



ICS-G24S4X

24x 100/1000Base-X SFP with 4x GbE Combo plus
4x 10GbE SFP+ Core Switch

ICS-G24S2X

24x 100/1000Base-X SFP with 4x GbE Combo plus
2x 10GbE SFP+ Core Switch



ICS-G24S4X & ICS-G24S2X are industrial grade Ethernet Core Switches that are equipped with 20 gigabit SFP ports plus 4 combo gigabit ports and 2 or 4 10G SFP+ ports. ICS series models are all fan-less designs with redundant, isolated power supplies (2 AC, 2 DC, AC + DC) and can be mounted in 19 inch EIA standard rack. This series offers various layer 2 Ethernet functions (IGMP, VLAN, QoS, ACL, Security, IPv6, bandwidth control, and port mirroring) and also support μ-Ring redundancy protocol that can establish 14 independent rings for flexible applications, especially when employed in backbone infrastructure. ICS switches can also be managed centrally and conveniently by CTC Union's SmartView™ Element Management System and mass configured by SmartConfig™.

Housed in rugged rack mountable enclosures, ICS Series are certified with many industrial-grade standards and are ideal for deployments in harsh environments to deliver mission-critical network services. Additionally, with high port density and Gigabit or 10 Gigabit high-speed uplink, ICS-G24S4X & ICS-G24S2X are a reliable and scalable solution for core layer or backbone applications (See figure 1 & 2).

Features

- 24x 100/1000Base-X SFP with 4x Combo (SFP+RJ-45) and 4x 10G Base-X SFP+ (ICS-G24S4X)
- 24x 100/1000Base-X SFP with 4x Combo (SFP+RJ-45) and 2x 10G Base-X SFP+ (ICS-G24S2X)
- Redundancy isolated low voltage 24/48VDC, or/and isolated High voltage (110/220VAC) power inputs
- **Supports negative voltage power input with isolated RS-232 console port (for example in telecom system)**
- Rugged metal, IP30 protection & Fanless design
- UL60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for redundant cabling
- Provides 14 instances that each can support μ-Ring, μ-Chain or Sub-Ring type for flexible uses. Supports up to 14 rings in one device (Please see CTC Union μ-Ring white paper for more details and more topology application)
- μ-Ring for Redundant Cabling, recovery time<50ms in 250 devices
- 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
- IEEE 802.1q 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 IEEE 802.1X, RADIUS, ACL, TACACS+, HTTP/HTTPS, SSL/SSH v2
- Software upgrade via TFTP and HTTP, redundant firmware to avoid in case of upgrade failure
- 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
- RMON, MIB II, Port mirroring, Event syslog, DNS, NTP, SNTP, IEEE 802.1ab LLDP
- Supports IPv6 Telnet server /ICMP v6
- CLI, Web based management, SNMP v1/v2c/v3, Telnet server for management
- Supports Modbus/TCP protocols for management
- Provides SmartConfig for quick and easy mass Configuration*
- Supports SmartView for Centralized Management*

*Please see Chapter 1- **Software Management** for more details

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 802.3ae	10 Gbit/s Ethernet over fiber
	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

Standard	IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.1ad	Stacked VLANs, Q-in-Q
	IEEE 802.1p	LAN Layer 2 QoS/CoS Protocol for Traffic Prioritization
	IEEE 802.ab	Link Layer Discovery Protocol (LLDP)
VLAN ID	4094	IEEE 802.1Q VLAN VID
Switch Architecture	Back-plane (Switching Fabric): 128Gbps (ICS-G24S4X) 88Gbps (ICS-G24S2X) (Full wire-speed)	
Data Processing Network Connector	Store and Forward 24x 100/1000Base-X SFP with 4x GbE Combo (UTP/SFP)+ 4x 10GBase-X SFP+ (ICS-G24S4X) 24x 100/1000Base-X SFP with 4x GbE Combo (UTP/SFP)+ 2x 10GBase-X SFP+ (ICS-G24S2X)	

Network Connector	RJ-45 UTP port support 10/100/1000Base-T(X) , Auto negotiation speed,Auto MDI/MDI-X function GbE port SFP support dual speed (100M/1000M) with DDMI 10GbE port SFP+ support dual speed (1000M/10G) with DDMI		
Console	RS-232 (RJ-45) Isolated RS-232 port grounding for negative voltage power system, or telecom application		
Network Cable	UTP/STP above Cat. 5e cable EIA/TIA-568 100-ohm (100m)		
Protocols	CSMA/CD		
Reverse Polarity Protection	Supported		
Overload Current Protection	Supported		
CPU Watch Dog	Supported		
Power Supply	Redundant 2x isolated High Voltage AC input power (-AA model) Redundant 2x Isolated Low Voltage DC Input power (-DD model) Redundant 1x isolated Low Voltage DC and 1x High Voltage AC input power (-AD model) Low Voltage DC (D): Isolated 24/48V (18~60VDC), Removable Terminal Block High voltage AC (A): Isolated 110/220VAC (85VAC~264VAC) Supports negative voltage power input with isolated RS-232 console port (for example in telecom system)		
Power Consumption	Input Voltage	ICS-G24S4X	ICS-G24S2X
	24VDC	33.1W	29.8W
	48VDC	33.4	30.1W
	110VAC	34.4W	31.1W
	220VAC	34.4W	31.1W
LED	Per unit: Power 1 (Green), Power 2 (Green), Act/Alarm (Green/ Amber), Ring Master (Green) Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Yellow) SFP (P1~24) Fiber Per port: 100Base-X Link/Active (Green) 1000Base-X Link/Active (Yellow) SFP+ (P25~P28) Fiber Per port: 1000Base-X Link/Active (Amber) 10GBase-X Link/Active (Blue)		
Jumbo Frame	10K		
MAC Address Table	32K		
Memory Buffer	4M Bytes for packet buffer		
Warning Message	System Syslog, SMTP/ e-mail event message, alarm relay		

Software Specifications

Topology	
VLAN	IEEE 802.1q VLAN, up to 4094 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 GVRP (GARP VLAN Registration Protocol) MVR (Multicast VLAN Registration)
Link Aggregation (Port Trunk)	Static (Hash with SA, DA, IP, TCP/UDP port), Maximum trunk group : 14group (ICS-G24S4X), 23group (ICS-G24S2X) Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 14group (ICS-G24S4X), 23group (ICS-G24S2X) Per group up-to 8 port
Spanning Tree Multiple μ-Ring	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP up to 14 instances that each supports μ-Ring, μ-Chain or Sub-Ring type for flexible uses, and maximum up to 14 Rings. Recovery time <50ms 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)
Loop Protection	Supported
ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology network

Alarm Relay Contact	Relay outputs with current carrying capacity of 1 A @24VDC, 2-Pin removable terminal block	
Operating Temperature	-10 ~ 60°C	
Operating Humidity	5% to 95% (Non-condensing)	
Storage Temperature	-40 ~ 85°C	
Housing	Rugged Metal, IP30 Protection, Fanless	
Dimensions	315 x 440 x 44 mm (D x W x H)	
Weight	4.755kg (ICS-G24S4X-AA) 4.51kg (ICS-G24S4X-AD) 4.2kg (ICS-G24S2X-DD)	4.26kg (ICS-G24S4X-DD) 4.695kg (ICS-G24S2X-AA) 4.45kg (ICS-G24S2X-AD)
Installation Mounting	19" rack mount	
MTBF	176,414 Hours (ICS-G24S4X-AA) 190,965 Hours (ICS-G24S4X-AD) 214,649 Hours (ICS-G24S4X-DD) 176,663 Hours (ICS-G24S2X-AA) 191,257 Hours (ICS-G24S2X-AD) 215,018 Hours (ICS-G24S2X-DD) (MIL-HDBK-217)	
Warranty	5 years	
Certification		
EMC	CE (EN55024, EN55032)	
EMI (Electromagnetic Interference)	FCC Part 15 Subpart B Class A, CE	
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	

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 QCE(QoS Control Entry): Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
Bandwidth Control for Ingress	Per port based
Bandwidth Control for Egress	Per port based Per queue / Per port shaper
DiffServ (RF 2474) Remarkings	
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 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP

RADIUS authentication & accounting 2019_v1.0

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

TACACS+ authentication & accounting, TACACS+ 3.0	
HTTPS, HTTP	Supported
SSL / SSH v2	Supported
User Name	Local Authentication
Password	Local Authentication
Authentication	Remote Authentication (via RADIUS / TACACS+)
Management	
Interface Access	Web, Telnet / SSH , CLI RS-232 console
Filtering	
Management Features	
CLI	Cisco® like CLI
Web Based Management	
Telnet	Server
SNMP	V1, V2c, V3
Modbus/TCP	Supports for management and monitoring
SW & Configuration Upgrade	Redundant firmware in case of upgrade failure
RMON	RMON I (1, 2, 3, 9 group), RMON II
MIB	RFC1213 MIB II, Private MIB
UPnP	Supported
DHCP	Server/Client/Relay/Relay option 82/Snooping
IP Source Guard	Supported
Port Mirroring	Supported

Event Syslog	Syslog server (RFC3164) (Support 1 server)
Warning Message	System syslog, e-mail, alarm relay
DNS	Client, Proxy
IEEE 1588 PTP V2	Supports 5 operating mode in each port : Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master, 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 L2 : Mac address SA/DA/VLAN L3: IP address SA/DA, Subnet L4: TCP/UDP

Application

Figure 1 : 10G Backbone application

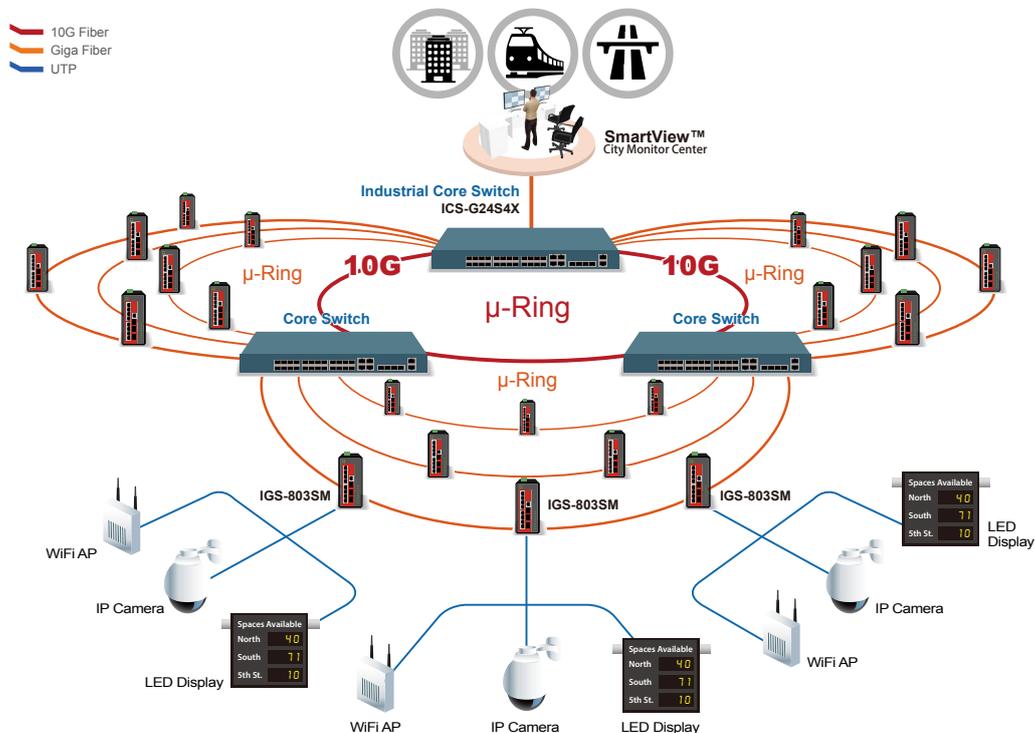
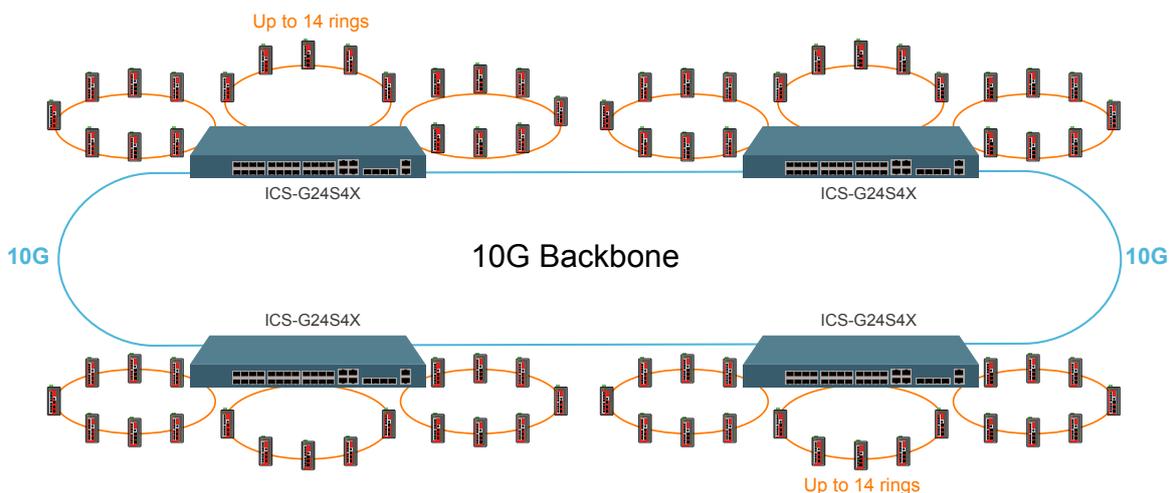
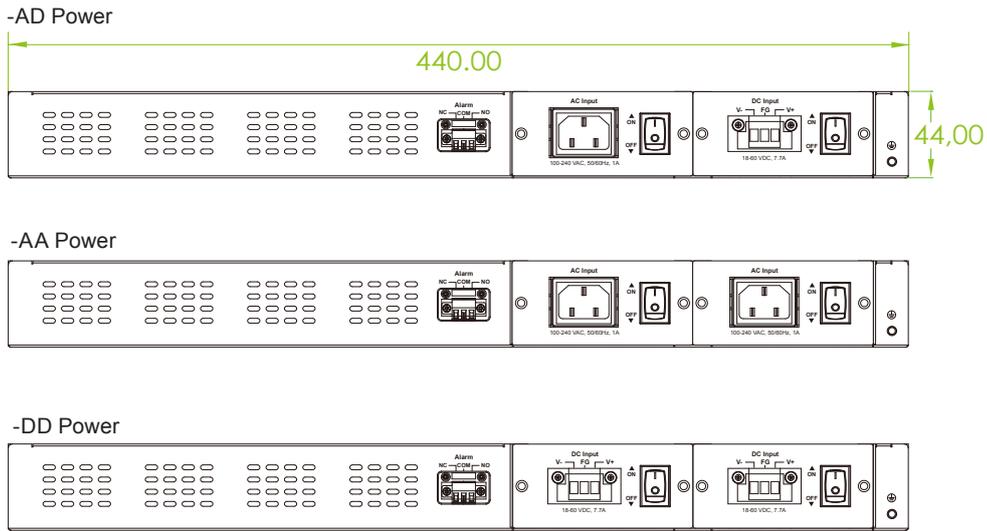


Figure 2 : 10G Backbone with μ-Ring topology

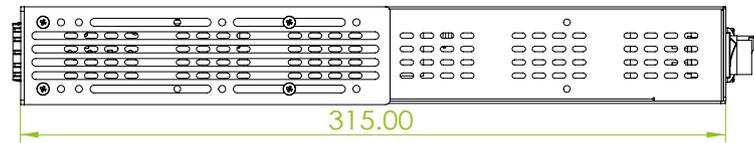


Dimensions

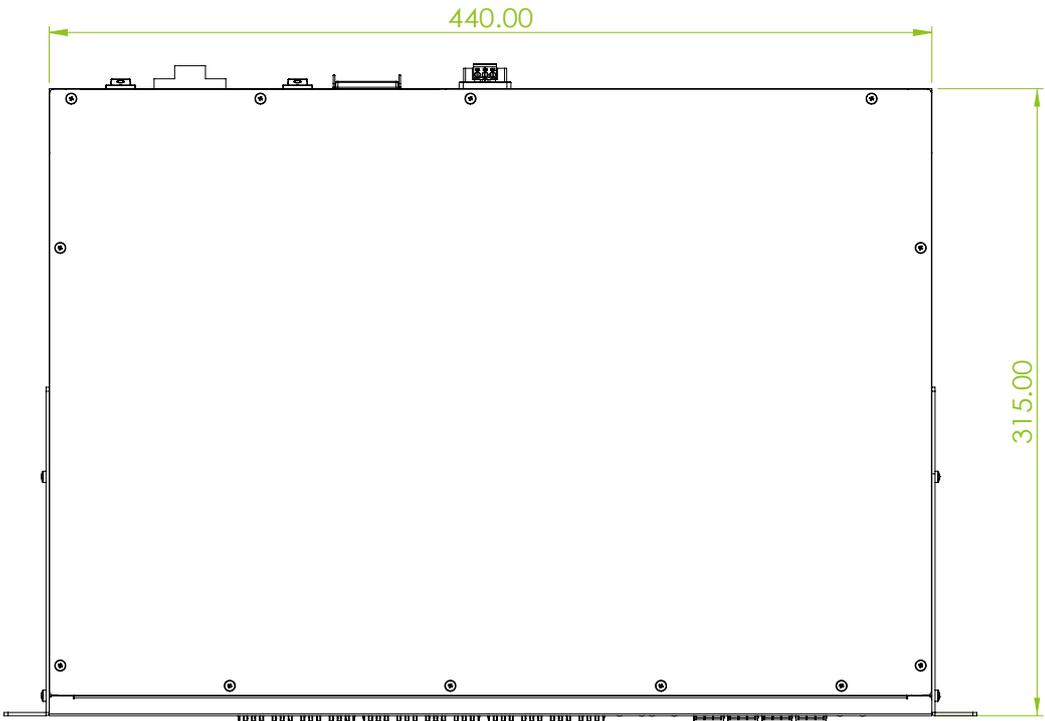
Rear View



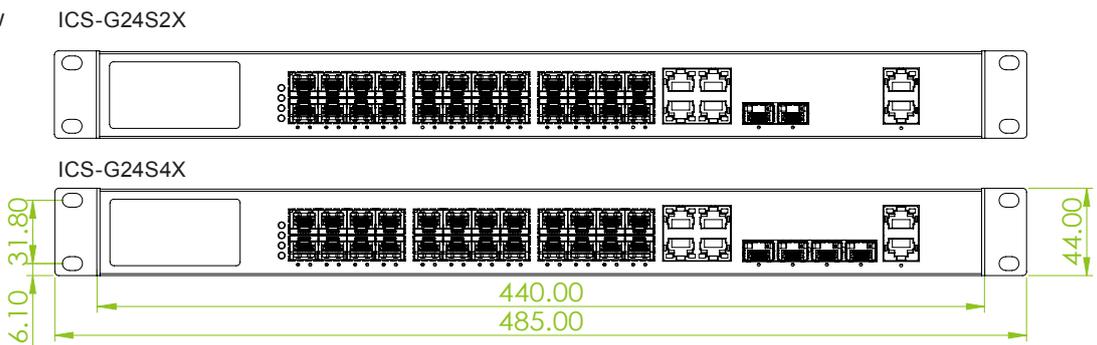
Side View



Top View



Front View

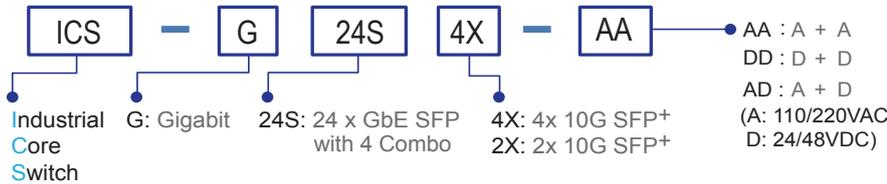


2
Industrial 10G Core Switch ICS-G24S2X & ICS-G24S4X

Ordering Information

Model Name	Managed	Total Port	GbE Port		10GbE	Input Power		Certification			
			100/1000 Base-X SFP	10/100/1000 Base-T UTP or 100/1000Base-X SFP	IEEE 802.3ae SFP+	DC (Low Volt) isolated 24/48VDC	High Volt 110/220VAC	Safety UL60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE FCC
ICS-G24S4X-AA	V	28	20	4 Combo	4		2	V	V	V	V
ICS-G24S4X-DD	V	28	20	4 Combo	4	2		V	V	V	V
ICS-G24S4X-AD	V	28	20	4 Combo	4	1	1	V	V	V	V
ICS-G24S2X-AA	V	26	20	4 Combo	2		2	V	V	V	V
ICS-G24S2X-DD	V	26	20	4 Combo	2	2		V	V	V	V
ICS-G24S2X-AD	V	26	20	4 Combo	2	1	1	V	V	V	V

Model Naming Rule



Package List

- ICS-G24S4X or ICS-G24S2X device
- Console cable (RJ-45 to DB9)
- CD (SmartConfig, MIB file, Manual)
- Quick installation guide
- Rack mount ear with screws
- Power cord (for-A model)

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.)

ISFP-M9000-85-D(E)	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber), wave length 850nm, DDMI, -10~70°C (-40~85°C)
ISFP-S9010-31-D(E)	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDMI, -10~70°C (-40~85°C)
ISFP-M7000-85-D(E)	Industrial SFP GbE 1000Base-SX, M/M, 500 meter, wave length 850nm, DDMI, -10~70°C (-40~85°C)
ISFP-S7020-31-D(E)	Industrial SFP 1000Base-SX, S/M, 20km, wave length 1310nm, 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)

SFP Naming Rule

