

**NEW**


## ICS-G24044X

24x 10/100/1000Base-T(X) +  
4x 100/1000Base-X SFP +  
4x 10GBase-X SFP+ Core Switch

## ICS-G4804X (Preliminary)

48x 10/100/1000Base-T(X) +  
4x 1G/2.5G/10G SFP+ Core Switch



CTC Industrial Rackmount Ethernet Core Switch family are hardened design managed core switch for rigorous demands of centralize and critical applications. The rackmount Ethernet core switch supports 4-port 10Gbps SFP+ and 24 / 48 Gigabit Ethernet (10/100/1000BaseTX) RJ-45 port plus 4 dual speed (100/1000Base-X) SFP fiber optical slots, thus providing 32 / 52 ports total for Ethernet connectivity. The family product are ideal solution for Smart City, surveillance, Intelligent traffic control systems and production automation applications.

The family product provides up to 10KB jumbo frame support, a 32K MAC address table and 4MB packet memory buffer. Moreover, the full Gigabit capability supports Link Aggregation (Dynamic IEEE 802.3ad LACP) with up to 16 / 26 trunk group (maximum 8 ports per group) to increase bandwidth for providing high performance quick transfer of large amounts of video, voice and data across a network.

The family product supports a variety of Ethernet ring redundancy functions, including STP/RSTP/MSTP/ERPS and enhanced µ-Ring/µ-Chain/Sub-Ring that provide less than 50ms recovery time with up to 250 nodes in a ring. Redundant power input increases system reliability and the availability of your network backbone.

## Features

- 24x10/100/1000Base-T RJ-45+ 4x100/1000Base-X SFP + 4x 1G/2.5G/10GBase-X SFP+ (ICS-G24044X)
- 48x10/100/1000Base-T RJ-45 + 4x 1G/2.5G/10GBase-X SFP+ (ICS-G4804X)
- Redundant isolated 24/48VDC, or/and isolated 110/220VAC power inputs
- Supports negative voltage power input**
- Rugged metal, IP30 protection & Fanless design
- UL60950-1, EN60950-1, CE, FCC, Rail Traffic EN50121-4 certified
- Heavy industrial grade EMS, EMI, EN61000-6-2, EN61000-6-4 certified
- 4KV surge protection for RJ45 and SFP ports**
- 2.25KVDC Hi-pot isolation protection for Ethernet ports and power**
- STP, RSTP, MSTP, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support µ-Ring, u-Chain or Sub-Ring for flexible networking applications
- µ-Ring redundancy, recovery time <50ms in 250 devices
- DHCP Server/Client/Relay/Snooping/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 V4.0, SNTP, IEEE 802.1ab LLDP
- 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	Standard	ITU-T G.8032 / Y.1344	ERPS (Ethernet Ring Protection Switching)
	IEEE 802.3u	100Base-TX, 100Base-FX, Fast Ethernet		IEEE 802.1Q	Virtual LANs (VLAN)
	IEEE 802.3ab	1000Base-T Gbit/s Ethernet over twisted pair		IEEE 802.1X	Port based and MAC based Network Access Control, Authentication
	IEEE 802.3z	1000Base-X Gbit/s Ethernet over Fiber-Optic		IEEE 802.3ac	Max frame size extended to 1522Bytes
	IEEE 802.3ae	10 Gbit/s Ethernet over fiber		IEEE 802.3ad	Link aggregation for parallel links with LACP(Link Aggregation Control Protocol)
	IEEE 802.1d	STP (Spanning Tree Protocol)			
	IEEE 802.1w	RSTP (Rapid Spanning Tree Protocol )			
	IEEE 802.1s	MSTP (Multiple Spanning Tree 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)
	IEEE 802.3az	EEE (Energy Efficient Ethernet)
<b>VLAN ID</b>	4094	IEEE 802.1Q VLAN VID
<b>Switch Architecture</b>	Back-plane (Switching Fabric): 136Gbps (ICS-G24044X) 156Gbps (ICS-G4804X) (Full wire-speed)	
<b>Data Processing</b>	Store and Forward	
<b>Network Connector</b>	<b>10GbE SFP+ :</b> 4x 1G/2.5G/10G SFP socket Supports DDMI <b>GbE SFP:</b> 4x 100/1000Base-X SFP socket (ICS-G24044X) Support DDMI <b>RJ45:</b> 24x 10/100/1000Base-T RJ-45 (ICS-G24044X) 48x 10/100/1000Base-T RJ-45 (ICS-G4804X) Support Auto negotiation speed, Auto MDI/MDI-X function	
<b>Console</b>	RS-232 (RJ-45)	
<b>Network Cable</b>	UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100m)	
<b>Protocols</b>	CSMA/CD	
<b>Reverse Polarity Protection</b>	For input power	
<b>Overload Current Protection</b>	Supported	
<b>CPU Watch Dog</b>	Supported	
<b>Power Supply</b>	Redundant 2x AC input power (-AA model) 1x AC input power (-A model) Redundant 1x AC and 1x DC input power (-AD model) Redundant 2x DC input power (-DD model) 1x DC input power (-D model)  AC input power (A) : Isolated 110/220VAC (85VAC~264VAC) DC input power (D) : Isolated 24/48VDC (18~60VDC), Removable Terminal Block Supports negative voltage power input	
<b>Power Consumption</b>	< 33W @24/48VDC, 110/220VAC (ICS-G24044X) TBD (ICS-G4804X)	
<b>LED</b>	Per unit: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green). P1~P24 (ICS-G24044X) P1~P48 (ICS-G4804X) Per RJ-45 port: 10/100 Link/Active (Green) 1000 Link/Active (Amber)  P25~P28 (ICS-G24044X) Per SFP Fiber port: 100/1000Base-X Link/Active (Amber)  P29~P32 (ICS-G24044X) P49~P52 (ICS-G4804X) Per SFP+ Fiber port: 1000Base-X Link/Active (Amber) 10GBase-X Link/Active (Blue)	

## 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 GVRP (GARP VLAN Registration Protocol) MVR (Multicast VLAN Registration)
<b>Link Aggregation (Port Trunk)</b>	Static (IEEE 802.3ad LACP), Maximum trunk group : 16group (ICS-G24044X) 26group (ICS-G4804X)  Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group (ICS-G24044X) 26group (ICS-G4804X)  Per group up-to 8 port
<b>Spanning Tree</b>	IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP
<b>Multiple μ-Ring</b>	Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications. Recovery time <50ms The maximum number of device is allowed 250 in a Ring.

<b>Jumbo Frame</b>	10K Byte
<b>MAC Address Table</b>	32K
<b>Memory Buffer</b>	4M Bytes for packet buffer
<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 1A @24VDC, 2-Pin removable terminal block
<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>	280x 440 x 44mm (D x W x H)
<b>Weight</b>	4.755kg (ICS-G24044X-AA ) 4.51kg (ICS-G24044X-AD ) 4.26kg (ICS-G24044X-DD ) TBD (ICS-G4804X )
<b>Installation Mounting</b>	19" rack mount
<b>MTBF</b>	103,057 Hours (ICS-G24044X-AA) 103,451 Hours (ICS-G24044X-AD) 103,447 Hours (ICS-G24044X-DD) TBD (ICS-G4804X)
<b>Warranty</b>	5 years
<b>Certification</b>	
<b>EMC</b>	CE (EN55024, EN55032)
<b>EMI (Electromagnetic Interference)</b>	FCC Part 15 Subpart B Class A, CE
<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 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>	UL60950-1, EN60950-1
<b>Hi pot protection</b>	DC 2.25KV for power to chassis ground, Ethernet port to chassis ground
<b>4KV surge protection</b>	Supported for RJ45 and SFP ports
<b>Shock</b>	IEC 60068-2-27
<b>Freefall</b>	IEC 60068-2-32
<b>Vibration</b>	IEC 60068-2-6

<b>Loop Protection</b>	Supported
<b>ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)</b>	Recovery time <50ms Single Ring, Sub-Ring, Multiple ring topology
<b>QoS Features</b>	
<b>Class of Service</b>	IEEE 802.1p 8 active priorities queues for per port
<b>Traffic Classification QoS</b>	IEEE 802.1p 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 Protocol, Source IP, IP Fragment, DSCP, TCP/UDP port number
<b>Bandwidth Control for Ingress</b>	Per port based
<b>Bandwidth Control for Egress</b>	Per port based Per queue / Per port shaper
<b>DiffServ (RF 2474) Remarking</b>	
<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

## Security Features

<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

## RADIUS authentication & accounting

## TACACS+ authentication & accounting, TACACS+ 3.0

<b>HTTPS, HTTP</b>	Supported
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<b>SSL / SSH v2</b>	Supported
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<b>User Name Password Authentication</b>	Local Authentication
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<b>Remote Authentication (via RADIUS / TACACS+)</b>	
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<b>Management Interface Access Filtering</b>	Web, Telnet / SSH, CLI RS-232 console
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## Management Features

<b>CLI</b>	Cisco® like CLI
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## Web Based Management

<b>Telnet</b>	Server
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<b>SNMP</b>	V1, V2c, V3
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<b>Modbus/TCP</b>	Support for management and monitoring
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<b>SW &amp; Configuration Upgrade</b>	TFTP, HTTP
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	Redundant firmware in case of upgrade failure
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<b>RMON</b>	RMON I (1, 2, 3, 9 group), RMON II
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<b>MIB</b>	RFC1213 MIB II, Private MIB
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<b>UPnP</b>	Supported
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<b>DHCP</b>	Server, Client, Relay, Relay option 82, Snooping
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<b>IP Source Guard</b>	Supported
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<b>Mirroring</b>	Local and Remote
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<b>Event Syslog</b>	Syslog server (RFC3164) (Support 1 server)
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<b>Warning Message</b>	System syslog, e-mail, alarm relay
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<b>DNS</b>	Client, Proxy
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<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, Slave
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<b>NTP V4.0, SNTP</b>	Client
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<b>LLDP (IEEE 802.1ab)</b>	Link Layer Discovery Protocol
	LLDP-MED

## IPv6 Features

<b>IPv6 Management</b>	Telnet Server/ICMP v6
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<b>SNMP over IPv6</b>	Supported
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<b>HTTP over IPv6</b>	Supported
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<b>SSH over IPv6</b>	Supported
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<b>IPv6 Telnet</b>	Supported
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<b>IPv6 NTP, SNTP</b>	Client
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<b>IPv6 TFTP</b>	Supported
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<b>IPv6 QoS</b>	Supported
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<b>IPv6 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

## Application

Figure 1 : 10G Backbone application

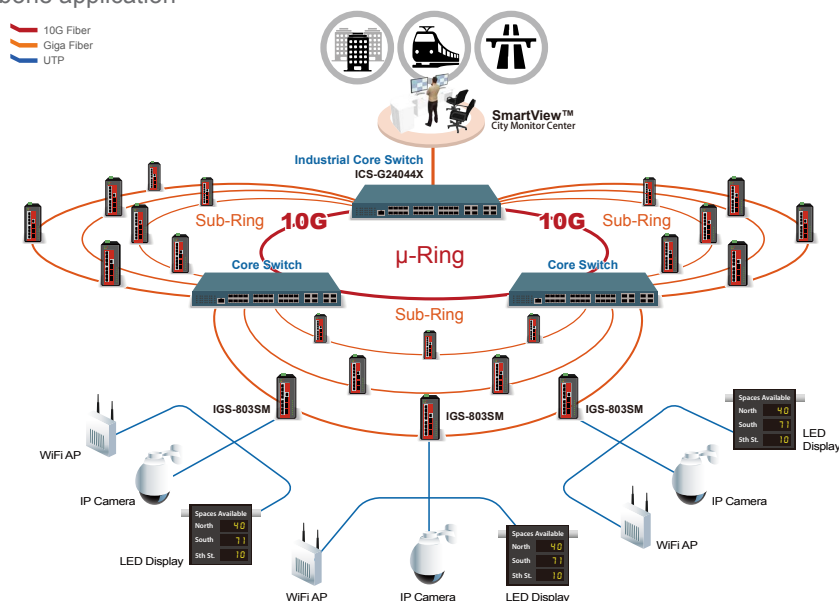
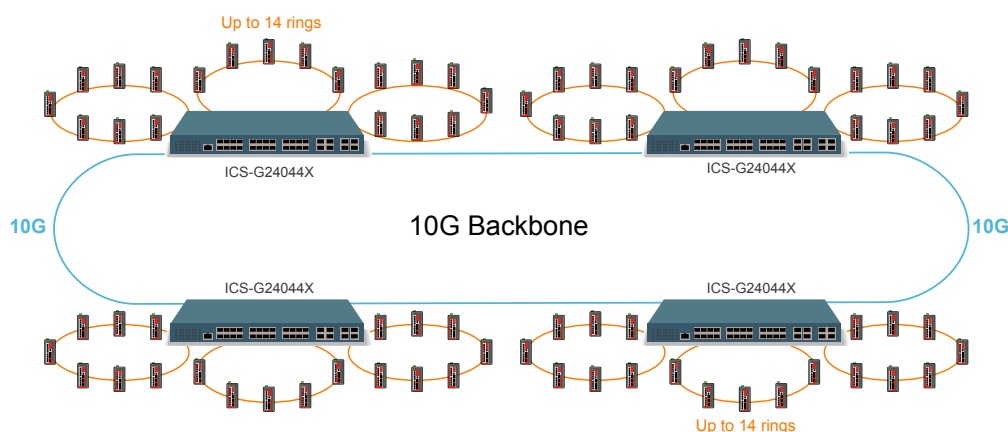


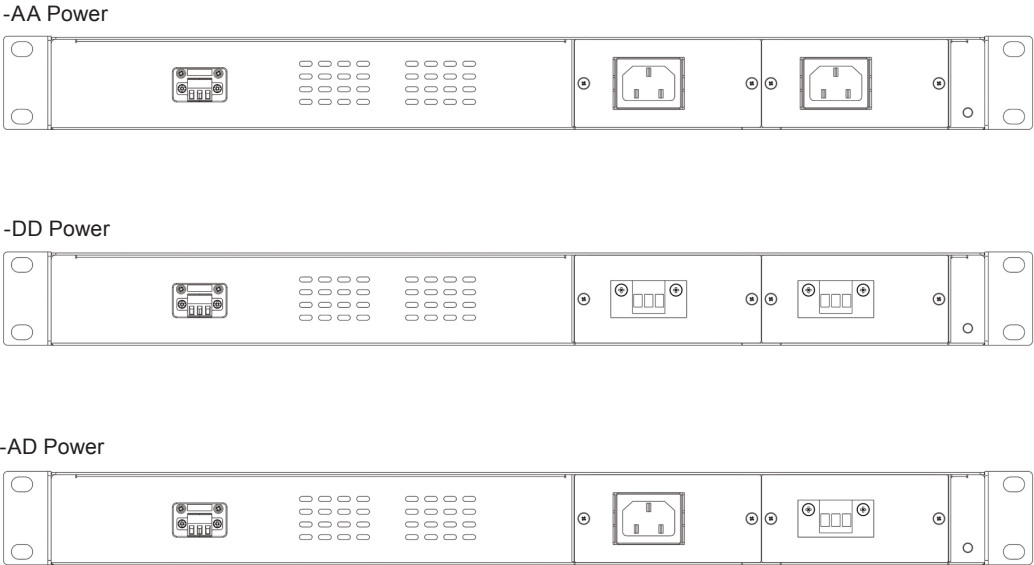
Figure 2 : 10G Backbone with μ-Ring topology



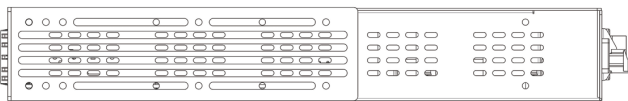
**Dimensions**

ICS-G24044X

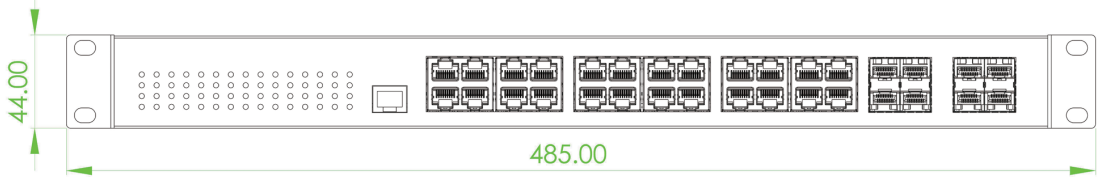
Rear View



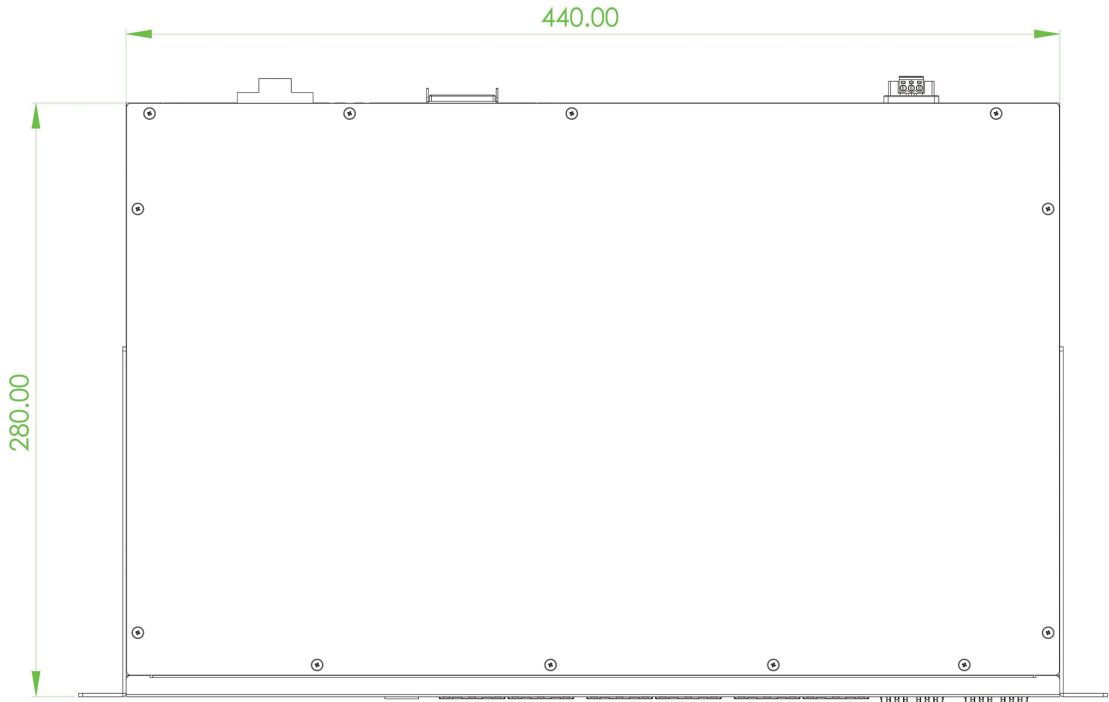
Side View



Front View



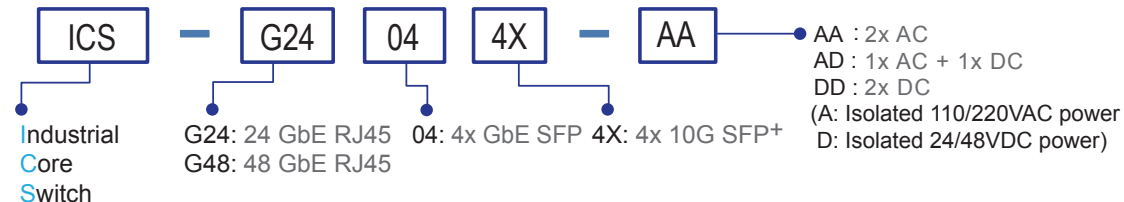
Top View



## Ordering Information

Model Name	Managed	Total Ports (Maximum)	GbE		10GbE 1G/2.5G/ 10GBase-X SFP+	Input power		Certification			
			10/100/1000 Base-T(X) RJ45	100/1000 Base-X SFP		24/48VDC	110/220VAC	Safety UL60950-1 EN60950-1	EN50121-4	EN61000-6-2 EN61000-6-4	CE, FCC
ICS-G24044X-AA	V	32	24	4	4		2	V	V	V	V
ICS-G24044X-AD	V	32	24	4	4	1	1	V	V	V	V
ICS-G24044X-DD	V	32	24	4	4	2		V	V	V	V
ICS-G4804X-AA	V	52	48		4		2	V	V	V	V
ICS-G4804X-AD	V	52	48		4	1	1	V	V	V	V
ICS-G4804X-DD	V	52	48		4	2		V	V	V	V

### Model Naming Rule



## 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.

<b>ISFP-M9000-85-D(E)</b>	Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber), wave length 850nm, DDMI, -10~70°C (-40~85°C)
<b>ISFP-S9010-31-D(E)</b>	Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, 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)
<b>ISFP-T7T00-00-(E)</b>	Industrial SFP 10/100/1000Base-T UTP 100meter, -10~70°C (-40~85°C)
<b>ISFP-M5002-31-D(E)</b>	Industrial SFP 155M 100Base-FX, MM, 2km, wave length 1310nm, 12dB, LC, DDMI, -10~70°C (-40~85°C)
<b>ISFP-S5030-31-D(E)</b>	Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDMI, -10~70°C (-40~85°C)

### SFP Naming Rule

