IGS-5816-2P

8 10/100/1000T + 16 DualSpeed SFP Industrial L2+ Switch w/ enhanced G.8032 Ring

- *Enhanced G.8032 ring protection < 20ms for single ring. Supports auto mode, enhanced mode, train mode and basic mode; Enhanced G.8032 ring covers multicast packets; MSTP 8/16* MSTI /RSTP ; support MRP ring*
- *Support dual power redundancy AC&DC*
- *Miss-wiring avoidance & Node failure protection*

- *User friendly UI, including auto topology drawing and DDM threshold monitoring with dB values***; Complete CLI*
- *Support LACP link aggregation, IGMP v3/router port, MLD snooping, DHCP server & DHCP Option82 for Port/VLAN based DHCP distribution, Mac based DHCP server, QoS by VLAN, SSH v2/SSL, HTTPS, TACACS+**, INGRESS/EGRESS ACL L2/L3*
- *Environmental Monitoring for temp., voltage & current*
- *USB slot for edited restoration and auto backup*

OVERVIEW

Lantech IGS-5816-2P is a high performance L2 + managed industrial switch which provides L2 wire speed and advanced security function for network aggregation and backbone deployment. It delivers ITU G.8032 enhanced ring recovery less than 20ms including train ring, enhanced mode for easy configuration, comprehensive QoS, QoS by VLAN, advanced security including INGRESS/EGRESS ACL L2/L3, SSH v2/SSL, Mac based DHCP server, DHCP Option 82, DHCP server, IGMPv1/v2/v3/router port, TACACS+**, QinQ (double tag VLAN) which are important features required in train and large network. It also supports Cisco Discovery Protocol (CDP) and LLDP for Ciscoworks to detect the switch info and show on L2 map topology.

Miss-wiring avoidance, Loop protection, Node failure protection

The IGS-5816-2P 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 IGS-5816-2P is able to alert with the LED indicator and send out an email or traps. 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. This feature prevents the broken ring and keep ring alive without any re-configuration needed. 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 IGS-5816-2P much easier to get hands-on. The switch also equips the RTC (real time clock) which can keep track of time always. The IGS-5816-2P supports DMI interface that can correspond with DDM SFPs (Digital diagnostic monitor) to display the five parameters in Lantech's UI, including optical output power, input power, temperature, laser bias current and transceiver supply voltage***. The TX power/RX power raw data is automatically converted to dB values for installer, making it easier to calculate the fiber distance. The complete CLI enables professional engineer to configure setting by command line.

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

Lantech IGS-5816-2P 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 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 RSTP over Vlan for redundant links with 8/16* MSTI.

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

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).

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; Optional N-key auto backup, exported text file

The configuration file of Lantech IGS-5816-2P can be exported in text file so that it can be edited and configured back to switch with ease for mass deployment. The factory reset button can restore the setting back to factory default and built-in watchdog design can automatically reboot the switch when CPU is found dead. The USB slot allows user to backup/ restore configuration.

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.

DIDO w/email** trap

The IGS-5816-2P DIDO function can support additional open/close physical contact for designate applications besides Port / Power events, for example, DIDO function can trigger alarm if the switch was moved or stolen. In case of events, the IGS-5816-2P 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.

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 and email when abnormal.

Various dual power conversions redundancy, high ESD protection

The Lantech IGS-5816-2P is designed with dual power redundancies with isolated 85~264VAC/100~370VDC power conversion and isolated 36~75VDC power conversion or with non-isolated 12~56VDC power module Featured with relay contact alarm function, the IGS-5816-2P is able to connect with alarm system in case of power failure. The IGS-5816-2P also provides ±4000V EFT and ±8000V ESD protection, which can reduce unstable situation caused by power line and Ethernet.

Lantech IGS-5816-2P 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.

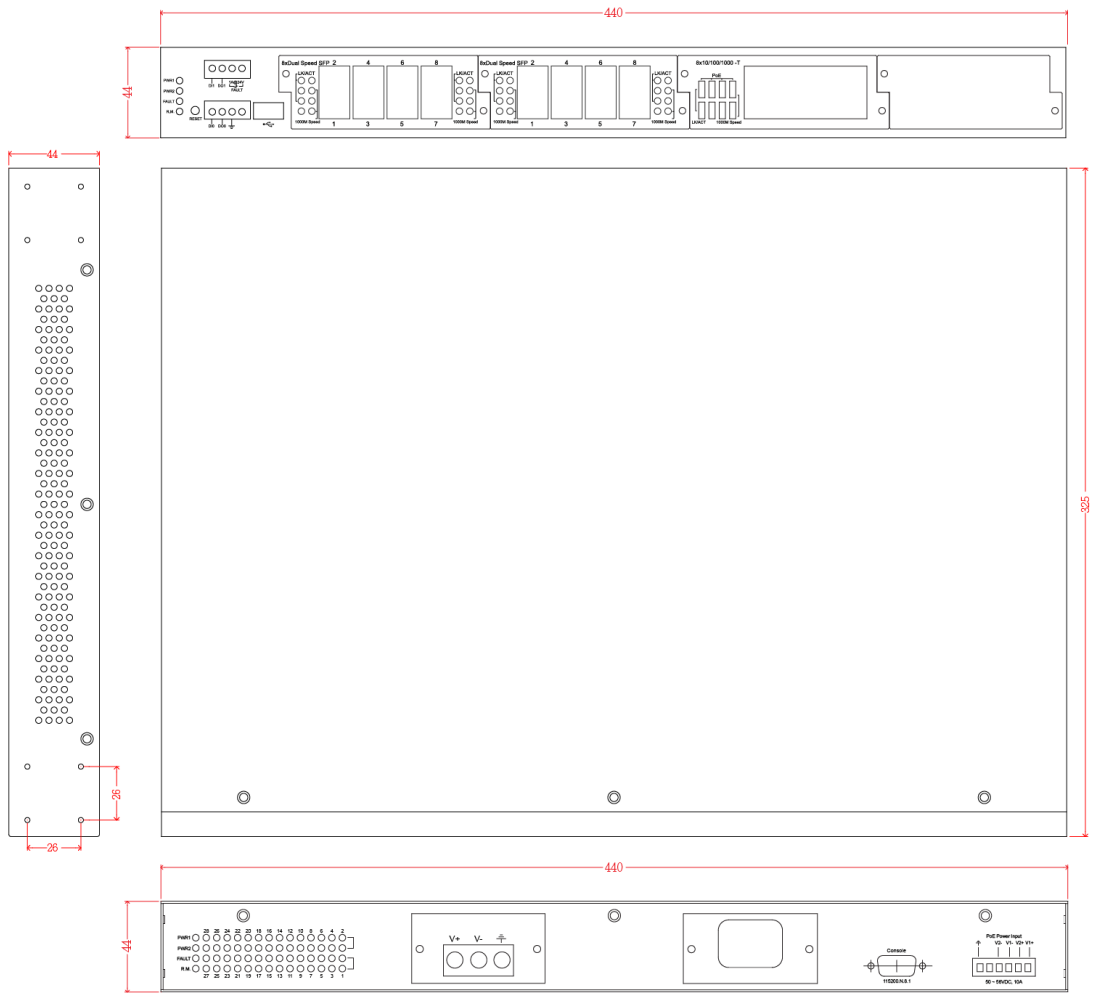
The IGS-5816-2P-E can be used in extreme environments with an operating temperature range of -40°C to 75°C.

FEATURES & BENEFITS

- **8 10/100/1000T + 16 Dual Speed SFP (Total 24 Ports Switch)**
- **Back-plane (Switching Fabric): 48Gbps**
- **System Interface/Performance**
  - *16K MAC Address Table*
  - *Backplane : 56Gbps*
  - *Dual isolated power conversions for 1600V DC(36V~75V)*
  - *Dual isolated power conversions for ±3000 V (85V~264VAC/100V~370VDC)*
  - *Dual power supply terinal block for non-isolated power DC(12V~56V)*
- **DDM to support SFP diagnostic function*****
  - *Automatically convert the raw data into dB values for TX power/RX power, making it easier to measure the fiber distance*
- **10KB Jumbo frame supported on all ports**
- **User friendly UI, auto topology drawing, topology demo, complete CLI for professional setting**
- **Enhanced G.8032 Ring protection in 20ms < 256 switches**
  - *Support various ring/chain topologies, including train ring*
  - *Enhanced G.8032 ring configuration with ease*
  - *Auto ring configuration (auto mode) for single ring*
  - *Ring covers multicast on different ports*
- **Provides EFT protection ±4000 VDC for power line.**
- **Supports ±8000 VDC Ethernet ESD protection**

- **LACP load balancing to distribute the load***
- **Built-in RTC (Real Time Clock) to keep track of time**
- **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**
- **4K 802.1Q VLAN, Port based VLAN, GVRP, QinQ**
- **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*
- **Relay alarm output system events**
- **Miss-wiring avoidance**
  - *LED indicator*
  - *Email or traps notification*
- **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; USB for edited restoration and auto backup**
- **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.*
  - *Management access control with priority*
  - *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**
- **Multicast static route for non- IGMP camera to prevent flooding; IGMP router port to assign query in ring and for reversed multicast video flow**
- **Multicast VLAN registration* for metro video**
- **IGMPv1,v2,v3 with Query mode for multimedia; GMRP**
- **Factory reset button to restore setting to factory default**
- **Watchdog design to auto reboot switch CPU is found dead**
- **Built-in IEC 61375-3-4 ECN (Ethernet Consist Network) to work with IEC61375-2-5 TBN**
- **Diagnostic including Ping / ARP table / DDM information**
- **MLD Snooping for IPv6 Multicast stream**
- **Environmental monitoring for system input voltage, current, ambient temperature**
- **Supports DIDO (Digital Input/Digital Output)**
- **IP30 metal housing with DIN rail and Wall-mount** design**

DIMENSIONS (unit=mm)



SPECIFICATION

Hardware Specification	
IEEE Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX Ethernet IEEE 802.3ab 1000Base-T Ethernet IEEE 802.3z Gigabit Fiber IEEE 802.3x Flow Control Capability ANSI/IEEE 802.3 Auto-negotiation IEEE 802.1Q VLAN IEEE 802.1p Class of Service IEEE 802.1X Access Control IEEE 802.1D Spanning Tree IEEE 802.1w Rapid Spanning Tree IEEE 802.1s 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)
Switch Architecture	Back-plane (Switching Fabric): 48Gbps
Transfer Rate	14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Ethernet / Gigabit Fiber port
CPU	Marvell 800Mhz
RAM	256M Byte
Flash	128M Byte
MAC Address	16K MAC address table
Jumbo frame	10KB on all ports
Connectors	8 10/100/1000T RJ-45 with auto MDI/MDI-X function 16 100M / 1000M Mini-GBIC : SFP sockets RS-232 console: Female DB-9 USB for automatic backup and restore
DDM	Conform to SFF-8472 to show diagnostic SFP with temperature, current, voltage, input and output power
Protocol	CSMA/CD
LED	Per unit: Power 1 (Green), Power 2 (Green), Alarm (Red) ,R.M (Green) Link/Activity (Green), Full duplex/collision(Yellow)), MINI GBIC (Link/Activity)(Green)
Power Supply	AC model: 85~265V AC IEC320 conversion X1 DC model: 12~56VDC INPUT X1 Additional power socket (optional): ■ 85-265VAC, 100-370VDC ■ 36-75VDC ■ 85-265VAC IEC320 ■ 12-56VDC
Power Consumption	Full load: 30W/ Unload: 13W
Relay Alarm	Provides one relay output for port breakdown, power

	fail and alarm. Alarm Relay current carry ability: 1A @ DC24V
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
Case Dimension	19" Metal case,IP-30; 440mm(W)x325mm(D)x44mm(H)
Weight	2.9 kgs
Operating Humidity	5%~95% (Non-condensing)
Operating Temperature	Standard: -20˚C ~60˚C -E model: -40˚C ~75˚C
Storage Temperature	-40˚C ~85˚C
EMI	FCC Class A, CE EN61000-4-2 (ESD), CE EN61000-4-3 (RS), CE EN-61000-4-4 (EFT), CE EN61000-4-5 (Surge), CE EN61000-4-6 (CS), CE EN61000-4-8, CE EN61000-4-11, CE EN55032 Class A, CE EN55024
Stability Testing	IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-64 (Vibration)
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 (basic mode) Support various ring/chain topologies Includes train ring Enhanced G.8032 ring configuration with ease
User friendly UI	■ Auto topology drawing ■ Topology demo ■ DDM threshold monitoring with dB values*** ■ Complete CLI for professional setting
Port Trunk with LACP	LACP Port Trunk: 8 Trunk groups/Maximum 24 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 IEEE 802.1Q Tag VLAN (256 entries)/ VLAN ID (Up to 4K, VLAN ID can be assigned from 1 to 4096.) GVRP, QinQ
Spanning Tree	Supports IEEE802.1d Spanning Tree and IEEE802.1w Rapid Spanning Tree, IEEE802.1s Multiple Spanning Tree
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 Management access control with priority 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; Supports IGMP static route; 1024 multicast groups; IGMP router port ; IGMP query
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.
RTC	Built-in Real Time Clock to keep track of time always
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. Alarm Relay current carry ability: 1A @ DC24V
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) ● PoE ping failure ● Power failure ● Environmental abnormal
DHCP	Provide DHCP Client/ DHCP Server/DHCP Option 82/Port based/VLAN based DHCP distribution (DHCP relay agent) ; 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
Configuration upload and download	Supports text configuration file for system quick installation; Support factory reset button to restore all settings back to factory default; USB for edited restoration and auto backup
IfAlias	Each port allows an alphabetic string of 128-byte assigned as its own unique name via the SNMP or CLI interface

*Future Release
**Optional
***Optional DDM SFP required

ORDERING INFORMATION

- **IGS-5816-2P-AC……..P/N: 8380-515**
  8 10/100/1000T + 16 Dual SFP L2 plus Industrial Switch
  Built-in 1x 85~265V AC IEC320 conversion + 1x additional power socket; -20°C to 60°C
- **IGS-5816-2P-DC……..P/N: 8380-516**
  8 10/100/1000T + 16 Dual SFP L2 plus Industrial Switch
  Built-in 1x 12~56V DC + 1x additional power socket; -20°C to 60°C
- **IGS-5816-2P-AC-E……..P/N: 8380-5151**
  8 10/100/1000T + 16 Dual SFP L2 plus Industrial Switch
  Built-in 1x 85~265V AC IEC320 conversion + 1x additional power socket; -40°C to 75°C
- **IGS-5816-2P-DC-E……..P/N: 8380-5161**
  8 10/100/1000T + 16 Dual SFP L2 plus Industrial Switch
  Built-in 1x 12~56V DC + 1x additional power socket; -40°C to 75°C

OPTIONAL ACCESSORIES

Power

EOTH000701

Isolation Power conversion 85-265VAC, 100-370VDC 1.5A , 47-63HZ

EOTH000702

Isolation Power conversion 36-75VDC, 2.5A

EOTH000703

Isolated Power conversion 85-265VAC IEC320 socket, 1.5A , 47-63HZ

EOTH000704

Power Input Module 12-56VDC, 2.5A

DIN Rail Power

- **AD1048-24FS** 24VDC, 2A, Wide AC Input, Convection Cooled, DIN Rail or Wall Mounted, RoHS, Operating Temp. -20°C~50°C (ambient, derating each output at 2.5% per degree from 50°C ~ 75°C, which means the output is 18 Watts at 75°C.)
- **AD1024-24F** 24VDC, 1A, Wide AC Input, Convection Cooled, DIN Rail or Wall Mounted, RoHS, Operating Temp. -20°C~50°C (ambient, derating each output at 2.5% per degree from 50°C ~ 75°C, which means the output is 9 Watts at 75°C.)

Mini GBIC (SFP)

- **8330-162X** MINI GBIC 1000SX (LC/MM/0.5KM) Transceiver
- **8330-163X** MINI GBIC 1000SX2 (LC/MM/2KM) Transceiver
- **8330-165X** MINI GBIC 1000LX (LC/SM/10KM) Transceiver
- **8340-0591** MINI GBIC 1000LHX (LC/SM/40KM) Transceiver
- **8330-166** MINI GBIC 1000XD (LC/SM/50KM) Transceiver
- **8330-169** MINI GBIC 1000XD (LC/SM/60KM) Transceiver
- **8330-167** MINI GBIC 1000ZX (LC/SM/80KM) Transceiver
- **8330-170** MINI GBIC 1000EZX (LC/SM/120KM) Transceiver
- **8330-168** MINI GBIC 10/100/1000T (100m) Transceiver
- **8330-060** MINI GBIC 100Base (LC/MM/2KM) Transceiver

8330-065	MINI GBIC 100Base (LC/MM/5KM) Transceiver
8330-061	MINI GBIC 100Base (LC/SM/30KM) Transceiver
8330-197	1.25Gbps BiDi SFP 0.5KM Transceiver (WDM 1310)
8330-198	1.25Gbps BiDi SFP 0.5KM Transceiver (WDM 1550)
8330-195	1.25Gbps BiDi SFP 2KM Transceiver (WDM 1310)
8330-196	1.25Gbps BiDi SFP 2KM Transceiver (WDM 1550)
8330-188	1.25Gbps BiDi SFP 10KM Transceiver (WDM 1310)
8330-189	1.25Gbps BiDi SFP 10KM Transceiver (WDM 1550)
8330-186	1.25Gbps BiDi SFP 20KM Transceiver (WDM 1310)
8330-187	1.25Gbps BiDi SFP 20KM Transceiver (WDM 1550)
8330-180	1.25Gbps BiDi SFP 40KM Transceiver (WDM 1310)
8330-182	1.25Gbps BiDi SFP 40KM Transceiver (WDM 1550)
8330-181	1.25Gbps BiDi SFP 60KM Transceiver (WDM 1310)
8330-183	1.25Gbps BiDi SFP 60KM Transceiver (WDM 1550)
8330-184	1.25Gbps BiDi SFP 80KM Transceiver (WDM 1490)
8330-185	1.25Gbps BiDi SFP 80KM Transceiver (WDM 1550)
8330-071	125Mbps BiDi SFP 2KM (WDM 1310) Transceiver
8330-072	125Mbps BiDi SFP 2KM (WDM 1550) Transceiver
8330-069	125Mbps BiDi SFP 20KM (WDM 1310) Transceiver
8330-068	125Mbps BiDi SFP 20KM (WDM 1550) Transceiver
8330-080	125Mbps BiDi SFP 40KM (WDM 1310) Transceiver
8330-082	125Mbps BiDi SFP 40KM (WDM 1550) Transceiver
8330-081	125Mbps BiDi SFP 60KM (WDM 1310) Transceiver
8330-083	125Mbps BiDi SFP 60KM (WDM 1550) Transceiver
8330-084	125Mbps BiDi SFP 80KM (WDM 1310) Transceiver
8330-085	125Mbps BiDi SFP 80KM (WDM 1550) Transceiver
8330-191	Dual Speed SFP 100M/1000M-LX 10KM Transceiver

All SFP# ended with D are with DDM function

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