TPGS-5010T

10 10/100/1000T X-coded w/8 PoE at/af EN50155 Managed Ethernet Switch w/ Enhanced G.8032 Ring; 24V/WVI input

- *EN50155/61373/45545-2 verification; 16.8~137.5V(WVI) or 12~56VDC (24V) input selection*
- *Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 ETBN*
- *IEEE802.3at/af up to 30W per port; PoE management incl. detection and scheduling*
- *PoE galvanic isolation between input, PoE and output as well as case*
- *IP54 Aluminum housing for best heat dissipation and preventing moist ingress*
- *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*
- *Inrush current protection*
- *Optional bypass in case of power failure*
- *User friendly UI, including auto topology drawing; Complete CLI*
- *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, QinQ, TACACS+***
- *N-key configurator** for upgrading, auto back up /editable restoration without computer*

OVERVIEW

Lantech TPGS-5010T-8 is a high performance L2+ All Gigabit Ethernet switch with 10 10/100/1000T w/8 PoE at/af ports at M12 X-coded providing L2 wire speed and advanced security function for network aggregation deployment. It houses in an IP54 aluminum compact enclosure that is waterproof and will prevent moisture ingress due to temperature fluctuations. It delivers ITU G.8032 enhanced ring recovery less than 20ms including train coupling ring, enhanced mode etc for easy configuration, comprehensive QoS, QoS by VLAN, advanced security including INGRESS/EGRESS ACL L2/L3, TACACS+**, SSH v2/SSL, Mac based DHCP server, DHCP Option 82 relay, QinQ, DHCP server and DHCP Option 82 server, IGMPv1/v2/v3/router port, which are important features required in train and large network. It also supports Cisco Discovery Protocol (CDP) for Ciscoworks to detect the switch info and show on L2 map topology.

Selection of dual WVI (16.8V~137.5VDC) input and 24V (12V~56VDC); Inrush current protection

WVI model w/galvanic isolation accepts 16.8~137.5VDC dual input and can feed 54V output with max 80W PoE budget. 24V model w/system isolation accept 12~56VDC dual input for PoE feeding with max 80W budget.

The inrush current on initial power up can be limited lower than 10 x nominal current and for less than 1ms.

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).

PoE +, Advanced PoE management

Lantech TPGS-5010T-8 supports IEEE802.3at/af standard which can feed power up to 30W at each PoE port for big power consumption devices like PTZ IP camera, 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 is hang up 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.

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

Lantech TPGS-5010T-8 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 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 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 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.

Miss-wiring avoidance, node failure protection, Loop protection
The TPGS-5010T-8 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 TPGS-5010T-8 (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 needs 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.

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 TPGS-5010T-8 (IP54) can be exported and edited with word processor for the other switches configuration with ease.
The optional N-key configurator offers firmware upgrade, auto backup/ editable configuration restore without computer by adjusting the DIP switch.
The built-in watchdog design can automatically reboot the switch when CPU is found dead.

User friendly UI, Auto topology drawing, complete CLI
The user-friendly UI, innovative auto topology drawing and topology demo makes TPGS-5010T-8 much easier to get hands-on. The complete CLI enables professional engineer to configure setting by command line.

Event log & message; 2 DI + 2 DO
In case of event alarm, the TPGS-5010T-8 will immediately send an email** to pre-defined addresses as well as SNMP Traps out. It provides 2DI and 2DO while 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, input voltage, current and total PoE load where can send the SNMP traps and email** when abnormal.

Optional bypass relay prevents from power lost
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 (one pair). (-BT model)

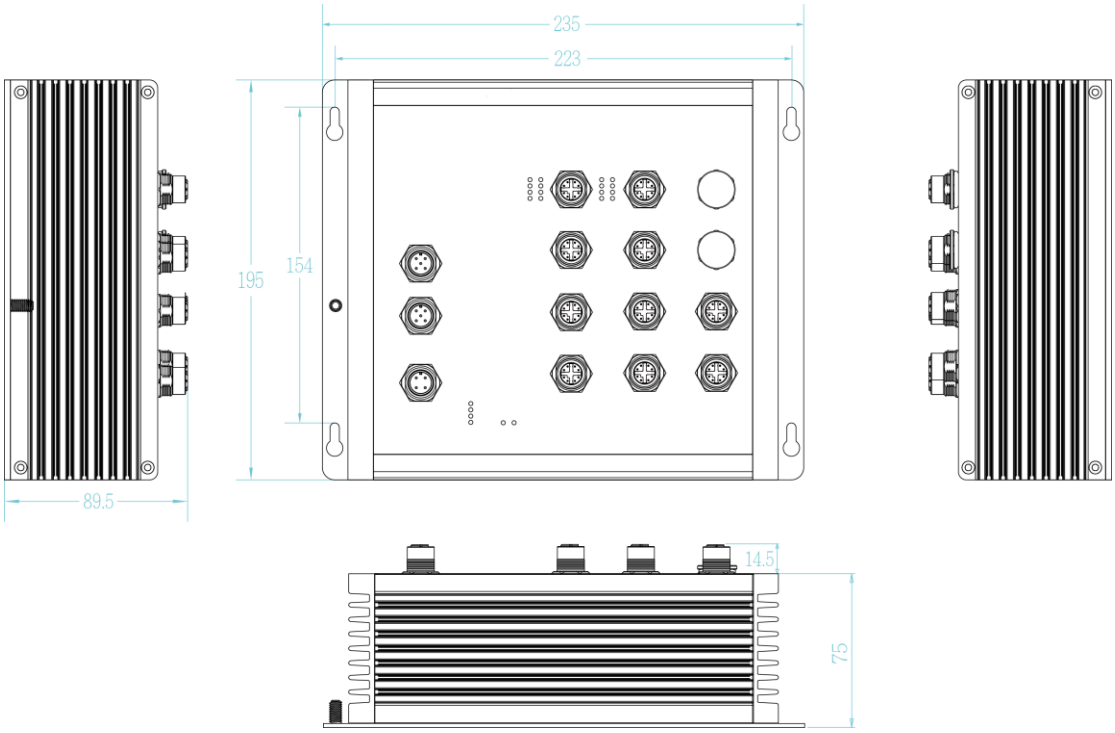
EN50155, 45545-2, 50121-3-2, 61373 certified; High ESD protection
Lantech TPGS-5010T-8 features high reliability and robustness coping with extensive EMI/RFI phenomenon, environmental vibration and shocks usually found in factory, substation, steel automation, aviation, mining and process control. It is the best solution for Automation, transportation, surveillance, Wireless backhaul, Semi-conductor factory and assembly lines.

The TPGS-5010T-8 is designed to meet with critical network environment with IP54 aluminum enclosure and M12 connectors for water proof. With EN45545-2 Fire & Smoke, and EN50155 & 61373 verification, the TPGS-5010T-8 is best for railway in train/track side, vehicle and mining applications. For more usage flexibilities, TPGS-5010T-8 supports wide operating temperature from -40°C to 75°C.

FEATURES & BENEFITS

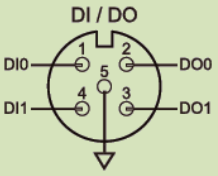
- **10 10/100/1000T X-coded EN50155 PoE Managed IP54 M12 Ethernet Switch w/8x 802.3at/af PoE ports (Total 10 Ports Gigabit Switch)**
- **EN45545-2 Fire & Smoke, EN50155 and EN61373 shock/vibration certified**
- **24V model w/system isolation accepts dual 12~56VDC power input and boost to 54V for PoE 802.3at/af at max 80W budget**
- **WVI model w/PoE galvanic isolation accepts dual 16.8V~137.5VDC power inputs and feed 54V for PoE at/af at to provide max 80W budget**
- **Galvanic isolation from power input/Ethernet ports to system 1.5KV**
- **PoE management including PoE detection and scheduling for PD (power devices)**
- **Back-plane (Switching Fabric): 20Gbps**
- **16K MAC address table**
- **10KB Jumbo frame supported**
- **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 16 MSTI**
- **4K 802.1Q VLAN, Port based VLAN, GVRP, QinQ, QoS**
- **MLD Snooping for IPv6 Multicast stream**
- **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; 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*
- **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*
- **Inrush current protection**
- **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+***
  - *Management access control with priority*
  - *Login Security: IEEE802.1X/RADIUS*
  - *HTTPS for secure access to the web interface*
- **Static multicast forwarding forward reversed IGMP flow (MVR) 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 when CPU is found dead**
- **Built-in environmental monitoring for input voltage, current, ambient temperature and total PoE load**
- **Supports 2 DI + 2 DO (Digital Input/Digital Output)**
- **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**
- **Diagnostic including Ping / ARP table / DDM information**
- **Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 TBN**
- **IP54 aluminum housing for wall mount design**
- **Bypass protection** on port 9/10 - Bypass failed switch caused by power failure of switch to protect network intactness (-BT model)**

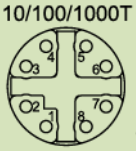
DIMENSIONS (unit=mm)



SPECIFICATIONS

Hardware Specification

Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX 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 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): 20Gbps
Transfer Rate	14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Ethernet
Mac Address	16K MAC address table
Jumbo frame	10KB
Connectors	10/100/1000T: 10 x ports M12 8-pole X-coded with Auto MDI/MDI-X function (port 9,10 with optional bypass) RS-232/Reset connector: 1 x M12 5-pole A-coded DI/DO: 1 x M12 5-pole A-coded Power Input connector: 1x M12 4-pole A-coded Male
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)
Bypass Protection**	Built-in bypass module on uplink ports (port#9,10) to pass to next switch in case of power failure (one pair)
LED	Per unit: Power 1 (Green), Power 2 (Green), FAULT (Red), RM (Green) Ethernet port: Link/Active (Green) PoE: Link / Active (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	16.8~137.5VDC on WVI model 12~56VDC on 24V model
Power Consumption	Max. 17W exclude PoE load

PoE Budget	WVI model: Input Range / Power Input / Maximal PoE Budget 16.8~27VDC / Dual Power Input / 80W 28~137.5VDC / Single Power Input / 80W 24V model: Input Range / Power Input / Maximal PoE Budget 12~20VDC / Dual Power Input / 80W 21~56VDC / Single Power Input / 80W
PoE pin assignment	M12 port # 1~ # 8 support IEEE 802.3at/af End-point Per port provides up to 30W 10/100/1000T  1:TXD1+ 5:BID4+ 2:TXD1- 6:BID4- 3:RXD2+ 7:BID3- 4:RXD2- 8:BID3+
Dimensions	Aluminum case (IP54) 235mm(W)x195mm(H)x89.5mm(D)
Weight	1.3kgs (IP54)
Installation	Wall Mount Design
EMI & EMS	FCC Part 15 Class A, CE EN55022, CE EN55024 , CE EN61000-4-11 CE EN61000-4-2 (ESD) Level 3 CE EN61000-4-3 (RS) Level 3 CE EN61000-4-4 (EFT) Level 3 CE EN61000-4-5 ED3 (Surge) Level 3 CE EN61000-4-6 (CS) Level 3 CE EN61000-4-8 (Magnetic field) Level 3
Stability Testing	EN61373 (Shock and Vibration)
Certifications & report	EN50155/EN50121-3-2/EN50121-4 Certificate EN45545-2 R13/R22/R23/R24/R25 (EN ISO 4589-2, EN ISO 5659-2, NF X70-100-1 & 2) Fire & Smoke verification
MTBF	736,421hrs. (standards: IEC 62380)
Warranty	5 years

Software Specification

Management	SNMP v1 v2c, v3/ Web/Telnet/CLI
SNMP MIB	RFC 1213 MIBII RFC 1158 MIBII RFC 1157 SNMP MIB, RFC 1493 Bridge MIB* RFC 1573 IF MIB Partial RFC 1757 RMON, RFC 2674 Q-Bridge MIB*; LLDP 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	■ PoE Detection to check if PD is hang up then restart the PD ■ 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, PoE load 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 by 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, 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 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
MLD Snooping	Support IPv6 Multicast stream
MVR	Static multicast forwarding forward reversed IGMP flow (MVR) 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	Supports SMTP Server and 8 e-mail accounts for receiving event alert
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 (Client & Server)/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
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).
SNTP	Supports SNTP to synchronize system clock in Internet
Firmware	Supports TFTP firmware update, TFTP backup and

Update	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 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 model names.

- **TPGS-5010T-8-54-WVI……..P/N: 8361-416**
  10 10/100/1000T X-coded w/8 PoE EN50155 M12 IP54 L2+ Managed Gigabit Ethernet Switch; 16.8~137.5VDC dual input w/ galvanic isolation; PoE max 80W budget ;-40°C to 75°C
- **TPGS-5010T-8-54-24V……..P/N: 8361-417**
  10 10/100/1000T X-coded w/8 PoE EN50155 M12 IP54 L2+ Managed Gigabit Ethernet Switch; ; 12V~56VDC dual input w/ galvanic isolation; PoE max 80W 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

Connector

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
ECONM12-04A(F)-C-180	4 pin M12 (Female) A-coded 180 degree crimp type connector for power supply

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

Lantech Communications Global Inc.

www.lantechcom.tw
info@lantechcom.tw