

T(P)GS-R6416XFT

16 10/100/1000T + 2 10G Copper + 2 10G SR/LR Fiber Q-ODC OM3 w/8/10/16 PoE, EN50155 OS4 Managed Ethernet Switch;
 WVI / 24VI / 24TVI input w/ optional dynamic routing, multicast routing, cybersecurity, and hardware NAT



OVERVIEW

Lantech TPGS-R6416XFT is a high performance OS4 Ethernet switch with 16 10/100/1000T + 2 1G/2.5G/5G/10G Copper + 2 1G/10G Q-ODC OM3 Fiber with w/10 (incl. 8 10/100/1000T + 2 uplink 10GT copper) or w/8/16 PoE 802.3af/at ports which provides advanced security function for network aggregation deployment.

Lantech OS4 Platform with complete L2 management and upgradable optional L3 & L3Lite communication protocols incl. dynamic routing, multicast routing, hardware NAT, and PTP

The switch runs Lantech OS4 platform which is powerful with complete Layer 2 management features and optional upgradable for future expansion, such as Layer 3 Lite, Layer 3, IEC61375-2-5 (ETBN), hardware NAT, PTP, etc. The PTP V2 supports transparent clock and two step processing that improves network time accuracy and precision. To learn more about the Lantech OS4 Platform, please refer to [Lantech OS3/OS4 Software Datasheet](#)

Enhanced cybersecurity features with IEC 62443-4-1, optional IEC 62443-4-2 compliance & built-in DDoS attack protection

Lantech OS4 platform is designed with high standard of cybersecurity to prevent the threats from network attack such as DDoS attacks. To ensure the safety and reliability of communication networks, Lantech develops our products under strict international security standard and is certified with IEC 62443-4-1 and the switch is also compliant to optional IEC 62443-4-2 standard. To learn more about Lantech cybersecurity software solution, please refer to [Lantech OS3/OS4 Software Datasheet](#)

Up to 8/10/16 PoE at/af ports w/advanced PoE management and PoE galvanic isolation

Compliant with 802.3af/at standard, the PoE model is able to feed each PoE port up to 30 Watt at each PoE port for various IP PD devices. It supports advanced PoE management including PoE detection and scheduling. 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. Each PoE ports can be Enabled/disabled, get the voltage, current, Watt, and temperature info displayed on WebUI.

PoE galvanic isolation up to 1.5KVDC to provide power input to PoE Ethernet ports insulation prevents cabling and grounding incidents from damaging the Ethernet switch itself.

Miss-wiring avoidance, node failure protection, Loop protection

The switch also embedded several features for strong and reliable network protection in an easy and intuitive way. When the pre-set ring configuration failed or looped by miss-wiring, the switch being 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.

User friendly GUI, Auto topology drawing, Enhanced Environmental Monitoring

The user-friendly UI, innovative auto topology drawing and topology demo makes the switch much easier to get hands-on. The complete CLI enables professional engineer to configure setting by command line. It supports enhanced environmental monitoring for actual input voltage, current, ambient temperature and total power load.

Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 TBN

Lantech OS4 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; USB port for import/export configuration

The configuration file of the switch can be imported and edited with word processor for the following switches to configure with ease. The USB port can import/export the configuration from/to USB dongle and also to upgrade firmware from USB dongle. TFTP/HTTP firmware upgrade is supported.

Event log & message; 2DI + 2DO; Factory default pin

The switch 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 outside alarm and switch will send alert information to IP network with email and traps. The factory reset pin can restore the setting back to factory default.

Optional smart bypass protection on dual 10G copper/fiber ports

The bypass relay is set to bypass the switch to the next one when power is off to prevent network disruption. Lantech bypass caters to remain in bypass mode until the switch is completely booting up when power is back to avoid another network lost. Optional smart bypass (one pair copper bypass and one pair fiber bypass) can be activated when switch encounters power failure or CPU fail. (-BT/-BF/-BT-BF model)

Dual WVI / 24VI / 24TVI input with max PoE budget and Inrush current protection

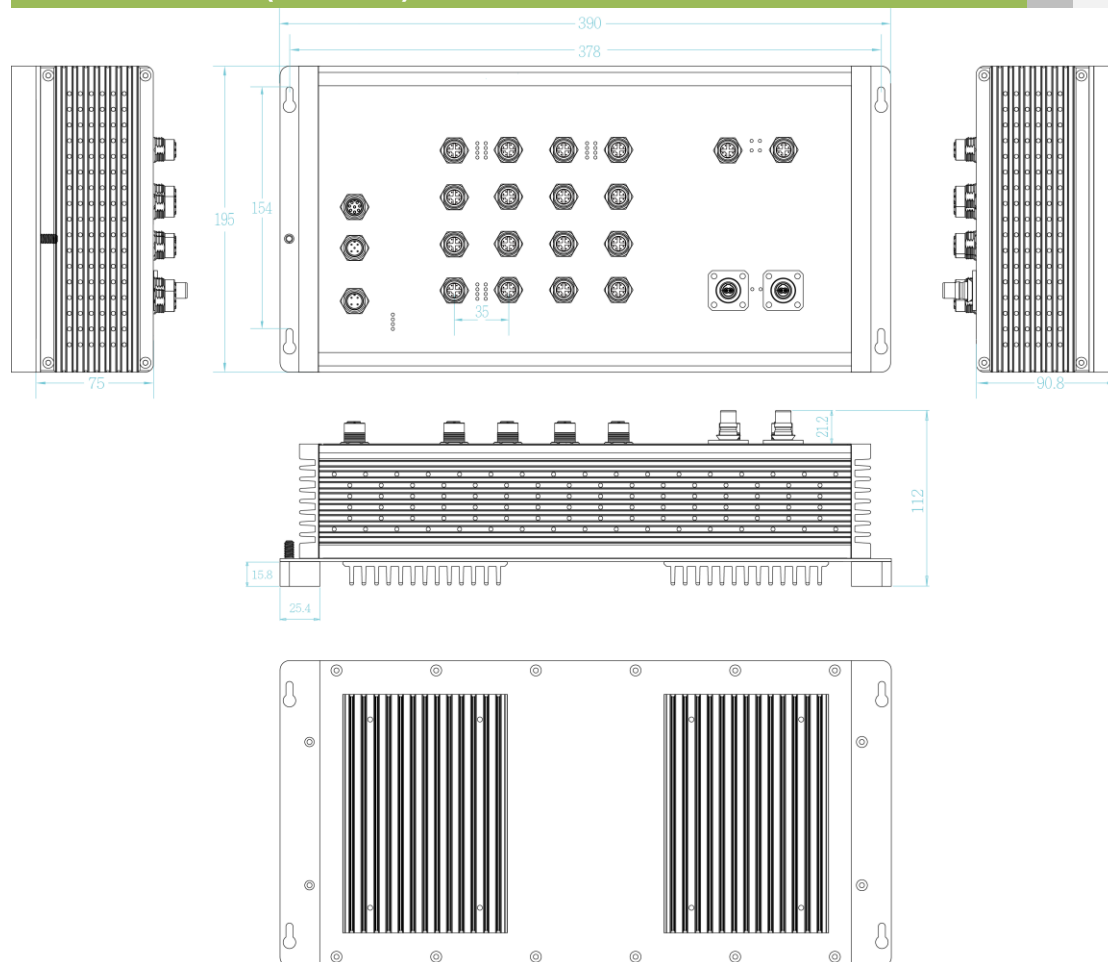
The switch accept 16.8~137.5VDC (WVI model) ; 9~36VDC (24VI model) ; 16.8~56VDC (24TVI model) dual input with Ethernet and PoE galvanic isolation and PoE model can feed 54V output for PoE feeding with 80W budget. The inrush current on initial power up can be limited lower than 10 x nominal current.

EN50155, EN45545-2; EN61373 compliance; Rugged design with high ESD protection

The switch is designed to meet with critical network environment with IP21 aluminum enclosure and M12 connectors for water proof. The switch passed serious tests under extensive Industrial EMI and Safety standards. With EN45545-2 Fire & Smoke and EN50155 verification, it is best switch for railway on-board/track side, vehicle, and

mining applications. For more usage flexibilities, the switch supports wide operating temperature from -40°C to 70°C (85°C operation for 10min), which is compliant with the EN50155 Operating Temperature Range Requirement Class OT4.

DIMENSIONS (unit=mm)



SPECIFICATIONS

Hardware Specification

Standards	IEEE802.3 10Base-T Ethernet IEEE802.3u 100Base-TX IEEE802.3ab 1000Base-T IEEE802.3ak 10Gbase-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 IEEE802.3ad Link Aggregation Control Protocol (LACP) IEEE802.1AB Link Layer Discovery Protocol (LLDP) IEEE802.1X User Authentication (Radius) IEEE802.1p Class of Service IEEE802.1Q VLAN Tag IEEE802.3at/af Power over Ethernet
Switch Architecture	Back-plane (Switching Fabric): 112Gbps
Mac Address	16K MAC address table
Jumbo frame	10KB
Connectors	10/100/1000T: 16 x M12 4-pole D-coded with Auto MDI/MDI-X function

	1G/2.5G/5G/10G Copper: 2 x M12 8-pole X-coded port 17-20 1G/10G FX: 2x ports Q-ODC OM3 with multi-mode/single-mode fiber Power Input connector: 1 x M12 4-pole Male A-coded Reset/Console/USB : 1 x M12 8-pole A-coded DIDO: 1 x M12 5-pole A-coded
Network Cable	10Base-T: 4-pair STP Cat3 cable 100Base-TX: 4-pair STP Cat3/5 cable 1000Base-T: 4-pair STP Cat5/5e cable; 2.5G Copper: 4-pair STP Cat5e cable 10G Copper: 4-pair STP Cat6/6A cable 1G/10G fiber: Multi-mode: 0 to 300 m, 850 nm (OM3 50/125 μm); Single-mode: 0 to 2 km, 1310 nm (9/125 μm)
LED	Per unit: Power 1 (Green), Power 2 (Green), FAULT (Red); RM(Green) 10/100/1000T Ethernet port: Link/Activity (Green) 1G/2.5G/5G/10G port: speed (1G/2.5G/5G:

	Yellow ; 10G: Orange) 1G/10G fiber: Link/Act (Orange) PoE : Link/Act (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 80 VDC, 50mA
Operating Humidity	5% ~ 95% (Non-condensing)
Operating Temperature	-40°C~70°C/-40°F~158°F (85°C operation for 10min.)
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	Dual DC input 16.8~137.5VDC (WVI model) ; 9~36VDC (24VI model) ; 16.8~56VDC (24TVI model)
PoE Budget (PoE model)	80W@24VDC Higher PoE budget can be applied upon request. **
PoE pin assignment	M12 port #1~#8 (-8 model) M12 port #1~#8, #17~#18 (-10 model) M12 port #1~#16 (-16 model) Support IEEE 802.3at/af End-point, Alternative A mode
Power Consumption	Max. 45.9W exclude PoE load
Dimensions	IP21 model: Aluminum case 390mm(W)x195mm(H)x112mm(D)
Weight	5.15 kgs

Installation	Wall Mount Design
EMI & EMS	FCC Part 15 Class A EN61000-6-2 EN61000-6-4 CE EN55032 Class A CE EN55024 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
Verifications	EN50155/EN50121-3-2/EN50121-4; EN 45545-1, EN 45545-2 Fire & Smoke verification
Stability Testing	EN61373 (Shock and Vibration)
MTBF	TBC (standards: IEC 62380)
Bypass**	Up to one pair copper and one pair fiber bypass on 10GT Copper ports and 10G Fiber Q-ODC ports pass to next switch in case of power failure and CPU hang -BT model: one pair 10GT copper bypass -BF model: one pair 10G fiber bypass -BT-BF model: one pair 10GT copper bypass + one pair 10G fiber bypass
Warranty	5 years
Software Specification	
Lantech OS4 Platform	Download Software Datasheet

*Future release

**Optional

ORDERING INFORMATION

All model packages include M12 caps. For optional bypass add -BT (one pair copper bypass); -BF (one pair Fiber bypass); -BT-BF (one pair copper & one pair fiber bypass) to end of model names. For Coating add -C to end of model names.

- **TPGS-R6416XFT-8-QMM-21-WVI.....P/N: 8361-559**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/8 PoE at/af EN50155 OS4 Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
- **TPGS-R6416XFT-8-QSM-21-WVI.....P/N: 8361-5591**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/8 PoE at/af EN50155 OS4 Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
- **TPGS-R6416XFT-10-QMM-21-WVI.....P/N: 8361-5592**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/10 PoE at/af incl. 2 10GT EN50155 OS4 Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
- **TPGS-R6416XFT-10-QSM-21-WVI.....P/N: 8361-5593**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/10 PoE at/af incl. 2 10GT EN50155 OS4 Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
- **TPGS-R6416XFT-16-QMM-21-WVI.....P/N: 8361-5594**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/16 PoE at/af EN50155 OS4 PoE Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
- **TPGS-R6416XFT-16-QSM-21-WVI.....P/N: 8361-5595**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/16 PoE at/af EN50155 OS4 PoE Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
- **TGS-R6416XFT-QMM-21-WVI.....P/N: 8361-55913**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; EN50155 OS4 Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ galvanic isolation
- **TGS-R6416XFT-QSM-21-WVI.....P/N: 8361-55923**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM EN50155 OS4 Managed Ethernet Switch; 16.8V~137.5VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ galvanic isolation
- **TPGS-R6416XFT-8-QMM-21-24VI.....P/N: 8361-55901**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/8 PoE at/af EN50155 OS4 Managed Ethernet Switch; 9V~36VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
- **TPGS-R6416XFT-8-QSM-21-24VI.....P/N: 8361-55911**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/8 PoE at/af EN50155 OS4

- Managed Ethernet Switch; 9V~36VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
- **TPGS-R6416XFT-10-QMM-21-24VI.....P/N: 8361-55921**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/10 PoE at/af incl. 2 10GT EN50155 OS4 Managed Ethernet Switch; 9V~36VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TPGS-R6416XFT-10-QSM-21-24VI.....P/N: 8361-55931**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/10 PoE at/af incl. 2 10GT EN50155 OS4 Managed Ethernet Switch; 9V~36VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TPGS-R6416XFT-16-QMM-21-24VI.....P/N: 8361-55941**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/16 PoE at/af EN50155 OS4 PoE Managed Ethernet Switch; 9V~36VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TPGS-R6416XFT-16-QSM-21-24VI.....P/N: 8361-55951**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/16 PoE at/af EN50155 OS4 PoE Managed Ethernet Switch; 9V~36VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TGS-R6416XFT-QMM-21-24VI.....P/N: 8361-55933**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; EN50155 OS4 Managed Ethernet Switch; 9V~36VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ galvanic isolation
 - **TGS-R6416XFT-QSM-21-24VI.....P/N: 8361-55943**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM EN50155 OS4 Managed Ethernet Switch; 9V~36VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ galvanic isolation
 - **TPGS-R6416XFT-8-QMM-21-24TVI.....P/N: 8361-55902**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/8 PoE at/af EN50155 OS4 Managed Ethernet Switch; 16.8V~56VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TPGS-R6416XFT-8-QSM-21-24TVI.....P/N: 8361-55912**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/8 PoE at/af EN50155 OS4 Managed Ethernet Switch; 16.8V~56VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TPGS-R6416XFT-10-QMM-21-24TVI.....P/N: 8361-55922**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/10 PoE at/af incl. 2 10GT EN50155 OS4 Managed Ethernet Switch; 16.8V~56VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TPGS-R6416XFT-10-QSM-21-24TVI.....P/N: 8361-55932**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/10 PoE at/af incl. 2 10GT EN50155 OS4 Managed Ethernet Switch; 16.8V~56VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TPGS-R6416XFT-16-QMM-21-24TVI.....P/N: 8361-55942**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; w/16 PoE at/af EN50155 OS4 PoE Managed Ethernet Switch; 16.8V~56VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TPGS-R6416XFT-16-QSM-21-24TVI.....P/N: 8361-55952**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM ; w/16 PoE at/af EN50155 OS4 PoE Managed Ethernet Switch; 16.8V~56VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ PoE galvanic isolation
 - **TGS-R6416XFT-QMM-21-24TVI.....P/N: 8361-55953**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber multi-mode Q-ODC OM3 300M; EN50155 OS4 Managed Ethernet Switch; 16.8V~56VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ galvanic isolation
 - **TGS-R6416XFT-QSM-21-24TVI.....P/N: 8361-55903**
16 10/100/1000T + 2 10G Copper M12 X-coded + 2 1G/10G Fiber single-mode Q-ODC 2KM EN50155 OS4 Managed Ethernet Switch; 16.8V~56VDC dual input; -40C~70C/-40F~158F; IP21 housing w/ galvanic isolation

OPTIONAL ACCESSORIES

Software package

Please refer to the [software datasheet](#)

M12 Connector & Cable

Connector

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

Cable

- **ECONM12-4P(F)1.5M CABLE** 4 pin M12 (Female) A-coded 90 degree cable for power supply, 150cm
- **ECONM12-08M2-CONSOLE** 8 pin M12 (Male) A-coded 180 degree to RS232 cable for console, 150cm
- **ECABM12X83MSTP** 8 pin M12 (Male) X-coded 180 degree RJ45 STP cable for data, shielded, 300cm
- **ECABM002-QOP2-3.0-MM-OM3** Q-ODC 2 plug/LC multi-mode fiber, MM-OM3, 300cm
- **ECABM002-QOP2-3.0-SM-OS2** Q-ODC 2 plug/LC single-mode fiber, SM-OS2, 300cm

Others

■ M12 to USB interface adapter	8 pin M12 (Male) A-coded 180 degree M12 to USB 2.0 interface adapter, 8cm
■ USB 2.0 Ethernet Adapter	USB 2.0 to RJ45 Ethernet Adapter
■ ECONM12-08(M) TO DB9+USB2.0-1.5M CABLE	8 pin M12 (Male) A-coded 180 degree M12 to USB2.0 to DB9 (Female) cable, 150cm

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