

Rack-mounted industrial Ethernet switch

Overview

STEC modular rack-type industrial Ethernet switches are dedicated in Power network, which can offer a multi-slot sub rack, as well as a variety of integrated modes, including gigabit networking, content switching, PRP/HSR modules. All modules support online upgrade functions, and can be adapted to in two- or three-layer rack - frame industrial switches. STEC rack type industrial Ethernet switches series use the same optical modules and operating system software, resulting in an architecture that can be adapted for future development. It provides operational consistency, which improves equipment utilization. Using the self-healing ring network technology, its hardware-based algorithm can ensure that the self-healing time of each node is less than 5ms, and the self-healing time of the ring network is less than 50ms (typical value).

It can also support the ring network media redundancy protocol based on IEC62439, PRP parallel redundancy protocol based on IEC62439-3 and HSR high availability seamless redundancy. Adopting FPGA and CPLD dynamic reconstruction and reprogramming technology, it can monitor various key operation parameters via local or remote, with high stability and high reliability.

STEC rack type industrial Ethernet switches series are suitable for various harsh environments and field applications because of using unique extended industrial design and process.



The performance characteristics

- High performance 3-slot modular industrial switch with Flexible configurable function, all modules support online upgrade, 2-tier industrial Ethernet switch and 3-tier industrial Ethernet switch are optional.
- support POE power supply (with independent POE+ power (44 ~ 57VDC) input terminals) is optional.
- dedicated in Power network, full compliance with IEC61850-3 and IEEE1613. Through the south network shortlisted test and the China Southern Power Grid class A industrial switch test, can not only be used in the power distribution network scene, but also can be applied to the digital substation.

Rack-mounted industrial Ethernet switch

- Support PRP parallel redundancy protocol based on IEC62439-3 ,with HSR high availability seamless redundancy.
- Support multiple independent self-healing rings, any two ports can be formed a self-healing ring network.
- Provides packet loss protection mechanism to recover quickly from network failures
- Multi-protocol Layer 3 routing meets the requirements of a dedicated network.
- Tiered bandwidth services can be provided in Ethernet services by providing rate limiting and traffic shaping in layer 2 QoS capabilities.
- Provides static and dynamic allocation and restriction functions for CPU resources, real-time monitoring key operation parameters, including CPU utilization, RAM, power supply voltage, motherboard voltage, etc.
- A full set of professional network management and monitoring alarm tools, support OPC, network management China Southern Power Grid MIB library.
- Redundant dual power input.
- -40℃ to +85℃ working in no Fan status.
- Average trouble-free operation time is up to 600000 hours.

Technical specifications

- IEEE 802.3 CSMA/CD method and physical Layer specifications
- IEEE 802.1p Priority Queuing,
- IEEE 802.1q VLAN tagging
- IEEE 802.1d Spanning Tree Algorithm
- IEEE 802.1w Rapid Spanning Tree
- IEEE 802.1s Multiple Spanning Tree
- IEEE 802.3ac VLAN Tagging
- IEEE 802.1x Authentication
- IEEE 802.3ad Link Aggregation
- IEEE 802.3x Flow Control
- IEEE 802.3 Ethernet
- IEEE 802.3u Fast Ethernet
- IEEE 802.3z Gigabit Ethernet
- IEEE 802 Networks
- IEEE 802.3af Power Over Ethernet
- IEEE 802.3at Power Over
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 Telnet Client & Server
- RFC 951 BootP
- RFC 862 Echo Protocol
- RFC 863 Discard Protocol
- RFC 867 Daytime Protocol
- RFC 868 Time Protocol
- RFC 904 Exterior Gateway Protocol Formal Specification
- RFC 919 Broadcasting Internet Datagrams
- RFC 922 Broadcasting Internet Datagrams in the Presence of Subnets
- RFC 1024, 1035 Domain names
- RFC 1027 Using ARP to Implement Transparent Subnet Gateways
- RFC 1042 Standard for the Transmission of IP Datagrams over Networks
- RFC 1058 RIP
- RFC 1059, 1119 NTPv1/2
- RFC 1112 IGMP IP
- RFC 1122 Host Requirements
- RFC 1166 Internet Numbers
- RFC 1191 Path MTU Discovery
- RFC 1256 ICMP Router discovery protocol
- RFC 1267 A Border Gateway Protocol 3 (BGP- 3)
- RFC 1305 NTPv3

- RFC 1332 The PPP Internet Protocol Control Protocol (IPCP)
- RFC 1334 PPP Authentication Protocols (specifies PAP)
- RFC 1388 RIP Version 2 Carrying Additional Information
- RFC 1403 BGP OSPF Interaction
- RFC 1519 CIDR (Classless Inter-domain Routing)
- RFC 1542 Bootstrap Extensions & DHCP
- RFC 1548 The Point-to-Point protocol
- RFC 1587 OSPF NSSA
- RFC 1765 OSPF Database Overflow
- RFC 1812 Requirements for IP Version 4 Routers
- RFC 1994 PPP Challenge Handshake Authentication Protocol (CHAP)
- RFC 2068 HTTP
- RFC 213 DHCP Server
- RFC 2132 DHCP Options and BOOTP Vendor Extensions
- RFC 2138 RADIUS
- RFC 2139 RADIUS Accounting
- RFC 2236 IGMPv2
- RFC 2328 OSPF V2
- RFC 2338 VRRP
- RFC 2362 PIM-SM/DM
- RFC 2370 The OSPF Opaque LSA Option
- RFC 2453 RIPv2,
- RFC 2474 DiffServ Precedence
- RFC 2475 DiffServ Core and Edge Router Functions
- RFC 2597 DiffServ Assured Forwarding
- RFC 2598 DiffServ Expedited Forwarding
- RFC 2644 Directed Broadcasts
- RFC 2865 Remote Authentication Dial In User Service (RADIUS)
- RFC 3046 DHCP Relay Agent Information Option
- RFC 3222 Forwarding Information Base
- GMRP GARP
- GVRP GARP
- SSH2 Secure Shell 2
- IGMP snooping
- SNMPv3

Hardware performance:

- The back of bandwidth: 96Gbps
- The processor: 600MHz RISC processor
- Switching technology: Parallel storage and forwarding based on ASIC
- MAC address table: 16K (maximum)
- Buffer: 1.5m (maximum)
- Exchange rate: 148,800 PPS / 100 Mbit port, 1,488,000 PPS / 1000 gigabit port.

Software functions:

- Management style: Browser, serial port, STD-17 MIB-II, STD-58 SMIv2, STD-59 RMON, STD-62 SNMPv3, SNMPv2c, SNMPv1, RFC2668 MAU, RFC2925 Ping MIB.
- Diagnosis way: indicator light, log file, relay, RMON, port mirroring, TRAP
- Redundant functions: MRP, HSR, PRP, Ring, MSTP, RSTP, Port together
- Time synchronization: IEEE1588, NTP, SNTP
- Other: IPv4/IPv6 multicast, Storm control, MC/BC protection, Jumbo Frame

Physical performance:

- Mean trouble-free time (MTBF): more than 800,000 hours
- Storage temperature: -40°C ~ 85°C
- Operating temperature: -40°C ~ 85°C
- Humidity: 5% ~ 95%, Non condensation
- Product size: height 44.4* width 440* depth 321mm
- Protection class: IP40 (part IP54)
- Weight: 3.7 kg (maximum)
- Power consumption: 25W (maximum)

Mechanical characteristics

- Vibration: IEC 60068-2-6
- Shock: IEC 60068-2-27
- Free fall: IEC 60068-2-32
- Circuit board: Comply with IPC standard

Electromagnetic property

- Electromagnetic radiation: FCC 47 CFR Part 15 Class A EN55022 Class A
- Electromagnetic compatibility:
- IEC(EN)61000-4-2, class 4;
- IEC(EN)61000-4-3, class 4;
- IEC(EN)61000-4-4, class 4;
- IEC(EN)61000-4-5, class 4
- IEC(EN)61000-4-6, class 4;
- IEC(EN)61000-4-9, class 4;

Industry certification and testing

- Product safety: CE EN60950-1 FCC
- Hazardous area: UL/cUL1604 Class 1 Div 2
- Power industry: IEC61850-3, IEEE1613 (C37.90.x)

The order references

Choose a rack-mounted industrial switch based on the following considerations

- According to access port type: gigabit, 100 Mbit, optical port, electric port(Eport).
- According to the number of access ports: 2, 4, 8.
- According to the protocol type: three layer or layer, layer 2 frame type industrial switches is IAC1428, three layers of frame type industrial switches is IAC1700 series.
- Depending on the way of power supply: -48V DC, 110V DC or 220V AC, please indicate when purchasing.
- According to the transmission distance: SFP pluggable modules involves single mode, multi-mode, MB port, gigabit, optical port, electric port(Eport), 20 km, 40 km, 80 km and other different transmission distance.

Example: If you need a three-layer rack industrial switch with 4 gigabit optical ports, 16 Mbit optical ports and 8 Mbit electric ports(Eport). The optical transmission distance is less than 20km and the power supply is -48V DC.

You should choose: IAC1728-4G-16-AC, And 4 gigabit short distance SFP optical modules and 16 100 Mbit short distance SFP optical modules.

The following is the type of Rack-frame industrial switch for China Southern Power Grid Frame bidding:

Type	Type for STEC	Description
Two layer Ethernet switch with 4 Gigabit optical port+8* 100MB optical port+12 *100MB Eport, 220V AC and 110V DC	IAC1428-4G-12-AC	Rack-mounted, modular two-layer industrial Ethernet switch with 12*100MB Eports +4 *gigabit and 100MB SFP ports +12 *100MB SFP ports. 88~300VDC or 90~264VAC input industrial-grade isolated power supply. Operating temperature -40 ~ 85 degrees, electromagnetic compatibility to meet industry level 4 standards. Protection level up to IP40.
Layer 2 Ethernet switch with 4 *Gigabit optical+8 *100MB optical+12 *100MB Eport, 48V DC.	IAC1428-4G-12-DC	Rack-mounted, modular two-layer industrial Ethernet switch with 12*100MB Eports +4*gigabit and 100MB SFP ports +12*100MB SFP ports. -48V DC redundant isolated power supply. Operating temperature -40 ~ 85 degrees, electromagnetic compatibility to meet industry level 4 standards. Protection level up to IP40.
Three-layer Ethernet switch with 2* Gigabit Optical +8*100 MB optical+4 Eport, DC 48V	IAC1728-4G-12-AC	Rack-mounted, modular three-layer industrial Ethernet switch with 12*100MB Eports +4*gigabit and 100MB SFP ports +12*100MB SFP ports.88~300VDC or 90~264VAC input industrial-grade isolated power supply. Temperature -40 ~ 85 degrees, electromagnetic compatibility to meet industry level 4 standards. Protection level IP40.
Layer 3 Ethernet switch with 2*Gigabit optical+8*100MB optical + 4 Eport. 220V AC and 110V DC	IAC1728-4G-12-DC	Rack-mounted, modular three-layer industrial Ethernet switch with 12*100MB Eports +4*gigabit and 100MB SFP ports +12*100MB SFP ports. -48V DC redundant isolated power supply. Working Temperature -40 ~ 85 degrees, electromagnetic compatibility to meet industry level 4 standards. Protection level IP40.
Layer 3 Ethernet switch with-2*Gigabit optical+16 *100MB optical + 4 Eport, 220V AC and 110V DC	IAC1728-4G-16-AC	Rack-mounted, modular three-layer industrial Ethernet switch with 4*gigabit and 100MB SFP ports +16*100MB SFP ports +8*100MB Eports.88~300VDC or 90~264VAC input industrial-grade isolated power supply. Temperature -40 ~ 85 degrees, electromagnetic compatibility to meet industry level 4 standards. Protection level IP40.
Layer 3 Ethernet switch with-2*Gigabit optical+16 *100MB optical + 4 Eport, 48VDC.	IAC1728-4G-16-DC	Rack-mounted, modular three-layer industrial Ethernet switch with 4*gigabit and 100MB SFP ports +16*100MB SFP ports +8*100MB Eports. -48V DC redundant power supply. Temperature -40 ~ 85 degrees, electromagnetic compatibility to meet industry level 4 standards. Protection level IP40.

Type	Type for STEC	Description
Layer 3 Ethernet switch with-4*Gigabit optical+4 *Gigabit Eport + 8 *100MB optical+8*100MB Eport, 220V AC and 110V DC	IAC1724-12-ACB	Rack-mounted, modular layer 3 industrial Ethernet switch with 4* 2.5 gigabit / 1.0 gigabit adaptive SFP ports +24*gigabit Eports +8 gigabit and 100MB SFP ports.88~300VDC or 90~264VAC input industrial-grade isolated power supply. Temperature -40 ~ 85 degrees, electromagnetic compatibility to meet industry level 4 standards. Protection level IP40.
Layer 3 Ethernet switch with-4*Gigabit optical+4 Gigabit Eport + 8*100MB optical+8*100MB Eport, 48 DC.	IAC1724-12-DCB	Rack-mounted, modular three-layer industrial Ethernet switch with 4* 2.5 gigabit / 1.0 gigabit adaptive SFP ports +24*gigabit Eports +8*gigabit and 100MB SFP ports.18 ~ 60VDC input industrial-grade isolated power supply. Temperature -40 ~ 85 degrees, electromagnetic compatibility to meet industry level 4 standards. Protection level IP40.
Three-layer industrial Ethernet switch (IP54), supporting more than 4 *gigabit optical ports, more than 4*gigabit Eports, more than 8*100MB optical ports and 8 *10/100M Eports, with POE power supply function.220V AC and 110V DC	IAC1728-4G-12-12P-AC	Modular three-layer POE industrial switches with four 100M/1000M/2500M adaptive SFP ports +12*100MB SFP port+ 12 *gigabit and 100MB POE+ Eports+independent POE+power supply (44 ~ 57VDC) input terminals. its working temperature is -40 ~ 85 degrees, the average trouble-free working time is more than 800,000 hours, and the electromagnetic compatibility meets the industry level 4 standard. Protection level IP54.88~300VDC or 90~264VAC input industrial-grade isolated power supply.
Three-layer industrial grade Ethernet switch (IP54), more than 4*gigabit optical port, 4 *gigabit Eport, 8*100MB optical port, and 8*10/100M Eport, with POE power supply function.48V DC	IAC1728-4G-12-12P-DC	Modular three-layer POE industrial switches with four 100M/1000M/2500M adaptive SFP ports +12*100MB SFP port+ 12*gigabit and 100MB POE +Eports+ independent POE+ power supply (44 ~ 57VDC) input terminals. The working temperature is -40 ~ 85 degrees, the average trouble-free working time is more than 800,000 hours, and the electromagnetic compatibility meets the industry level 4 standard. Protection level IP54. 18 ~ 60VDC input industrial-grade isolated power supply.
Netmanager software	ArtiFirm	comprehensive network management platform, English interface network management system based on SNMP english interface network management system, support WIN operating system
Megabyte optical module - Short	FSFP-LX-20	100MB signal mode SFP optical module (1310nm), LC interface, maximum distance 20km

Type	Type for STEC	Description
distance (less than 10km)		
100 MB optical Module - Medium distance (10km-40km)	FSFP-LX-40	100MB SINGLE mode SFP optical module (1310/1550nm), LC interface, maximum distance 40km
100 MB optical module - Long distance (greater than 40km)	FSFP-LX-80	100MB SINGLE mode SFP optical module (1550nm), LC interface, maximum distance 80km
Gigabit optical module - Short distance (less than 10km)	GSFP-LX-20	Gigabit single mode SFP optical module (1310nm), LC interface, maximum distance 20km
Gigabit optical Module - Medium distance (10km-40km)	GSFP-LX-40	Gigabit single mode SFP optical module (1310/1550nm), LC interface, maximum range 40 km
Gigabit optical module - Long distance (greater than 40km)	GSFP-LX-80	Gigabit single mode SFP optical module (1550nm), LC interface, maximum distance 80km

Please noted: the Gigabit optical and 100 MB SFP can achieve the maximum transmission of 20 kilometers, so if you need SFP which is less than 20 kilometers, please choose the short distance optical module.