



## IFS-402GSM

4x 10/100Base-TX + 2x 100/1000Base-X SFP

## IFS-803GSM

8x 10/100Base-TX + 3x 100/1000Base-X SFP

## IFS-1604GSM

16x 10/100Base-TX + 4x 100/1000Base-X SFP



These models are managed industrial grade switches with 4/8/16 10/100Base-TX ports and 2/3/4 Gigabit/Fast Ethernet SFP ports that provide stable and reliable Ethernet transmission. These switches support a variety of Ethernet functions, including STP/RSTP/MSTP/ ITU-T G.8032 ERPS and multiple u-Ring for redundant cabling, layer 2 Ethernet IGMP, VLAN, QoS, Security, IPv6, bandwidth control, port mirroring, cable diagnostic and Green Ethernet. Housed in rugged DIN rail or wall mountable enclosures, these switches are designed for harsh environments, such as industrial networking, security automation applications, intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications (See Figure 1). Standard operating temperature range models (-10 to 60°C) and wide operating temperature range models (-40 to 75°C) fulfill the special needs of industrial automation applications.

### Features

- 4x 10/100Base-TX RJ-45 and 2x 100/1000Base-X SFP Fiber (IFS-402GSM)
- 8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP Fiber (IFS-803GSM)
- 16x 10/100Base-TX RJ-45 and 4x 100/1000Base-X SFP Fiber (IFS-1604GSM)
- UL60950-1, CE, FCC, Rail Traffic EN50121-4, Traffic control NEMA TS2 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable normal or broken point distance
- Rugged Metal, IP30 Protection & Fanless design
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power Consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 5 instances that each can support u-Ring, u-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC u-Ring white paper for more details and more topology application)
- u-Ring for Redundant Cabling, recovery time < 10ms in 250 devices
- DHCP Server/Client/Relay/Snooping/Snooping option 82/Relay option 82
- QoS, Traffic classification QoS, CoS, bandwidth control for Ingress and Egress, Storm Control, DiffServ
- IEEE802.1q VLAN, MAC based VLAN, IP subnet based VLAN, Protocol based VLAN, VLAN translation, GVRP, MVR
- Dynamic IEEE 802.3ad LACP Link Aggregation, Static Link Aggregation
- IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- Security : Port based and MAC based IEEE802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- Supports IEEE1588 PTP V2 for precise time synchronization to operate in Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave mode by each port
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP, SNMP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Provides SmartConfig for quick and easy mass configuration tool (Please see Catalog chapter 1- Software Management for more details)
- Supports SmartView for Centralized management (Please see Catalog chapter 1- Software Management for more details)
- Supporting Central EMS for management of up to 50 SmartView Server, and maximum up to 25,000 device (Please see Catalog chapter 1- Software Management for more details)

### Specifications

<b>Standard</b>	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.1d	STP (Spanning Tree Protocol)
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol)
	IEEE 802.1s	MSTP (Multiple Spanning Tree Protocol)
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
	IEEE802.3ac	Max frame size extended to 1522Bytes.
	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.3x	Flow control for Full Duplex
IEEE 802.1ad	Stacked VLANs, Q-in-Q	
IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization	
IEEE 802.1ab	Link Layer Discovery Protocol (LLDP)	
IEEE 802.3az	EEE (Energy Efficient Ethernet)	
<b>VLAN ID</b>	4094	IEEE802.1Q VLAN VID

<b>Switch Architecture</b>	Back-plane (Switching Fabric): 4.8Gbps (IFS-402GSM), 7.6Gbps (IFS-803GSM) 11.2Gbps (IFS-1604GSM) Full wire-speed
<b>Data Processing</b>	Store and Forward
<b>Flow Control</b>	IEEE 802.3x for full duplex mode Back pressure for half duplex mode
<b>Network Connector</b>	4x 10/100Base-TX RJ-45 + 2x 100/1000Base-X SFP Slot (IFS-402GSM) 8x 10/100Base-TX RJ-45 and 3x 100/1000Base-X SFP Slot (IFS-803GSM) 16x 10/100Base-TX RJ-45 and 4x 100/1000Base-X SFP Slot (IFS-1604GSM) RJ-45 UTP port support Auto negotiation speed, Auto MDI/MDI-X function, SFP port support 100/1000M dual speed with DDMI
<b>Console</b>	RS-232 (RJ-45)
<b>Network Cable</b>	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)
<b>Protocols</b>	CSMA/CD
<b>Reverse Polarity Protection</b>	Supported
<b>Overload Current Protection</b>	Supported
<b>CPU Watch Dog</b>	Supported

<b>Power Supply</b>	Redundant Dual DC 12/24/48V (9.6~60VDC) Input power (Removable Terminal Block)			
<b>Power Consumption</b>	<b>Input Voltage</b>	<b>IFS-402GSM</b>	<b>IFS-803GSM</b>	<b>IFS-1604GSM</b>
	12VDC	5.7W	6.5W	10.8W
	24VDC	5.8W	7W	10.6W
	48VDC	8.5W	8.6W	12.5W
<b>LED</b>	Per unit: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow) Per RJ-45 port: 10/100 Link/Active (Green) SFP Fiber Per port: Link/Active (Green)			
<b>Jumbo Frame</b>	9.6KB			
<b>IEEE802.3ac</b>	Max frame size extended to 1522Bytes (allow Q-tag in packet)			
<b>MAC Address Table</b>	8K			
<b>Memory Buffer</b>	512K Bytes for packet buffer			
<b>Warning Message</b>	System Syslog, SMTP/ e-mail event message, alarm relay			
<b>Alarm Relay Contact</b>	Relay outputs with current carrying capacity of 1 A @24VDC			
<b>Removable Terminal Block</b>	Provide 2 redundant power, alarm relay contact, 6 Pin			
<b>Operating Temperature</b>	-10 ~ 60°C (IFS-402GSM, IFS-803GSM, IFS-1604GSM) -40 ~ 75°C (IFS-402GSM-E, IFS-803GSM-E, IFS-1604GSM-E)			
<b>Operating Humidity</b>	5% to 95% (Non-condensing)			
<b>Storage Temperature</b>	-40 ~ 85°C			
<b>Housing</b>	Rugged Metal, IP30 Protection, Fanless			
<b>Dimensions</b>	106 x 62.5 x 135 mm (D x W x H) (IFS-402GSM) 106 x 72 x 152 mm (D x W x H) (IFS-803GSM, IFS-1604GSM)			

## Software Specifications

<b>Topology</b>	
<b>VLAN</b>	IEEE 802.1q VLAN, up to 4094 802.1Q VLAN VID IEEE 802.1q VLAN, up to 4094 Groups IEEE 802.1ad Q-in-Q MAC-based VLAN, up to 256 entries IP Subnet-based VLAN, up to 128 entries Protocol-based VLAN (Ethernet, SNAP, LLC), up to 128 entries VLAN Translation, up to 256 entries GVRP (GARP VLAN Registration Protocol) MVR ( Multicast VLAN Registration)
<b>Link Aggregation (Port Trunk)</b>	Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group Dynamic (IEEE 802.3ad LACP), up to 5 trunk group
<b>Spanning Tree</b>	IEEE802.1d STP IEEE802.1w RSTP IEEE802.1s MSTP
<b>Multiple u-Ring</b>	up to 5 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250. (Please see CTC Union u-Ring white paper for more details and more topology applications)
<b>Loop Protection</b>	Supported
<b>ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)</b>	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network
<b>QoS Features</b>	
<b>Class of Service</b>	IEEE802.1p 8 active priorities queues for per port
<b>Traffic Classification QoS</b>	IEEE802.1p based CoS IP Precedence based CoS IP DSCP based CoS QCL(QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
<b>Bandwidth Control for Ingress</b>	Rate in steps :1 kbps / Mbps / fps / kfps Range : 100 kbps to 1Gbps / 1fps to 3300kfps Rate Unit : bit or frame
<b>Bandwidth Control for Egress</b>	Rate in steps : 1 kbps / Mbps Range : 100 kbps to 1Gbps Rate Unit : bit Per queue / Per port shaper
<b>DiffServ (RF 2474) Remarkings</b>	

<b>Weight</b>	0.715kg (IFS-402GSM), 0.79kg (IFS-803GSM) 0.82kg (IFS-1604GSM)
<b>Installation Mounting</b>	DIN Rail mounting or wall mounting (optional)
<b>MTBF</b>	861,962hrs (IFS-402GSM) 612,523hrs (IFS-803GSM) 419,048hrs (IFS-1604GSM) (MIL-HDBK-217)
<b>Warranty</b>	5 years
<b>Certification</b>	
<b>EMC</b>	CE
<b>EMI (Electromagnetic Interference)</b>	FCC Part 15 Subpart B Class A, CE EN55022 Class A
<b>Railway Traffic</b>	EN50121-4
<b>Traffic control</b>	NEMA TS2 (IFS-402GSM, IFS-803GSM)
<b>Immunity for Heavy Industrial Environment</b>	EN61000-6-2
<b>Emission for Heavy Industrial Environment</b>	EN61000-6-4
<b>EMS (Electromagnetic Susceptibility) Protection Level</b>	EN61000-4-2 (ESD) Level 3, Criteria B EN61000-4-3 (RS) Level 3, Criteria A EN61000-4-4 (Burst) Level 3, Criteria A EN61000-4-5 (Surge) Level 3, Criteria B EN61000-4-6 (CS) Level 3, Criteria A EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A
<b>Safety</b>	UL60950-1
<b>Shock</b>	IEC 60068-2-27
<b>Freefall</b>	IEC 60068-2-32
<b>Vibration</b>	IEC 60068-2-6

<b>Storm Control</b>	for Unicast, Broadcast, Multicast
<b>IP Multicasting Features</b>	
<b>IGMP / MLD Snooping</b>	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Port Filtering Profile Throttling, Fast Leave Maximum Multicast Group : up to 1022 entries Query / Static Router Port
<b>Security Features</b>	
<b>IEEE 802.1X</b>	Port-Based MAC-Based
<b>ACL</b>	Number of rules : up to 256 entries for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
<b>RADIUS authentication &amp; accounting</b>	
<b>TACACS+ authentication &amp; accounting, TACACS+ 3.0</b>	
<b>HTTPS, HTTP</b>	Supported
<b>SSL / SSH v2</b>	Supported
<b>User Name Password Authentication</b>	Local Authentication Remote Authentication (via RADIUS / TACACS+)
<b>Management Interface Access Filtering</b>	Web, Telnet / SSH , CLI RS-232 console
<b>Management Features</b>	
<b>CLI</b>	Cisco® like CLI
<b>Web Based Management</b>	
<b>Telnet</b>	Server
<b>SNMP</b>	V1, V2c, V3
<b>SW &amp; Configuration Upgrade</b>	TFTP, HTTP Redundant firmware in case of upgrade failure
<b>RMON</b>	RMON I (1, 2, 3, 9 group), RMON II
<b>MIB</b>	RFC1213 MIB II, Private MIB
<b>UPnP</b>	Supported
<b>DHCP</b>	Server, Client, Relay, Snooping Snooping option 82 Relay option 82
<b>IP Source Guard</b>	Supported
<b>Port Mirroring</b>	Supported
<b>Event Syslog</b>	Syslog server (RFC3164) (Support 1 server )
<b>Warning Message</b>	System syslog, e-mail, alarm relay
<b>DNS</b>	Client, Proxy

<b>IEEE1588 PTP V2</b>	Support 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, Slave
<b>NTP, SNTP</b>	Client
<b>LLDP (IEEE 802.1ab)</b>	Link Layer Discovery Protocol LLDP-MED
<b>IPv6 Features</b>	
<b>IPv6 Management</b>	Telnet Server/ICMP v6
<b>SNMP over IPv6</b>	Supported
<b>HTTP over IPv6</b>	Supported
<b>SSH over IPv6</b>	Supported
<b>IPv6 Telnet</b>	Supported
<b>IPv6 NTP, SNTP</b>	Client
<b>IPv6 TFTP</b>	Supported

<b>IPv6 QoS</b>	Supported
<b>IPv6 ACL</b>	Number of rules: up to 256 entries for L2 / L3 / L4 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
<b>Others Features</b>	
<b>Green Ethernet</b>	Supports IEEE802.3az EEE (Energy Efficient Ethernet) Management to optimize the power consumption Determine the cable length and lowering the power for ports with short cables Lower the power for a port when there is no link LED Power Management :Adjustment LEDs intensity
<b>Cable Diagnostic</b>	Measuring UTP cable normal or broken point distance

## Application

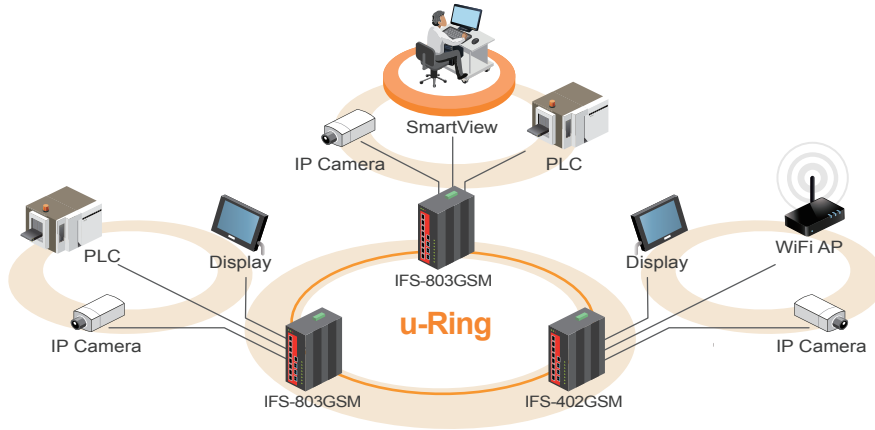
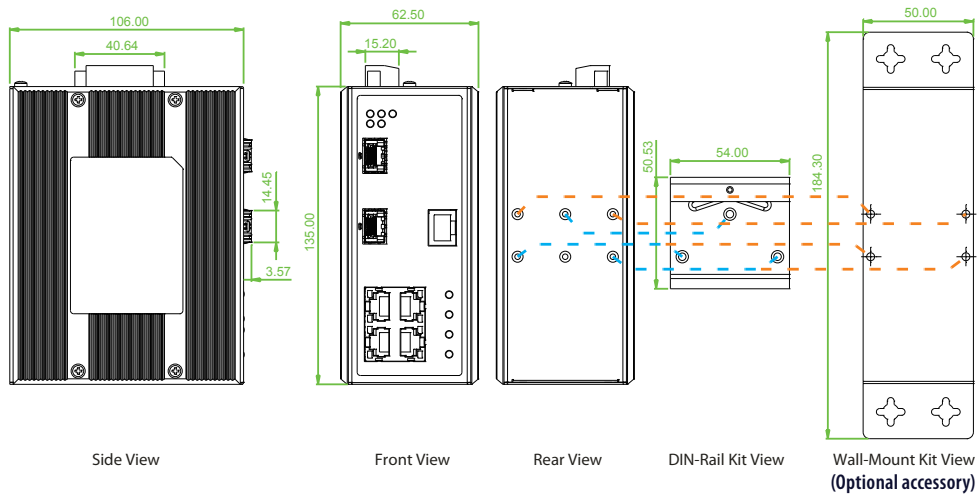


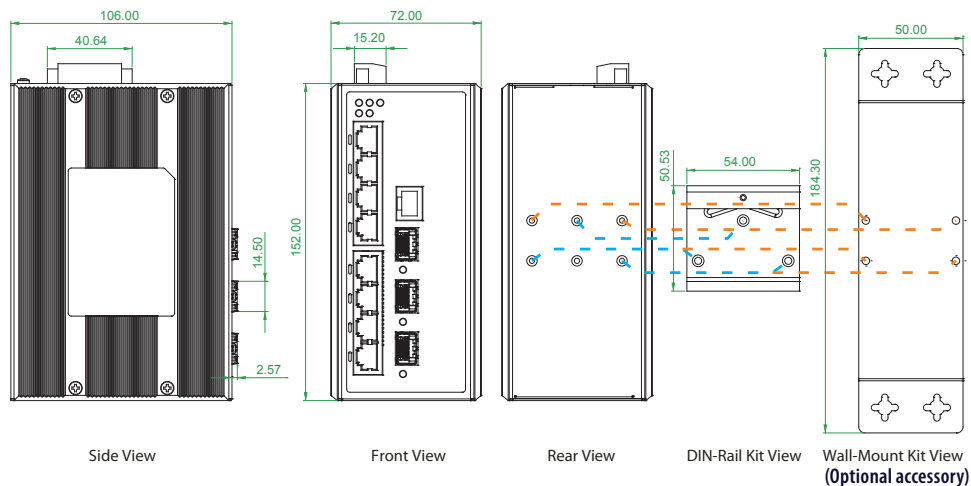
Figure 1 : Application Example

## Dimensions

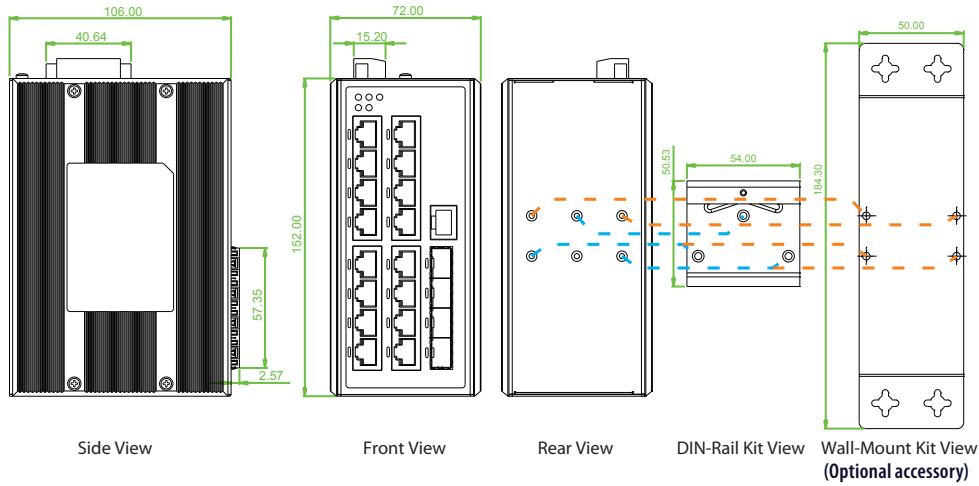
### ► IFS-402GSM



### ► IFS-803GSM



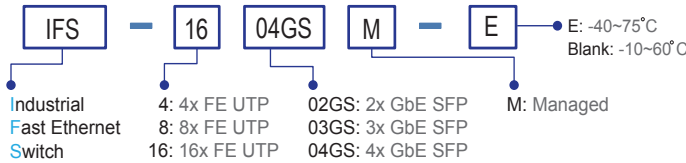
► IFS-1604GSM



Ordering Information

Model Name	Managed	Total Port	RJ45 UTP Port		Fiber Port		Power Input		Certification					Operating Temperature
			10/100 Base-TX	100/1000 Base-X	Redundant	Railway EN50121-4	NEMATS 2	Safety UL60950-1	EN61000-6-2 EN61000-6-4	CE	FCC			
IFS-402GSM	V	6	4	2 SFP	12/24/48VDC	V	V	V	V	V	V	-10~60°C		
IFS-402GSM-E	V	6	4	2 SFP	12/24/48VDC	V	V	V	V	V	V	-40~75°C		
IFS-803GSM	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	V	V	-10~60°C		
IFS-803GSM-E	V	11	8	3 SFP	12/24/48VDC	V	V	V	V	V	V	-40~75°C		
IFS-1604GSM	V	20	16	4 SFP	12/24/48VDC	V	V	V	V	V	V	-10~60°C		
IFS-1604GSM-E	V	20	16	4 SFP	12/24/48VDC	V	V	V	V	V	V	-40~70°C		

Model Naming Rule



Optional Accessories

Industrial Power Supply

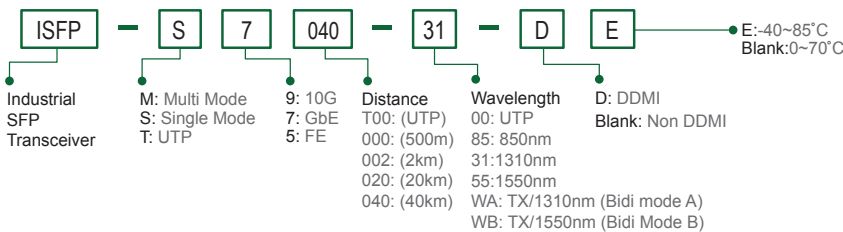
IND-WMK02	Wall Mount kit for Industrial product (Wide) (184 x 50mm)
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Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with the series product for guaranteed compatibility and performance. The best performance can be guaranteed even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheet for more details and more items.)

ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-T7T00-00-(E)	Industrial SFP 1000Base-T UTP 100meter, -10~70°C (-40~85°C)
ISFP-M5002-31-D(E)	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
ISFP-S5030-31-D(E)	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

SFP Naming Rule



Package List

- One device of the series
- Console cable (RJ-45 to DB9)
- CD (SmartConfig, MIB file, Manual)
- Quickly installation guide
- Din Rail with screws
- Terminal block
- Protective caps for SFP ports