

I(P)GS-L5416MGSFPR-AC

16 10/100/1000T + 4 1G/2.5G SFP OS3 (w/16 PoE af/at) Industrial Managed

Ethernet Switch w/ Enhanced G.8032 Ring, PXE ; dual AC Power Inputs

- Enhanced G.8032 ring protection < 20ms for single ring
- Supports enhanced mode and basic mode; Enhanced G.8032 ring covers multicast packets; MSTP 8 MSTI /RSTP; support MRP ring
- Support PXE to verify switch firmware with the latest or certain version on server
- Miss-wiring avoidance & node failure protection
- 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, DHCP Snooping, SSH v2/SSL, HTTPS, INGRESS ACL L2/L3, TACACS+, QinQ, QoS by VLAN
- Protocol based VLAN; IPv4 Subnet based VLAN
- Enhanced Environmental Monitoring for temp., actual input voltage, current & total power load
- USB port to upload & download the configuration file; optional out-of-band management via 100Mbps Ethernet Port
- Optional L3Lite/L3* to be upgradable
- Built in 2 separate AC power supplies with IEC320 sockets
- Support Out-of-band Management** (OOBM)
- Factory reset pin to restore to factory default setting
- Wide range operation temperature: -40~70C/-40~158F



OVERVIEW

Lantech I(P)GS-L5416MGSFPR-AC is a high performance OS3 Industrial Ethernet switch with 16 10/100/1000T + 4 1G/2.5G SFP (w/16 PoE af/at ports) which provides advanced security function for network aggregation deployment. It delivers ITU G.8032 enhanced ring recovery less than 20ms in single ring while also supports enhanced mode with easy configuration. The comprehensive QoS (RFC2474), advanced security including INGRESS ACL L2/L3, TACACS+, SSH v2/SSL and Mac based DHCP server, DHCP Option 82, DHCP server, IGMPv1/v2/v3/router port are supported and are also required in large network. It also supports 10K Jumbo frames.

Up to 16 PoE af/at ports w/advanced PoE management (PoE model)

Compliant with 802.3af/at standard, the Lantech IPGS-L5416MGSFPR-AC being able to feed each PoE port up to 30 Watt. Lantech IPGS-L5416MGSFPR-AC 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 port can be Enabled/disabled, get the voltage, current, Watt, and temperature info displayed on WebUI.

Miss-wiring avoidance, Node failure protection, Loop protection

The I(P)GS-L5416MGSFPR-AC 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, Lantech I(P)GS-L5416MGSFPR-AC being able to alert with the LED indicator and disable ring automatically. Node failure protection ensures the Ethernet switches in a ring to survive after power breakout is back. The status can be shown in NMS when each Ethernet 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, 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. DHCP Option66 server can offer IP address of TFTP server to DHCP client for VOIP application. Basic IPv6 DHCP service can be supported.

Support PXE to verify switch firmware with the latest or certain version

The switch can check its firmware version during booting time via PXE protocol. If switch finds any newer version, it will upload automatically.

User friendly GUI, Auto topology drawing

The user-friendly UI, innovative auto topology drawing and

topology demo makes I(P)GS-L5416MGSFPR-AC much easier to get hands-on. The complete CLI enables professional engineer to configure setting by command line.

Enhanced G.8032 ring, 8 MSTI MSTP; MRP ring

Lantech I(P)GS-L5416MGSFPR-AC 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 enhanced ring and basic ring by easy setup than others. It supports MSTP that allows RSTP over VLAN for redundant links with 8 MSTI.

MRP (Media Redundancy Protocol) can be supported for industrial automation networks.

Enhanced Storm control

Storm control prevents traffic on a LAN from being disrupted by a broadcast, multicast, or unicast storm on one of the physical interfaces and the detection is more precise and reaction is more efficient.

Optional L3 Lite/L3* to be upgradable

Lantech OS3 is optional upgradable to L3 Lite for expansion. The optional L3Lite includes editable routing table, VRRP (RFC3768), Router-on-a-stick, Inter- VLAN routing, PIM-SM RP mode and OSPFv2 for dynamic routing, OSPF redistribute static.

QinQ, QoS and GVRP supported

It supports the QinQ, QoS (RFC2474) and GVRP for large VLAN segmentation.

Protocol based VLAN; Subnet based VLAN

The protocol-based VLAN processes traffic based on protocol. It filters IP traffic from nearby end-stations using a particular protocol such as IP, IPX, ARP or other Ethernet-types in a Hex value. Subnet based VLANs group traffics into logical VLANs based on the source IP address and IP subnet. The above features can help to build VLAN in the network mixed with managed and un-managed switch as to define packets to which VLAN group based on protocol or subnet.

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.

Editable configuration file; USB port for upload/download configuration; optional out-of-band management via 100Mbps Ethernet port

The configuration file of Lantech I(P)GS-L5416MGSFPR-AC can be exported and edited with word processor for the following Ethernet switches to configure with ease.

The USB port can upload/download the configuration from/to USB dongle.

The console port can act as OOB management for remote service and management.

Enhanced environmental monitoring for switch inside information

The enhanced environmental monitoring can detect switch overall temperature, total power load, actual input voltage and current it also can send the SNMP traps alert when abnormal.

Dual AC power Supplies

The Lantech I(P)GS-L5416MGSFPR-AC is designed with dual isolated power supplies at 85~265VAC with IEC320 sockets.

Industrial hardened design with high EFT and ESD protection

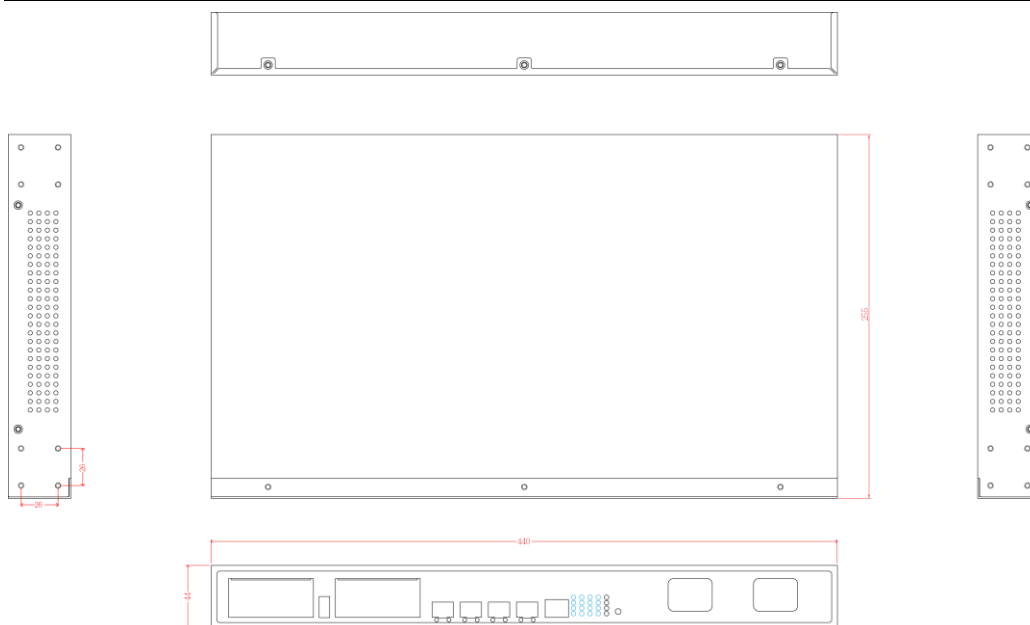
Lantech I(P)GS-L5416MGSFPR-AC features high reliability and robustness coping with extensive EMI/RFI phenomenon, environmental vibration and shocks usually found in factory, substation, steel automation, aviation, mining and process control.

It is the best solution for Automation, transportation, surveillance, Wireless backhaul, Semi-conductor factory applications. The switch can be used in extreme environments with an operating temperature range of -40°C to 70°C.

FEATURES & BENEFITS

- 16 10/100/1000T + 4 1G/2.5G SFP auto sensing SFP* (w/16 PoE 802.3af/at ports) (Total 20 Ports Switch)
- Galvanic isolation from power input/Ethernet ports to system 1.5KV
- Back-plane (Switching Fabric): 52Gbps
- 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 enhanced ring and basic ring,
 - Enhanced G.8032 ring configuration with ease
 - 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 8 MSTI
- 4K 802.1Q VLAN, Port based VLAN, GVRP, QinQ, QoS (RFC2474)
- Subnet VLAN and protocol VLAN
- Supports IEEE 802.1ab LLDP, Cisco CDP; LLDP info can be viewed via Web/ CLI
- Supports optional out-of-band management via 100Mbps Ethernet Port
- Support PXE to verify switch firmware with the latest or certain version
- 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 that includes dumb Ethernet 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
- System Event Log, SMTP alert and SNMP Trap for alarm support
- Security
 - SSL/SSH v2/INGRESS ACL L2/L3
 - MAC address table: MAC address entries/Filter/static MAC-Port binding
 - Remote Admin: 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 for Multicast protection
- IGMPv1, v2, v3 with Query mode for multi media
- Dual image firmware support
- MLD Snooping for IPv6 Multicast stream
- Factory reset button to restore setting to factory default
- Enhanced environmental monitoring for system actual input voltage, current, ambient temperature, and total power load
- Configuration backup and restoration
 - Supports editable configuration file for system quick installation
 - USB port for upload/download configuration file
- TFTP/HTTP firmware upgrade
- Diagnostic including Ping / ARP table / DDM information
- Enhanced Storm Control
- Optional L3Lite/L3* to be upgradable
- IP30 metal housing with Rack-mount design

DIMENSIONS (unit=mm)



*Note: The component in blue color only appears on PoE models.

SPECIFICATION

Hardware Specification

Standards	IEEE802.3 10Base-T Ethernet IEEE802.3u 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 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 (PoE model)
Switch Architecture	Back-plane (Switching Fabric): 52Gbps
Mac Address	16K MAC address table
Jumbo frame	10KB
Connectors	10/100/1000T: 16 x ports RJ-45 with Auto MDI/MDI-X function Mini-GBIC: 4 x 1G/2.5G SFP socket with DDMI RS-232 connector: RJ-45 type for CLI; optional 100Mbps Ethernet for management out-of-band feature USB x 1 Power connector: 2 x IEC320 sockets
Network Cable	100Base-TX: 2-pair STP Cat. 5/ 5E/ 6 cable; EIA/TIA-568 100-ohm (100m) 1000Base-T: 4-pair STP Cat5E/6 cable
Optical Cable	1Gbps: Multi-mode: 0 to 550 m, 850 nm (50/125 μm); 0 to 2 km, 1310 nm (50/125 μm) Single mode: 0 to 10 km/ 30 km/ 40 km, 1310 nm (9/125 μm); 0 to 50 km/ 60 km/ 80km/ 120 km, 1550 nm (9/125 μm) 2.5Gbps Multi-mode: 0 to 300 m, 850 nm (50/125 μm); Single mode: 0 to 2 km/ 15 km/ 40 km, 1310 nm (9/125 μm); 0 to 40 km/ 80 km/ 100km, 1550 nm (9/125 μm) WDM 1Gbps: Single-mode: 0 to 10 km/ 20 km/ 40 km/ 60 km,

	1310 nm (9/125 μm); 0 to 80 km, 1490 nm (9/125 μm); 0 to 10 km/ 20 km/ 40 km/ 60 km/ 80 km, 1550 nm (9/125 μm) WDM 2.5Gbps Single-mode: 0 to 5 km/ 20 km/ 40 km/ 60 km, 1310 /1550nm (9/125 μm); 0 to 80 km, 1490/1550 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 fiber: Link/Act (Orange) PoE : Link/Act (Green) (PoE model)
Operating Humidity	5% ~ 95% (non-condensing)
Operating Temperature	-40°C~70°C / -40°F~167°F
Storage Temperature	-40°C~85°C / -40°F~185°F
PoE Budget (PoE model)	120W Higher PoE budget can be applied upon request. **
PoE pin assignment (PoE model)	M12 port #1~#8; support IEEE 802.3at/af End-point, Alternative A mode
Power Supply	Dual AC power inputs, 85~265 AC input
Power Consumption	Max. 28.5W (For PoE Model), 27.5W (For Non PoE Model)
Case Dimension	Metal case, IP-30, 440mm(W)x255mm(D)x44mm(H)
Weight	3.2kg
Installation	Rack Mount Design
EMI & EMS	FCC Class A, CE EN55032 Class A, CE EN55024, CE EN61000-4-2, CE EN61000-4-3, CE EN61000-4-4, CE EN61000-4-5, CE EN61000-4-6, EN61000-4-10, EN61000-4-11, EN61000-4-12, EN61000-4-16, EN61000-4-17, EN61000-4-29 EN50121-4 CE EN61000-6-2, CE EN61000-6-4, CE EN61000-6-5
Substation Verification	IEC 61850-3*
	IEEE1613*

MTBF	TBC (standards: IEC 62380)
Warranty	5 years
Software Specification	
Management	SNMP v1 v2c, v3/ Web/Telnet/CLI
SNMP MIB	RFC 1213 MIBII RFC 1158 MIB RFC 1157 SNMP MIB RFC 1493 Bridge MIB* RFC 1573 IF MIB RFC 2674 Q-Bridge MIB* RFC 2819 RMON MIB Private MIB
ITU G.8032	Support ITU G.8032 for Ring protection in less than 20ms for self-heal recovery (single ring enhanced mode) Support basic single ring & enhanced ring Enhanced G.8032 ring configuration with ease Cover multicast & data packets protection
PoE Management (PoE model)	PoE Detection to check if PD hangs then restart the PD ■ PoE Scheduling to On/OFF PD upon routine time table
Per Port PoE Status (PoE model)	■ On/ Off, voltage, current, watts, temperature
User friendly UI	■ Auto topology drawing ■ Topology demo ■ 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 actual input voltage, current ambient temperature, and total power load to be shown in GUI and sent alerting if any abnormal status
VLAN	Port Based VLAN IEEE 802.1Q Tag VLAN (64 entries)/ VLAN ID (Up to 4K, VLAN ID can be assigned from 1 to 4096) GVRP, QinQ, QoS (RFC2474) 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 8 MSTI
Quality of Service	The quality of service determined by IPv4 Type of service, IPv4 Differentiated Services Code Points – DSCP (RFC2474)
Class of Service	Support IEEE802.1p class of service, per port provides 8 priority queues
Remote Admin	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/static MAC-Port binding Ingress ACL L2/L3 SSL/SSH v2 for Management (minimal 2048 bits key support)

	HTTPS for secure access to the web interface TACACS+ for Authentication
IGMP	Support IGMP snooping v1, v2, v3; Supports IGMP static route; 1024 multicast groups; IGMP router port; IGMP query; GMRP
MLD Snooping	Support IPv6 Multicast stream
Static multicast forwarding	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 packets. 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 5 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
PXE	PXE to verify switch firmware with the latest or certain version
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 can set Primary and Secondary DNS server
SNTP	Supports NTP/SNTP to synchronize system clock in Internet
Firmware Update	Supports TFTP firmware update, TFTP backup and restore; HTTP firmware upgrade
Configuration upload and download	Supports editable configuration file for system quick installation; Support factory reset button to restore all settings back to factory default
Enhanced Storm Control	prevents traffic on a LAN from being disrupted by a broadcast, multicast, or unicast storm on one of the physical interfaces
L3Lite**/L3*	Lantech OS3 is optional upgradable to L3 Lite for expansion. The optional L3Lite includes editable routing table, VRRP (RFC3768), Router-on-a-stick, Inter- VLAN routing, PIM-SM RP mode and OSPFv2 for dynamic routing, OSPF redistribute static.
Diagnostic	Support Ping, ARP table and DDM information
Dual Image Firmware	Support dual image firmware function

*Future release

**Optional

ORDERING INFORMATION

- **IGS-L5416MGSFPR-ACP/N: 8361-5843**
16 10/100/1000T + 4 1G/2.5G SFP OS3 Managed Ethernet Switch; built-in 2x 85~265VAC IEC320 power conversion; -40°C to 70°C; IP30 Rackmount design
- **IPGS-L5416MGSFPR-ACP/N: 8361-5844**
16 10/100/1000T + 4 1G/2.5G SFP w/16 PoE 802.3af/at ports OS3 Managed Ethernet Switch; built-in 2x 85~265VAC IEC320 power conversion; -40°C to 70°C; IP30 Rackmount design
- **IGS-L5416MGSFPR-ACP/N: 8361-5845**
16 10/100/1000T + 4 1G/2.5G SFP OS3 Managed Ethernet Switch; built-in 2x 85~265VAC IEC320 power conversion; -40°C to 70°C; IP30 Rackmount design, **w/out-of-band management feature**
- **IPGS-L5416MGSFPR-ACP/N: 8361-5846**
16 10/100/1000T + 4 1G/2.5G SFP w/16 PoE 802.3af/at ports OS3 Managed Ethernet Switch; built-in 2x 85~265VAC IEC320 power conversion; -40°C to 70°C; IP30 Rackmount design, **w/out-of-band management feature**

OPTIONAL ACCESSORIES

Software package

- **OS3 – L3L upgrade kit P/N: 9000-114**
OS3 software platform with Layer 3 Lite functions (please check this data sheet's product features/specification for details)
- **OS3 – L3* upgrade kit P/N: 9000-116**
OS3 software platform with Layer 3 functions (please check this data sheet's product features/specification for details)

Mini GBIC (SFP)

- | | | | |
|-----------------------|--|-----------------------|---|
| ■ 8330-162-V1 | MINI GBIC 1000SX (LC/0.5km) Transceiver | ■ 8330-187-V1 | LTSFP-1000BX-20KM Transceiver (WDM 1550) |
| ■ 8330-163-V1 | MINI GBIC 1000SX2 (LC/2km) Transceiver | ■ 8330-180-V1 | LTSFP-1000BX-40KM Transceiver (WDM 1310) |
| ■ 8330-165-V1 | MINI GBIC 1000LX (LC/10km) Transceiver | ■ 8330-182-V1 | LTSFP-1000BX-40KM Transceiver (WDM 1550) |
| ■ 8340-0591-V1 | MINI GBIC 1000LHX (LC/40km) Transceiver | ■ 8330-181-V1 | LTSFP-1000BX-60KM Transceiver (WDM 1310) |
| ■ 8330-166-V1 | MINI GBIC 1000XD (LC/50km) Transceiver | ■ 8330-183-V1 | LTSFP-1000BX-60KM Transceiver (WDM 1550) |
| ■ 8330-169-V1 | MINI GBIC 1000XD (LC/60km) Transceiver | ■ 8330-184-V1 | LTSFP-1000BX-80KM Transceiver (WDM 1490) |
| ■ 8330-167-V1 | MINI GBIC 1000ZX (LC/80km) Transceiver | ■ 8330-185-V1 | LTSFP-1000BX-80KM Transceiver (WDM 1550) |
| ■ 8330-170-V1 | MINI GBIC 1000EZ (120km) Transceiver | ■ 8330-262D-V1 | MINI GBIC 2.5G 850nm VCSEL (LC/0.3km) |
| ■ 8330-168-V1 | MINI GBIC 1000T (100m) Transceiver | | Transceiver |
| ■ 8330-188-V1 | LTSFP-1000BX-10KM Transceiver (WDM 1310) | ■ 8330-263D-V1 | MINI GBIC 2.5G 1310nm FP (LC/2km) Transceiver |
| ■ 8330-189-V1 | LTSFP-1000BX-10KM Transceiver (WDM 1550) | ■ 8330-265D-V1 | MINI GBIC 2.5G 1310nm DFB (LC/15km) Transceiver |
| ■ 8330-186-V1 | LTSFP-1000BX-20KM Transceiver (WDM 1310) | | |

All SFP ended with D are with Diagnostic function

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