I(P)GS-H7416XF

16 GE (PoE) + 4 10G SFP+ Industrial Managed Ethernet Security Switch; 24V/48V input models w/optional dynamic routing, multicast routing, Cybersecurity, and hardware NAT



OVERVIEW

Lantech I(P)GS-H7416XF is a high-performance OS5 (All Gigabit) Ethernet security switch with 16 100/1000T + 4 1G/2.5G/10G auto-sensing SFP+ (w/16 PoE 802.3af/at Ports) which provides advanced security function for network aggregation deployment. The OS5 platform supports L3/L2, IPv6/v4, NAT**, standardized ITU G.803 ring, IEC62443-4-2 certified cybersecurity, SNMPv3, Macsec**, PTP v2** as well as ETBN TTDP** protocol suitable for the future-proof modern network.

Lantech OS5 platform is equipped with complete L2 management and L3 communication protocols incl. dynamic routing, multicast routing, hardware NAT and ETBN TTDP; 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), and hardware-based NAT. Optional hardware-base encryption compliance with IEEE 802.3AE MACsec for the point-to-point security links.
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.

Up to 16 PoE at/af ports w/advanced PoE management and PoE galvanic isolation with max PoE budget; Ethernet power input galvanic isolation, support Perpetual/Fast PoE

Compliant IEEE with 802.3af/at standards, the PoE model provides up to 30 Watts per port for various IP PD devices, with a total PoE power budget of 80W at 24TVI/24VI/48VI, 120W at 24V, and 240W at 48V. 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 pre-set power feeding schedule upon routine time table. Each PoE ports 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. Galvanic isolation between power input and Ethernet power system, also 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%.

Miss-wiring avoidance, node failure protection, Loop protection

The switch also embedded several features for strong and reliable network protection in an easy and intuitive way. When the pre-set ring configuration failed or looped by miss-wiring, the switch being able to alert with the LED indicator and disable ring automatically. Node failure protection ensures the switches in a ring to survive after power breakout is back. The status can be shown in NMS when each switch is back. Loop protection is also available to prevent the generation of broadcast storm when a dumb switch is inserted in a closed loop connection.

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

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 (including PoE if any) where user can set threshold to trigger an alert or event log.

Editable configuration file; USB port for import/export configuration

The configuration file of the switch can be imported and edited with word processor for the following switches to

configure with ease. The USB port can import/export the configuration from/to USB dongle and also to upgrade firmware from USB dongle. TFTP/HTTP firmware upgrade is supported.

Out-Of-Band management

OOB management allows a separate and secure method to access and manage the switch even when the primary network is inaccessible.

Real-Time Clock for precise time

The switch built-in a real-time clock (RTC) for measurement the passage of time with a NTP server.

Event log & message; 2DI + 2DO; Factory reset button

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

Industrial-hardened design with high EFT and ESD protection

The switch features high reliability and robustness coping with extensive EMI/RFI phenomenon, environmental vibration and shocks. It is the best solution for Automation, transportation, autonomous vehicles, surveillance, Wireless backhaul, Semi-conductor factory applications. The switch can be used in extreme environments with an operating temperature range of -40°C to 75°C.

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

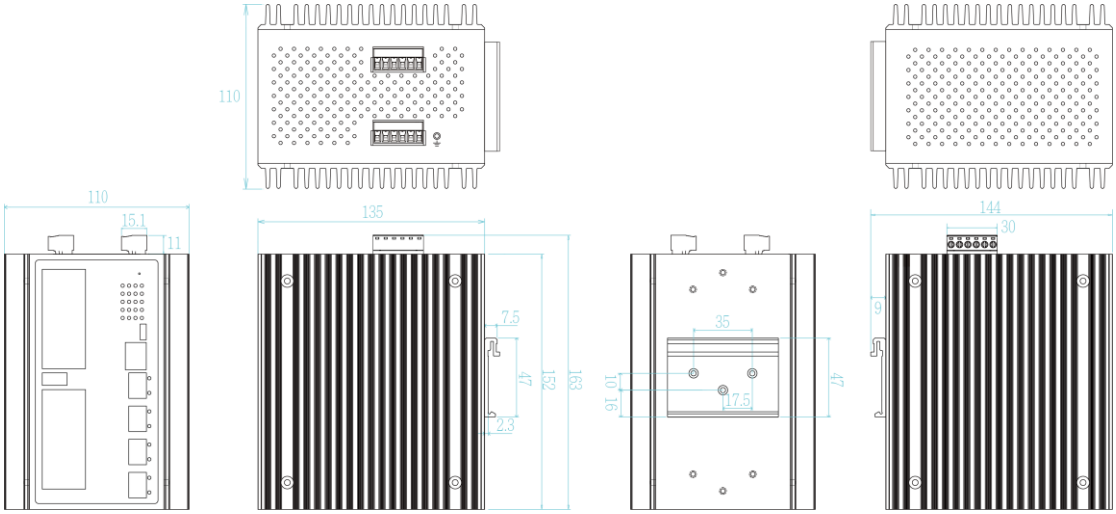
LantechView** can automatically discover Lantech devices on the network, providing seamless configuration management across multiple IP subnets and VLAN areas (single device and batch). It also supports firmware management, allowing single and batch verification and simultaneous upgrades to the latest 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

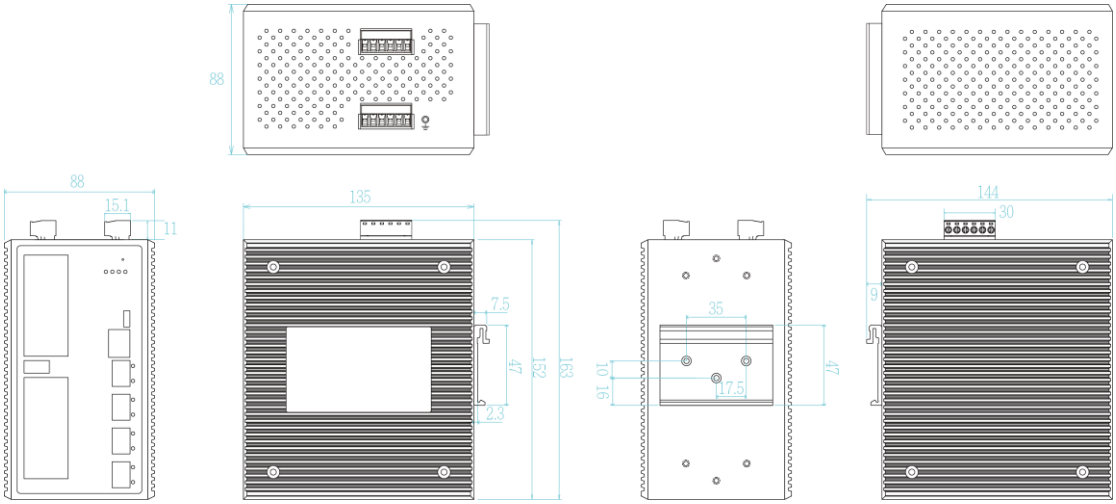
	OS5	OS5 - SEC
IEC 62443-4-2 Cyber Security	NA	Y, need optional license
Boot up time	Around 100 sec.	Around 135 sec.

DIMENSIONS (unit=mm)

PoE model



Non-PoE model



SPECIFICATIONS

Hardware Specification	
Standards	IEEE802.3 10Base-T Ethernet IEEE802.3u 100Base-TX IEEE802.3ab 1000Base-T IEEE802.3z Gigabit fiber 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): 112 Gbps
Forwarding rate	83.33Mpps
Mac Address	16K MAC address table
Jumbo frame	10KB

Connectors	10/100/1000T: 16 x ports RJ-45 with Auto MDI/MDI-X function Mini-GBIC: 4 x 1G/2.5G/10G SFP+ auto-sensing socket with DDMI RS-232 connector: USB type-C USB type-A x 1 Power connector: 1 x 6-pole terminal block DIDO: 1 x 6-pole terminal block Out-Of-Band connector: RJ-45 type
Network Cable	100Base-TX: 2-pair STP Cat. 5/ 5E/ 6 cable; EIA/TIA-568 100-ohm (100m) 1000Base-T: 4-pair STP Cat5E/6 cable; 10GBaseT:4-pair STP Cat6/6A/7 cable
Optical Cable	**1Gbps:** Multi-mode: 0 to 550 m, 850 nm (50/125 µm); 0 to 2 km, 1310 nm (50/125 µm) Single mode: 0 to 10 km/ 30 km/ 40 km, 1310 nm (9/125 µm); 0 to 50 km/ 60 km/ 80km/ 120 km, 1550 nm (9/125 µm) **2.5Gbps** Multi-mode: 0 to 300 m, 850 nm (50/125 µm); Single mode: 0 to 2 km/ 15 km/ 40 km, 1310 nm

	(9/125 µm); 0 to 40 km/ 80 km/ 100km, 1550 nm (9/125 µm) **WDM 1Gbps:** Single-mode: 0 to 10 km/ 20 km/ 40 km/ 60 km, 1310 nm (9/125 µm); 0 to 80 km, 1490 nm (9/125 µm); 0 to 10 km/ 20 km/ 40 km/ 60 km/ 80 km, 1550 nm (9/125 µm) **WDM 2.5Gbps** Single-mode: 0 to 5 km/ 20 km/ 40 km/ 60 km, 1310 /1550nm (9/125 µm); 0 to 80 km, 1490/1550 nm (9/125 µm) **10Gbps** Multi-mode: 0 to 300 m, 850 nm (OM3 50/125 µm); Single mode: 0 to 10 km/ 20 km, 1310 nm (9/125 µm); 0 to 40 km/ 80km/ 100 km, 1550 nm (9/125 µm) **WDM 10Gbps** Single-mode: 0 to 10 km/ 20 km/ 40 km/ 60 km, 1270/1330 nm (9/125 µm); 0 to 80km, 1490/1550 nm (9/125 µm)
LED	Per unit: Power 1 (Green), Power 2 (Green), FAULT (Red); RM(Green) Ethernet port: Link/Activity (Green), Speed (Green); 10G (Amber) PoE: Link/Act (Green, PoE model); Mini-GBIC: Link/Activity (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 40 VDC, 200mA
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-40°C~75°C / -40°F~167°F
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	Dual DC input, 16.8~56VDC (24TVI model); 48~56VDC(48V/48VI model) : 12~56VDC(24V/24VI model)

PoE Budget (PoE model)	Vehicle 24TVI/24VI/48VI models: 80W; IT 24V model:120W; IT 48V model:240W
PoE pin assignment (PoE model)	RJ-45 port # 1~#16 supports IEEE 802.3at/af End-point, Alternative A mode. Positive (VCC+): RJ-45 pin 1,2 Negative (VCC-): RJ-45 pin 3,6
Power Consumption	Max. 31.91W (full load w/o PoE)
Case Dimension	Metal case IP-30, 110 (W) x 135 (D) x 152 (H) mm (PoE model) 88 (W) x 135 (D) x 152 (H) mm (Non-PoE model)
Weight	2.1kgs
Installation	DIN Rail and Wall Mount** Design
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
Stability Testing	EN 61373: 2010 (Shock and Vibration)
MTBF	339,024hrs (standards: IEC 62380)

Software Specification

Lantech OS5 Platform
Download Software Datasheet

(https://www.lantechcom.tw/global/eng/download/datasheet/D-OS5.pdf)

*Future release
**Optional

ORDERING INFORMATION

For conformal coating add –C to P/N & 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

EN50155/Vehicle models:

- **IPGS-H7416XF-16-24TVI-OOB ……P/N: 8361-0342**
  16 10/100/1000T PoE at/af up to 30W + 4 1G/2.5G/10G SFP+ OS5 EN50155 PoE Managed Ethernet Switch; -40°C to 75°C; dual 16.8~56V input; w/Out-of-band; w/PoE & Ethernet galvanic isolation
- **IGS-H7416XF-24TVI-OOB ……P/N: 8361-034**
  16 10/100/1000T + 4 1G/2.5G/10G SFP+ OS5 EN50155 Managed Ethernet Switch; -40°C to 75°C; dual 16.8~56V input; w/Out-of-band; w/Ethernet galvanic isolation
- **IPGS-H7416XF-16-48VI-OOB……..P/N: 8361-03401**
  16 10/100/1000T PoE at/af up to 30W + 4 1G/2.5G/10G SFP+ OS5 EN50155 Managed Ethernet Switch; -40°C to 75°C; dual 48~56V input; w/Out-of-band; w/PoE & Ethernet galvanic isolation
- **IPGS-H7416XF-16-24VI-OOB……..P/N: 8361-03402**
  16 10/100/1000T PoE at/af up to 30W + 4 1G/2.5G/10G SFP+ OS5 EN50155 Managed Ethernet Switch; -40°C to 75°C; dual 12~56V input; w/Out-of-band; w/PoE & Ethernet galvanic isolation
- **IGS-H7416XF-24VI-OOB……P/N: 8361-03403**
  16 10/100/1000T + 4 1G/2.5G/10G SFP+ OS5 EN50155 Managed Ethernet Switch; -40°C to 75°C; dual 12~56V input; w/Out-of-band; w/Ethernet galvanic isolation

IT models:

- **IPGS-H7416XF-16-48V-OOB……..P/N: 8361-03428**
  16 10/100/1000T PoE at/af up to 30W + 4 1G/2.5G/10G SFP+ OS5 EN50155 Managed Ethernet Switch; -40°C to 75°C; dual

48~56V input; w/Out-of-band; w/Ethernet galvanic isolation

- **IPGS-H7416XF-16-24V-OOB……..P/N: 8361-03429**
  16 10/100/1000T PoE at/af up to 30W + 4 1G/2.5G/10G SFP+ OS5 EN50155 Managed Ethernet Switch; -40°C to 75°C; dual 12~56V input; w/Out-of-band; w/Ethernet galvanic isolation

*For all detailed part nos. and model names, please refer to

https://www.lantechcom.tw/global/eng/download/datasheet/P-I(P)GS-H7416XF.pdf

OPTIONAL ACCESSORIES

Software package

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

DIN Rail Power for 802.3at Applications

- **NDR-240 series** 240W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C)

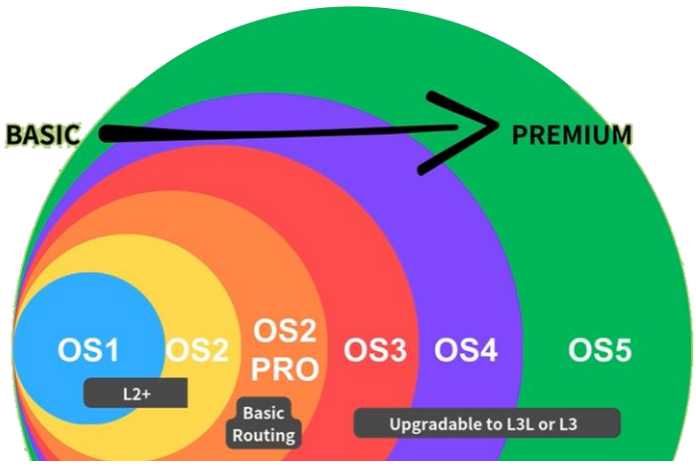
Mini GBIC (SFP)

- **8330-162D-V1** MINI GBIC 1000SX (LC/0.5km) Transceiver
- **8330-163D-V1** MINI GBIC 1000SX2 (LC/2km) Transceiver
- **8330-165D-V1** MINI GBIC 1000LX (LC/10km) Transceiver
- **8340-0591D-V1** MINI GBIC 1000LHX (LC/40km) Transceiver
- **8330-166D-V1** MINI GBIC 1000XD (LC/50km) Transceiver
- **8330-169D-V1** MINI GBIC 1000XD (LC/60km) Transceiver
- **8330-167D-V1** MINI GBIC 1000ZX (LC/80km) Transceiver
- **8330-170D-V1** MINI GBIC 1000EZX (120km) Transceiver
- **8330-168-V1** MINI GBIC 1000T (100m) Transceiver
- **8330-188D-V1** LTSFP-1000BX-10KM Transceiver (WDM 1310)
- **8330-189D-V1** LTSFP-1000BX-10KM Transceiver (WDM 1550)
- **8330-186D-V1** LTSFP-1000BX-20KM Transceiver (WDM 1310)
- **8330-187D-V1** LTSFP-1000BX-20KM Transceiver (WDM 1550)
- **8330-180D-V1** LTSFP-1000BX-40KM Transceiver (WDM 1310)
- **8330-182D-V1** LTSFP-1000BX-40KM Transceiver (WDM 1550)
- **8330-181D-V1** LTSFP-1000BX-60KM Transceiver (WDM 1310)
- **8330-183D-V1** LTSFP-1000BX-60KM Transceiver (WDM 1550)
- **8330-184D-V1** LTSFP-1000BX-80KM Transceiver (WDM 1490)
- **8330-185D-V1** LTSFP-1000BX-80KM Transceiver (WDM 1550)
- **8330-262D-V1** MINI GBIC 2.5G 850nm VCSEL (LC/0.3km) Transceiver
- **8330-263D-V1** MINI GBIC 2.5G 1310nm FP (LC/2km) Transceiver
- **8330-265D-V1** MINI GBIC 2.5G 1310nm DFB (LC/15km) Transceiver
- **8330-193D-V1** 10G Base SFP+ SR, Multi-mode (LC/300m) Transceiver
- **8330-194D-V1** 10G Base SFP+ LR, Single-mode (LC/10km) Transceiver
- **8330-223D-V1** 10G Base SFP+ LR, Single-mode (LC/1310nm/20km) DDM Transceiver
- **8330-225D-V1** 10G Base SFP+ LR , Single-mode (LC/1310nm /40km) DDM Transceiver
- **8330-205D-V1** 10G Base SFP+ LR , Single-mode (LC/1550nm/40km) DDM Transceiver
- **8330-209D-V1** 10G Base SFP+ , Single-mode(10km) Transceiver (WDM 1270)
- **8330-210D-V1** 10G Base SFP+ , Single-mode(10km) Transceiver (WDM 1330)
- **8330-200D-V1** 10G Base SFP+ , Single-mode(20km) Transceiver (WDM 1270)
- **8330-201D-V1** 10G Base SFP+ , Single-mode(20km) Transceiver (WDM 1330)
- **8330-202D-V1** 10G Base SFP+ , Single-mode(40km) Transceiver (WDM 1270)
- **8330-203D-V1** 10G Base SFP+ , Single-mode(40km) Transceiver (WDM 1330)
- **8330-206-V1** 10G/5G/2.5G/1000Base-T SFP, 3.3V,30m (10G) 50m (2.5G/5G) 100m (1G); -10~70°C

All SFPs ended with D are with Diagnostic function

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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In a continuing effort to improve and advance technology, product specifications are subject to change without notice.