# IFS-402GSM-4PH24

**4x 10/100Base-T+ 2x 100/1000Base-X SFP Slot with 4x PoE+ Managed Switch**
*(120 Watts, 24V Booster)*



IPv6 Ready · SmartView · EN50121-4 · PoE Regulated 20-57V · u-Ring · EN61000-6-2 EN61000-6-4 · C UL US LISTED

**7**

**PoE Ethernet Managed Switch**

IFS-402GSM-4PH24 models are managed industrial grade PoE (Power over Ethernet) switches with 4x 10/100Base-T PoE ports and 2 SFP Gigabit/Fast Ethernet ports that provide stable and reliable Ethernet transmission. The Ethernet switches support a variety of management functions, including STP/RSTP/MSTP/ ITU-T G.8032 Ring and multiple u-Ring for redundant cabling , advanced PoE management functions such as PoE device auto-checking and auto reset, PoE power weekly scheduling, 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, Traffic surveillance, security automation applications, IP surveillance ,City Security , intelligent transportation systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications. 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-T RJ-45 with 2x 100/1000Base-X SFP Fiber
- 24/48VDC redundant dual input power, and built-in power booster design upto 55 VDC for PoE/PoE+ output
- Constant and regulated PoE output voltage at 55VDC
- Provides 4-port IEEE802.3af / 802.3at PoE output (30W per Port)
- Maximum PoE output power budget 120W
- Advanced PoE Management, PoE PD Failure Auto Checking ,and auto reset when PD fail PoE configuration for power planning, weekly scheduling
- UL60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Industrial Grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- Cable diagnostic, Measuring cable OK or broken point distance
- Supports Green Ethernet IEEE802.3az EEE (Energy Efficient Ethernet) management to optimize the power consumption
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Protection Ring (EPR) for redundant cabling
- Provide up to 3 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses
- u-Ring for Redundant Cabling, recovery time<10ms in 250 maximum devices

- DHCP 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, 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
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP/SNTP, IEEE802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, **SNMP** v1/v2c/v3, Telnet server for management
- **SmartView** Management System support

## Specifications

| Standard | | |
|---|---|---|
| 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 | |
| IEEE 802.3ad | Link aggregation for parallel links with LACP(Link Aggregation Control Protocol) | |
| IEEE 802.3x | Flow control for Full Duplex | |
| IEEE 802.3af | PoE (Power over Ethernet) | |
| IEEE 802.3at | PoE+ (Power over Ethernet ehancements) | |
| 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) | |

| | |
|---|---|
| **VLAN ID** | 4094 IEEE802.1Q VLAN VID |
| **Switch Architecture** | Back-plane (Switching Fabric): 4.8Gbps |
| **Data Processing** | Store and Forward |

| | |
|---|---|
| **Flow Control** | IEEE 802.3x for full duplex mode Back pressure for half duplex mode |
| **PoE RJ-45 Pin Assignment** | 4 RJ-45 ports support IEEE 802.3af / IEEE 802.3at End-Span, Alternative A mode. |
| | Positive (V+) : RJ-45 pin 1, 2. Negative (V-) : RJ-45 pin 3, 6. Data (1,2,3,6 ) |
| **Network Connector** | 4 x RJ-45 10/100Base-TX auto negotiation speed, Auto MDI/MDI-X function, Full/Half duplex 2X 100/1000 Base-X dual speed mode SFP slot, with DDMI |
| **Console** | RS-232 (RJ-45) |
| **Network Cable** | UTP/STP above Cat. 5e cable |
| | EIA/TIA-568 100-ohm (100m) |
| **Protocols** | CSMA/CD |
| **Reverse Polarity Protection** | Present |
| **Overload Current Protection** | Present |
| **CPU Watch Dog** | Present |
| **Power Supply** | Redundant Dual DC 24/48V (20~57VDC) Input power (Removable Terminal Block ) |
| **LED** | 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) |
| | PoE Port LED 1 LED /per Port : <br> • PoE Output Power On : ON (Green) <br> • PoE Fault (Over Load, Short Circuit, Port failed at Startup) : Flash 1times /sec (Green) <br> • PoE Output Power Off : Off (Green) |

Specifications & design are subject to change without prior notice. Please visit CTC Union website for more details.

## Specifications

| | |
|---|---|
| **Jumbo Frame** | 9.6KB |
| **MAC Address Table** | 8K |
| **PoE Standard** | IEEE802.3af, IEEE802.3at |
| **PoE Power Output** | Maximum PoE output power budget 120W (30W/per port) |
| **Power Consumption** | |

| | Items<br>Input Voltage | Total Power<br>Consumption | Device Power<br>Consumption | PoE Budget | Boost<br>Efficiency |
|---|---|---|---|---|---|
| | 24VDC | 134.8W | 7.1W | 120W | 94% |
| | 48VDC | 132.2W | 8.5W | 120W | 97.2% |

| | |
|---|---|
| **Warning Message** | System Syslog, SMTP/ e-mail event message, alarm relay |
| **Alarm Relay Contact** | Relay outputs with current carrying capacity of 1 A @24VDC |
| **Removable Terminal Block** | Provide 2 redundant power, alarm relay contact, 6 Pin |
| **Operating Temperature** | -10 ~ 60℃  (IFS-402GSM-4PH24)<br>-40 ~ 75℃  (IFS-402GSM-4PHE24) |
| **Operating Humidity** | 5% to 95% (Non-condensing) |
| **Storage Temperature** | -40 ~ 85℃ |
| **Housing** | Rugged Metal, IP30 Protection |
| **Dimensions** | 106 x 62.5 x 134.8mm (D x W x H) |
| **Weight** | 0.71kg |
| **Installation Mounting** | DIN Rail mounting or wall mounting |

## Software Specifications

### Topology

| | |
|---|---|
| **VLAN** | 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(Ethernt, SNAP, LLC), up to 128 entries |
| | VLAN Translation, up to 256 entries |
| | MVR ( Multicast VLAN Registration ) |
| **Link Aggregation (Port Trunk)** | Static (Hash with SA, DA, IP, TCP/UDP port), up to 5 trunk group |
| | Dynamic (IEEE 802.3ad LACP), up to  5 trunk group |
| **Spanning Tree** | IEEE802.1d STP |
| | IEEE802.1w RSTP |
| | IEEE802.1s MSTP |
| **Multiple u-Ring** | up to 3 instances that each supports u-Ring, u-Chain or Sub-Ring type for flexible uses, and maximum up to 3 Rings.<br>Recovery time <10ms<br>The maximum number of devices allowed in a Ring supported are 250 devices. |
| **Loop Protection** | Present |
| **ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection )** | Recovery time <50ms<br><br>Single Ring, Sub-Ring, Multiple ring topology network |

### QoS Feature

| | |
|---|---|
| **Class of Service** | IEEE802.1p 8 active priorities queues for  per port |
| **Traffic Classification QoS** | 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 |
| **Bandwidth Control for Ingress** | Rate in steps :1 kbps / Mbps / fps / kfps |
| | Range : 100 kbps to 1Gbps / 1fps to 3300kfps |
| | Rate Unit : bit or frame |
| **Bandwidth Control for Egress** | Rate in steps : 1 kbps / Mbps |
| | Range : 100 kbps to 1Gbps |
| | Rate Unit : bit |
| | Per queue / Per port shaper |

| | |
|---|---|
| **DiffServ (RF 2474) Remarking** | |
| **Storm Control** | for Unicast, Broadcast, Multicast |

### IP Multicasting Feature

| | |
|---|---|
| **IGMP / MLD Snooping** | 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 |

### Security Features

| | |
|---|---|
| **IEEE 802.1X** | Port-Based |
| | MAC-Based |
| **ACL** | Number of rules : up to 256 entries |
| | for L2 / L3 / L4 |
| **RADIUS authentication & accounting** | |
| **TACACS+ authentication & accounting, TACACS+ 3.0** | |
| **HTTPS, HTTP** | |
| **SSL / SSH v2** | |

### Certification

| | |
|---|---|
| **EMC** | CE |
| **EMI (Electromagnetic Interference)** | FCC Part 15 Subpart B Class A,CE EN55022 Class A |
| **Railway Traffic** | EN50121-4 |
| **Immunity for Heavy Industrial Environment** | EN61000-6-2 |
| **Emission for Heavy Industrial Environment** | EN61000-6-4 |
| **EMS (Electromagnetic Susceptibility) Protection Level** | 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 |
| **Safety** | UL60950-1 |
| **Shock** | IEC 60068-2-27 |
| **Freefall** | IEC 60068-2-32 |
| **Vibration** | IEC 60068-2-6 |
| **MTBF** | 276,161 Hrs (MIL-HDBK-217) |
| **Warranty** | 5 years |

| | |
|---|---|
| **User Name Password Authentication** | Local Authentication |
| | Remote Authentication (via  RADIUS / TACACS+) |
| **Management Interface Access Filtering** | Web, Telnet / SSH  , CLI RS-232 console |

### Management Features

| | |
|---|---|
| **CLI** | |
| **Web Based Management** | |
| **Telnet** | Server |
| **SNMP** | V1, V2c, V3 |
| **SW & Configuration Upgrade** | TFTP, HTTP |
| | Redundant firmware in case of upgrade failure |
| **RMON** | RMON I (1, 2, 3, 9 group), RMON II |
| **MIB II** | RFC 1213 |
| **DHCP** | Client |
| | Relay |
| | Snooping |
| | Snooping option 82 |
| | Relay option 82 |
| **IP Source Guard** | |
| **Port Mirroring** | |
| **Event Syslog** | Syslog server (RFC3164) (Support 1 server ) |
| **Warning Message** | System syslog, e-mail, alarm relay |
| **DNS** | Client, Proxy |
| **NTP / SNTP** | |
| **LLDP (IEEE 802.1ab)** | Link Layer Discovery Protocol |
| | LLDP-MED |

### IPv6 Features

| | |
|---|---|
| **IPv6 Management** | Telnet Server/ICMP v6 |
| **SNMP over IPv6** | |
| **HTTP over IPv6** | |
| **SSH over IPv6** | |
| **IPv6 Telnet Support** | |
| **IPv6 NTP / SNTP Support** | |
| **IPv6 TFTP Support** | |
| **IPv6 QoS** | |
| **IPv6 ACL** | Number of rules: up to 256 entries |
| | L2 / L3 / L4 |

### Others Features

| | |
|---|---|
| **Green Ethernet** | 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 |
| **Cable Diagnostic** | Measuring cable OK or broken point distance |
| **Advanced PoE Management** | PoE PD Failure Auto Checking, and Auto reset when PD fail |
| | PoE Scheduling  ( On/Off schedule weekly) |
| | PoE Configuration |
| | PoE Enable/Disable |
| | Power limit by classification |
| | Power limit by management |
| | Total PoE Power budge (maximum 120W) limitation |
| | Power feeding priority |

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## Application

### Figure 1: Application Example



### Figure 2: Multiple Rings



Ring 3 2 1    Multiple Rings    Master
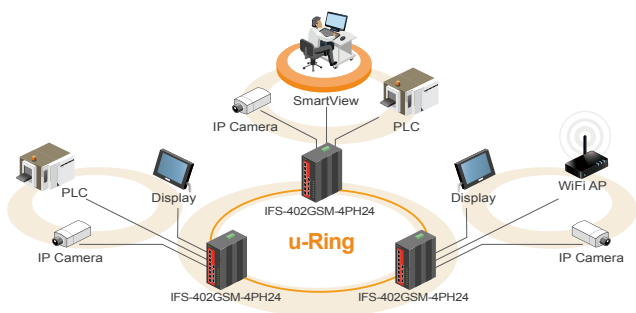- Maximum up to 3 Ring
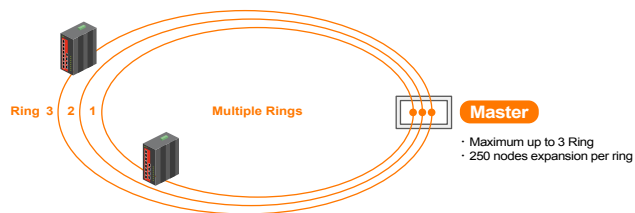- 250 nodes expansion per ring

### Figure 3: An illustration of u-Ring instances configured in Web interface

**u-Ring Configuration**

| Delete | Instance | Type | Master | East | | West | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | Port | Edge | Port | Edge |
| Delete | 1 | u-Ring | ☐ | 1 ⌄ | | 2 ⌄ | |
| Delete | 2 | Sub-Ring | ☐ | 3 ⌄ | | | |
| Delete | 3 | u-Chain | ☐ | 5 ⌄ | ☐ | 6 ⌄ | ☐ |

Add New Instance

Save   Reset

### Figure 4: u-Ring Type



Master

Port 3    Port 5    Backup Path

Slave          Slave

Ring

Slave

**u-Ring Type**



Third Party Network

Backup Path

Slave   Edge          Edge   Master

**Chain**

Slave          Slave

Slave

**Determining the backup path (u-Chain type)**



Master

Backup Path          Master

Ring          Backup Path

**Sub-Ring**

**A major ring and a Sub-Ring topology**
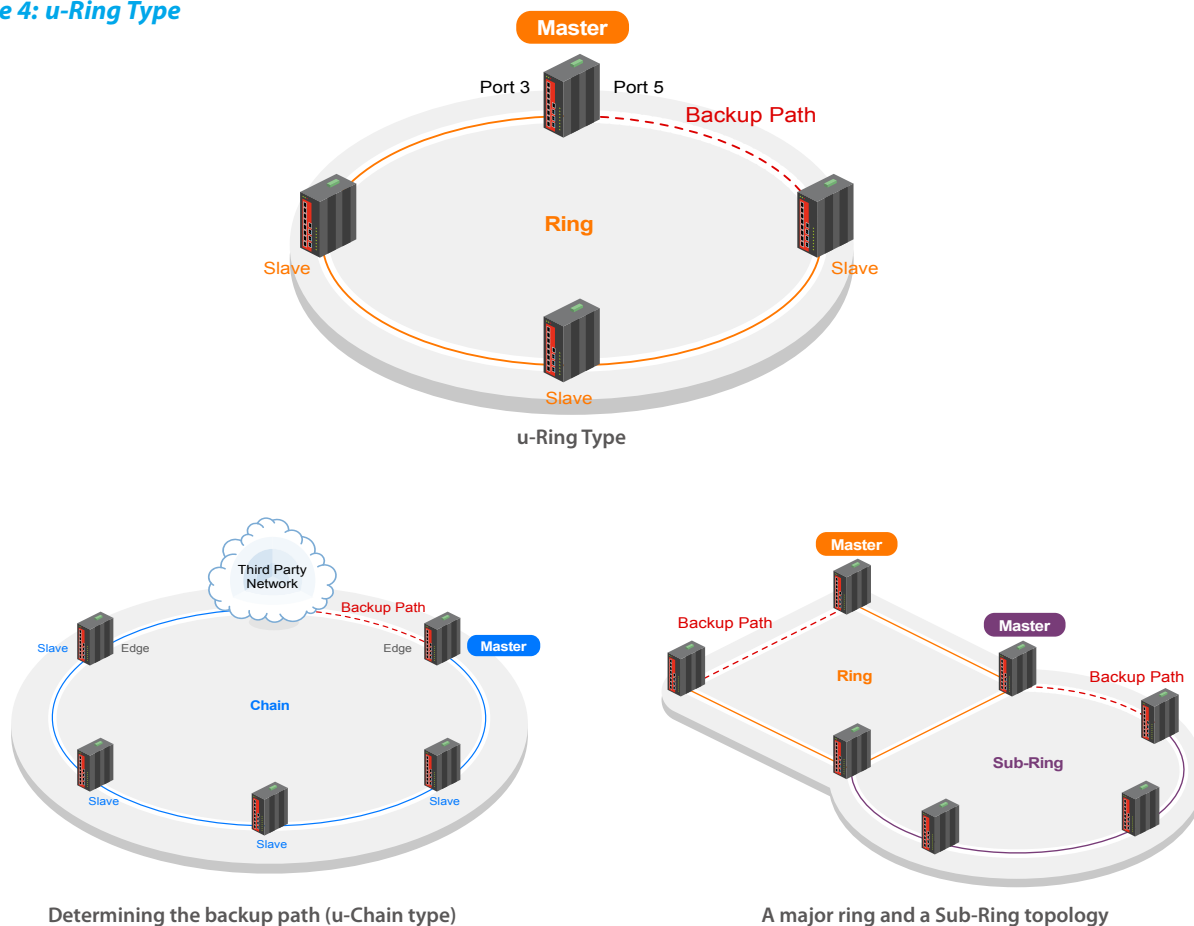
## Figure 5: Ring Configuration Example

Ring Configuration Type
- ● u-Ring
- ■ Sub-Ring
- ▲ u-Chain



**Ring**    **Sub-Ring**    **Sub-Ring**

Ring Configuration Type



**Ring**

**Sub-Ring**    **Sub-Ring**

Combination of a ring and two Sub-Ring



**Sub-Ring**

**Sub-Ring**   **Ring**   **Sub-Ring**

**Sub-Ring**

Combination of a ring and four Sub-Ring

## Dimensions



Side View    Front View    Rear View    DIN-Rail Kit View    Wall-Mount Kit View
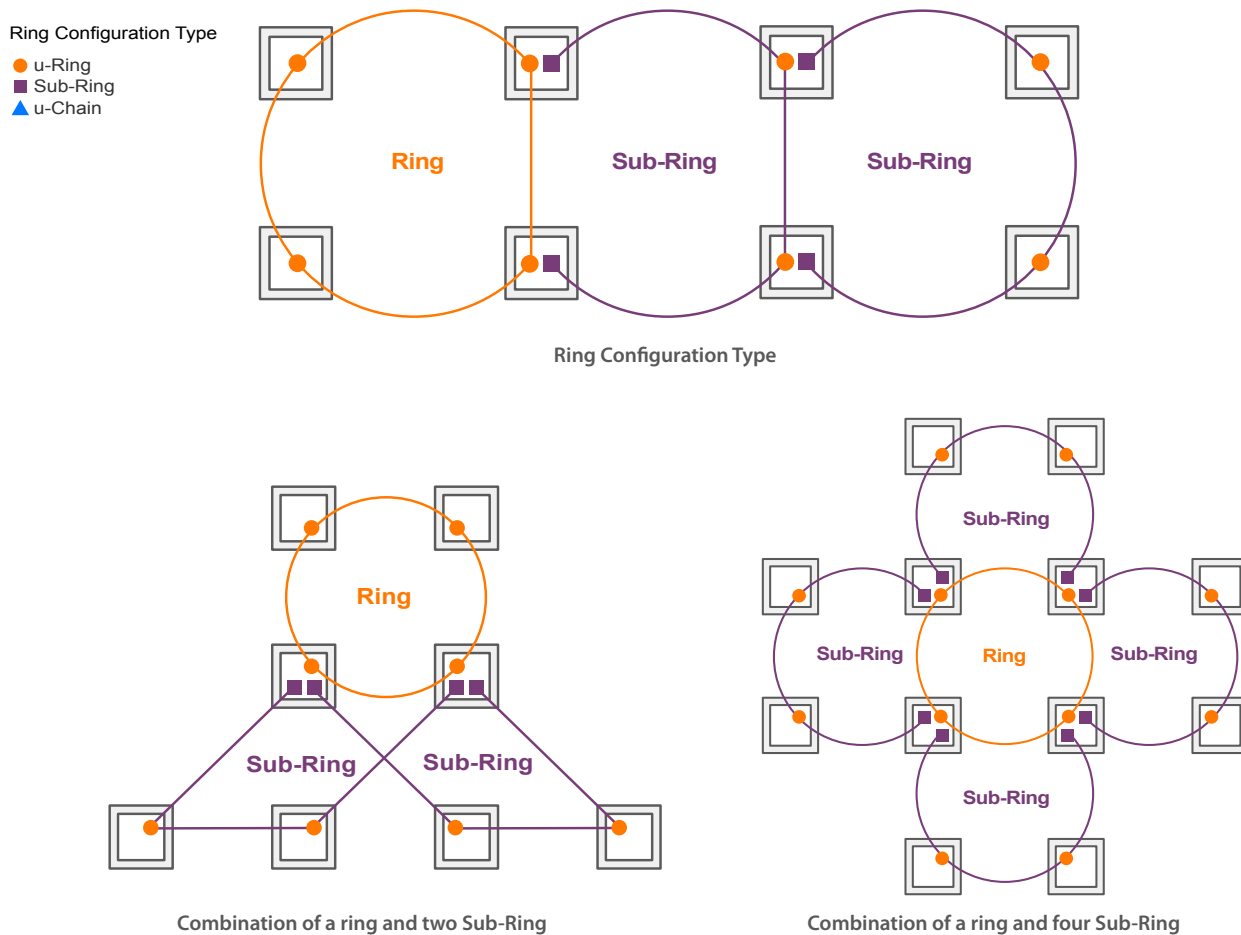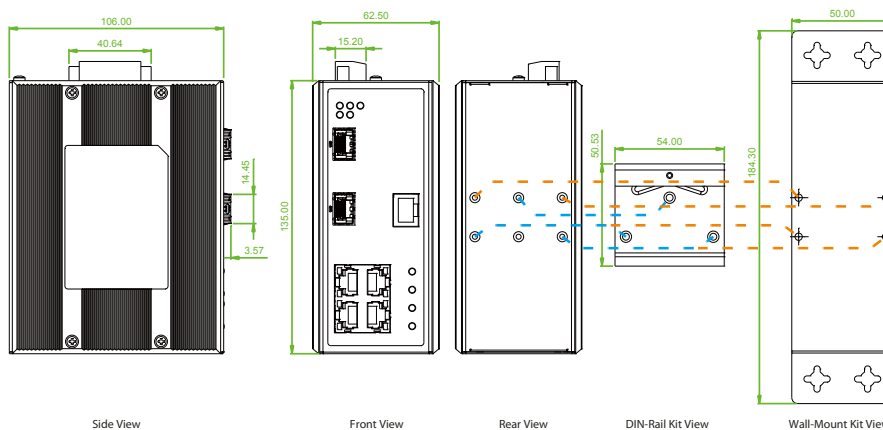
## Ordering Information

| Model Name | Description |
|---|---|
| IFS-402GSM-4PH24 | 4x 10/100Base-TX + 2x 100/1000Base-X SFP slot with 4 High Power PoE Managed Switch (30W/Per Port ,Total 120W, 24V Booster, -10~60˚C) |
| IFS-402GSM-4PHE24 | 4x 10/100Base-TX + 2x 100/1000Base-X SFP slot with 4 High Power PoE Managed Switch (30W/Per Port ,Total 120W, 24V Booster, -40~75˚C) |

**Accessories**

| | |
|---|---|
| DR-120-24 | Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60℃ |
| DRP-240-48 | Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70℃ |
| SFP Transceiver | Compatible, Reliable, 5-year Warranty |

Temperature

**IFS-402GSM-4PH** ☐ **24**

Example: IFS-402GSM-4PH **E24**

ISFP – M 7 040 – 31 – E

● E : -40~85℃
Blank : 0~70℃

● Industrial SFP Transceiver
● M : Multi Mode
S : Single Mode
T : Copper
● 7 : GbE
5 : FE
● Distance
002(2km),
020(20km), 040(40km)...
● Wavelength