

T(P)GR-3208T

10 GE (PoE) M12 NAT Router Switch



OVERVIEW

Lantech T(P)GR-3208T is a high-performance router switch designed for rail/metro and vehicle 24V input systems with 10 10/100/1000T w/8 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.

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)GR-3208T is designed with dual power inputs that accept 9V~36V DC for 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, reducing the impact of high-frequency pulse voltage that could be incurred by motor applications.

Ignition PoE timer function on IGN model, ITxPT Xstatus protocol

The IGN model features a programmed timer for each port that allows users to shut down individual PoE ports with customizable intervals ranging from 30 seconds to 60 minutes. This design eliminates the need for additional relay wiring, facilitating remote configuration to adjust the PoE timer at any time and from anywhere. The switch supports the ITxPT Xstatus protocol, which enables detailed monitoring of Ethernet switches.

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

T(P)GR-3208T 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.

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.

DDoS security to protect switch and server; Optional IEC 62443 compliance with physical tamper resistance and detection for integrity and authenticity of the boot process

The switch is designed with a high standard of security methods to prevent network threats, such as prevention of DDoS attacks, 802.1X security authentication, Dynamic ARP Inspection, IP Source Guard and Port Security. The optional cybersecurity features compliant with IEC 62443-4-2 include vulnerability checking, encrypted files, public key management, strong password enforcement, account management, and penetration and stress testing, among many others, totaling up to 90 security measures. The compliance of IEC 62443-4-2 employs roots of trust to verify the integrity and authenticity of the firmware, software, and configuration data needed for the switch's boot process.

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

The switch developed on Lantech OS2 Pro platform is equipped with Layer 2 management and some Layer 3 routing protocols, including OSPF and RIP V1,V2. Engineered for diverse vehicle applications, this platform also supports a range of features such as NAT, Port forwarding, multiple Static IP address, DHCP server/option/client/port based, VLAN, IGMP, RSTP/ G.8032 enhanced ring recovery, LACP etc.

Support Open API document for Restful API for better switch performance

The switch supports an OPEN API that uses JSON format to access and manipulate data using GET, PUT, POST, and DELETE methods, thereby avoiding the CPU utilization associated with traditional SNMP management.

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 distributes the "payload" to the subscribers all in a very lightweight protocol.

Reliable eMMC for better power efficiency and reliability

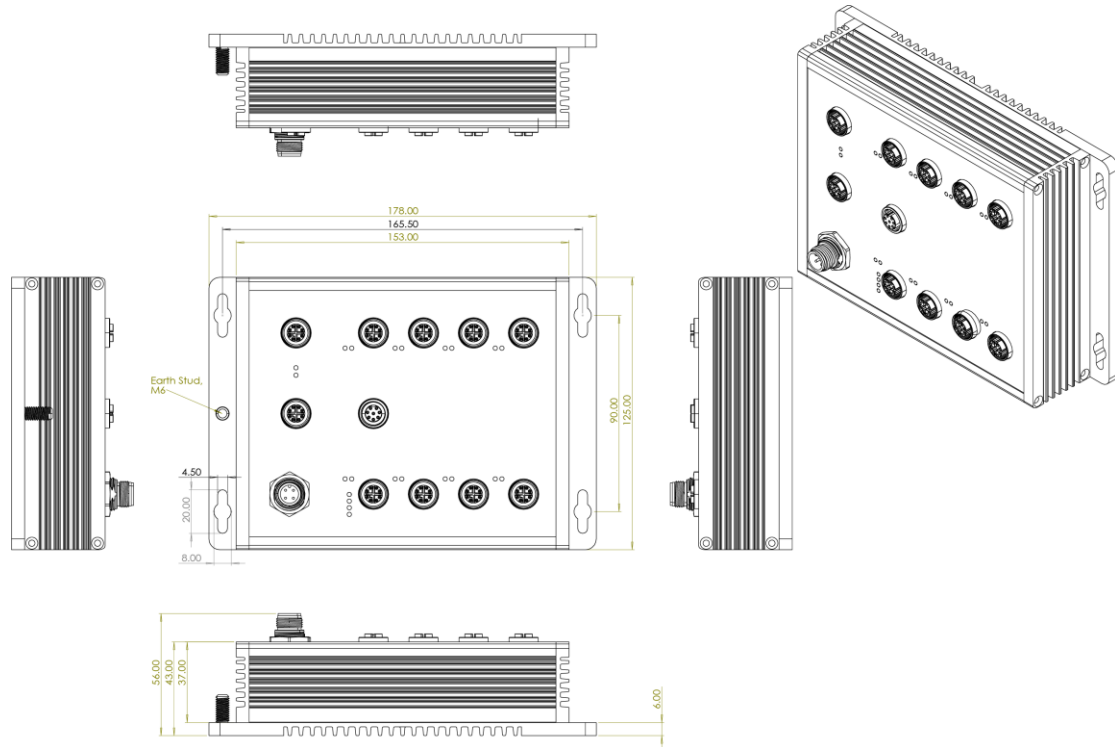
The switch utilizes eMMC for firmware storage. The eMMC's standard interface streamlines the design process while delivering improved power efficiency and enhanced reliability, thereby extending the storage's lifespan.

Optional bypass relay prevents power loss

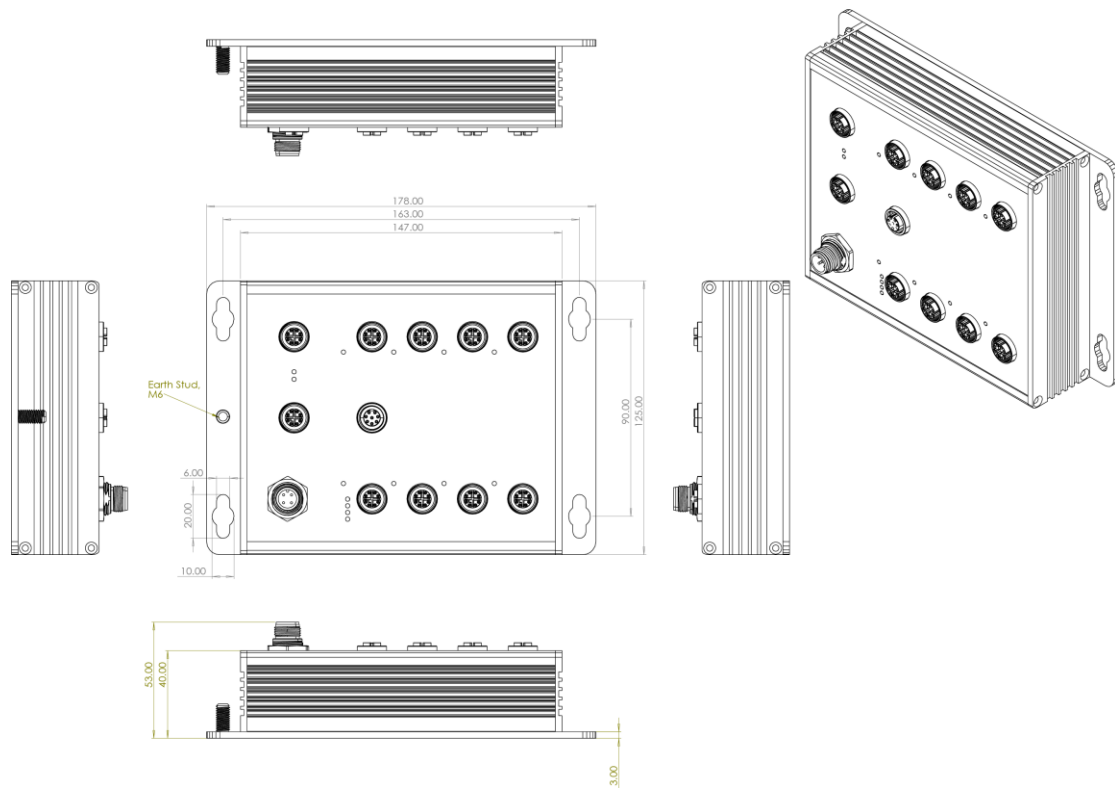
The optional bypass relay is set to bypass the switch to the next one when power is off in order to protect the network from crashing. Lantech bypass caters to remain in bypass mode until the switch is completely booting up when power is back to avoid another network loss. Smart bypass can be activated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

DIMENSIONS (unit=mm)

PoE models



Non-PoE models



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): 20Gbps
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	10/100/1000T: 9 x M12 8-pole X-coded 10/100/1000T 1x router/LAN configurable (port#9) Power Input connector: 1 x M12 4-pole Male A-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 model)
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	9-36VDC (24VI) 16.8-56VDC (24TVI)
PoE Budget	80W at 24VDC A higher PoE budget can be applied upon request. **
PoE pin assignment	M12 port #1-#8 supports IEEE 802. 3at/af End-point. Per port provides up to 30W
Power Consumption	7W (w/o PoE load)
Case Dimension	IP67/IP54: Aluminum case 178mm(W)x125mm(H)x56mm(D) (PoE models) 178mm(W)x125mm(H)x53mm(D) (Non-PoE models)
Weight	1.03kgs (PoE model) 933g (Non-PoE model)
Installation	Wall Mount / Din Rail 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	320,928 hrs
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)
Software Specification	
Lantech OS2 PRO Platform	Download Software Datasheet

*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)

- **TPGR-3208T-54-24VI-E** **P/N: 8351-140**
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP54 rated
- **TPGR-3208T-54-24VI-IGN-E** **P/N: 8351-1401**
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation & ignition; 9~36VDC dual input; -40°C to 70°C; IP54 rated
- **TPGR-3208T-54-24TVI-E** **P/N: 8351-1402**
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation; 16.8~56VDC dual input; -40°C to 70°C; IP54 rated
- **TGR-3208T-54-24VI-E** **P/N: 8351-1403**
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP54 rated
- **TGR-3208T-54-24VI-IGN-E** **P/N: 8351-1404**
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation & ignition; 9~36VDC dual input; -40°C to 70°C; IP54 rated
- **TGR-3208T-54-24TVI-E** **P/N: 8351-1405**
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation; 16.8~56VDC dual input; -40°C to 70°C; IP54

- rated
- **TPGR-3208T-54-24VI** P/N: 8351-1406
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation; 9~36VDC dual input; -20°C to 60°C; IP54 rated
 - **TPGR-3208T-54-24VI-IGN**P/N: 8351-1407
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation & ignition; 9~36VDC dual input; -20°C to 60°C; IP54 rated
 - **TPGR-3208T-54-24TVI** P/N: 8351-1408
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation; 16.8~56VDC dual input; -20°C to 60°C; IP54 rated
 - **TGR-3208T-54-24VI** P/N: 8351-1409
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation; 9~36VDC dual input; -20°C to 60°C; IP54 rated
 - **TGR-3208T-54-24VI-IGN**P/N: 8351-14041
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation & ignition; 9~36VDC dual input; -20°C to 60°C; IP54 rated
 - **TGR-3208T-54-24TVI** P/N: 8351-14051
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation; 16.8~56VDC dual input; -20°C to 60°C; IP54 rated
 - **TPGR-3208T-67-24VI-E** P/N: 8351-14001
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP67 rated
 - **TPGR-3208T-67-24VI-IGN-E**P/N: 8351-14011
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation & ignition; 9~36VDC dual input; -40°C to 70°C; IP67 rated
 - **TPGR-3208T-67-24TVI-E** P/N: 8351-14021
10 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE galvanic isolation; 16.8~56VDC dual input; -40°C to 70°C; IP67 rated
 - **TGR-3208T-67-24VI-E** P/N: 8351-14031
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP67 rated
 - **TGR-3208T-67-24VI-IGN-E**P/N: 8351-14041
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation & ignition; 9~36VDC dual input; -40°C to 70°C; IP67 rated
 - **TGR-3208T-67-24TVI-E** P/N: 8351-14051
10 10/100/1000T L2+ NAT router Switch w/ galvanic isolation; 16.8~56VDC dual input; -40°C to 70°C; IP67 rated

OPTIONAL ACCESSORIES

Software package

Please refer to the [software datasheet](#)

M12 Connector & Cable

Connector

- **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

- **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
- **ECONM12-4P(F)1.5M CABLE** 4 pin M12 (Female) A-coded 90 degree cable for power supply, 150cm
- **ECONM12-08M2-CONSOLE** 8 pin M12 (Male) A-coded 180 degree to RS232 cable for console, 150cm

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