IPES-5416T-16 (IP67/IP54)

16 10/100TX + 4 10/100/1000T X-coded L2+ 16 PoE at/af EN50155 Managed Ethernet Switch w/ enhanced G.8032 Ring

- *EN50155/EN61373/EN45545-2 verification*
- *IEEE802.3at/af up to 30W per port; PoE management incl. detection and scheduling*
- *WV dual input steps down to 54V output PoE max.80W; optional 24V input can boost to 54V output PoE max 80W*
- *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***
- *Miss-wiring avoidance & node failure protection*
- *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***
- *Environmental Monitoring for temp., voltage, current and total PoE load*
- *Optional bypass in case of power failure, watchdog loss (IP67 Only)*
- *IP67/IP54 housing; User friendly UI, including auto topology drawing; Complete CLI*
- *N-key configurator** for upgrading, auto/editable configuration back up and restoration without computer*

IP67 model

IP54 model

OVERVIEW

Lantech IPES-5416T-16 (IP67/IP54) is a high performance L2+ (Gigabit uplink) switch with 16 10/100TX (D-coded) + 4 10/100/1000T (X-coded) w/16 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) for Ciscoworks to detect the switch info and show on L2 map topology.

Up to 16 PoE ports with advanced PoE management

Lantech IPES-5416T-16 (IP67/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.

Wide selection of input range models (24V/ WV) w/maximum PoE budget

The Lantech IPES-5416T-16 is designed with various dual power input to feed 54V PoE. The WV model accepts 16.8V~137.5V wide range input and yields PoE budget max 80W. Featured with relay contact alarm function, the IPES-5416T-16 (IP67/IP54) is able to connect with alarm system in case of power failure or port disconnection events.

The 24V model accepts 12V~56V wide range input and yields PoE budget max.80W (A code power connector).

Miss-wiring avoidance, Repowered auto ring restore, Loop protection

The IPES-5416T-16 (IP67/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-5416T-16 (IP67/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.

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

DHCP server can assign dedicated IP address by MAC or by port (Port based for single switch), it also can assign IP address by port for multiple switches with single DHCP option82 server. For the ending device which need to download file from TFTP server, DHCP Option66 server can offer IP address of TFTP server to DHCP client. Optional IPv6 address resolution for DHCP service can be supported.

Editable configuration file; Optional N-key auto backup, exported text file

The configuration file of Lantech IPES-5416T-16 (IP67/IP54) can be exported and edited with word processor for the other switches configuration with ease. The built-in watchdog design can automatically reboot the switch when CPU is found dead. The optional N-key configurator offers firmware upgrade, auto/editable configuration back up and restoration without computer by adjusting the DIP switch.

User friendly GUI, Auto topology drawing

The user friendly UI, innovative auto topology drawing and topology demo makes IPES-5416T-16 (IP67/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-5416T-16 (IP67/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 multi-chain (under enhanced ring), train ring, basic ring, multiple-VLAN ring and auto-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.

QoS by VLAN for legacy device

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

QinQ, QoS and GVRP supported

It supports the QinQ, QoS, 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; 1 DI + 1DO

In case of event, the IPES-5416T-16 (IP67/IP54) is able to send an email** & SMS** text message to pre-defined addresses as well as SNMP Traps out immediately. It provides 1DI and 1DO 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 switch inside information

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

EN50155, EN45545-2, EN61373 verification; High ESD protection

Lantech IPES-5416T-16 (IP67/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-5416T-16 (IP67/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 & EN61373 verification, the IPES-5416T-16 (IP67/IP54) is the best for railway in train/track side, vehicle and mining applications. For more usage flexibilities, IPES-5416T-16 (IP67/IP54) supports wide operating temperature from -40°C to 75°C.

IPES-5416T-16 (IP67/IP54) also provides ±2000V EFT and ±6000V ESD contact protection, which can reduce unstable situation caused by power line and Ethernet

Optional smart bypass protection (IP67 Only)

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 optional smart bypass can be

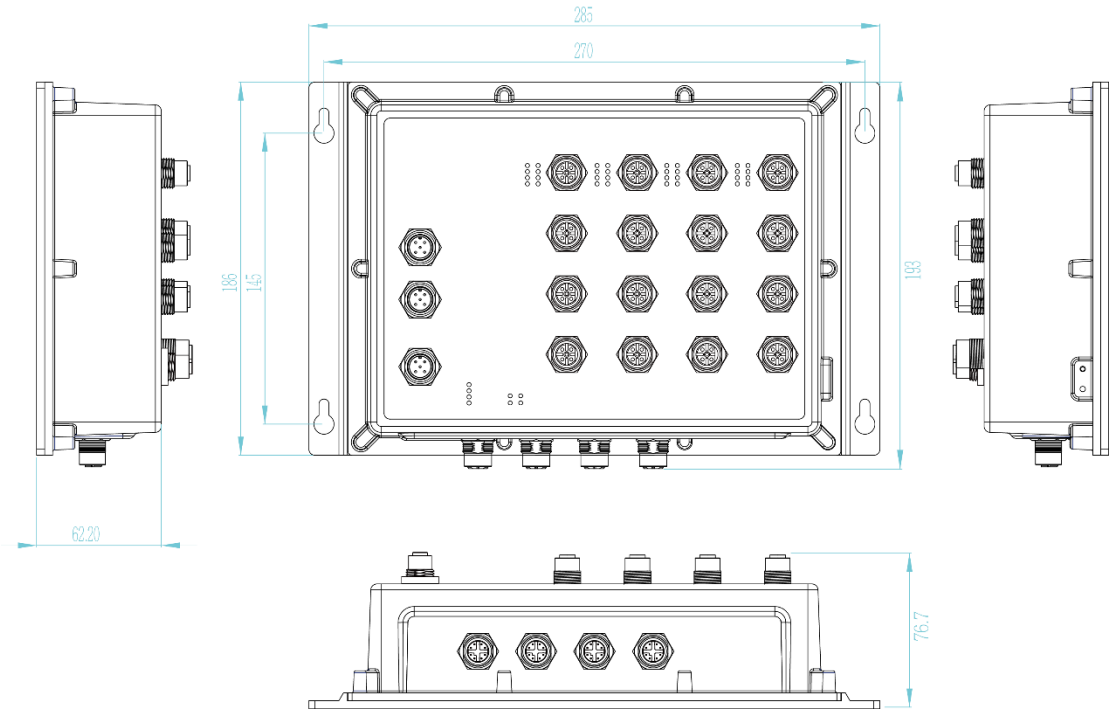
activated when switch encounters power failure or watch dog hang.

FEATURES & BENEFITS

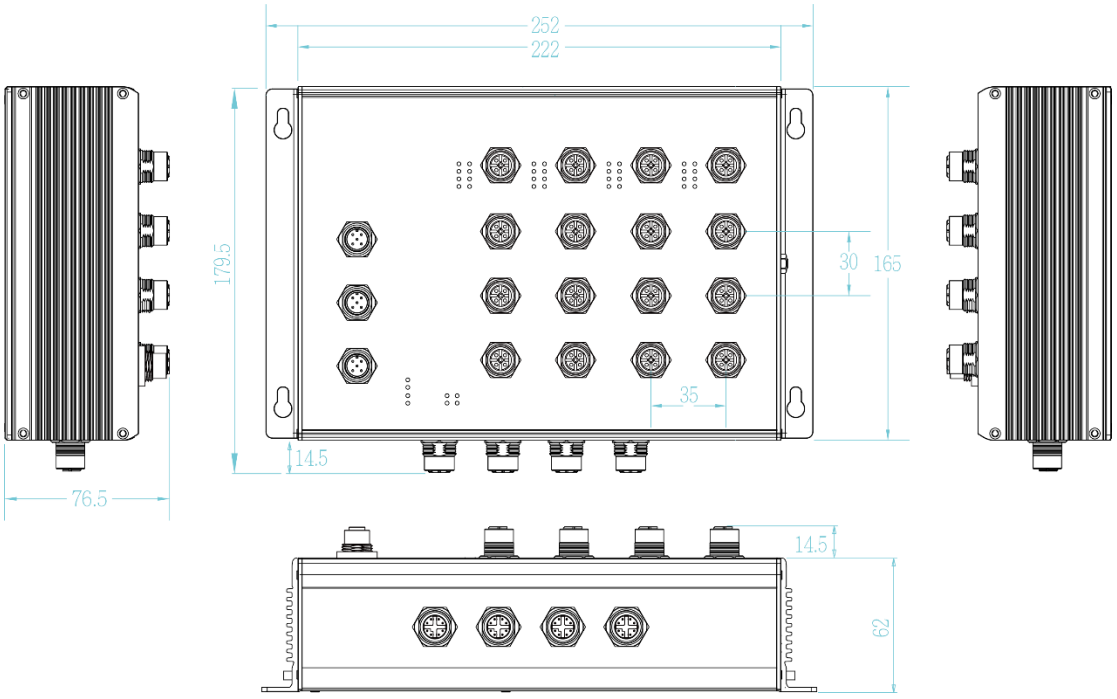
- **16 10/100TX(D-coded) + 4 10/100/1000T(X-coded) w/16 POE 802.3af/at Injectors EN50155 IP67/IP54 M12 Managed Ethernet Switch (Total 20 Ports Switch)**
- **EN45545-2 Fire & Smoke, EN50155 and EN61373 shock/vibration verification**
- **PoE management including PoE detection and scheduling for PD (power devices)**
- **24V model accepts dual power input ranges from 12~56V and can boost up to 54V for PoE 802.3at/af max. 80W budget**
- **WV model accepts dual 16.8~137.5V input and feed 54V for PoE at/af at max 80W budget**
- **Back-plane (Switching Fabric): 11.2Gbps**
- **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*
  - *Cover multicast and data packets protection*
- **Provides 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**
- **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**
- **Supports IEEE 802.1ab LLDP, Cisco CDP; LLDP info can be viewed via Web/ Console**
- **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*
- **Relay alarm output system events**
- **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*
- **TFTP/SFTP**/HTTP firmware upgrade**
- **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*
  - *MAC address table: 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**
- **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**
- **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*
- **Supports 1DI + 1DO (Digital Input/Digital Output)**
- **IP67 aluminum housing with wall mount and DIN rail** design; IP54 aluminum housing with wall mount design**
- **Bypass protection** - Bypass failed switch caused by power / CPU failure of switch or watch dog hang to protect network from disconnection (IP67 Only)**

DIMENSIONS (unit=mm)

IP67 model

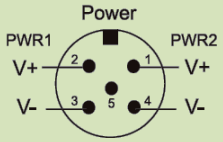
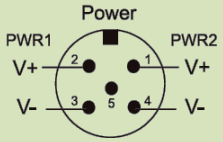
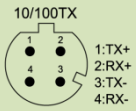


IP54 model



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): 11.2Gbps
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: 16 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 connector: 1 x M12 5-pole A-coded Power Input connector : 1 x M12 5-pole A-coded Male (WV)  1 x M12 5-pole A-coded Male (24V)  Relay contact : 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) Ethernet port: Link/Activity (Green), Speed (Green); R.M. indicator (Green) PoE (Green)
DI/DO	1 Digital Input (DI) : Level 0: -30~2V / Level 1: 10~30V Max. input current:8mA 1 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 (72V model: -40°C~60°C / -40°F~140°F)
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	12~56VDC (24V) 16.8~137.5VDC (WV)
PoE Budget	WV model: 80W 24V model: 80W (A code)
PoE pin assignment	M12 port # 1~ # 16 support IEEE 802.3at/af End-point. Per port provides up to 30W
	10/100TX 
Power Consumption	Max. 16W
Dimensions	IP67 model: Aluminum case 285mm(W)x193mm(H)x76.7mm(D) IP54 model: Aluminum case 252mm(W)x179.5mm(H)x76.5mm(D)
Weight	2.1kgs(IP67) ; 1.8kgs(IP54)
Installation	IP67 model: DIN Rail** and Wall Mount Design IP54 model: Wall Mount Design
EMI & EMS	FCC Class A, CE EN55032, CE EN55024, CE EN61000-6-2, 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	550,217 hrs (standards: IEC 62830)
Verifications & report	EN50155/EN50121-3-2/EN50121-4 verification EN45545-2 R13/R22/R23/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 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 (single ring enhanced 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 Cover multicast & data packets protection
PoE Management	1. PoE Detection to check if PD hangs then restart the PD 2. PoE Scheduling to On/OFF PD upon routine time table On/ Off, voltage, current, watts, temperature
User friendly UI	■ 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, 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 16MSTI
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 Management access control with priority 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 ; 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
Relay Alarm	Provides one relay output for port breakdown, power fail and alarm Alarm Relay current carry ability: 1A @ DC24V
Protection	■ Miss-wiring avoidance ■ Repowered auto ring restore Loop protection
SNMP Trap	Up to 10 trap stations; trap types including: ● Device cold start ● Authorization failure ● Port link up/link down ● DI/DO open/close ● Typology change(ITU ring) ● Power failure ● Environmental abnormal
DHCP	● Provide DHCP Client/ DHCP Server/DHCP Option 82/Port based DHCP; DHCP Option 66; IPv6 address resolution for DHCP server**
Mac based DHCP Server	Assign IP address by Mac that can include dumb switch in DHCP network
DNS	Provide DNS client feature and support Primary and Secondary DNS server
SNTP	Supports SNTP to synchronize system clock in Internet
Firmware Update	Supports TFTP/SFTP** firmware update, TFTP backup and restore; HTTP firmware upgrade
N-Key Configurator**	RJ45 dongle for firmware upgrade, auto / editable configuration backup/restoration
Configuration upload and download	Supports editable configuration file for system quick installation

*Future release
**Optional

ORDERING INFOMATION

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/BB model name. (only on IP67 version)

- **IPES-5416T-16-67-24V…….....P/N: 8360-8012**
  16 10/100TX 16 POE at/af up to 30W + 4 GigaT X-coded EN50155 PoE M12 IP67 L2+ Managed Ethernet Switch w/ M12 A code power connector; PoE 12V~56V dual input; 80W PoE budget, -40°C to 75°C
- **IPES-5416T-16-54-24V…….....P/N: 8360-8013**
  16 10/100TX 16 POE at/af up to 30W + 4 GigaT X-coded EN50155 PoE M12 IP54 L2+ Managed Ethernet Switch w/ M12 A code power connector; PoE 12V~56V dual input; 80W PoE budget, -40°C to 75°C
- **IPES-5416T-16-67-WV…….....P/N: 8360-803**
  16 10/100TX 16 POE at/af up to 30W + 4 Giga T X-coded EN50155 PoE M12 IP67 L2+ Managed Ethernet Switch; 16.8~137.5V dual input; 80W PoE budget; -40°C to 75°C
- **IPES-5416T-16-54-WV…….....P/N: 8360-8031**
  16 10/100TX 16 POE at/af up to 30W + 4 Giga T X-coded EN50155 PoE M12 IP54 L2+ Managed Ethernet Switch; 16.8~137.5V dual input; 80W PoE budget; -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 60°

OPTIONAL ACCESSORIES

M12 Connector & Cable

ECONM12-5P(F)70CM CABLE	5 pin M12 power cable 90 degree angle, 70cm
ECONM12-5P(F)1.5M CABLE	5 pin M12 power cable 90 degree angle, 150cm
ECONM12-04A(F)-C-180	M12 4P(Female) A-coded 180 Degree Crimp Type Connector
ECONM12-5P(M)-W-180	M12 5P(Male) 180 Degree Wire Type Connector (DI/DO)
ECONM12-04D(M)-C-180	Connector,4-pin (Male),M12 D-coded Crimp Type 180 degree

ECAB124030MJS	4 Pin M12 RJ45 Male 3 Meters; STP Cable

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