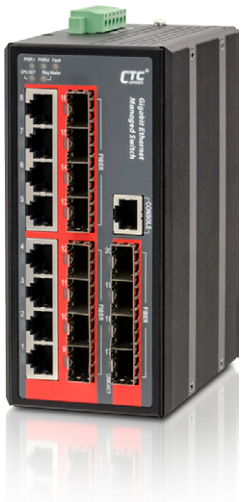
# 10 IGS-812SM

## 8x GbE RJ45 + 12x 100/1000Base-X SFP

- *Supports IEEE 1588 PTP V2*
- *Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for Redundant Cabling*
- *Cable Diagnostics, Identifies Opens/Shorts Distance*
- *UL60950-1, EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC Certified*



UL60950-1 CE FC

EN50121-4 EN61000-6-2 EN61000-6-4 EN62368-1 μ-Ring IEEE 1588v2

The Layer 2 managed industrial Ethernet switch, IGS-812SM, has 8 Gigabit UTP ports and is equipped with 12 100/1000Base-X SFP slots for centralized fiber optic connections to meet expanded transmission in a variety of requirements and locations. Long distance and high-speed transmission, fanless design, high MTBF, 4KV surge protection, supports wide operating temperature, 12/24/48VDC redundant power input, suitable for heavy-duty applications in harsh environments, such as industrial factory automation, data centers, smart transportation systems, military, and harsh application conditions such as utility markets exceed commercial product specifications.

## Features

- Provides 5 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 5 rings in one device (Please see CTC μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<10ms in 250 devices
- Supports IEEE 1588 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
- Supports EMS Management

## Specifications

| | | |
|---|---|---|
| **Standard** | IEEE 802.3 | 10Base-T 10Mbit/s Ethernet |
| | IEEE 802.3u | 100Base-TX, 100Base-FX, Fast Ethernet |
| | IEEE 802.3ab | 1000Base-T Gbit/s Ethernet over twisted pair |
| | 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) |
| | ITU-T G.8031 / Y.1342 | EPS (Ethernet Protection Switching) |
| | IEEE 802.1Q | Virtual LANs (VLAN) |
| | IEEE 802.1X | Port based and MAC based Network Access Control, Authentication |
| | IEEE 802.3ac | 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) |

# Industrial Managed GbE Switch

| | |
|---|---|
| **VLAN ID** | 4094 IEEE 802.1Q VLAN ID |
| **Switch Architecture** | Back-Plane (Switching Fabric): 40Gbps (Full Wire-Speed) |
| **Data Processing** | Store and Forward |
| **Flow Control** | IEEE 802.3x for full duplex mode Back pressure for half duplex mode |
| **Network Connector** | 8x 10/100/1000Base-T RJ-45 + 12x 100/1000Base-X SFP |
| | RJ-45 UTP port supports Auto negotiation speed, Auto MDI/MDI-X function |
| | SFP port supports dual speed with DDMI |
| **Console** | RS-232 (RJ-45) |
| **Network Cable** | UTP/STP Cat. 5e cable or above |
| | EIA/TIA-568 100-ohm (100 meter) |
| **Protocols** | CSMA/CD |
| **Reverse Polarity Protection** | Supported for power input |
| **Overload Current Protection** | Supported |
| **CPU Watch Dog** | Supported |
| **Power Supply** | Redundant Dual DC 12/24/48VDC (9.6~60VDC) Input power (Removable Terminal Block ) |
| **Power Consumption** | |

| Input Voltage | Total Power Consumption |
|---|---|
| 12 VDC | 14.3W |
| 24 VDC | 14.2W |
| 48 VDC | 15.8W |

| | |
|---|---|
| **LED** | System: Power 1 (Green), Power 2 (Green), Fault (Amber), CPU Act (Green), Ring Master (Yellow) |
| | UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber) |
| | SFP Slot: Link/Active (Green) |
| **Jumbo Frame** | 9.6KB |
| **IEEE 802.3ac** | Max frame size extended to 1522Bytes (allow Q-tag in packet) |
| **MAC Address Table** | 8K |
| **Memory Buffer** | 512K Bytes for packet buffer |
| **Device Memory** | 16M Bytes Flash ROM, 128M Bytes RAM |
| **Warning Message** | System Syslog, SMTP/ e-mail event message, alarm relay |
| **Alarm Relay Contact** | Relay outputs with current carrying capacity of 1A @24VDC |
| **Removable Terminal Block** | Provide 2 redundant power, alarm relay contact, 6 Pin |
| **Operating Temperature** | -10 ~ 60°C (IGS-812SM)<br>-40 ~ 75°C (IGS-812SM-E) |
| **Operating Humidity** | 5% to 95% (Non-condensing) |
| **Storage Temperature** | -40 ~ 85°C |
| **Housing** | Rugged Metal, IP30 Protection and Fanless |
| **Dimensions** | 106 x 72 x 152mm (D x W x H) |
| **Weight** | 0.795kg |
| **Installation Mounting** | DIN Rail mounting or wall mounting (optional) |
| **MTBF** | 517,181 Hours (MIL-HDBK-217) |
| **Warranty** | 5 years |

## Certification

| | |
|---|---|
| **EMC** | CE (EN55032, EN55035) |
| **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, EN62368-1 |
| Shock | IEC 60068-2-27 |
| Freefall | IEC 60068-2-32 |
| Vibration | IEC 60068-2-6 |

## Software Specifications

### Topology

| | |
|---|---|
| VLAN | IEEE 802.1q VLAN, up to 4094 802.1Q VLAN ID |
| | 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 |
| | Private VLAN for port isolation |
| | GVRP (GARP VLAN Registration Protocal) |
| | MVR (Multicast VLAN Registration) |
| | Voice VLAN |
| 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 | IEEE 802.1d STP |
| | IEEE 802.1w RSTP |
| | IEEE 802.1s MSTP |
| Multiple μ-Ring | Up to 5 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 5 Rings. |
| | Recovery time <10ms |
| | The maximum number of devices in the ring supports 250 nodes. |
| Loop Protection | Supported |
| ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection) | Recovery time <50ms |
| | Single Ring, Sub-Ring, Multiple ring topology network |
| ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching) | Supported |

### QoS Features

| | |
|---|---|
| Class of Service | IEEE 802.1p 8 active priorities queues for per port |
| Traffic Classification QoS | IEEE 802.1p based CoS |
| | IP Precedence based CoS |
| | IP DSCP based CoS |
| | QCL (QoS Control List): Frame Type, Source/Destination MAC, VLAN ID, PCP, DEI, Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number |
| Bandwidth Control for Ingress | 100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps" |
| Bandwidth Control for Egress | 100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps" |
| | Per queue / Port shaper |
| DiffServ (RF 2474) Remarking | |
| Storm Control | for Unicast, Broadcast, Multicast |

### IP Multicasting Features

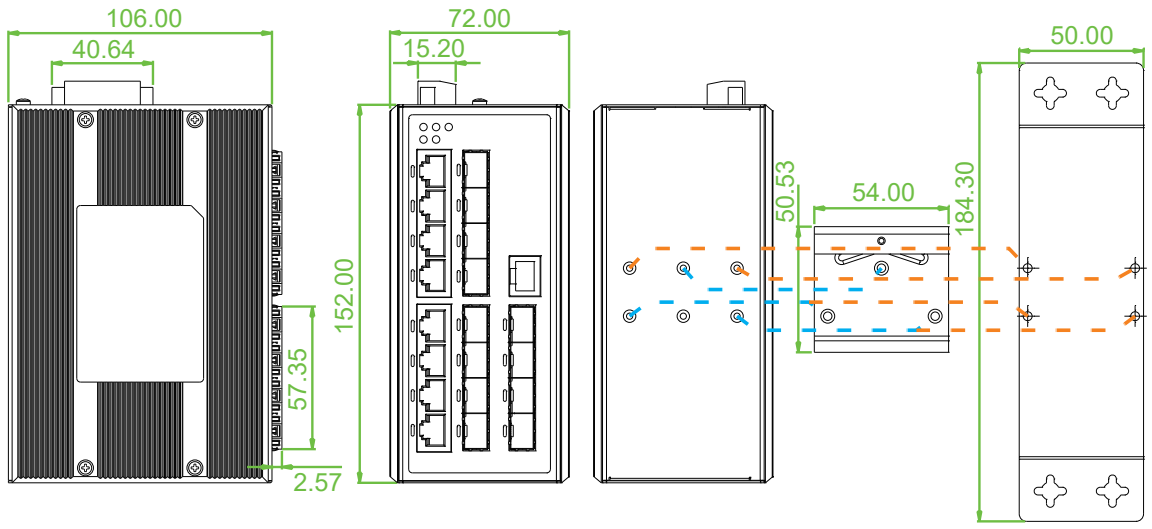
| | |
|---|---|
| IGMP / MLD Snooping | IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 |
| | Port Filtering Profile |
| | Throttling, Fast Leave |
| | Maximum Multicast Group : up to 1022 entries |
| | Query / Static Router Port |

| | |
|---|---|
| **Security Features** | |
| **IEEE 802.1X** | Port-Based |
| | MAC-Based |
| **ACL** | Number of rules : up to 256 entries |
| | for L2 / L3 / L4<br>L2 : Mac address SA/DA/VLAN<br>L3: IP address SA/DA, Subnet<br>L4: TCP/UDP |
| **RADIUS** | Authentication & Accounting |
| **TACACS+** | Authentication |
| **HTTPS, HTTP** | Supported |
| **SSL / SSH v2** | Supported |
| **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** | Cisco® like CLI |
| **WeB UI** | Supported |
| **Telnet** | Server |
| **SNMP** | V1, V2c, V3 |
| **sFlow** | Supported |
| **Modbus/TCP** | Supports for management and monitoring |
| **SW & Configuration Upgrade** | TFTP, HTTP |
| | Redundant firmware in case of upgrade failure |
| **FTP client** | Supports for upload/download configuration |
| **RMON** | RMON I (1, 2, 3, 9 group), RMON II |
| **MIB** | RFC1213 MIB II, Private MIB |
| **UPnP** | Supported |
| **BOOTP** | Supported |
| **DHCP** | Server, Client, Relay, Relay option 82, Snooping |
| **RARP** | Supported |
| **IP Source Guard** | Supported |
| **Port Mirroring** | Supported |
| **Event Syslog** | Syslog server (RFC3164) |
| **Warning Message** | System syslog, e-mail, alarm relay |
| **DNS** | Client, Proxy |
| **IEEE 1588 PTP V2** | Supports 5 operating mode in each port :<br>Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave |
| **NTP, SNTP** | Client |
| **LLDP (IEEE 802.1ab)** | Link Layer Discovery Protocol |
| | LLDP-MED |
| **IPv6 Features** | |
| **IPv6 Management** | Telnet Server/ICMP v6 |
| **SNMP over IPv6** | Supported |
| **HTTP over IPv6** | Supported |
| **SSH over IPv6** | Supported |
| **IPv6 Telnet** | Supported |
| **IPv6 NTP, SNTP** | Client |
| **IPv6 TFTP** | Supported |
| **IPv6 QoS** | Supported |
| **IPv6 ACL** | Number of rules: up to 256 entries |
| | for L2 / L3 / L4<br>L2 : Mac address SA/DA/VLAN<br>L3: IP address SIP, Subnet (32bit)<br>L4: TCP/UDP |

## Others Features

| | |
|---|---|
| **Green Ethernet** | Supports IEEE 802.3az 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 UTP cable normal or broken point distance |

## Dimensions




Side View | Front View | Rear View | DIN-Rail Kit View | Wall-Mount Kit View (Optional Accessory)

## Ordering Information

| Model Name | Managed | Total Port | RJ45 | SFP | Power Input | Certification | | | | Operating Temperature |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 10/100/1000 Base-T | 100/1000 Base-X | Redundant | UL60950-1 EN62368-1 | EN50121-4 | EN61000-6-2 EN61000-6-4 | CE FCC | |
| IGS-812SM | V | 20 | 8 | 12 | 12/24/48VDC | V | V | V | V | -10~60°C |
| IGS-812SM-E | V | 20 | 8 | 12 | 12/24/48VDC | V | V | V | V | -40~75°C |

## Optional Accessories

### ■ Wall Mount Kit

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

### ■ Industrial SFP Transceiver

The ISFP series of industrial grade SFP modules have been fully tested with all CTC Union industrial grade Ethernet switches for guaranteed compatibility and performance. Best performance can be guaranteed, even in mission-critical applications. (Please see CTC Union's Industrial SFP datasheets for more items and detailed information.)

| | |
|---|---|
| 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 10/100/1000Base-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) |

### ■ Industrial Power Supply

| | |
|---|---|
| MDR-40-48 | Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ 70°C |