

IPES-5408S (IP65/IP54)

8 10/100TX + 4 10/100/1000T X-coded L2+ 8 PoE at/af EN50155 Managed Ethernet Switch w/ enhanced G.8032 Ring & LTDP**; 24V/WV input models

- EN50155/61373/45545-2 verification*;
Compact size
- IEEE802.3at/af up to 30W per port; PoE management incl. detection and scheduling
- Wide input range from 16.8V to 137.5V w/ galvanic isolation for IEEE802.3at/af max.80W power budget
- LTDP** (Lantech Train Discovery Protocol) to auto-assign IP for swapping train cars as well as inherit the configuration in replaced switch
- Galvanic isolation between input, PoE and output as well as case(WV model)
- Enhanced G.8032 ring protection < 20ms for single ring. Supports auto mode, enhanced mode, train mode, multi-VLAN and basic mode; Enhanced G.8032 ring covers multicast packets; MSTP 16MSTI /RSTP; support MRP ring**
- Support IEEE 1588 v2 two-step PTP** w/transparent clock (end-to-end, peer-to-peer) for Gigabit ports
- Miss-wiring avoidance & node failure protection
- IP65/IP54 housing; User friendly UI, including auto topology drawing; Complete CLI
- Support LACP link aggregation, IGMP v3/router port, DHCP server & DHCP Option82; Port based DHCP distribution, Mac based DHCP server, QoS by VLAN, SSH/SSL, HTTPS, INGRESS/EGRESS ACL L2/L3, TACACS+*, QinQ**, SMS**
- Protocol based VLAN** ; IPv4/IPv6 Subnet based VLAN**
- Optional bypass in case of power failure, watchdog loss or LTDP** time out protection
- Environmental Monitoring for temp., voltage, current and total PoE load
- Optional InstaView** for centralized backup, editing the configuration file and upgrade firmware
- N-key configurator** for upgrading, auto back / editable configuration restore without computer



OVERVIEW

Lantech IPES-5408S (IP65/IP54) is a high performance L2+ (Gigabit uplink) switch with 8 10/100TX(D-coded) + 4 10/100/1000T(X-coded) w/8 PoE 802.3af/at Injectors by M12 provides L2 wire speed and advanced security function for network aggregation deployment. It delivers ITU G.8032 enhanced ring recovery less than 20ms in single ring while also supports train ring, enhanced mode, multiple VLAN mode with easy configuration. The comprehensive QoS, QoS by VLAN, advanced security including INGRESS/EGRESS ACL L2/L3, TACACS+*, SSH/SSL, Mac based DHCP server, DHCP Option 82, DHCP server, IGMPv1/v2/v3/router port, QinQ** are

supported and also required in large network. It also supports Cisco Discovery Protocol (CDP) and Ciscoworks to detect the switch info and show on L2 map topology.

Innovative LTDP (Lantech Train Discovery Protocol) to assign proper IP address when car changes as well as inherit configuration for replaced switch**

With port-based DHCP server, LTDP** allows Lantech EN50155 switch series in single ring discover the current IP addresses and ensure the swapped middle cars to assign the same IP address and configuration. Furthermore,

LTDP** can inherit the same configuration to new replaced switch for zero-touch maintenance.

IEEE1588 PTP v2 two-step for 4 x GigaT ports**

Lantech IPES-5408S (IP65/IP54) features hardware-based PTP IEEE1588 v2 function which can allow 4 10/100/1000T uplinks to synchronize the network with precise accuracy.

8x 802.3at/af ports w/advanced PoE management

Lantech IPES-5408S (IP65/IP54) supports IEEE802.3at/af standard which can feed HI-power up to 30W at each PoE port for big power consumption devices like PTZ IP camera, High power wireless AP etc. The advanced PoE management includes PoE detection and scheduling besides the regular PoE per port status. 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. Per port PoE status can remotely On/Off the power and display information of voltage, current, watt and PoE temperature.

Galvanic isolation for WV (16.8V~137.5VDC) input; 24V model ranging from 16.8V~57VDC input, High PoE budget

The Lantech IPES-5408S (IP65/IP54) provides galvanic isolation between DC input and PoE circuit for WV model. The WV model can accept dual power input (16.8V~137.5V) at PoE 80W budget. 24V model can work with dual input voltage from 16.8V~57VDC for PoE budget 90W.

Miss-wiring avoidance, Repowered auto ring restore, Loop protection, Ring storm control

The IPES-5408S (IP65/IP54) also embedded several features for stronger and reliable network protection in an easy and intuitive way. When the pre-set ring configuration failed or looped by miss-wiring, Lantech IPES-5408S (IP65/IP54) is able to alert with the LED indicator and disable ring automatically. Repowered auto ring restore function (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. The G.8032 Ring storm control can automatically cut off RPL line when broadcast threads hold is over 85%

DHCP option 82 & Port based, Mac based DHCP, Option66, IPv6 DHCP server**

DHCP option 82 and Port based DHCP function can offer the same IP address on port base or VLAN base where there is need to replace the new device connecting to Lantech switches to avoid any network disruption. The built-in DHCP Option 82 server offers the convenience of policy setting on the switch. Mac based DHCP server function assigns an IP address according to its MAC address to include dumb switches in DHCP network. DHCP option 66 is also supported. Optional IPv6 address resolution for DHCP server can be supported.

User friendly GUI, Auto topology drawing

The user friendly UI, innovative auto topology drawing and topology demo makes IPES-5408S (IP65/IP54) much easier to get hands-on. The complete CLI enables professional engineer to configure setting by command line.

Enhanced G.8032 ring, 16 MSTI MSTP; Optional MRP ring

Lantech IPES-5408S (IP65/IP54) features enhanced G.8032 ring which can be self-healed in less than 20ms for single ring topology protection covering Multicast packets. It also supports various ring topologies that covers double ring, multi-chain (under enhanced ring), train ring, basic ring by easy setup than others. The innovative auto-Ring configurator (auto mode) can calculate owner and neighbor in one step. It supports MSTP that allows RSTP over VLAN for redundant links with 16 MSTI.

Optional MRP (Media Redundancy Protocol) can be supported for industrial automation networks.

Editable configuration file; InstaView for mass deployment; Optional N-key auto backup, Exported text file**

The configuration file of Lantech IPES-5408S (IP65/IP54) can be exported and edited with word processor for the other switches configuration with ease.

The optional N-key configurator offers mass firmware auto upgrade, auto back up /editable restoration by adjusting the DIP switch.

With optional InstaView, the configuration files can be mass backup, mass-editable deployed and auto upgrading firmware in batch make maintenance easy.

QoS by VLAN for legacy device

QoS by VLAN can allow switch to prioritize packets by VLAN tag regardless the devices acknowledge QoS or not in which greatly enhance the bandwidth management in a network.

QinQ, QoS QinQ** and GVRP** supported**

It supports the QinQ**, QoS QinQ**, GVRP** for large VLAN segmentation.

IGMPv3, GMRP, router port, static multicast forwarding and multicast Ring protection**

The unique multicast protection under enhanced G.8032 ring can offer immediate self-recovery instead of waiting for IGMP table timeout. It also supports IGMPv3, GMRP**, router port and static multicast forwarding binding by ports for video surveillance application.

Event log & message; 2DI + 2DO

In case of event, the IPES-5408S (IP65/IP54) is able to send an email & SMS** text message to pre-defined addresses as well as SNMP Traps out immediately. It 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 alarm while sending alert information to

IP network with email and traps.

Environmental monitoring for inside switch info

The built-in environmental monitoring can detect switch overall temperature, voltage, current and PoE total load where can send the SNMP traps, email and SMS** alert when abnormal.

EN50155, 45545-2, 50121-3-2, EN61373 verification; High ESD protection

Lantech IPES-5408S (IP65/IP54) features high reliability and robustness coping with extensive EMI/RFI phenomenon, environmental vibration and shocks usually found in factory, substation, steel automation, aviation, mining and process control. It is the best solution for Automation, transportation, surveillance, Wireless backhaul, Semi-conductor factory and assembly lines.

The IPES-5408S (IP65/IP54) is designed to meet with critical network environment with IP67/IP54 aluminum enclosure and

M12 connectors for water proof. With EN45545-2 Fire & Smoke, and EN50155 & 61373 verification, the IPES-5408S (IP65/IP54) is best for railway in train/track side, vehicle and mining applications. For more usage flexibilities, IPES-5408S (IP65/IP54) supports wide operating temperature from -40°C to 75°C.

The IPES-5408S (IP65/IP54) also provides ±2000V EFT and ±6000V ESD protection, which can reduce unstable situation caused by power line and Ethernet

Optional GigaT bypass

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 lost. The bypass is also activated when detecting the CPU watchdog is ON.

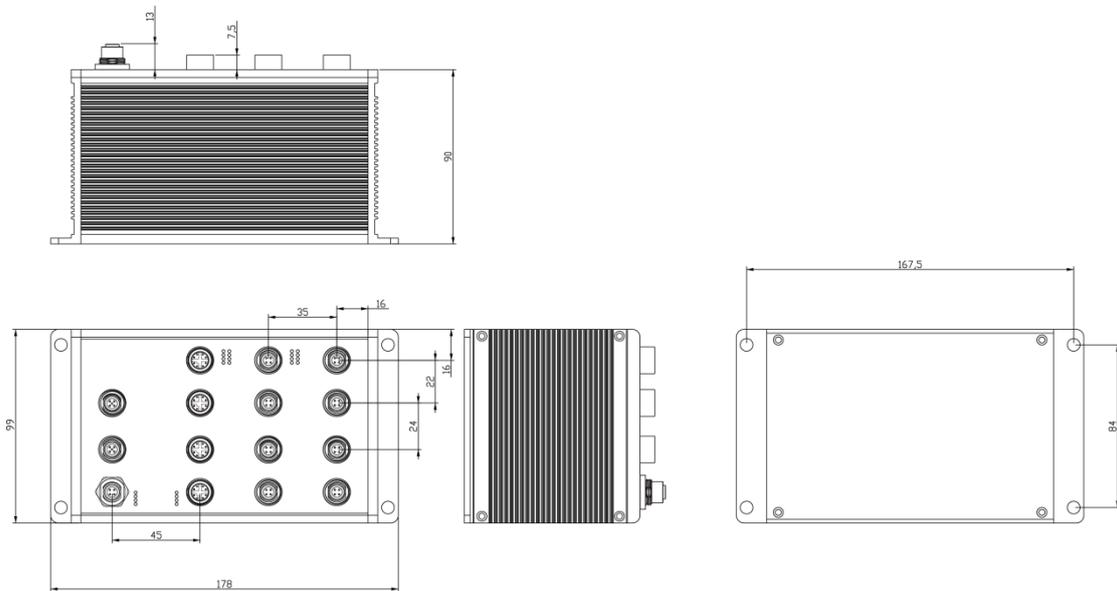
FEATURES & BENEFITS

- 8 10/100TX(D-coded) + 4 10/100/1000T(X-coded) w/8 PoE 802.3af/at Injectors EN50155 Managed IP65 M12 Ethernet Switch (Total 12 Ports Switch)
- EN45545-2 Fire & Smoke, EN50155 and EN61373 shock/vibration verification
- IEEE802.3at/af feeding power up to 30W per PoE port
- PoE management including PoE detection and scheduling for PD (power devices)
- WV model can accept two 16.8V~137.5V input w/ galvanic isolation with PoE budget up to 80W; 24V model can accept two 16.8V~57VDC input with PoE budget up to 90W
- Galvanic isolation between input and PoE for WV model
- IEEE 1588 PTP v2** two-step with 4 10/100/1000T
- Back-plane (Switching Fabric): 9.6Gbps
- 16K MAC address table
- 10KB Jumbo frame
- User friendly UI, auto topology drawing, topology demo, complete CLI for professional setting
- Enhanced G.8032 Ring protection in 20ms for single ring
 - Support various ring/chain topologies, including train ring, enhanced ring, basic ring, auto ring & multiple VLAN ring
 - Enhanced G.8032 ring configuration with ease
 - Auto ring configuration(auto mode) for single ring
 - Ring covers multicast on different ports
 - Train ring for auto coupling topology
 - Cover multicast and data packets protection
- Ring storm control to cut off RPL line when broadcast threshold is over 85%
- LTDP** (Lantech Train Discovery Protocol) with Port based DHCP can assign the same IP address and configuration to switch when middle car changes in a ring. It can also keep the config file when switches being swapped
- Provides Surge / EFT protection ±2000 VDC for power line.
- Supports ±6000 VDC Ethernet ESD protection
- Supports IEEE 802.1p Class of Service, per port provides 8 priority queues Port base, Tag Base and Type of Service Priority
- QoS by VLAN to prioritize all devices in the network
- IEEE 802.1d STP, IEEE 802.1w RSTP,802.1s MSTP VLAN redundancy with 16 MSTI
- 4K 802.1Q VLAN, Port based VLAN, GVRP**, QinQ**, QoS QinQ**
- Supports IEEE 802.1ab LLDP, Cisco CDP; LLDP info can be viewed via Web/ Console / Lantech™ InstaView**
- DHCP server / client / DHCP Option 82 relay / DHCP Option 82 server; Port based DHCP server; DHCP Option 66; IPv6 address resolution for DHCP server**
- Mac based DHCP server to assign IP address that includes dumb switches in DHCP network
- Bandwidth Control
 - Ingress packet filter and egress rate limit
 - Broadcast/multicast packet filter control
- Miss-wiring avoidance
 - LED indicator
- Repowered auto ring restore
 - Ensure the switches in a ring to survive after power breakout is back
 - The status can be shown in NMS when each switch is back
- System Event Log, SMTP Email alert, SMS** mobile (text) and SNMP Trap for alarm support; 32 RMON counters
- Security
 - SSL/SSH/INGRESS/EGRESS ACL L2/L3

- Port Security: MAC address entries/Filter/MAC-Port binding
- IP Security: IP address security management to prevent unauthorized intruder.
- TACACS+*
- Login Security: IEEE802.1X/RADIUS
- HTTPS for secure access to the web interface
- **Static multicast forwarding forward reversed IGMP flow with multicast packets binding with ports for IP surveillance application**
- **Multicast static route for non- IGMP camera to prevent flooding; IGMP router port to assign query in ring for reversed multicast video flow**
- **IGMPv1,v2,v3 with Query mode for multimedia; GMRP****
- **Watchdog design to auto reboot switch CPU is found dead**
- **Built-in environmental monitoring for system input voltage, current, ambient temperature and total PoE**

- **load**
- **Supports 2DI + 2DO (Digital Input/Digital Output)**
- **IP65/IP54 aluminum housing with DIN rail** and wall mount design**
- **Bypass protection** - Bypass failed switch caused by power failure of switch to protect network intactness**
- **Configuration backup and restoration**
 - Supports editable configuration file for system quick installation
 - N-key** for mass configuration auto-backup, editable restoration and auto firmware upgrade
 - InstaView** for centralized configuration deployment, backup & upgrade
- **TFTP/SFTP**/HTTP firmware upgrade; Lantech™ InstaView** for multiple upgrade**

DIMENSIONS (unit=mm)

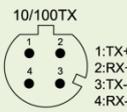


SPECIFICATION

Hardware Specification

Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX IEEE802.3ab 1000Base-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 IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.1AB Link Layer Discovery Protocol (LLDP) IEEE 802.1X User Authentication (Radius) IEEE802.1p Class of Service IEEE802.1Q VLAN Tag IEEE802.3at/af Power over Ethernet
Switch Architecture	Back-plane (Switching Fabric): 9.6Gbps

Transfer Rate	14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Ethernet / Gigabit Fiber port
Mac Address	16K MAC address table
Jumbo frame	10KB
Connectors	10/100TX: 8 x ports M12 4-pole D-coded with Auto MDI/MDI-X function 10/100/1000T: 4 x ports M12 8-pole X-coded with Auto MDI/MDI-X function RS-232/Relay connector: 1 x M12 5-pole A-coded Power Input connector : 1 x M12 4-pole A-coded DIDO : 1 x M12 5-pole A-coded
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), PoE (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~154°F
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	Dual 16.8~137.5VDC for WV model w/ galvanic isolation Dual 16.8~57VDC for 24V model w/ galvanic isolation
PoE Budget	WV model: 80W 24V model: 90W
PoE pin assignment	M12 port # 5~ # 12 support IEEE 802.3at/af End-point. Per port provides up to 30W 
Power Consumption	Without PoE: Max.13W
Case Dimension	IP65/IP54 model: Aluminum case 178mm(W)x99mm(H)x103mm(D)
Weight	1.0kgs
Installation	Wall Mount Design
EMI & EMS	FCC Class A, CE EN55022 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
Stability Testing	EN61373 (Shock and Vibration)
MTBF	622,533 hrs (WV) ; 677,726 hrs (24V)
Verifications & report*	EN50155/EN50121-3-2/EN50121-4 verification EN45545-2 R24/R25 (EN ISO 4589-2, EN ISO 5659-2, NF X70-100-1 & 2) Fire & Smoke verification
Warranty	5 years
Bypass protection**	Built-in bypass module on uplink ports (one pair) to pass to next switch in case of power failure
Software Specification	
Management	SNMP v1 v2c, v3/ Web/Telnet/CLI
SNMP MIB	RFC 1215 Traps MIB*, RFC 1213 MIBII RFC 1158 MIBII RFC 1157 SNMP MIB, RFC 1493 Bridge MIB* RFC 1573 IF MIB RFC 2674 VLAN MIB*, Partial RFC 1757 RMON, RFC 2674 Q-Bridge MIB*; Bridge MIB, LLDP MIB RSTP MIB* Private MIB
ITU G.8032	Support ITU G.8032 v2/2012 for Ring protection in less than 20ms for self-heal recovery (basic mode) Support various ring/chain topologies Includes train ring, auto ring, basic single ring, enhanced ring, multiple-VLAN ring Enhanced G.8032 ring configuration with ease Ring covers multicast on different ports Train mode for auto coupling ring/multiple train ring configuration
LTDP**(optional)	Lantech Train Discovery Protocol with Port based DHCP server to assign the same IP address when any car changes. It can also keep the config file when switch is swapped.

PoE Management	<ol style="list-style-type: none"> PoE Detection to check if PD hangs then restart the PD PoE Scheduling to On/OFF PD upon routine time table On/ Off, voltage, current, watts, temperature
PTP v2**	Support hardware-based two step IEEE1588 PTP v2 with all Gigabit ports
User friendly UI	<ul style="list-style-type: none"> Auto topology drawing Topology demo Auto configuration for G.8032(auto mode) for single ring Complete CLI for professional setting
Port Trunk with LACP	LACP Port Trunk: 8 Trunk groups
LLDP	Supports LLDP to allow switch to advise its identification and capability on the LAN
CDP	Cisco Discovery Protocol for topology mapping
Environmental Monitoring	System status for input voltage, current and ambient temperature to be shown in GUI and sent alerting if any abnormal status
VLAN	Port Based VLAN IEEE 802.1Q Tag VLAN (256 entries)/ VLAN ID (Up to 4K, VLAN ID can be assigned from 1 to 4096.) GVRP**, QinQ**, QoS QinQ**Protocol based VLAN** ; IPv4/IPV6 Subnet based VLAN**
IPv6/4	Present
Spanning Tree	Supports IEEE802.1d Spanning Tree and IEEE802.1w Rapid Spanning Tree, IEEE802.1s Multiple Spanning Tree 16 MSTI
Quality of Service	The quality of service determined by port, Tag and IPv4 Type of service, IPv4 Differentiated Services Code Points - DSCP
Class of Service	Support IEEE802.1p class of service, per port provides 8 priority queues
QoS by VLAN	Tagged QoS by VLAN for all devices in the network
IP Security	Supports 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder.
Login Security	Supports IEEE802.1X Authentication/RADIUS
Port Mirror	Support 3 mirroring types: "RX, TX and Both packet"
Network Security	Support 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder. 802.1X access control for port based and MAC based authentication/MAC-Port binding Ingress/Egress ACL L2/L3 SSL/ SSH for Management HTTPS for secure access to the web interface TACACS+* for Authentication
IGMP	Support IGMP snooping v1,v2,v3; Supports IGMP static route; 1024 multicast groups; IGMP router port ; IGMP query; GMRP**
Static MAC-Port bridge	Static multicast forwarding forward reversed IGMP flow with multicast packets binding with ports for IP surveillance application
Bandwidth Control	Support ingress packet filter and egress packet limit. The egress rate control supports all of packet type. Ingress filter packet type combination rules are Broadcast/Multicast/Flooded Unicast packet, Broadcast/Multicast packet, Broadcast packet only and all types of packet. The packet filter rate can be set an accurate value through the pull-down menu for the ingress packet filter and the egress packet limit.
Flow Control	Supports Flow Control for Full-duplex and Back Pressure for Half-duplex
System Log	Supports System log record and remote system log server
SMTP/Text SMS**	Supports SMTP Server and 8 e-mail accounts for receiving event alert; can send SMS** text alert via mobile
Protection	<ul style="list-style-type: none"> Miss-wiring avoidance Repowered auto ring restore

	<ul style="list-style-type: none"> Loop protection Ring Storm control cut off RPL line when threshold is over 85% 	DNS	Provide DNS client feature and support Primary and Secondary DNS server.
SNMP Trap	Up to 10 trap stations; trap types including: <ul style="list-style-type: none"> Device cold start Authorization failure Port link up/link down Dl/DO open/close Typology change(ITU ring) Power failure Environmental abnormal 	SNTP	Supports SNTP to synchronize system clock in Internet
DHCP	Provide DHCP Client/ DHCP Server/DHCP Option 82/Port based DHCP; DHCP Option 66; IPv6 address resolution for DHCP server**	Firmware Update	Supports TFTP/SFTP** firmware update, TFTP backup and restore; HTTP firmware upgrade; Lantech™ InstaView** for multiple upgrade
Mac based DHCP Server	Assign IP address by Mac that can include dumb switch in DHCP network	N-Key Configurator**	RJ45 dongle for firmware upgrade, auto / editable configuration backup/restoration
		Configuration upload and download	Supports text configuration file for system quick installation Optional InstaView for mass backup, editing configuration and upgrade

*Future release
**Optional

ORDERING INFORMATION

All model packages include M12 caps and wall mount bracket. All standard models are non-coating, optional coating models are available with -C model name, Optional bypass models are available with -B model names; optional PTPv2** are available with -PTP model name.

- **IPES-5408S-65-WV.....P/N: 8356-83629**
8 10/100TX PoE at/af up to 30W + 4 10/100/1000T X-coded EN50155 M12 IP65 L2+ Industrial Managed Ethernet Switch; 16.8V~137.5V dual isolated input w/ galvanic isolation; -40°C to 75°C
- **IPES-5408S-54-WV.....P/N: 8356-8361**
8 10/100TX PoE at/af up to 30W + 4 10/100/1000T X-coded EN50155 M12 IP54 L2+ Industrial Managed Ethernet Switch; 16.8V~137.5V dual isolated input w/ galvanic isolation; -40°C to 75°C
- **IPES-5408S-65-24V.....P/N: 8356-83721**
8 10/100TX PoE at/af up to 30W + 4 10/100/1000T X-coded EN50155 M12 IP65 L2+ Industrial Managed Ethernet Switch; 16.8V~57V dual input; -40°C to 75°C
- **IPES-5408S-54-24V.....P/N: 8356-8372**
8 10/100TX PoE at/af up to 30W + 4 10/100/1000T X-coded EN50155 M12 IP54 L2+ Industrial Managed Ethernet Switch; 16.8V~57V dual input; -40°C to 75°C
- **N-key Configurator.....P/N: 8850-100**
RJ45 connector dongle for firmware upgrade, auto/editable configuration backup and restoration; -20°C to 56°

OPTIONAL ACCESSORIES

M12 Connector / Cable

- **ECONM12-4P(F)70CM CABLE** M12 power cable 90 degree angle, 70cm, 4 pin
- **ECAB124030MJS** 4 Pin M12 RJ45 Male 3 Meters; STP Cable
- **ECABM12X83MSTP** 8 Pin M12 X-coded RJ45 Male 3 METER, STP CABLE w/ Shielding

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