

# ICS-G7828A Series

## 24G+4 10GbE-port Layer 2/Layer 3 full Gigabit managed Ethernet switches



### Features and Benefits

- 24 Gigabit Ethernet ports plus up to 4 10G Ethernet ports
- Up to 28 optical fiber connections (SFP slots)
- Fanless, -10 to 60°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- Isolated redundant power inputs with universal 110/220 VAC power supply range
- Supports MXstudio for easy, visualized industrial network management
- V-ON™ ensures millisecond-level multicast data and video network recovery

### Certifications



## Introduction

Process automation and transportation automation applications combine data, voice, and video, and consequently require high performance and high reliability. The ICS-G7828A Series is equipped with 24 Gigabit Ethernet ports plus up to 4 10 Gigabit Ethernet ports, and support Layer 3 routing functionality to facilitate the deployment of applications across networks, making them ideal for large-scale industrial networks.

The ICS-G7828A's full Gigabit capability increases bandwidth to provide high performance and the ability to quickly transfer large amounts of video, voice, and data across a network. The fanless switches support the Turbo Ring, Turbo Chain, and RSTP/STP redundancy technologies, and come with an isolated redundant power supply to increase system reliability and the availability of your network backbone.

### Additional Features and Benefits

- Layer 3 switching functionality to move data and information across networks
- Command line interface (CLI) for quickly configuring major managed functions
- Supports advanced VLAN capability with Q-in-Q tagging
- DHCP Option 82 for IP address assignment with different policies
- Supports EtherNet/IP, PROFINET, and Modbus TCP protocols for device management and monitoring
- IGMP snooping and GMRP for filtering multicast traffic
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- Port Trunking for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- Access control lists (ACL) increase the flexibility and security of network management
- SNMPv1/v2c/v3 for different levels of network management
- RMON for proactive and efficient network monitoring
- Bandwidth management to prevent unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Digital inputs for integrating sensors and alarms with IP networks
- Redundant, dual AC power inputs

## Specifications

### Ethernet Interface

|  |  |
|--|--|
| 10/100/1000BaseT(X) Ports (RJ45 connector) | ICS-G7828A-4GTXSFP-4XG-HV-HV: 20<br>ICS-G7828A-8GSFP-4GTXSFP-4XG-HV-HV: 12       |
| 100/1000BaseSFP Ports                      | ICS-G7828A-8GSFP-4GTXSFP-4XG-HV-HV: 8<br>ICS-G7828A-20GSFP-4GTXSFP-4XG-HV-HV: 20 |
| 10GbE SFP+ Slots                           | 4  |

|   |   |
|---|---|
| Combo Ports (10/100/1000BaseT(X) or 100/1000BaseSFP+) | 4   |
| Standards   | IEEE 802.1D-2004 for Spanning Tree Protocol<br>IEEE 802.1p for Class of Service<br>IEEE 802.1Q for VLAN Tagging<br>IEEE 802.1s for Multiple Spanning Tree Protocol<br>IEEE 802.1w for Rapid Spanning Tree Protocol<br>IEEE 802.1X for authentication<br>IEEE 802.3 for 10BaseT<br>IEEE 802.3ab for 1000BaseT(X)<br>IEEE 802.3ad for Port Trunk with LACP<br>IEEE 802.3ae for 10 Gigabit Ethernet<br>IEEE 802.3u for 100BaseT(X) and 100BaseFX<br>IEEE 802.3x for flow control<br>IEEE 802.3z for 1000BaseSX/LX/LHX/ZX<br>IEEE 802.3ae for 10 Gigabit Ethernet |

### Ethernet Software Features

|                      |  |
|----------------------|--|
| Management           | ARP, Back Pressure Flow Control, BOOTP, DDM, DHCP Option 66/67/82, DHCP Server/Client, IPv4, LLDP, Port Mirror, RMON, SNMP Inform, SNMPv1/v2c/v3, Syslog, Telnet, TFTP, SMTP, RARP, Flow control |
| Filter               | 802.1Q, GMRP, GVRP, IGMP v1/v2/v3, QinQ VLAN   |
| Multicast Routing    | DVMRP, PIM-DM, PIM-SM, PIM-SSM   |
| Redundancy Protocols | Link Aggregation, MSTP, RSTP, Turbo Chain, Turbo Ring v1/v2, V-ON  |
| Routing Redundancy   | VRRP   |
| Security             | Access control list, Broadcast storm protection, HTTPS/SSL, MAB authentication, Sticky MAC, NTP authentication, Port Lock, RADIUS, SSH, TACACS+  |
| Time Management      | NTP Server/Client, SNTP  |
| Unicast Routing      | OSPF, RIPV1/V2, Static Route   |
| Industrial Protocols | EtherNet/IP, Modbus TCP, PROFINET  |
| MIB                  | Bridge MIB, Ethernet-like MIB, MIB-II, P-BRIDGE MIB, Q-BRIDGE MIB, RMON MIB Groups 1, 2, 3, 9, RSTP MIB  |

### Switch Properties

|                    |               |
|--------------------|---------------|
| DRAM               | 128 MB        |
| Flash              | 16 MB         |
| IGMP Groups        | 4096          |
| Jumbo Frame Size   | 9.6 KB        |
| MAC Table Size     | 16 K          |
| Max. No. of VLANs  | 256           |
| Packet Buffer Size | 12 Mbits      |
| VLAN ID Range      | VID 1 to 4094 |
| Priority Queues    | 8             |

### USB Interface

|              |            |
|--------------|------------|
| Storage Port | USB Type A |
|--------------|------------|

## Serial Interface

|              |                                       |
|--------------|---------------------------------------|
| Console Port | USB-serial console (Type B connector) |
|--------------|---------------------------------------|

## Input/Output Interface

|                        |   |
|------------------------|---|
| Alarm Contact Channels | Relay output with current carrying capacity of 2 A @ 30 VDC                     |
| Digital Inputs         | +13 to +30 V for state 1<br>-30 to +1 V for state 0<br>Max. input current: 8 mA |

## Power Parameters

|                             |                                       |
|-----------------------------|---------------------------------------|
| Input Voltage               | 110 to 220 VAC, Redundant dual inputs |
| Operating Voltage           | 85 to 264 VAC                         |
| Overload Current Protection | Supported                             |
| Reverse Polarity Protection | Supported                             |
| Input Current               | 0.99/0.65 A @ 110/220 VAC             |

## Physical Characteristics

|              |   |
|--------------|---|
| IP Rating    | IP30  |
| Dimensions   | 440 x 44 x 386.9 mm (17.32 x 1.73 x 15.23 in) |
| Weight       | 5500 g (12.14 lb)                             |
| Installation | Rack mounting                                 |

## Environmental Limits

|  |                            |
|--|----------------------------|
| Operating Temperature                  | -10 to 60°C (14 to 140°F)  |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity              | 5 to 95% (non-condensing)  |

## Standards and Certifications

|           |  |
|-----------|--|
| Safety    | EN 60950-1, UL 60950-1   |
| EMC       | EN 55032/24  |
| EMI       | CISPR 32, FCC Part 15B Class A   |
| EMS       | IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV<br>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m<br>IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV<br>IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV<br>IEC 61000-4-6 CS: 10 V<br>IEC 61000-4-8 PFMF |
| Railway   | EN 50121-4   |
| Freefall  | IEC 60068-2-32   |
| Shock     | IEC 60068-2-27   |
| Vibration | IEC 60068-2-6  |

## MTBF

|           |                          |
|-----------|--------------------------|
| Time      | 411,819 hrs              |
| Standards | Telcordia (Bellcore), GB |

## Warranty

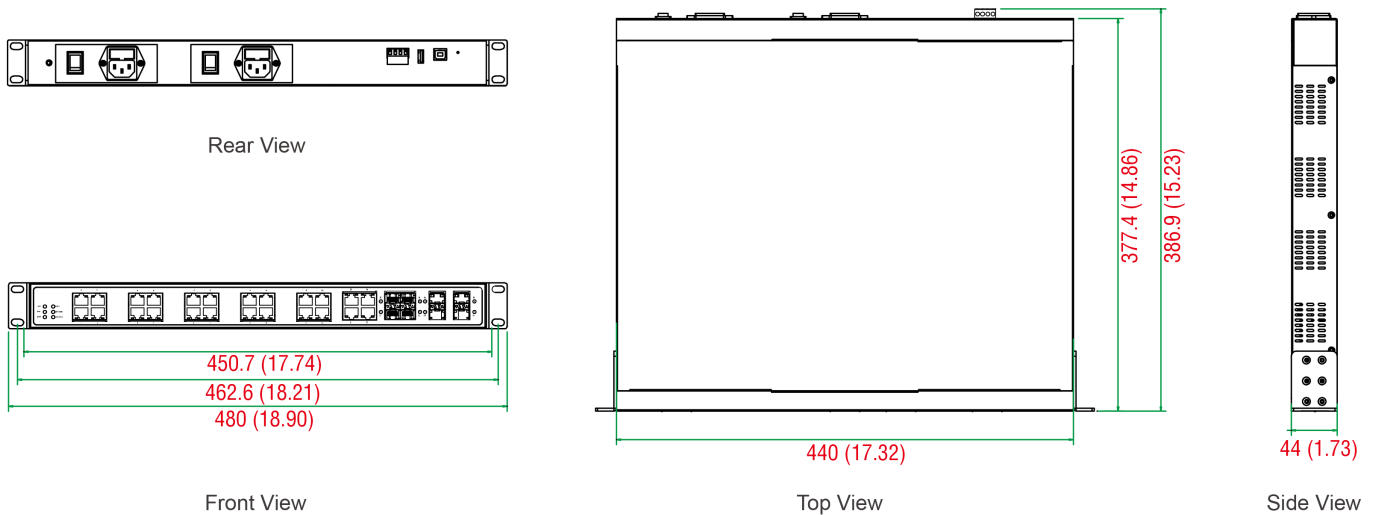
|                 |  |
|-----------------|--|
| Warranty Period | 5 years  |
| Details         | See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a> |

## Package Contents

|                  |  |
|------------------|--|
| Device           | 1 x ICS-G7828A Series switch   |
| Cable            | 1 x USB type A male to USB type B male   |
| Installation Kit | 2 x rack-mounting ear<br>12 x cap, plastic, for SFP slot (ICS-G7828A-4GTXSFP-4XG-HV-HV)<br>20 x cap, plastic, for SFP slot (ICS-G7828A-8GSFP-4GTXSFP-4XG-HV-HV)<br>32 x cap, plastic, for SFP slot (ICS-G7828A-20GSFP-4GTXSFP-4XG-HV-HV) |
| Power Supply     | 1 x power cord, EU type<br>1 x power cord, US type   |
| Documentation    | 1 x document and software CD<br>1 x warranty card  |
| Note             | SFP modules need to be purchased separately for use with this product.   |

## Dimensions

Unit: mm (inch)



## Ordering Information

| Model Name                          | Layer | 10GbE SFP+ Slots | Combo Ports<br>10/100/<br>1000BaseT(X) or<br>100/1000BaseSFP+ | 100/1000Base SFP<br>Slots | 10/100/<br>1000BaseT(X) Ports<br>RJ45 Connector | Operating Temp. |
|-------------------------------------|-------|------------------|---|---------------------------|---|-----------------|
| ICS-G7828A-4GTXSFP-4XG-HV-HV        | 3     | 4                | 4   | 0                         | 20  | -10 to 60°C     |
| ICS-G7828A-8GSFP-4GTXSFP-4XG-HV-HV  | 3     | 4                | 4   | 8                         | 12  | -10 to 60°C     |
| ICS-G7828A-20GSFP-4GTXSFP-4XG-HV-HV | 3     | 4                | 4   | 20                        | 0   | -10 to 60°C     |

## Accessories (sold separately)

### Software

MXview

Industrial network management software designed for converged automation networks

## Storage Kits

|            |   |
|------------|---|
| ABC-02-USB | Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature |
|------------|---|

## SFP Modules

|                |  |
|----------------|--|
| SFP-1FELLC-T   | SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature                                      |
| SFP-1FEMLC-T   | SFP module with 1 100Base multi-mode with LC connector for 4 km transmission, -40 to 85°C operating temperature  |
| SFP-1FESLC-T   | SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature                                      |
| SFP-1G10ALC    | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G10ALC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G10BLC    | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |
| SFP-1G10BLC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1G20ALC    | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G20ALC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G20BLC    | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |
| SFP-1G20BLC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1G40ALC    | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature   |
| SFP-1G40ALC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G40BLC    | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature   |
| SFP-1G40BLC-T  | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1GEZXC     | SFP module with 1 1000BaseEZXC port with LC connector for 110 km transmission, 0 to 60°C operating temperature   |
| SFP-1GEZXC-120 | SFP module with 1 1000BaseEZXC port with LC connector for 120 km transmission, 0 to 60°C operating temperature   |
| SFP-1GLHLC     | SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, 0 to 60°C operating temperature  |
| SFP-1GLHLC-T   | SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature  |
| SFP-1GLHXC     | SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°C operating temperature   |
| SFP-1GLHXC-T   | SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature   |
| SFP-1GLSXC     | SFP module with 1 1000BaseLSX port with LC connector for 500 m transmission, 0 to 60°C operating temperature   |
| SFP-1GLSXC-T   | SFP module with 1 1000BaseLSX port with LC connector for 500 m transmission, -40 to 85°C operating temperature   |
| SFP-1GLXC      | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature  |
| SFP-1GLXC-T    | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature  |

|                |   |
|----------------|---|
| SFP-1GSXLC     | SFP module with 1 1000BaseSX port with LC connector for 300/550 m transmission, 0 to 60°C operating temperature   |
| SFP-1GSXLC-T   | SFP module with 1 1000BaseSX port with LC connector for 300/550 m transmission, -40 to 85°C operating temperature |
| SFP-1GZXLC     | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature       |
| SFP-1GZXLC-T   | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature     |
| SFP-10GERLC    | SFP+ module with 1 10GBase-ER port with LC connector for 40 km transmission, 0 to 60°C operating temperature      |
| SFP-10GLRLC    | SFP+ module with 1 10GBase-LR port with LC connector for 10 km transmission, 0 to 60°C operating temperature      |
| SFP-10GSRLC    | SFP+ module with 1 10GBase-SR port with LC connector for 33 m transmission, 0 to 60°C operating temperature       |
| SFP-1GTXRJ45-T | SFP module with 1 1000BaseT port with RJ45 connector for 100 m transmission, -40 to 75°C operating temperature    |

#### Power Cords

|                  |   |
|------------------|---|
| PWC-C13AU-3B-183 | Power cord with Australian (AU) plug, 1.83 m                    |
| PWC-C13CN-3B-183 | Power cord with three-prong China (CN) plug, 1.83 m             |
| PWC-C13EU-3B-183 | Power cord with Continental Europe (EU) plug, 1.83 m            |
| PWC-C13UK-3B-183 | Power cord with United Kingdom (UK) plug, 1.83 m                |
| PWC-C13US-3B-183 | Power cord with United States (US) plug, 1.83 m                 |
| PWC-C7AU-2B-183  | Power cord with Australian (AU) plug, 2.5A/250V, 1.83 m         |
| PWC-C7EU-2B-183  | Power cord with Continental Europe (EU) plug, 2.5A/250V, 1.83 m |
| PWC-C7UK-2B-183  | Power cord with United Kingdom (UK) plug, 2.5A/250V, 1.83 m     |
| PWC-C7US-2B-183  | Power cord with United States (US) plug, 10A/125V, 1.83 m       |

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