Lantech Company Overview and Product Solutions/ Technology Presentation

Version 5.1, Feb 2019

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Agenda

1: Lantech Company background

2: Lantech Vertical Markets overview

3: The Major Lantech solutions portfolio

4: Our Value positions

5: Lantech solutions advantages

6: Lantech Wireless and Mobile 4G router product introduction

7: Case study

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Lantech Company Background Milestones

1986~2005	• Setup to promote Novell software in Taiwan • Focus SMB and Enterprise markets • Separate Lantech brand and OEM division for commercial switches and routers
2005	• Start Industrial Switch development with Pro-ring topology
2007	• Focus on Industrial Switch+Giga uplinks with PoE surveillance applications
2008~2010	• Build Linux platform for 3,5 series with advanced features and Enhanced G.8032 ring • Differentiate 2 series with close platform with advanced 3/5 series • More POE solutions to support 12V/24V applications, like solar panels and car batteries
2011	• Release railway PoE switch solutions with different input range : 24V,72V,110V WV with High PoE budget • IP67/IP65/IP54/IP41 housing
2014-till now	• New WIFI /Mobile routers for Railway and industrial applications • Load balancing + TWDP & TWCC technology

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Major Lantech Markets

City Surveillance

- Public Safety
- Traffic Control
- City Building

Railway Trains and Metro

- Passenger WIFI
- Infotainment
- PIS
- Intercom
- CCTV

Vehicle and Bus

- Ticketing, CCTV
- Passenger WIFI
- Route info
- Multi-media

Highway and Tunnel

- CCTV
- Traffic and lane signaling control
- Emergency phone
- Light and ventilation

IoT

- Pipeline
- Aquaculture
- Traffic light

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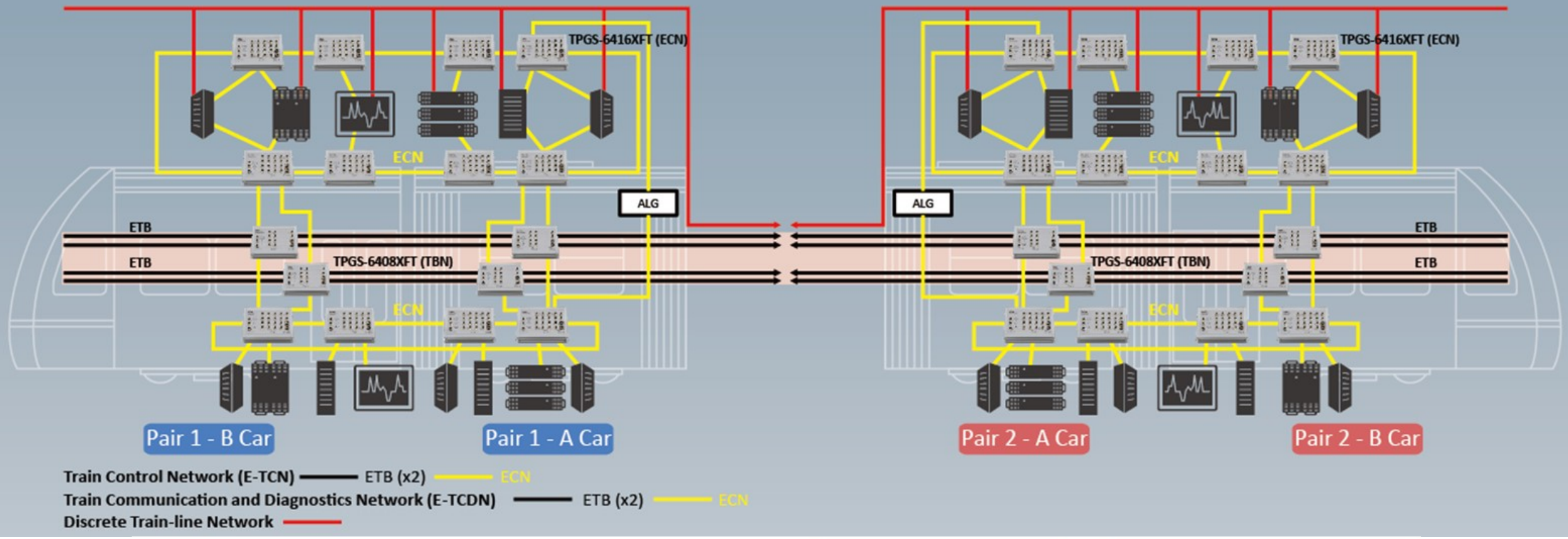
Onboard/Trackside Communications



L3 Lite

IEC 61375 2-5/3-4

10G Fiber or Copper

- √ Layer 3 Lite (L3L/TBN model)
- √ 10G Fiber or Copper Uplinks
- √ Inrush Current Limit
- √ Up to 80W PoE w/PoE & System Isolation
- √ IEC 61375-3-4 & IEC 61375-2-5 (TBN model)
- √ Wide Voltage Input 16.8~137.5VDC
- √ EN 50155:2017, EN 55032, EN 50124, EN 12663, EN45545-2, IEC 60571 Certified

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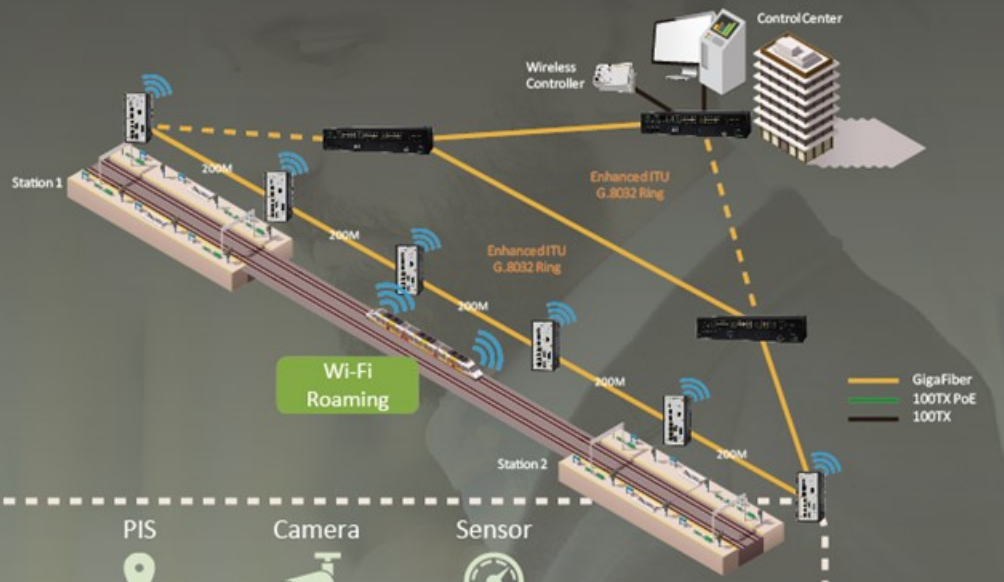
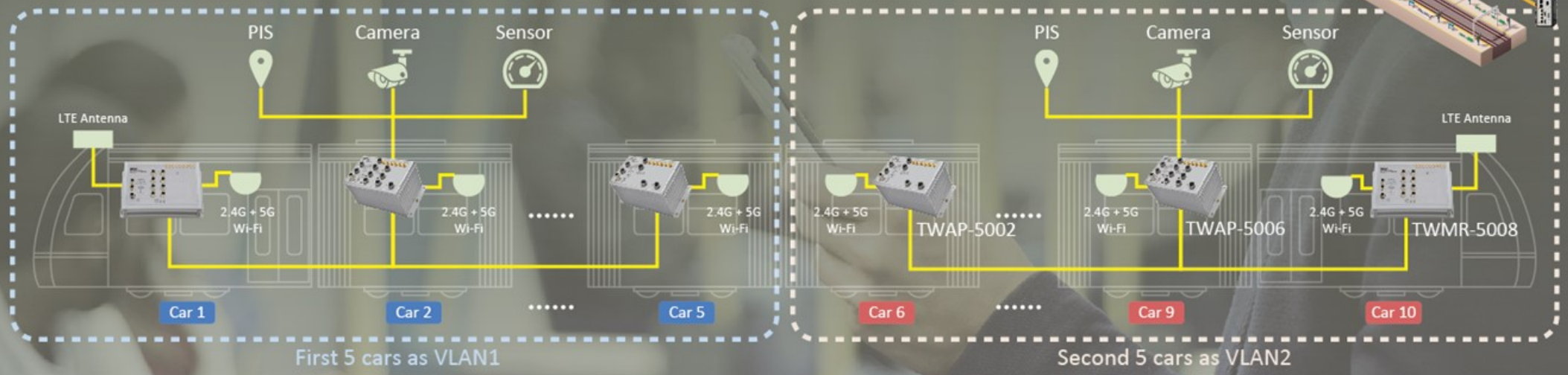
Onboard/Trackside Communications

- √ Two LTE WAN Load Balancing
- √ Quad SIM Design
- √ LTE & Wi-Fi Redundancy
- √ EMMC Flash Storage**
- √ eSIM Chip Built-in
- √ VPN router for Multi-site VPN, OpenVPN, L2TP, IPSec, L2 over GRE
- √ TWCC (Train Wireless Carriage Coupling)
- √ Concurrent Dual Band 2.4G+5G Wi-Fi
- √ Up to 80W PoE Budget
- √ Built-in L2+ Managed Switch Function**

**Optional





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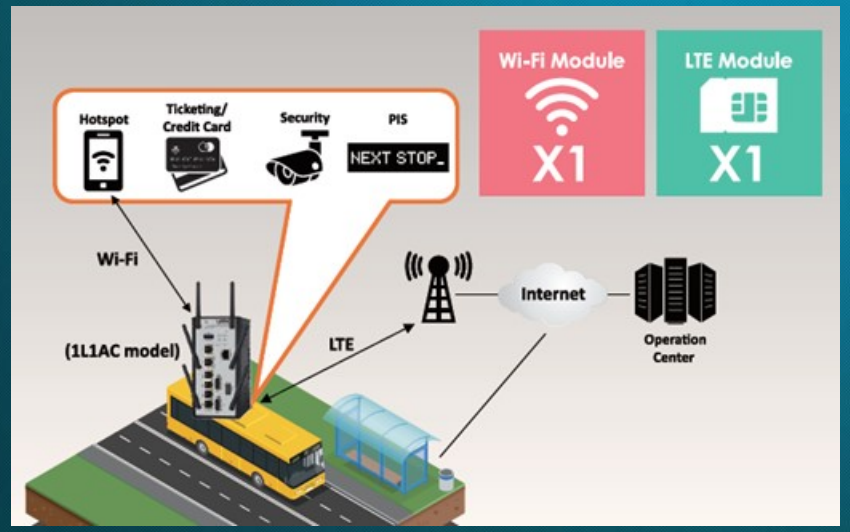
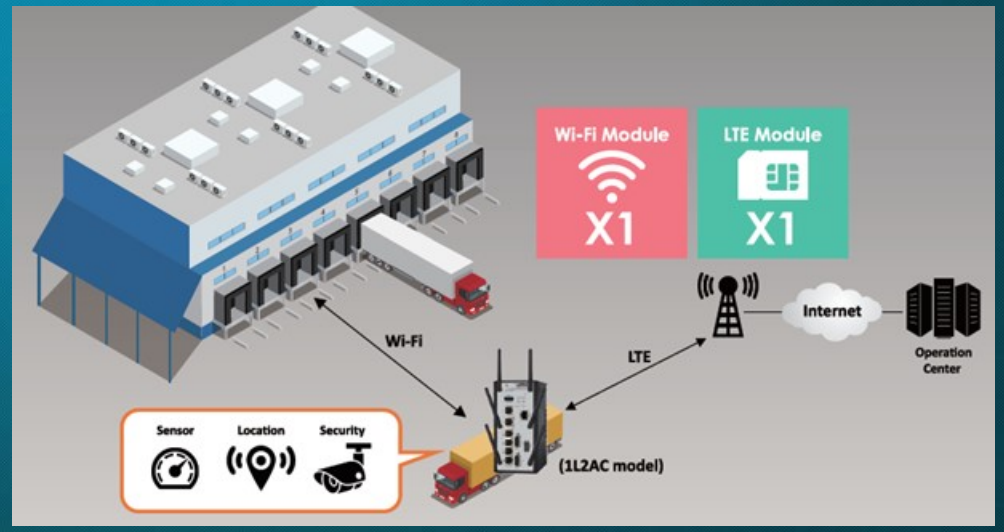
Vehicle Communications

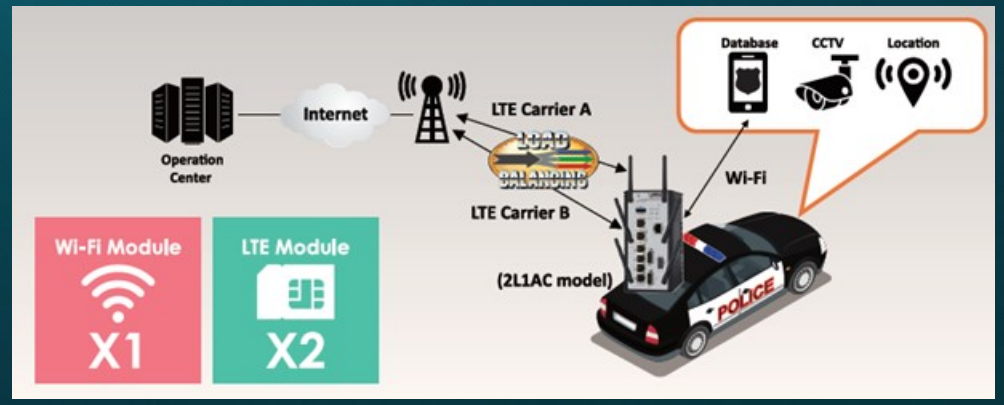




Features at a glance Lantech Multi-function Routers

- √ Two LTE WAN Load Balancing
- √ Quad SIM Design
- √ LTE & Wi-Fi Redundancy
- √ Ignition Sensing Design
- √ EMMC Flash Storage**
- √ eSIM Chip Built-in
- √ 2 RS422/485 w/isolation or 2 RS232 ports
- √ Up to 3 Modules (Wi-Fi / LTE module)
- √ Up to 80W PoE Budget
- √ Supports AP/Bridge /Client modes
- √ L2+ Managed Switch Function
- √ VPN router for Multi-site VPN, OpenVPN, L2TP, IPSec, L2 over GRE

**Optional



Features at a glance Lantech Ethernet Switches

- √ Ignition Sensing Design
- √ 12/24VDC PoE Booster
- √ ITxPT Compliant
- √ E-Marking Certified for Vehicle
- √ 802.3at Standard, Up To 30W/port
- √ ISO 7637 Certified for Vehicle

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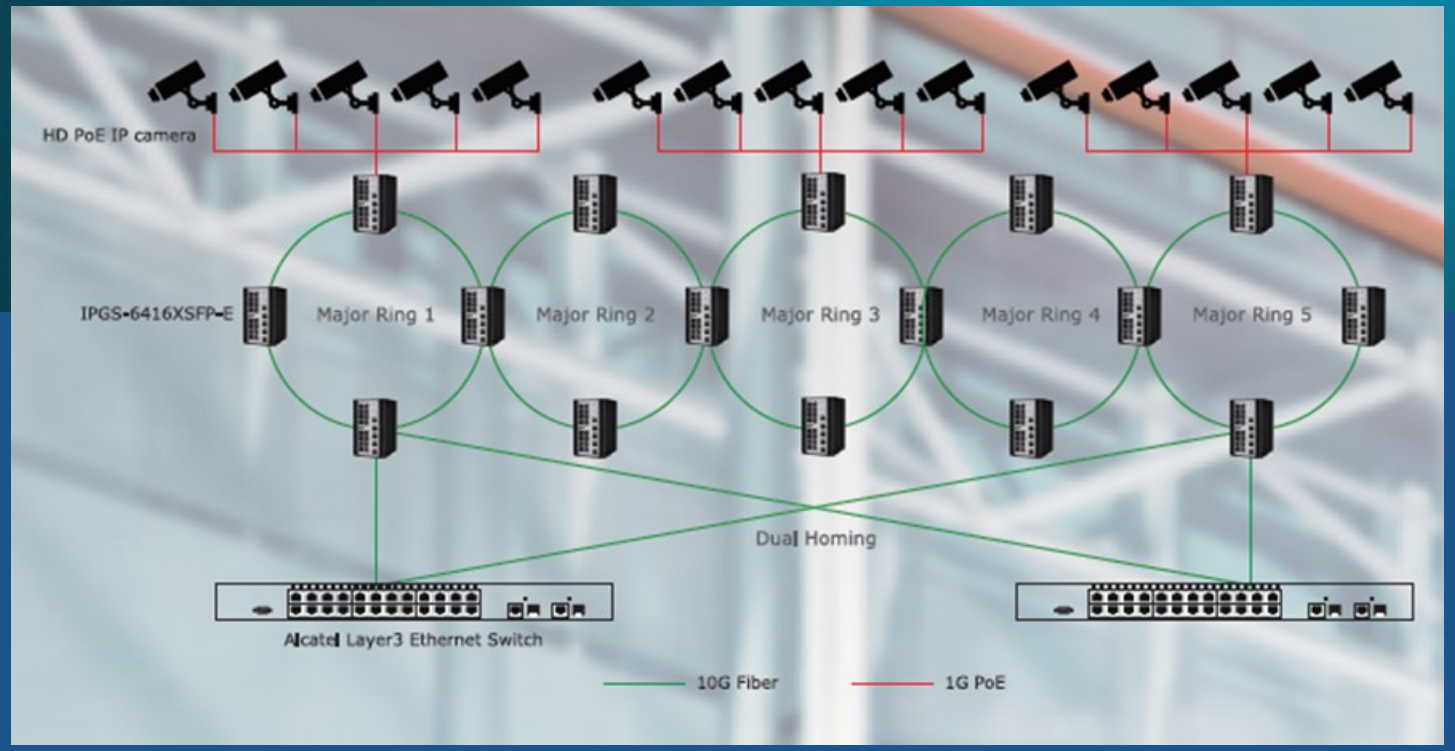
Surveillance Systems



- √ 10G SFP+/Copper Uplinks
- √ 802.3at Standard, Up To 30W/port
- √ IGMP v1/v2/v3
- √ Complete PoE Managed/Unmanaged Models

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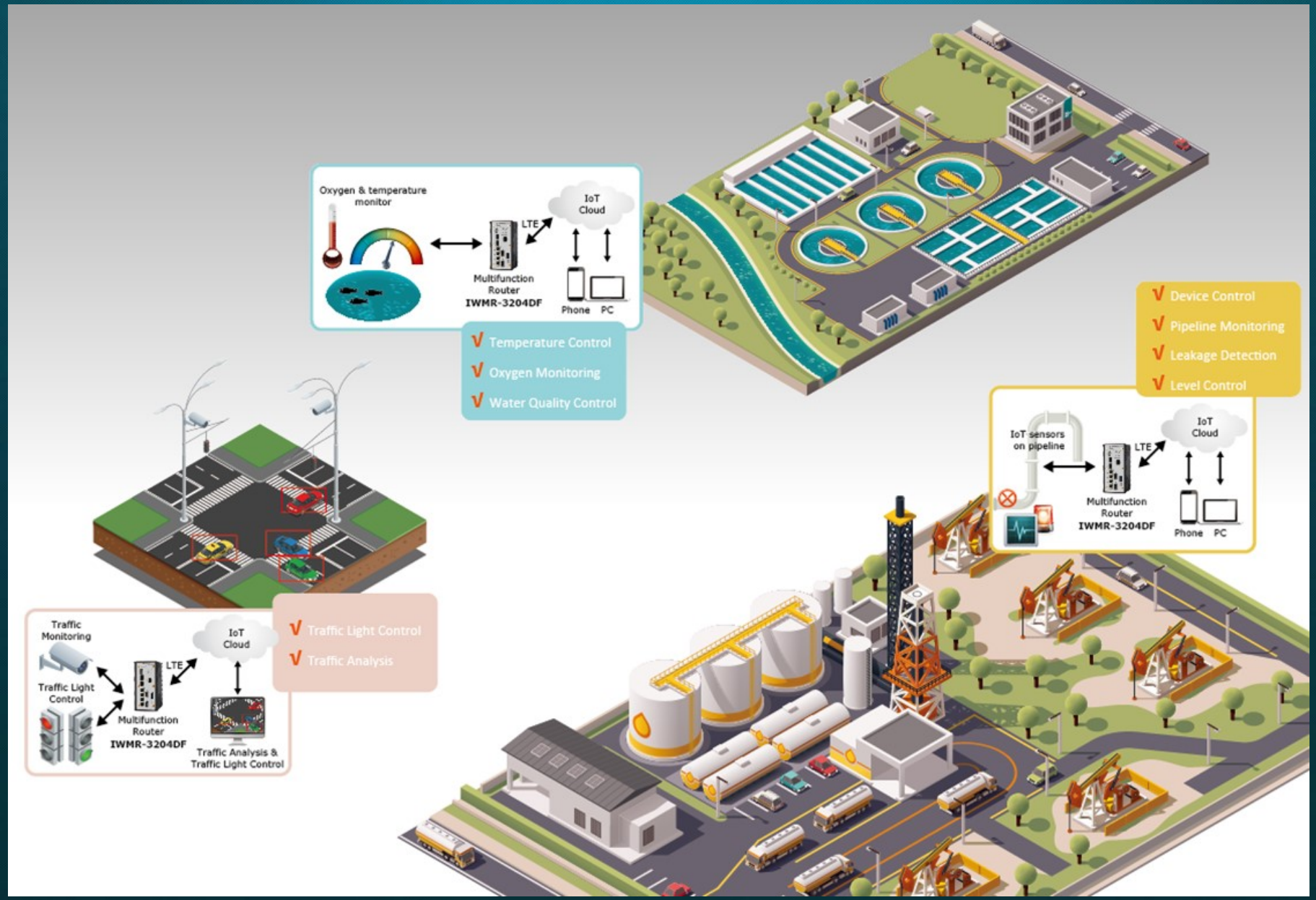
IoT Solutions



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Our Value Positions

Truly Industrial Solution Provider

- EN50155/ E-marking for Railway/Metro/Vehicle
- IEC-61850-3 for Energy market
- DNV for maritime and offshore
- Mining, Oil and Gas.

Strong POE Product Lines-up

- 5-28port various options
- Full Gigabit with managed and unmanaged options
- 1G, 2.5G, 10G fiber uplink
- Sufficient POE power budget
- Down to 12V/24V booster design for solar panel and battery power source
- 802.3af at ,bt

Between Wire and Wireless Solution

- Lantech Enhanced ITU Ring
- Link Train discovery protocol (LTDP)
- Train Wireless discovery protocol (TWDP)
- Train Wireless Carriage Coupling (TWCC)
- LTE load balancing technology
- Lantech Air-teaming technology

Open software platform by Linux

- User friendly UI
- Config with ease
- Tune up easily
- Easy to expand

Customization Service

- Networking Compatibility issue
- Software customization
- Special requests case by case

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Communication Solutions (Wired)

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Lantech Managed Ethernet Switches

OS4 NEW!

Optional ☑ R-NAT ☑ L3 ☑ TBN ☑ L3L ☑ ECN

OS3 NEW!

Optional ☑ L3 ☑ TBN ☑ L3L ☑ ECN

OS2 NEW!

Optional ☐ L3 ☐ TBN ☐ L3L ☑ ECN

OS1

Optional ☐ L3 ☐ TBN ☐ L3L ☑ ECN

2000 series

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Lantech Managed Ethernet Switches

L2+ Functions Comparison

		2000 series	OS1	NEW! OS2	NEW! OS3	NEW! OS4
Management	SNMP v1 v2c v3	●	●	●	●	●
	Web browser	●	●	●	●	●
	Telnet	●	●	●	●	●
	SSH		●	●	●	●
	SNTP	●	●	●	●	●
	LLDP	●	●	●	●	●
	CDP		●	●	●	●
	Topology View		●	●	●	●
	Environment Monitoring		●	●	●	●
Redundancy	STP	●	●	●	●	●
	RSTP	●	●	●	●	●
	MSTP		●	●	●	●
	Loop Protection		●	●	●	●
	Proprietary redundant protocol	ProRing2se	ITU-Ring Enhance mode	ITU-Ring Enhance mode	ITU-Ring Enhance mode	ITU-Ring Enhance mode
	MRP				●	●
	Dual Homing		●	●	●	●
	G.8032 standard		●			
Security	MAC filter	●	●	●	●	●
	IP Security(What IP can access switch)	●	●	●	●	●
	Login Security (RADIUS)		●	●	●	●
	SSL		●	●	●	●
	Login Security (TACACS+)		●	●	●	●
	ACL	●	●	Ingress Only	●	●
	IEEE 802.1X	●	●	●	●	●
	IP Source Guard		●		●	●
	ARP inspection		●		●	●
	BPDU Guard		●		●	●
	Remote admin (limitation of accessing way)		●	●	●	●
VLAN	Port Based VALN	●	●	●	●	●
	Tagged VLAN	●	●	●	●	●
	GVRP		●	●	●	●
	QinQ		●		●	●
	Protocol Based				●	●
	Subnet Based				●	●

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Lantech Managed Ethernet Switches

L2+ Functions Comparison

		2000 series	OS1	NEW! OS2	NEW! OS3	NEW! OS4
Multicast	IGMP Snooping	●	●	●	●	●
	MLD Snooping				●	●
	IGMP router port		●	●	●	●
	Static Multicast forwarding	●	●	●	●	●
	GMRP		●	●	●	●
Traffic control	Rate Limiting	●	●	●	●	●
	Link aggregation	●	●	●	●	●
	Port based QoS	●	●	●	●	●
	VLAN based QoS		●	●	●	●
	CoS/DSCP	●	●	●	●	●
	Small-frame arrival rate				●	●
	Protocol storm protection				●	●
	Port Monitoring				●	●
DHCP	IP v6 version				●	●
	IP v4 version	●	●	●	●	●
	Port Based DHCP	●	●	●	●	●
	MAC based DHCP		●	●	●	●
	Option82 DHCP Relay		●	●	●	●
	Option 12/42/66		option 66 only	option 66 only	●	●
	DHCP Snooping		●	●	●	●
	PXE application				●	●
PoE	Alive Detecting	●	●	●	●	●
	PoE Scheduling	●	●	●	●	●
Event&Log	SysLog client&server	●	●	●	●	●
	Email	●	●	●	●	●
	SNMP Trap	V1/V2c	●	●	●	●
	Relay	●	●	●	●	●
	Digital Input/Output		●	●	●	●
	Triggered by event of environment		●	●	●	●
	Triggered by event of SFP DDM		●	●	●	●
Diagnostic	Ping		●	●	●	●
	ARP		●	●	●	●
	DDM information	●	●	●	●	●
Maintainance	Firmware upgrading	WEB/TFTP	WEB/TFTP/FTP	WEB/TFTP/FTP	WEB/TFTP/FTP	WEB/TFTP/FTP
	Configuration file import/export	WEB/TFTP	WEB/TFTP/FTP	WEB/TFTP/FTP	WEB/TFTP/FTP	WEB/TFTP/FTP
	Auto Provision		●			
	Dual Image			●	●	●

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Lantech IP30 Ethernet Switches

12V booster 48V

10G

Layer 3

Various 12V PoE models: Unmanaged to Managed

10G Ethernet uplinks without fan

Layer 3 upgradable OS3 Platform OS4 Platform

DIN rail high ports, up to 8 100M/1G SFP + 4 1G/2.5G/10G SFP+

*spec may vary by model

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Lantech IP30 Ethernet Switches

Passed various tests

EN55032 | EN55024 | ±2000V EFT | ±4000V ESD (Contact) | ±8000V ESD (Air)

*EMI, EMS, EFT, ESD safety testing standards may vary by model

EN55032 = protection to the radio spectrum & radio service without debilitating interference.

EN55024 = include Electrostatic Discharges (ESD), Electrical Fast Transients (EFT), Surge, Power Frequency Magnetic Fields, Power interruptions, Radio Frequency Interference (RFI)

EN61000-6-2

- **EN61000-4-2 =** Electostatic discharge **Contact: ± 4KV ; Air: ± 8KV**
- **EN61000-4-3 =** Electromagnetic field **80 to 1000 MHz; 10 V/m, 80% AM (1kHz)**
- **EN61000-4-4 =** Burst / fast transients **± 2KV input DC power ports**
- **EN61000-4-5 =** Surge / show transient **Line to Line: ± 2KV (DC power port, peak)**
- **EN61000-4-6 =** Conducted radio frequency **0.15 to 80 MHz; 10V, 80% AM (1kHz)**
- **EN61000-4-8 =** PF magnetic fiels **50 or 60 Hz; 30 A/m**

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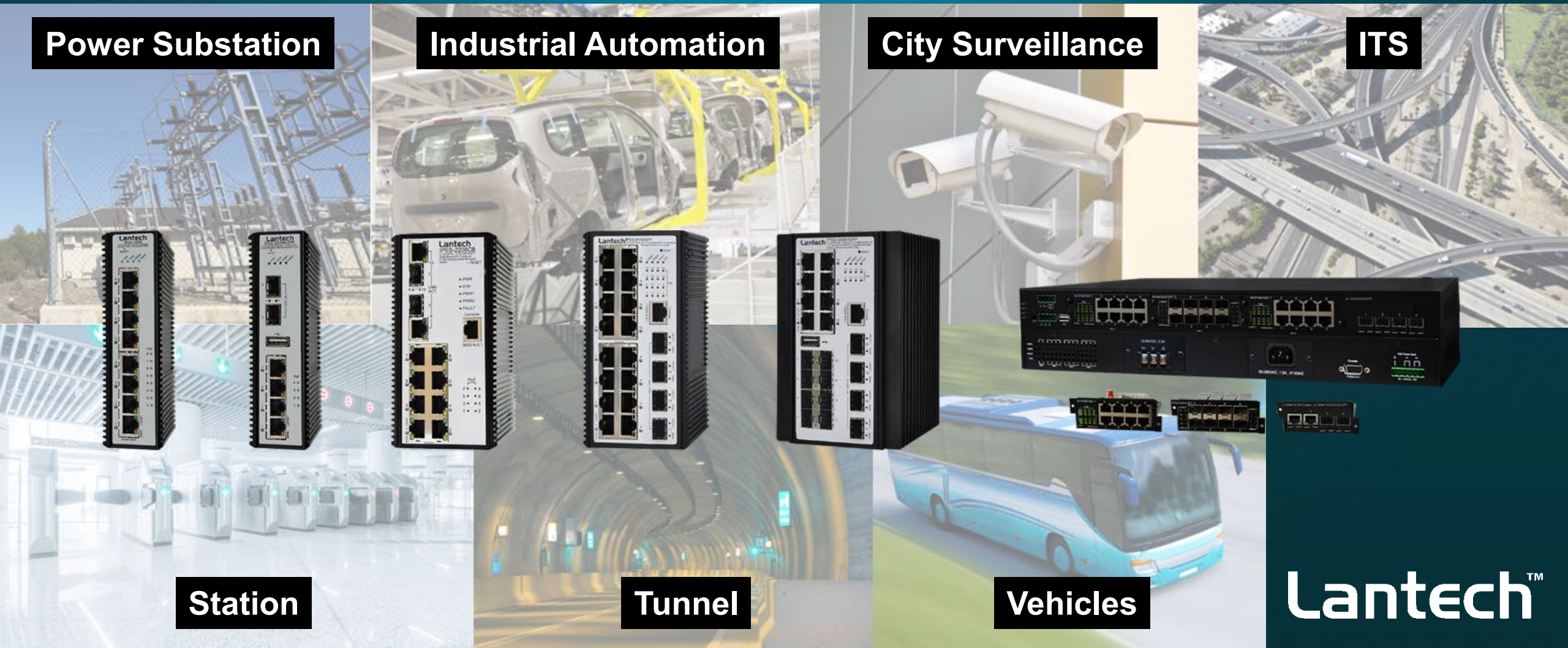
Lantech IP30 Ethernet Switches

Designed for Various Applications!



Lantech EN50155 Rolling Stock Switches

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Lantech EN50155 Railway Solution

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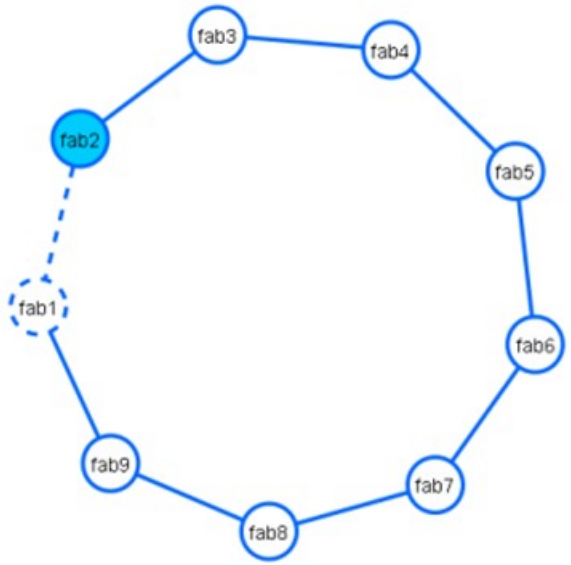
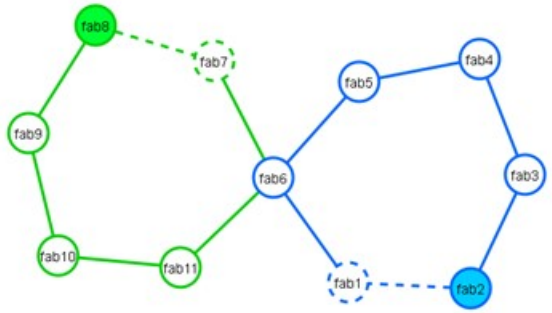
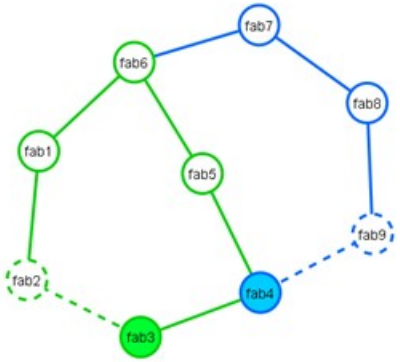
Lantech Enhanced G.8032 Multiple Ring/ Chain Protection Covering Data & Multicast.

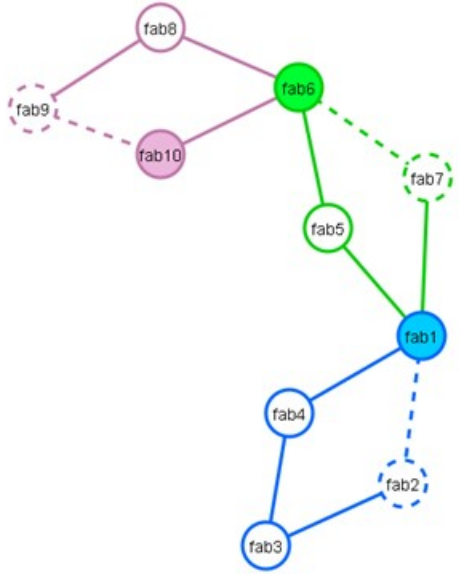
Faster multicast recovery than other competitors, don't need to wait until IGMP table timeout refresh

Lantech Exclusive









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Lantech Software Features – Enhanced G.8032 ring Covers Multicast

OS1 Platform

Mode	Auto	Basic	Enhanced	Multiple Train	LTDP**
Property	Lantech Proprietary	Standardized	Lantech Proprietary	Lantech Proprietary	Lantech Proprietary
Benefit	• Simple setting (only need to assign ring port, the other options will be defined automatically by switch)	• Compatible with the other brands	• Redundancy between Rings • Multi-cast redundancy (G.8032 + IGMP Router Port to duplicate the packet)	• Each car is an independent ring, coupled by dual uplinks • Support up to 64 cars • Robust redundancy	• Automatically assign proper IP address to complete original topology • Config. Inheritance • Convenience
Topology	Single Ring	Single Ring	Verified 11 (Fixed IP)	Multiple Ring (Fixed IP)	Single Ring (Dynamic IP)

OS2 Platform OS3 Platform

OS4 Platform

**Optional

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System Status for Input Voltage, Current and Ambient Temperature to be Shown in GUI and Alerts Sent if Any Abnormal or Anomalies Occur

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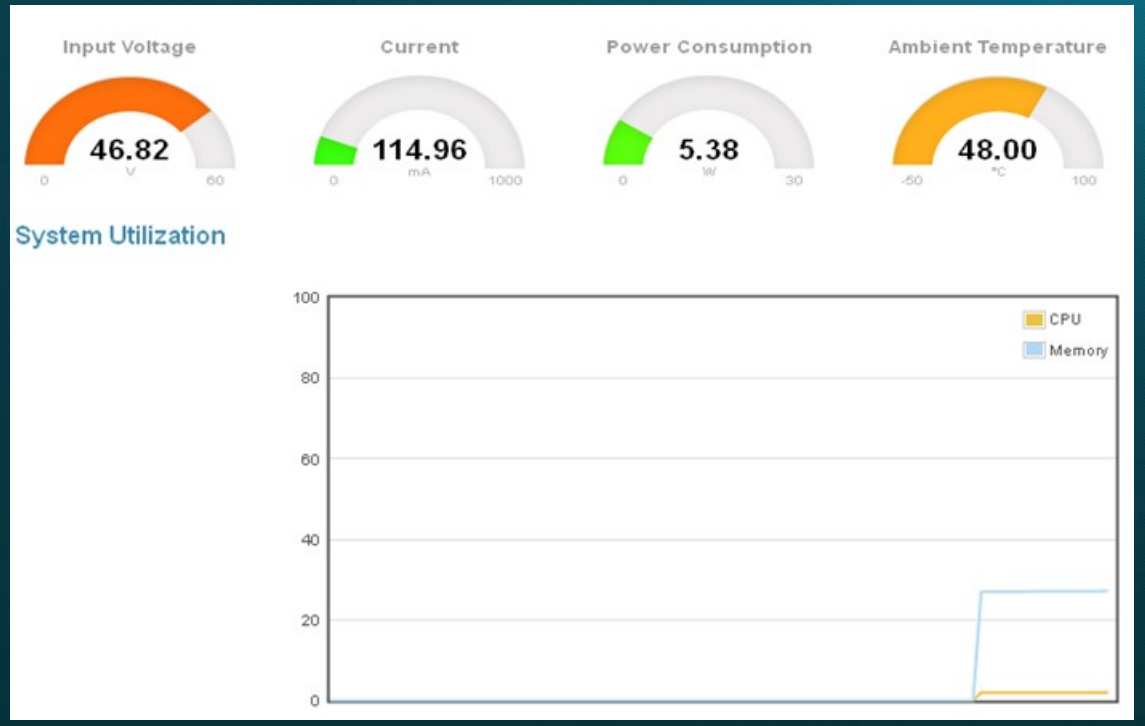
Previous Platform – System real-time voltage



New Platform – Real input voltage

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Communication Solutions (Wireless+LTE Modem)

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Highly Integrated Wireless AP+ LTE Router

WiFi
802.11AC

VPN

LTE

PoE

Protocol Gateway
Modbus
DNP3**

Managed Switch

Storage

7 IN 1

IP30

IP21,54,65,67

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Lantech Wireless AP Leading Features

Load Balancing support 8 mechanism

Train wireless carriage coupling

High-reliability transmission between Train to Ground communications

High-sustainability redundancy and aggregated bandwidth (2AC model)

For mesh tunneling to Bridge together all distant sites as a virtual single LAN through the cloud

802.11AC up to 2.6G Mbps WIFI Bandwidth (2AC model)

Support NAT and Firewall Support 802.11e traffic prioritization

MIMO technology 3T3R up to 6 antennas (2AC model)

Isolated Wide input range

24V(9~60VDC)

WV(16.8~137.5VDC)

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Load Balancing

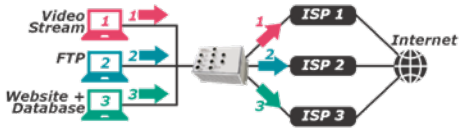
FULL PACKAGE

BASIC PACKAGE

STANDARD

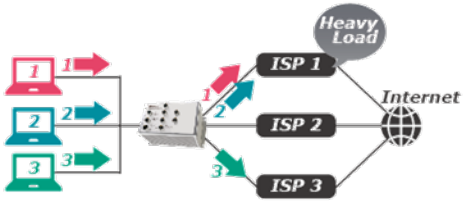
Fixed

Manually route by traffic type through fixed WAN link.



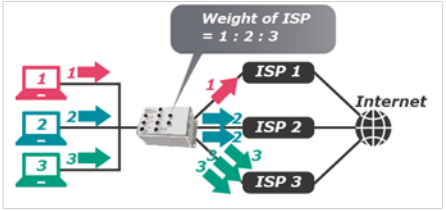
Priority

Routes connections through preferred WAN link while others stand-by. Sequentially activate other links if overflow occurs.



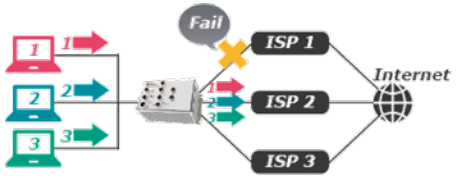
Weighted Round-Robin

Evenly distribute the traffic over all working WAN links in circular order according to the specified weights.



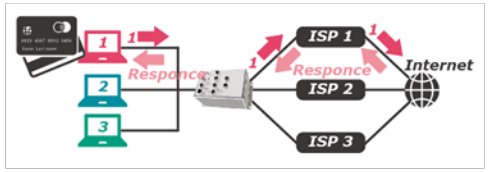
Fail Over

Routes connections through preferred WAN link while others stand-by. Sequentially activate another link if preferred link failure occurs.



Custom Route

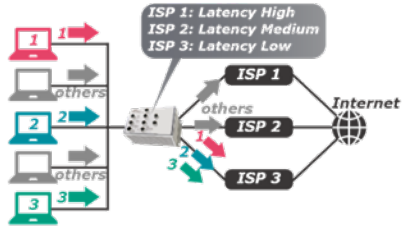
Routing through the selected WAN links for each specific traffic, ex: TCP/UDP port number and IP address.



FULL PACKAGE

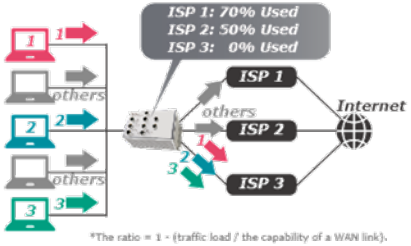
Fastest

Routes connections through the WAN link with lowest latency time.



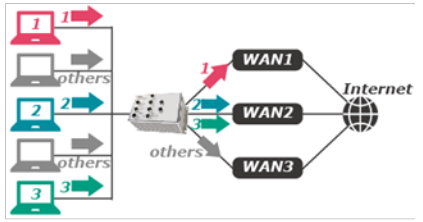
Smallest Load

Routes connections through the WAN link with highest free bandwidth ratio*. The traffic load could be by downstream, upstream or total traffic.



Sticky Session

Bind all connections in an application session to particular WAN link. This ensures that all connections in the session are routed to the same WAN link. This is suitable for security services like online payment etc.



Lantech™ | CASE STUDIES

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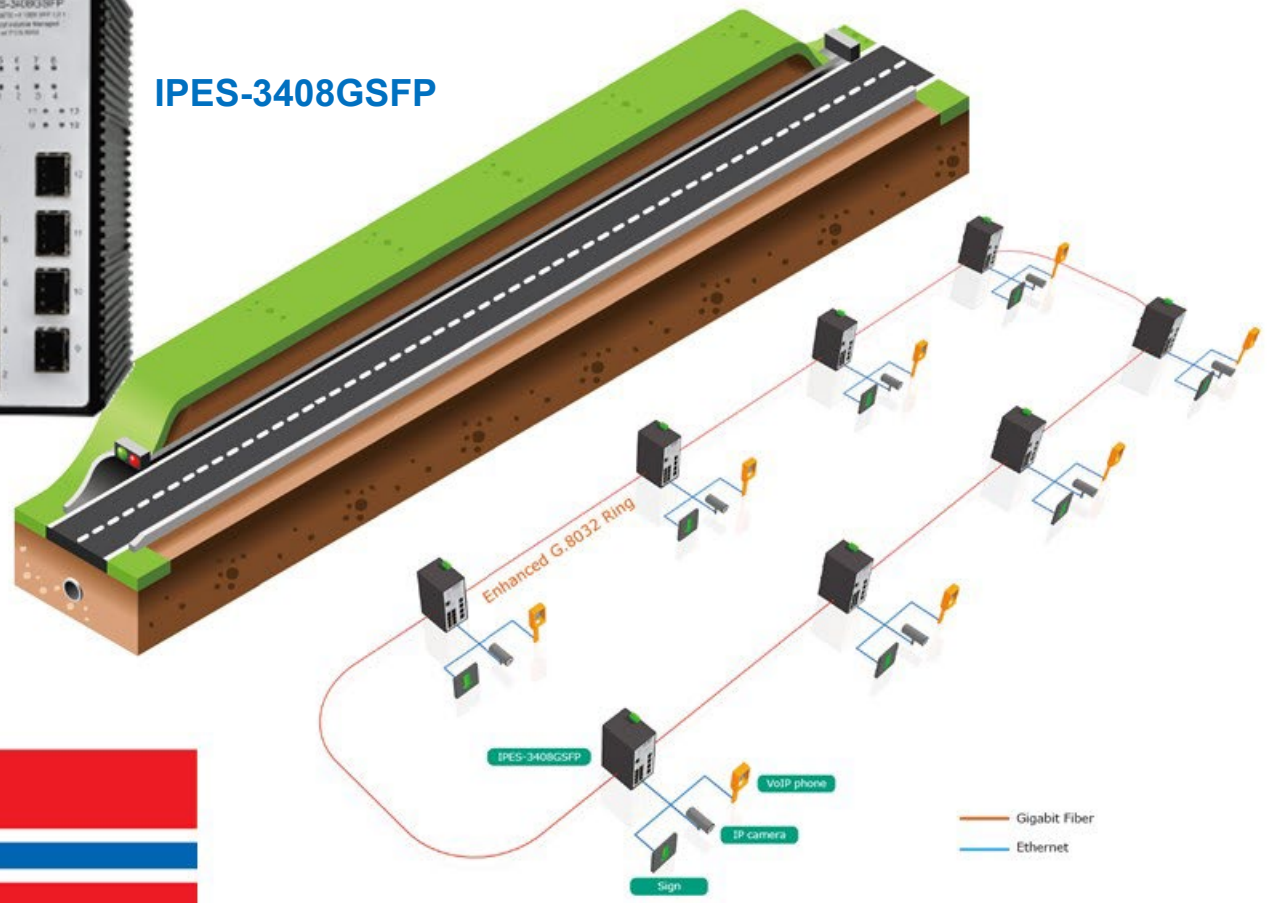
Lantech Industrial Switches are adopted for the longest road tunnel in the world

IPES-3408GSFP



Project Introduction:

Lærdal Tunnel is a 24.51 km (15.23 mi) long road tunnel on European route E16 and located approximately 175~200 km (109–124 mi) north-east of Bergen, the second-largest city in Norway

1. Multicast static route for video application
2. Support 8-port PoE+ up to 30W per port
3. Auto Ring for easy configuration for users

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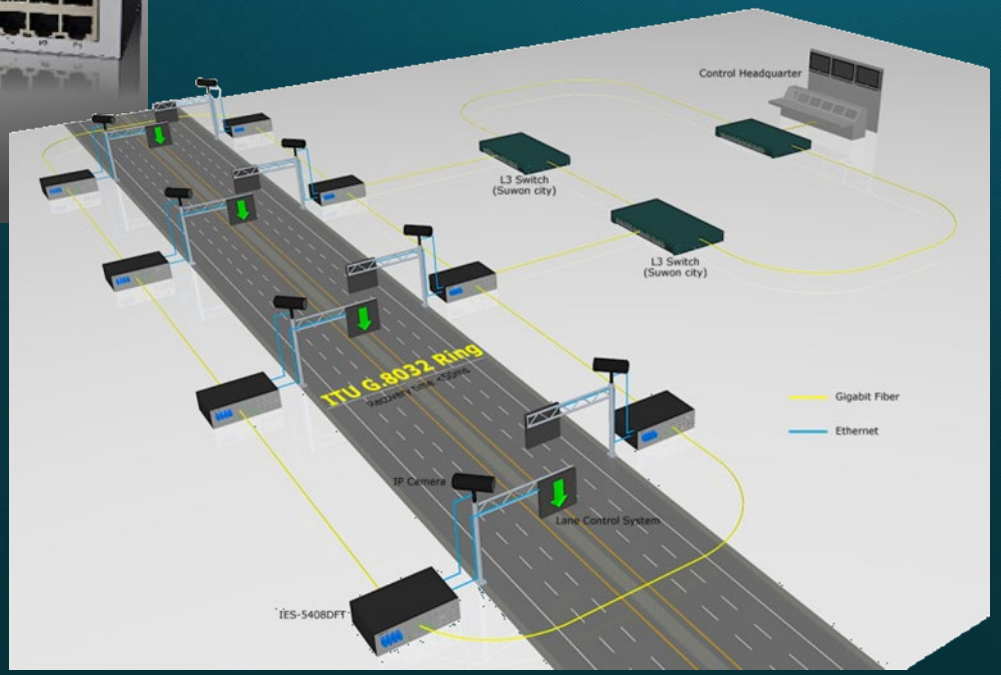
Expressway Lane Control System in South Korea

Gyeongbu Expressway connects Seoul and Busan, the capital and the second largest city of South Korea.



1. Customized bypass model based on IES-5408DFT
2. ITU G.8032 redundant Dual Homing Ring protection
3. DDM SFP is able to monitor the Fiber transmission status remotely.
4. Giga speed fiber and IGMP v3 ensure smooth and real-time HD quality surveillance

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Lantech PoE Switches + Sony IP cameras

City Surveillance Project in Romania

Deva, the capital of Hunedoara County, Romania, is a historical city with population of less than 60,000 people (2011).

1. ITU G.8032 standard Single ring protection, providing recovery time of less than 20ms
2. Supports IGMP router port, which can shorten the query distance between video source and receiver, to prevent network flooding
3. Powerful HW/SW spec with competitive price means the best Cost / Performance

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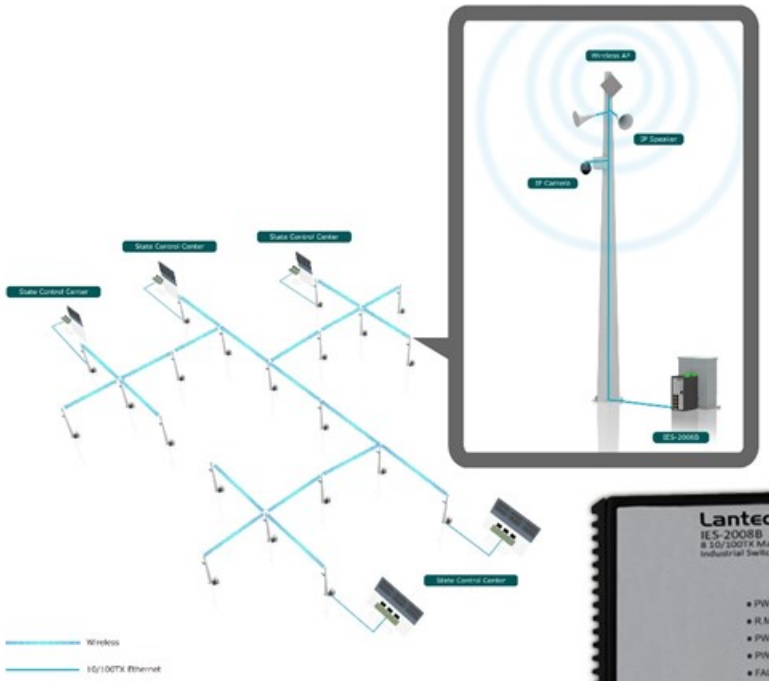
Secure Outdoor Wireless Surveillance System

of 25 City Councils Nationwide in Malaysia

Located in SouthEast Asia, Malaysia consists of 13 States and 3 Federal Territories. -f-Full Wireless City Surveillance System for its 25 City Councils nationwide from East and West Malaysian States



1. Support IGMP snooping, query and source only for multicast IP surveillance
2. Wide operating humidity (up to 95%) – ability to sustain operation in an humid equatorial climates
3. High compatibility with HP management software

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Success Story: USA

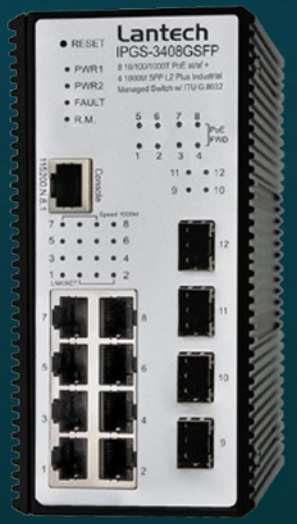
Google

Loon Project (End user: Google):

1. Project Loon is an experimental project for suburbs or places with difficulty in building traditional network infrastructure.

2. Lantech switches are used for: the Communication system, to receive command signals from the control center and send back status reports.

- Model: IPGS-3408GSFP



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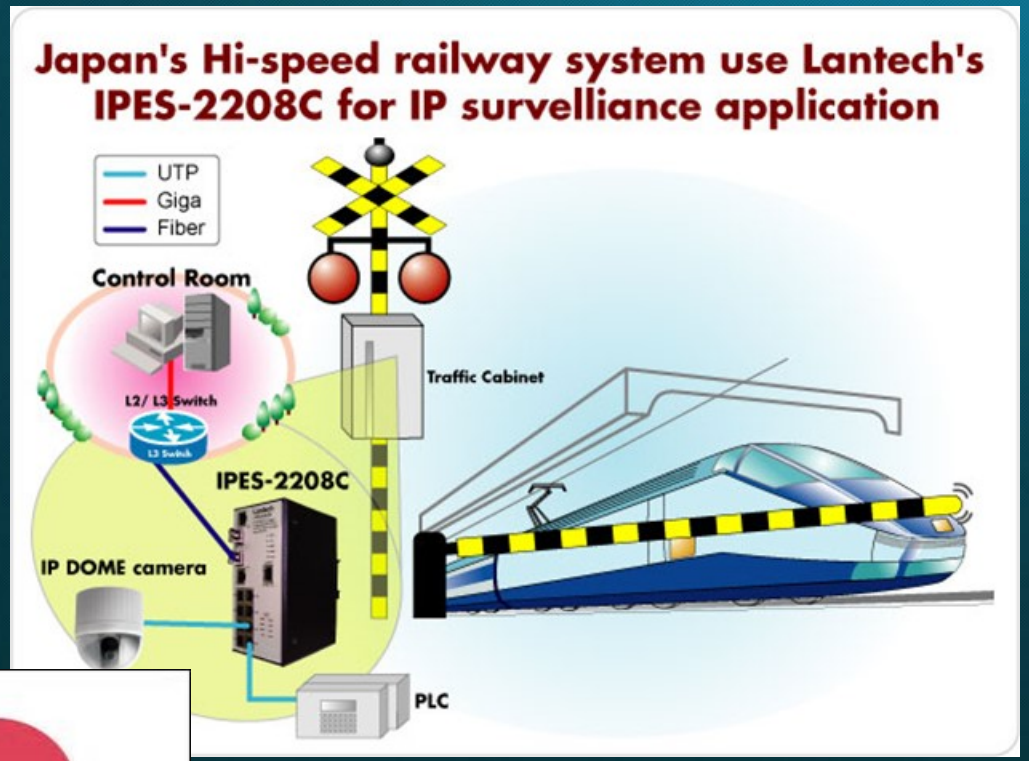
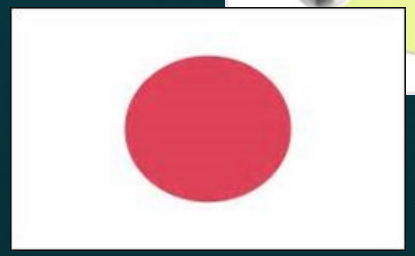
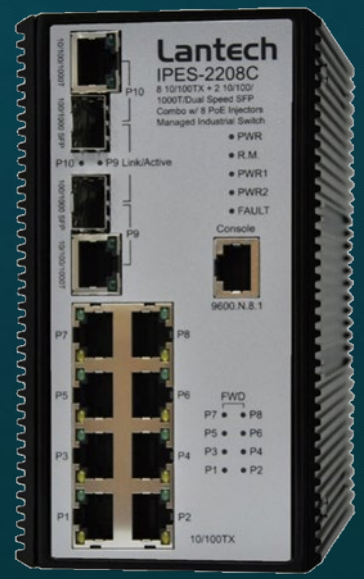
Railroad Crossing System in Japan





1. Client: JR, one of the most famous railway transportation companies in the world
2. Required extremely high quality
3. Integrated perfectly with NEC's IP cameras
4. Consist of signal control, railway security and train monitor
5. Harsh outdoor environment
6. Adopted 100 units of IPES-2208C



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Success Story: Hong Kong

Highways Department
The Government of the Hong Kong Special Administrative Region

Central - Wan Chai Bypass (CWB):

1. The CWB is a strategic road along the north shore of Hong Kong Island targeted to alleviate the traffic congestion along the existing Gloucester Road - Harcourt Road - Connaught Road Central corridor. (length: 4.5KM)

2. Lantech industrial switches are adopted for signaling control system .

- Model: IES-5408DSFP-E

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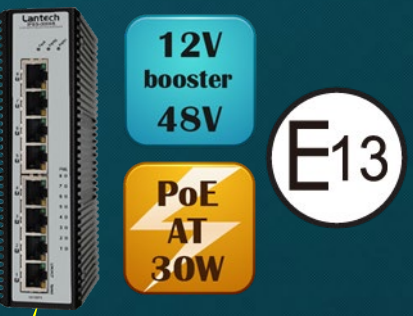
Success Story: Chile

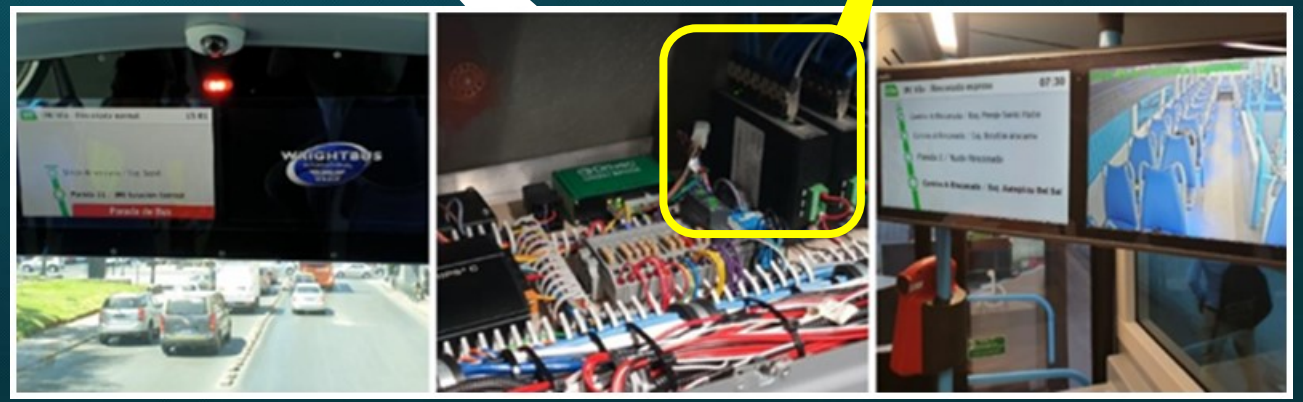
New Wright StreetDeck Bus:

1. The Wright StreetDeck is a double-decker bus manufactured by Wrightbus since 2014. New model with the latest on-board technology is designed for the South American market.
2. A fully connected system including CCTV, PIS, and ticketing are connected with Lantech industrial switch.

- Model: IPES-0008B-12V

IPES-0008B-12V





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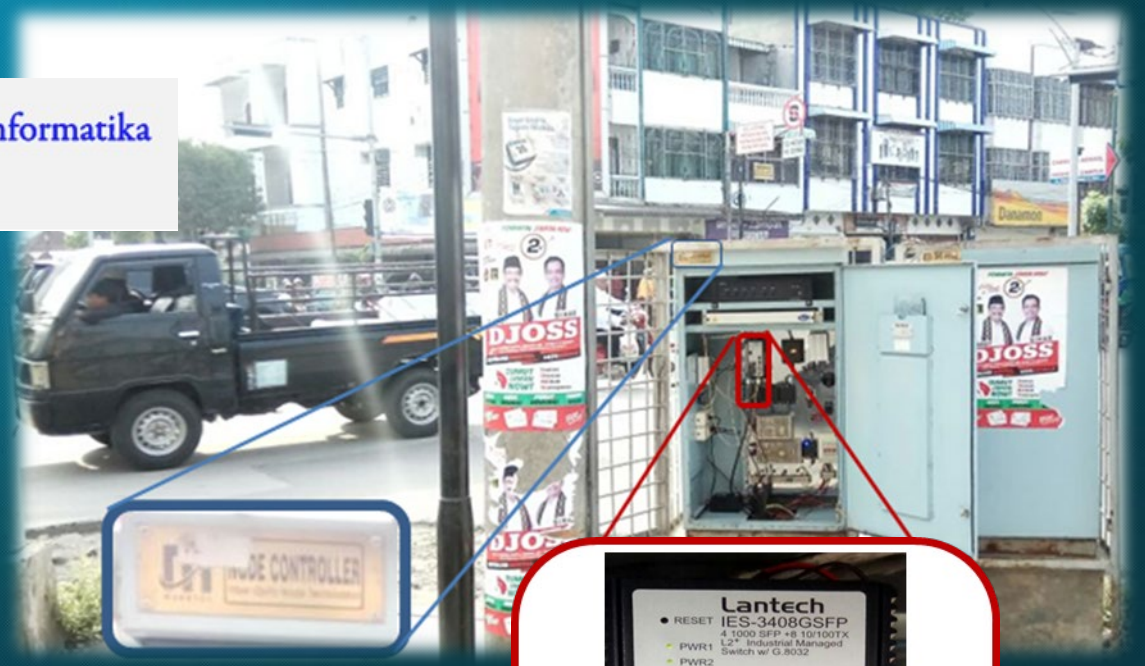
Success Story: Indonesia

DINAS PERHUBUNGAN KOTA MEDAN
HTTP://DISHUB.PEMKOMEDAN.GO.ID

Dinas Perhubungan Komunikasi & Informatika
Kota Surakarta



ITS System in Medan City & Surakarta City:

1. Medan is the fourth largest city by population in Indonesia and Surakarta is the birthplace of the current President of Indonesia, Joko Widodo.

2. Lantech industrial Ethernet switches are adopted for ITS system in both cities, installed in the node controllers and control centers.

- Model: IES-3408GSFP

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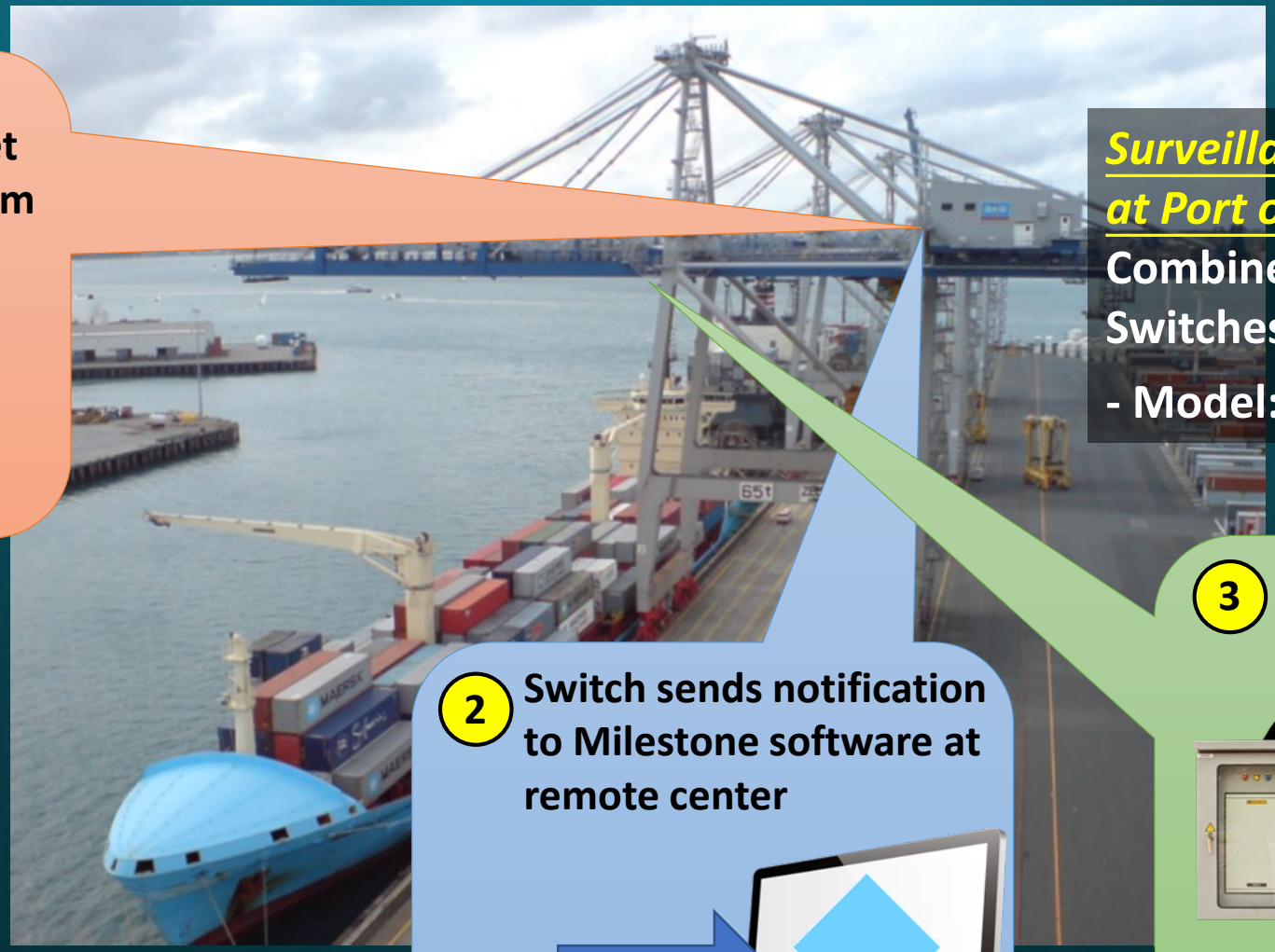
Success Story: New Zealand



1 Any unauthorized intrusion to the cabinet and switch's DIDO alarm is triggered

IPES-3416DSFP

Surveillance CMS at Port of Auckland:

Combined Solutions between Switches and Surveillance CMS

- Model: IPES-3416DSFP

2 Switch sends notification to Milestone software at remote center

3 Cms controls camera to action

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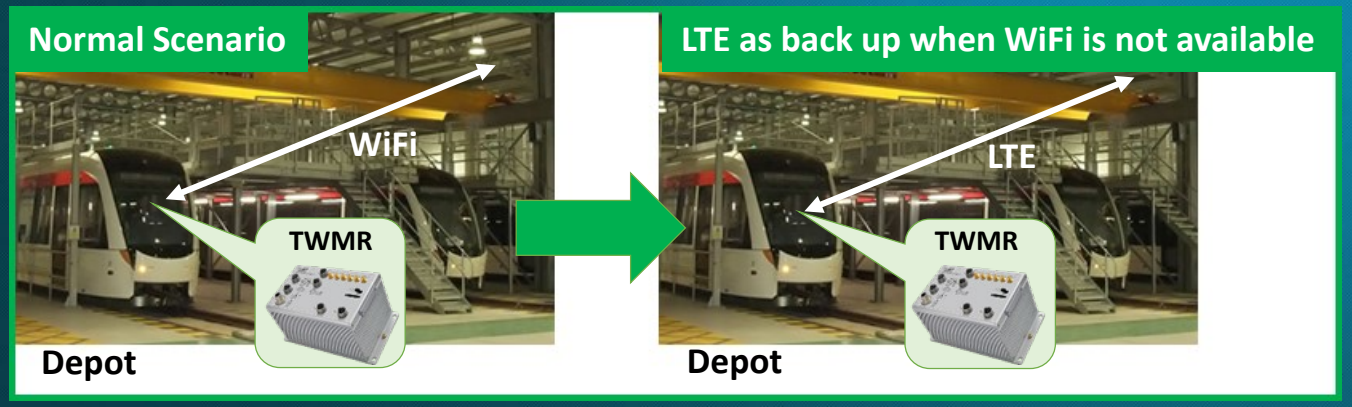
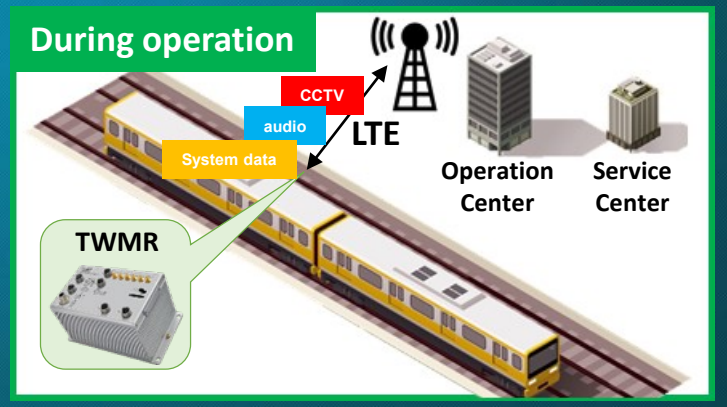
Success Story: Australia





CCTV, audio, and data transmission project (End user: Sydney Metro):

1. Sydney Metro is a future automated rapid transit system in Sydney, Australia. The first line is planned to consist of 31 stations and 66 km of track. The first stage is under construction and testing and is expected to open in the first half of 2019.

2. During operation, Lantech multi-function routers are used for data transmission of CCTV, audio, system data via LTE. When train is in depot, the data is transmitted via WiFi and LTE will be backup method.

- Model: TWMR-5002-1L-1AC-WV

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Success Story: France

Wireless Communication project (End user: SNCF):

1. SNCF (Société nationale des chemins de fer français; "National society of French railways" or "French National Railway Company") is France's national state-owned railway company and manages the rail traffic in France and the Principality of Monaco.

2. Lantech switches are used for in-train CCTV, PIS, Wi-Fi hotspot and passenger entertainment system.

- Model: IGS-5408DSFP

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Success Story: Hong Kong

MTR港鐵

MTR Project in Hong Kong:

1. The Mass Transit Railway (MTR) is the rapid transit railway system in Hong Kong.

2. Lantech industrial switches are adopted for information TV system on MTR's rolling stock .

- Model: IES-2008B

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Success Story: USA

Wireless Communication project (End user: SMART RAIL):

1. Smart Rail (SONOMA-MARIN AREA RAIL TRANSIT); is San Francisco Bay Area's newest transportation option for travel, offering passengers rail service in Sonoma and Marin counties.

2. Lantech switches are used for in-train CCTV, PIS, Wi-Fi hotspot and passenger entertainment system.

- Model: IPES-5408T-43-72V

Lantech™

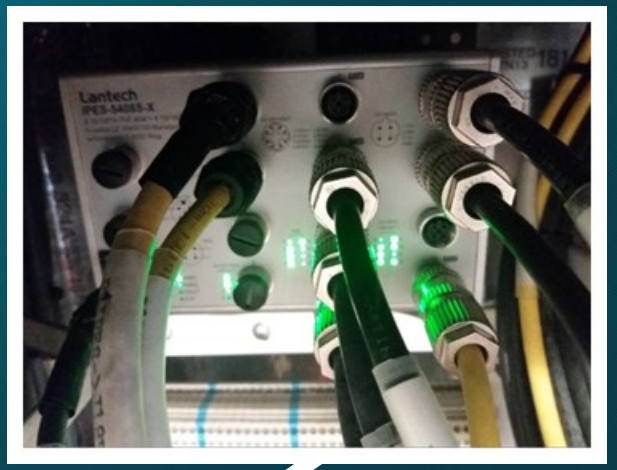
Success Story: Malaysia

Bandar Utama-Klang Line Project (End user: Prasarana):

1. The 37-kilometer Bandar Utama–Klang line is a light rapid transit (LRT) line that is slated to be the third LRT system in Klang Valley, Malaysia.

2. Lantech EN50155 switches are installed as CCTV surveillance system for onboard LRT rolling stock.

- Model: IPES-5408S-X-65



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Success Story: Brazil

CPTM Train Project in São Paulo, Brazil:

1. Brazil held the 2016 Rio Olympic and the country has upgraded their infrastructure in recent years, including the railway system.

- Model: IPES-5408T-67-72V/110V, IPES-5416T-8-67-72V/110V

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Success Story: Vietnam

Military Communications (End user: Viettel):

1. Viettel is a telecommunication service provider in Vietnam that provides mobile networks (GSM 700/800/1000/1200) in Vietnam.

2. With the management of Vietnamese Ministry of Defense, Lantech industrial switches are installed to integrate wireless and modem devices.

- Model: IES-5208DF-67

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Success Story: Netherlands

Tram project in Amsterdam, Netherlands (End user: GVB):

Lantech switches are used in Amsterdam's trams operated by GVB. The tram system consists of 15 tram routes with a total route-length of 80 kilometers.

- Model: IPES-5408T-X-12V

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Success Story: Egypt

Police car Project in Egypt nationwide (End user: Egypt's Ministry of Interior):

1. Lantech switches are installed in police cars nationwide.

2. The switches are mainly connected to IP cameras inside/outside the police car to monitor the criminals in the car and record the real-time status outside the police car.

- Models: IPES-5408T-X-67-12V, IPES-5408T-X-54-12V

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Success Story: Ukraine

Metro project in Kiev, Ukraine:

1. The Kiev metro system has three lines with a total length of 67.65 km (42.04 mi) and 52 stations.
2. The system plans to expand current routes and construct new routes.
3. Lantech switches are installed in stations, connecting the WiFi APs that communicate with trains.
4. Lantech switches also help construct a reliable network between stations and the control center.

- Models: IGS-5408GSFP, IPES-3408GSFP, IPGS-5400-2P

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Success Story: United Kingdom

CALEDONIAN SLEEPER

CAF

New Caledonian Sleeper trains:

1. The overnight sleeper train services between London and Scotland, in the United Kingdom.
2. A standalone franchise operated by Serco. In 2017 Serco revealed details of a £150m revamp of the Caledonian Sleeper, with en-suite cabins, double beds, Wi-Fi, charging panels and hotel-style key card entry system.
3. Train developer: CAF ; Estimated operation year: 2018
4. Lantech switches are used for in-train CCTV, PIS, Wi-Fi hotspot and passenger entertainment system.

- Model: IES-5408T-43

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Thank you

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