

**L3 24x 100/1000Base-X SFP + 4x GbE RJ45 + 4x 1G/2.5G/10G SFP+**

- » VRRP v2/v3, L3 IPV4/IPV6 Static Routing, RIP v1/v2 Dynamic Routing, OSPF v2/v3 Dynamic Routing
- » Supports u-Ring, ERPS, EPS, MSTP, RSTP, STP for Redundant Cabling
- » Supports Maximum up to 14 u-Rings in One Device
- » EN62368-1, EN50121-4, EN61000-6-2, EN61000-6-4, CE and FCC Certified
- » 4KV Surge Protection for RJ45 and SFP Ports
- » Supports Negative Voltage Power Input



As an industrial Layer 3 Ethernet switch for process and transportation automation applications, IXR-GS24044X supports static and dynamic routing protocols, features 4 10G SFP+ slots, 24 100/1000Mbps SFP slots and 4 Gigabit UTP ports, fanless design and redundancy isolated power supplies, certified to many industry-grade standards, are ideal for deployment in harsh environments to provide mission-critical network services

**Features**

- Redundant isolated 24/48/-48VDC (18~60VDC), or/and isolated 110/220VAC power inputs
- Supports negative voltage power input
- 2.25K VDC Hi-pot isolation protection for Ethernet ports and power
- STP, RSTP, MSTP, G.8031 EPS, ITU-T G.8032 Ethernet Ring Protection Switching (ERPS) for network redundancy
- Provides 14 instances each can support  $\mu$ -Ring, u-Chain or Sub-Ring for flexible networking applications
- $\mu$ -Ring redundancy, recovery time <20ms 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 802.3ae          | 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)                                         |
| 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 Layer 3 10G Switch

|                                                       |                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VLAN ID                                               | 4094 IEEE 802.1Q VLAN ID                                                                                                                                                                                                                                                                                                       |
| Switch Architecture                                   | Back-plane (Switching Fabric): 136Gbps (Full wire-speed)                                                                                                                                                                                                                                                                       |
| Data Processing                                       | Store and Forward                                                                                                                                                                                                                                                                                                              |
| Network Connector                                     | 10GbE SFP+ :<br>4x 1G/2.5G/10G SFP+ socket, Supports DDMI<br>GbE SFP:<br>24x 100/1000Base-X SFP socket, Support DDMI<br>RJ45:<br>4x 10/100/1000Base-T RJ-45, Support Auto negotiation speed, Auto MDI/MDI-X function                                                                                                           |
| Console                                               | RS-232 (RJ-45)                                                                                                                                                                                                                                                                                                                 |
| Network Cable                                         | UTP/STP Cat.5e cable or above EIA/TIA-568 100-ohm (100meter)                                                                                                                                                                                                                                                                   |
| Protocols                                             | CSMA/CD                                                                                                                                                                                                                                                                                                                        |
| Reverse Polarity                                      | Protection for input power                                                                                                                                                                                                                                                                                                     |
| Overload Current                                      | Protection Supported                                                                                                                                                                                                                                                                                                           |
| Power Supply                                          | Redundant 2x AC input power (-AA model)<br>Redundant 1x AC and 1x DC input power (-AD model)<br>Redundant 2x DC input power (-DD model)<br>AC input power (A) : Isolated 110/220VAC (85VAC~264VAC)<br>DC input power (D) : Isolated 24/48/-48VDC (18~60VDC), Removable Terminal Block<br>Supports negative voltage power input |
| Power Consumption                                     | <36W                                                                                                                                                                                                                                                                                                                           |
| LED                                                   | System: Power 1 (Green), Power 2 (Green), Act /Alarm (Green/Amber), Ring Master (Green)<br>P25~28 UTP: 10/100 Link/Active (Green), 1000 Link/Active (Amber)<br>P1~24 SFP Slot: Link/Active (Amber)<br>P29~32 SFP+ Slot: Link/Active (Amber), 10GBase-X Link/Active (Blue)                                                      |
| Jumbo Frame                                           | 10K Byte                                                                                                                                                                                                                                                                                                                       |
| MAC Address Table                                     | 32K                                                                                                                                                                                                                                                                                                                            |
| Memory Buffer                                         | 4M Bytes for packet buffer                                                                                                                                                                                                                                                                                                     |
| Device Memory                                         | 16M Bytes Flash ROM, 512M 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, 2-Pin removable terminal block                                                                                                                                                                                                                                      |
| Operating Temperature                                 | -40 ~ 60°C                                                                                                                                                                                                                                                                                                                     |
| Operating Humidity                                    | 5% to 95% (Non-condensing)                                                                                                                                                                                                                                                                                                     |
| Storage Temperature                                   | -40 ~ 85°C                                                                                                                                                                                                                                                                                                                     |
| Housing                                               | Rugged Metal, IP30 Protection and Fanless                                                                                                                                                                                                                                                                                      |
| Dimensions                                            | 280x 440 x 44mm (D x W x H)                                                                                                                                                                                                                                                                                                    |
| Weight                                                | 3.92kg (IXR-GS24044X-AA)<br>3.82kg (IXR-GS24044X-AD)<br>3.72kg (IXR-GS24044X-DD)                                                                                                                                                                                                                                               |
| Installation Mounting                                 | 19" rack mount                                                                                                                                                                                                                                                                                                                 |
| MTBF                                                  | 190,213 Hours (IXR-GS24044X-AA)<br>205,524 Hours (IXR-GS24044X-AD)<br>223,567 Hours (IXR-GS24044X-DD)<br>(MIL-HDBK-217)                                                                                                                                                                                                        |
| Warranty                                              | 5 years                                                                                                                                                                                                                                                                                                                        |
| Certification                                         |                                                                                                                                                                                                                                                                                                                                |
| EMC                                                   | CE (EN55032, EN55035)                                                                                                                                                                                                                                                                                                          |
| 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<br>EN61000-4-3 (RS) Level 3, Criteria A<br>EN61000-4-4 (Burst) Level 3, Criteria A<br>EN61000-4-5 (Surge) Level 3, Criteria B<br>EN61000-4-6 (CS) Level 3, Criteria A<br>EN61000-4-8 (PFMF, Magnetic Field) Field Strength: 300A/m, Criteria A                                           |

# Industrial Layer 3 10G Switch

|                      |                                                                        |
|----------------------|------------------------------------------------------------------------|
| Safety               | EN62368-1                                                              |
| Hi Pot Protection    | DC 2.25KV for power to chassis ground, Ethernet port to chassis ground |
| 4KV Surge Protection | Supported for RJ45 and SFP ports                                       |
| Shock                | IEC 60068-2-27                                                         |
| Freefall             | IEC 60068-2-32                                                         |
| Vibration            | IEC 60068-2-6                                                          |

| Software Specifications                                   |                                                                                                                                            |  |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--|
| L3 Routing                                                |                                                                                                                                            |  |
| IPv4/v6 Static Routing                                    | Supported                                                                                                                                  |  |
| RIP v1/v2 Dynamic Routing                                 | Supported                                                                                                                                  |  |
| OSPF v2, OSPF v3 Dynamic Routing                          | Supported                                                                                                                                  |  |
| Layer 3 Redundancy                                        | VRRP v2, v3                                                                                                                                |  |
| 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 (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)                                                                                                          |  |
|                                                           | Voice VLAN                                                                                                                                 |  |
|                                                           | Static (IEEE 802.3ad LACP), Maximum trunk group : 16group                                                                                  |  |
| Link Aggregation (Port Trunk)                             | Dynamic (IEEE 802.3ad LACP), Maximum trunk group : 16group                                                                                 |  |
|                                                           | Per group up-to 8 port                                                                                                                     |  |
| Spanning Tree                                             | IEEE 802.1d STP, IEEE 802.1w RSTP, IEEE 802.1s MSTP                                                                                        |  |
| Multiple μ-Ring                                           | Up to 14 instances each support μ-Ring, μ-Chain or Sub-Ring for flexible networking applications                                           |  |
|                                                           | Recovery time <20ms                                                                                                                        |  |
|                                                           | The maximum number of device is allowed 250 nodes in a Ring.                                                                               |  |
| Loop Protection                                           | Supported                                                                                                                                  |  |
| ITU-T G.8032 / Y.1344 ERPS (Ethernet Ring Protection)     | Recovery time <50ms                                                                                                                        |  |
|                                                           | Single Ring, Sub-Ring, Multiple ring topology                                                                                              |  |
| ITU-T G.8031 / Y.1342 EPS (Ethernet Protection Switching) | Supported                                                                                                                                  |  |
| QoS Features                                              |                                                                                                                                            |  |
| Class of Service                                          | IEEE 802.1p 8 active priorities queues 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                             | Per port based                                                                                                                             |  |
| Bandwidth Control for Egress                              | Per port based                                                                                                                             |  |
|                                                           | Per queue / Per port shaper                                                                                                                |  |
| DiffServ (RF 2474) Remarking                              |                                                                                                                                            |  |
| Storm Control                                             | For Unicast, Broadcast and 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                                                                                                                 |  |

# Industrial Layer 3 10G Switch

## Security Features

|                                              |                                                                                                                                         |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>IEEE 802.1X</b>                           | Port-Based                                                                                                                              |
|                                              | MAC-Based                                                                                                                               |
| <b>ACL</b>                                   | Number of rules : up to 256 entries<br>for L2 / L3 / L4<br>L2 : Mac address SA/DA/VLAN<br>L3 : IP address SA/DA, Subnet<br>L4 : TCP/UDP |
| <b>RADIUS</b>                                | Authentication & Accounting                                                                                                             |
| <b>TACACS+</b>                               | Authentication, Authorization and Accounting                                                                                            |
| <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                                                                                                   |

## Management Features

|                                       |                                                                                                                                               |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <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 management and monitoring                                                                                                            |
| <b>SW &amp; Configuration Upgrade</b> | SFTP, 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>Mirroring</b>                      | Local and Remote                                                                                                                              |
| <b>Event Syslog</b>                   | Syslog server (RFC3164)                                                                                                                       |
| <b>Warning Message</b>                | System syslog, e-mail, alarm relay                                                                                                            |
| <b>DNS</b>                            | Client, Proxy                                                                                                                                 |
| <b>IEEE 1588 PTP V2</b>               | Supports 5 operating mode in each port :<br>Ordinary-Boundary, Peer to Peer Transparent Clock, End to End Transparent Clock, Master and Slave |
| <b>NTP V4.0, SNTP</b>                 | Client                                                                                                                                        |
| <b>LLDP (IEEE 802.1ab)</b>            | Link Layer Discovery Protocol                                                                                                                 |
|                                       | LLDP-MED                                                                                                                                      |

## IPv6 Features

|                        |                                                                                                                                                                                                                                                                                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IPv6 Management</b> | Telnet Server/ICMP v6                                                                                                                                                                                                                                                                                                   |
| <b>SNMP 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<br>for L2 / L3 / L4<br>L2 : Mac address SA/DA/VLAN<br>L3 : IP address SIP, Subnet (32bit)<br>L4 : TCP/UDP                                                                                                                                                                            |
|                        |                                                                                                                                                                                                                                                                                                                         |
| <b>Other Features</b>  | <b>Green Ethernet</b><br>Supports IEEE 802.3az EEE (Energy Efficient Ethernet)<br>Management to optimize the power consumption<br>Determine the cable length and lowering the power for ports with short cables<br>Lower the power for a port when there is no link<br>LED Power Management : Adjustment LEDs intensity |

# Industrial Layer 3 10G Switch

## Dimensions

Front View



Rear View

-AA Power



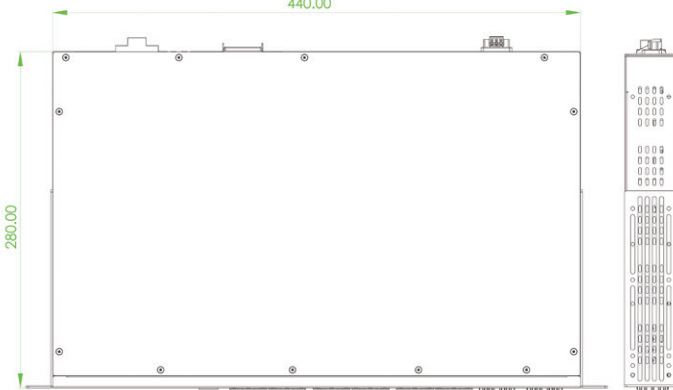
-DD Power



-AD Power



Top View



Side View



## Ordering Information

| Model Name      | Managed | Total Ports (Maximum) | GbE                        |                     | 10GbE | Input Power  |            | Certification    |                   |                         |         |
|-----------------|---------|-----------------------|----------------------------|---------------------|-------|--------------|------------|------------------|-------------------|-------------------------|---------|
|                 |         |                       | 10/100/1000 Base-T(X) RJ45 | 100/1000 Base-X SFP |       | 24/48/48 VDC | 110/220VAC | Safety EN62368-1 | RailWay EN50121-4 | EN61000-6-2 EN61000-6-4 | CE, FCC |
| IXR-GS24044X-AA | V       | 32                    | 4                          | 24                  | 4     |              | 2          | V                | V                 | V                       | V       |
| IXR-GS24044X-AD | V       | 32                    | 4                          | 24                  | 4     | 1            | 1          | V                | V                 | V                       | V       |
| IXR-GS24044X-DD | V       | 32                    | 4                          | 24                  | 4     | 2            |            | V                | V                 | V                       | V       |

## Optional Accessories

### 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-M9000-85-D(E) | Industrial SFP 10GbE 10GBase-SR, M/M, 300 meter (OM3 fiber) ,wave length 850nm, DDML, -10~70°C (-40~85°C) |
| ISFP-S9010-31-D(E) | Industrial SFP 10GbE 10GBase-LR, S/M, 10km, wave length 1310nm, DDML, -10~70°C (-40~85°C)                 |
| ISFP-M7000-85-D(E) | Industrial SFP GbE 1000Base-SX, M/M, 500 meter,wave length 850nm, 7.5dB, LC, DDML, -10~70°C (-40~85°C)    |
| ISFP-S7020-31-D(E) | Industrial SFP 1000Base-LX, S/M, 20km, wave length 1310nm, 15dB, LC, DDML, -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, DDML, -10~70°C (-40~85°C)          |
| ISFP-S5030-31-D(E) | Industrial SFP 155M 100Base-FX, SM, 30km, 1310nm, 19dB, LC, DDML, -10~70°C (-40~85°C)                     |

### Industrial Power Supply

|            |                                                                                                |
|------------|------------------------------------------------------------------------------------------------|
| NDR-120-48 | Industrial Power, Input 90 ~ 264VAC/127 ~ 370VDC, Output 48VDC, 120W, -20 ~ 70°C (For DC type) |
|------------|------------------------------------------------------------------------------------------------|