

# IPS-G803SM

## IEC 61850-3 Managed GbE Switch

### 8x GbE RJ45 + 3x 100/1000Base-X SFP, Managed Ethernet Switch

- » IEC 61850-3, IEEE 1613 Certified for Power Substation
- » Supports IEEE 1588 PTP V2
- » Supports GOOSE Message that Complies with IEC61850 Standard to Achieve Zero Packet Loss
- » Supports u-Ring, ERPS, MSTP, RSTP, STP for Redundant Cabling
- » UL60950-1, EN60950-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC Certified



The managed industrial-grade IEC61850 Gigabit Ethernet switch with 8 Gigabit UTP ports and 3 100/1000 SFP slots, it is fully compliant with the requirement of IEC 61850-3 and IEEE 1613. The switch provides a variety of redundant functions to increase the reliability of your communications system, including redundant and isolated power supplies of 24/48 VDC and 110/220V AC/DC and link redundancy functions of STP/RSTP/MSTP/ERPS and a proprietary ring protocol, features of IGMP, VLAN, QoS, ACL, Security, IPv6, bandwidth control, and port mirroring. Supports wide temperature operation of -40~85°C, fanless and rugged enclosure specifically designed for harsh substation network environments.

## Features

- Redundant isolated low voltage 24/48VDC, or/and isolated High voltage AC/DC (110/220 VAC/VDC) power inputs
- Wide Operating Temperature -40~85°C
- DIN Rail mounting or wall mounting
- IP30 rugged metal housing and Fanless
- Cable diagnostic, Measuring cable normal or broken point distance
- 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
- Provides 5 instances that each can support  $\mu$ -Ring,  $\mu$ -Chain or Sub-Ring type for flexible uses.  
(Please see CTC Union  $\mu$ -Ring white paper for more details and more topology application)
- $\mu$ -Ring for Redundant Ethernet Ring, recovery time <10ms in 250 units
- Supports EMS Management

## Specifications

Standard	Specification
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)
IEEE 802.1Q	for VLAN Tagging
IEEE 802.1X	Port based and MAC based Network mAccess Control, Authentication
IEEE 802.3ac	Flow Control and Back Pressure
IEEE 802.3ad	Link aggregation for parallel links with LACP (Link Aggregation Control Protocol)
IEEE 802.3x	Flow Control and Back Pressure
ITU-T G.8032/ Y.1344	ERPS (Ethernet Ring Protection Switching)
ITU-T G.8031 / Y.1342	EPS (Ethernet Protection Switching)

<b>Standard</b>	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>Switch Architecture</b>	Back-plane (Switching Fabric): 22 Gbps (Full wire-speed)											
<b>Data Processing</b>	Store and Forward											
<b>Flow Control</b>	IEEE 802.3x flow control, back pressure flow control											
<b>Jumbo Frame</b>	9.6KB											
<b>IEEE 802.3ac</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>Network Connector</b>	8x 10/100/1000Base-T RJ-45, Auto negotiation speed											
	Auto MDI/MDI-X function, Full/Half duplex											
	3x 100/1000Base-X dual speed mode SFP slot, support DDMI											
<b>Console</b>	RS-232 (RJ-45)											
<b>Network Cable</b>	UTP/STP Cat. 5e cable or above											
	EIA/TIA-568 100-ohm (100meter)											
<b>Protocols</b>	CSMA/CD											
<b>LED</b>	System: Power 1 (Green), Power 2 (Green), Fault (Amber) (-LL Model)											
	System: Power 1 (Green), Power 2 (Green), Power 3 (Green), Fault (Amber) (-HL Model)											
	UTP:10/100 Link/Active: (Green), 1000Link/Active: (Amber)											
	SFP Slot: Link/Active (Green)											
<b>Reverse Polarity Protection</b>	Supported for Power Input											
<b>Overload Current Protection</b>	Supported											
<b>CPU Watch Dog</b>	Supported											
<b>Power Input</b>	Redundant 2x Isolated Low Voltage DC Input power (-LL model)											
	Redundant 2x isolated Low Voltage DC and 1 High Voltage AC/DC input power (-HL model)											
	Isolated Low Voltage DC : Isolated 24/48V (18~72VDC), Removable Terminal Block											
	High voltage AC/DC : Isolated 110/220VAC (85VAC~264VAC) or 110/220VDC (88~300VDC), Removable Terminal Block											
<b>Power consumption</b>	<table border="1"> <thead> <tr> <th>Input Voltage</th> <th>IPS-G803SM</th> </tr> </thead> <tbody> <tr> <td>110VAC</td> <td>9.3 W</td> </tr> <tr> <td>220VAC</td> <td>9.2 W</td> </tr> <tr> <td>24VDC</td> <td>9.6 W</td> </tr> <tr> <td>48VDC</td> <td>11.1 W</td> </tr> </tbody> </table>		Input Voltage	IPS-G803SM	110VAC	9.3 W	220VAC	9.2 W	24VDC	9.6 W	48VDC	11.1 W
	Input Voltage	IPS-G803SM										
	110VAC	9.3 W										
	220VAC	9.2 W										
	24VDC	9.6 W										
48VDC	11.1 W											
<b>Alarm Relay Contact</b>	Relay outputs with current carrying capacity of 1A @24VDC											
<b>Removable Terminal Block</b>	Provides 2 redundant low volt power, alarm relay contact (6 Pin) (-LL Model)											
	Provides 2 redundant low volt power, alarm relay contact (6 Pin) , and High volt Power (2 Pin) (-HL Model)											
<b>Operating Temperature</b>	-40 ~ 85°C											
<b>Operating Humidity</b>	5% to 95% (Non-condensing)											
<b>Storage Temperature</b>	-40 ~ 85°C											
<b>Housing</b>	Rugged Metal, IP30 Protection and Fanless											
<b>Dimension</b>	106 x 82 x 152mm (D x W x H)											
<b>Weight</b>	0.885kg (IPS-G803SM-LL)											
	1.085kg (IPS-G803SM-HL)											
<b>Installation mounting</b>	DIN Rail mounting or wall mounting (Optional)											
<b>MTBF</b>	535,335 Hours (IPS-G803SM-LL)											
	143,943 Hours (IPS-G803SM-HL)											
	(MIL-HDBK-217)											
<b>Certification</b>												
<b>EMC/EMS</b>	CE (EN55024, EN55032)											
<b>EMI</b>	FCC Part 15 Subpart B Class A, EN55032 Class A											
<b>Railway Traffic</b>	EN50121-4											

<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 4, Criteria B
	EN61000-4-3 (RS) Level 4, Criteria A
	EN61000-4-4 (EFT) Level 4, Criteria A
	EN61000-4-5 (Surge) Level 4, Criteria B
	EN61000-4-6 (CS) Level 4, Criteria A
	EN61000-4-8 (Magnetic Field) Level 5, Criteria A
<b>Safety</b>	UL60950-1, EN60950-1
<b>Power Substation</b>	IEC 61850-3, IEEE 1613
<b>Freefall</b>	IEC 60068-2-32
<b>Vibration</b>	IEC 60068-2-6
<b>Shock</b>	IEC-60068-2-27

## Software Specifications

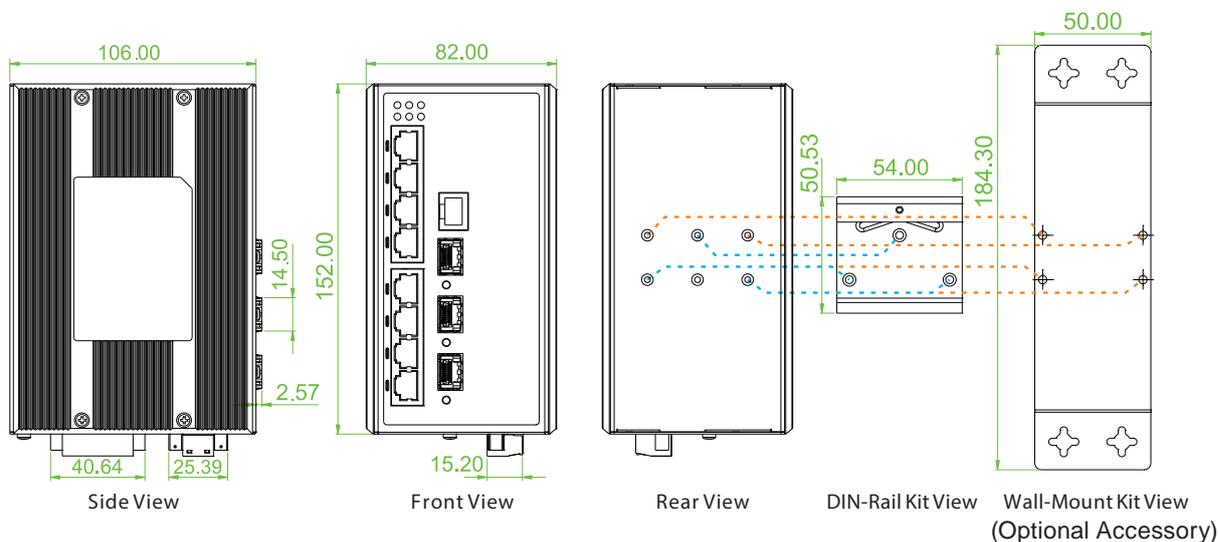
### Topology

<b>Static Route</b>	IPv4/ IPv6, 32 entries
<b>VLAN</b>	IEEE 802.1q VLAN, up to 4094 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 (Ethernet, SNAP, LLC), up to 128 entries
	VLAN Translation, up to 256 entries
	MVR (Multiple VLAN Registration)
	GVRP (GARP VLAN Registration Protocol)
	Voice VLAN
<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>	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s 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, Maximum 250 devices in a Ring
<b>Loop Protection</b>	Supported
<b>ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)</b>	Convergence time <50ms
	Single Ring, Sub-Ring, Multiple ring topology network
<b>ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching)</b>	Supported
<b>QoS Feature</b>	
<b>Class of Service</b>	IEEE 802.1p 8 active priorities queues for per port
<b>GOOSE Message</b>	Complies with IEC61850 standard to achieve zero packet loss
<b>Traffic Classification QoS</b>	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
<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 / Port shaper
<b>DiffServ (RF 2474) Remarking</b>	
<b>Storm Control</b>	For Unicast, Broadcast and Multicast
<b>IP Multicasting Feature</b>	
<b>IGMP / MLD Snooping</b>	IGMP Snooping v1, v2, v3 / MLD Snooping v1, v2 Supports 1022 IGMP groups, 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</b>	Authentication & Accounting
<b>TACACS+</b>	Authentication
<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 UI</b>	Supported
<b>Telnet</b>	Server
<b>SNMP</b>	V1, V2c, V3
<b>sFlow</b>	Supported
<b>Modbus/TCP</b>	Supports for management and monitoring
<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>	MIB II RFC1213, Private MIB
<b>UPnP</b>	Supported
<b>DHCP</b>	Server, Client, Relay, Relay option 82, Snooping
<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, SMTP/ e-mail event message, alarm relay
<b>DNS</b>	Client, Proxy
<b>IEEE 1588 PTP V2</b>	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and 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

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 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP
<b>Others Features</b>	
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 is normal or broken point distance

## Dimensions



## Ordering Information

Model Name	Managed	Total Port	RJ45		SFP		Redundant Input Power		Certification				
			10/100/1000 Base-T(X)	100/1000 Base-X	Low Voltage 24/48VDC	High Voltage 110/220VDC/AC	IEC61850-3 IEEE 1613	UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC		
IPS-G803SM-LL	V	11	8	3	2			V	V	V	V	V	
IPS-G803SM-HL	V	11	8	3	2	1		V	V	V	V	V	

## Optional Accessories

### ■ Wall Mount Kit

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 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)