T(P)GS-H7416XT

16 GE + 4 10 GE Copper M12 Push-Pull X-coded (PoE) EN50155 Managed Ethernet Security Switch w/optional L3 & Cybersecurity, WVI input



OVERVIEW

Lantech T(P)GS-H7416XT is a high-performance OS5 Ethernet security switch with 16 10/100/1000T + 4 100M/1G/2.5G/5G/10G Copper PoE switch (total 20 ports) w/ M12 X-coded Push-Pull lock connectors (IEC 61076-2-010). The OS5 platform supports L3/L2, IPv6/v4, NAT**, standardized ITU G.8032 ring, IEC62443-4-2 certified cybersecurity, SNMPv3, Macsec**, PTP v2 as well as ETBN TTDP**, TRDP** protocol suitable for the future-proof modern network.

*Lantech OS5 platform is equipped with complete L2 management and optional L3 communication protocols incl. dynamic routing, multicast routing, hardware NAT and ETBN TTDP, TRDP**; optional PTP, MacSec to be upgradable*

The switch runs on the Lantech OS5 platform which is powerful with complete Layer 2 management features and major L3 protocols inclusive of RIP, OSPF, PIM, DVMRP, IEC61375-2-5 (ETBN), TRDP** and hardware-based NAT. It also supports optional Macsec for authentication and encryption between two Macsec devices. The optional PTP V2 and gPTP support transparent clock, boundary clock and ordinary clocks with 2-step processing that synchronizes network time accuracy to sub-microseconds. To learn more about the Lantech OS5 Platform, please refer to **Lantech OS5 Software Datasheet** (https://www.lantechcom.tw/global/eng/download/datasheet/D-OS5.pdf)

SNMP v3 Security Models

SNMPv3 enhances security with three key models. The User-based Security Model (USM) provides authentication and encryption, verifying the sender's identity and protecting data. The View-based Access Control Model (VACM) manages user access to specific objects based on their security level. The Transport Security Model (TSM) uses secure protocols like TLS or DTLS for communication encryption. Together, these models make SNMPv3 implementations highly secure, meeting modern cybersecurity standards for large-scale and high-security projects.

Comprehensive Network Protection Against DDoS and Layer 2 Threats

Lantech OS5 generation 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.

Support Restful API for better switch performance; Auto-provisioning for firmware/configuration update

The switch supports Restful API that uses JSON format to access and use data for GET, PUT, POST and DELETE types to avoid traditional SNMP management occupying CPU utilization. The OPEN API document format for Restful API can greatly improve central management efficiency for various applications including fleet management and AIOT.
It also supports auto-provisioning for switch to auto-check the latest software image and configuration through TFTP server.

Optional IEC 61375-2-5/3-4 ETBN/ECN TTDP protocol, RNAT and proprietary DHCP and VLAN over TTDP

Lantech optional L3L/L3 license includes IEC 61375-2-5 and 3-4 ETBN standardized TTDP protocol that automatically assigns the switch IP address reflecting its location to adapt with various train-car arrangements of the operator's plan. With RNAT (railway NAT), each car device's IP address can be routed to the specific server and proprietary DHCP and VLAN over TTDP to help manage fixed IP address per device as well as the segmentation of VLAN in ECN.

Redundant dual WVI power input w/ power transient, inrush current, polarity reverse

The T(P)GS-H7416XT WVI model accepts 16.8~137.5VDC dual inputs with galvanic isolation to PoE and all Ethernet ports. The switch incorporates a power protection circuit to safeguard against potential adverse effects and hazards from power transients (surges, spikes, power fluctuations). It is also designed to clamp inrush current and protect from polarity reversal damage.

Up to 16 PoE IEEE 802.3at/af and 8 PoE include 4 IEEE 802.3at/af and 4 T4 PoE bt/at/af ports w/advanced PoE management and PoE galvanic isolation with max PoE budget, support Perpetual/Fast PoE

Compliant with 802.3 bt/at/af standard, the PoE model is able to feed 16 PoE ports up to 30 Watt@ for various PD devices and 4 T4 PoE IEEE 802.3bt (-8 model) to feed PoE up to 90 Watt@. The switch supports 80W PoE budget. It supports advanced PoE management including PoE detection and scheduling. PoE detection can detect if the connected PD hangs then restart the PD; PoE scheduling is to allow a pre-set power feeding schedule upon a routine timetable. Each PoE port can be Enabled/disabled, get the voltage, current, Watt, and temperature info displayed on WebUI.Perpetual and Fast PoE provides immediate and continuous power to devices during PSE switch reboots.
The PoE galvanic isolation provides insulation between the power input to PoE Ethernet ports, preventing cabling and grounding incidents from damaging the Ethernet switch. The efficiency of the galvanically decoupled voltage converters can reach above 90%.

Reliable eMMC for better power efficiency and reliability

The T(P)GS-H7416XT 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.

Support RTC (Real Time Clock) with longevity golden capacitor

Our switch supports RTC which is powered by a golden capacitor, ensuring accurate real-time event logs for all times. Unlike traditional batteries, golden capacitors offer superior reliability, and longevity, without a need to change battery.

Auto feed configuration for swapped new switches for Seamless Network Maintenance

The T(P)GS-H7416XT supports auto-feed configuration features that revolutionize network switch setup and management. It ensures that new and replacement switches automatically receive the correct configuration without manual intervention.

User-friendly GUI, Auto topology drawing, Enhanced Environmental Monitoring

The user-friendly UI, innovative auto topology drawing, and topology demo make the switch much easier to get hands-on. The complete CLI enables professional engineers to configure settings by command line. It supports real-time power monitoring for actual input voltage, current, switch ambient temperature and total power load.

Editable configuration file; USB port for import/export configuration

The configuration file of the switch can be imported and edited with a word processor for the following switches to configure with ease. The USB data port can import/export the configuration from/to the USB dongle and also to upgrade firmware. It supports USB console port that allows CLI access. It supports USB type-C console port that allows CLI access without an external RS232 adapter is required.

Event log & message; 2DI + 2DO; Factory default pin

The switch provides 2DI and 2DO. When disconnection of the specific port is detected; DO will activate the signal LED to alarm. DI can integrate the sensors for events and DO will trigger the outside alarm and the switch will send alert information to IP network with traps. The factory reset pin can restore the setting to factory default.

Optional smart bypass protection on dual/quad 10G copper ports

The bypass relay is set to bypass the switch to the next one when power is off to prevent network disruption. Lantech bypass caters to remain in bypass mode until the switch completely booting up when power is back to avoid another network loss. Optional smart bypass (Up to two pairs) can be activated when switch encounters power failure or CPU hang. (-BT/-BBT model)

EN50155, EN45545-2; EN61373 compliance

The IP54/IP67 aluminum alloy enclosure meets with EN60529 with M12 connectors for waterproofing. With EN50155 verification along with EN45545-2 Fire & Smoke compliance, this switch is ideally suited for railway on-board/trackside, vehicle, and other rugged applications. The switch operates under wide-ranging temperatures from -40°C to 70°C (-40°F to 158°F) (EN50155 T4).

OPTIONAL FEATURES

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

For enhanced cybersecurity, the optional certified IEC 62443-4-2** model is available. 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-OS5.pdf

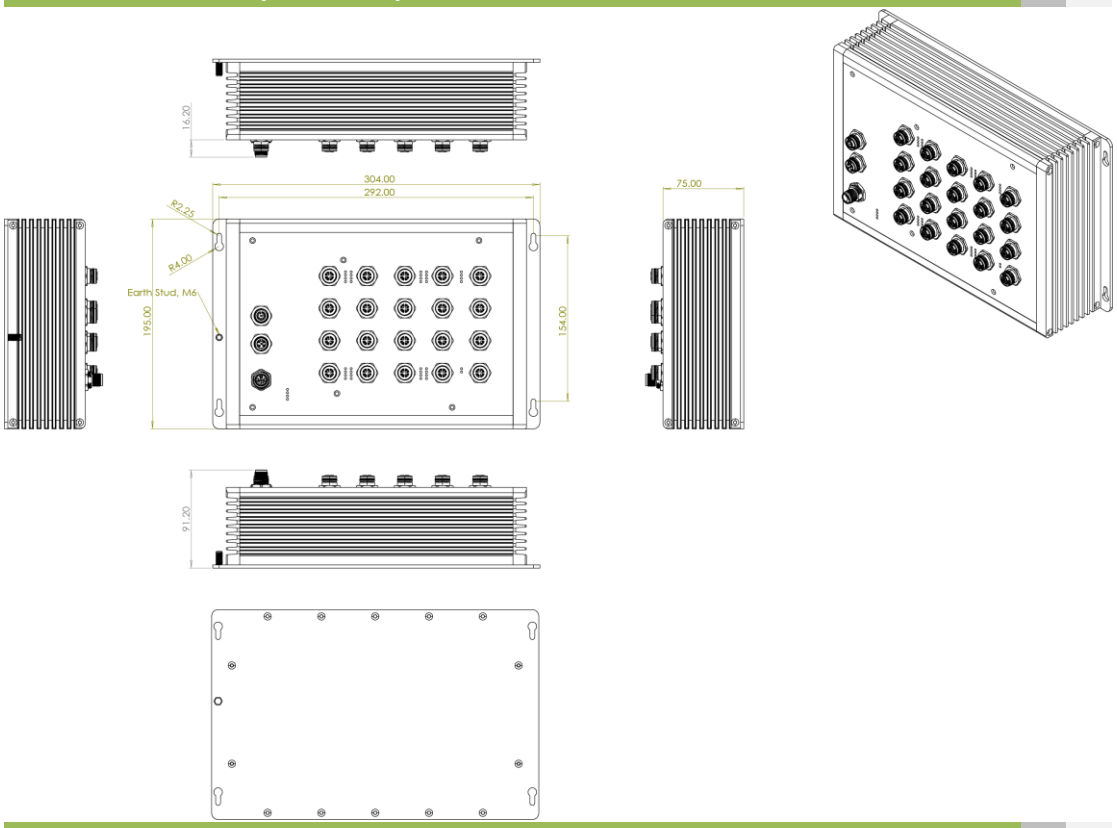
Optional LantechView for Lantech devices maintenance

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

OS5 vs. OS5 - SEC models comparison

	OS5	OS5 - SEC
IEC 62443-4-2 Cyber Security	NA	Y, need optional license
Boot up time	Around 100 sec.	Around 135 sec.

DIMENSIONS (unit=mm)



SPECIFICATIONS

Hardware Specification

Standards	IEEE802.3 10Base-T Ethernet IEEE802.3u 100Base-TX IEEE802.3ab 1000Base-T IEEE802.3an 10Gbase-T 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
Switch Architecture	Back-plane (Switching Fabric): 112Gbps
Mac Address	16K MAC address table
Jumbo frame	10KB
Connectors	10/100/1000T: 16 x M12 8-pole X-coded with Push-Pull connectors, Auto MDI/MDI-X function 100M/1G/2.5G/5G/10G Copper: 4 x M12 8-pole X-coded port 17-20 with Push-Pull connectors Power Input connector: 1 x M12 5-pole Male K-coded Reset/USB console/USB data: 1 x M12 8-pole A-coded DIDO: 1 x M12 5-pole A-coded
Network Cable	1000Base-T: 4-pair STP Cat5E/6 cable; 10G Copper: 4-pair STP Cat6a/7 cable
LED	Per unit: Power 1 (Green), Power 2 (Green), FAULT (Red) 100/1000T Ethernet port: Link/Activity (Green), Speed (Green); R.M. indicator (Green) Uplink 100M/1G/2.5G/5G/10G Copper ports: Speed (100M/1G: Green; 2.5G/5G/10G: Orange) PoE: Link/Act (Green)
DI/DO	2 Digital Input (DI): Level 0: -30~2V / Level 1: 10~30V Max. input current:8mA 2 Digital Output(DO): Open collector to 80 VDC, 50mA
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-40C~70C / -40F~158F (85°C operation for 10min.)
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	Dual DC input WVI (16.8~137.5VDC)
Inrush Current	6A
PoE Budget (PoE model)	80W with PoE galvanic isolation
PoE pin assignment (PoE model)	-16 model M12 port #1~#16 (AT 30W) -8 model M12 port #1~#4 (AT 30W) Port #5~8 (T4 BT 90W) Support IEEE 802.3bt/at/af End-point, Alternative A mode
Power Consumption	Max. 28.88W excludes PoE load
Dimensions	IP54/IP67 Aluminum alloy case (wall mount): 304mm(W)x91.2mm(H)x195mm(D)
Weight	3.95kgs
Installation	Wall Mount Design
EMI & EMS	FCC Part 15 Class A EN61000-6-2 EN61000-6-4 CE EN55032 Class A CE EN55024 CE EN61000-4-2 (ESD) Level 3 CE EN61000-4-3 (RS) Level 3 CE EN61000-4-4 (EFT) Level 3 CE EN61000-4-5 ED3 (Surge) Level 3 CE EN61000-4-6 (CS) Level 3

	CE EN61000-4-8 (Magnetic field) Level 3
Verifications	EN50155/EN50121-3-2/EN50121-4; EN 45545-1, EN 45545-2 Fire & Smoke verification
Stability Testing	EN61373 (Shock and Vibration)
MTBF	268,403 hours (standards: IEC 62380)
Bypass**	Up to two pairs Bypass modules on 10GT ports to pass to next switch in case of power failure and CPU fail

Software Specification

Lantech OS5 Platform
Download Software Datasheet
(https://www.lantechcom.tw/global/eng/download/datasheet/D-OS5.pdf)

*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); -BBT (two pairs) to model names. For other optional features (PTP, MacSec, Cybersecurity, L3L or L3 software, add -PTP; -MacSec, -SEC, -L3L or -L3 to model names, please refer to the corresponding software part numbers as listed in the software datasheet.
https://www.lantechcom.tw/global/eng/download/datasheet/D-OS5.pdf

- **TPGS-H7416XT-16-54-WVI-PP……..P/N: 8361-053**
  16 10/100/1000T w/PoE at/af + 4 100M/1G/2.5G/5G/10G M12 X-coded push-pull connector EN50155 OS5 Managed Ethernet Switch; 16.8V~137.5V dual input; IP54 housing; -40°C to 70°C; w/PoE & ethernet galvanic isolation
- **TPGS-H7416XT-8-54-WVI-PP……..P/N: 8361-0531**
  16 10/100/1000T w/4 PoE at/af & 4 T4 PoE bt 90W + 4 100M/1G/2.5G/5G/10G M12 X-coded push-pull connector EN50155 OS5 Managed Ethernet Switch; 16.8V~137.5V dual input; IP54 housing; -40°C to 70°C; w/PoE & ethernet galvanic isolation
- **TGS-H7416XT-54-WVI-PP……P/N: 8361-0532**
  16 10/100/1000T + 4 100M/1G/2.5G/5G/10G Copper M12 X-coded push-pull connector EN50155 OS5 Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40°C to 70°C; IP54 housing w/ethernet galvanic isolation
- **TPGS-H7416XT-16-67-WVI-PP……..P/N: 8361-05308**
  16 10/100/1000T w/PoE at/af + 4 100M/1G/2.5G/5G/10G M12 X-coded push-pull connector EN50155 OS5 Managed Ethernet Switch; 16.8V~137.5V dual input; IP67 housing; -40°C to 70°C; w/PoE & ethernet galvanic isolation
- **TPGS-H7416XT-8-67-WVI-PP……..P/N: 8361-05325**
  16 10/100/1000T w/4 PoE at/af & 4 T4 PoE bt 90W + 4 100M/1G/2.5G/5G/10G M12 X-coded push-pull connector EN50155 OS5 Managed Ethernet Switch; 16.8V~137.5V dual input; IP67 housing; -40°C to 70°C; w/PoE & ethernet galvanic isolation
- **TGS-H7416XT-67-WVI-PP……P/N: 8361-05340**
  16 10/100/1000T + 4 100M/1G/2.5G/5G/10G Copper M12 X-coded push-pull connector EN50155 OS5 Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40°C to 70°C; IP67 housing w/ethernet galvanic isolation

*For all detailed part nos. and model names, please refer to
https://www.lantechcom.tw/global/eng/download/datasheet/P-T(P)GS-H7416XT.pdf

OPTIONAL ACCESSORIES

Software package

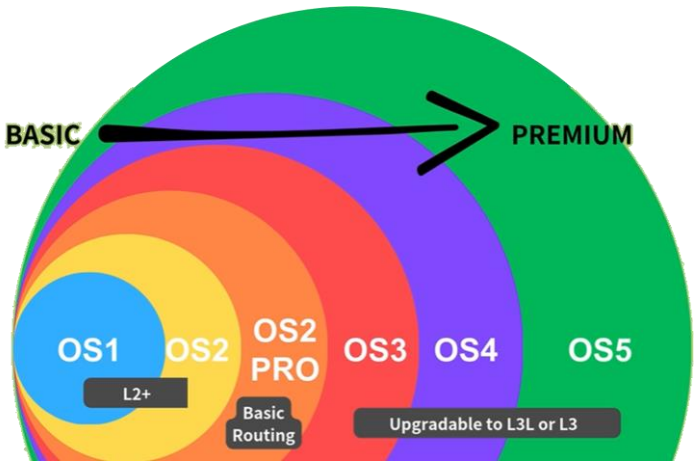
Please refer to the software datasheet (https://www.lantechcom.tw/global/eng/download/datasheet/D-OS5.pdf)

M12 Connector & Cable

Connector	
ECONM12-08A(M)-180	8 pin M12 (Male) A-coded 180 degrees crimp type connector for reset/console/USB
ECONM12-05A(M)-S-180	5 pin M12 (Male) A-coded 180 degrees crimp type connector for DI/DO
ECONM12-08X(M)-SPEEDCON	8 pin M12 (Male) X-coded 180 degrees crimp type connector for data, Ethernet CAT6A (10G), shielded, SPEEDCON
4106-00000097-001 **ECONM12-05K(F)-S-180**	5 pin M12 (Female) K-coded 180 degrees screw type connector for power supply
Cable	
ECABM12X83MSTP	8 pin M12 (Male) X-coded 180 degrees RJ45 STP cable for data, shielded, 300cm
4106-00000096-001 **ECABM12-05K(F)-90-1.5M**	5 pin M12 (Female) K-coded 90 degrees 1.5M cable for power supply
Others	
4106-00000100-001	8 pin M12 (Male) A-coded 180 degrees to USB Female/male plug, 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**

Lantech Communications Global Inc.
www.lantechcom.tw
info@lantechcom.tw
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