# IES-5408T

## 8 10/100TX + 4 10/100/1000T X-coded L2+ EN50155 Managed Ethernet

## Switch w/ enhanced G.8032 Ring ; 24V/WV model

- *EN50155/61373/45545-2 verification: 24V/ WV Input voltage selections*
- *Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 ETBN*
- *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*
- *Environmental Monitoring for temp., voltage and current*
- *Miss-wiring avoidance & node failure protection*
- *Support LACP link aggregation, IGMP v3/router port, MLD snooping, DHCP server & DHCP Option82; Port based DHCP distribution, Mac based DHCP server, QoS by VLAN, SSH v2/SSL, HTTPS, INGRESS/EGRESS ACL L2/L3, TACACS+**, QinQ of VLAN*
- *Protocol based VLAN; IPv4 Subnet based VLAN*
- *Optional bypass in case of power failure (IP67 only)*
- *N-key configurator** for upgrading, auto/editable configuration back up and restoration without computer*
- *IP67/IP54 housing; User friendly UI, including auto topology drawing; Complete CLI*

**IP67 model**

**IP54 model**

## OVERVIEW

Lantech IES-5408T (IP67/IP54) is a high performance L2+ (Gigabit uplink) switch with 8 10/100TX(D-coded) + 4 10/100/1000T(X-coded) 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 by VLAN, advanced security including INGRESS/EGRESS ACL L2/L3, TACACS+**, SSH v2/SSL and 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.

*Wide input range model (WV) and optional 24V*
The Lantech IES-5408T (IP67/IP54) is designed with dual power supply ranging from 16.8V~137.5VDC. 24V model can accept 12V~56VDC. Featured with relay contact alarm function, the IES-5408T (IP67/IP54) is able to connect with alarm system in case of power failure or port disconnection events.
A voltage which can be minimal 0,5 Un nominal voltage (when

Vin≧36V) and/or a voltage which can be maximal 1,5 Un nominal voltage for more than 1000 consecutive ms (one second).

*Miss-wiring avoidance, Loop protection, Node failure protection*
The IES-5408T (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 IES-5408T (IP67/IP54) is 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.

*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. Basic IPv6 DHCP service can be supported.

***User friendly UI, Auto topology drawing, complete CLI***
The user friendly UI, innovative auto topology drawing and topology demo makes IES-5408T (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; MRP ring***
Lantech IES-5408T (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 double ring, 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 each spanning tree for each VLAN for redundant links with 16 MSTI. MRP (Media Redundancy Protocol) can be supported for industrial automation networks.

***QoS by VLAN for legacy devices to tag with priority***
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 and GVRP supported***
It supports the QinQ, GVRP for large VLAN segmentation.

***IGMPv3, GMRP, router port, MLD Snooping, 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, MLD snooping and static multicast forwarding binding by ports for video surveillance application.

***Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 TBN***
Lantech OS1 Ethernet switches comply with IEC 61375-3-4 (ECN) standard. The support of Ethernet Consist Network allows interconnection between end devices located in single consist of train and interoperability with IEC61375-2-5 (TBN).

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

The configuration file of Lantech IES-5408T (IP67/IP54) can be exported in text file so that it can be edited and configured back to switch with ease for mass deployment.
The optional N-key configurator offers firmware upgrade, auto/editable configuration back up and restoration without computer by adjusting the DIP switch.

***Event log & message; 1 DI + 1 DO***
In case of event, the IES-5408T (IP67/IP54) is able to send an email** 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.

***Built-in environmental monitoring to show switch inside info***
The built-in environmental monitoring can detect switch overall temperature, voltage and current where can send the SNMP traps, email** alert when abnormal.

***EN50155, EN45545-2, EN61373 verification; High ESD protection***
Lantech IES-5408T (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 IES-5408T (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 IES-5408T (IP67/IP54) is best for railway in train/track side, vehicle and mining applications. For more usage flexibilities, IES-5408T (IP67/IP54) supports wide operating temperature from -40°C to 75°C.

***Optional bypass relay prevent from power lost (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. Smart bypass can be activated when switch encounters power failure. (-BT/-BBT model)
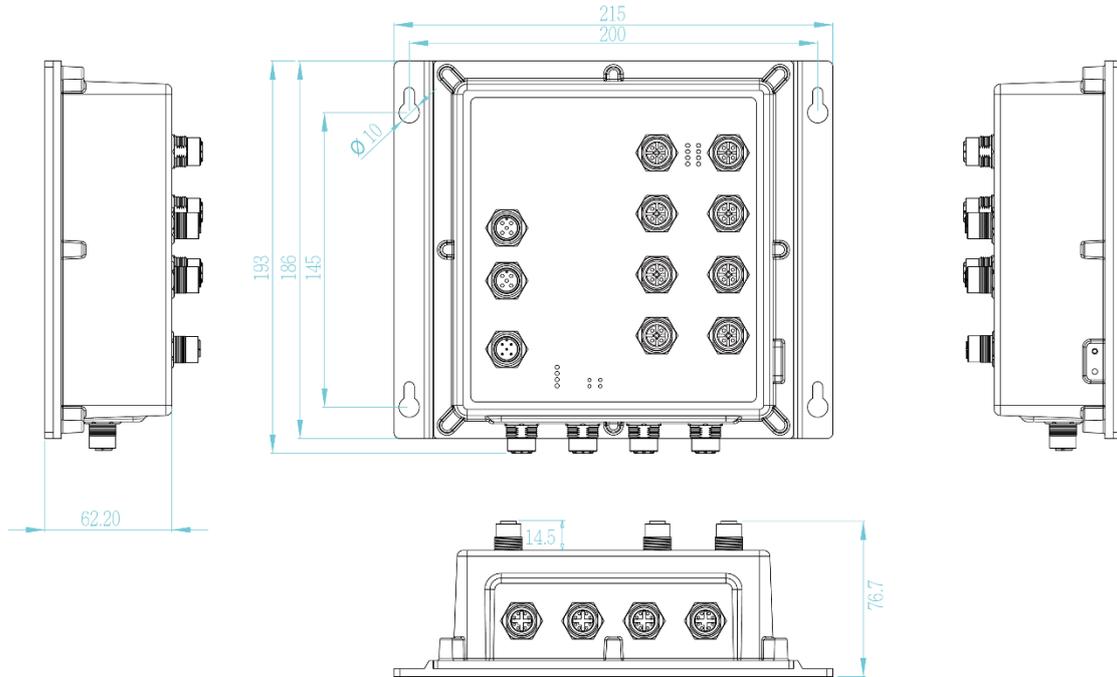
## FEATURES & BENEFITS

- **8 10/100TX (D-coded) + 4 10/100/1000T (X-coded) EN50155 IP67/IP54 M12 Managed Ethernet Switch (Total 12 Ports Switch)**
- **EN45545-2 Fire & Smoke, EN50155 and EN61373 shock/vibration verification**
- **24V model can accept dual power input ranges from 12~56V ; WV model can accept dual 16.8~137.5V input**
- **Galvanic isolation from power input/Ethernet ports to system 1.5KV**

- **N-key** configurator for firmware upgrade, auto/editable configuration back up and restoration**
- **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**
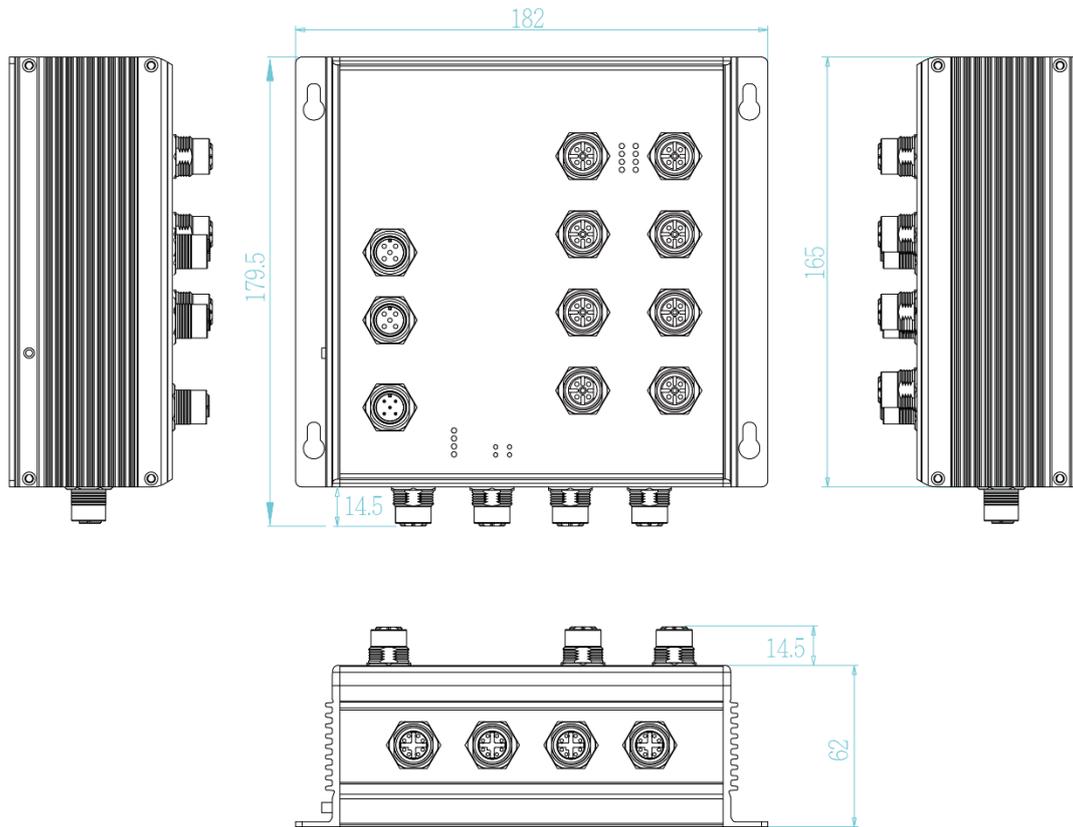  - *Support various ring/chain topologies, including*

- *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*
  - *Cover multicast and data packets 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 of VLAN, QoS**
- **Supports IEEE 802.1ab LLDP, Cisco CDP; LLDP info can be viewed via Web/ Console**
- **MLD Snooping for IPv6 Multicast stream**
- **DHCP server / client / DHCP Option 82 relay / DHCP Option 82 server; Port based DHCP server; DHCP Option 66; basic IPv6 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*
- **Node failure protection**
  - *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/HTTP firmware upgrade**
- **System Event Log, SMTP Email** alert and SNMP Trap for alarm support; 32 RMON counters**

- **Security**
  - *SSL/SSH v2/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**
- **Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 TBN**
- **Diagnostic including Ping / ARP table / DDM information**
- **Watchdog design to auto reboot switch CPU is found dead**
- **Built-in environmental monitoring for system input voltage, current, ambient temperature**
- **Supports 1DI + 1DO (Digital Input/Digital Output)**
- **IP67/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 (-BT/-BBT model)**
- **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*

## DIMENSIONS (unit=mm)

**IP67 model**



**IP54 model**

## SPECIFICATION

### Hardware Specification

| | | | |
|---|---|---|---|
| Standards | IEEE 802.3 10Base-T Ethernet<br>IEEE 802.3u 100Base-TX<br>IEEE802.3ab 1000Base-T<br>IEEE802.3x Flow Control and Back Pressure<br>IEEE802.3ad Port trunk with LACP<br>IEEE802.1d Spanning Tree<br>IEEE802.1w Rapid Spanning Tree<br>IEEE802.1s Multiple Spanning Tree<br>IEEE 802.3ad Link Aggregation Control Protocol (LACP)<br>IEEE 802.1AB Link Layer Discovery Protocol (LLDP)<br>IEEE 802.1X User Authentication (Radius)<br>IEEE802.1p Class of Service<br>IEEE802.1Q VLAN Tag | | EIA/TIA-568 100-ohm (100m)<br>1000Base-TX: 2-pair UTP/STP Cat. 5/ 5E/ 6 cable<br>EIA/TIA-568 100-ohm (100m) |
| | | Bypass Protection** | Built-in bypass module on uplink ports to pass to next switch in case of power failure (two pairs) |
| | | LED | Per unit: Power 1 (Green), Power 2 (Green), FAULT (Red)<br>Ethernet port: Link/Activity (Green), Speed (Green);<br>R.M. indicator (Green) |
| | | DI/DO | 1 Digital Input (DI) :<br>Level 0: -30~2V / Level 1: 10~30V<br>Max. input current:8mA<br>1 Digital Output(DO): Open collector to 40 VDC, 200mA |
| Switch Architecture | Back-plane (Switching Fabric): 9.6Gbps | Operating Humidity | 5% ~ 95% (Non-condensing) |
| Transfer Rate | 14,880pps for Ethernet port<br>148,800pps for Fast Ethernet port<br>1,488,000pps for Gigabit Ethernet port | Operating Temperature | -40°C~75°C / -40°F~167°F |
| Mac Address | 16K MAC address table | Storage Temperature | -40°C~85°C / -40°F~185°F |
| Jumbo frame | 10KB | Power Supply | 12~56VDC on 24V model<br>16.8~137.5VDC on WV model |
| Connectors | 10/100TX: 8 x ports M12 4-pole D-coded with Auto MDI/MDI-X function<br>10/100/1000T: 4 x ports M12 8-pole X-coded with Auto MDI/MDI-X function<br>RS-232 connector: 1 x M12 5-pole A-coded<br>Power Input connector : 1 x M12 5-pole A-coded<br>Relay contact : 1 x M12 5-pole A-coded | Power Consumption | Max. 11W 12V input<br>Max. 16W WV input |
| | | Dimensions | IP67 model: Aluminum case<br>215mm(W)x193mm(H)x76.7mm(D)<br>IP54 model: Aluminum case<br>182mm(W)x179.5mm(H)x76.5mm(D) |
| Network Cable | 10Base-T: 2-pair UTP/STP Cat. 3, 4, 5/ 5E/ 6 cable<br>EIA/TIA-568 100-ohm (100m)<br>100Base-TX: 2-pair UTP/STP Cat. 5/ 5E/ 6 cable | Weight | 1.6kgs (IP67); 1.3kgs(IP54) |
| | | Installation | IP67 model: DIN Rail** and Wall Mount Design<br>IP54 model: Wall Mount Design |

| | |
|---|---|
| EMI & EMS | FCC Class A,<br>CE EN55032 Class A, CE EN55024,<br>CE EN61000-4-2, CE EN61000-4-3,<br>CE EN61000-4-4, CE EN61000-4-5,<br>CE EN61000-4-6, CE EN61000-4-8,<br>CE EN61000-6-2, CE EN61000-6-4 |
| Stability Testing | EN61373 (Shock and Vibration) |
| MTBF | 685,902 hrs (standards: IEC 62380) |
| Verifications & report | EN50155/EN50121-3-2/EN50121-4 verification<br>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 |

## Software Specification

| | |
|---|---|
| Management | SNMP v1 v2c, v3/ Web/Telnet/CLI |
| SNMP MIB | RFC 1213 MIBII<br>RFC 1158 MIBII<br>RFC 1157 SNMP MIB<br>RFC 1493 Bridge MIB*<br>RFC 1573 IF MIB<br>Partial RFC 1757 RMON<br>RFC 2674 Q-Bridge MIB*;<br>LLDP MIB<br>Private MIB |
| ITU G.8032 | Support ITU G.8032 v2/2012 for Ring protection in less than 20ms for self-heal recovery (basic mode)<br>Support various ring/chain topologies<br>Includes train ring, auto ring, basic single ring, enhanced ring, multiple-VLAN ring<br>Enhanced G.8032 ring configuration with ease<br>Ring covers multicast on different ports<br>Train mode for auto coupling ring configuration |
| User friendly UI | ■ Auto topology drawing<br>■ Topology demo<br>■ Auto configuration for G.8032 (auto mode) for single ring<br>■ Complete CLI for professional setting |
| Port Trunk with LACP | LACP Port Trunk: 8 Trunk groups/Maximum 8 trunk members |
| 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<br>IEEE 802.1Q Tag VLAN (256 entries)/ VLAN ID (Up to 4K, VLAN ID can be assigned from 1 to 4096)<br>GVRP, QinQ of VLAN, QoS, Protocol based VLAN; IPv4 Subnet based VLAN |
| 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 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 | Support 10 IP addresses that have permission to |

| | |
|---|---|
| Security | access the switch management and to prevent unauthorized intruder.<br>802.1X access control for port based and MAC based authentication/MAC-Port binding<br>Ingress/Egress ACL L2/L3<br>SSL/ SSH v2 for Management<br>HTTPS for secure access to the web interface<br>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.<br>The egress rate control supports all of packet type.<br>Ingress filter packet type combination rules are Broadcast/Multicast/Flooded Unicast packet, Broadcast/Multicast packet, Broadcast packet only and all types of packet.<br>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** | Supports SMTP Server and 8 e-mail accounts for receiving event alert |
| Relay Alarm | Provides one relay output for port breakdown, power fail and alarm<br>Alarm Relay current carry ability: 1A @ DC24V |
| Protection | ■ Miss-wiring avoidance<br>■ Node failure protection<br>■ Loop protection |
| SNMP Trap | Up to 10 trap stations; trap types including:<br>● Device cold start<br>● Authorization failure<br>● Port link up/link down<br>● DI/DO open/close<br>● Typology change(ITU ring)<br>● Power failure<br>● Environmental abnormal** |
| DHCP | Provide DHCP Client/ DHCP Server/DHCP Option 82/Port based DHCP; DHCP Option 66; basic IPv6 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 firmware update, TFTP backup and restore; HTTP firmware upgrade |
| MLD Snooping | Support IPv6 Multicast stream |
| Diagnostic | Support Ping, ARP table and DDM information |
| ECN | Complies with IEC 61375-3-4 (ECN) standard. The support of Ethernet Consist Network allows interconnection between end devices located in single consist of train and interoperability with IEC61375-2-5 (TBN). |
| 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 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 –BT/BBT model name. (only on IP67 version)

■ **IES-5408T-X-67-24V**……….…......**P/N: 8360-718**
8 10/100TX + 4 GigaT X-coded EN50155 M12 IP67 L2+ Managed Ethernet Switch; -40°C to 75°C; dual 12~56VDC

■ **IES-5408T-X-54-24V**……….…......**P/N: 8360-7181**
8 10/100TX + 4 GigaT X-coded EN50155 M12 IP54 L2+ Managed Ethernet Switch; -40°C to 75°C; dual 12~56VDC

■ **IES-5408T-X-67-WV**………….........**P/N: 8360-719**
8 10/100TX + 4 GigaT X-coded EN50155 M12 IP67 L2+ Managed Ethernet Switch; -40°C to 75°C; dual 16.8~137.5VDC

■ **IES-5408T-X-54-WV**………….........**P/N: 8360-7191**
8 10/100TX + 4 GigaT X-coded EN50155 M12 IP54 L2+ Managed Ethernet Switch; -40°C to 75°C; dual 16.8~137.5VDC

■ **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**

**Connector**
■ **ECONM12-08A(M)-180**   8 pin M12 (Male) A-coded 180 degree crimp type connector for reset/console/USB
■ **ECONM12-05A(M)-C-180**   5 pin M12 (Male) A-coded 180 degree crimp type connector for DI/DO
■ **ECONM12-04D(M)-C-180**   4 pin M12 (Male) D-coded 180 degree crimp type connector for data

**Cable**
■ **ECABM12X83MSTP**   8 pin M12 (Male) X-coded 180 degree RJ45 STP cable for data, shielded, 300cm
■ **ECAB124030MJS**   4 pin M12 (Male) D-coded 180 degree RJ45 STP cable for data, 300cm
■ **ECONM23-5P(F)1.5M CABLE**   5 Pin M23 Power Female 90° angle Connector+ 1.5 M CABLE, Made in Taiwan