Transition Networks Enterprise and Industrial Security Applications presentation

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Transition Networks Overview

- Founded 1987 – 53 quarters of dividends paid
- Headquartered in Minnetonka, MN
- Public company (NASDAQ: JCS)
- Global Support and Operations
- US Manufacturing and Quality Control
- Pre-Sales and Network Design Support
- Demonstrations of Equipment – Try before you Buy!
- Lifetime Equipment Warranties – Includes Tech Support
- “Total Solution Offerings” – Hardware and Software
- 100% Channel Sales

Transition Network's Products

Key Product Families

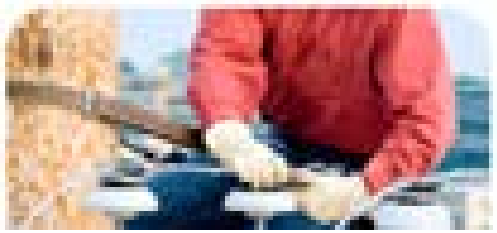
- Media Converters-Enterprise and Industrial
- Layer 2 Switches – Enterprise and Industrial
- PoE/PoE+/PoE++ Switches/Media Converters
- FTTD NIC
- CWDM
- MSA, Cisco-compatible SFPs/OTDR SFPs
- Business Ethernet NIDs

Transition Network's Vertical Markets

- Hazardous Locations
- Oil & Gas
- Petro Chemical
- Water/Waste Water
- Agriculture
- Mining

- Transportation
- Airports
- Traffic Controls
- Track and Rail
- Security

- Schools
- Colleges
- Higher Education
- Administration



- Business Ethernet
- Mobile Backhaul
- Data Center Conversion

- Solar
- Substation
- Power
- Wind
- Hydro
- Smart Grid

- Automotive
- Machine Builders
- Food &Bev
- Packaging
- OEM's

- Retail
- Banking
- Brokerage Firms
- Credit Bureaus

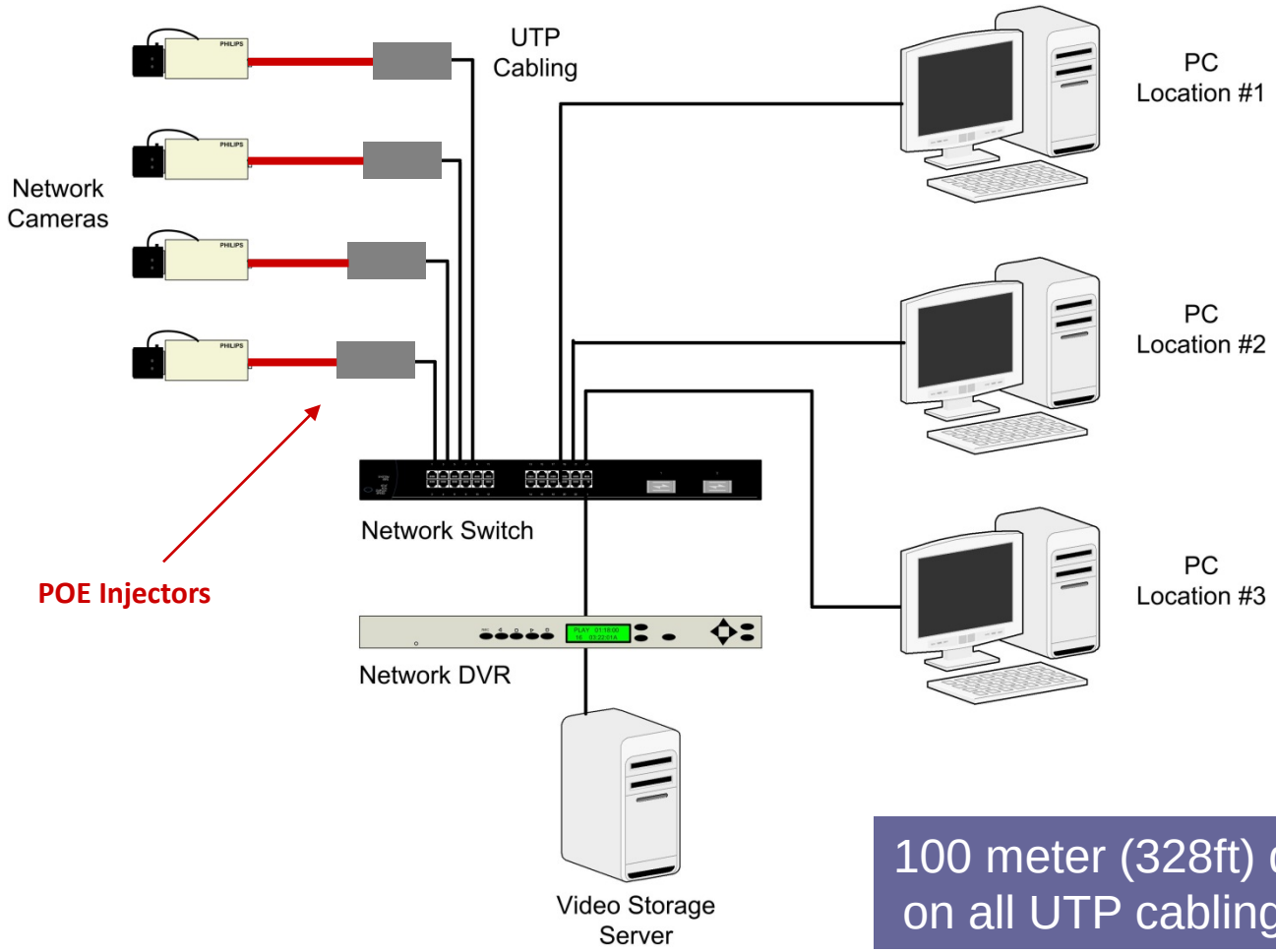
- Federal Govt.
- State Agencies
- Local Cities
- Municipalities

Axis Silver Partner - Transition Networks

http://www.axis.com/us/en/partners/technology-partner-program/north-and-central-america

Managed and Industrial PoE/POE+/POE++ Products

Typical IP Video System w/POE injectors



100 meter (328ft) distance limitation on all UTP cabling runs still applies

POE Injectors

MIL-L100i

- 10/BaseT,100BaseX
- Copper to Copper
- 0 to 40°C
- PoE device over a copper network
- Lifetime Warranty

L1000i-at

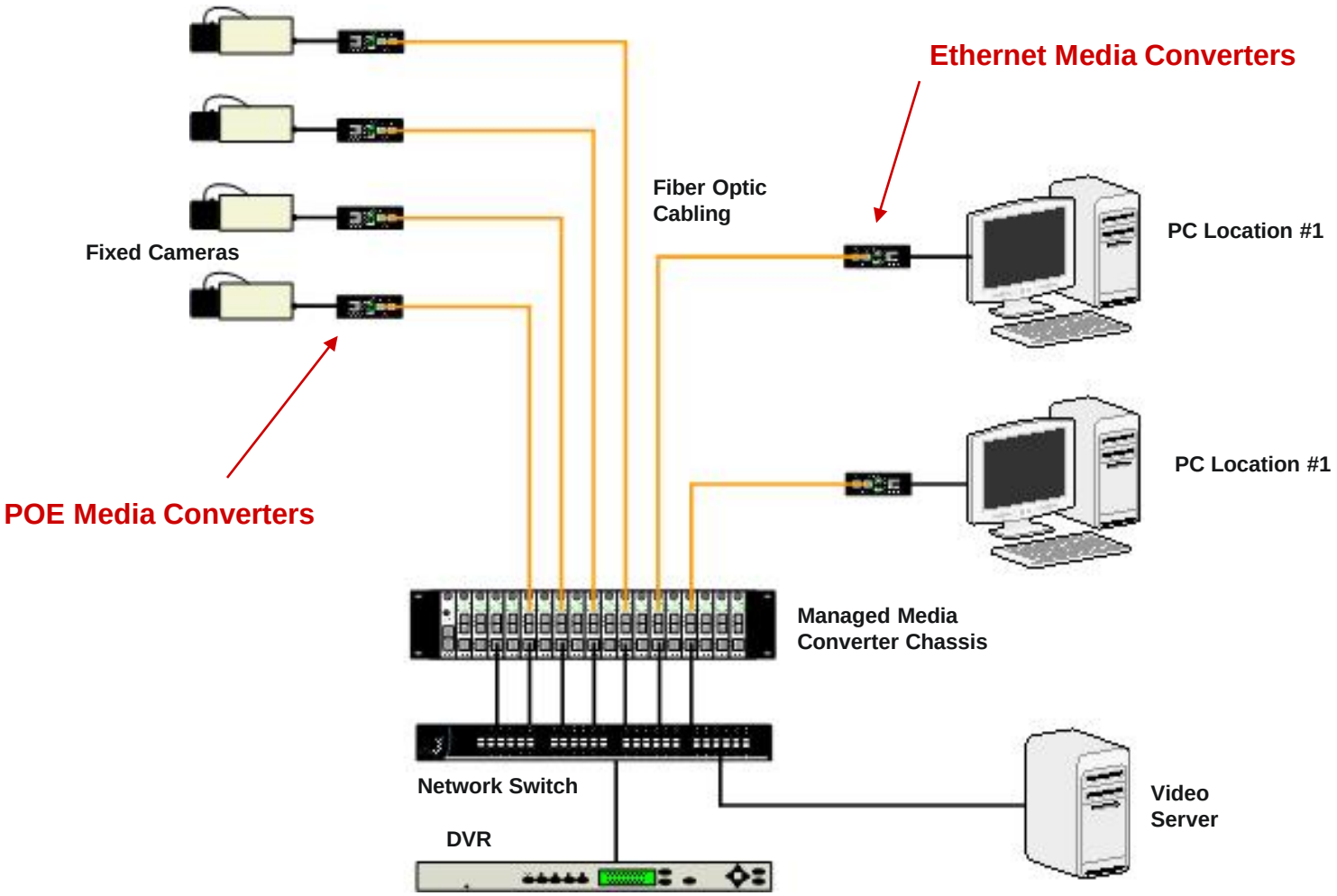
- 10/100/1000BaseT
- Copper to Copper
- 0 to 40°C
- PoE+ device over a copper network
- Lifetime Warranty

Hardened

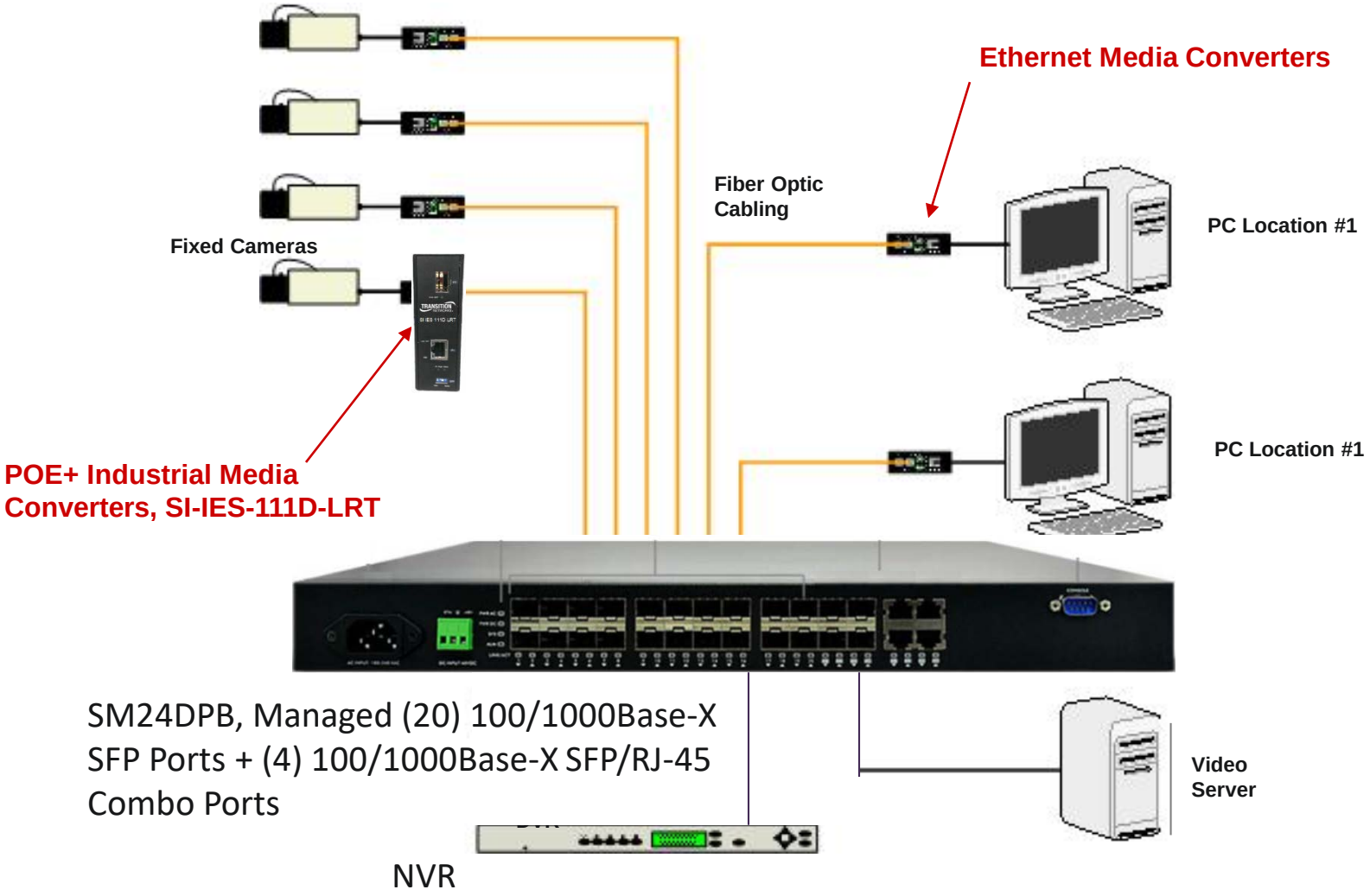
SI-IES-1200-LRT

- 10/100/1000BaseT
- Copper to Copper
- -40 to 75°C
- PoE+ device over a copper network
- Couple w/25079
- Lifetime Warranty

Using Media Conversion in IP Video Networks



Using Media Conversion in IP Video Networks



POE Media Converters

PoE/PoE+ Media Converter Family

SPOEB1014-100

- 10/100BaseTX
- 100Base FX
- 0 to 40°C
- PoE device over a copper network
- Lifetime Warranty

SGPOE1040-110

- 10/100/1000BaseTX
- 1000Base FX
- 0 to 40°C
- PoE device over a copper network
- Lifetime Warranty

SGPAT10xx-105

- 10/100/1000BaseTX
- 1000Base FX
- 0 to 45°C
- PoE+ device over a copper network
- SGMII SFP, 100/1000 SFP, Active Link Pass Through, Jumbo frame support, Redundant fiber mode, 2-media converter mode
- Lifetime Warranty

Hardened PoE+ Media Converter Family

SI-IES-111D-LRT

- 10/100/1000BaseT
- 100/1000 SFP
- -40 to 75°C
- PoE+ device over a fiber network
- Couple w/25105

SI-IES-121D-LRT

- (2) 10/100/1000BaseT
- 100/1000 SFP
- -40 to 75°C
- 2 PoE+ devices over a fiber network
- Couple w/25105

Security Surveillance with Advanced POE

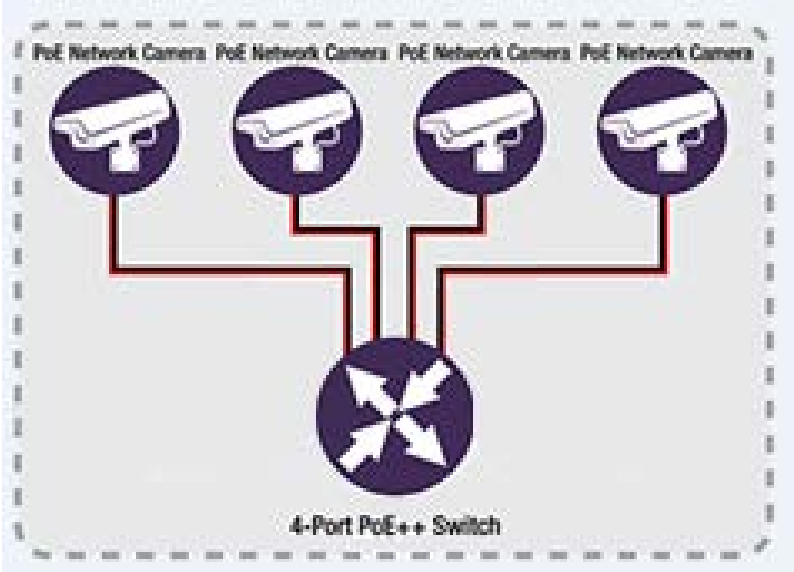
Four PoE types – Type 1, Type 2, Type 3 and Type 4

Type 1 - PoE, 2-pair PoE, IEEE 802.3af

PoE Type 1 utilizes two pairs to connect many types of lower-powered devices. It provides up to 15.4W of DC power to each PoE port (up to 12.95W of power for each device). PoE Type 1 can support devices such as VoIP phones, sensors/meters, wireless access points with two antennas and simple, static surveillance cameras that don't pan, tilt or zoom.

Type 2 - PoE+, 2-pair PoE Plus, IEEE 802.3at

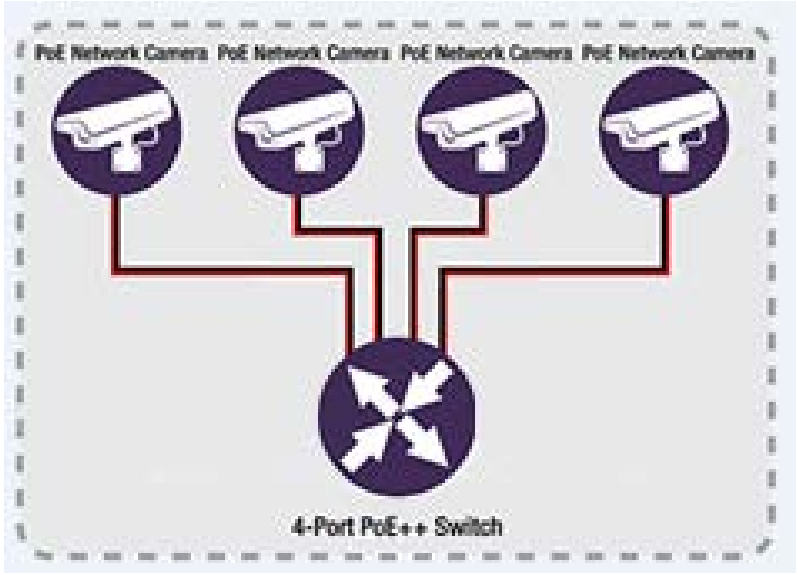
Higher-powered devices are connected to the network, it is backward compatible to Type 1. It provides up to 30W of DC power to each PoE port (up to 25.5W of power for each device). PoE Type 2 can support devices such as more complex surveillance cameras that pan, tilt or zoom, as well as wireless access points with six antennas, LCD displays, biometric sensors and tablets.



Security Surveillance with Advanced POE

Type 3 - PoE++ IEEE 802.3bt, *Max:* 60W

PoE Type 3 uses all four pairs in a copper cable. It provides up to 60W of DC power to each PoE port (up to 51W of power for each device). PoE Type 3 can support devices such as more complex surveillance cameras that pan, tilt or zoom, video conferencing system components and building management devices. It is still waiting to be ratified.



Type 4 - Higher-power PoE IEEE 802.3bt, *Max:* 90W

Growing power requirements of network devices are pushing the need for higher power delivered through network cabling – which is where PoE Type 4 comes into play. It provides up to 90W of DC power to each PoE port (up to 71W of power for each device). PoE Type 4 can support devices such as laptops and TVs. The standard is currently under development, and scheduled to be ratified in 2017

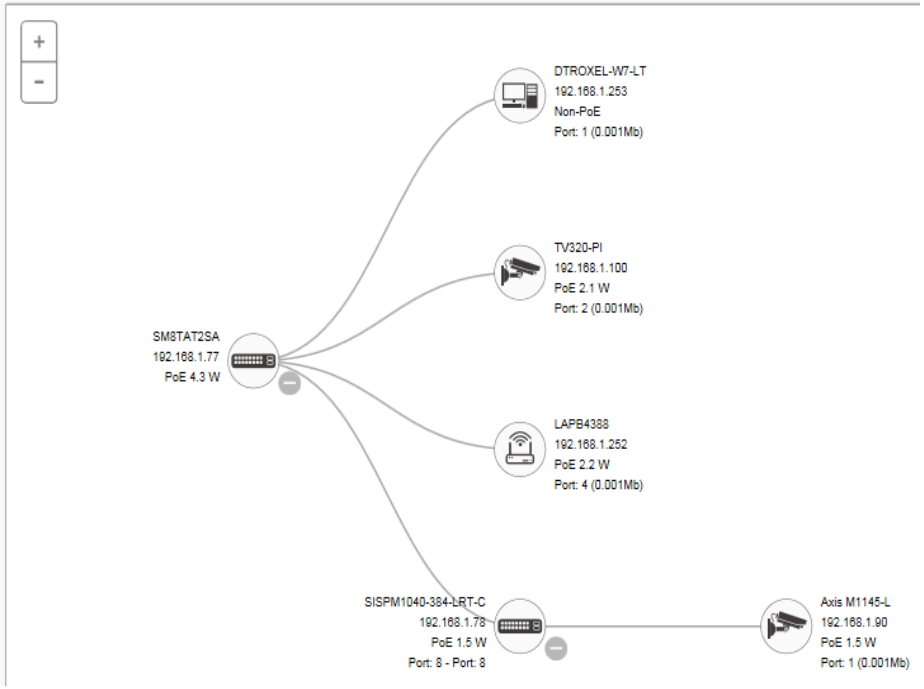
Power++ Platform: Features and Benefits

- 4 Port PoE++ Switch with Optional Wireless Ethernet Extender
- PoE++ (≈240W+) total output; ≤60W power per port configurable through software
- 4 Copper (10/100/1000Base-T RJ-45) + 1 combo 10/100/1000Base-T RJ-45/Fiber (SFP) port + 1 optional Wireless Ethernet Extender (802.11b/g/h 2.5GHz wireless point-to-point connection for data transfer < 1.5 km away)
- Optional 12V Aux port (up to 80W of unused power)
- Wall and pole mountable IP67 enclosure

Security Surveillance with Advanced POE

- Next generation Smart Managed switches are in the requirement specifications to support these types of Surveillance Systems. The Embedded Device Management Software (DMS) provides the benefits of ease of use for Security Surveillance Systems
- The DMS capability provides time-saving features enabling security integration for network administrators to establish and document a baseline deployment and automatically discover and remotely configure attached IP-powered devices (PDs). With topology views of the attached devices, management to the endpoint is easily achieved making configuration, management and diagnostics as simple as a point-n-click operation.

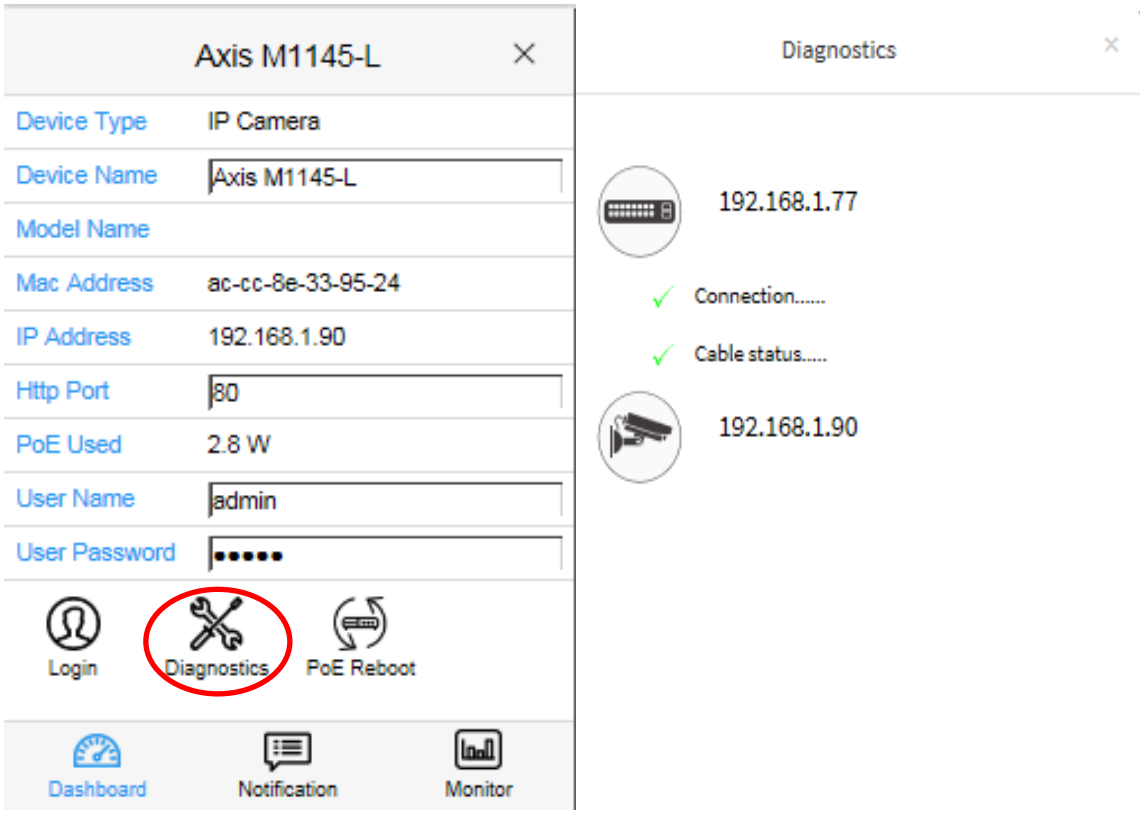
Topology View



Security Surveillance with Advanced POE

- Single-Button diagnostics provides ease of use for checking each device's physical cable connections and its IP connectivity.
- Physical cable diagnostics check each of the 4 pairs in the RJ-45 Ethernet connector and determines if cabling pins are connected correctly and that there are no open or shorted conditions.
- IP Connectivity diagnostics provides a verification process that the device is still working and accessible for network management of the device

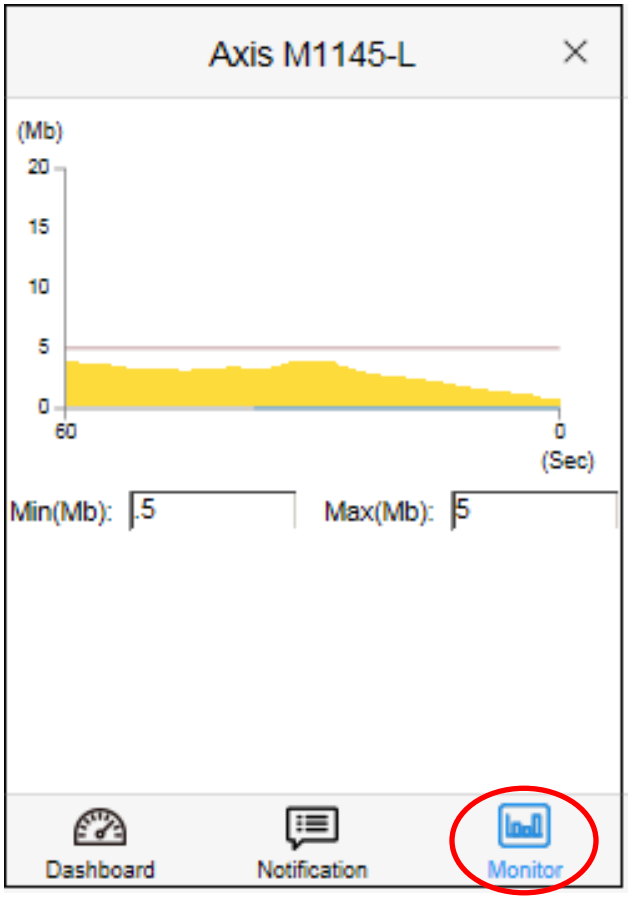
Diagnostics



Security Surveillance with Advanced POE

- Single-Button monitoring capability provides ease of use for checking traffic flows and provides analysis of the data from each of the video surveillance devices.
- These Monitoring capabilities include:
  - Traffic Packet Counters of attached IP Devices
  - Traffic Monitor by Day/Week/Port/Device
  - Health Checks with configurable Thresholds
  - Auto Alarm if Abnormal Condition exists
- https://www.transition.com/resources/smart-managed-poe-switches-device-management-system-video/
-

Monitoring



PoE Network Switches

SM8TAT2DPA

- Managed, Lifetime Warranty
- (8) 10/100/1000BASE-T +
  (2) 100/1000BASE-X SFP/RJ-45 ports
- POE+ 4 ports, POE 8 ports
- 0 to 40°C

SM24TAT4XA

- Managed, Lifetime Warranty
- (24) 10/100/1000BASE-T +
  (4) 1G/10G SFP slots
- POE+ 12 ports, POE 24 ports
- 0 to 40°C

SM16TAT2DPA

- Managed, Lifetime Warranty
- (16) 10/100/1000BASE-T +
  (2) 100/1000 SFP/RJ-45 ports
- POE+ 12 ports, POE 16 ports
- 0 to 40°C

DMS Hardened Switches

- Hardened Managed PoE+ Switch
  - SISPM1040-384-LRT-C

    (8) 10/100/1000Base-T PoE+ with (4) 100/1000 SFP
  - SISPM1040-362-LRT-C

    (4) 10/100/1000Base-T PoE+ (2) GE with (2) 100/1000 SFP
- Physical Specification
  - IP30 Metal Enclosure
  - Slim form factor
  - All front-facing design
  - Din Rail and Wall Mounting
  - 48V-57V DC Dual Power Inputs
  - Digital in and Digital out

DMS Hardened Switches

- Full PoE+ power capacity on all ports
  - SISPM1040-384-LRT-C: 240W
  - SISPM1040-362-LRT: 120W
- Environment
  - Operating Temperature: -40°C to + 75°C
  - Storage Temperature: -40°C to + 85°C
- EMI and Safety Compliance
  - CE/FCC
  - IEC 60950-1
  - UL Class 1/Div 2

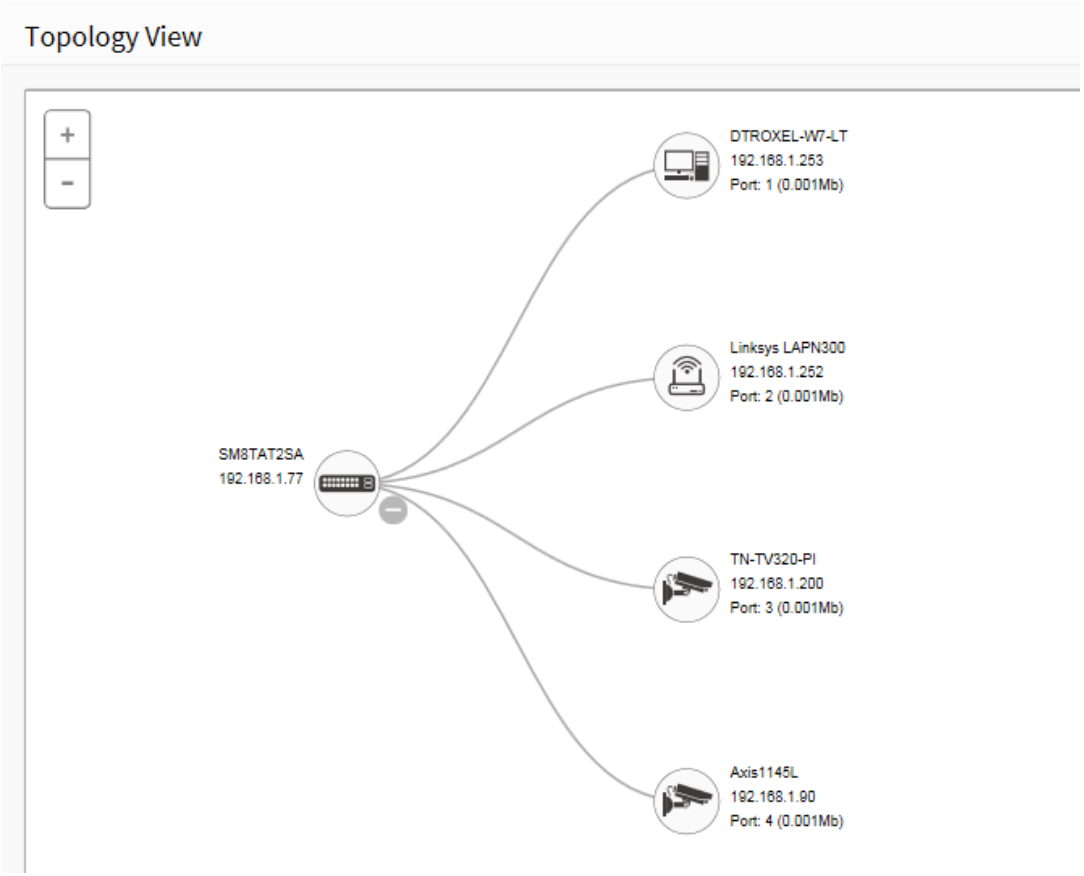
Key Features

- Management: CLI/SNMP V1,v2c,v3/Web GUI
- Security :
  - SSH, HTTPS
  - Port Security, IP Source Guide
  - Radius/TACACS+ authentication
- VLAN: Port based, 802.1Q, maximum 4096 groups, Q-in-Q
- Multicast: IGMP Snooping v2/v3
- Ring Protection: G.8032,MSTP, RSTP, STP, Rapid Ring
- IEEE 1588 v2 Precise Timing Protocoal
- Power over Ethernet
  - Port configuration
  - Auto Power Reset (APR)
  - DHCP per Port
  - PoE Scheduling
- Devise Management System (DMS)

DMS Features

- Auto Discover All Types of IP Devices
- On-Line Search, Sort, and Edit
- Auto Detect Device Status Real Time
- Trouble Shooting Cables & Devices
- Reboot Remote Devices
- Single Sign-On Login
- Export View Pages to Files
- Auto Provisioning

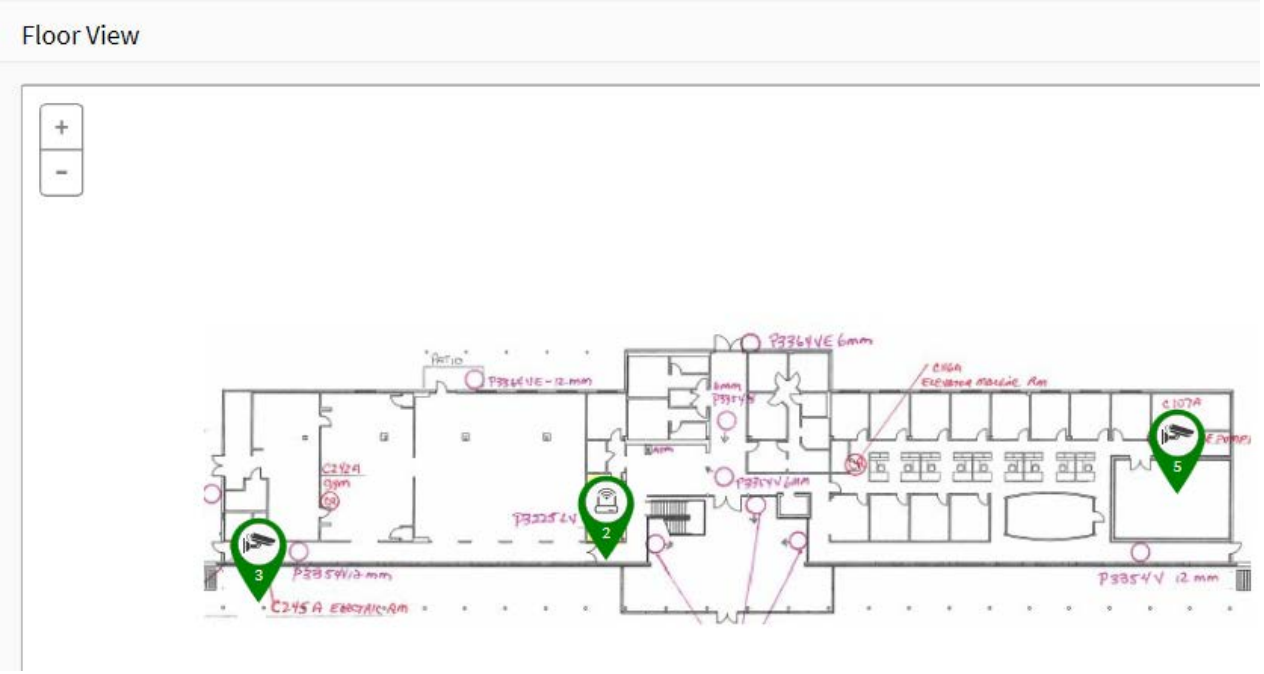
Topology View



DMS Features

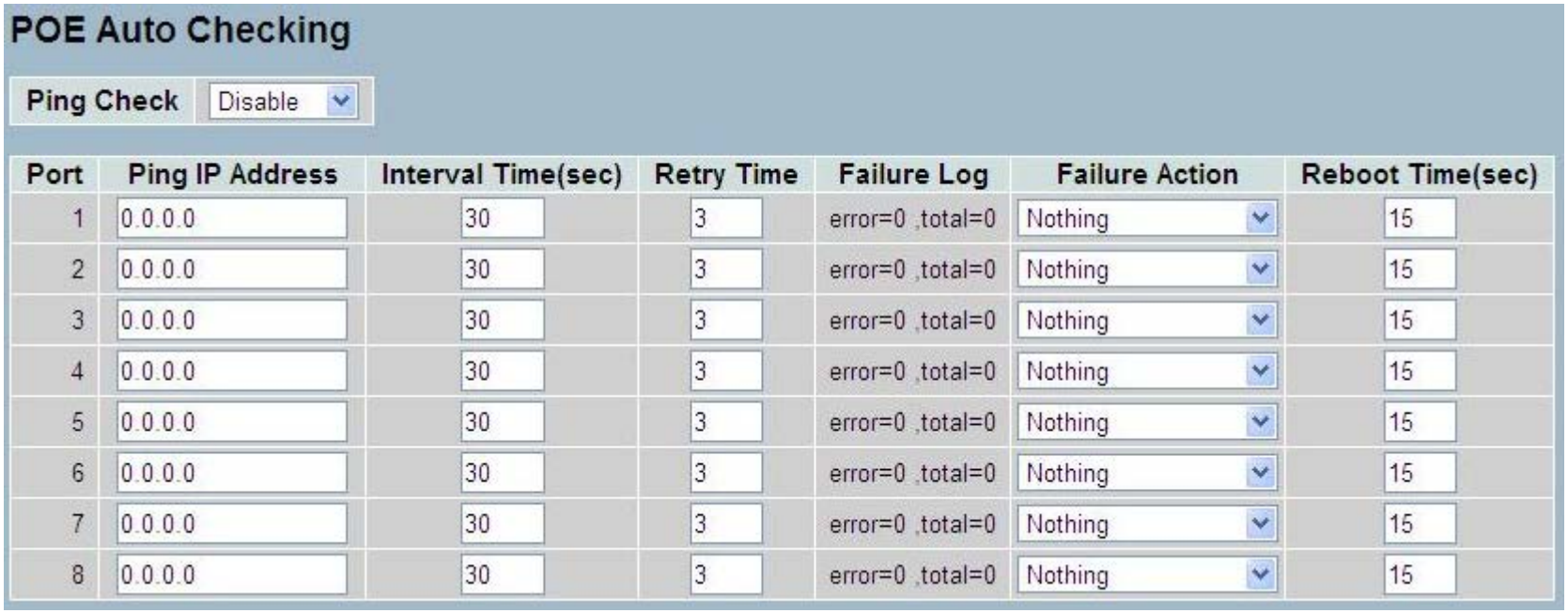
- Anchor Devices onto Floor Maps
- Find Devices Instantly by Floor View
- 10 Maps can be Stored in Each Switch
- IP Surveillance/VoIP/WiFi Applications
- Other Features same as Topology View

Floor View



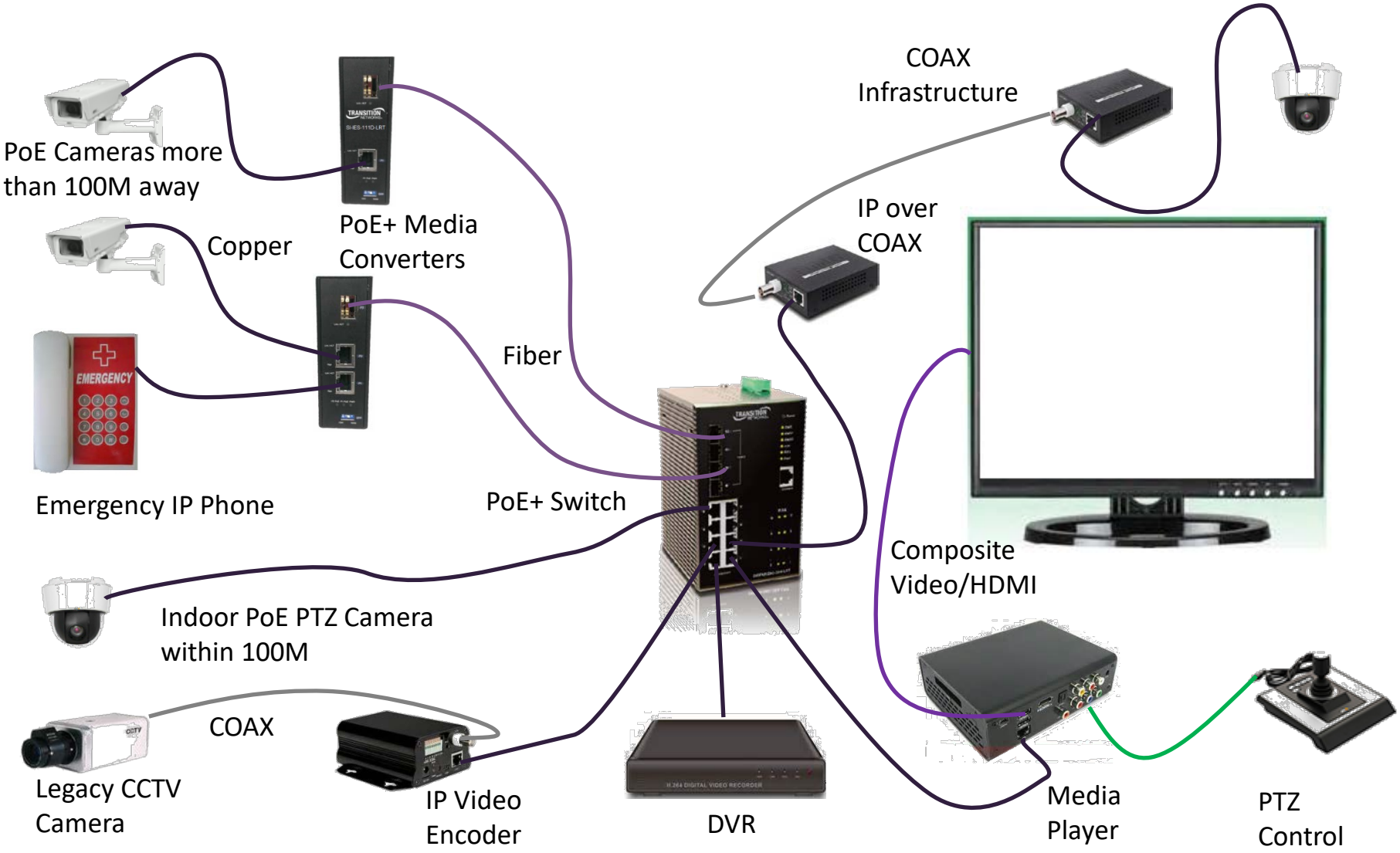
Key Feature – Auto Power Reset

- Auto ping the Remote PD IP Address
- Set Ping Time
- Set Number of Failed Pings
- Set Failure Action – Reset the Port and drop POE power to PD
  - Automatically resets IP camera or Wireless Access Point
    - Saves OPEX with no truck rolls or repair equipment rental costs
    - Reduces need for additional staff work time and resources
    - Monitors end devices automatically for occasional lockups or glitches



Port	Ping IP Address	Interval Time(sec)	Retry Time	Failure Log	Failure Action	Reboot Time(sec)
1	0.0.0.0	30	3	error=0 ,total=0	Nothing	15
2	0.0.0.0	30	3	error=0 ,total=0	Nothing	15
3	0.0.0.0	30	3	error=0 ,total=0	Nothing	15
4	0.0.0.0	30	3	error=0 ,total=0	Nothing	15
5	0.0.0.0	30	3	error=0 ,total=0	Nothing	15
6	0.0.0.0	30	3	error=0 ,total=0	Nothing	15
7	0.0.0.0	30	3	error=0 ,total=0	Nothing	15
8	0.0.0.0	30	3	error=0 ,total=0	Nothing	15

Transition Networks Solutions for Surveillance & Monitoring



PoE++ IP-67 rated Industrial Switches

PoE Features
- PoE++ compliant
- IEEE 802.3at PoE+ compliant
- IEEE 802.3af PoE compliant
- 802.1AB LLDP-MED Configuration
- PoE configuration
- PoE Scheduling
- Power Delay
- Auto Power Reset
- IP65 rated, providing protection from dust and water in outdoor environments

Features

- Supports IPv4/IPv6 dual protocol stack
- Supports Jumbo Frame up to 9K bytes
- Supports RADIUS and TACACS+ authentication
- Supports SSH v1/SSH v2/SSL security
- DHCP Relay, DHCP Server
- L2/L3/L4 ACLs Support MAC ACL, IP standard/extended ACL
- Link Layer Discovery Protocol (LLDP)
- IEEE802.3az Energy Efficiency
- IP Source Guard, Port Security
- Rate Limiting: Ingress Policer, Egress shaping and rate control, per port
- IEEE802.3ah OAM, IEEE802.1ag CFM, EPS, ERPS, IEEE 1588 v2

Preserving Legacy Infrastructure for IP/Ethernet Connectivity

Legacy Infrastructure exists in the environments of new Security and Wireless networks

Concerns:

1. Too expensive to install new cabling
2. Some environments are too difficult to change/upgrade
3. Buildings can have historical or hazardous materials to change infrastructure

Solution:

Utilize existing infrastructure with Copper, Coax or 2-wire Ethernet Extension

- Ethernet Extension → 18-24AWG 2-Wire
- Ethernet Extension → Cat3, Cat5, Cat6 UTP
- Ethernet Extension → RG59 - Coax

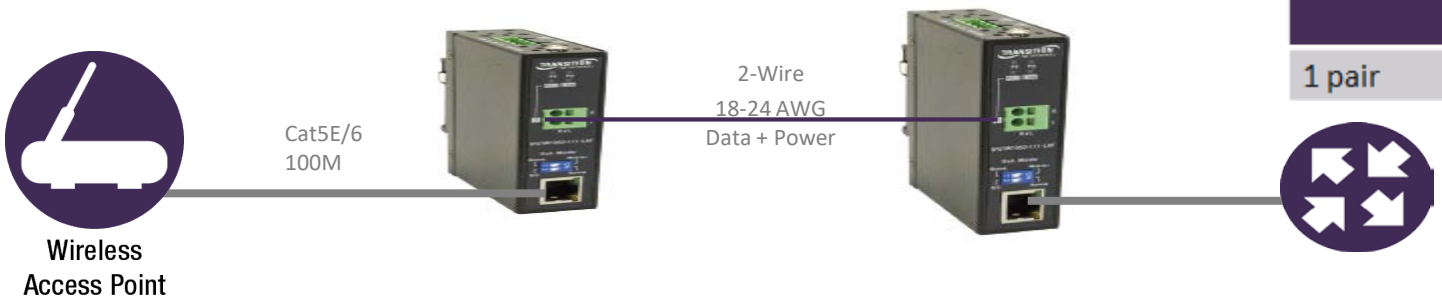
Preserving Legacy Infrastructure for IP/Ethernet Connectivity

Ethernet Extension > 18-24 AWG 2-Wire with PoE+ (Remote Powered)

- Extend Ethernet with PoE+ over Ordinary 2-wire plain telephone 18-24AWG cabling
- Ideal for hard-to-reach locations where new cabling (Cat 5E/6) is not possible
  - **Light Poles, Guard Shacks, Warehouses, Elevators**
- Used as a pair of devices, with a local and remote device at opposite ends of the 2-Wire cable
  - Fiber or copper connection (100Mb) from network equipment to Local Unit
  - Ethernet Cat5e/6 (100M additional) from Remote to PoE+ camera/WAP

  Power for Local Unit can be provided from an isolated +48VDC power source or designated 90W power supply. Power delivered from Local Unit provides power to the Remote Unit and PoE+ to the camera/WAP

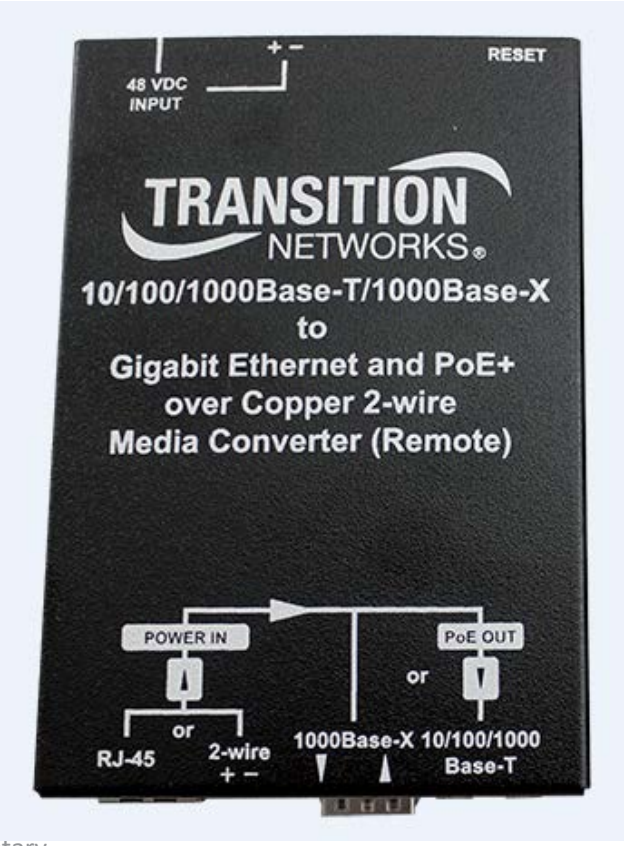
	18AWG	22AWG
1 pair	1527’	614’



Ethernet Over 2-Wire Extender With PoE+

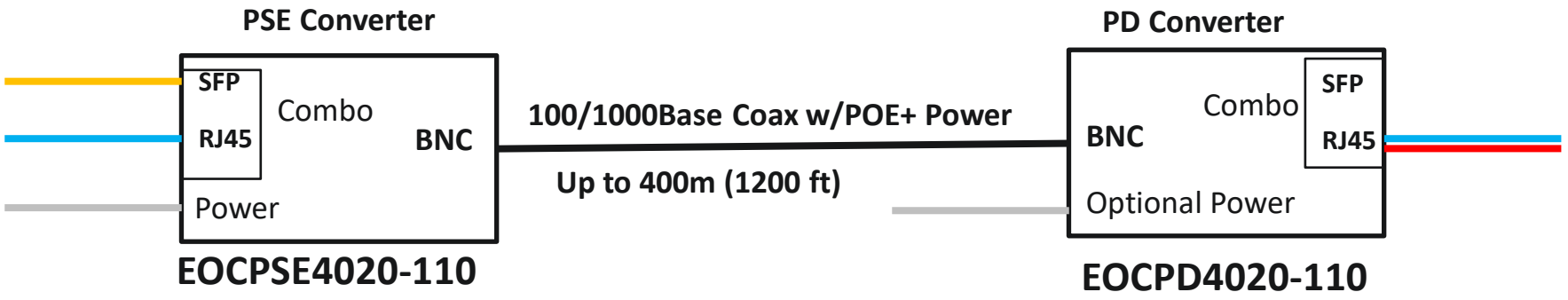
- Two separate devices, must be used in pairs

Local	Remote
EO2PSE4052-111	EO2PD4052-111



G.hn Components

G.hn Architecture



G.hn Coax Architecture

- Provides copper and fiber Ethernet terminations over a coax cable
- Speeds up to 1 Gbps
- Distances supported up to 300 meters
- POE+ power can be provided for IP Camera or Wireless Access Point
- Reuse of coax infrastructure in Brown fields without cabling or re-cabling
- Devices are managed locally and remotely
- Operating Temp 0 – 70C
- 48 VDC using PS 25135

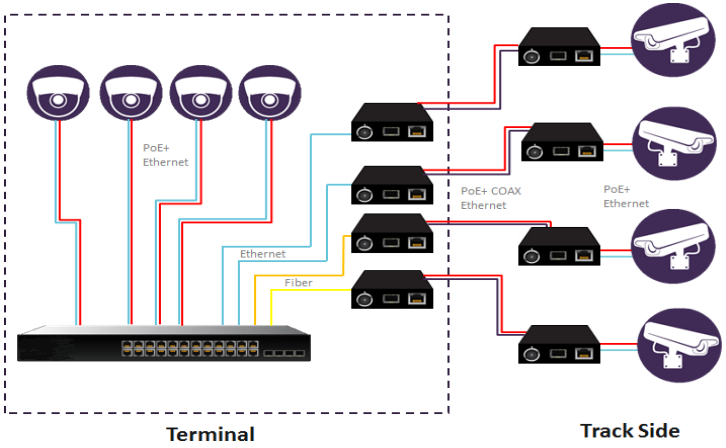
G.hn Implementation

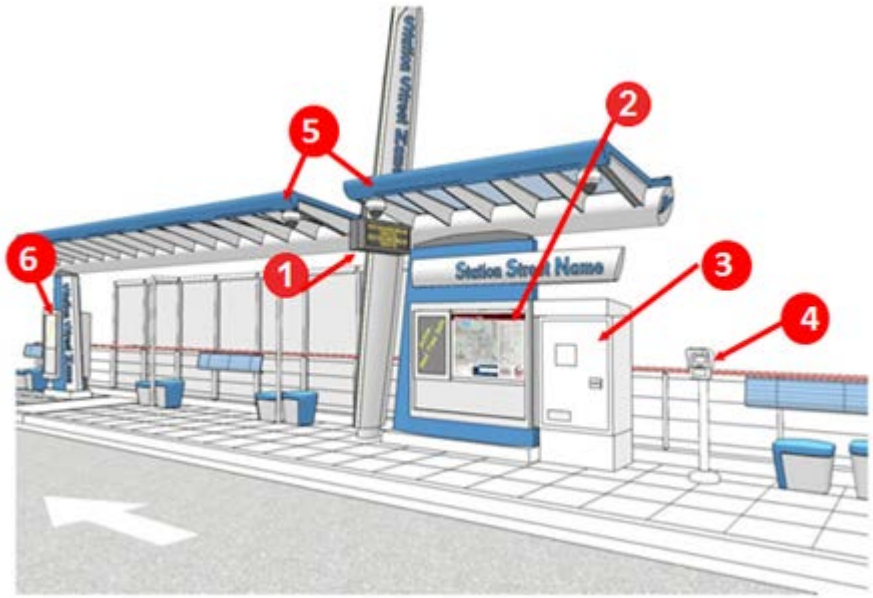
G.hn Coax Application

Intelligent Transportation

- Subway Commerce & Security –
  - Utilize coax cable infrastructure for connecting Ethernet Devices
  - Upgrade old Analog Cameras to IP Cameras
  - Provide Bandwidth for Multiple Services to each platform
  - Eliminates upgrading underground cable or installing fiber

System Elements Key
1 – Digital Sign
2 – LCD Real Time Info Display
3 – Ticket Vending Machine (TVM)
4 – Clipper e-card scanner
5 – IP Security Camera
6 – Emergency Phone/post/camera



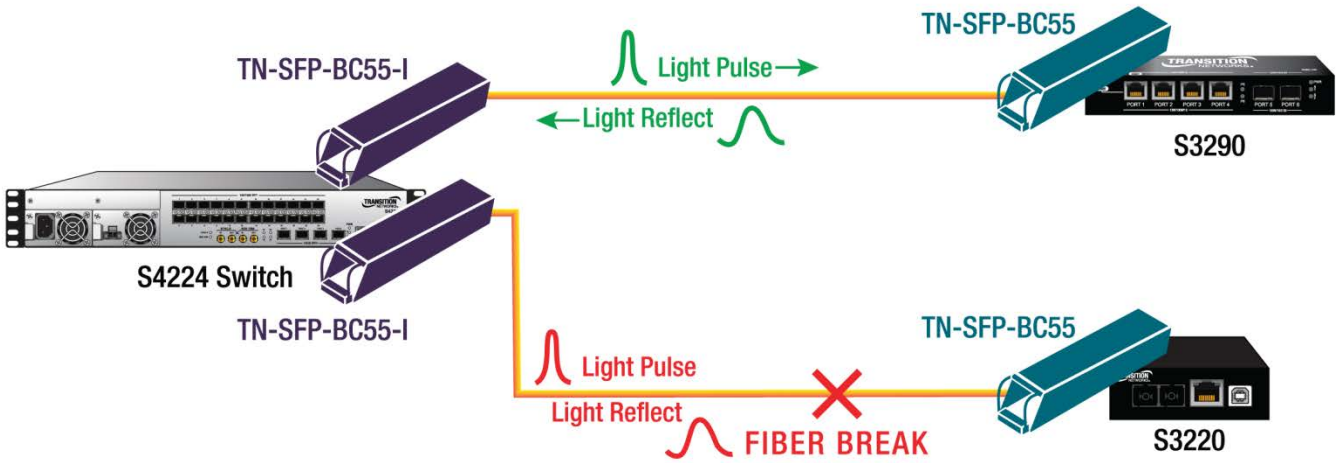


SFP/XFP Products

SFPs, XFPs, GBICs, SFP+, CWDM + Extended Temp

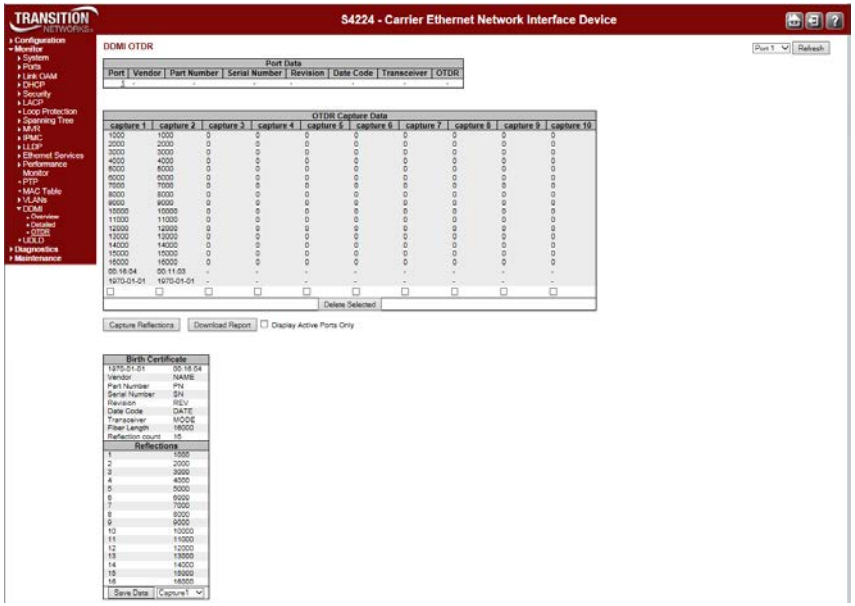
- TN-SFP-GE, TN-SFP-GE-L, TN-SFP-GE-Z Gigabit Ethernet 1000Base-LX with Digital Diagnostics in MM or SM versions
- MSA, Cisco, Juniper & HP Compatible
- -40 to +85 C operating temperature range
- Key part of solution for bringing Ethernet switching and Media Conversion into industrial environments
- Lifetime Warranty!

OTDR SFP Application – Locate Fiber break



- Physical layer fiber fault determination and location
- Full-time observation from the Center office
- Provides a cost-effective solution to minimize troubleshooting and recovery activities
- Reduce the time to repair

OTDR SFP Application – Link Birth Certificate



Birth Certificate	
1970-01-02	12:45:33
Vendor	Transition
Part Number	TN-SFP-BC55-I
Serial Number	52150224104
Revision	A114
Date Code	2016-02-19
Transceiver	1000BASE_LX
Fiber Length	50558
Reflection count	1

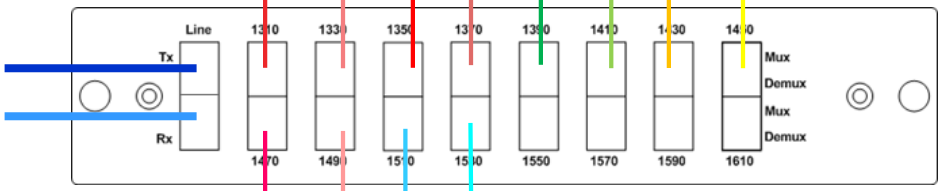
- Provides the Link Birth Certificate during installation
- Store the Link Birth Certificate on Switch

CWDM – Security Camera Application

Control Center

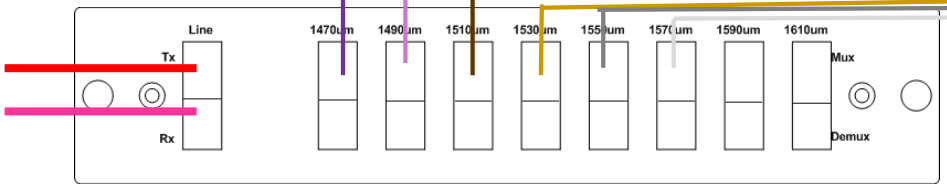
TN SM24DPB Fiber Switch

CWDM-M1631LCR



2 Fibers to Field
Enclosure #1 & #2

CWDM-M847LCR



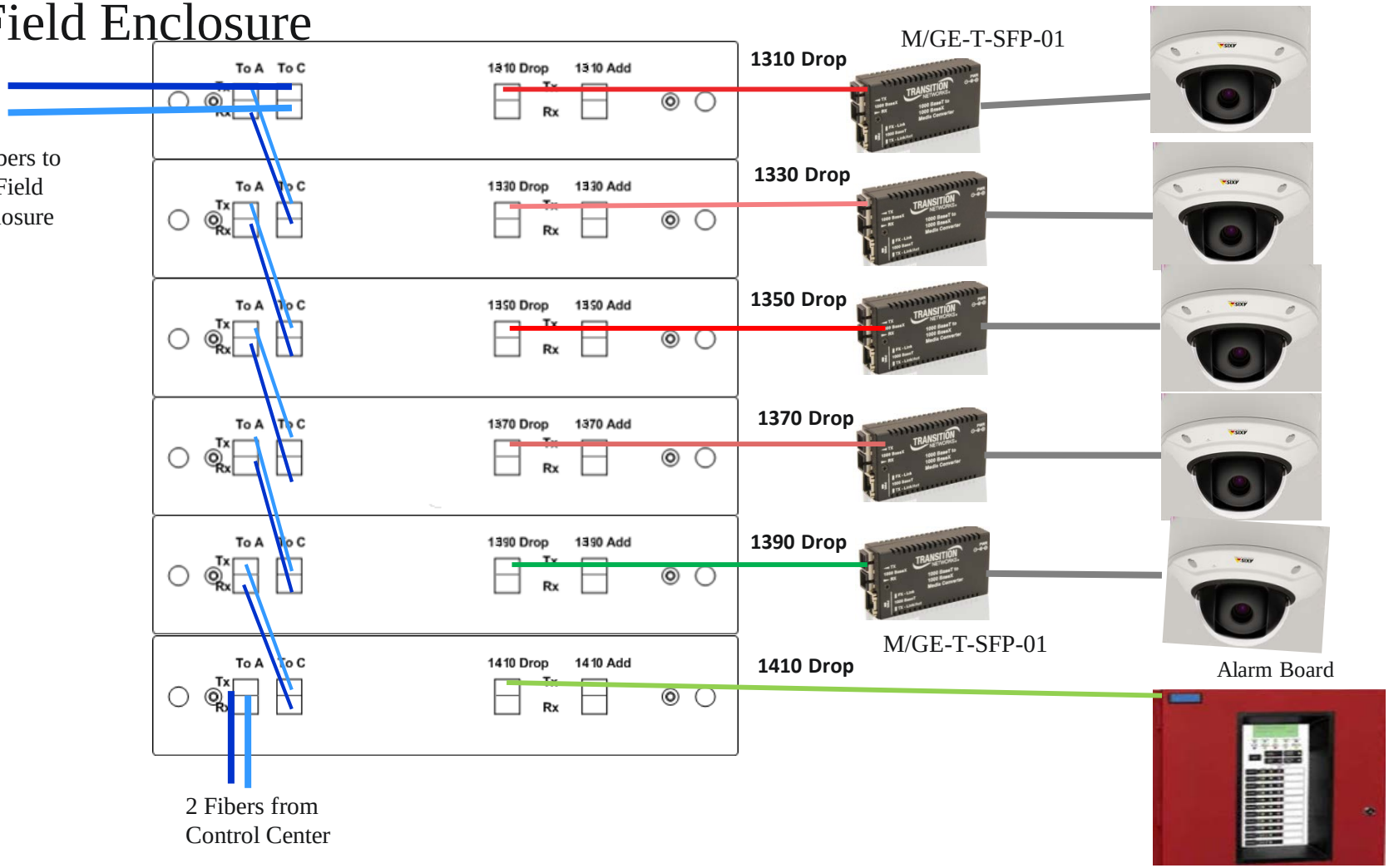
2 Fibers to Field
Enclosure #3

VMS

Master Alarm Board

CWDM – Security Camera Application

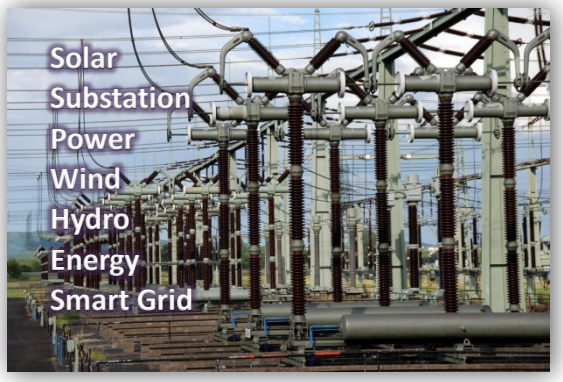
#1 Field Enclosure



Industry Applications

Industrial Ethernet Markets

Power, Transmission & Distribution (PT&D)



Process Automation

Physical Security

Infrastructure

Material Handling

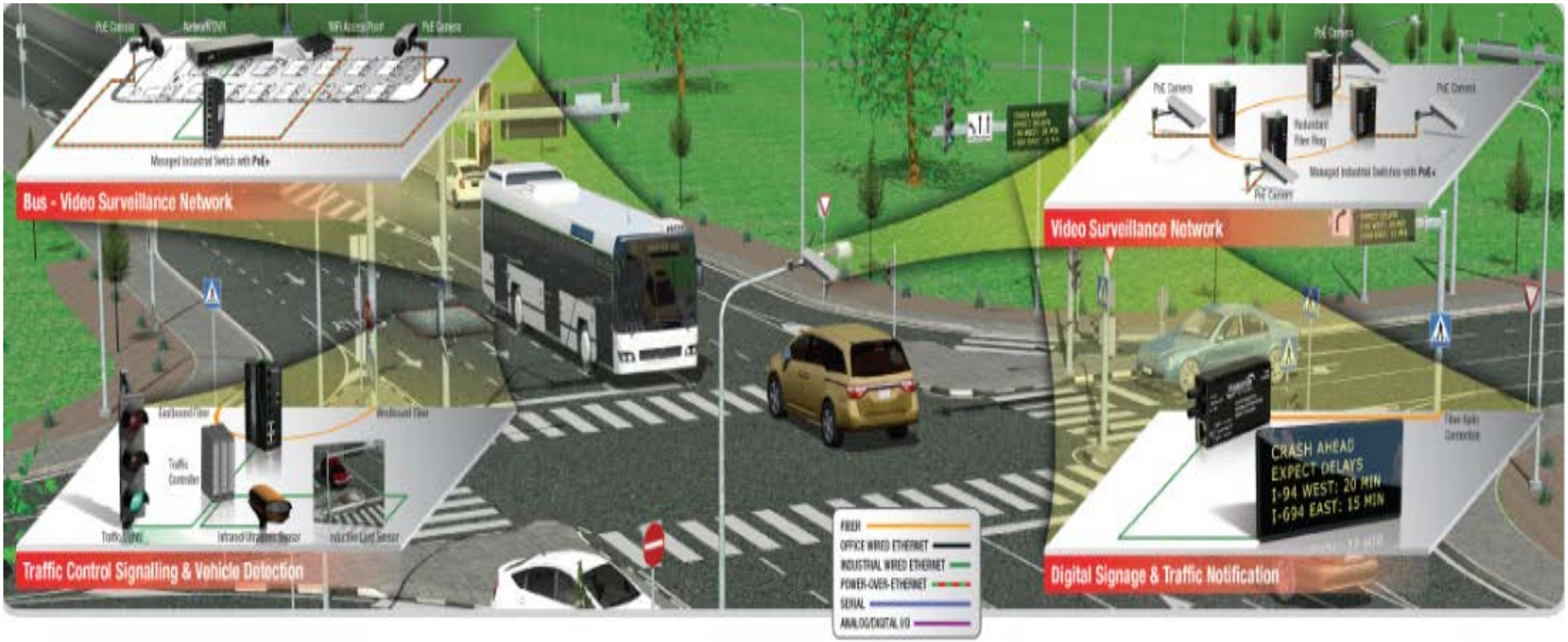
Intelligent Transportation Systems (ITS)

In-Vehicle Deployment

Traffic Control Signaling and Vehicle Detection

Video Surveillance Network

Digital Signage and Traffic Notification



ITS Media Conversion and Switching

M/GE-ISW-SFP-01-AC

Mini 10/100/1000BASE-TX (RJ-45) [100 m/328 ft.] to 1000BASE-X SFP

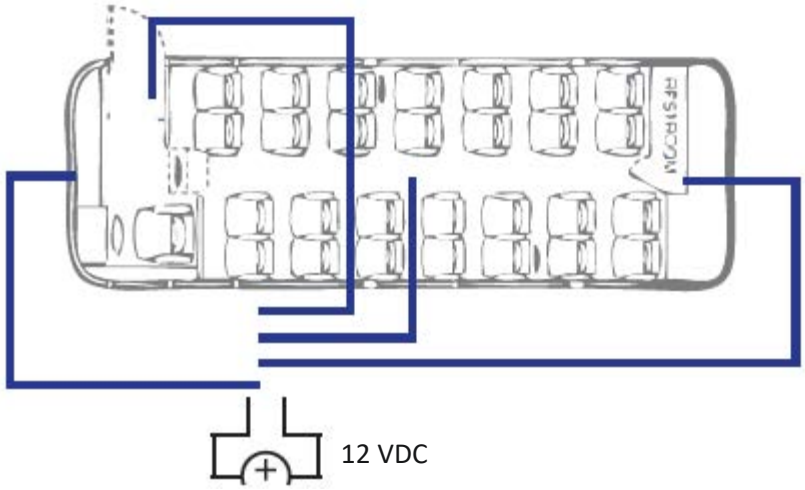
- **Industrial Mini Media Converters provide a cost-effective method for integrating fiber optic cabling into industrial or outdoor 10/100/1000 UTP Ethernet networks.**
- **Featuring wide operating temperature range, low-voltage power, multiple mounting methods and Transition Networks' Lifetime Warranty**

SISTP1010-380-LRT

Industrial PoE switch is a High Power Sourcing Equipment (PSE) device that complies with the IEEE802.3at standard, providing Power-over-Ethernet over standard twisted pair cables in an Ethernet network.

- **Operating from a wide-range 12 – 36 VDC power input, the device is ideal for providing communications services onboard vehicles.**
- **It's extended operating temperature range of -40 to +70 C allows the switch to be located outside of environmentally conditioned passenger areas.**
- **Transition Networks' Lifetime Warranty**

PoE+ from Vehicle Power to Enable Onboard Video Security and Wireless Services



Converged Services….Unified Network Connectivity

Voice

VoIP Call Boxes

Data

Wireless Access Point

VTM Ticket Machine
Clipper Card Reader

LED Signs

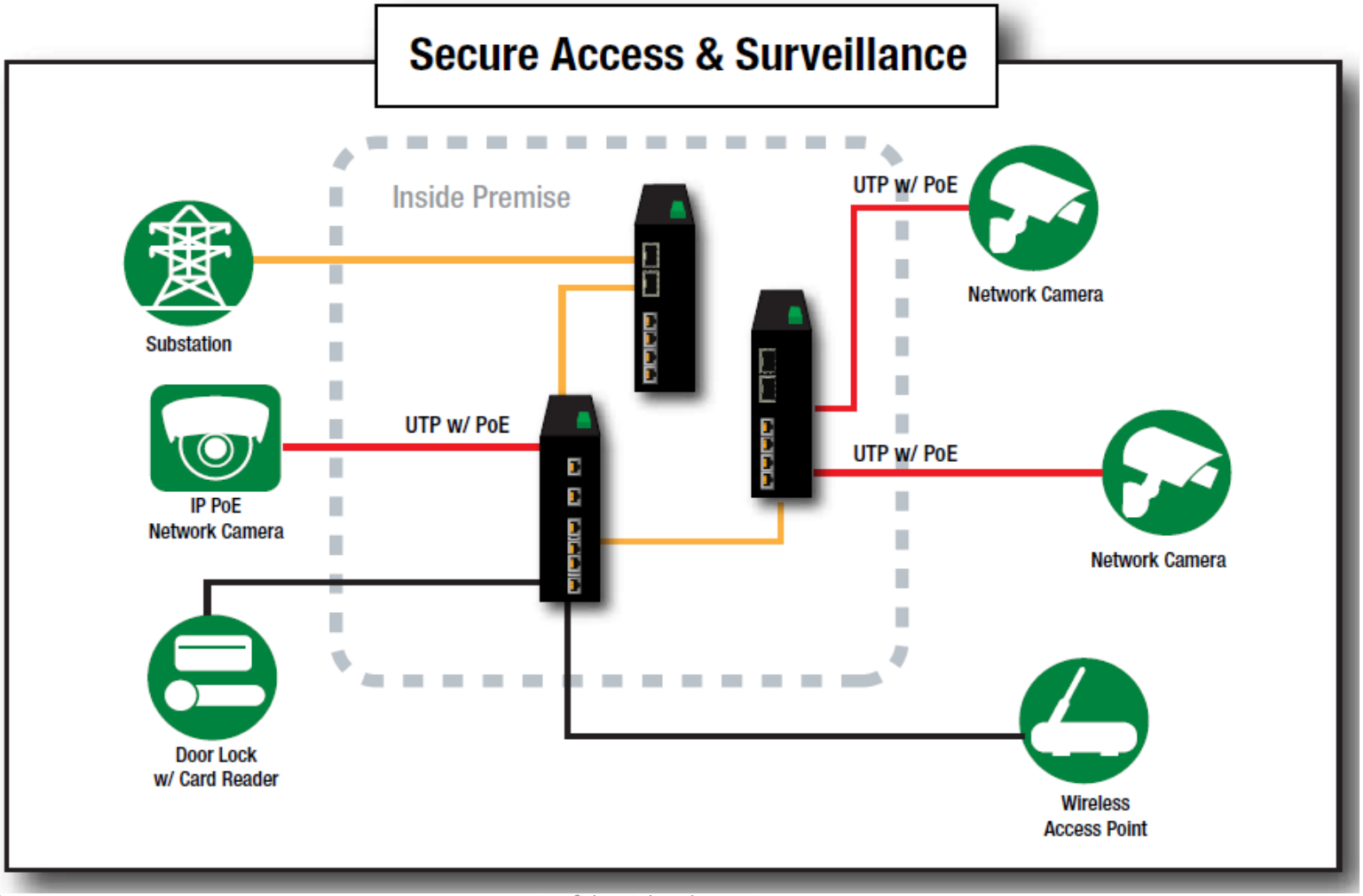
Video

Power over Ethernet
IP Cameras

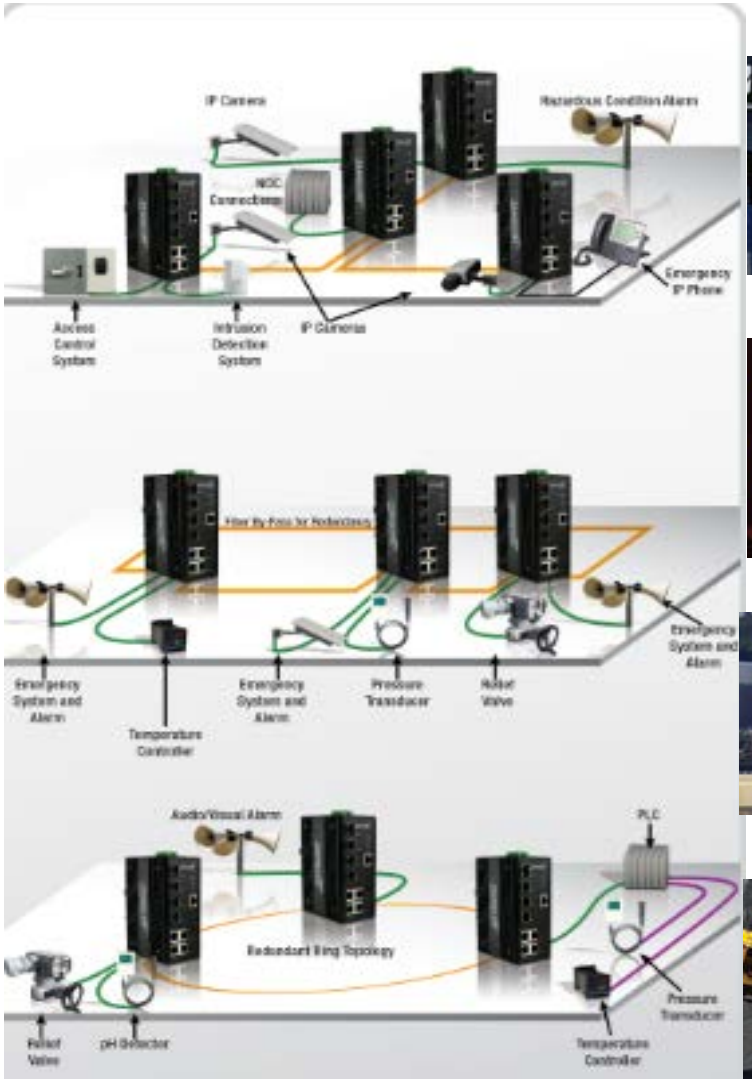
LCD Video
Digital signs

Power, Transmission and Distribution – Electrical Utilities

Substation Automation



Hazardous Locations



Wastewater Treatment

Oil/Gas Production

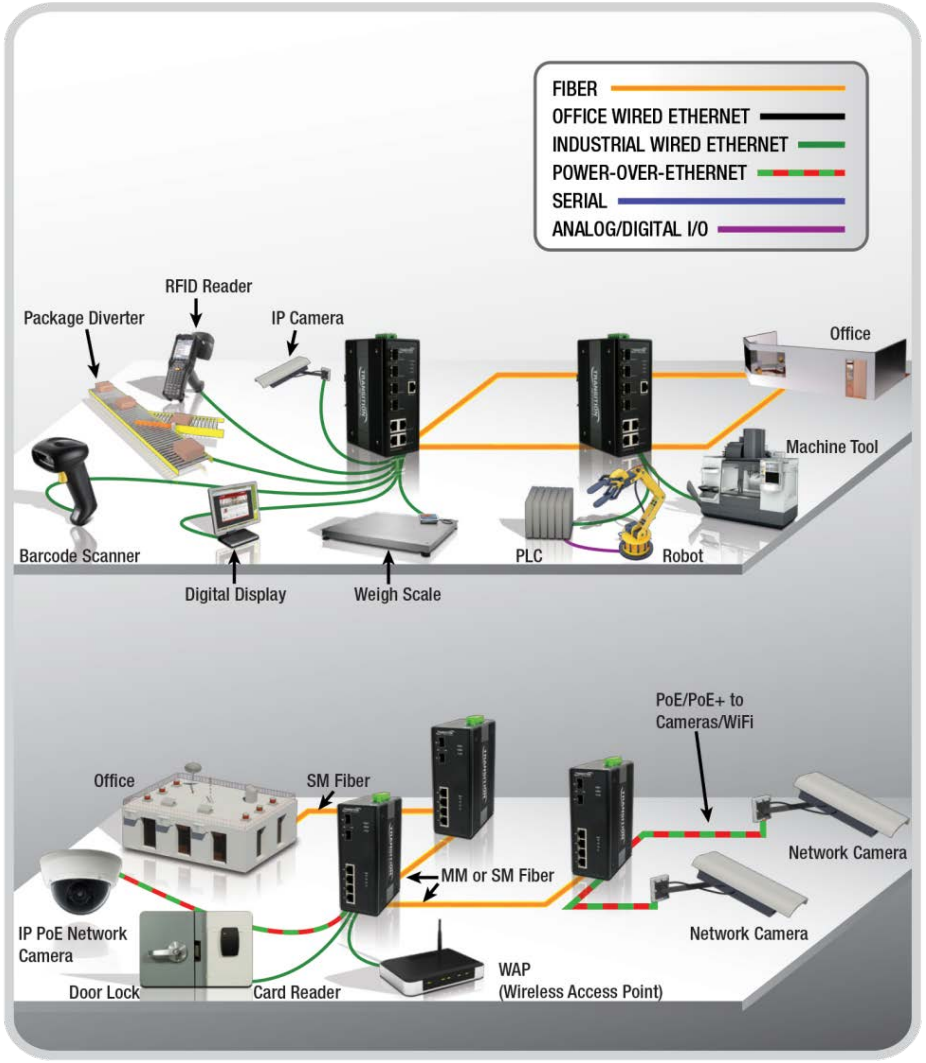
Chemical Industries

Mining

Transition Networks' industrial grade network switches

- **Class , Div 2 and ATEX Certification**
- **Serial servers transmit Sensor Data**
- **Power-over-Ethernet (PoE) to connect and power IP surveillance cameras & phones**
- **Redundant Power and Data Connections**
- **Non-Sparking Certified switches**
- **Lifetime Warranty**

Manufacturing



Manufacturing & Material Handling

Secure Access & Surveillance

Questions?

Thank You

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www.transition.com