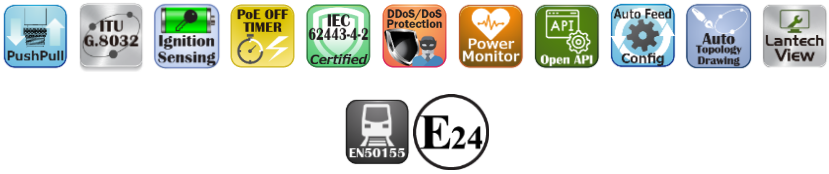
T(P)ER-3208T

8 FE + 2 GE (w/8 PoE at/af) M12 (Push-Pull) Vehicle and EN50155 NAT Router Switch



OVERVIEW

Lantech T(P)ER-3208T is available for basic and standard variants. It's a high-performance router switch designed for rail/metro and vehicle 24V input systems with 8 10/100TX + 2 10/100/1000T w/M12 X-coded (Push-Pull** lock connectors IEC 61076-2010) 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)ER-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)ER-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 Switches and Servers

The Lantech OS2Pro platform is designed with robust security methods to prevent network threats, such as DDoS attack prevention, 802.1X security authentication, Dynamic ARP Inspection, IP Source Guard, and Port Security.

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 distributors 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.

Auto feed configuration for swapped new switches for Seamless Network Maintenance, USB port for backup, restoring configuration and upgrading firmware

The switch supports auto-feed configuration features that revolutionize network switch setup and management. It ensures that new and replacement switches automatically receive the correct configurations without manual intervention. Additionally, it supports the traditional way of uploading or downloading the firmware / configuration through a USB dongle.

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 temperature, and total power load 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 Ignition 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. (system off timer default: 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. (-IGN model)

*Optional IEC 62443-4-2*** Model to Help Maintain the Safety and Reliability of Critical Infrastructure and Ensure Operational Continuity*

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. (-SEC model) To learn more about Lantech cybersecurity software solutions, please refer to
https://www.lantechcom.tw/global/eng/download/datasheet/D-OS2.pdf

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

*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)

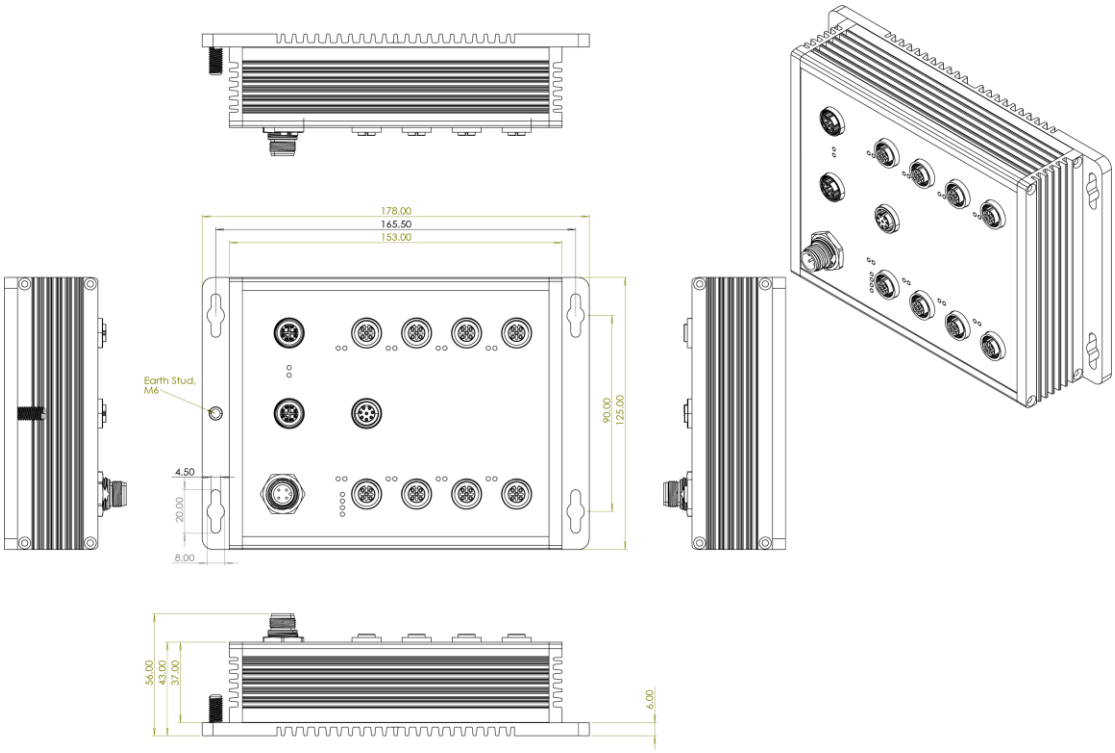
OS2 Pro Basic vs. OS2 Pro Standard models comparison

	OS2 Pro Basic	OS2 Pro Standard
Management	Web UI/Telnet	Web UI/Telnet complete CLI command line
IEC 62443 Cybersecurity	NA	Y(optional)
Hardware Environmental Monitoring	NA	Y
Bypass	NA	Y(optional)
Boot up time	Within 60sec.	Within 60sec. (for security -SEC model around 90sec.)

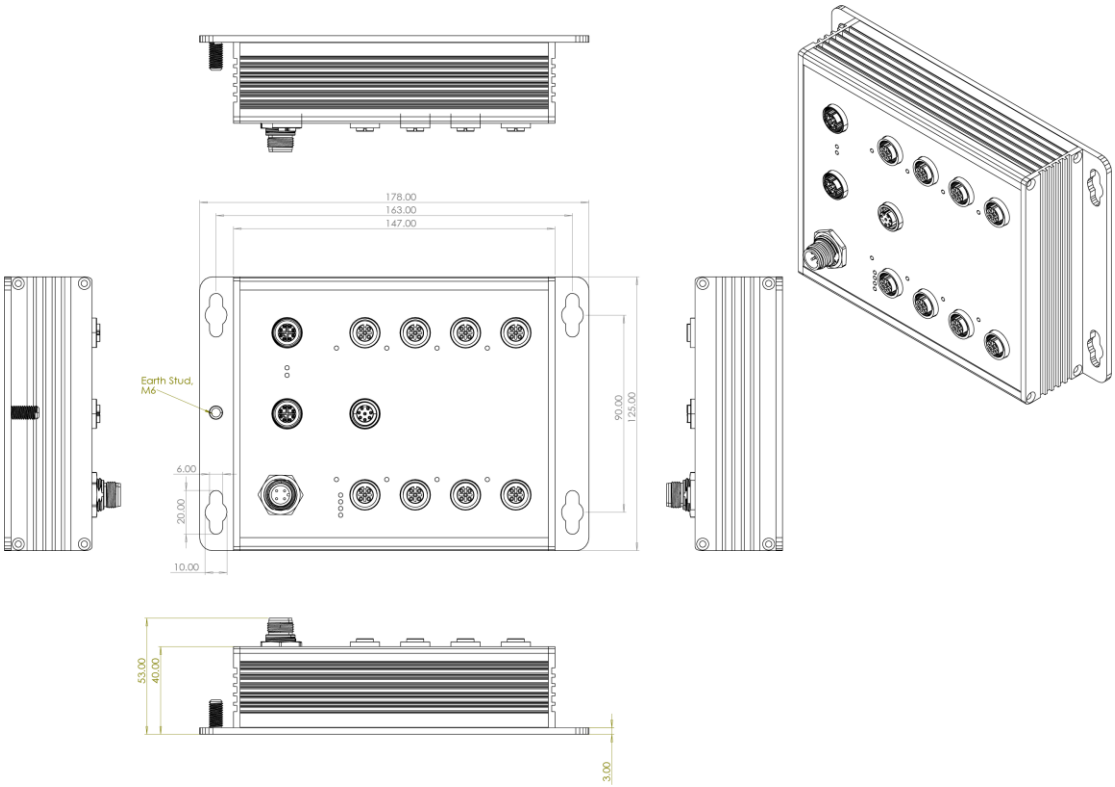
(Note: OS2 Pro Basic is only available on 24VI models)

DIMENSIONS (unit=mm)

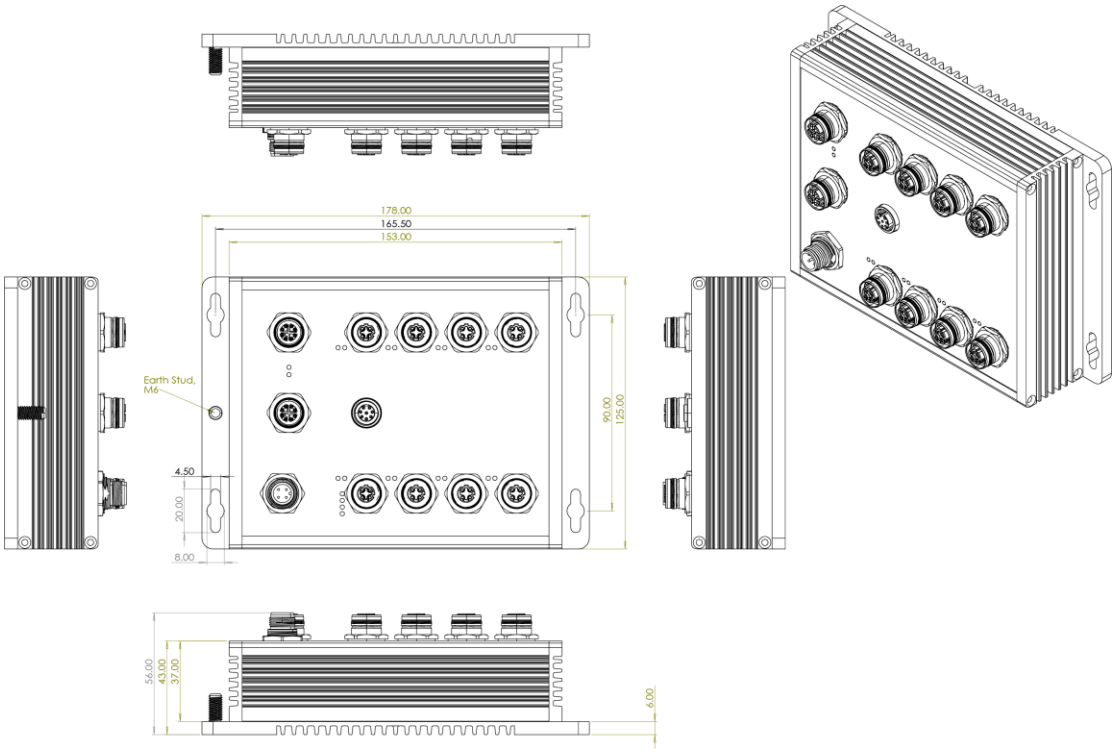
PoE models



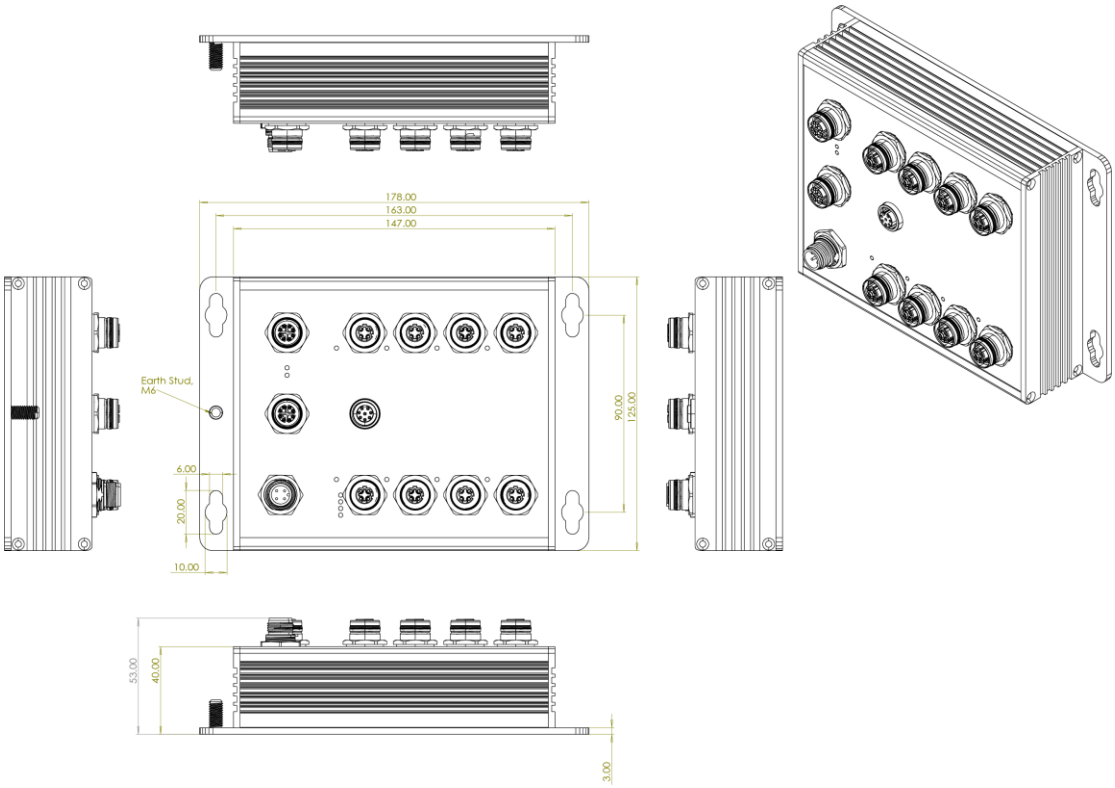
Non-PoE models



PoE -PP models



Non-PoE -PP 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): 5.6Gbps
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: 8 x M12 4-pole D-coded (Push-Pull** connector) 10/100/1000T: 1 x M12 8-pole X-coded (Push-Pull** connector) 10/100/1000T 1 x M12 8-pole X-coded (Push-Pull** connector); 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, -24TVI 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
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 models) 880g (Non-PoE model)
Installation	Wall Mount / Din Rail mount**
EMI & EMS	EN 55035: 2017/ A11: 2020 EN 55032: 2015/ A11: 2020 FCC Part 15, Subpart B ICES-003 Issue 7 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 IEC 61000-6-2: 2016 IEC 61000-6-4: 2018 EN IEC 61000-6-2: 2019 EN IEC 61000-6-4: 2019 BS EN 55035: 2017+A11: 2020 BS EN 55032: 2015+A11: 2020
Verifications	EN 50155: 2021 EN 50121-4: 2016/ A1: 2019 EN 50121-3-2: 2016/ A1: 2019 EN45545-1, EN 45545-2 Fire & Smoke
Stability Testing	EN 61373: 2010 (Shock and Vibration)
Vehicle Certificate	E24 marking (UN ECE R10) ITxPT labeled*
Vehicle Compliance	UN ECE R118
MTBF	326,701hrs
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 OS2PRO Platform
Download Software Datasheet

(https://www.lantechcom.tw/global/eng/download/datasheet/D-OS2PRO.pdf)

*Future release
**Optional
*** not for Basic model

ORDERING INFORMATION

All model packages include M12 caps. For coating add –C to model names; for optional bypass add –BT (one pair) to end of model names. (only for 24TVI models) for wide temp. model add -E to model names, add -IGN for ignition models, add -PP for push-pull connector models; add -SEC for Cybersecurity models

✻To support environmental sustainability, a console cable will not be included with each device by default. If your project requires one, please contact your sales representative.

- **TPER-3208T-54-24VI-E …..……..…….…..... P/N: 8351-139 (8351-13901 for basic model, 8351-13902 for -PP model, 8351-13903 for -PP basic model / 8351-13904 for IP67, 8351-13905 for IP67 basic, 8351-13906 for IP67 -PP basic model)**
  8 10/100TX + 2 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE & Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP54 rated

- **TPER-3208T-54-24VI-IGN-E …….P/N: 8351-1391 (8351-13911 for basic model, 8351-13912 for -PP model, 8351-13913 for -PP basic model / 8351-13914 for IP67, 8351-13915 for IP67 basic, 8351-13916 for IP67 -PP basic model)**
  8 10/100TX + 2 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE & Ethernet galvanic isolation & ignition; 9~36VDC dual input; -40°C to 70°C; IP54 rated
- **TPER-3208T-54-24TVI …….. P/N: 8351-1392 (8351-13922 for -PP model / 8351-13924 for IP67 model)**
  8 10/100TX + 2 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE & Ethernet galvanic isolation; 16.8~56VDC dual input; -40°C to 70°C; IP54 rated
- **TER-3208T-54-24VI-E …….. P/N: 8351-1393 (8351-13931 for basic model, 8351-13932 for -PP model, 8351-13933 for -PP basic model / 8351-13934 for IP67, 8351-13935 for IP67 basic, 8351-13936 for IP67 -PP basic model)**
  8 10/100TX + 2 10/100/1000T L2+ NAT router Switch w/ Ethernet galvanic isolation; 9~36VDC dual input; -40°C to 70°C; IP54 rated
- **TER-3208T-54-24VI-IGN-E …….. P/N: 8351-1394 (8351-13941 for basic model, 8351-13942 for -PP model, 8351-13943 for -PP basic model / 8351-13944 for IP67, 8351-13945 for IP67 basic, 8351-13946 for IP67 -PP basic model)**
  8 10/100TX + 2 10/100/1000T L2+ NAT router Switch w/ Ethernet galvanic isolation & ignition; 9~36VDC dual input; -40°C to 70°C; IP54 rated
- **TER-3208T-54-24TVI …….. P/N: 8351-1395 (8351-13952 for -PP model / 8351-13954 for IP67 model)**
  8 10/100TX + 2 10/100/1000T L2+ NAT router Switch w/ Ethernet galvanic isolation; 16.8~56VDC dual input; -40°C to 70°C; IP54 rated
- **TPER-3208T-54-24VI …….. P/N: 8351-1396 (8351-13961 for basic model, 8351-13962 for -PP model, 8351-13963 for -PP basic model / 8351-13964 for IP67, 8351-13965 for IP67 basic, 8351-13966 for IP67 -PP basic model)**
  8 10/100TX + 2 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE & Ethernet galvanic isolation; 9~36VDC dual input; -20°C to 60°C; IP54 rated
- **TPER-3208T-54-24VI-IGN …….P/N: 8351-1397 (8351-13971 for basic model, 8351-13972 for -PP model, 8351-13973 for -PP basic model, 8351-13974 for IP67, 8351-13975 for IP67 basic, 8351-13976 for IP67 -PP basic model)**
  8 10/100TX + 2 10/100/1000T w/8 PoE at/af L2+ NAT router Switch w/ PoE & Ethernet galvanic isolation & ignition; 9~36VDC dual input; -20°C to 60°C; IP54 rated
- **TER-3208T-54-24VI …….. P/N: 8351-1398 (8351-13981 for basic model, 8351-13982 for -PP model, 8351-13983 for -PP basic model / 8351-13984 for IP67, 8351-13985 for IP67 basic, 8351-13986 for IP67 -PP basic model)**
  8 10/100TX + 2 10/100/1000T L2+ NAT router Switch w/ Ethernet galvanic isolation; 9~36VDC dual input; -20°C to 60°C; IP54 rated
- **TER-3208T-54-24VI-IGN …….. P/N: 8351-1399 (8351-13991 for basic model, 8351-13992 for -PP model, 8351-13993 for -PP basic model / 8351-13994 for IP67, 8351-13995 for IP67 basic, 8351-13996 for IP67 -PP basic model)**
  8 10/100TX + 2 10/100/1000T L2+ NAT router Switch w/ Ethernet isolation & ignition; 9~36VDC dual input; -20°C to 60°C; IP54 rated

OPTIONAL ACCESSORIES

Software package

Please refer to the software datasheet (https://www.lantechcom.tw/global/eng/download/datasheet/D-OS2PRO.pdf)

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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