

iES28TG



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Intelligent 28 Port Configurable Gigabit Switch IEC 61850, IEEE 1613 and EN50155

Features

- Supports up to 4 x 10 Gigabit Uplink Ports
- Modular chassis allows for easy scalability and future proofing of network designs
- Supports iRing (recovery time < 30ms up to 250 units in one ring)
- Supports STP, RSTP and MSTP
- Supports Layer 3 routing, RIP and static routing function
- Support IEEE 1588v2 PTP clock synchronization
- IPv6 support
- VLAN Priority: Supports priority-tagged frames to be received by specific IEDs
- MRP Media Redundancy Protocol as per IEC62439-2
- Supports HTTPS/SSH protocol enhanced network security
- Supports SMTP clock client
- IP-based bandwidth management
- Application-based QoS management
- Device Linking security function
- DOS/DDOS auto threat prevention
- IGMP v2/v3 (IGMP snooping support)
- SNMP v1/v2c/v3 & RMON and 802.1Q VLAN Network Management
- Support ACL, TACACS+ and 802.1x User Authentication
- Supports 9.6K Bytes Jumbo Frame
- Multiple alarm notification methods
- Administration by Web-browser, Telnet, Console (CLI), and iManage Software Suite configuration
- LLDP (Link Layer Discovery Protocol)
- Redundant hot swappable power supplies
- 19 inch rack mount design



iS5 COMMUNICATIONS

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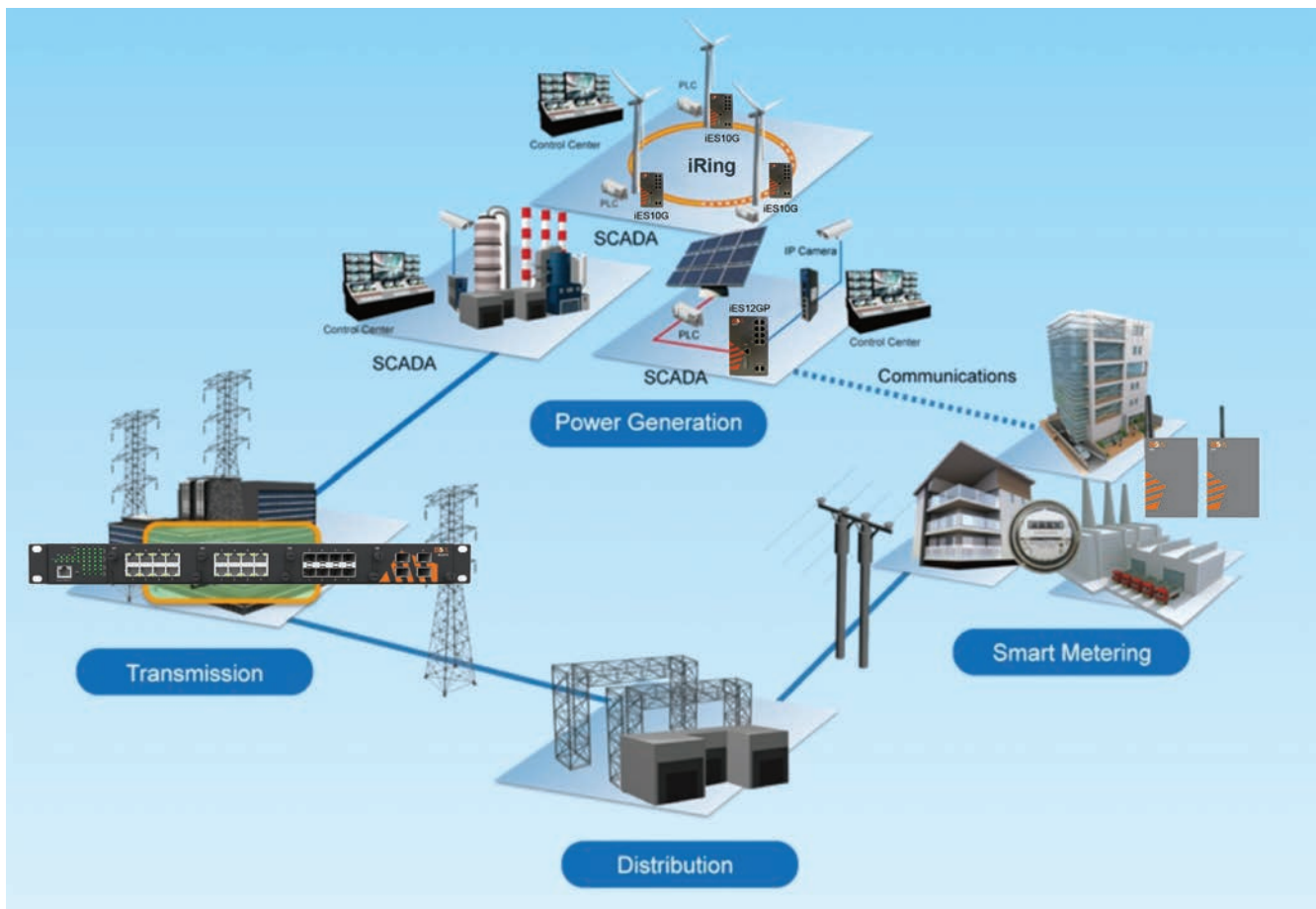


Introduction

iES28TG is a highly redundant and scalable Layer-3 managed Gigabit Ethernet switch with 4 modular slots. Designed to withstand the harshest environments of Transmission and Distribution substations and rolling stock applications. The iES28TG is fully compliant with industry standards such as IEC 61850, IEEE 1613, and EN50155, with an operating temperature from -40 to +85 degrees C and redundancy support through functions like iRing and STP/RSTP/MSTP assuring protection of all mission critical network applications.

iES28TG can also be managed conveniently via the iManage Software Suite, Telnet, and console (CLI) configuration.

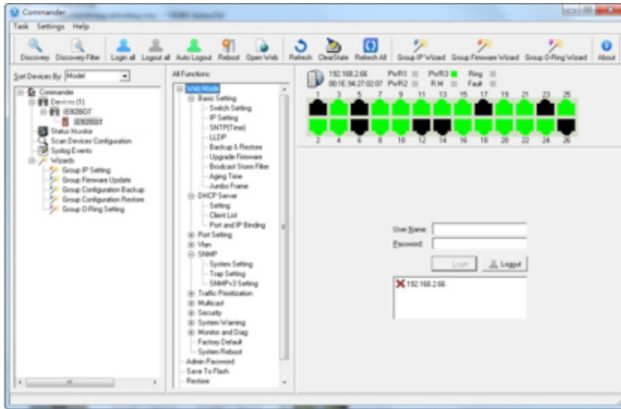
- ➔ **IP-based Bandwidth Management:** The switch provides advanced IP-based bandwidth management limiting maximum bandwidth for each IP device. Users can configure an IP camera and NVR with dedicated bandwidth and limit the bandwidth of other devices.
- ➔ **Application-Based QoS:** The switch also supports application-based QoS. Application-based QoS can be set with the highest priority for data streaming according to TCP/UDP port number.
- ➔ **Device Link Function:** The special Device Link function permits only allowed IP addresses with a MAC address to access the network preventing unauthorized access to the network .
- ➔ **Advanced DOS/DDOS Auto Prevention:** Switch provides advance DOS/DDOS auto prevention. – This is a hardware based prevention. If there is a sudden surge in IP flow, the switch locks the source IP address temporarily and hence prevents 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.
- ➔ **Modular Design:** Modular chassis design makes network planning easy by providing flexibility as your network grows and future proofing by developing modules based on newer standards.



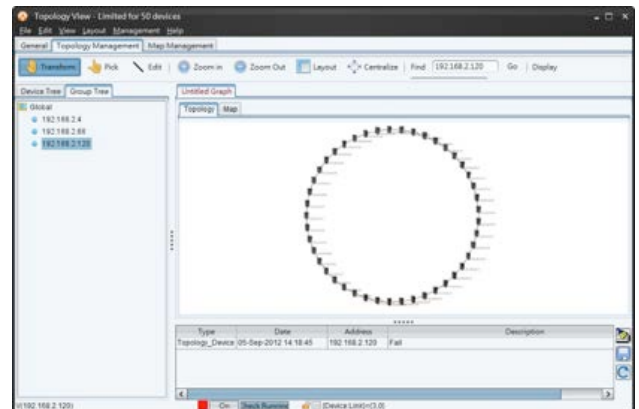


iManage Software Suite

iManage Software Suite is a Windows utility provided to manage and monitor all the Ethernet switches on the network.



iProvisioning



Topology View

Specifications

Model Number iES28TG	
Physical Ports	
Slot Number	4 (up to 3 slots for 8 x 1G ports each and 1 slot for 4 x 10G ports)
Technology	
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 802.3ae for 10Gigabit Ethernet 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	8
Processing	Store-and-Forward
Switch Properties	Switching latency: 7 us Max. Number of Available VLANs: 256 IGMP multicast groups: 128 for each VLAN Port rate limiting: User Defined
Jumbo frame	Up to 9.6K Bytes



Security Features	<p>Device Linking security feature. Enable/disable ports, MAC based port security Port based network access control (802.1x) Single 802.1x and Multiple 802.1x MAC-based authentication QoS assignment Guest VLAN MAC address limit TACACS+ VLAN (802.1Q) to segregate and secure network traffic Radius centralized password management SNMPv3 encrypted authentication and access security Web and CLI authentication and authorization Authorization (15 levels) via TACACS+ IP source guard</p>
Software Features	<p>Hardware routing, RIP and static routing IEEE 1588v2 PTP clock synchronization IEEE 802.1D Bridge, auto MAC address learning/aging and MAC address (static) Multiple Registration Protocol (MRP) Multiple VLAN Registration Protocol (MVRP) MSTP (RSTP/STP compatible) 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 Voice VLAN IGMP v2/v3 Snooping IP-based bandwidth management Application-based QoS management DOS/DDOS auto prevention Port configuration, status, statistics, monitoring, security DHCP Server/Client/snooping DHCP Relay Modbus TCP DNS client proxy ARP inspection SMTP Client</p>
Network Redundancy	<p>iRing iBridge MRP (Media Redundancy Protocol as per IEC62439-2) MSTP (RSTP/STP compatible)</p>
RS-232 Serial Console Port	RS-232 in RJ-45 connector with console cable. 115200bps, 8, N, 1
LED Indicators	
Power Indicator (PWR1 / PWR2)	Green : Power LED x 2
System Ready Indicator (PWR)	Green : Indicates that the system ready. The LED is blinking when the system is upgrading firmware
Ring Master Indicator (R.M.)	Green : Indicates that the system is operating in iRing Master mode
iRing Indicator (Ring)	Green : Indicates that the system operating in iRing mode Green Blinking : Indicates that the Ring is broken.
Fault Indicator (Fault)	Amber : Indicate unexpected event occurred
Reset To Default Running Indicator (DEF)	Green : System resets to default configuration
Supervisor Login Indicator (RMT)	Green : System is accessed remotely
Smart LED Display system	<p>Link/Act(LK/ACT) / Speed(SPD) / Duplex(FDX) green LED indicator x 3 Mode select(MODE) : Link/Act(LK/ACT) / Speed(SPD) / Duplex(FDX) mode select button Port Link/Act(LK/ACT) / Speed(SPD) / Duplex(FDX) LED show : Green x 28t</p>

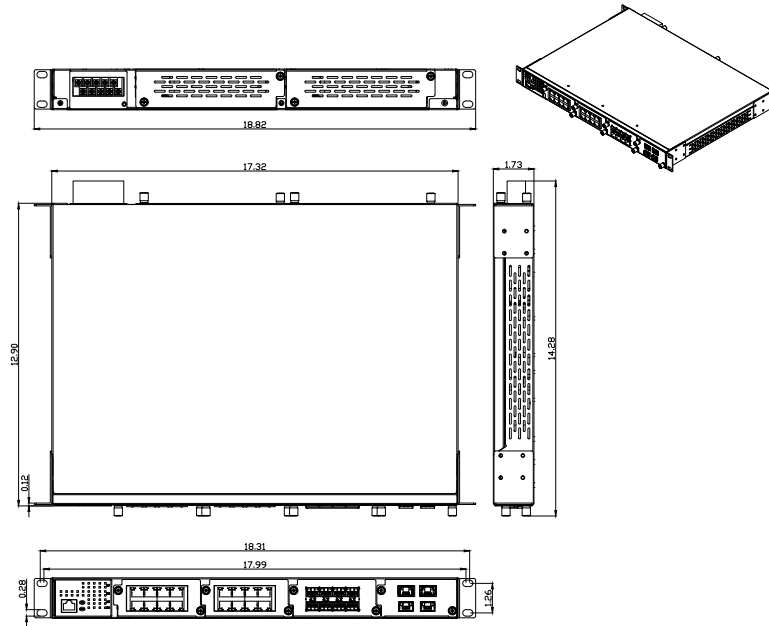


Fault Contact			
Relay	Relay output capacity of 1A at 24VDC		
Power			
Redundant power input modular	Dual 24VDC power inputs at terminal block	Dual 48VDC (36-72VDC) power inputs at terminal block	Dual 110/220VDC/AC (88~264VAC / 100~370VDC) power inputs at terminal block
Overload current protection	Present	Present	Present
Physical Characteristic			
Enclosure	19 inches rack mountable		
Environmental			
Storage Temperature	-40 to 85°C (-40 to 185°F)		
Operating Temperature	-40 to 85°C (-40 to 185°F)		
Operating Humidity	5% to 95% Non-condensing		
Regulatory Approvals			
Power Automation	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		
Warranty			
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 9-16	Ethernet Port 17-24	Ethernet Port 25&26	Ethernet Port 27&28	Description
iES28TG	LV	LV	R	8GSFP**	8GSFP**	XX	XX	XX	
iES28TG									Core assembly and packaging
	XX	XX							None
	LV	LV							24VDC (18-36VDC)
	MV	MV							48 VDC (36-72VDC)
	HV	HV							88-300VDC or 85-264VAC
			RF						19" Rack Mount - Power terminal in the Front (same side as Ethernet ports)
			RR						19" Rack Mount - Rear Mount Power Terminal connection
			P						Panel Mounting
			N						No Mounting Hardware
				XX	XX	XX			None
				8GRJ45	8GRJ45	8GRJ45			8 X 10/100/1000Base TX RJ45 Module
				8GSFP**	8GSFP**	8GSFP**			8 X 100/1000Base (X) SFP (Blank no SFP transceivers) Module
							XX	XX	Blank module
							2TGSFP	2TGSFP	2 X 10GE SFP (Blank no SFP transceiver)

SFP** SEE ACCESSORIES FOR SFP TRANSCEIVER PRICING



**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

For 10G SFP transceivers please contact the factory.