IPES-3416DSFP

16 10/100TX + 4 Dual Speed SFP L2+ PoE at/af Industrial Managed Ethernet Switch w/ Enhanced G.8032 Ring & LTDP**

- *Support IEEE802.3at/af up to 30W per port*
- *PoE management incl. Detection and Scheduling*
- *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***
- *LTDP** (Link Train Discovery Protocol) to auto-assign IP as well as inherit the configuration in replaced switch*
- *Miss-wiring avoidance & Repowered auto ring restore (node failure protection)*
- *Inrush current protection (24V model)*
- *User friendly UI, including auto topology drawing and DDM threshold with dB values***; Complete CLI*
- *Support LACP link aggregation, IGMP v3/router port, DHCP server & DHCP Option82; Port based DHCP distribution, Mac based DHCP server, QoS by VLAN, SSH/SSL, HTTPS, INGRESS/EGRESS ACL L2/L3,TACACS+*, QinQ**, SMS***
- *Protocol based VLAN** ; IPv4/IPv6 Subnet based VLAN***
- *Optional Environmental Monitoring for temp., voltage, total PoE load and current. (-M model)*
- *E-marking* certificate for vehicle application (24V model)*

OVERVIEW

Lantech IPES-3416DSFP is a high performance L2+ (Gigabit uplink) switch with 16 10/100TX + 4 100/1000M SFP w/16 PoE 802.3af/at Injectors which 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 model with easy configuration. The comprehensive QoS, QoS by VLAN, advanced security including INGRESS/EGRESS ACL L2/L3, TACACS+*, SSH/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) for Ciscoworks to detect the switch info and show on L2 map topology.

Innovative LTDP** (Link Train Discovery Protocol) to assign proper IP address as well as inherit configuration for replaced switch

With port-based DHCP server, LTDP** allows Lantech EN50155 switch series in single ring discover the current IP addresses and to assign the same IP address and configuration. Furthermore, LTDP** can inherit the same configuration to new replaced switch for zero-touch maintenance.

Up to 16 PoE at/af ports w/advanced PoE management

Compliant with 802.3af/at standard, the Lantech IPES-3416DSFP is able to feed each PoE port up to 30 Watts providing the connected PD devices. Lantech IPES-3416DSFP supports advanced PoE management including PoE detection and scheduling. PoE detection can detect if the connected PD hang 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.

Miss-wiring avoidance, Repowered auto ring restore, Loop protection

The IPES-3416DSFP 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 IPES-3416DSFP is able to alert with the LED indicator and disable ring automatically. Repowered auto ring restore function (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 need to download file from TFTP server, DHCP Option66 server can offer IP address of TFTP server to DHCP client. Optional IPv6 address resolution for DHCP service can be supported.

User friendly GUI, Auto topology drawing

The user friendly UI, innovative auto topology drawing and topology demo makes IPES-3416DSFP much easier to get hands-on. The complete CLI enables professional engineer to configure setting by command line.

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

Lantech IPES-3416DSFP 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 topologIPES that covers double ring, 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.

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

Editable configuration file

The configuration file of Lantech IPES-3416DSFP can be exported and edited with word processor for the other switches configuration with ease. 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.

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 QinQ** and GVRP** supported

It supports the QinQ**, QoS QinQ**, GVRP** for large VLAN segmentation.

Event log & message; 2DI / 2DO

In case of event, the IPES-3416DSFP is able to send an email & SMS** text message 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.

Optional environmental monitoring for switch inside information (-M model)

The environmental monitoring can detect switch overall temperature, voltage, total PoE load and current where can send the SNMP traps, email and SMS** alert when abnormal.

Wide range dual DC powered input with 24V/48V model Relay contact alarm, High ESD protection

The Lantech IPES-3416DSFP is designed with dual power supply at 48VDC (48V model) or 12V~57VDC input (12V model). Featured with relay contact alarm function, the IPES-3416DSFP is able to connect with alarm system in case of power failure. The IPES-3416DSFP also provides ±2000V EFT and ±4000 VDC (Contact) / ±8000 VDC (Air) Ethernet protection, which can reduce unstable situation caused by power line and Ethernet.

Inrush current protection on 24V model

The inrush current on initial power up can be limited lower than 10 x nominal current and for less than 1ms on the 24V model.

E-marking certificate*

The E-marking certificate* (24V model) makes it the most suitable PoE switch for bus, carriage, other vehicles application as well as for industrial areas where the power source is limited with 24V but has demand of IP surveillance or VoIP applications.

Industrial hardened design for extended temperature operation

Lantech IPES-3416DSFP 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 -E model can be used in extreme environments with an operating temperature range of -40°C to 75°.

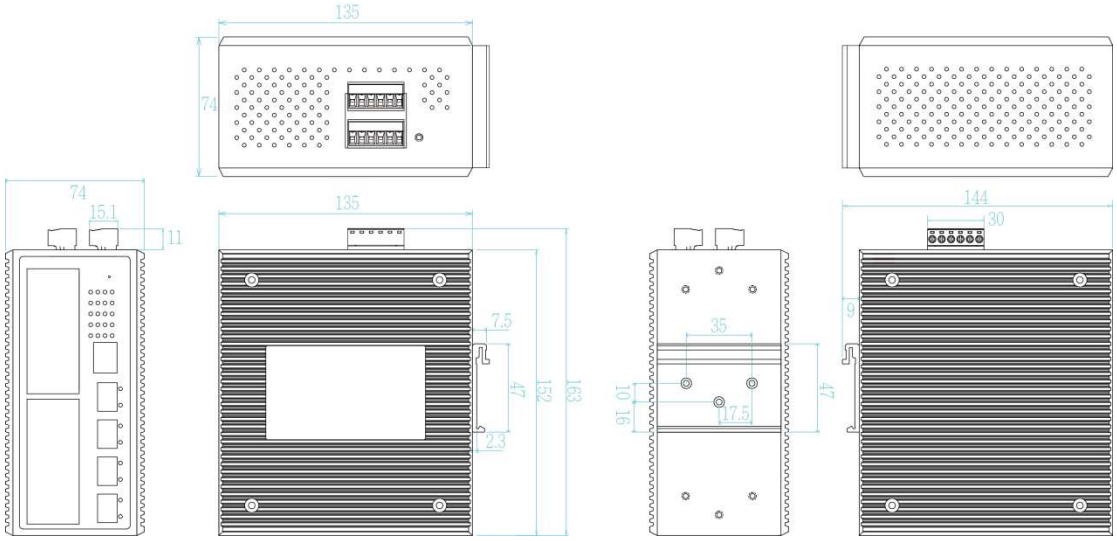
FEATURES & BENEFITS

- **16 10/100TX + 4 100/1000M SFP w/16 PoE 802.3af/at Injectors (Total 20 Ports Switch)**
- **Embedded 16 PoE Injectors IEEE802.3af/at function to feed power up to 30W per port for active operation; 48V input for PoE budget 240W; 12V input for PoE budget 80W/ 24V input for PoE budget 100W**
- **PoE management including PoE detection and scheduling for PD (power devices)**
- **E-marking certificate* for vehicle application (24V model)**
- **Back-plane (Switching Fabric): 11.2Gbps**
- **16K MAC address table**
- **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**
- **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 ring, basic ring, auto ring &*

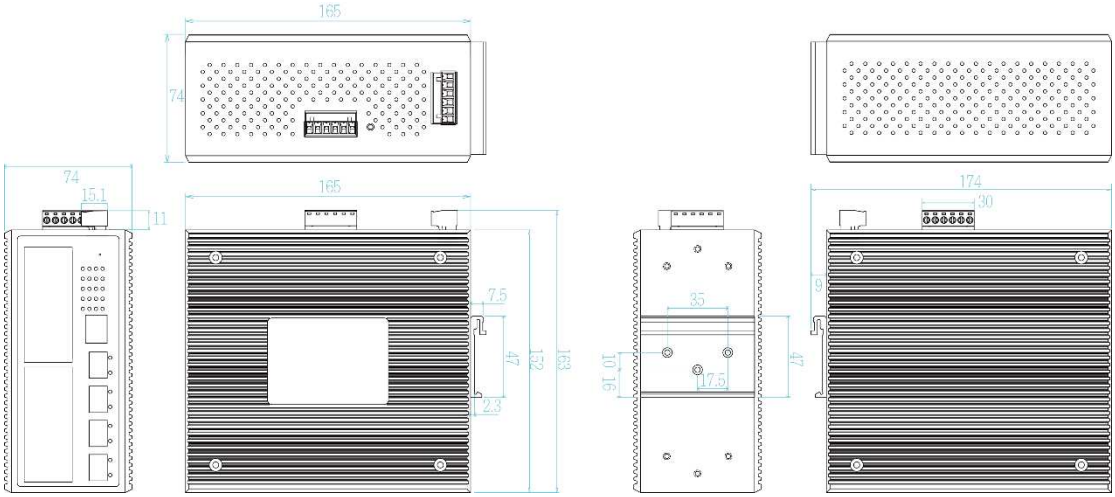
- *multiple VLAN ring*
  - *Enhanced G.8032 ring configuration with ease*
  - *Auto ring configuration(auto mode) for single ring*
  - *Cover multicast and data packets protection*
- **LTDP** (Link Train Discovery Protocol) with Port based DHCP can assign the same IP address and configuration to switch in single ring. It can also keep the config file when switches being swapped**
- **Provides EFT protection ±2000 VDC for power line.**
- **Supports ±4000 VDC (Contact) and ±8000 VDC (Air) 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**
- **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 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; IPv6 address resolution for 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*
- **Repowered auto ring restore**
  - *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/SFTP**/HTTP firmware upgrade**
- **System Event Log, SMTP Email alert, SMS** mobile (text) and SNMP Trap for alarm support; 32 RMON counters**
- **Inrush current protection**
- **Security**
  - *SSL/SSH/INGRESS/EGRESS ACL L2/L3*
  - *Port Security: 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**
- **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**
- **Environmental monitoring** for system input voltage, current , total PoE load and ambient temperature.(-M model)**
- **Supports 2DI / 2DO (Digital Input/Digital Output)**
- **Configuration backup and restoration**
  - *Supports editable configuration file for system quick installation*
- **IP30 metal housing with DIN rail and Wall-mount** design**

DIMENSIONS (unit=mm)

48V model



24V model



SPECIFICATION

Hardware Specification

Standards	IEEE802.3 10Base-T Ethernet IEEE802.3u 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 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): 11.2Gbps
Transfer Rate	14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Fiber Ethernet port
Packet Buffer	8Mbits
Mac Address	16K MAC address table
Jumbo frame	10KB

Connectors	10/100TX: 16 x ports RJ-45 PoE with Auto MDI/MDI-X function Mini-GBIC: 4 x 100/1000 SFP socket with DDM RS-232 connector: RJ-45 type Power & Relay connector: 1 x 6-pole terminal block DIDO : 1 x 6-pole terminal block
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)
Optical Cable	**1.25Gbps:** 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) **125Mbps:** Multi mode: 0 to 2 km/ 5 km, 1310 nm (62.5/125 µm) Single mode: 0 to 30 km, 1310 nm (62.5/125 µm) **WDM 1.25Gbps:** 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 125Mbps:** Single mode: 0 to 20 km/ 40 km/ 60 km/ 80 km, 1310 nm (9/125 µm); 0 to 20 km/ 40 km/ 60 km/ 80 km, 1550 nm (9/125 µm)
LED	Per unit: Power 1 (Green), Power 2 (Green), FAULT (Red) Ethernet port: Link/Activity (Green), Speed (Green); Mini-GBIC: Link/Activity (Green) R.M. indicator (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	-20°C~60°C / -4°F~140°F (Standard model) -40°C~75°C / -40°F~167°F(-E model)
Storage Temperature	-40°C~85°C / -40°F~185°F
Power Supply	44~56VDC(48V model); 12V~57VDC(12V model)
PoE Budget	240W for 44~56V input(48V model) (54V input is recommended for PTZ or heater applications 80W at 12V input; 100W at 24V input(24V model)
PoE pin assignment	RJ-45 port # 1~ # 8 support IEEE 802.3at/af End-point. Per port provides up to 30W Positive (VCC+): RJ-45 pin 1,2. Negative (VCC-): RJ-45 pin 3,6.
Power Consumption	10W
Case Dimension	Metal case. IP-30, 74 (W) x 135 (D) x 152 (H) mm (48V model) 74 (W) x 165 (D) x 152 (H) mm (24V model)
Weight	1000g (48V model) 1250g (24V model)
Installation	DIN Rail and Wall Mount** Design
EMI & EMS	FCC Class A, CE EN55032, CE EN55024, CE EN61000-4-2, CE EN61000-4-3, CE EN61000-4-4, CE EN61000-4-5, CE EN61000-4-6, CE EN61000-4-8, CE EN61000-6-2
Stability Testing	IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-64 (Vibration)
MTBF	615,724 hours (48V model) 548,636 hours (24V model) (standards: IEC62830)
Vehicle certificate*	E13 marking (24V model)
Warranty	5 years

Software Specification

Management	SNMP v1 v2c, v3/ Web/Telnet/CLI
SNMP MIB	RFC 1215 Traps MIB*, RFC 1213 MIBII RFC 1158 MIBII RFC 1157 SNMP MIB, RFC 1493 Bridge MIB* RFC 1573 IF MIB RFC 2674 VLAN MIB*, Partial RFC 1757 RMON, RFC 2674 Q-Bridge MIB*; Bridge MIB, LLDP MIB RSTP 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. Protect multicast & unicast data
LTDP**(optional)	Link Train Discovery Protocol with Port based DHCP server to assign the same IP address when any car changes. It can also keep the config file when switch is swapped.
PoE Management	PoE Detection to check if PD is hang up then restart the PD
Per Port PoE Status	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, total PoE load and ambient temperature to be shown in GUI and sent alerting if any abnormal status(-M model).
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 QinQ**, Protocol based VLAN** ; IPv4/IPv6 Subnet based VLAN**
IPv6/4	Present
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 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
SMTP/Text SMS**	Supports SMTP Server and 8 e-mail accounts for receiving event alert; can send SMS** text alert via mobile
Relay Alarm	Provides one relay output for port breakdown, power fail and alarm. Alarm Relay current carry ability: 1A @ DC24V
Protection	■ Miss-wiring avoidance ■ Repowered auto ring restore ■ 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**(-M model)
DHCP	Provide DHCP Client/ DHCP Server/DHCP Option 82/Port based DHCP; DHCP Option 66; IPv6 address resolution for 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/SFTP** 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.

*Future release

**Optional

***Optional DDM SFP required

ORDERING INFORMATION

- **IPES-3416DSFP-48V…….P/N: 8350-796**
  16 10/100TX PoE at/af up to 30W + 4 100/1000M SFP L2+ Industrial PoE Managed Ethernet Switch; -20°C to 60°C; 44~56VDC power input
- **IPES-3416DSFP-48V-E…….P/N: 8350-797**
  16 10/100TX PoE at/af up to 30W + 4 100/1000M SFP L2+ Industrial PoE Managed Ethernet Switch; -40°C to 75°C; 44~56VDC power input

- **IPES-3416DSFP-48V-M……..…….....P/N: 8350-798**
  16 10/100TX PoE at/af up to 30W + 4 100/1000M SFP L2+ Industrial PoE Managed Ethernet Switch w/environmental monitoring; -20°C to 60°C; 44~56VDC power input
- **IPES-3416DSFP-48V-M-E…….....P/N: 8350-799**
  16 10/100TX PoE at/af up to 30W + 4 100/1000M SFP L2+ Industrial PoE Managed Ethernet Switch w/environmental monitoring; -40°C to 75°C; 44~56VDC power input
- **IPES-3416DSFP-24V……..…….....P/N: 8350-706**
  16 10/100TX PoE at/af up to 30W + 4 100/1000M SFP L2+ Industrial PoE Managed Ethernet Switch; -20°C to 60°C; 12~57VDC power input
- **IPES-3416DSFP-24V-E…….....P/N: 8350-707**
  16 10/100TX PoE at/af up to 30W + 4 100/1000M SFP L2+ Industrial PoE Managed Ethernet Switch; -40°C to 75°C; 12~57VDC power input
- **IPES-3416DSFP-24V-M……..…….....P/N: 8350-708**
  16 10/100TX PoE at/af up to 30W + 4 100/1000M SFP L2+ Industrial PoE Managed Ethernet Switch w/environmental monitoring; -20°C to 60°C; 12~57VDC power input
- **IPES-3416DSFP-24V-M-E…….....P/N: 8350-709**
  16 10/100TX PoE at/af up to 30W + 4 100/1000M SFP L2+ Industrial PoE Managed Ethernet Switch w/environmental monitoring; -40°C to 75°C; 12~57VDC power input

OPTIONAL ACCESSORIES

DIN Rail Power

NDR-480 Series	480W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C)
NDR-240 Series	240W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C)
NDR-120 Series	120W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C; For 115VAC, please refer to derating curve on NDR-120 Series datasheet)
NDR-75 Series	75W Single Output Industrial Din Rail Power; 90-264VAC / 127-370VDC Input Range; Cooling by free air convection; RoHS2 ; Operating Temp. -20°C~70°C (ambient, derating each output at 2.5% per degree from 50°C ~ 70°C; For 115VAC, please refer to derating curve on NDR-120 Series datasheet)

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