

# T(P)ES-3216MGT

## 16 FE + 2 2.5G M12 (PoE) NAT Router Switch



### OVERVIEW

Lantech T(P)ES-3216MGT is a high-performance router switch designed for rail/metro and vehicle 24V input systems with 16 10/100TX + 2 1G/2.5G w/16 PoE 802.3af/at Ethernet ports (PoE model). It provides L2 management, NAT and advanced security functions for onboard network deployment. WebGUI, and complete CLI settings make configuration easy. The OPEN API document format for Restful API can greatly improve central management efficiency for various applications including fleet management and AIOT. The advanced cybersecurity mechanism can prevent hackers from hacking or attacking. EN50155\*, ITxPT\* and Emarking\* certificates ensure the design to be met with world-class criteria.

#### **Lantech OS2 PRO Platform with advanced L2 management and L3 routing protocols incl. OSPF and RIP V1&V2**

The Lantech OS2 PRO platform powers our switch, combining robust Layer 2 management with advanced Layer 3 routing protocols, including OSPF and RIP V1&V2. Engineered for diverse industrial applications, this platform also supports a range of features such as MQTT (Publisher & Broker), Auto Feed, mDNS, NAT, PAT, firewall, OPEN API, and more. To learn more about the Lantech OS2 PRO Platform, please refer to [Lantech OS2 PRO Software Datasheet](#)

#### **Certified cybersecurity development process with IEC 62443-4-1, and IEC 62443-4-2\*\* compliance with physical tamper resistance and detection for integrity and authenticity of the boot process**

Lantech OS2 PRO platform is designed with a high standard of cybersecurity to prevent threats from network attacks. To ensure the safety and reliability of communication networks, Lantech software development is certified with IEC 62443-4-1 security process standards and the switch is also compliant to IEC 62443-4-2\*\*. The switch uses roots of trust to verify the integrity and authenticity of the firmware, software, and configuration data needed for the switch's boot process. To learn more about Lantech cybersecurity software solution, please refer to [Lantech OS2 PRO Software Datasheet](#)

#### **PoE budget up to 120W for 16 Ports with PD detection, auto reboot, scheduling**

The PoE model supports PoE budget 120W w/advanced PoE management including PoE auto detection and

scheduling. PoE detection can detect if the connected PD hangs then restart the PD; PoE scheduling allows pre-set power feeding schedule upon routine timetable. Each PoE port can be Enabled/disabled, get the voltage, current, Watt, and temperature info displayed on WebUI, CLI, SNMP or OpenAPI.

#### ***Ignition PoE timer function on IGN model***

The IGN model has a programmed timer by port to shut down each PoE port, with variants from 30 seconds to 60 minutes, eliminating the additional relay wire to shut down PoE ports and allowing for remote configuration to change the PoE timer time anytime, anywhere.

#### ***Reliable eMMC for better power efficiency and reliability***

The switch utilizes eMMC for firmware storage. The eMMC with integrated controller that offloads and simplifies the task for the main processor. Its standard interface simplifies the design process while delivering improved power efficiency and enhanced reliability, thereby extending the storage's lifespan. increasing the lifespan of the storage.

#### ***USB port for backup, restoring configuration and upgrading firmware***

The built-in USB port can upload/download the firmware, export and import configuration

#### ***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***

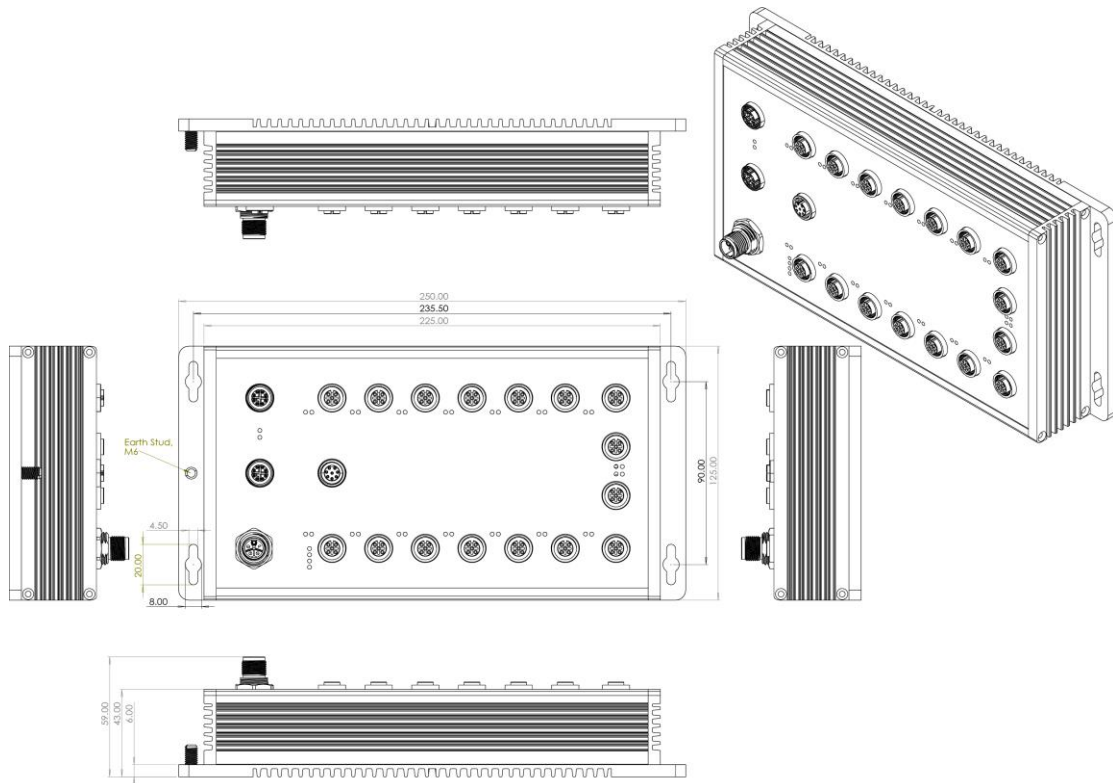
The switch is designed with dual power inputs that accept 9V~36VDC for vehicle use, and 16.8V-56VDC for 24TVI train model. It features high reliability and robustness coping with extensive EMI/RFI phenomenon, environmental vibration and shocks usually found in onboard networks. The redundant power input design prevents inrush current and safeguards against polarity reversal. The galvanic isolation design can isolate power transients that commonly exist in onboard networks. It is labeled with ITxPT\* public transport standards & E-marked\* and also compliant with ISO 16750-2 P5A (12V system DC14V 87V/0.5Ω/400ms; 24V system DC28V 174V/2Ω/350ms) which protects the switch from being damaged by high voltage that could be found at vehicle cranky start.

#### ***Optional bypass relay prevents power loss***

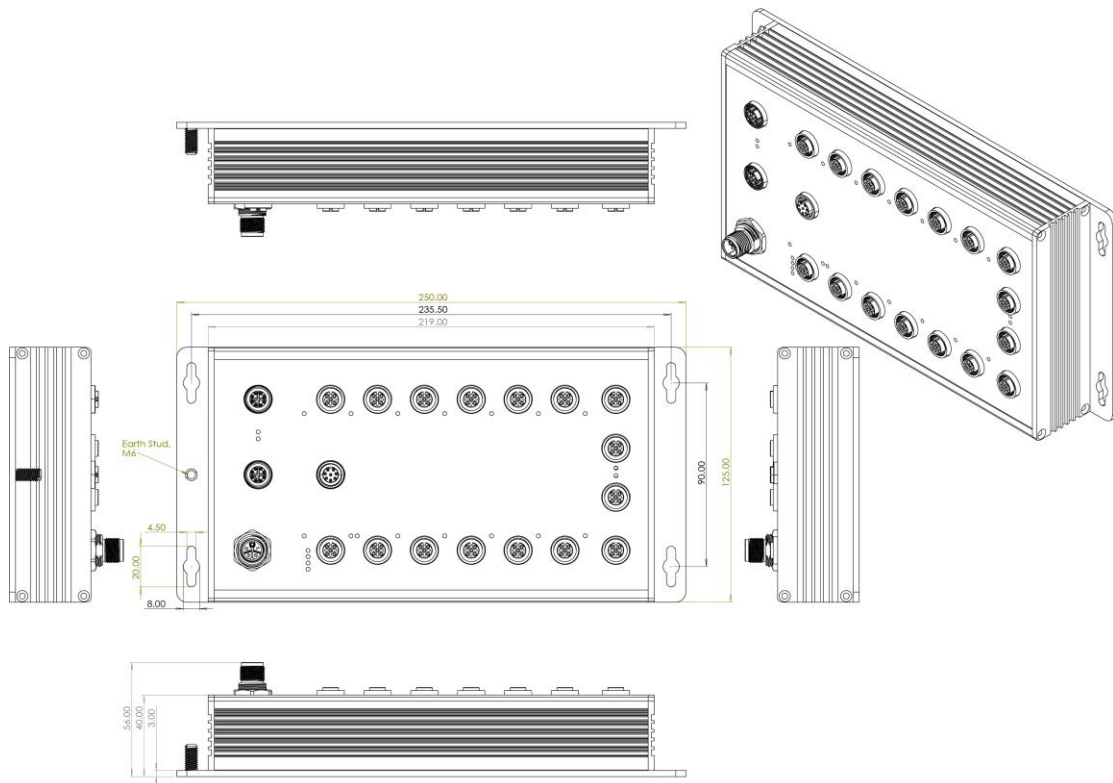
The optional bypass relay is set to bypass the switch to the next one when power is off in order to protect the network from crashing. Lantech bypass caters to remain in bypass mode until the switch is completely booting up when power is back to avoid another network loss. Smart bypass can be activated when switch encounters power failure. (-BT model) (only for 24TVI models)

**DIMENSIONS (unit=mm)**

**PoE model**



**Non-PoE model**



## 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): 13.2Gbps
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: 16 x M12 4-pole D-coded (Router/LAN configurable) 1G/2.5G: 2 x M12 8-pole X-coded (Router/LAN configurable) Power Input connector: 1 x M12 5-pole Male K-coded Reset/Console/USB: 1 x M12 8-pole A-code
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	-20°C~60°C / -4°F~140°F -40°C~70°C / -40°F~167°F (-E models)
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	9-36VDC (24V) 16.8-56VDC (24TVI)
PoE Budget (PoE model)	120W at 24VDC
PoE pin assignment (PoE model)	M12 port #1-#16 supports IEEE 802. 3at/af End-point. Per port provides up to 30W
Power Consumption	10W (w/o PoE load)
Case Dimension	IP54: Aluminum case 250mm(W)x125mm(H)x59mm(D) (PoE model) 250mm(W)x125mm(H)x56mm(D) (Non-PoE model)
Weight	TBC
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
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	292,282 hrs (standards: IEC 62380)
Warranty	5 years
Bypass**	One pair bypass module on uplink ports to pass to next switch in case of power failure and CPU hang (-BT model) (only for 24TVI models)
<b>Software Specification</b>	
Lantech OS2 PRO Platform	<a href="#">Download Software Datasheet</a>

\*Future release  
\*\*Optional

## ORDERING INFORMATION

All model packages include M12 caps. For coating add -C to model name; for optional bypass add -BT (one pair) to end of model names. (only for 24TVI models)

- **TPES-3216MGT-16-54-24VI-IGN-E ..... P/N: 8361-044**  
16 10/100TX + 2 1G/2.5G Copper w/16 PoE at/af L2+ NAT router Switch w/PoE & Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP54 rated; w/ignition
- **TES-3216MGT-54-24VI-IGN-E ..... P/N: 8361-0441**  
16 10/100TX + 2 1G/2.5G Copper L2+ NAT router Switch w/Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP54 rated; w/ignition
- **TPES-3216MGT-16-54-24VI-IGN ..... P/N: 8361-0444**  
16 10/100TX + 2 1G/2.5G Copper w/16 PoE at/af L2+ NAT router Switch w/PoE & Ethernet galvanic isolation; 9~36VDC dual input; -20°C to 60°C; IP54 rated; w/ignition
- **TES-3216MGT-54-24VI-IGN ..... P/N: 8361-0445**  
16 10/100TX + 2 1G/2.5G Copper L2+ NAT router Switch w/Ethernet galvanic isolation; 9~36VDC dual input; -20°C to 60°C; IP54 rated; w/ignition
- **TPES-3216MGT-16-54-24TVI-E ..... P/N: 8361-0446**  
16 10/100TX + 2 1G/2.5G Copper w/16 PoE at/af L2+ NAT router Switch w/PoE & Ethernet galvanic isolation; 16.8~56VDC dual input; -40°C to 70°C; IP54 rated
- **TES-3216MGT-54-24TVI-E ..... P/N: 8361-0447**  
16 10/100TX + 2 1G/2.5G Copper L2+ NAT router Switch w/Ethernet galvanic isolation; 16.8~56VDC dual input; -40°C to

- 70°C; IP54 rated
- **TPES-3216MGT-16-54-24TVI** ..... P/N: 8361-0448  
 16 10/100TX + 2 1G/2.5G Copper w/16 PoE at/af L2+ NAT router Switch w/PoE & Ethernet galvanic isolation; 16.8~56VDC dual input; -20°C to 60°C; IP54 rated
  - **TES-3216MGT-54-24TVI** ..... P/N: 8361-0449  
 16 10/100TX + 2 1G/2.5G Copper L2+ NAT router Switch w/Ethernet galvanic isolation; 16.8~56VDC dual input; -20°C to 60°C; IP54 rated

## OPTIONAL ACCESSORIES

### Software package

Please refer to the [software datasheet](#)

### M12 Connector & Cable

#### Connector

- **4106-0000097-001** 5 pin M12 (Female) K-coded 180 degrees screw type connector for power supply
- **ECONM12-05K(F)-S-180**
- **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

- **4106-0000096-001** 5 pin M12 (Female) K-coded 90 degrees 1.5M cable for power supply
- **ECABM12-05K(F)-90-1.5M**
- **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

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