

# IQS-402XSM

4x 2.5G N-Base-TX + 2x 10G Base-X SFP+ Compact Size

**NEW**



- EN50121-4, EN61000-6-2, EN61000-6-4, CE, FCC Certified
- Redundant 12/24/48VDC power input
- Supports  $\mu$ -Ring, ERPS, MSTP, RSTP, STP for redundant cabling



IQS-402XSM is an 1G/2.5G/10G managed Layer 2 Ethernet switch. It provides 4 port of electrical 10M/100M/1G/2.5GBase-T via RJ-45 plus 2 ports SFP slots of 100M/1G/2.5G/10GBase-X which provide stable and reliable long-distance Ethernet transmission over optical fiber. Built to Industrial grade standards, the FANLESS design provides high MTBF in indoor environments of operating temperature from -10 to 60°C (14 to 160°F), and incorporates redundant 12/24/48VDC power input. With Din-Rail or wall mounting metal housings, these switches are perfect choices for heavy duty use in harsh environments, such as Industrial Factory Automation, Data Center Networking, Intelligent Transportation Systems (ITS) and are also suitable for many military and utility market applications where environmental conditions exceed commercial product specifications.

These managed switches also support a wide variety of Ethernet Layer 2 functions, including CTC Union proprietary  $\mu$ -Ring, ERPS, MSTP, RSTP and STP. They also support Layer 2 IGMP, VLAN, QoS, ACL, Security, IPv6, bandwidth control, and port mirroring. Additionally, these switches can also be managed by CTC Union's SmartView™ Element Management System, which offers a user-friendly and centralized device management platform and provides administrators the ability to monitor and configure these connected switches remotely.

## Features

- 4x 10M/100M/1G/2.5GBase-T RJ-45+ 2x 1G/2.5G/10GBase-X SFP
- Provides 3 ring instances that each can support  $\mu$ -Ring,  $\mu$ -Chain or Sub-Ring type for flexible uses.
- Supports up to 3 rings in one device (Please see CTC  $\mu$ -Ring white paper for more details and more topology application)
- 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
- Flexibility 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 upgrade failure
- 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

## Specifications

<b>Standard</b>	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 802.3bz	2.5GBase-T
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic
	IEEE 802.3ae	10G bit/s Ethernet over Fiber
	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	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	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)

<b>Standard</b>	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)
<b>Switch Architecture</b>	Back-plane (Switching Fabric): 60Gbps 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 10M/100M/1G/2.5GBase-T RJ-45 + 2x 1G/2.5G/10GBase-X SFP port RJ45 port supports auto-negotiation Auto MDI/MDI-X function SFP port supports 1G/2.5G/10G speed with DDMI	

<b>Network Cable</b>	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)	
<b>Protocols</b>	CSMA/CD	
<b>Overload Current Protection</b>	Supported	
<b>CPU Watch Dog</b>	Supported	
<b>Power Supply</b>	Redundant dual power input 12/24/48VDC(9.6~60VDC) (Removable terminal block)	
<b>Power Consumption</b>	<b>Input Voltage</b>	<b>Power Consumption</b>
	12VDC	11.1W
	24VDC	11.5W
	48VDC	12W
<b>LED</b>	Per unit: PWR 1, PWR 2 (Green) Per RJ-45 port: 10/100 Link/Active (Green) 1G/2.5G Link/Active (Amber) SFP Fiber Per port: Link/Active (Green)	
<b>Jumbo Frame</b>	9.6K Byte	
<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>Device Memory</b>	128M Bytes Flash ROM, 256M Bytes RAM	
<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>	Provides redundant power PWR1, PWR2 and Alarm Relay, 6 pin	
<b>Operating Temperature</b>	-10 ~ 60°C	
<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>	127.6x 48.6x 160mm ( D x W x H)
<b>Weight</b>	1,530g
<b>Installation Mounting</b>	DIN Rail mounting, or wall mounting (Optional)
<b>MTBF</b>	588,603 Hours (MIL-HDBK-217)
<b>Warranty</b>	5 Years
<b>Certification</b>	
<b>EMC</b>	CE (EN55032, EN55035)
<b>EMI (Electromagnetic Interference)</b>	FCC Part 15 Subpart B Class A,CE
<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>	EN62368-1 (Pending)
<b>Shock</b>	IEC 60068-2-27
<b>Freefall</b>	IEC 60068-2-31
<b>Vibration</b>	IEC 60068-2-6

## Software Specifications

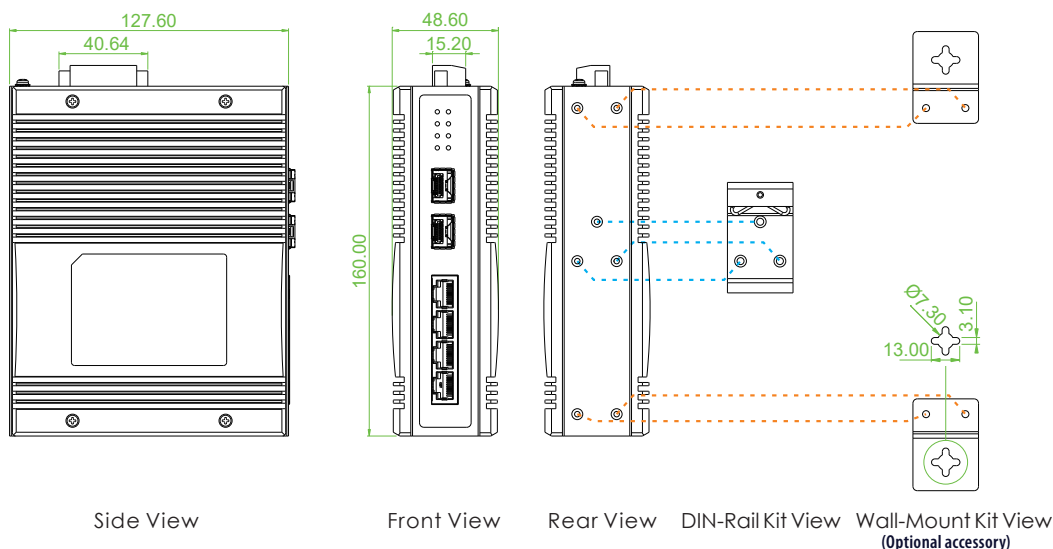
<b>Topology</b>	
<b>VLAN</b>	IEEE 802.1q VLAN, up to 4094 802.1Q VLAN VID IEEE 802.1q VLAN, up to 4094 Groups IEEE 802.1ad Q-in-Q MAC-based VLAN, up to 256 entries IP Subnet-based VLAN, up to 128 entries Protocol-based VLAN(Ethernet, SNAP, LLC), up to 128 entries VLAN Translation, up to 256 entries Private VLAN for port isolation 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 μ-Ring</b>	up to 3 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 3 Rings Recovery time <10ms The maximum number of devices allowed in a Ring supported ring is 250 (Please see CTC Union μ-Ring white paper for more details and more topology application)
<b>ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)</b>	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network
<b>Loop Protection</b>	Supported
<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
<b>Traffic Classification QoS</b>	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>	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps"
<b>Bandwidth Control for Egress</b>	100~1,000,000 when the "Unit" is "kbps" and 1~1,000 when the "Unit" is "Mbps" Per queue / Per port shaper
<b>DiffServ (RF 2474) Remarking</b>	for Unicast, Broadcast, Multicast
<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>	
<b>CLI</b>	Cisco® like CLI
<b>Web Based Management</b>	
<b>Telnet</b>	Server
<b>SNMP</b>	V1, V2c, V3
<b>Modbus/TCP</b>	Support 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>	RFC1213 MIB II, 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) (Supports 4 servers)
<b>Warning Message</b>	System syslog, SMTP/e-mail event message, alarm relay
<b>DNS</b>	Client, Proxy
<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 SIP, Subnet (32bit) L4 : TCP/UDP

## Dimensions



## Ordering Information

Model Name	Total Ports	UTP (RJ45)	Fiber	Redundant Power Input	Certification		
		10/100/1G/2.5G Base-T	1G/2.5G/10G		RailWay EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
IQS-402XSM	6	4	2 SFP	12/24/48VDC	V	V	V

### Package List

- IQS-402XSM device
- Protective caps for SFP ports

## Optional Accessories

### 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.)

<b>ISFP-M9000-85-D(E)</b>	Industrial SFP 10GBase-SR MM, 300meter, wave length 850nm LC, DDMI, -10~70°C (-40~85°C)
<b>ISFP-S9010-31-D(E)</b>	Industrial SFP 10GBase-LR SM, 10km, 1310nm, 6.4dB, LC, DDMI, -10~70°C (-40~85°C)
<b>ISFP-M7000-85-D(E)</b>	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, 7.5dB, LC, DDMI, -10~70°C (-40~85°C)
<b>ISFP-S7020-31-D(E)</b>	Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDMI, -10~70°C (-40~85°C)

### Industrial Power Supply

<b>MDR-40-24</b>	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 24VDC, 40W, -20 ~ +70°C
<b>MDR-40-48</b>	Industrial Power, Input 85 ~ 264VAC/120 ~ 370VDC, Output 48VDC, 40W, -20 ~ +70°C