

# iES22GF

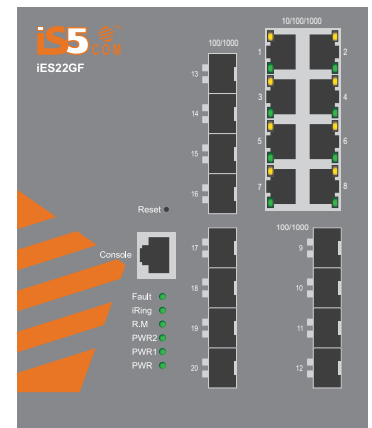


www.iS5com.com

Intelligent 20 Port Managed Gigabit Ethernet Switch IEC 61850 and IEEE1613 Compliant

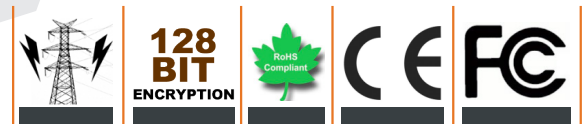
## Features

- Designed for power substation / Railway application and fully compliant with the requirement of IEC 61850-3 and IEEE 1613
- Leading EN50155-compliant Ethernet switch for rolling stock application
- Supports iRing (recovery time < 30ms over 250 units) and MSTP(RSTP/STP compatible) for Ethernet Redundancy
- iBridge support other vendors ring technology in an open architecture
- iChain allows for multiple redundant network rings
- Supports standard IEC 62439-2 MRP (Media Redundancy Protocol) function
- Supports IEEE 1588v2 clock Synchronization
- Supports IPV6 new internet protocol version
- Supports Modbus TCP protocol
- Supports IEEE 802.3az Energy-Efficient Ethernet technology
- Provides HTTPS/SSH protocol to enhance network security
- Supports SMTP client
- Supports IP-based bandwidth management
- Supports application-based QoS management
- Supports Device Linking security function
- Supports DOS/DDOS auto prevention
- IGMP v2/v3 (IGMP snooping support) for filtering multicast traffic
- Supports SNMP v1/v2c/v3 & RMON & 802.1Q VLAN Network Management
- Support ACL, TACACS+ and 802.1x User Authentication for security
- Supports 9.6K Bytes Jumbo Frame
- Multiple notification for warning of unexpected event
- Web-based ,Telnet, Console (CLI), and Windows utility (iMSS) configuration
- Support LLDP Protocol
- Rigid IP-40 housing design
- DIN-Rail and wall mount
- Available with Dual High Voltage Universal Power Supplies



**iS5 COMMUNICATIONS**

**SERVICES • SUPPORT • SECURITY • SOLUTIONS • SYSTEMS**



Tel: +905-670-0004

Fax: +289-401-5206

Email: info@is5com.com



#3-7490 Pacific Circle, Mississauga, Ontario, L5T 2A3



## Introduction

The iES22GF is an IEC 61850-3 compliant managed full gigabit Ethernet switch with 8x10/100/1000Base-T(X) ports and 12x100/1000Base-X SFP ports. The switch is designed for power substation applications and rolling stock applications. The iES22GF is also fully compliant with EN50155 requirements. Complete support of the Ethernet Redundancy protocol, iRing (recovery time < 30ms over 250 units) and is MSTP/RSTP/STP compatible. The switch is designed to protect mission-critical applications from network interruptions and/or temporary malfunctions. The iES22GF can be managed centrally using the iManaged Software Suite, a Web-based interface, Telnet and console (CLI) configuration. This switch is one of the most reliable choices for power substation and rolling stock applications.

- ➔ **iRing:** is a redundant ring technology with recovery times of less than 30ms with up to 250 nodes. The iRing redundant ring technology protects mission-critical applications from network interruptions and/or temporary malfunctions with its fast recover technology.
- ➔ **iBridge:** is an enhanced redundant technology that makes iS5Com switches compatible with other vendors proprietary redundant ring technologies. It allows for a single ring when formed with other vendor products.
- ➔ **iChain:** is a revolutionary network redundancy technology that provides the add-on network redundancy topology for any backbone network. iChain allows multiple redundant network rings of different redundancy protocols to join and function together as a larger, more robust compound network topology. iChain provides ease-of-use while maximizing fault-recovery swiftness, flexibility, compatibility, and cost-effectiveness.
- ➔ **MRP:** Media Redundancy Protocol (MRP) meets the IEC 62439-2 protocol standard. It allows rings of Ethernet switches to overcome any single failure with recovery times much faster than achievable using the Spanning Tree Protocol.
- ➔ **IP-based Bandwidth Management:** The switch provides an advanced IP-based bandwidth management which can limit the maximum bandwidth for each IP device. User can configure IP camera and NVR with more bandwidth and limit other device bandwidth.
- ➔ **Application-Based QoS:** The switch also supports application-based QoS. Application-based QoS can set highest priority for data stream according to TCP/UDP port number.
- ➔ **Device Link Function:** This function prevents unauthorized access to the network by only allowing permitted IP addresses that have a MAC address to access the network.
- ➔ **Advanced DOS/DDOS Auto Prevention:** The switch also provides an advanced hardware based DOS/DDOS auto prevention. If there is a sudden surge in IP flow, the switch locks the source IP address temporarily and hence preventing network failure.
- ➔ **IEEE 1588 Precision Time Protocol:** IEEE 1588 PTPv2 provides precision time synchronization for protection and control applications such as SMV in the IEC 61850 process bus.
- ➔ **Modbus TCP:** This is a Modbus variant used for communications over TCP/IP networks.
- ➔ **IEEE 802.3az Energy-Efficient Ethernet:** This is a set of enhancements to the twisted-pair and backplane Ethernet family of networking standards, which allow for less power consumption during periods of low data activity.



# Specifications

Model Number iES22GF	
<b>Physical Ports</b>	
10/100 Base-T(X) Ports in RJ45 Auto MDI/MDIX	8
100/1000Base-X with SFP port	Up to 12
<b>Technology</b>	
Ethernet Standards	IEEE 802.3 for 10Base-T IEEE 802.3u for 100Base-TX and 100Base-FX IEEE 802.3ab for 1000Base-T IEEE 802.z for 1000Base-X IEEE 802.3x for Flow control IEEE 802.3ad for LACP (Link Aggregation Control Protocol ) IEEE 802.1p for COS (Class of Service) IEEE 802.1Q for VLAN Tagging IEEE 802.1w for RSTP (Rapid Spanning Tree Protocol) IEEE 802.1s for MSTP (Multiple Spanning Tree Protocol) IEEE 802.1x for Authentication IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)
MAC Table	8k
Priority Queues	4
Processing	Store-and-Forward
Switch Properties	Switching latency: 7 us Switching bandwidth: 40Gbps Max. Number of Available VLANs: 256 IGMP multicast groups: 128 for each VLAN Port rate limiting: User Define Https / SSH enhance network security
Jumbo frame	Up to 9.6K Bytes
Security Features	Device Binding security feature Enable/disable ports, MAC based port security Port based network access control (802.1x) VLAN (802.1Q ) to segregate and secure network traffic Radius centralized password management SNMPv3 encrypted authentication and access security Https / SSH enhance network security
Software Features	STP/RSTP/MSTP (IEEE 802.1D/w/s) Redundant Ring (iRing) with recovery time less than 30ms over 250 units TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging and GVRP supported IGMP Snooping IP-based bandwidth management Application-based QoS management DOS/DDOS auto prevention Port configuration, status, statistics, monitoring, security DHCP Server/Client/Relay SMTP Client Modbus TCP

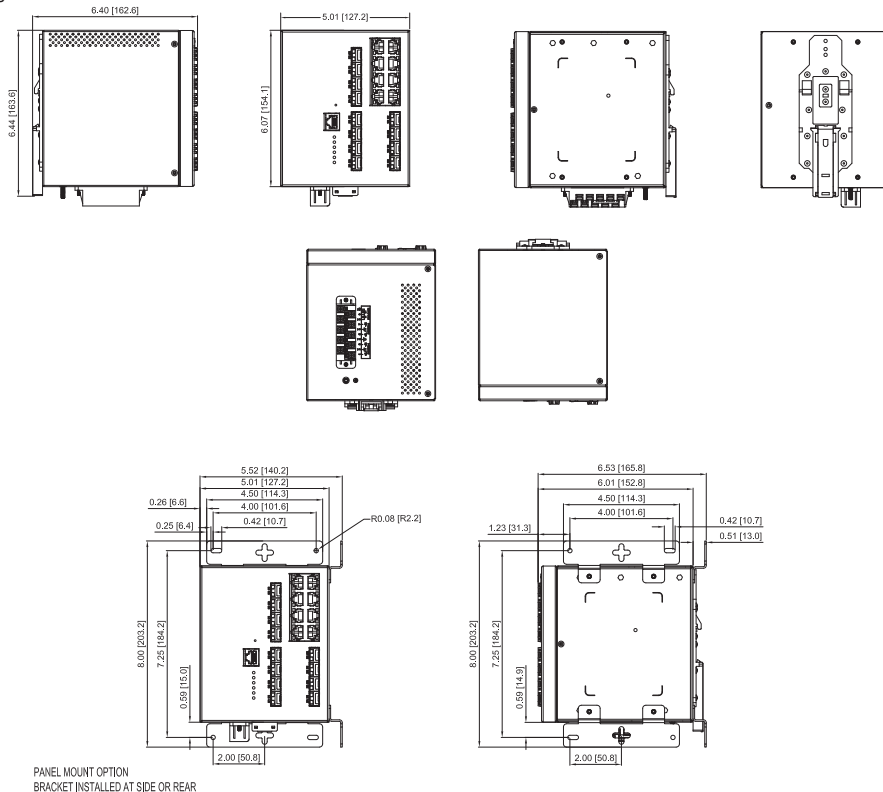


Network Redundancy	iRing iBridge iChain MRP MSTP (RSTP/STP compatible)
RS-232 Serial Console Port	RS-232 in RJ45 connector with console cable. 115200bps, 8, N, 1
<b>Fault Contact</b>	
Relay	Relay output capacity: 1A at 24VDC
<b>Power</b>	
Redundant Input Power	Dual DC inputs 10-48VDC, Dual DC 36-72VDC, and Dual AC/DC power inputs. 85-264VAC / 88-370VDC.
Power Consumption (Typ.)	18 Watts
Overload Current Protection	Present
Reverse Polarity Protection	Present
<b>Physical Characteristic</b>	
Enclosure	IP-40
Dimension (W x D x H)	5 x 6.44 x 6.07 inch
<b>Environmental</b>	
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Operating Temperature	-40°C to 85°C (-40°F to 158°F)
Operating Humidity	5% to 95% Non-condensing
<b>Regulatory Approvals</b>	
Power Automation Compliancy	IEC 61850-3, IEEE 1613
EMI	FCC Part 15, CISPR (EN55022) class A, EN50155 (EN50121-3-2, EN55011, EN50121-4)
EMS	EN61000-4-2 (ESD) EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN61000-4-11
Shock	IEC60068-2-27
Free Fall	IEC60068-2-32
Vibration	IEC60068-2-6
Safety	EN60950-1
<b>Warranty</b>	
Warranty	5 Years



# Dimensions

All Dimensions are in Inches



# Ordering Information

Base	Power Supply 1	Power Supply 2	Mount	Ethernet Port 1-8	Ethernet Port 9-12	Ethernet Port 12-16	Ethernet Port 17-20	Description
iES22GF	HV	LV	D	8GRJ45	4GSFP	4GSFP	XX	
iES22GF								Core assembly and packaging
	LV	LV						Power Supply Input (10-48VDC)
	MV	MV						Power Supply input (36-72VDC)
	HV	HV						Power Supply Input 88-370VDC or 85-264VAC
			D					DIN Rail Mounting
			P					Panel Mounting
			N					No Mounting Hardware
				8GRJ45				8 X 10/100/1000BaseTX RJ45
				XX	XX	XX	XX	None
					4GSFP	4GSFP	4GSFP	4 x 100/1000 BASE (X) SFP (Blank no SFP transceiver**)

SFP\*\* SEE ACCESSORIES FOR SFP TRANSCEIVER PRICING

Example Order Code: iES22GF-HV-LV-D-8GRJ45-4GSFP-4GSFP-XX-C1-F3.07  
 Description: 20 Port Gigabit Switch, Power Supply 1 Input 88-370VDC or 85-264VAC, Power Supply 2 input 36-72VDC, DIN Rail Mount, 8x10/100/1000Base TX Ports, 4x100/1000Base (X) SFP, 4x100/1000Base (X) SFP ports, Conformal Coating, Firmware version 3.07, C1 – Add for conformal coating, FW – Leave blank for latest firmware \*\*SFP's to be ordered separately.



SFP Module #	Description
SFP100-MM-2	SFP 100Mbps Multimode LC Transceiver 2km, 1310nm, -40C - +85C
SFP100-SM-30	SFP 100Mbps Singlemode LC Transceiver 30km, 1310nm, -40C - +85C
SFP100-SM-60	SFP 100Mbps Singlemode LC Transceiver 60km, 1310nm, -40C - +85C
SFP100-SM-100	SFP 100Mbps Singlemode LC Transceiver 100km, 1550nm, -40C - +85C
SFP100-SM-120	SFP 100Mbps Singlemode LC Transceiver 120km, 1550nm, -40C - +85C
SFP100BIDI1-SM-20	SFP 100Mbps Bi-Directional Singlemode LC Transceiver 20km, TX1310 nm, RX1550nm, -40C - +85C
SFP100BIDI2-SM-20	SFP 100Mbps Bi-Directional Singlemode LC Transceiver 20km, TX1550 nm, RX1310nm, -40C - +85C
SFP100BIDI1-SM-40	SFP 100Mbps Bi-Directional Singlemode LC Transceiver 40km, TX1310 nm, RX1550nm, -40C - +85C
SFP100BIDI2-SM-40	SFP 100Mbps Bi-Directional Singlemode LC Transceiver 40km, TX1550 nm, RX1310nm, -40C - +85C
SFP100BIDI1-SM-60	SFP 100Mbps Bi-Directional Singlemode LC Transceiver 60km, TX1310 nm, RX1550nm, -40C - +85C
SFP100BIDI2-SM-60	SFP 100Mbps Bi-Directional Singlemode LC Transceiver 60km, TX1550 nm, RX1310nm, -40C - +85C
SFP1000-MM-550	SFP 1Gbps Multimode LC Transceiver 500m, 850nm, -20C - +85C
SFP1000-MM-2	SFP 1Gbps Multimode LC Transceiver 2km, 1310nm, -40C - +85C
SFP1000-SM-10	SFP 1Gbps Singlemode LC Transceiver 10km, 1310nm, -40C - +85C
SFP1000-SM-20	SFP 1Gbps Singlemode LC Transceiver 20km, 1310nm, -40C - +85C
SFP1000-SM-30	SFP 1Gbps Singlemode LC Transceiver 30km, 1310nm, -40C - +85C
SFP1000-SM-40	SFP 1Gbps Singlemode LC Transceiver 40km, 1310nm, -40C - +85C
SFP1000-SM-50	SFP 1Gbps Singlemode LC Transceiver 50km, 1550nm, -40C - +85C
SFP1000-SM-70	SFP 1Gbps Singlemode LC Transceiver 70km, 1550nm, -40C - +85C
SFP1000-SM-8-	SFP 1Gbps Singlemode LC Transceiver 80km, 1550nm, -40C - +85C
SFP1000BIDI1-SM-10	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 10km, TX1310 nm, RX1550nm, -40C - +85C
SFP1000BIDI2-SM-10	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 10km, TX1550 nm, RX1310nm, -40C - +85C
SFP1000BIDI1-SM-20	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 20km, TX1310 nm, RX1550nm, -40C - +85C
SFP1000BIDI2-SM-20	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 20km, TX1550 nm, RX1310nm, -40C - +85C
SFP1000BIDI1-SM-40	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 40km, TX1310 nm, RX1550nm, -40C - +85C
SFP1000BIDI2-SM-40	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 40km, TX1550 nm, RX1310nm, -40C - +85C
SFP1000BIDI1-SM-60	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 60km, TX1310 nm, RX1550nm, -40C - +85C
SFP1000BIDI2-SM-60	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 60km, TX1550 nm, RX1310nm, -40C - +85C
SFP1000BIDI1-SM-80	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 80km, TX1310 nm, RX1550nm, -40C - +85C
SFP1000BIDI2-SM-80	SFP 1Gbps Bi-Directional Singlemode LC Transceiver 80km, TX1550 nm, RX1310nm, -40C - +85C