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 up to 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**

**Specifications**

<table>
<thead>
<tr>
<th>Standard</th>
<th>IEEE 802.3</th>
<th>10Base-T 10Mbit/s Ethernet</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEEE 802.3</td>
<td>100Base-TX, 100Base-FX, Fast Ethernet</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.3z</td>
<td>1000Base-X Gigabit Ethernet over Fiber-Optic</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.1d</td>
<td>STP (Spanning Tree Protocol)</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.1w</td>
<td>RSTP (Rapid Spanning Tree Protocol)</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.1s</td>
<td>MSTP (Multiple Spanning Tree Protocol)</td>
<td></td>
</tr>
<tr>
<td>ITU-T G.8032 / Y1344</td>
<td>ERPS (Ethernet Ring Protection Switching)</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.1Q</td>
<td>Virtual LANs (VLAN)</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.1X</td>
<td>Port based and MAC based Network Access Control, Authentication</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.3ad</td>
<td>Link aggregation for parallel links with LACP (Link Aggregation Control Protocol)</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.3x</td>
<td>Flow control for Full Duplex</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.3af</td>
<td>PoE (Power over Ethernet)</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.3at</td>
<td>PoE+ (Power over Ethernet enhancement)</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.1ad</td>
<td>Stacked VLANs, Q-in-Q</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.1ab</td>
<td>Link Layer Discovery Protocol (LLDP)</td>
<td></td>
</tr>
<tr>
<td>IEEE 802.1az</td>
<td>EEE (Energy Efficient Ethernet)</td>
<td></td>
</tr>
<tr>
<td>VLAN ID</td>
<td>4094, IEEE802.1Q VLAN VID</td>
<td></td>
</tr>
<tr>
<td>Switch Architecture</td>
<td>Back-plane (Switching Fabric) - 4.8Gbps</td>
<td></td>
</tr>
<tr>
<td>Data Processing</td>
<td>Store and Forward</td>
<td></td>
</tr>
</tbody>
</table>

**Flow Control**
IEEE 802.3x for full duplex mode Back pressure for half duplex mode

**PoE RJ-45 Pin Assignment**
4RJ-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 10/100/1000 Base-X dual speed mode SFP slot, with DOMI

**Console**
RS-232 (RJ-45)

**Network Cable**
UTP/STP above Cat. 5e cable
EI/A/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 :
- PoE Output Power On : ON (Green)
- PoE Fault (Over Load, Short Circuit, Port failed at Startup) : Flash 1times/sec (Red)
- PoE Output Power Off : Off (Green)
Specifications

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

<table>
<thead>
<tr>
<th>Total Power Consumption</th>
<th>Device Power Consumption</th>
<th>PoE Budget Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>120W</td>
<td>120W</td>
<td>94%</td>
</tr>
</tbody>
</table>

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°C (IFS-402GSM-4PH24)
-40 ~ 75°C (IFS-402GSM-4PHE24)
Operating Humidity: 5% to 95% (Non-condensing)
Storage Temperature: -40 ~ 85°C
Housing: Rugged Metal, IP30 Protection
Dimensions: 106 x 625 x 134.8 mm (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
IEEE 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(IEEE, SNAP, LLC), up to 128 entries
VLAN Translation, up to 256 entries

MVIR (Multicast VLAN Registration)

Link Aggregation
Port Trunk:
Static (Hash with 5A, TCP/UDP port), up to 5 trunk groups
Dynamic (IEEE 802.1ad LACP), up to 2 trunk groups

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

Loop Protection
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)

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

QoS Control List (QCL):
Frame Type, Source/Destination MAC, VLAN ID, PCP, IP DSCP based CoS
IP Precedence based CoS
IEEE802.1p based CoS

Bandwidth Control for Ingress
Rate in steps: 1 kbps / Mbps / fps
Rate Limit: 0 to 1024 fps (MAX)

Bandwidth Control for Egress
Rate in steps: 1 kbps / Mbps
Rate Limit: 0 to 1024 Mbps

DiffServ (RF 2474) Remarking
Port Mirroring
for Uncast, Broadcast, Multicast

IP Multicast 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

RADIUS authentication & accounting
TACACS+ authentication & accounting, TACACS+ 3.0
HTTP, HTTPS
SSL / SSH v2

Certification
EMC
CE
EMI (Electromagnetic Interference)
FCC Part 15 Subpart B Class A
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 A
EN61000-4-3 (RF) Level 3, Criteria A
EN61000-4-4 (Burst) Level 3, Criteria A
EN61000-4-5 (Surge) Level 3, Criteria A
EN61000-4-6 (CS) Level 3, Criteria A
EN61000-4-8 (FMF, Magnetic Field) Field Strength: 3000A/m, Criteria A

Safety
UL60950-1
Shock
IEC 60068-2-27
Freefall
IEC 60068-2-32
Vibration
IEC 60068-2-6
MTBF
278,161 Hrs (MIL-HDBK-217)
Warranty
5 years

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

Management Features
CLI
Web Based Management
Telnet
Server
SNMP
V1, V2c, V3
SW & Configuration
Upgrade
Redundant firmware in case of Upgrade failure
RMON
RMON 1 (1, 2, 3, 9 group), RMON II
MIB II
RFC 1213
DHCP
Client
Relay
Snoping
Snoping 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)
LLDP-MED
Link Layer Discovery Protocol
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 Quo
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

Cable Diagnostic
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 budget (maximum 120W) limitation
Power testing priority

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

**Figure 1: Application Example**

![Application Example Diagram](image)

**Figure 2: Multiple Rings**

![Multiple Rings Diagram](image)

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

<table>
<thead>
<tr>
<th>Delete</th>
<th>Instance</th>
<th>Type</th>
<th>Master</th>
<th>East</th>
<th>West</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delete</td>
<td>1</td>
<td>u-Ring</td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Delete</td>
<td>2</td>
<td>Sub-Ring</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Delete</td>
<td>3</td>
<td>u-Chain</td>
<td></td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Add New Instance

Save | Reset

**Figure 4: u-Ring Type**

![u-Ring Type Diagram](image)

Determining the backup path (u-Chain type)

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

Ring Configuration Type
- u-Ring
- Sub-Ring
- u-Chain

Dimensions

Ordering Information

<table>
<thead>
<tr>
<th>Model Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFS-402GSM-4PH24</td>
<td>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)</td>
</tr>
<tr>
<td>IFS-402GSM-4PHE24</td>
<td>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)</td>
</tr>
</tbody>
</table>

Accessories

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR-120-24</td>
<td>Industrial Power, Input 88 ~ 132VAC / 176 ~ 264VAC, Output 24VDC, 120W, -10 ~ +60˚C</td>
</tr>
<tr>
<td>DRP-240-48</td>
<td>Industrial Power, Input 85 ~ 264VAC, Output 48VDC, 240W, -10 ~ +70˚C</td>
</tr>
</tbody>
</table>

Example: IFS-402GSM-4PH E24