I(P)ES-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 ; 24V/WV input models

- *EN50155/61373/45545-2 verification; Compact size*
- *Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 ETBN*
- *PoE model: IEEE802.3at/af up to 30W per port; PoE management incl. detection and scheduling*
- *PoE model: WV dual input steps down to 54V output PoE max.80W; optional 24V input can boost to 54V output PoE max 80W*
- *Galvanic isolation between input, PoE (PoE model) 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*
- *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, MLD snooping, DHCP server & DHCP Option82; DHCP Snooping, Port based DHCP distribution, Mac based DHCP server, QoS by VLAN, SSH v2/SSL, HTTPS, INGRESS/EGRESS ACL L2/L3, TACACS+**, QinQ*
- *Protocol based VLAN ; IPv4 Subnet based VLAN*
- *Optional bypass in case of power failure*
- *Environmental Monitoring for temp., voltage, current and total PoE load (PoE model)*
- *N-key configurator** for upgrading, auto back / editable configuration restore without computer*

OVERVIEW

Lantech I(P)ES-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 v2/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.

8x 802.3at/af ports w/advanced PoE management (PoE model)

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.

Wide input range model (WV) w/maximum PoE budget

The Lantech I(P)ES-5408S (IP65/IP54) is designed with dual power input ranges from 16.8~137.5VDC. The WV model can accept dual 16.8~137.5VDC to feed 54V PoE to provide PoE budget max 80W (PoE model). 24V model can accept dual 12~56VDC to feed 54V PoE to provide PoE budget max. 80W (PoE model) (A code power connector).

QinQ, QoS and GVRP supported

It supports the QinQ, QoS and 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.

802.1X security by MAC address

MAC-based port authentication is an alternative approach to 802.1x for authenticating hosts connected to a port. By authenticating based on the host's source MAC address, the host is not required to run a user for the 802.1x protocol. The RADIUS server that performs the authentication will inform the switch if this MAC can be registered in the MAC address table of switch.

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).

DHCP option 82 & Port based, Mac based DHCP, Option66, DHCP Snooping, 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. DHCP Snooping is supported. 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.

Event log & message; 2DI + 2DO

In case of event, the I(P)ES-5408S (IP65/IP54) is able to send an email 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 (PoE model) where can send the SNMP traps and email when abnormal.

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

Lantech I(P)ES-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 I(P)ES-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 I(P)ES-5408S (IP65/IP54) is best for railway in train/track side, vehicle and mining applications. For more usage flexibilities, I(P)ES-5408S (IP65/IP54) supports wide operating temperature from -40°C to 75°C.

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

Optional bypass relay prevent from power lost

The optional bypass relay is set to bypass the switch to the next one 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. (-BT/-BBT model)

Auto-provisioning for firmware/configuration update

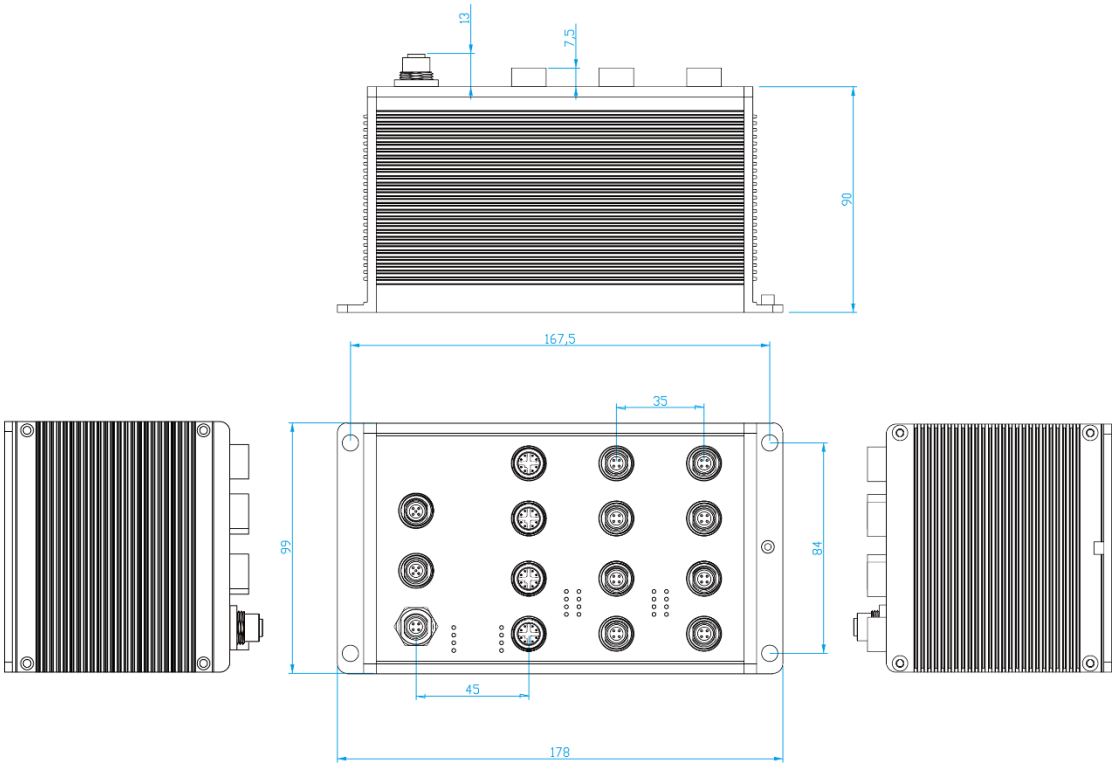
The switch supports auto-provisioning for switch to auto-check the latest software image and configuration through TFTP server.

FEATURES & BENEFITS

- **8 10/100TX (D-coded) + 4 10/100/1000T (X-coded) (w/8 PoE 802.3af/at ports) EN50155 Managed IP65 M12 Ethernet Switch (Total 12 Ports Switch)**
- **EN45545-2 Fire & Smoke, EN50155 and EN61373 shock/vibration verification**
- **PoE model: IEEE802.3at/af feeding power up to 30W per PoE port**
- **PoE model: PoE management including PoE detection and scheduling for PD (power devices)**
- **PoE WV model can accept two 16.8V~137.5V input w/ galvanic isolation with PoE budget up to 80W; 24V model can accept two 12V~56VDC input with PoE budget up to 80W**
- **Galvanic isolation between input and PoE for WV PoE model**
- **Galvanic isolation from power input/Ethernet ports to system 1.5KV**
- **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%**
- **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**
- **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 Snooping; DHCP Option 66; basic IPv6 DHCP server**
- **Mac based DHCP server to assign IP address**
- **Bandwidth Control**
  - *Ingress packet filter and egress rate limit*
  - *Broadcast/multicast packet filter control*
- **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*
- **System Event Log 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**
- **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 (PoE model)**
- **MLD Snooping for IPv6 Multicast stream**
- **Diagnostic including Ping / DDM information**
- **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 (-BT/-BBT model)**
- **Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 TBN**
- **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*
- **TFTP/HTTP firmware upgrade**
- **Auto Provision to verify switch firmware with the latest or certain version**

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/Reset connector: 1 x M12 4-pole A-coded Power Input connector : 1 x M12 5-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, PoE model)
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	-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 Dual 12~56VDC for 24V model
PoE Budget (PoE model)	Total 80W @ 24 VDC and above Higher PoE budget can be applied upon request. ** **Note: This is a non-PoE galvanic isolated model.**
PoE pin assignment (PoE model)	M12 port # 5~ # 12 support IEEE 802.3at/af End-point. Per port provides up to 30W 10/100TX 1:TX+ 2:RX+ 3:TX- 4:RX-
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,

	EN55032 Class A, EN55024 , CE EN55011 CE EN61000-4-2 (ESD) Level 3 CE EN61000-4-3 (RS) Level 3 CE EN-61000-4-4 (EFT) Level 3 CE EN61000-4-5 (Surge) Level 3 CE EN61000-4-6 (CS) Level 3 CE EN61000-4-8 (Magnetic Field) Level 3
Stability Testing	EN61373 (Shock and Vibration)
MTBF	622,533 hrs (WV) ; 677,726 hrs (24V) (standards: IEC 62380)
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 (two pairs) to pass to next switch in case of power failure

Software Specification

Management	SNMP v1 v2c, v3/ Web/Telnet/CLI
SNMP MIB	MIB MIBII SNMP MIB Bridge MIB IF MIB RMON 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
PoE Management (PoE model)	1. PoE Detection to check if PD hangs then restart the PD 2. PoE Scheduling to On/OFF PD upon routine time table 3. 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, 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 port / CoS / ToS / VLAN / 61375-3-4
Class of Service	Support IEEE802.1p class of service, per port provides 8 priority queues
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 v2 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
Protection	■ Miss-wiring avoidance ■ Node failure protection ■ 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 Snooping; 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
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).
MLD Snooping	Support IPv6 Multicast stream
Diagnostic	Support Ping and DDM information
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
Auto Provision	To verify switch firmware with the latest or certain version

*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 names.

- **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 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 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; 12V~56V 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; 12V~56V dual input; -40°C to 75°C
- **IES-5408S-65-WV……P/N: 8356-838**
  8 10/100TX + 4 10/100/1000T X-coded EN50155 M12 IP65 L2+ Managed Ethernet Switch; 16.8V~137.5V dual input w/ galvanic isolation; -40°C to 75°C
- **IES-5408S-65-24V……P/N: 8356-839**
  8 10/100TX + 4 10/100/1000T X-coded EN50155 M12 IP65 L2+ Managed Ethernet Switch; 12V~56V dual input w/ galvanic isolation; -40°C to 75°C
- **IES-5408S-54-WV……P/N: 8356-840**
  8 10/100TX + 4 10/100/1000T X-coded EN50155 M12 IP54 L2+ Managed Ethernet Switch; 16.8V~137.5V dual input w/ galvanic isolation; -40°C to 75°C
- **IES-5408S-54-24V……P/N: 8356-841**
  8 10/100TX + 4 10/100/1000T EN50155 M12 IP54 L2+ Managed Ethernet Switch; 12V~56V dual input w/ galvanic isolation; -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

Connector

ECONM12-04A(F)-C-180	4 pin M12 (Female) A-coded 180 degree crimp type connector for power supply
ECONM12-08X(M)-SPEEDCON	8 pin M12 (Male) X-coded 180 degree crimp type connector for data, Ethernet CAT6A (10G), shielded, SPEEDCON
ECONM12-05A(M)-C-180	5 pin M12 (Male) A-coded 180 degree crimp type connector for DI/DO

Cable

ECONM12-4P(F)1.5M CABLE	4 pin M12 (Female) A-coded 90 degree cable for power supply, 150cm
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

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