→ Active power supply

Basics

Terminology



Non PoE-capable
switch

PoE Injector:
"Midspan" device

→ Passive power supply

Standards and performance classes

IEEE Standard for PoE → 3 Standards - Overview

PoE	Standard	max. power from PSE	max. power at PD	Type
PoE	IEEE 802.3 af - 2003	15,4 W	12,95 W	Type 1
PoE+	IEEE 802.3 at - 2009	30 W	25,5 W	Type 2
UPOE (Cisco)	Not standard (cisco used all 4 twisted pairs) - 2011	60 W		Type 3
PoE++ (4PPoE) [four pair PoE]	IEEE 802.3 bt - 2018	90 W	71 W	Type 4

Standards and performance classes

IEEE standard for PoE → Types

	Type	Standard	Maximum current	Powered data pairs	max. power from PSE	max. power at PD
PoE	Type 1	IEEE 802.3 af - 2003	350 mA	2	15,4 W	12,95 W
PoE+	Type 2	IEEE 802.3 at - 2009	600 mA	2	30 W	25,5 W
PoE++ (4PPoE) [four pair PoE]	Type 3	IEEE 802.3 bt - 2018	600 mA	4	60 W	51 W
PoE++ (4PPoE) [four pair PoE]	Type 4	IEEE 802.3 bt - 2018	960 mA	4	90 W	71 W

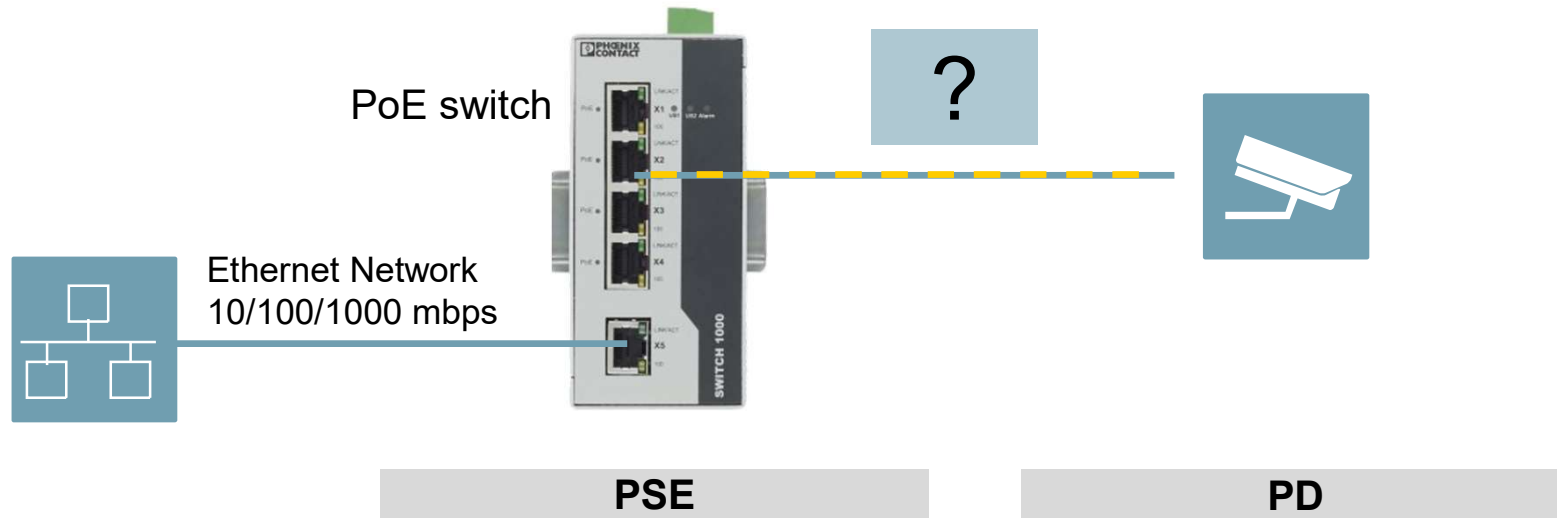
Standards and performance classes

IEEE standard for PoE → Classes

	Type	Standard	Class	Maximum current	Powered data pairs	max. power from PSE	max. power at PD
PoE	Type 1	IEEE 802.3 af - 2003	0 1 2 3	350 mA 350 mA	2 2 2 2	15,4 W 4,0 W 7,0 W 15,4 W	12,95 W 3,84 W 6,49 W 12,95 W
PoE+	Type 2	IEEE 802.3 at - 2009	4	600 mA	2	30 W	25,5 W
PoE++ (4PPoE) [four pair PoE]	Type 3	IEEE 802.3 bt - 2018	5 6	600 mA	4 4	45 W 60 W	40 W 51 W
PoE++ (4PPoE) [four pair PoE]	Type 4	IEEE 802.3 bt - 2018	7 8	960 mA	4 4	75 W 90 W	62 W 71 W

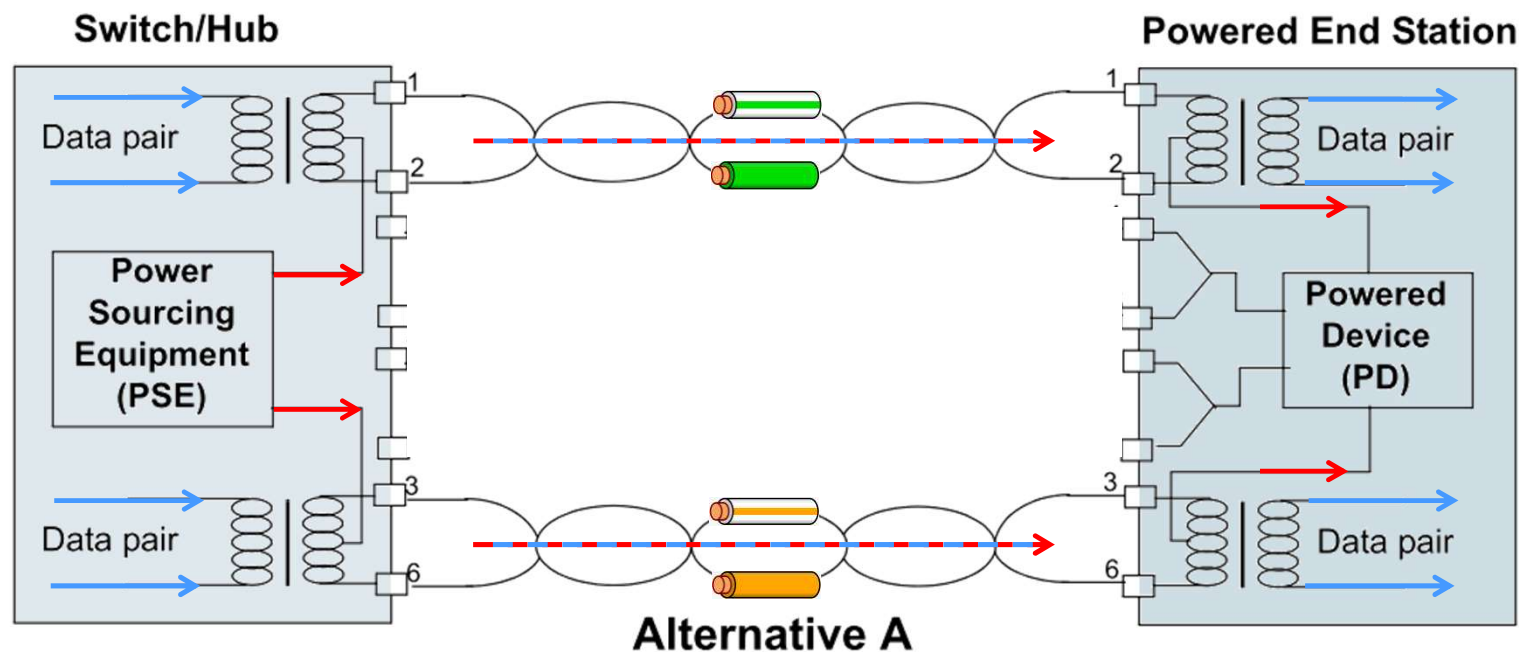
Transmission modes

PoE af / at



Transmission modes

PoE af / at → Mode A - "Phantom Power"



Mode A

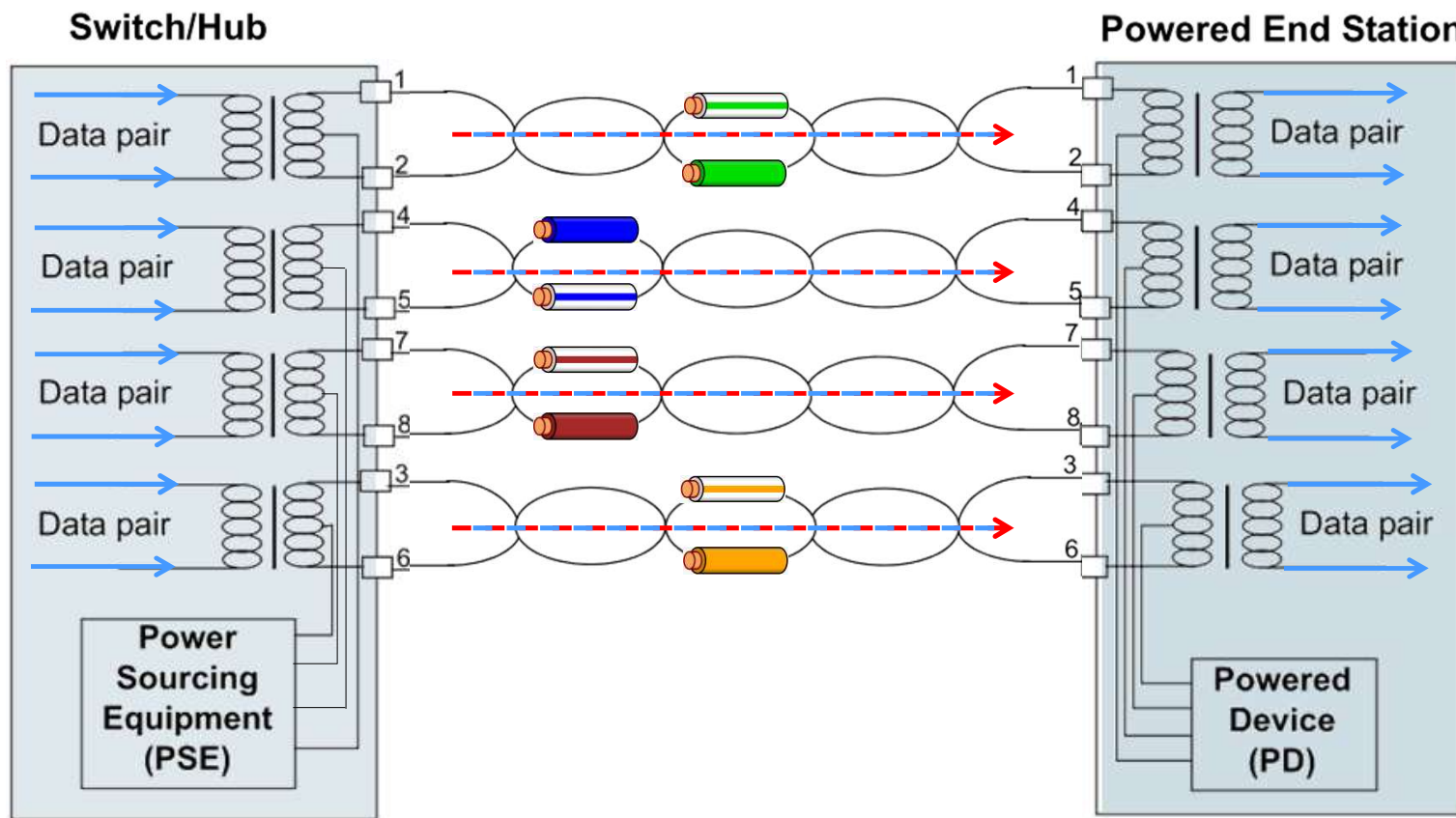
Voltage is modulated via the data lines

- "Phantom power"
- 2-pair mode

10BASE-T/100BASE-TX Endpoint PSE location overview

Transmission modes

PoE bt → 4 data pair mode

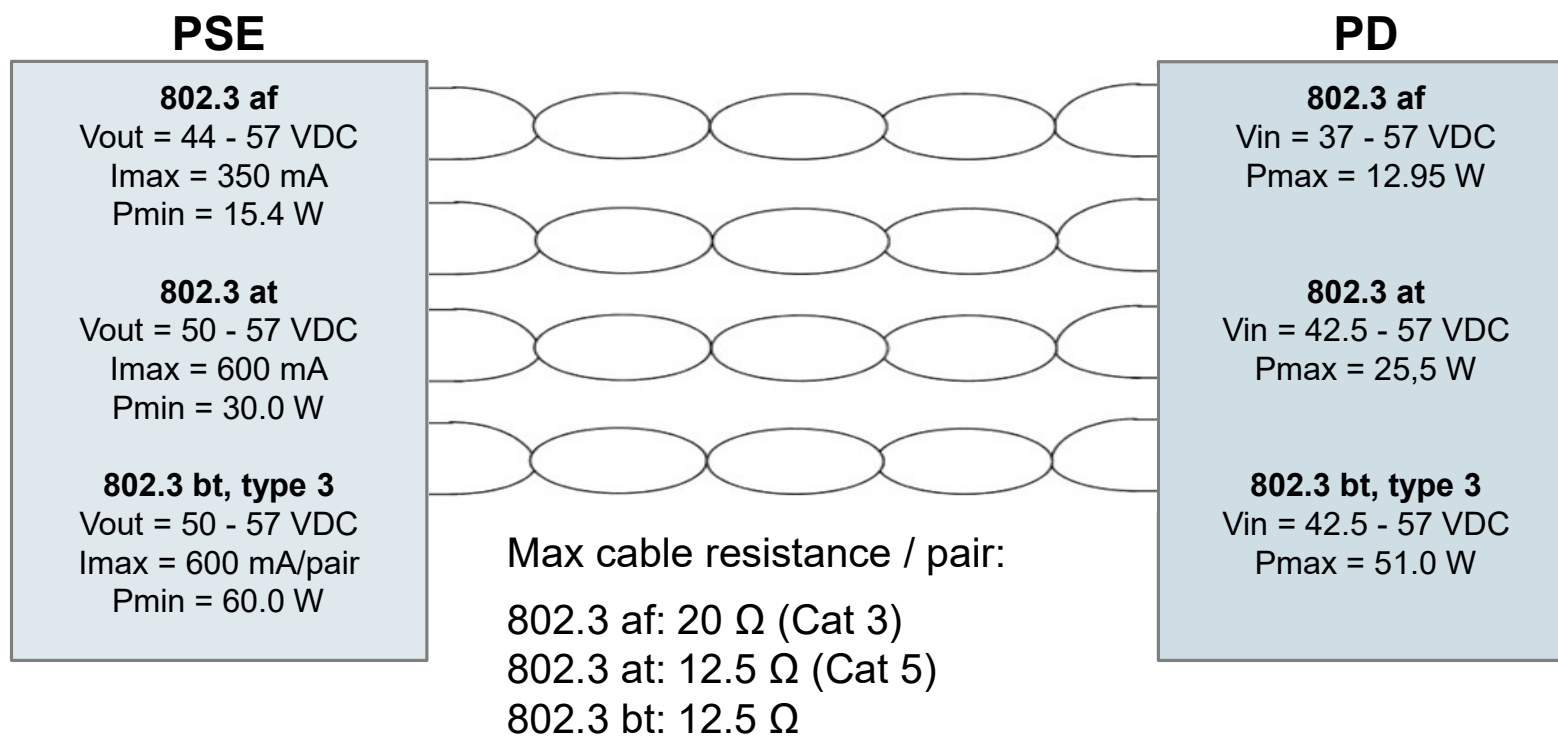


4-pair mode
Power is modulated
on all data pairs

1000/2,5G/5G/10GBASE-T 4-pair Endpoint PSE location overview

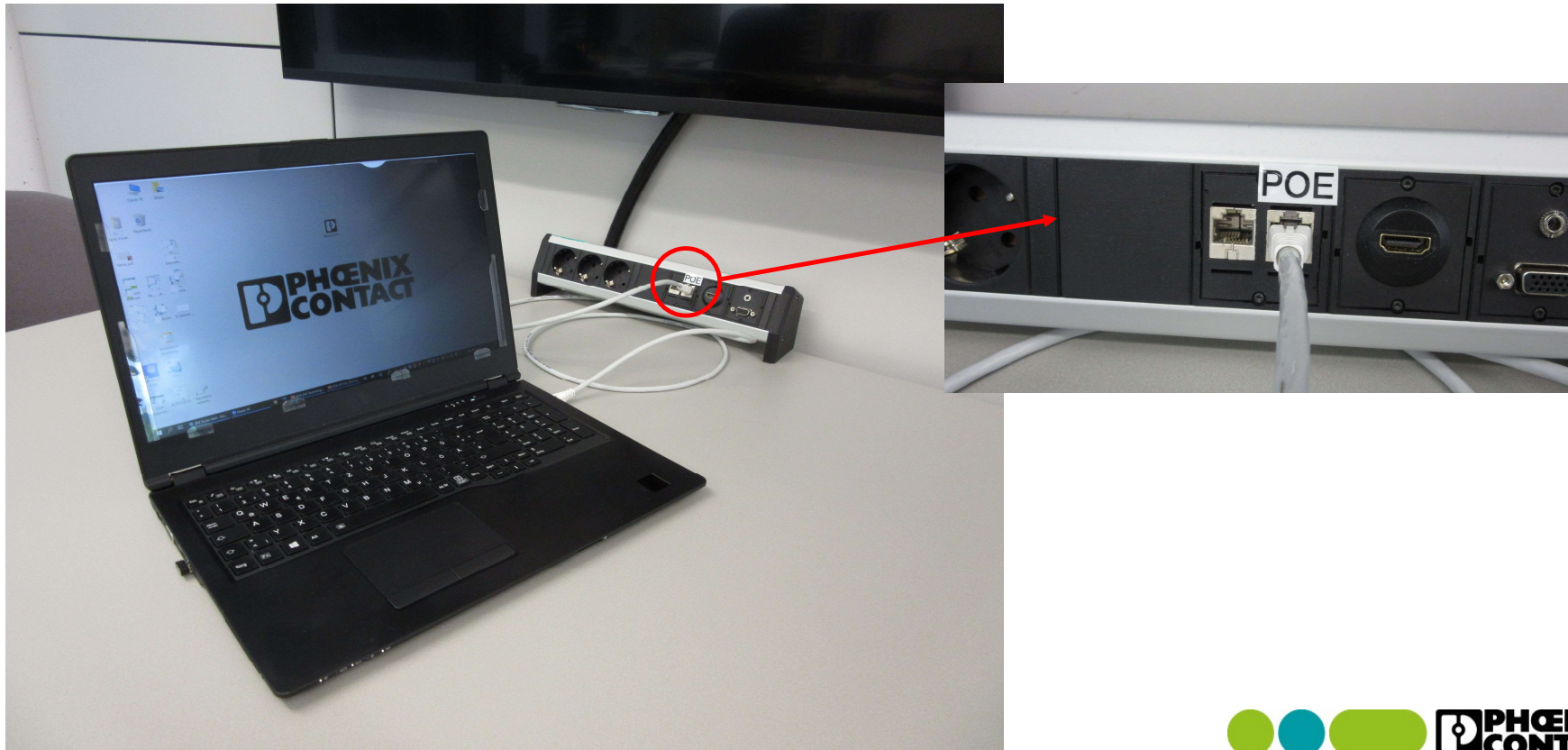
Transmission modes

Parameters



Detection and classification

Non-PoE-capable devices at the PoE connection



Detection and classification

Non-PoE-capable devices at the PoE connection



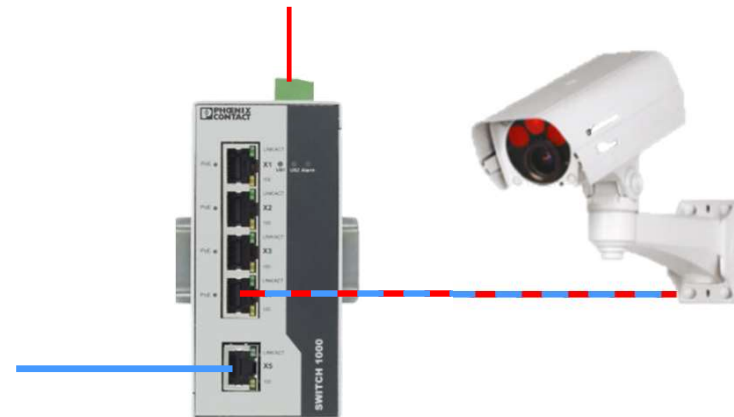
- No danger of overvoltage damage
 - Protective mechanism existing
 - Regular intervals for identification the valid signature of a PD
 - No identification → No voltage
- „Resistive Power Directory (Discovery)“

Detection and classification

PoE detection

→ Resistive power directory

- 1. Detection
PSE – measurement circuit for the internal resistant and capacity of the connected PD
- If the values are in the range,
power will be activated
- 2. Classification
PSE – measurement circuit for the
power class



Detection and classification

PoE Detection and Classification

Stage	Action	Volts specified [V]	
		802.3af	802.3at
Detection	PSE detects if the PD has the correct signature resistance of 19–26.5 k Ω	2.7–10.1	
Classification	PSE detects resistor indicating power range	14.5–20.5	
Mark 1	Signals PSE is 802.3at capable. PD presents a 0.25–4 mA load.	-	7-10
Class 2	PSE outputs classification voltage again to indicate 802.3at capability	-	14,5-20,5
Mark 2	Signals PSE is 802.3at capable. PD presents a 0.25–4 mA load.	-	7-10
Startup	start-up voltage	> 42	> 42
Normal operation	Supply power to device	37-57	42,5-57

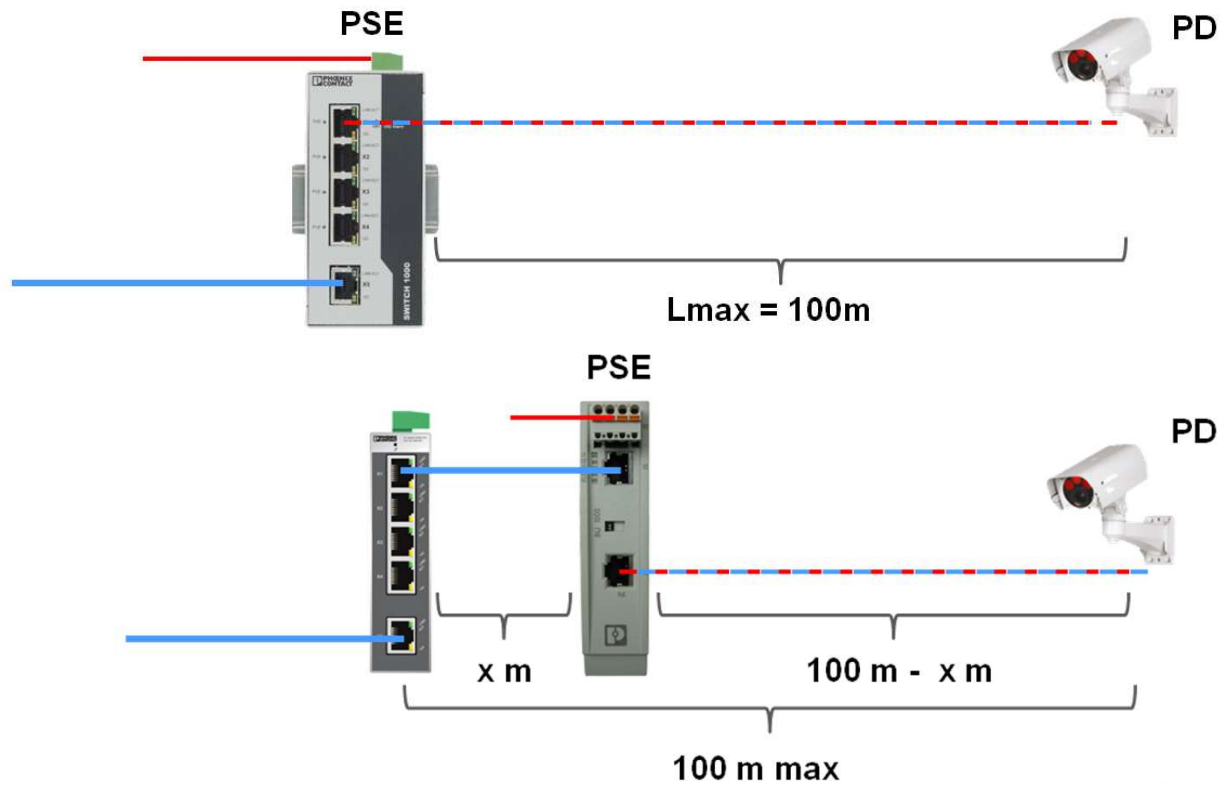
Detection and classification

Physical layer classification

Standard	Class	Type	Classification Current	Max. Power by PSE	Max. Power at PD
IEEE 802.3 af	0	default	0 - 4 mA	15,4 W	0,44 - 12,95 W
IEEE 802.3 af	1	optional	9 - 12 mA	4,0 W	0,44 – 3,84 W
IEEE 802.3 af	2	optional	17 - 20 mA	7,0 W	3,84 – 6,49 W
IEEE 802.3 af	3	optional	26 - 30 mA	15,4 W	6,49 – 12,95 W
IEEE 802.3 at	4	optional	36 - 44 mA	30,0 W	12,95 – 25,50 W

Detection and classification

maximum distance



Product Portfolio

Phoenix Contact PoE Portfolio



Product Portfolio

From the Injector to the Splitter



Injectors



Unmanaged Switches



Managed Switches



Splitter



Smart Camera Box

Product Portfolio

PoE- Injector or switch



Injector

- Plug and play one port
- Hi Power (60W)
- Price advantage by one port
- Patch Panel technology
- Surge protection
- Shield current diagnostics
- galvanic isolation

Unmanaged Switch

- Plug and play several ports
- SFP fiber ports
- Remote monitoring of connected PDs

Managed Switch

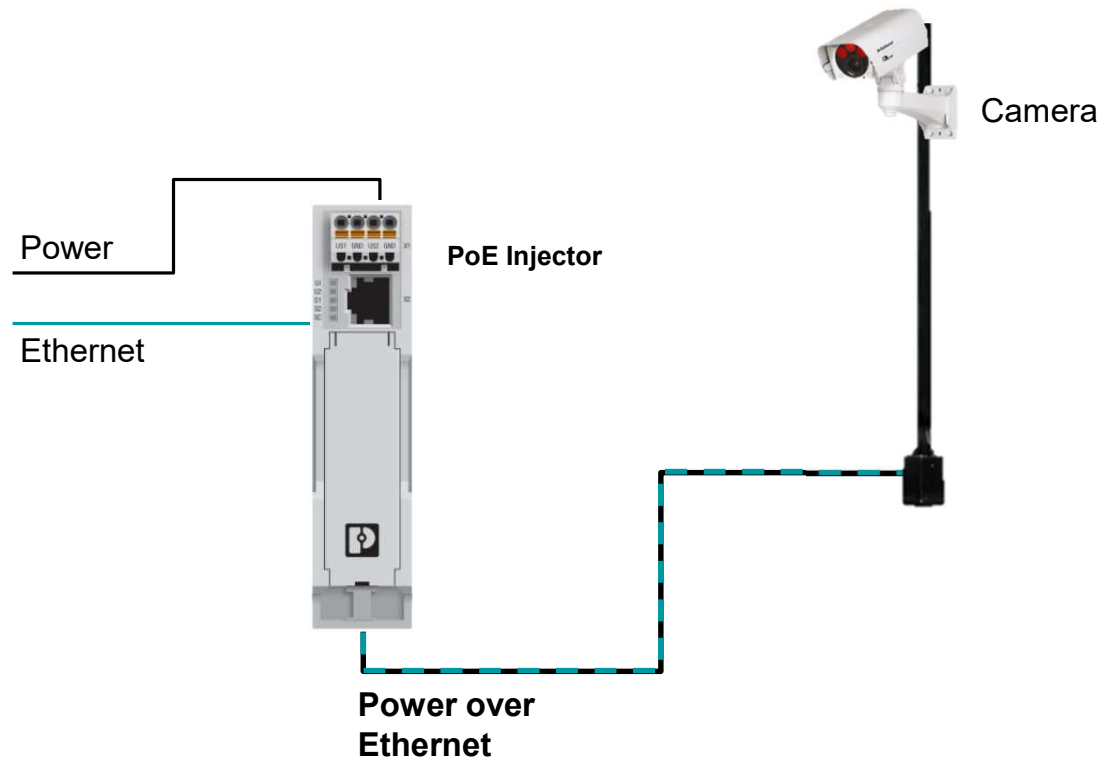
- Managed features like redundancy, monitoring, configuration, security
- SFP fiber ports
- Hi Power (60W)
- Prioritize PDs
- Remote control of PDs
- PoE Watchdog
- Force power to non-compliant PDs

Product Portfolio

PoE Injectors

Injector

- Plug and play one port
- Hi Power (60W)
- Price advantage by one port
- Patch Panel technology
- Surge protection
- Shield current diagnostics
- galvanic isolation



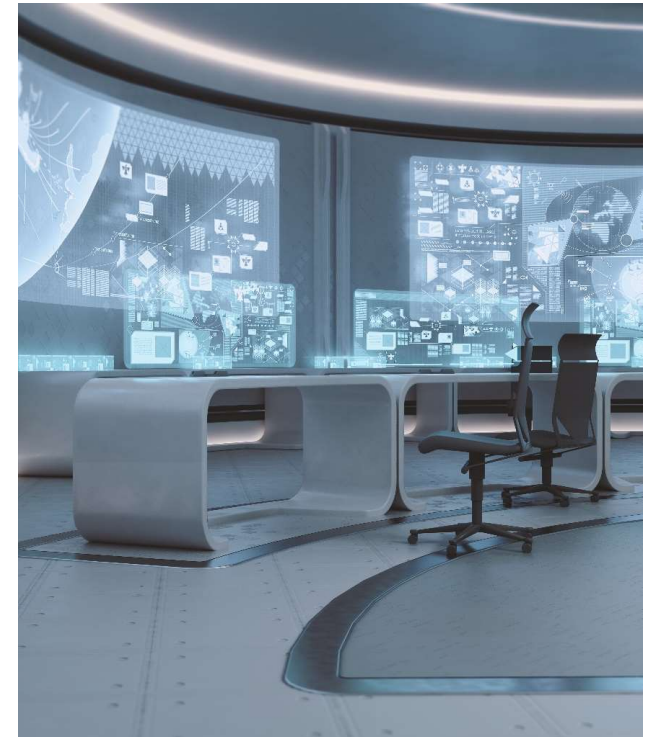


Best Home Security Cameras 2021 - Outdoor, Indoor, Battery & Wired, WIFI & PoE Cameras

Surveillance Infraestructure

Overview

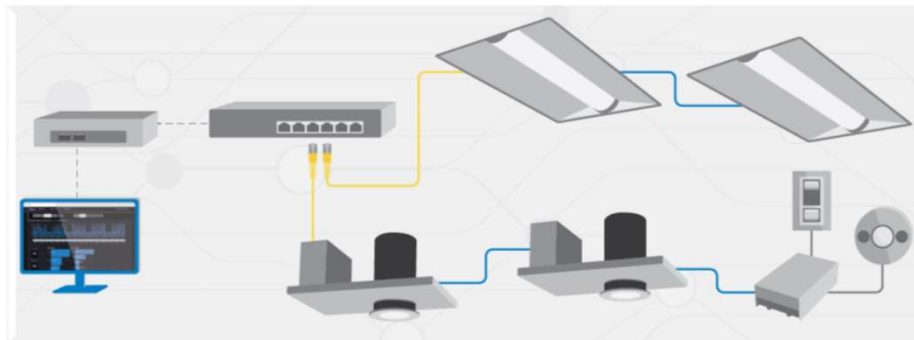
- Security
- Access
- Recording
- Process
- Paths
- Warning
- Alarm
- Control
- Actions
- Light
- Dark
- Temperature
- PoE
- Fiber optic
- Cameras
- Wireless
- Control Room
- Doors
- Bars
- Tunnels
- Traffic Light
- Urban Monitoring
- Police
- Fire Department



IEEE 802.3 bt - the new standard

IEEE Standard → PoE bt

- PTZ cameras, PanTilt Zoom with infrared lighting and heating
- Monitors
- PCs / HMI
- Kiosks
- POS terminals
- thin clients
- LED lighting
- TIMESERVER



Aplicación PoE

Puerto PoE

Splitter



Equipo PoE
(Access Point)

Surveillance Infrastructure

Phoenix Contact



Video Surveillance

Webinar IMA 2020

Mayor información



Phoenix Contact, S.A. de C.V.
Lago Alberto 319 Piso 9,
Locales 902 y 903-A,
Col. Granada Del. Miguel Hidalgo,
Ciudad de México. 11520
Tel.: +52 55 1101 1380 Ext. 393
Cel.: +52 55 3233 6518
agordillo@phoenixcontact.com.mx
www.phoenixcontact.com.mx

Ing. Antonio Gordillo
Infrastructure and Systems Automation
Product Marketing Manager

www.phoenixcontact.com.mx

ventas@phoenixcontact.com.mx

55 1101 1380

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