Industrial Switch Introduction

Your Partner in Industrial Communication

3onedata

C O N T E N T S

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01

About Industrial Switch

- What is an industrial switch?
- The difference between industrial switch and commercial switch

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What is an industrial switch?

- Used in industrial control network
- Apply with international protocol: TCP/IP

- Adopt harsh environment: temperature, salt spray, electrical noise, vibration, shock, etc.
- Higher availability and longer MTBF than commercial switch

Safe City

Automation

Smart Grid

Rail Transit

Oil Field Automation

Mine Monitor System

Utility Tunnel

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The difference between industrial switch and commercial switch

Components
Industrial switch components have higher requirements for selection and should be better adapted to the needs of industrial production sites.

Mechanical environment
Industrial switch can better adapt to harsh mechanical environments, including vibration, shock, corrosion, dust and water.

Climate
Industrial switch is better suited to poorer climates, including temperature and humidity.

Electromagnetic environment
Industrial switch has strong anti-electromagnetic interference capabilities.

Operating voltage
Industrial switch has a wide operating voltage range, and commercial switch requires higher voltages.

Power supply design
Commercial switch is basically single-supply, while industrial switch power supply is generally dual-power backup.

Installation method
Industrial switch can be installed in DIN rails and racks. Commercial switch is generally rack and desktop.

Cooling method
Industrial switch generally use a fanless enclosure for heat dissipation, while commercial switch is fan-distributed.
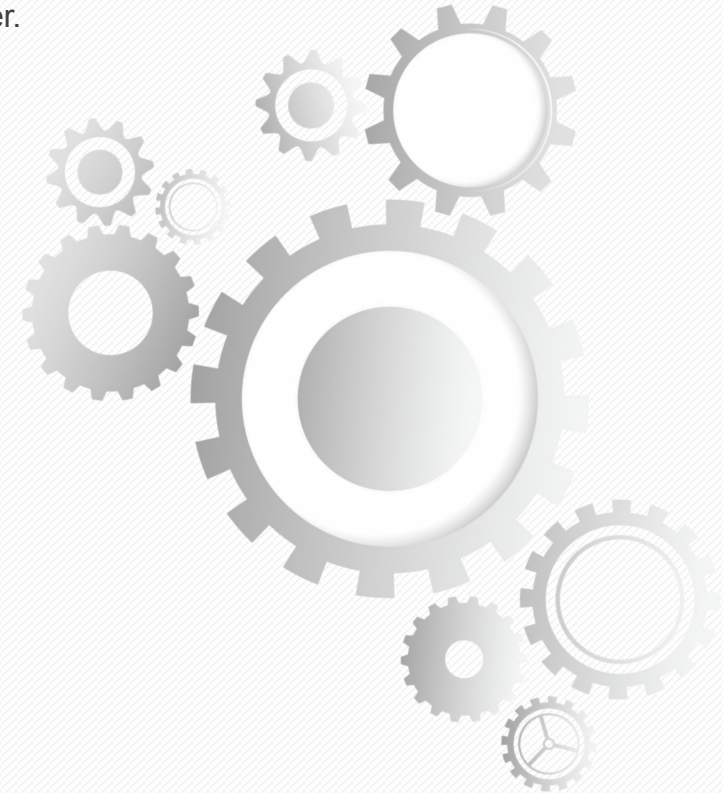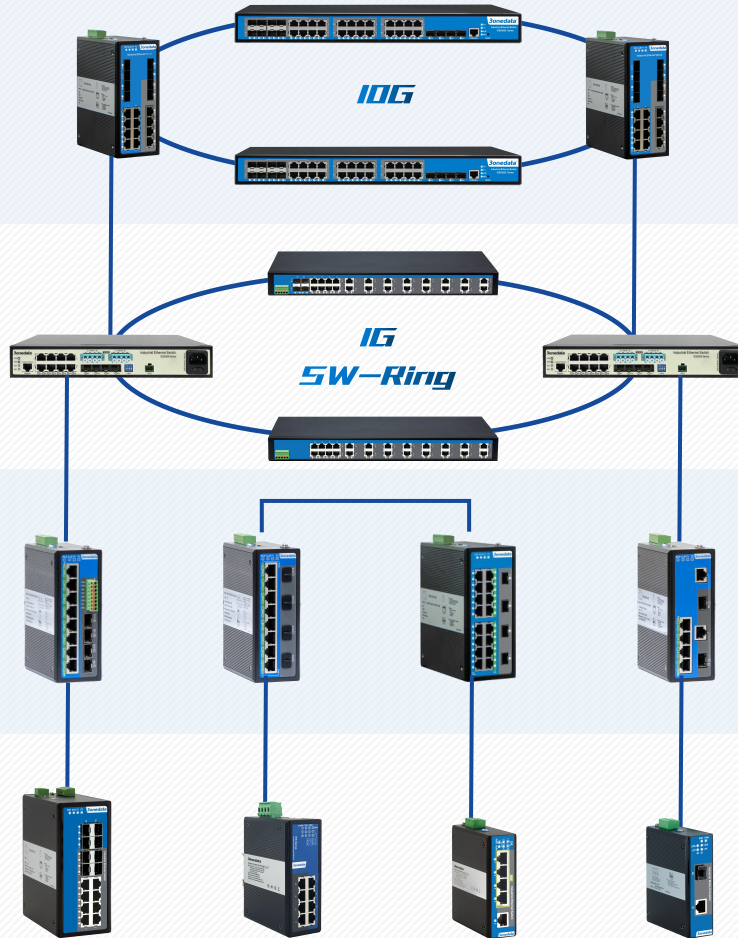
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02

3onedata Industrial Switch Introduction

- Product Family
- Product Classification
- Featured Products
- Software

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Product Family

Backbone Layer

- 10G Switch

Convergence Layer

- Gigabit Switch
- Bypass Switch

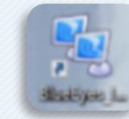**Access Layer**

- Managed Switch
- PoE Switch

Device Layer

- Uumanaged Switch
- Media Converter

10G

1G
SW-Ring

Management Software

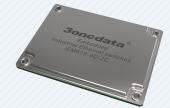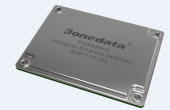BlueEye Pro

BlueEyes_II

VSP Manager

EN50155 Switch

IEC61850-3 Switch

Embedded Module

3onedata

Product Classification

Unmanaged Ethernet Switch

With no setup required, 3onedata's unmanaged Ethernet switch is truly plug-and-play and is designed for use in demanding industrial environments.

Managed Ethernet Switch

3onedata's managed Ethernet switch allows users to expand their industrial network quickly and efficiently, while their rugged industrial-grade design assures reliability and stability.
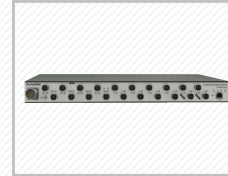
PoE Ethernet Switch

3onedata's PoE switch provides up to 60W per port for powering IEEE802.3af/at-compliant devices (PD) via an Ethernet cable, eliminating the need for additional wiring.

Bypass Ethernet Switch

3onedata's Bypass switch ensures the stability of data transmission, network connection will not be affected by power failure.

EN50155 Ethernet Switch

With an M12 connector design, 3onedata's EN50155 Ethernet switch is designed to withstand severe shock and vibration, making them reliable for uninterrupted rail communication.

IEC61850-3 Ethernet Switch

3onedata offers the highest quality IEC61850-3 certification industrial ethernet switches for the Power and Energy Automation applications.

Ethernet Switch Module

3onedata has a variety of switch modules to meet customers' specific needs quickly, and can meet a wide range of industrial applications.

Media Converter

3onedata's media converter is more compact and robust device designed to convert Gigabit Ethernet or Fast Ethernet networks into Gigabit or Ethernet fiber optic networks.

3onedata

L3 Ethernet Switch

ICS5028G--4XGS-8GC

28-port Gigabit/10 Gigabit L3 Rack-mounted Managed Industrial Switch

ICS6424 Series

16/20-port Gigabit/10 Gigabit L3 DIN-rail/Wall-mounted Managed Industrial Switch

Eight Gigabit Combo (SFP slots or RJ45)

Four 10G SFP slots

Sixteen Gigabit copper ports

Four 10G SFP slots

Four Gigabit SFP slots

IP40 protection

-40℃-75℃ operating temperature
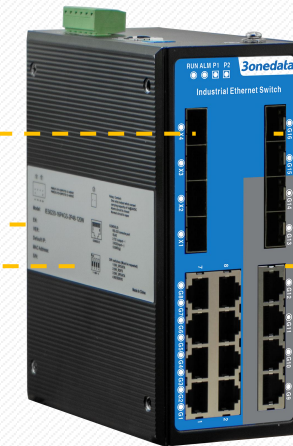
Dual AC/DC power supply

100~240VAC or 36~72VDC input

IP40 protection

-40℃-75℃ operating temperature

Twelve Gigabit copper ports

12~48VDC dual power supply input

3onedata

L2 Rack-mounted Ethernet Switch

IES5028G Series

28-port Full Gigabit L2 Managed Industrial Switch

Eight Gigabit Combo (SFP slots or RJ45)

Sixteen Gigabit copper ports

Four Gigabit SFP slots

Relay output warning

IP40 protection

-40℃-75℃ operating temperature

IES5028 Series
28-port 100M/Gigabit Managed

IES5024 Series
28-port 100M/Gigabit Managed
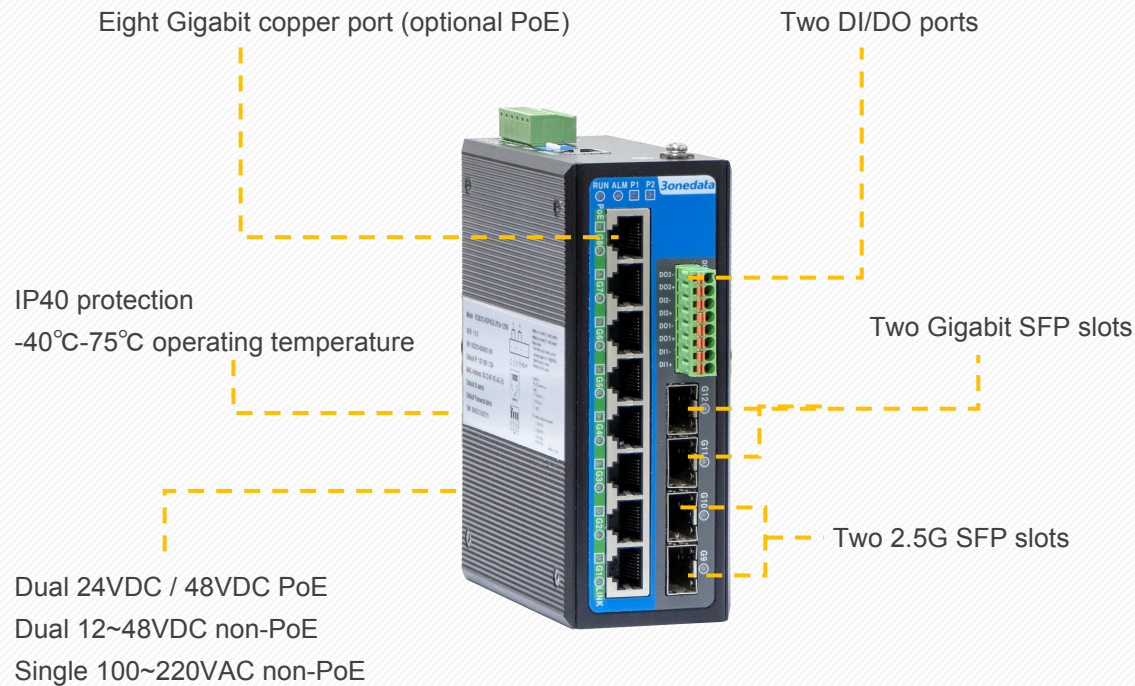
IES1028 Series
28-port 100M/Gigabit Unmanaged

IES1024 Series
28-port 100M/Gigabit Unmanaged

CE   FC   RoHS   UL LISTED   SW-Ring

3onedata

L2 DIN-rail Managed Ethernet Switch

IES6300 Series

12/8/6-port Full Gigabit L2 Managed Industrial Switch (optional PoE)

Eight Gigabit copper port (optional PoE)

Two DI/DO ports

IP40 protection

-40℃-75℃ operating temperature

Two Gigabit SFP slots

Two 2.5G SFP slots

Dual 24VDC / 48VDC PoE

Dual 12~48VDC non-PoE

Single 100~220VAC non-PoE

SW-Ring

IES6312 Series
12-port Full Gigabit
(optional PoE)

IES6310 Series
6/10-port Full Gigabit
(optional PoE)

IES6210 Series
6/10-port 100M/Gigabit
(optional PoE)

IES6220 Series
20-port 100M/Gigabit
(optional PoE)

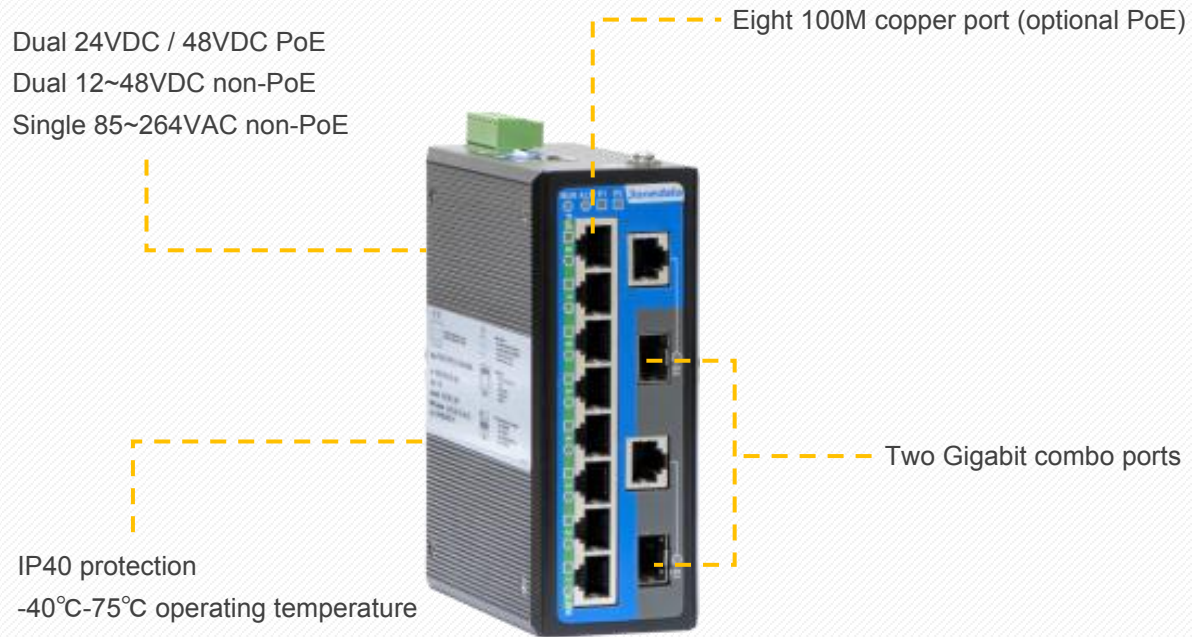IES618-4D Series
8-port 100M +
4 serial ports

IES615-2D Series
5-port 100M +
2 serial ports

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L2 DIN-rail Unmanaged Ethernet Switch

IES2210 Series

6/10-port 100M/Gigabit L2 Unmanaged Industrial Switch (optional PoE)

Dual 24VDC / 48VDC PoE
Dual 12~48VDC non-PoE
Single 85~264VAC non-PoE

Eight 100M copper port (optional PoE)

Two Gigabit combo ports

IP40 protection
-40℃-75℃ operating temperature

IES2312 Series
12-port Full Gigabit
(optional PoE)

IES2220 Series
20-port 100M/Gigabit
(optional PoE)

IES2210 Series
6/10-port 100M/Gigabit
(optional PoE)

IES215 Series
5-port 100M

IES318 Series
8-port 100M

IES3020 Series
20-port 100M/Gigabit

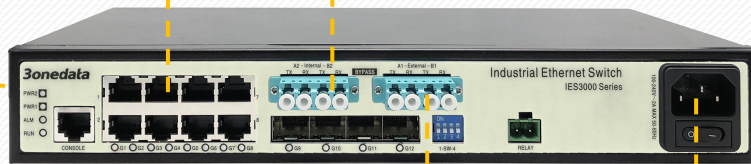CE   FC   RoHS   UL LISTED   SW-Ring

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Bypass Ethernet Switch

IES3000

12-port Full Gigabit Rack-mounted Managed Bypass Industrial Switch

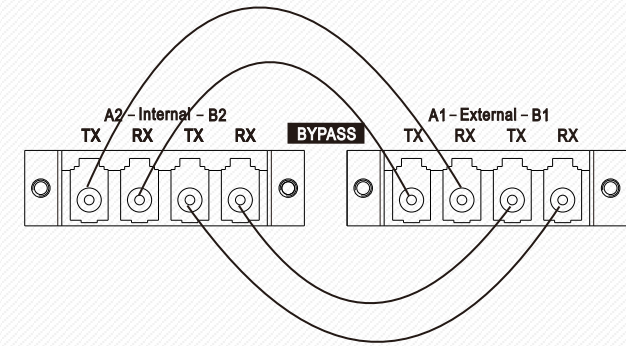Eight Gigabit copper ports (optional PoE)

Two Bypass

Four Gigabit SFP slots

Dual 48VDC PoE
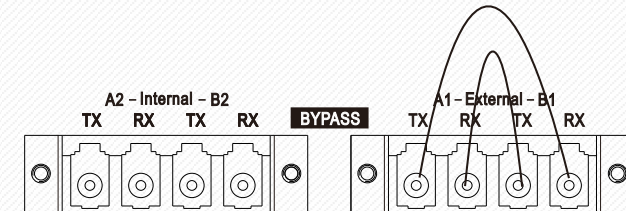
Dual 48VDC(12~48VDC) / 220VAC(100~240VAC) non-PoE

IP40 protection

-40℃-75℃ operating temperature

When powered on,

TX, RX at A2 end connect to RX, TX at A1 side separately,

TX, RX at B2 end connect to RX, TX at B1 side separately.
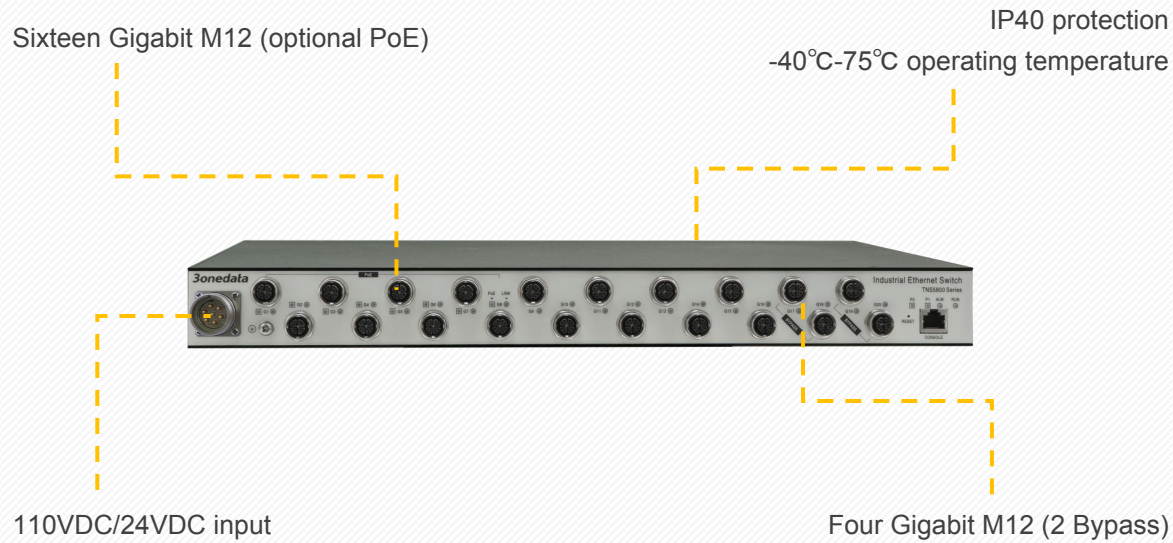
When powered off,

TX, RX at A1 side connects to RX, TX at B1 side

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EN50155 Ethernet Switch

TNS5800-20GT

20-port Full Gigabit L3 Managed EN50155 Switch (optional PoE)

Sixteen Gigabit M12 (optional PoE)

IP40 protection

-40℃-75℃ operating temperature

110VDC/24VDC input

Four Gigabit M12 (2 Bypass)

IRIS Certification

c UL us LISTED

EN 50121

EN 50155

SW-Ring

TNS5800-4GT-8T
12-port Gigabit L3 Managed

TNS5800D-4GT-8T
12-port Gigabit L3 Managed

TNS5500-4GT-8T
12-port Gigabit/100M L2 Managed

TNS5500D-4GT-8T
12-port Gigabit/100M L2 Managed

TNS5500-4GT-8PoE
12-port Gigabit/100M L2 Managed

TNS5500D-4GT-8PoE
12-port Gigabit/100M L2 Managed

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IEC61850-3 Ethernet Switch

MES5000 Series

28-port Gigabit/100M L2 Rack-mounted Managed IEC61850-3 Switch

MES600 Series

8-port 100M L2 DIN-rail Managed IEC61850-3 Switch with 4 3IN1 serial ports

Twenty-four 100M fiber/copper ports

Four Gigabit fiber ports (SFP slot)

12~48VDC
dual power supply input

Four 3IN1 serial ports

Four 100M fiber ports
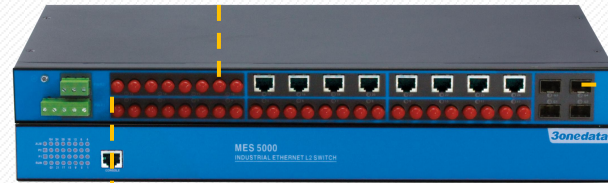
90～264VAC or 36~72VDC
dual power supply input

IP40 protection
-40℃-75℃ operating temperature

Four 100M copper ports

IP40 protection
-40℃-75℃ operating temperature

IEC 61850

IEC 61850

Media Converter

RACK2100

2U Rack Mounting 18-Slot Card Industrial Multi-service Rack

85~264VAC/DC
dual power supply input
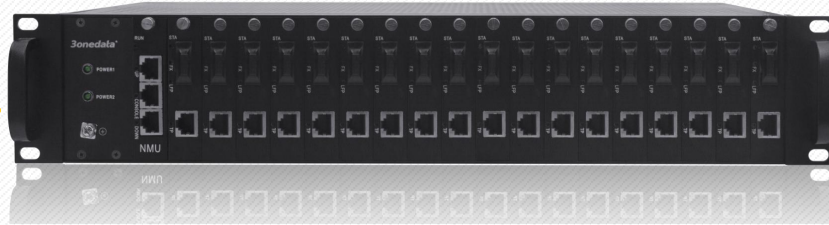
IP30 protection
-40℃-75℃ operating temperature

NUM

ECU100

ECU100M

IMC100M

IMC102GT
2 Full Gigabit Ethernet to Fiber

IMC102B-F
2-port 100M Ethernet to Fiber

IMC101M (managed)
1 Copper +1 Fiber 100M

IMC100M (managed)
1/2 Copper + 1 Fiber

Model 3012
1-port Gigabit Ethernet to Fiber

Model 1100M (managed)
1-port Fast Ethernet to Fiber

RACK2000A
14 Slot Card Rack

RACK2000B
16 Slot Card Rack

RACK2000C
16 Slot Card Rack

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Software

VSP Manager

BlueEyes_II

BlueEye Pro

Available equipment:

- Serial device server
- CAN server
- Modbus gateway
- Switch with serial port

Function:

Maintenance and Diagnostics

Serial Communication Management

Available equipment:

Management switch of 3onedata

Function:

Network communication status

Switch port state

Link broken display

Alarm log

Change device IP address

Available equipment:

Device according SNMP

Function:

Network communication status

Switch port state

Link broken display

Alarm log

Change device IP address

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Why 3onedata?

03

- Advantages & Certificates
- Key Technologies

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Advantages & Certificates

Certificates

EMC Level 4 Design

Ripple Metal Shell

-40~85℃ Working Temperature

Industry-grade Component

RELIABLITY

Low Power Consumption No Fan

Dual Power Supply Redundant Backup

IEEE802.1X Security Certification

SW-Ring<20ms Self-recovery Time

Prevent DOS Attacks

IGMP Snooping

Relay Alarm Output

INSTANTANEITY

SECURITY

VLAN Division

Flow Control

Port Mirroring

QOS

ACL

IEC 61850
IEC61850-3

EN 50155
EN-50155

IRIS Certification
IRIS

ISO 9001
ISO9001

ISO 14001
ISO14001

OHSAS 18001
OHSAS18001

UL LISTED
UL

PROFI NET
PROFINET

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SW-Ring (recovery time < 20ms)

SW-Ring
（Recovery time＜20ms）

PLC

Patent technology

Long-term market test, stable and efficient

No need to designate the master station

Any devices can be replaced and make the whole network redundancy

Maximized bandwidth utilization

Polling packets will not be transmitted normally

Support multiple network structure

Single Ring, Couple Ring, Chain, Dual homing, etc.

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Fiber & Copper Bypass

Fiber & Copper Bypass

PLC

A

B
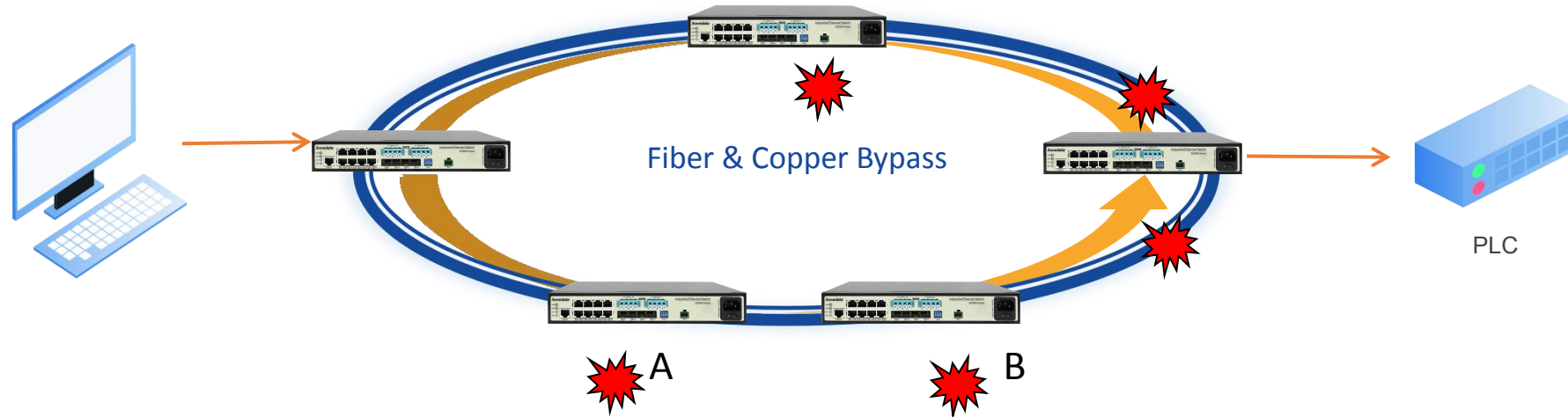
- Two ports in one switch will connect directly by physical conduction, triggered by specific state
- Bypassed switch will not process the data packet

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LACP (Port Trunking)

Trunking Process

400 Mbps
(theoretical value)

100 Mbps

100 Mbps

100 Mbps

100 Mbps

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DDM (SFP diagnosis & trouble shooting)

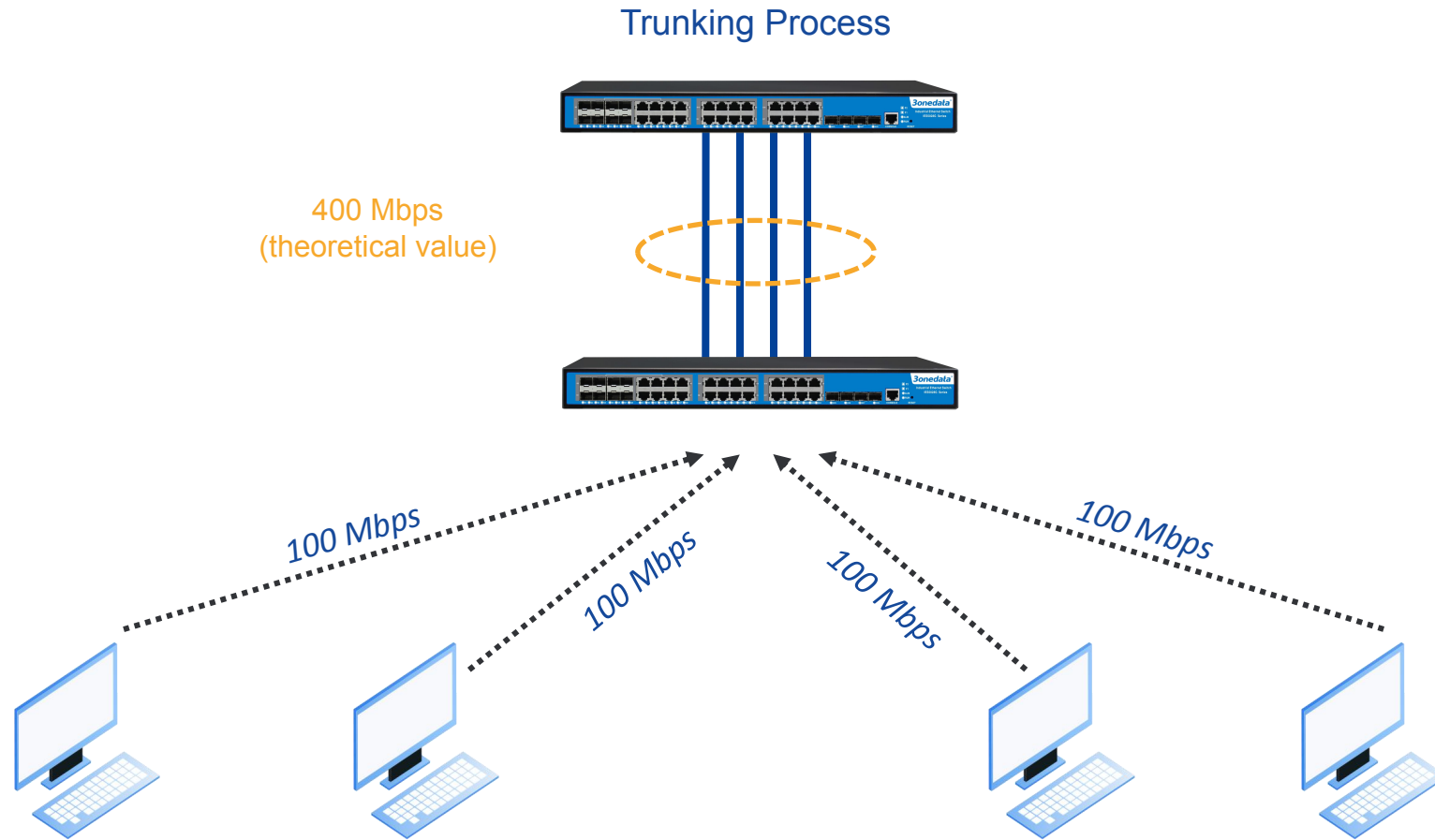|			SFP DDM Monitor									
Port	Model Name	Wavelength(nm)	Vcc(V)		Temperature(℃)		Tx Power (dBm)		Rx Power (dBm)		Bias(mA)	
			Current	Max.	Current	Max./Min.	Current	Max./Min.	Current	Max./Min.	Current	Max./Min.
G1		0	0.00	0.00	0	0/0	-inf	-inf/-inf	0.00	0.00/0.00	0.00	0.00/0.00
G2		0	0.00	0.00	0	0/0	-inf	-inf/-inf	0.00	0.00/0.00	0.00	0.00/0.00

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QoS (quality of service)

Traffic Classification

Scheduling Queue

Data Frames

HIGH
MEDIUM
NORMAL
LOW
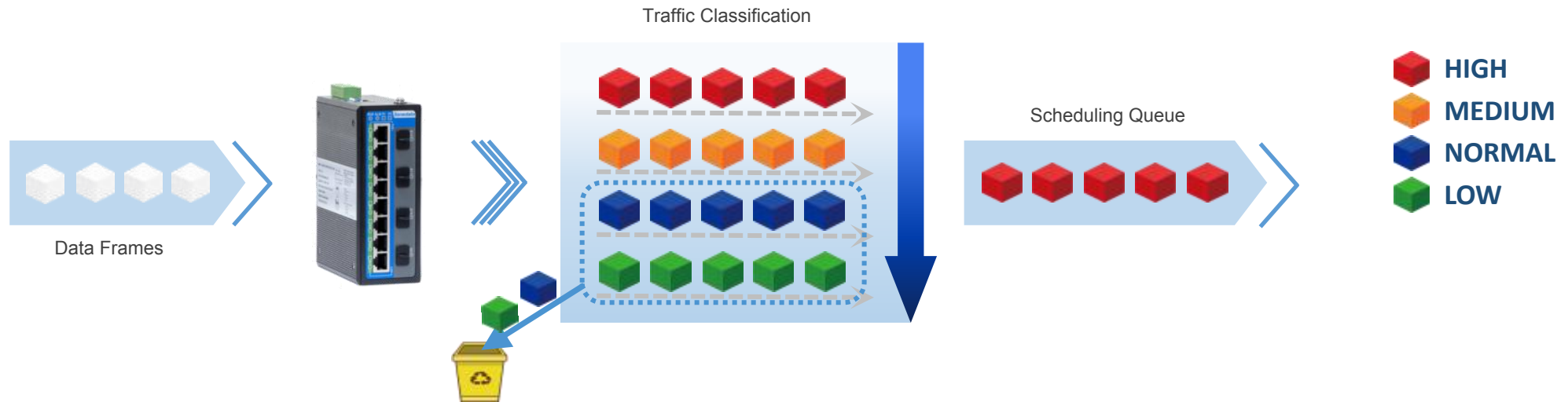
A technology used to solve problems such as network latency and congestion
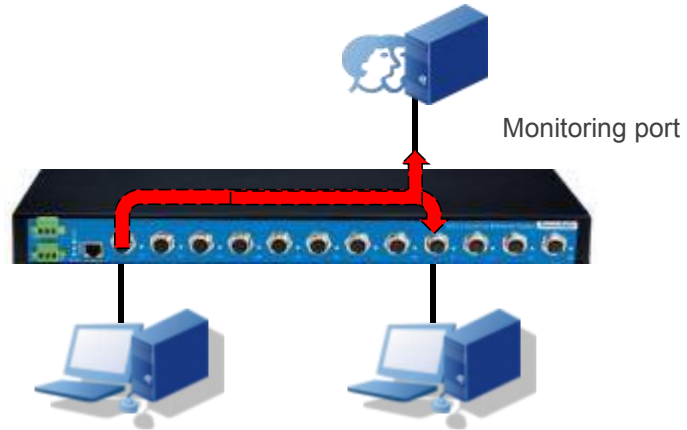
Offering different priority, guarantee a certain level of performance to a data flow

Important services are ensured not be delayed or discarded

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Port Mirroring & NAT (net address translation)

Monitoring port

- Network performance and alerts

- Analyze data and diagnose errors

192.168.5.10

192.168.5.11
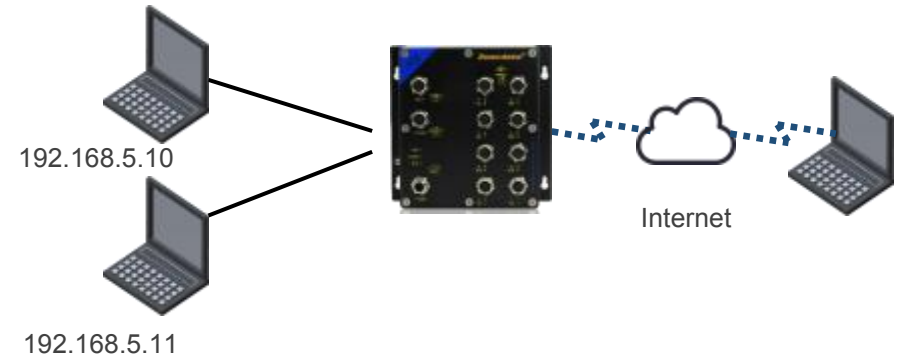
Internet

NAT Address Table:

Internal IP		External IP
192.168.5.10	←--→	200.10.1.5
192.168.5.11	←--→	200.10.1.6

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ACL (acess control list)

Rules of ACL

ACL: MAC, IP, and upper-layer
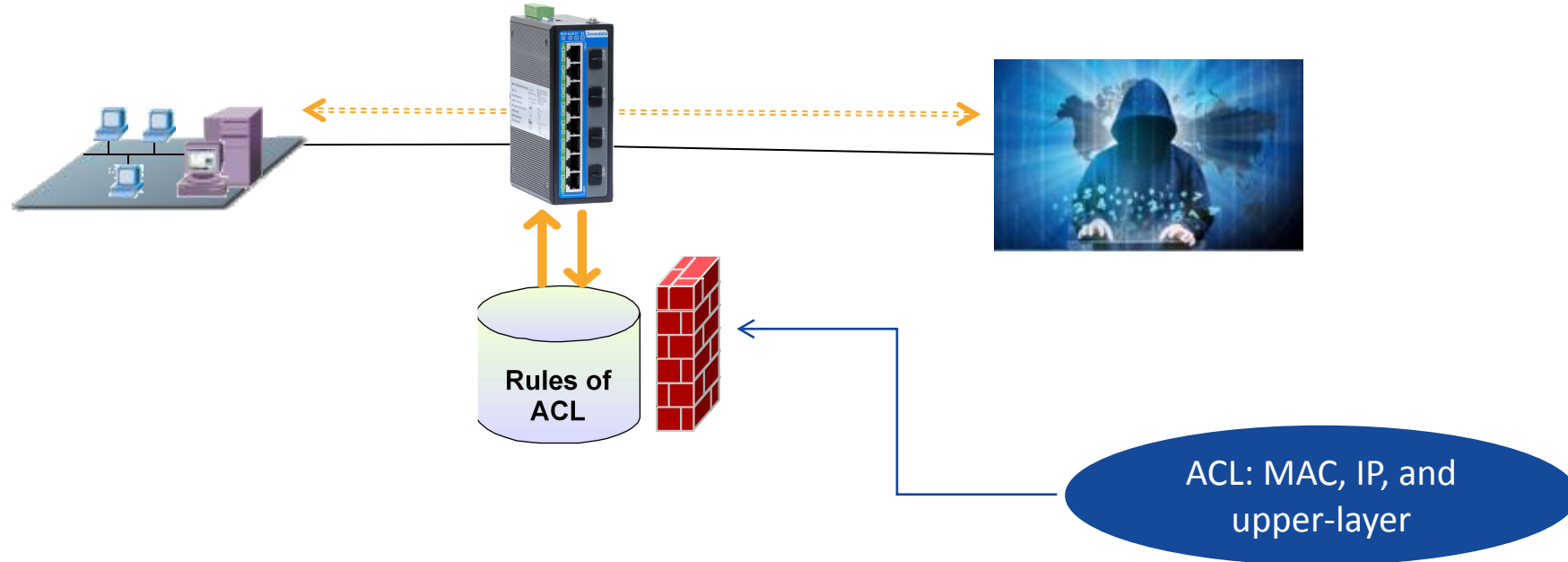
- Access list criteria could be the source/destination address of the traffic
- Address : MAC, IP and upper-layer protocol based on port
- Based on different time period

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PoE Siwtch Reduces Field Wiring

PoE IP Camera

Data+Power

Data+Power

PoE Wireless

Data+Power

Power

Data+Power

Fiber+Data

Fiber Media Converter

PoE Splitter

PoE Switch

VoIP Phone

PoE VoIP Phone

Network Center / Monitoring Center

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04

Solutions & Case Sharing

- Solutions
- Case Sharing

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CCTV Solution

Video Surveillance

IPS2000G Series

IPMC100 Series

Tunnel Monitoring

IES6320 Series
Industrial PoE Switch

10Gigabit

ICS5028G Series
Industrial Ethernet Switch

SW-Ring PoE+ Gigabit

IES6312 Series

IES6312 Series

Gigabit

IES6312 Series

SW-Ring

IES6210 Series

a b g **WiFi** n a PoE Gigabit IP67

IAP2600 Series
Industrial Outdoor Wireless AP

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Traffic Information

IMC102GT Series

LED

Information Board

Wireless Coverage

NP301 Series
Serial Device Server

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Rail Transit Solution

Train PIS System

LCD Screen

Emergency Alarm

IRIS Certification

EN 50155

EN 50121

IEC61373

EN45545

TNS5800D Series EN50155 Industrial Switch

M12 PoE BYPASS Gigabit IP67

3onedata Inside

3onedata Inside

TNS5800 Series
EN50155 Industrial Switch

M12 PoE BYPASS Gigabit

3onedata Inside

On-board Embedded
Wireless AP

On-board Embedded Switch

On-board Embedded Switch

Bus

TNS5500D Series M12

IAP2312 Series
Industrial Indoor Wireless AP

3onedata

Automation Solution

Industrial Vision Systems

ICS5028G Series
Industrial L3 Ethernet Switch
10Gigabit
VRRP

10Gigabit

TNS5500D
Industrial L2 Ethernet Switch

High Speed
Industrial Camera
750Mbps

Material Warehouse

Workshop

Finished Product Warehouse

IES7110 Series

NP318T Series
Serial Device Server

SW-Ring

IES618 Series

IES6116 Series

3G/4G

IPS2000G Series
Industrial PoE Switch
PoE

3onedata

IGW1114 Series
DIN-rail
Modbus Gateway

Temperature
Sensor

Humidity
Sensor

IRT5300 Series
Industrial Cellular Router

PROFI
NET

MRP IEC62439-2

IES6220 Series

PLC

IAP2312 Series
Industrial
Indoor Wireless AP

Fire Detector

Sprinkler

Fire Detector

Sprinkler

3onedata
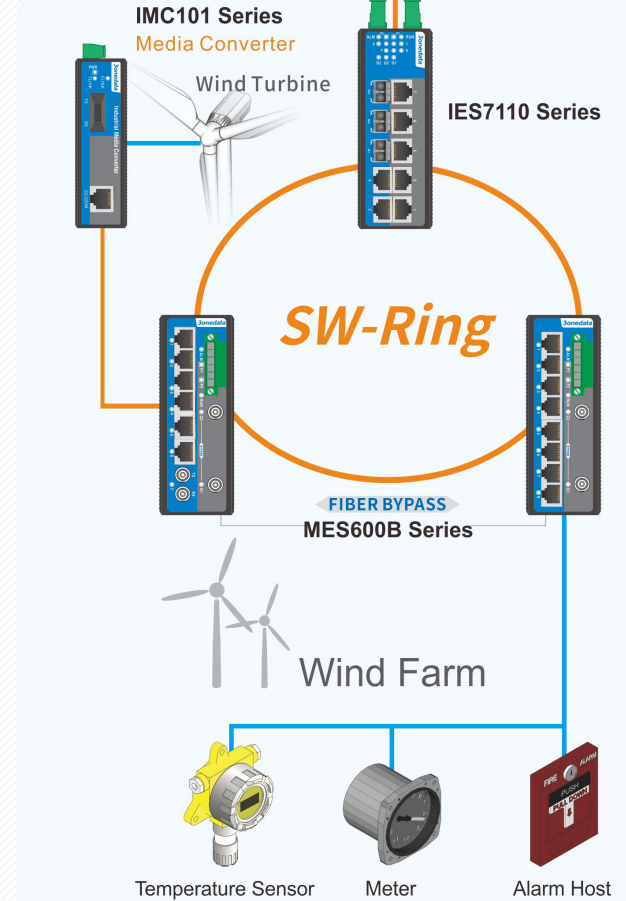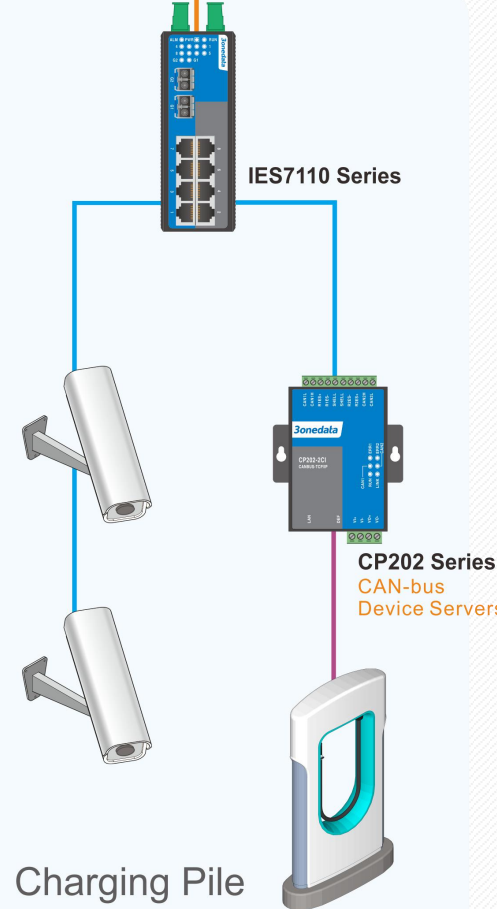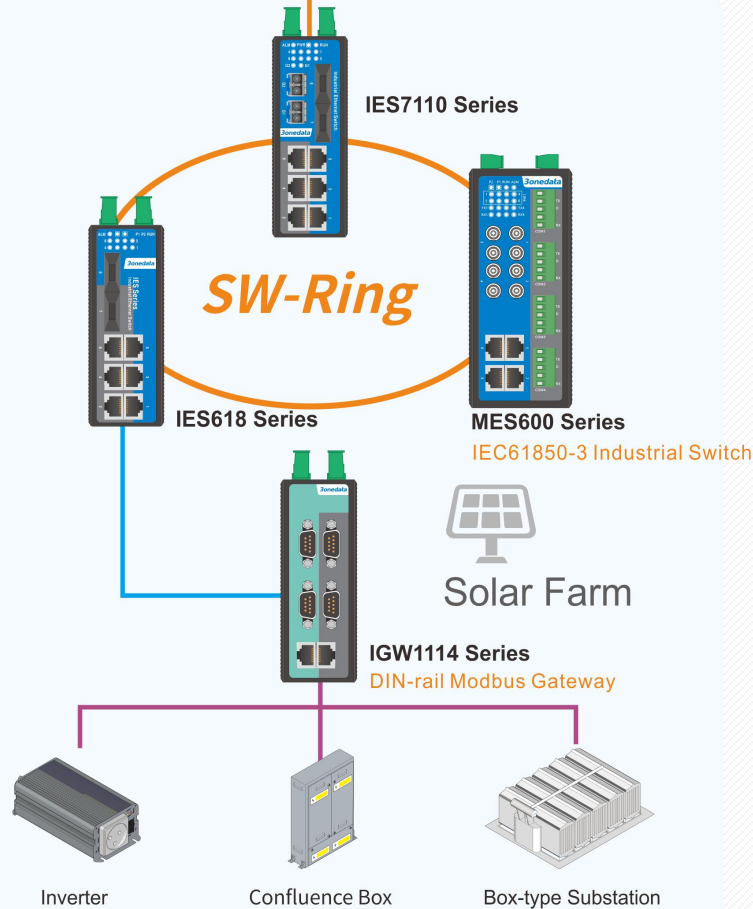
Smart Grid Solution

IEEE1613
IEC61850-3

⊙ Professional industrial switch
⊙ Complies with IEEE1613,IEC61850-3 standard
⊙ Stable operation in harsh environment

Substation

MES5600 Series
IEC61850-3 Industrial Switch

IES7110 Series

SW-Ring

IES618 Series

MES600 Series
IEC61850-3 Industrial Switch

Solar Farm

IGW1114 Series
DIN-rail Modbus Gateway

Inverter

Confluence Box

Box-type Substation

IES7110 Series

CP202 Series
CAN-bus
Device Servers

Charging Pile

IMC101 Series
Media Converter

Wind Turbine

IES7110 Series

SW-Ring

FIBER BYPASS
MES600B Series

Wind Farm

Temperature Sensor

Meter

Alarm Host

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Emergency System of Beijing Metro

- Automatic serial data transmission between railroad stations
- Compat design to fit in existing enclosures
- Wide range of operating temperatures for performance in diverse weather conditions
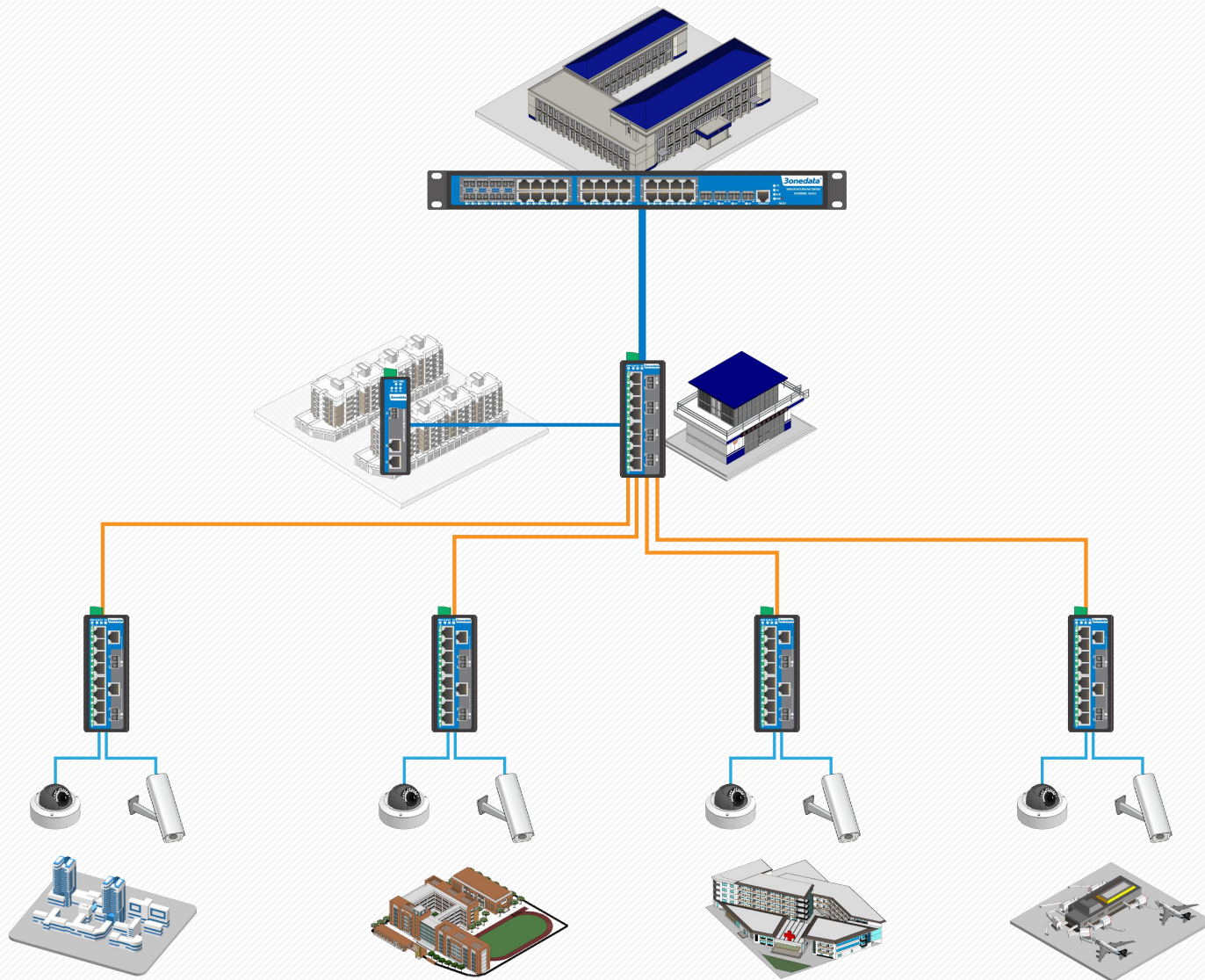- Industrial grade design with long product life cycle
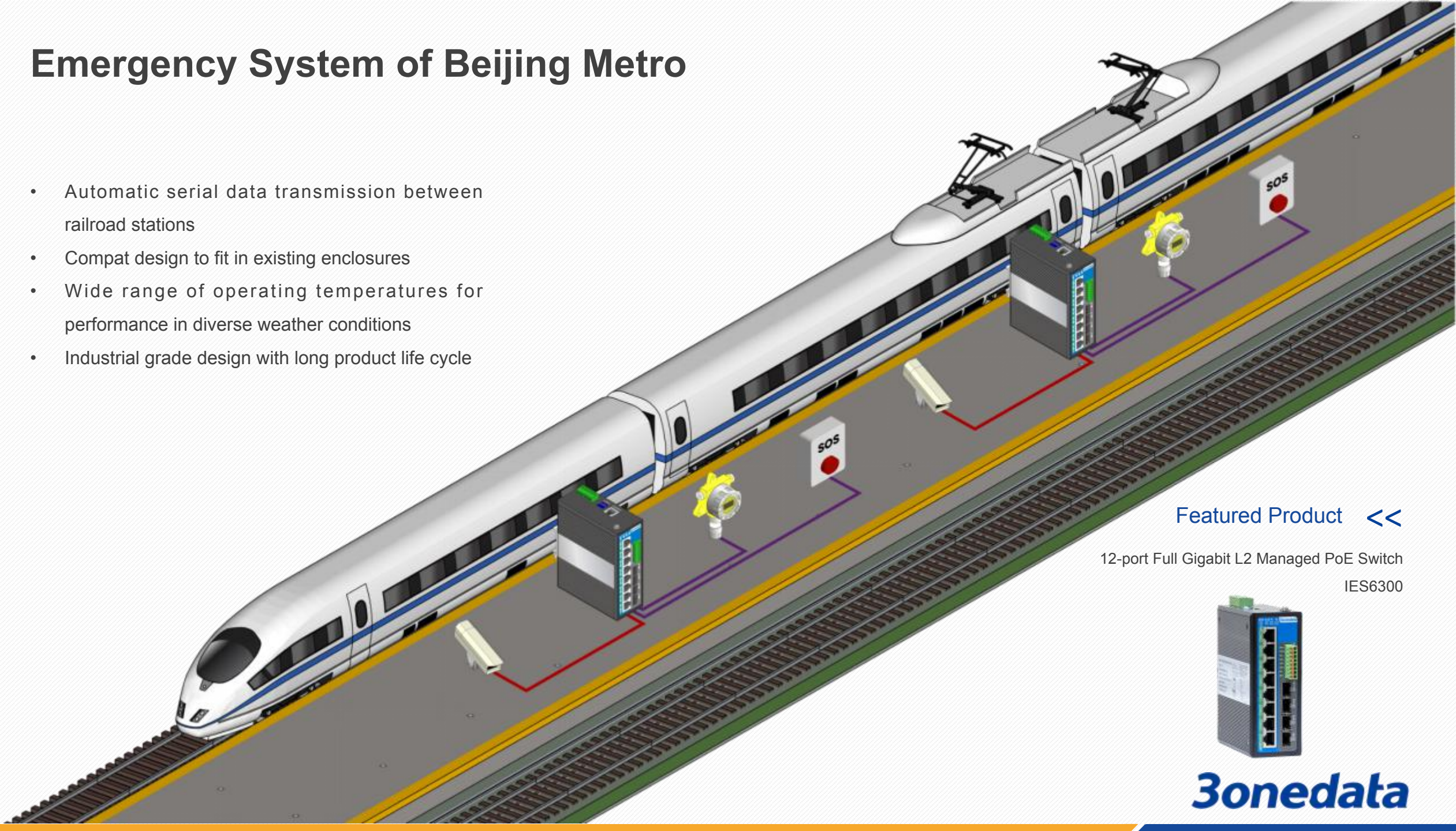
Featured Product <<

12-port Full Gigabit L2 Managed PoE Switch
IES6300

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Public Video Surveillance System in Turkey

- Industrial grade design for outdoor use in harsh environments
- Max 120km distance of fiber transmission
- Rich network management, seperate devices with different business-type in LAN
- High bandwidth guarantees the video fluent
- Easy installation and maintenance, convenient to expand

Featured Products <<

ICS5028G

28-port 10G L3 Managed Switch

IES6312

12-port Full Gigabit L2 Managed PoE Switch

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Traffic Signal Control and Coordination System in France

- 12~48VDC/24VAC wide voltage input, high ability in resisting voltage fluctuation
- Remote monitoring of equipment operational condition and data transmission reduces maintenance cost
- Rugged design for use in harsh environment.

Recommend Product

IES6300

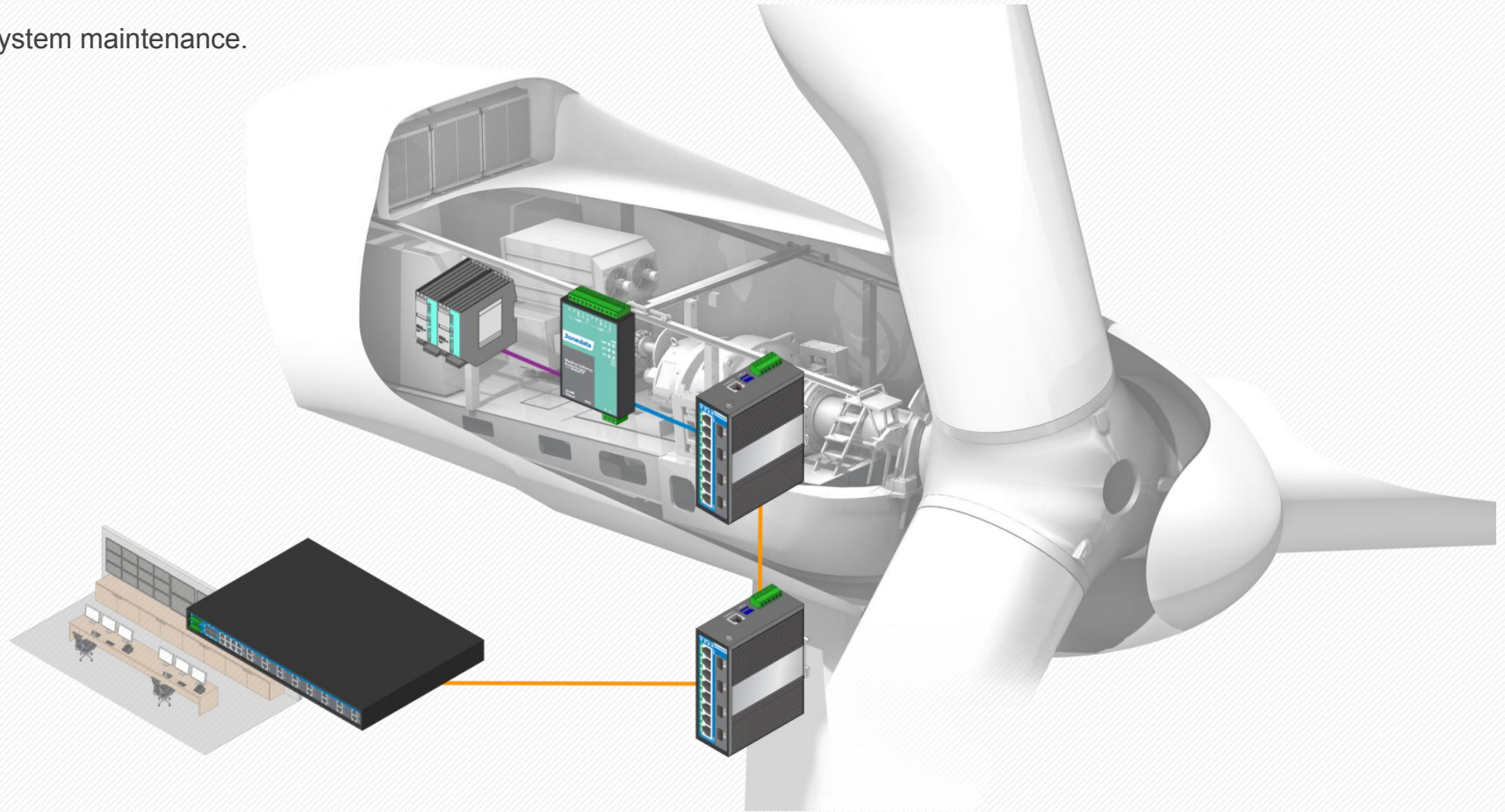12-port Full Gigabit L2 Managed PoE Switch

3onedata
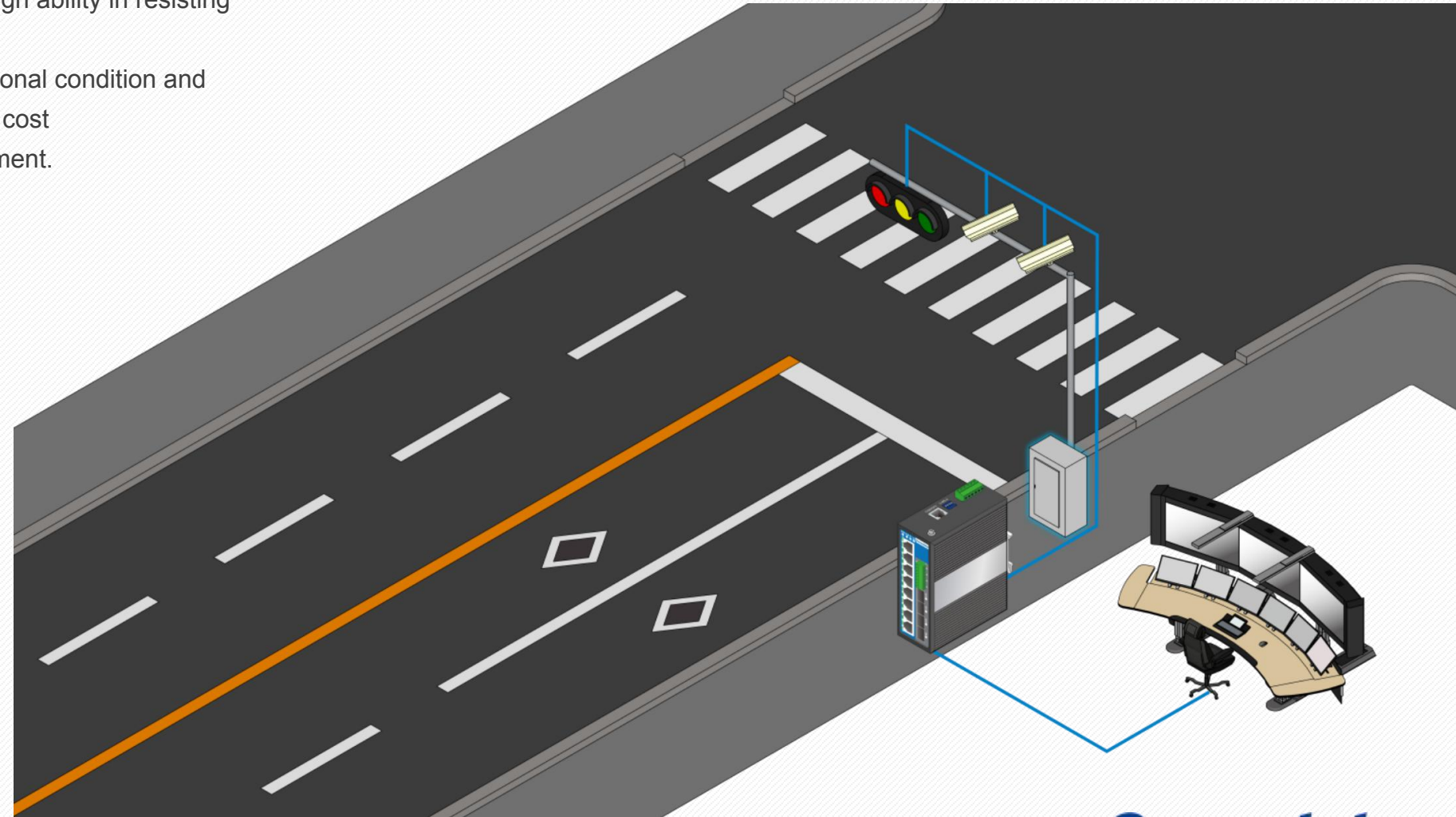
Wind Turbines Remote Monitoring & Control System in Xinjiang

- Long MTBF with high reliability and effective system maintenance.
- Small size for easy configuration.
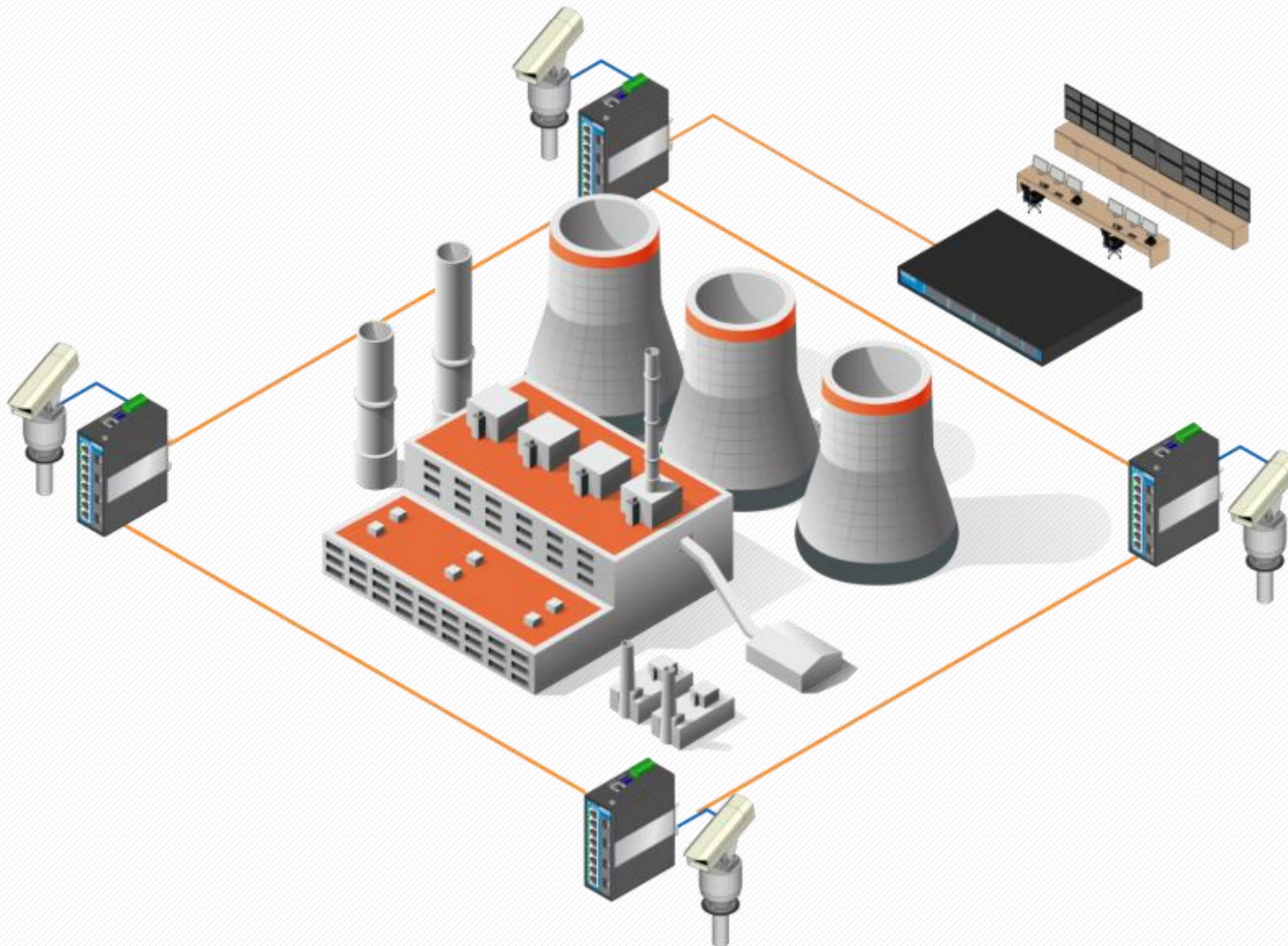- Rugged design for use in harsh environment.

Recommend Product

IES6312

12-port Full Gigabit L2 Managed PoE Switch

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Industrial Park Monitoring System in Spain

- Control center engages in remote monitoring and control of field site equipment and surveillance of pipelines
- Network equipment suitable for wide temperature ranges, high humidity, dusty and even explosive environments
- Fiber optics cascade for long distance tranmission

Featured Products <<

IES6312

12-port Full Gigabit L2 Managed PoE Switch

IES6210

12-port 100M L2 Managed PoE Switch

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Thank you !

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