T(P)ES-3406T

6 FE + 4 GE L2+ (PoE) Vehicle and EN50155 NAT Router Switch





OVERVIEW

The Lantech T(P)ES-3406T (OS2 Pro platform) is a compact router switch with a PoE budget of 80W, designed for rail, metro, and vehicle 24V input Ethernet switch systems. It features 6 10/100TX + 4 10/100/1000T ports, along with 8 PoE 802.3af/at Ethernet ports (PoE model) with push-pull inner-lock connectors for secure and fast installation. The switch offers Layer 2 management, NAT, Ignition PoE timer off, unique AUTO-FEED configuration, MQTT, advanced security functions and Health diagnostic snapshot maintenance to ensure reliable and easy onboard network deployment. It's WebGUI and complete CLI interface make configuration straightforward for all skill levels. Additionally, the OPEN API document format enhances central management efficiency, making it ideal for fleet management and AIoT applications. Compliance with EN50155, ITxPT, and E-marking certifications rest assured the product meets world-class standards for vehicle, rail onboard performance and reliability.

Embedded Inner-lock push-pull connectors ensure fast installation and connection reliability

The built-in inner-lock push-pull connectors give the switch small-footprint design and for space-saving cabling installation. They ensure quick, tool-free installation with a simple push. Most importantly, their secure locking mechanism provides unwavering reliability, preventing accidental disconnections crucial for network uptime.

Redundant dual power input design (24VI;24TVI model); EN50155 verification with high ESD and inrush current prevention and polarity reverse protection; E-marking & ITxPT certificate; ISO 16750-2 compliant

T(P)ES-3406T is designed with dual power inputs that accept 9V~36V DC for 24VI vehicle use, and 16.8V-56VDC for 24TVI train model and is capable of withstanding EMI/RFI interference in the onboard network as well as environmental shocks and vibrations. The redundant power input design integrates inrush current protection also protect against polarity reversal. Additionally, the galvanic isolation feature shields the system from power transients often present in onboard networks. The switch complies with ITxPT public transport standards and E-marking. It also meets the requirements of ISO 16750-2 P5A (24V system DC 174V/8Ω/350ms), reducing the impact of high-frequency pulse voltage that could be incurred by motor applications.

PoE budget up to 80W for 8 Ports with PD detection, auto PD reboot, scheduling and Ethernet power input galvanic isolation with partial ports for PoE galvanic isolation; support Perpetual/Fast PoE

TPES-3406T supports maximum PoE budget of 80W with advanced PoE management features, including PoE auto-detection and scheduling. The PoE detection function can identify if a connected Powered Device (PD) becomes unresponsive and then auto-restart the PD. Moreover, PoE scheduling allows for a pre-set power feeding schedule based on a routine timetable. Each PoE port can be enabled or disabled, and it provides information on voltage, current, power (W), and temperature.

Perpetual and Fast PoE provides immediate and continuous power to devices during PSE switch reboots.

There is galvanic isolation between the power input and the Ethernet power system. The PoE galvanic isolation on PoE at/af ports provides insulation between the power input and the PoE Ethernet ports, preventing cabling and grounding incidents from damaging the Ethernet switch.

Sleep Mode, Ignition timer; ITxPT Xstatus, DNS-SD and MQTT protocol on IGN model

To meet ITxPT specifications, the -IGN model supports Sleep Mode, in which no network features are active and remains the device's power consumption below 0.048W.
In addition, the switch supports the ITxPT Xstatus, DNS-SD and MQTT protocol for comprehensive remote monitoring of Ethernet switch status.
The -IGN model also includes the Ignition timer to configure both individual PoE port shutdown delays (PoE model) and system shutdown (entering Sleep Mode) from 30 seconds up to 60 minutes (system off timer default: 60 minutes). This eliminates the need for additional relay wiring and supports remote PoE timer configuration anytime, from anywhere.

Reliable eMMC for better power efficiency and reliability

The switch utilizes eMMC for firmware storage. The eMMC's standard interface streamlines the design process while delivering improved power efficiency and enhanced reliability, thereby extending the storage's lifespan.

Comprehensive Network Protection Against DDoS and Layer 2 Threats

The Lantech OS2Pro platform integrates advanced security mechanisms to safeguard both switches and networks. Key features include DDoS attack mitigation, 802.1X port-based authentication, Dynamic ARP Inspection (DAI), IP Source Guard, and Port Security, providing multi-layer protection against spoofing, unauthorized access, and traffic floods. These security capabilities ensure stable, resilient network operation.

Lantech OS2 PRO Generation with L2 management and routing protocols incl. OSPF and RIP V1&V2

T(P)ES-3406T developed on the Lantech OS2 Pro generation, is equipped with comprehensive Layer 2 management and routing protocols, including inter-VLAN routing, OSPF, and RIP v1/v2. Designed for versatile vehicle applications, the generation further supports advanced networking functions such as NAT, port forwarding, multiple static IP addresses, DHCP (server/option/client/port-based), VLAN, DHCP over VLAN, IGMP, RSTP/G.8032 enhanced ring recovery, LACP, and more.

Open RESTful API for Seamless Integration and High-Performance Network Management

The switch features a lightweight and efficient Open RESTful API designed for seamless integration with centralized network management software. Using standard HTTP methods (GET, PUT, POST, DELETE) and JSON data structures, the API enables real-time access to configuration and operational data.
By leveraging modern web technologies, the switch minimizes CPU overhead typically associated with traditional SNMP polling, delivering faster response times, reduced system load, and improved scalability for high-performance network environments.

mDNS (Multicast DNS) and DNS server/client feature and MQTT-role of Publisher or Broker

It supports mDNS (Multicast DNS) which enables hosts in the LAN to discover and communicate with devices each other in compliance with the DNS protocol, without requiring a traditional DNS server. The switch can act as MQTT Publisher or Broker that can send data to the broker then broker distributors the "payload" to the subscribers all in a very lightweight protocol.

User-friendly GUI, Auto topology drawing, Editable configuration text file, Enhanced Environmental Monitoring, CPU watchdog, Snapshot switch information for trouble-shooting

analysis

The user-friendly UI, innovative auto topology drawing, and topology demo make the Lantech switch much easier to use. The complete CLI enables professional engineers to configure settings via the command line. The configuration file can be exported as a text file, allowing it to be easily edited and reconfigured for mass deployment. It supports enhanced environmental monitoring of actual input voltage, current, ambient and PoE port temperature, and total power load (including PoE if any) where user can set threshold to trigger an alert or event log. The built-in watchdog design can automatically reboot the switch if the CPU becomes unresponsive. With the distinctive Snapshot feature, the switch can gather data, including port statistics, system core information, configuration, and event logs, either at a specific point in time or by scheduling, to address switch issues and analyze the root cause promptly.

OPTIONAL FEATURES

Optional IEC 62443-4-2 Model with Physical Tamper Resistance and a Variety of Security Measures

For enhanced cybersecurity, the optional IEC 62443-4-2 is available on standard models. This includes over 90 security measures such as vulnerability checking, encrypted files, public key management, strong password enforcement, account management, and both penetration and stress testing. It emphasizes protection against unauthorized access, tampering, and malware through detailed log events and roots of trust security IC. To learn more about Lantech cybersecurity software solutions, please refer to
https://www.lantechcom.tw/global/eng/download/datasheet/D-OS2.pdf

Optional bypass relay prevents power loss

The optional bypass relay is set to bypass the switch to the next one when power is off in order to protect the network from crashing. Lantech bypass caters to remain in bypass mode until the switch is completely booting up when power is back to avoid another network loss. Smart bypass can be activated when switch encounters power failure. (-BT model)

Optional LantechView for Lantech devices maintenance

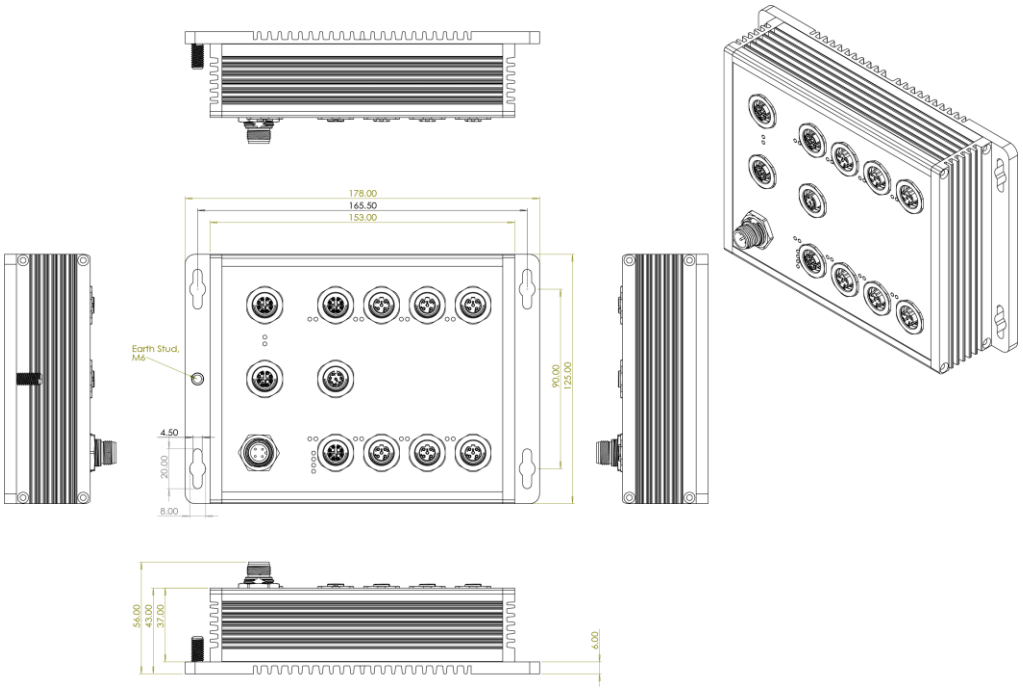
LantechView can automatically discover Lantech devices on the network, providing seamless configuration management across multiple IP subnets and VLAN areas (single device and batch). It also supports firmware management, allowing single and batch verification and simultaneous upgrades to the latest firmware versions.
To learn more about Lantech LantechView software solutions, please refer to
https://www.lantechcom.tw/global/eng/download/datasheet/D-LantechView.pdf

OS2 Pro vs. OS2 Pro - SEC models comparison

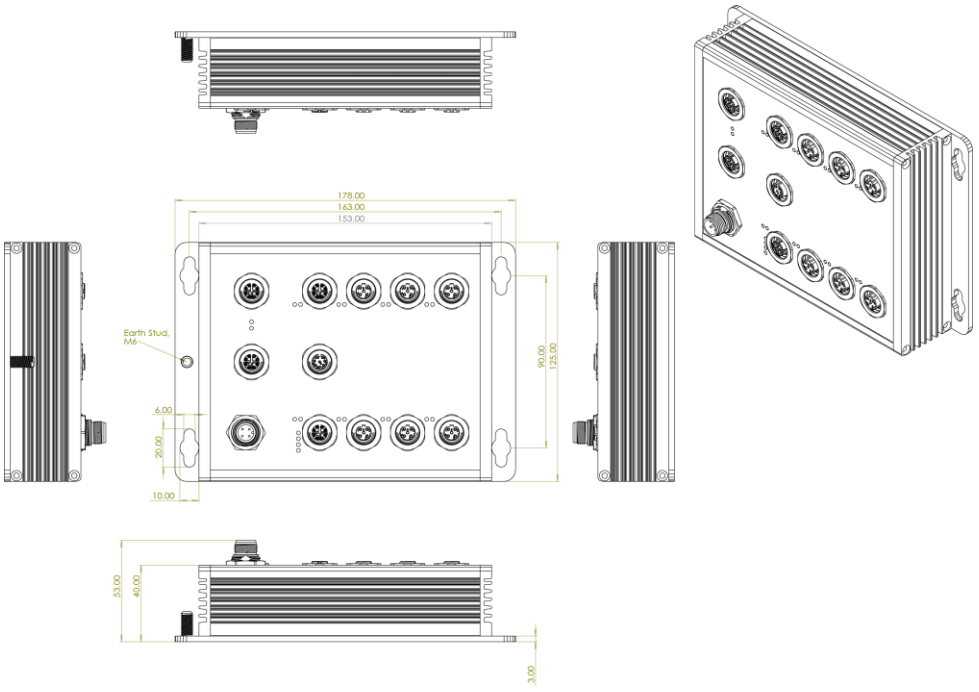
	OS2 Pro	OS2 Pro - SEC
Management	Web UI/Telnet complete CLI command line	Web UI/Telnet complete CLI command line
IEC 62443-4-2 Cyber Security	NA	Y, need optional license
Hardware Environmental Monitoring	Y	Y
Bypass	Optional	Optional
Boot up time	Within 60sec.	Around 90sec.

DIMENSIONS (unit=mm)

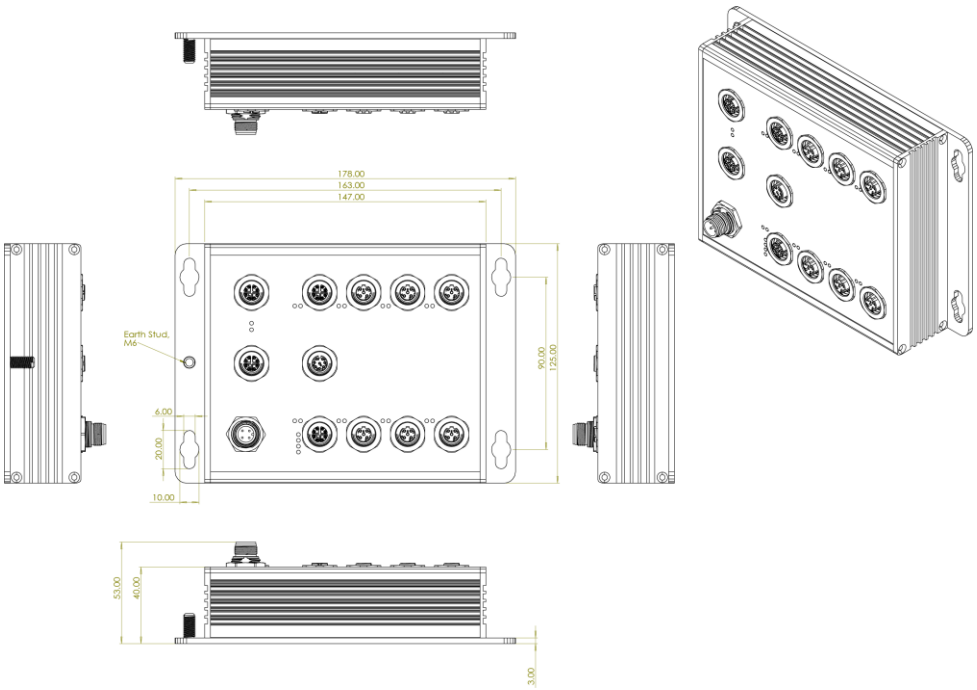
PoE model



Non-PoE model, IP67



Non-PoE model, IP54



SPECIFICATIONS

Hardware Specification

Standards	IEEE802.3 10Base-T Ethernet IEEE802.3u 100Base-TX IEEE802.3ab 1000Base-T Ethernet IEEE802.3x Flow Control and Back Pressure IEEE802.3ad Port trunk with LACP IEEE802.1d Spanning Tree IEEE802.1w Rapid Spanning Tree IEEE802.1s Multiple Spanning Tree IEEE802.3ad Link Aggregation Control Protocol (LACP) IEEE802.1AB Link Layer Discovery Protocol (LLDP) IEEE802.1X User Authentication (Radius) IEEE802.1p Class of Service IEEE802.1Q VLAN Tag IEEE802.3at/af Power over Ethernet (PoE model)
Switch Architecture	Back-plane (Switching Fabric): 9.2Gbps
Transfer Rate	14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Ethernet port
Mac Address	16K MAC address table
Jumbo frame	10KB
Connectors	10/100TX: 6 x M12 4-pole D-coded Push-Pull inner-lock connectors (Router/LAN configurable) 10/100/1000T: 4 x M12 8-pole X-coded Push-Pull inner-lock connectors (WAN/LAN configurable) Power Input connector: 1 x M12 4-pole Male A-coded Reset/Console/USB: 1 x M12 8-pole A-code Note: Push-pull connectors feature an inner lock and are suitable for push-pull and screw-type cabling.
Network Cable	10Base-T: 2-pair UTP/STP Cat. 3, 4, 5/ 5E/ 6 cable
	EIA/TIA-568 100-ohm (100m) 100Base-TX: 2-pair UTP/STP Cat. 5/ 5E/ 6 cable EIA/TIA-568 100-ohm (100m) 1000Base-TX: 2-pair UTP/STP Cat. 5/ 5E/ 6 cable EIA/TIA-568 100-ohm (100m)
LED	Per unit: Power 1 (Green), Power 2 (Green), FAULT (Red); RM(Green) Ethernet port: Link/Activity (Green), Speed (Amber) PoE: Link/Act (Green)
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-40°C~75°C / -40°F~167°F (-24VI-E)
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	9-36VDC (24VI) 16.8-56VDC (24TVI)
PoE Budget (PoE model)	80W at 24VDC
PoE pin assignment (PoE model)	M12 port #1-#6(FE) port#7-#8 (GE) supports IEEE 802. 3at/af PoE PSE. Per port provides up to 30W
Power Consumption	7W (w/o PoE load)
Case Dimension	IP54/IP67: Aluminum case 178mm(W)x125mm(H)x56mm(D) (PoE models) 178mm(W)x125mm(H)x53mm(D) (Non-PoE models)
Weight	1.05kgs (PoE model) 885g (non-PoE model)
Installation	Wall Mount
EMI & EMS	FCC Class A, CE EN55032 Class A, CE EN55024, CE EN61000-4-2, CE EN61000-4-3, CE EN61000-4-4, CE EN61000-4-5, CE EN61000-4-6, CE EN61000-4-8,

	CE EN61000-6-2, CE EN61000-6-4 BS EN 55035:2017+A11:2020, BS EN 55032:2015+A11:2020, IEC 61000-4-2:2008, IEC 61000-4-3:2020, IEC 61000-4-4:2012, IEC 61000-4-5:2014+AMD1:2017 CSV, IEC 61000-4-6:2023, IEC 61000-4-8:2009
Verifications	EN50155/EN50121-3-2/EN50121-4 EN45545-1, EN 45545-2 Fire & Smoke

Stability Testing	EN61373 (Shock and Vibration)
Vehicle Certificate	E24 marking (UN ECE R10) ITxPT labeled
MTBF	351,801 hrs
Bypass**	One pair bypass module on uplink ports to pass to next switch in case of power failure and CPU hang (-BT model)
Software Specification	
Lantech OS2 PRO Platform	**Download Software Datasheet**

*Future release
**Optional

ORDERING INFORMATION

All model packages include M12 caps. For conformal coating add –C to P/N & model names; for optional bypass add –BT (one pair); add -IGN for ignition models; for IEC 62443-4-2 Cybersecurity add -SEC to model names; for gPTP add -PTP to model names.
✻To support environmental sustainability, a console cable will not be included with each device by default.

- **TPES-3406T-8-54-24VI-IGN-E-PP ……..……..……,,,.... P/N: 8351-153**
  6 10/100TX w/6 PoE at/af + 4 10/100/1000T w/2 PoE at/af M12 push-pull connectors L2+ NAT router Switch w/PoE & Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 75°C; IP54 rated w/ignition
- **TPES-3406T-8-54-24VI-E-PP ……..……..……..... P/N: 8351-15301**
  6 10/100TX w/6 PoE at/af + 4 10/100/1000T w/2 PoE at/af M12 push-pull connectors L2+ NAT router Switch w/PoE & Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 75°C; IP54 rated
- **TES-3406T-54-24VI-IGN-E-PP ……..……..……..... P/N: 8351-15302**
  6 10/100TX + 4 10/100/1000T M12 push-pull connectors L2+ NAT router Switch w/ Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 75°C; IP54 rated w/ignition
- **TES-3406T-54-24VI-E-PP ……..……..……..……..... P/N: 8351-15303**
  6 10/100TX + 4 10/100/1000T M12 push-pull connectors L2+ NAT router Switch w/ Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 75°C; IP54 rated
- **TPES-3406T-8-54-24TVI-E-PP ……..……..……..... P/N: 8351-15304**
  6 10/100TX w/6 PoE at/af + 4 10/100/1000T w/2 PoE at/af M12 push-pull connectors L2+ NAT router Switch w/ PoE & Ethernet galvanic isolation; 16.8~56VDC dual input; -40°C to 70°C; IP54 rated
- **TES-3406T-54-24TVI-E-PP ……..……..……..... P/N: 8351-15305**
  6 10/100TX + 4 10/100/1000T M12 push-pull connectors L2+ NAT router Switch w/ Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP54 rated

*For all detailed part nos. and model names, please refer to
https://www.lantechcom.tw/global/eng/download/datasheet/P-T(P)ES-3406T.pdf

OPTIONAL ACCESSORIES

Software LantechView package

Please refer to the software datasheet LantechView datasheet

M12 Connector & Cable

Connector

ECONM12-04A(F)-C-180	4 pin M12 (Female) A-coded 180 degree crimp type connector for power supply
ECONM12-08A(M)-180	8 pin M12 (Male) A-coded 180 degree crimp type connector for reset/console/USB
ECONM12-04D(M)-C-180	4 pin M12 (Male) D-coded 180 degree crimp type connector for data
ECONM12-08X(M)-SPEEDCON	8 pin M12 (Male) X-coded 180 degree crimp type connector for data, Ethernet CAT6A (10G), shielded, SPEEDCON

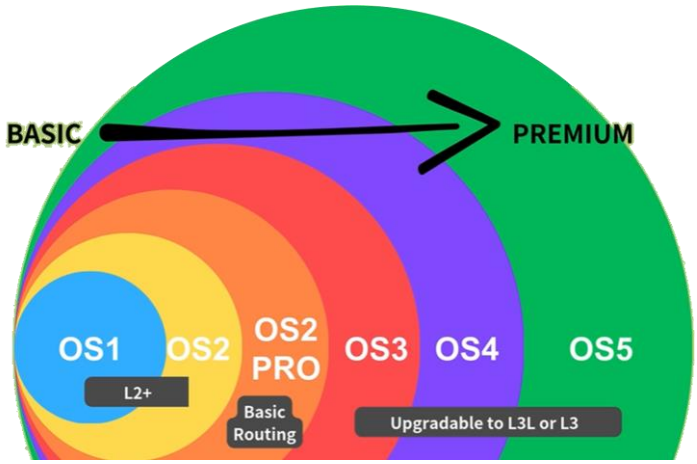
Cable

ECONM12-4P(F)1.5M CABLE	4 pin M12 (Female) A-coded 90 degree cable for power supply, 150cm
ECAB124030MJS	4 pin M12 (Male) D-coded 180 degree RJ45 STP cable for data, 300cm
ECABM12X83MSTP	8 pin M12 (Male) X-coded 180 degree RJ45 STP cable for data, shielded, 300cm
ECONM12-08(M) TO DB9+USB2.0-1.5M CABLE	8 pin M12 (Male) A-coded 180 degree M12 to USB2.0 to DB9 (Female) cable, 150cm

Managed Switch OS Generations

We offer a comprehensive range of managed switches, from OS1 and OS2 with rich L2+ management features, to OS2 PRO with basic routing functionality, and OS3, OS4, and OS5, which can be upgraded with optional Layer 3 Lite

or Layer 3 capabilities to meet diverse customer needs. Note: Model differences include both software features and hardware specifications.



[LEARN MORE]

→ OS2PRO Generation

→ OS3/OS4 Generation

→ OS5 Generation

[CHECK THE DIFFERENCES]

→ Generation Comparison Table

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