Gigabit (PoE+) Fiber Secured Routing Managed Switch

DS406 / DP406

Industrial 4G+2GF SFP Managed (PoE+) Routing Switch

DS406 / DP406 is a managed (PoE) fiber switch with enhanced routing functionality in a robust design. It offers static routing, IPSec VPN, DMZ and a powerful firewall in order to segregate networks and protect mission-critical data. With support for Network Address Translation (NAT) and port-forwarding, it isolates the threats from the Internet. DP406 equips with 4 Gigabit PoE/PoE+ ports for IP camera or wireless AP up to 30W/port. The support of latest ERPS v2 is fully compatible with 3rd party devices for flexible network redundancy. The USB port for configuration file can help mass installation and site support.

DS406 DP406

VPN ERPS G.8032v2 PoE+ MQTT -40~70°C

NetMaster
ThingsMaster
ThingsMaster OTA

Features & Benefit

High Throughput Ethernet Switching

- 4 **Gigabit Ethernet port and 2 Giga SFP slots**
- 8K MAC address table
- Stores and Forwards with non-blocking Switch Fabric

ITU-T G.8032 v1/v2 ERPS Ring Redundancy

- An ITU standard Ring redundancy Protocol
- Provide sub-50ms protection and recovery switching for Ethernet traffic
- Interoperate with 3rd party industrial switch and still remain fast recovery time
- Interoperate with commercial switch instead of STP/RSTP
- Efficient network interconnection and topology with ERPS Chain, multiple chain

Management Features

- Various configuration paths, including WebGUI, CLI, Telnet, SNMP V1/V2c/V3/trap
- LLDP topology control
- USB for easy field side configuration and firmware update
- NetMaster- NMS system for individual node monitoring
- ViewMaster- Remote configuration software utility for distributed management

Enhanced Cyber Security for Critical Application

- Firewall* for traffic classification
- DMZ*, *port forwarding, NAT* for LAN protection
- OpenVPN*, Ipsec*, L2TP* for secure connection
- Port Security
- HTTPs/SSH secure login, TACACS+

*released in Firmware v1.1

Cloud Management Service

- Support Amazon AWS & Microsoft Azure cloud service
- Support proprietary ThingsMaster cloud service
- Interactive monitoring dashboard and map shows the status, signal strength, location etc.

Extreme PoE Capability (DP406)

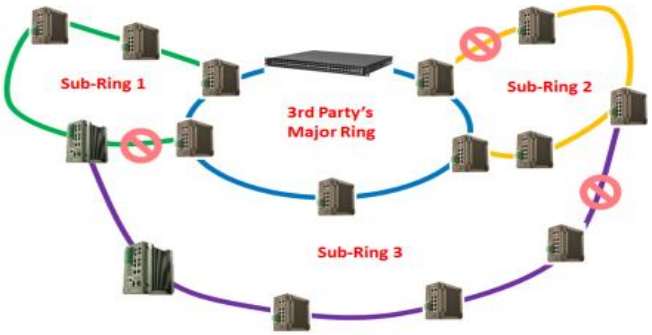
- Provides 4-port IEEE 802.3af/at compliance PoE, up to **30W** per port
- Up to 120W PoE power budget
- Complete PoE management including per-port Power **Budget Control**, PoE **Scheduling and** PoE Status

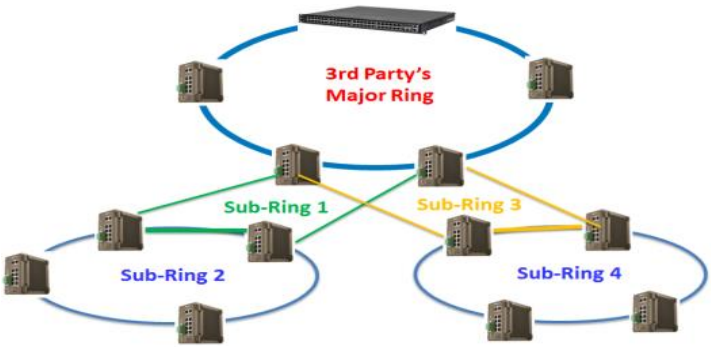
Rugged Design for Wayside Surveillance, ITS Application

- NEMA TS2 compliance for ITS application
- Effective heat dissipation design for operating in **-40~75ºC** environments
- Railway EMC: **EN50121-4** compliance
- CE Marking
- IEC61000-6-2/IEC61000-6-4 heavy industrial EMC
- Emission: FCC part 15 B Class A

✓ ITU-T G.8032 ERPSv2 gives ultimate Inter-Operability, Flexibility, and Scalability

G.8032 v.2 ERPS is becoming the most common standard for redundancy on industrial networks and replacing proprietary ring redundancy and standard Ethernet Ring Switching, as it provides stable protection of the entire Ethernet Ring from any loops and open standard for 3rd party devices. The ITU-T G.8032 v2 ERPS recovers the network break within less than 20ms recovery time thus significantly increases network reliability for critical IIoT applications, such as heavy industrial automation (power substation and oil and gas vertical markets), ITS (traffic control, public transportation), railway networks, and other smart city applications concerning public safety.

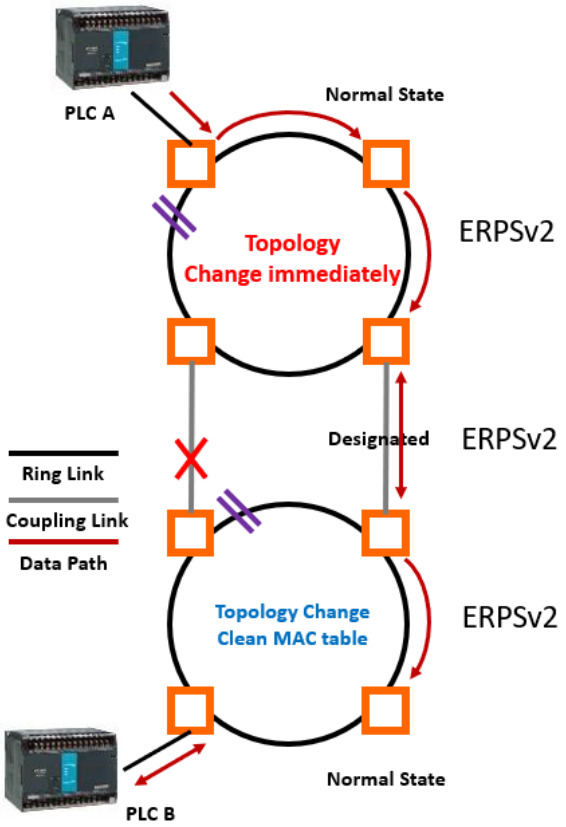




G.8032 v1 only supports single ring topology, whilst G.8032 version 2 additionally features recovery switching for Ethernet traffic in Multiple Ring (ladder) of conjoined Ethernet Rings by one or more interconnections which saves deployment costs by providing wide-area multipoint connectivity with reduced number of links. Deploying switches with support of G.8032 v2 ERPS ensures highly resilient Ethernet infrastructure whilst simultaneously saving costs, as they can interoperate with third-party switches and still guarantee fast network recovery time without any data loss.

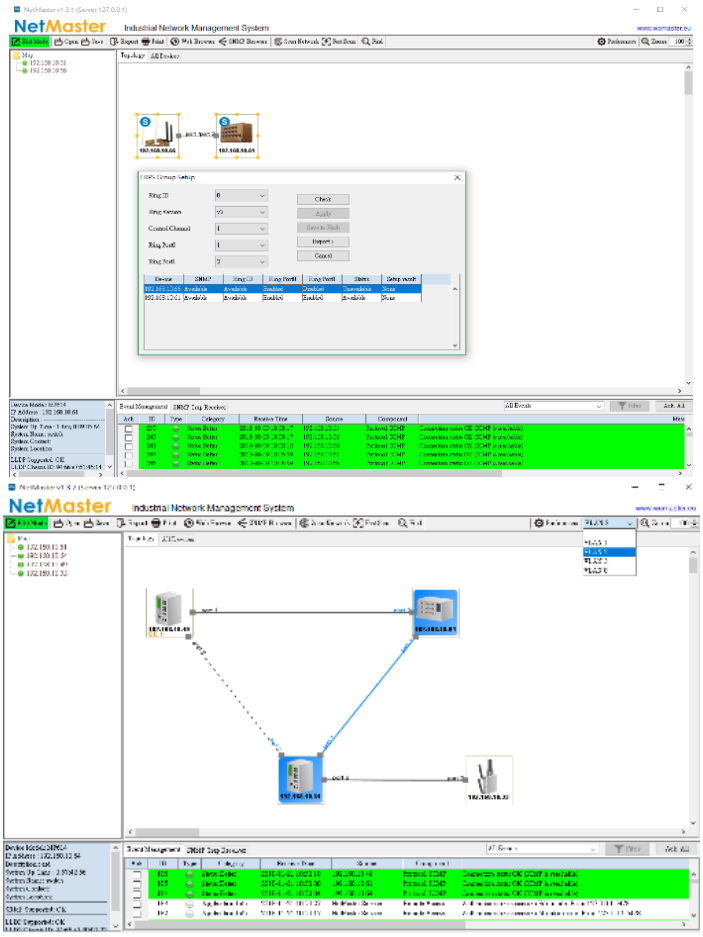
✓ ITU-T G.8032 ERPSv2 reduces coupling Ring failure recovery time

The G.8032 ERPS v2 technology effectively saves the recovery time for coupling ring link breakdown from 300 sec to less than 20ms by immediately change topology of both major ring and sub ring.



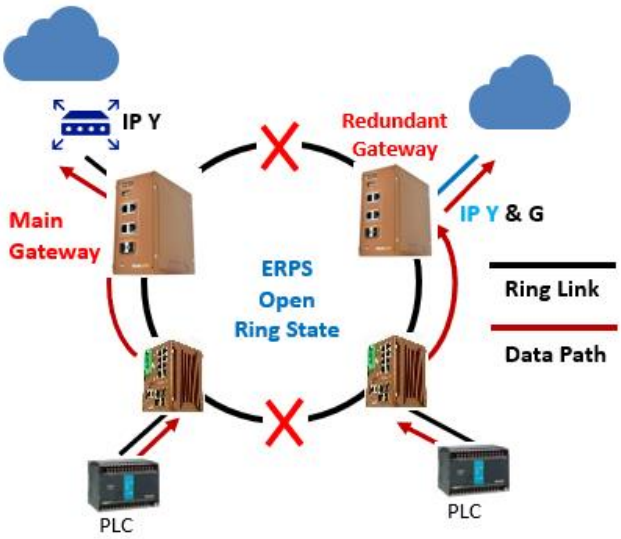
✓ NMS NetMaster Made Easy Deploy and Visualize Large Scale of ERPS Ring and VLAN

It is very time consuming and technical to set up a large group of ERPS v2 ring. However, NetMaster NMS provides a smart way to configure a group of ERPS ring and visualize ERPS major/sub ring in purple/yellow color. With VLAN visualization, devices, ports, and links with the VLAN ID will be colored-coded.



✓ Exclusive Redundant Gateway for Industrial Ethernet ERPS/Ring Network

In addition to the advanced ERPS v2 redundancy support, DP406/DS406 can also acts as the gateway for WAN. The unique redundant gateway design ensures even the ring link has multiple breaks; the network can be seamlessly connected.



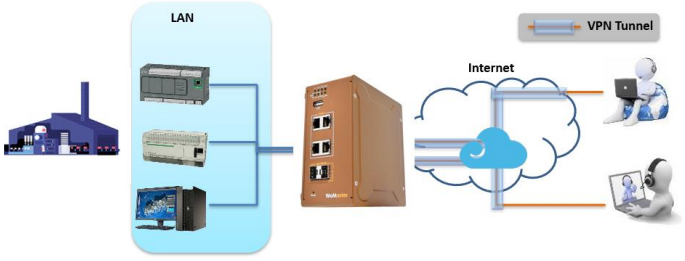
✓ Exclusive Advanced Managed Switch plus IoT and Router Features

Normal routers have no support for managed switch features, ex. VLAN routing, LAN security, or ERPS v2 Redundant Ring. However, the managed switches doesn't support WAN/NAT/VPN/Firewall security features. With unique routing switches that combines features of WAN/NAT/VPN/Firewall and VLAN routing, advanced cyber security with full network redundancy, the management time and cost can be reduced while delivery better network performance.

	Traditional L3 Switch	Routing Switch
Routing Performance	HW based. Wire speed.	SW based CPU Routing
L3 Routing Protocol	RIPv2, OSPFv2, Static Multicast Route, DVMRP, PIM, VRRPv2	RIPv2, OSPFv2, Static Multicast Route, DVMRP, PIM, VRRPv2
NAT/WAN	NA	NAT: 1-1 NAT, NAPT(SNAT/DNAT)
Firewall	NA	Stateful Inspection firewall, DMZ
VPN	NA	IPsec, OpenVPN, GRE, L2TP

✓ Secured Remote Access by VPN*

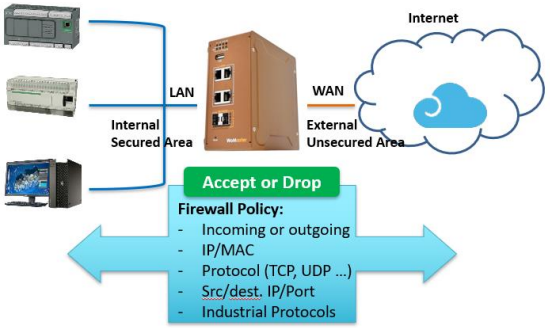
DP406/DS406 Routing Switch can act as VPN server for data encryption and dynamic remote access. Multiple VPN protocols are supported such as IPSec, OpenVPN, GRE, and L2TP. The channels between multiple networks, ex. private/public/hybrid networks are fully secured and with authentication features.



✓ Cyber Security Guard*

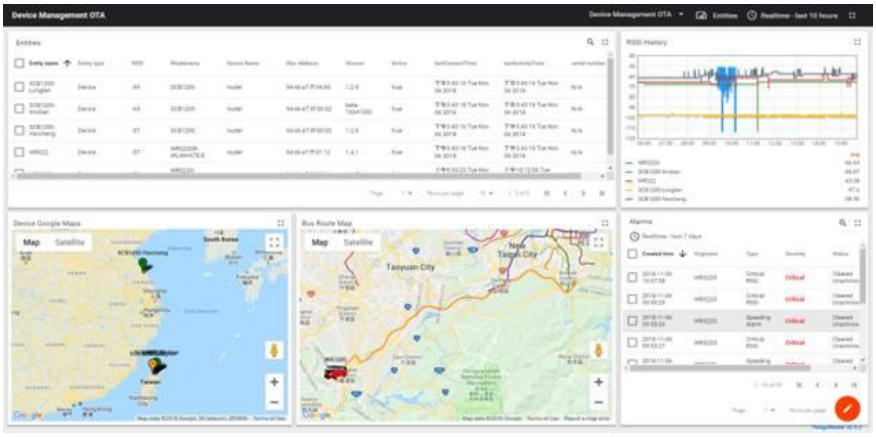
A stateful firewall monitor is in place to monitor the state of the connection at all time. Multiple industrial fieldbus protocols, ex. Modbus TCP*, EtherNet/IP* are also supported for factory automation applications.

*by Request



✓ ThingsMaster OTA (device management over the air)

The OTA agent embedded in DP406/DS406 routing switches upgrades device management over the air, anywhere you are and any time you want over your mobile devices. ThingsMaster OTA is a secured local OTA software that can be installed in a private or public server or even QNAP NAS (network attached storage). With OTA, all device information such as location, warning event can be shown in real time. The maintenance such as configuration reload, or device reboot can also be run by group.



Interfaces

DS406

System LED
- 2 x Power
- 1 x System Status
- 1 x DO
- 2 x Fiber Port
- 2 x Ring Status

Easy System Management
- USB for Configuration/Firmware update

Gigabit Ethernet
- 4-port 100/1000MBase-T

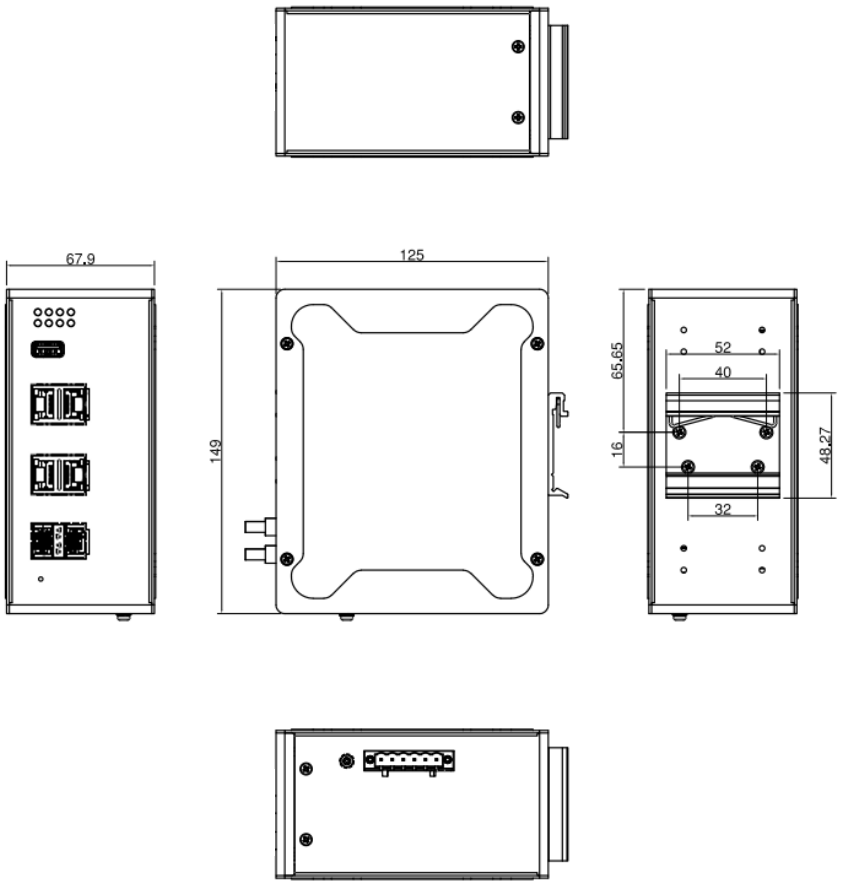
DIN Clip

Fiber Ethernet
- 2 100M/1000M SFP

Integrated Power Connector
- 1 x 6-pin terminal block
  4 pin for redundant power input
  2 pin DO

Dimensions

(mm)



Interfaces

DP406

System LED
- 2 x Power
- 1 x System Status
- 1 x DO
- 2 x Fiber Port
- 1 x Ring
- 4 x PoE

Easy System Management
- USB for Configuration/Firmware update

Gigabit Ethernet
- 4-port 100/1000M RJ45
- IEEE 802.3af/at

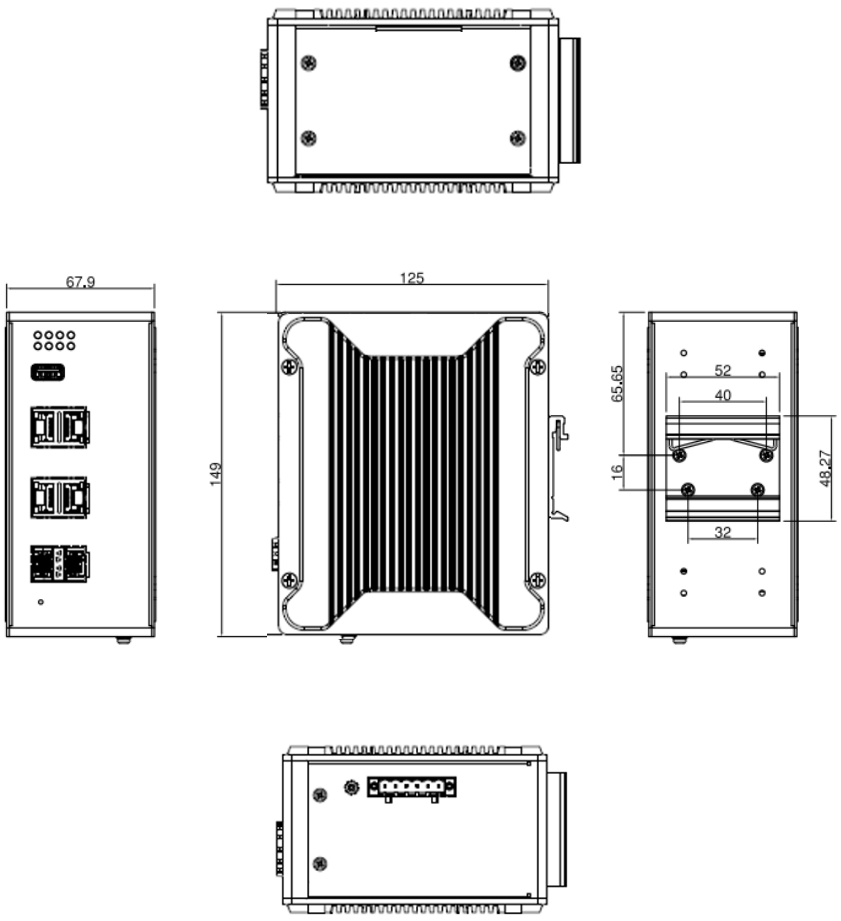
DIN Clip

Fiber Ethernet
- 2 100M/1000M SFP

Integrated Power Connector
- 1 x 6-pin terminal block
  4 pin for redundant power input
  2 pin DO

Dimensions

(mm)



Technology	
Standard	IEEE 802.3 10Base-T Ethernet
	IEEE 802.3u 100Base-TX Fast Ethernet
	IEEE 802.3ab 1000Base-T Gigabit Ethernet copper
	IEEE 802.3u 100Base-FX Fast Ethernet Fiber
	IEEE 802.3x Flow Control and back-pressure
	IEEE 802.3ab 1000Base-T Gigabit Ethernet copper
	IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
	IEEE 802.1p Class of Service (CoS)
	IEEE 802.1Q VLAN
	ITU-T G.8032 Version 2.0 Ethernet Ring Protection Switching (ERPSv2)
	IEEE 802.1D-2004 Rapid Spanning Tree Protocol (RSTP)
	IEEE 802.3af/at Power-over-Ethernet (DP406)
Interface	
Ethernet Port	4 x 100/1000MBase-T RJ45, Auto Negotiation 2 x 100/1000M SFP
System LED	2 x Power: Green On 1 x SYS: Ready: (Green On), Firmware Updating: (Green Blinking) 1 x DO: Red On 2 x Fiber: Link (Green On), Activity (Green Blinking) 1 x Ring: Off: Ring disabled, Green On: Ring normal (Not RPL Owner), Green Blinking: Ring normal (RPL Owner) 4 x PoE status: Green On
Ethernet Port LED	Link (Green On), Activity (Green Blinking)
Reset	System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds)
USB	1 x USB for Configuration/Firmware Update
Power Input, Digital Output	6-Pin Removable Terminal Block Connector 4 Pin for Redundant Power 2 Pin for DO (Relay Alarm) DO: Dry Relay Output with 0.5A/24V DC
Power Requirement	
Input Voltage	DS406- 24VDC(12~48VDC) DP406- 48VDC(46~57VDC, 50~57VDC suggested for IEEE802.3at)
Reverse Polarity Protect	Yes
Input Current	DS406- 0.3A@24VDC DP406- 2.5A@54VDC
Power Consumption	DS406- Max 7.2W@24VDC full loading, suggest to reserve 15% tolerance DP406- Max 8.5W@54VDC full traffic without PD Loading, suggest to reserve 15% tolerance
Software	
Management	CGI WebGUI, Command Line Interface (CLI), IPv4/IPv6(RFC2460)*, Telnet, SNMP v1/v2c/v3, LLDP, DHCP server/client, DHCP Relay*, TFTP, System Log, SMTP, ARP response over 802.2 LLC SNAP, Proxy ARP, DNS (client/proxy)
Traffic Management	Flow Control, Rate Control, Port Mirror, Class of Service, QoS,
Filter	IGMP Snooping v1/v2, IGMP Query, IEEE802.1Q VLAN
Security	RADIUS, TLS v1.2, HTTPs/SSH, First login password management, Port Security
Advanced Security	TACACS+
Redundancy	G.8032 ERPSv2, STP/RSTP, eRSTP (Enhanced RSTP)*, Patented Redundant Gateway
Time Management	NTP, SNTP

*by Request

WAN/Routing/NAT/Firewall/ VPN*	Routing: Static Route*, RIPv2*, OSPFv2*, VRRPv2* NAT: 1-1 NAT*, NAPT(SNAT/DNAT)*, Port Forwarding* Firewall: Stateful Inspection firewall*, DMZ* VPN: IPSec*, OpenVPN*, L2TP*, GRE* Dual WAN interface*	*released in Firmware v1.1
IIoT Industrial Protocol	MQTT, RESTful API	
Private Cloud	ThingsMaster, ThingMaster OTA	
Public Cloud	AWS Agent, Azure Agent	
Location*	Google map*, Baidu map*	*by Request
MIB	ERPS MIB, Entity MIB, MIB-II, WoMaster Private MIB	
Utility	ViewMaster, NetMaster, Ping, Traceroute	
PoE (DP406)		
Power forwarding mode	Alternative A	
PoE Power Budget	System: Max. 120W@75°C Per Port: Max. 30W	
PoE Standard	IEEE 802.3af/at	
Management	System/Port Power Budget Control, PD Alive Check, PoE Scheduling, PoE Status	
Mechanical		
Installation	DIN Rail	
Enclosure Material	Steel Metal with Aluminum	
Dimension	78.5 x 149 x 125 mm(W x H x D) / without DIN Rail Clip	
Ingress Protection	IP30	
Weight	Around 800g	
Environmental		
Operating Temperature & Humidity	-40°C~70°C , 5%~95% Non- Condensing	
Storage Temperature	-40°C~85°C	
MTBF	>200,000 hours	
Warranty	5 years	
Approval		
Safety	EN60950-1 Compliance	
EMC	EN61000-6-2/EN61000-6-4	
EMI	CISPR 22, FCC part 15B Class A	
EMS	EN61000-4-2 ESD, EN61000-4-3 RS, EN61000-4-4 EFT, EN61000-4-5, EN61000-4-6 CS, EN61000-4-8 Magnetic Field	

*Functions by request.

Ordering Information

Model Name	Description
DS406	Industrial 4G+2GF Managed Routing Fiber Switch
DP406	Industrial 4G+2GF Managed Routing Fiber PoE Switch
	Package List
	1 x Product Unit
	1 x 6-pin Removable Terminal Connector
	1 x Attached Din Clip
	1 x Quick Installation Guide

Optional Accessory

Item	
SFPGEM05	SFP, 1000Mbps, LC, multi, 550M, 0~70°C
SFPGEM05T	SFP, 1000Mbps, LC, multi, 550M, -40~85°C
SFPGEM05D	SFP, 1000Mbps, LC, multi, DDM, 550M, 0~70°C
SFPGEM05DT	SFP, 1000Mbps, LC, multi, DDM, 550M, -40~85°C
SFPGEM2	SFP, 1000Mbps, LC, multi, 2KM, 0~70°C
SFPGEM2T	SFP, 1000Mbps, LC, multi, 2KM, -40~85°C
SFPGEM2D	SFP, 1000Mbps, LC, multi, DDM, 2KM, 0~70°C
SFPGEM2DT	SFP, 1000Mbps, LC, multi, DDM, 2KM, -40~85°C
SFPGES10	SFP, 1000Mbps, LC, single, 10KM, 0~70°C
SFPGES10T	SFP, 1000Mbps, LC, single, 10KM, -40~85°C
SFPGES10D	SFP, 1000Mbps, LC, single, DDM, 10KM, 0~70°C
SFPGES10DT	SFP, 1000Mbps, LC, single, DDM, 10KM, -40~85°C
SFPGES30	SFP, 1000Mbps, LC, single, 30KM, 0~70°C
SFPGES30T	SFP, 1000Mbps, LC, single, 30KM, -40~85°C
SFPGES30D	SFP, 1000Mbps, LC, single, DDM, 30KM, 0~70°C
SFPGES30DT	SFP, 1000Mbps, LC, single, DDM, 30KM, -40~85°C
SFPGES40	SFP, 1000Mbps, LC, single, 40KM, 0~70°C
SFPGES40T	SFP, 1000Mbps, LC, single, 40KM, -40~85°C
SFPGES40D	SFP, 1000Mbps, LC, single, DDM, 40KM, 0~70°C