JetNet 5828G Series

IEC61850-3 substation-rated 24+4G Layer 3 Modular Managed Ethernet Switch

Power Substation L3

CE FC RoHS

IEC 61850-3 IEEE1613 | MSR < 10ms | 12+2G Rings | Layer 3 Routing | VRRP

3 Modular Slots | 256 VLANs | Modbus TCP/IP | NEMA TS-2 | EN 50121-4

LLDP & JetView Pro | -40~85°C

- 3 exchangeable modular slots for adding up to 24 10/100-TX or 18 100Base-FX
- 4 On-Board Gigabit RJ45/SFP combo ports
- Exceeds IEC61850-3, IEEE1613 Power Substation Standard requirements
- NEMA TS-2 rated for traffic control systems
- EN 50121-4 EMC rated for railway installations
- Korenix MSR pattern aggregates up to 12 x 100M Rings plus 2 Gigabit Rings
- Layer 3 IP, VLAN Routing & Multicast Routing
- Dynamic IP Routing protocol supports RIPv1/v2 and OSPFv2
- IP IGMP Multicast Management & MRoute for Local Multicast Routing
- Advanced Multicast Routing Protocol, DVMRP, PIM-DM (Available Soon)
- 256 Tag based VLANs segregate IEC 61850 GOOSE message streams from each other
- 8 QoS priority for prioritizing the control and management packet from SCADA
- Up to 9KB Jumbo Frame for large file transmission
- Virtual Router Redundancy Protocol
- Secure system by 802.1x, IP/MAC Access Control List
- Industrial Modbus TCP protocol for device monitoring
- Advanced Network Management by SNMP, RMON, and event notifications
- Supports LLDP and JetViewPro i^{2}NMS software for auto-topology visualization and efficient group management
- Fan-Less design, -40~85°C operating temperature

Industrial Intelligent NMS
Rackmount PoE Plus Switch
Industrial PoE Plus Switch
Industrial 12-24V PoE Switch
Industrial PoE Switch
Rackmount L3/L2 Switch
Gigabit Managed Switch
Managed Ethernet Switch
Entry-level Switch
Wireless Outdoor AP
Embedded PoE/Router Computer (LINUX)
Industrial Communication Computer (WIN/LINUX)
Ethernet/PoE/ Serial Board
Ethernet I/O Server
Media Converter
Serial Device Server
SFP Module
Din Rail Power Supply

Overview

JetNet 5828G is part of Korenix IEC 61850-3 substation-rated Modular Managed Ethernet Switch Family designed with complete Layer 3 IP Unicast routing features to provide enhanced group management of large scale networks in power substations environments. The switch is equipped with 4 onboard Gigabit RJ45 / MINI GBIC combo ports plus 3 modular slots for delivering maximum 24 copper or 18 fiber ports for various network connection needs while reducing the device units and costs. With the 4 gigabit combo ports users can trunk up to 8G uplink bandwidth and/or form two independent gigabit rings, as a result allowing JetNet 5828G to perform as an access-level switch in the power substations and ensure the reliable high bandwidth data transmission.

JetNet 5828G, a special design for substation automation and industrial control room, is verified to conform with the IEC 61850-3, IEEE1613 high level environmental certifications. The JetNet 5828G has also passed all the test requirements of NEMA-TS2 certification for traffic control systems and EN50121-4 EMC certification for Railway installation.

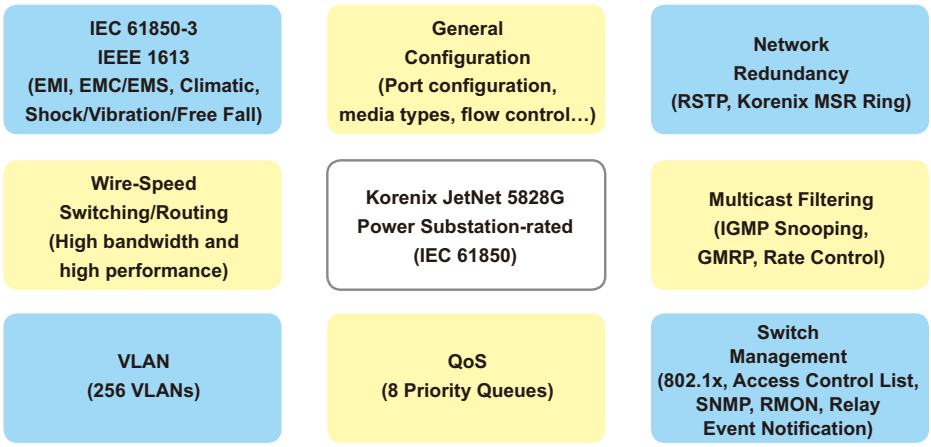
By choosing JetNet 5828G rackmount switch, administrators get the advantage of wire-speed switching/routing traffic within or among different subnets, choosing the best route from source IP address to destination IP. The injected layer 2/3 data, GOOSE, SCADA message can be transmitted without any loss or collision.

With the exclusive MultiRing technology, users can aggregate up to 12 fast Ethernet and 2 gigabit rings into a single switch and ensure network reliability in applications with increased bandwidth and expanded system. Furthermore, users can configure multiple IP subnets through a single port or the VLAN interface and route multiple rings with each other.

To automatically discover devices and efficiently manage the industrial network performance in power substations, JetNet 5828G incorporates LLDP function and perfectly works with the Korenix patented JetView Pro i^{2}NMS. Moreover, it fulfills and even exceeds the high-end management requirements of IEC 61850-3/IEEE 1613 substation standards by providing doubled performance and efficient traffic transmission through superb management features, including 8 QoS Priority, 256 Tag VLAN groups, 16K MAC address table, DHCP Option 82, MSTP/RSTP, LACP, ACL, VRRP, Layer 3 IP Routing features... etc.

IEC 61850-3 / IEEE 1613 Compatibility

In substation environments, there are many EMI & Environmental Phenomena, such as the electric,magnetic, interference high energy power surge, uncontrolled temperature & humidity...etc. When it comes to the Ethernet for substation automation, the utility companies generally advice integrating networking solutions compliant with the IEC 61850-3 and IEEE 1613 standards. IEC61850-3 defines the standard for the "Communication Networks and Systems in Substations“, including "General Requirements" for relevant equipments. The IEEE 1613 defines the “Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations”.

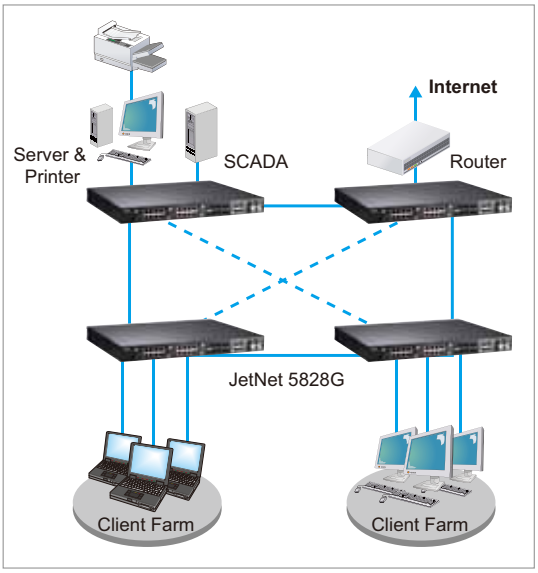


High Bandwidth and Performance

JetNet 5828G series support 24 fast Ethernet ports plus 4 gigabit combo ports as well as wire speed forwarding and up to 9,216 bytes jumbo frame.

- Acting as the access switch, 100M speed is still the major and popular in industrial environment.
- 2 Gigabit ports are for forming independent ring, port trunking (LACP) or connecting multiple switches with RSTP protection.
- Connect the 2 Gigabit ports with ring redundancy and the other 2 gigabit ports to public servers with gigabit bandwidth.
- All the front interfaces can communicate with each other with wire-speed Layer 2 and Layer 3 switching performance.
- Acting as the distribution switch, all interfaces have their own forwarding domain, design for network redundancy or routings interfaces.
- Each F.E., Gigabit ports or VLAN groups can work as the Layer 3 IP interfaces. The interfaces are the default gateway of the client workstations.
- All the IP subnets attached to the JetNet 5828G can route with wire-speed performance.

The 24+4G combo port design provides benefits and advantages when planning your industrial network architecture.



Multiple Super Ring (MSR™) Technology

The JetNet 5828G supports the new generation ring technology – MSR™ which includes various new technologies for redundancy applications and structures of different networks.

Multiple Super Ring

Rapid Super Ring	Rapid Dual Homing	MultiRing	TrunkRing
■ Ring Master auto-select ■ Seamless restoration ■ Ring Failure alarms/LED ■ Failed ring port together with Ring Master ■ Up to 10ms Recovery Time ■ Backward compatible with legacy Super Ring	■ Multiple Uplink Paths ■ One to One upper, Many to One upper, One to Many upper switches ■ Seamless Restoration ■ Korenix Patent protected	■ Couple 2 rings with shared unit ■ Multiple up to 12 100M Rings & 4G for 2 Gigabit rings ■ Korenix Patent protected	■ Integrate Port Trunk/ LACP with MSR, RSR ■ Load balancing of ring Ports ■ Backup with each other ■ Korenix Patent protected

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Industrial 12-24V PoE Switch
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Gigabit Managed Switch
Managed Ethernet Switch
Entry-level Switch
Wireless Outdoor AP
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Ethernet/PoE/ Serial Board
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Media Converter
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SFP Module
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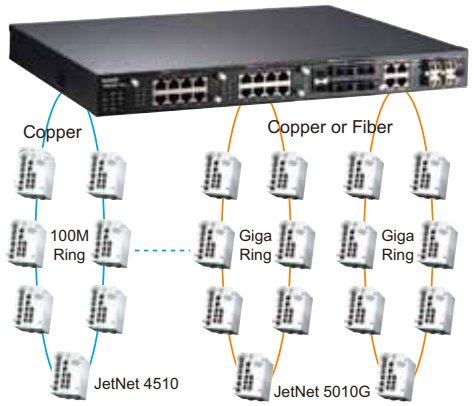
Maximum 12+2G Rings Aggregation Capability

Korenix JetNet 5828G supports MultiRing which allows aggregating multiple Rapid Super Rings. With the MultiRing technology all the Fast Ethernet and Gigabit Ethernet ports can be part of the ring ports.

Besides, up to 12 100M Rings can be formed and 2 Gigabit Rings can be aggregated to single access switch. Moreover, after the rings are formed, the device can work as a layer 2 switch and allow all rings to communicate within the same VLAN. The JetNet 5828G can also work in a layer 3 mode, where it acts as the default gateway of the lower IP subnets and VLANs groups of each rings. These IP subnets and VLAN groups can inter-route within the single JetNet 5828G. With the layer 3 protocol supported, the technicians can easily plan the IP network infrastructure for the field stations, security filtering and wire-speed routing.



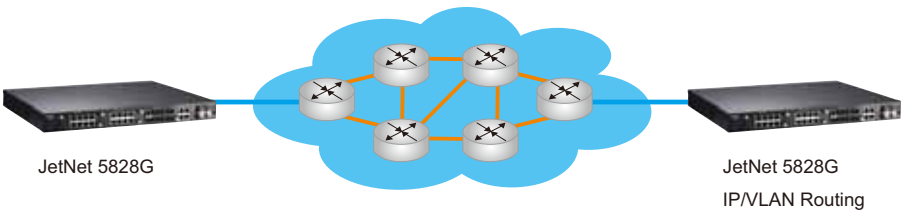
Up to 12 x 100M Rings + 2 Gigabit Rings
Different VLAN/IP subnets Inter Routing

Routing Protocol

Routing is the process of moving packets through an internetwork, such as the Internet. To Route traffic, a router or layer 3 switch needs to know the destination IP address, sources IP it can learn from, the possible routes, finding the best route, maintaining and verifying routing information. If the next hop address is known or assigned by IT manager or service provider, the static route can direct the correct routing request to the connected interface. If not, the dynamic routing protocol is needed.

The dynamic routing protocol includes unicast routing and multicast routing protocols. The unicast routing protocol includes hop based or distance vector based. RIP is the typical hop based, the less hops path is always the best route. OSPF is the typical distance vector base, the lowest cost is the best route path.

To route multicast services, like the movie, video, industrial automation streams. The multicast routing and related protocols are needed. The MRoute, DVMRP, PIM-DM are supported by JetNet 5828G series.

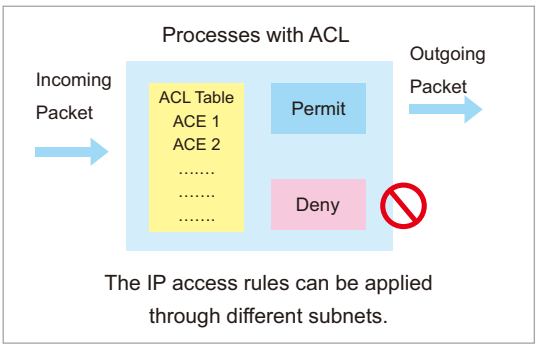


- Static Route
- Dynamic IP Unicast Routing
- Dynamic IP Multicast Routing

Advanced Security by Layer 3 Access Control List

After layer 3 interfaces are established, the IP interface or IP subnet can communicate as soon as the IP routing is enabled. To restrict the traffic routing and enhance the security protection, the Access Control List (ACL) makes it easy to limit certain devices communicating with the other addressed devices and by the specific protocol. Example rules include (1) administrator to multiple stations, (2) stations to stations and (3)stations to public servers…etc.

The ACLs provide “Permit” and “Deny” rules for any or the specific host. The IP address, MAC address and port ID are the destinations allowed to be applied the rules. The protocol ID, QoS tag, TCP flag… are the operations which users prefer to control.



The IP access rules can be applied through different subnets.

The JetNet 5828G is equipped with one layer 2+ switch fabric which provides flexible ACLs for the specified subjects and operations within the same LAN.

Link Layer Discovery Protocol

The Link Layer Discover Protocol (LLDP) was formally ratified as IEEE 802.1AB-2005. LLDP is the Layer 2 protocol that allows the network device/station to advertise connectivity & management information, the identity & major capabilities. It receives and establishes network management information on the local same network.

In industrial environments, most vendors provide their own discovering protocols, window utility or other tools to manage their switches. The LLDP protocol fixes the interoperability among them. With LLDP supported, users can easily browse the network devices and establish the network management information schema for the stations.

Supporting SNMP, LLDP and JetView protocol, the JetNet 5828G series can be easily discovered, port and ring status can be displayed by JetView Pro, Korenix designed Network Management System or other NMS which support SNMP and LLDP. The software can help administrators efficiently and effectively manage the industrial network.

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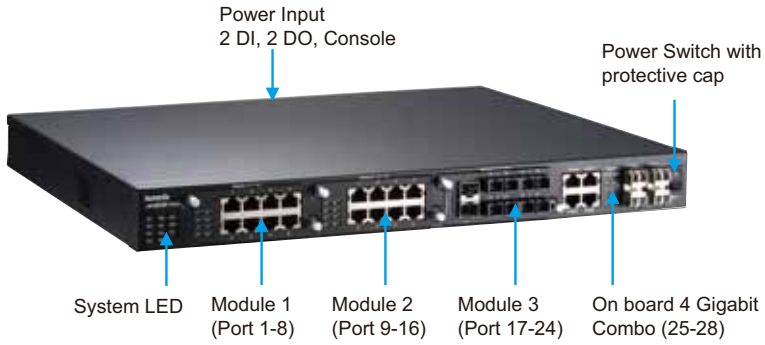
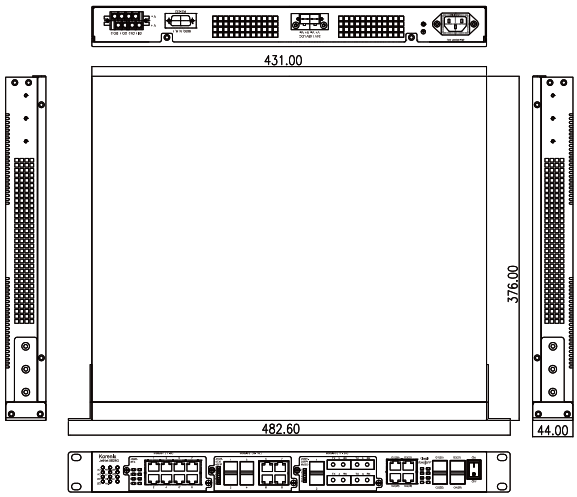
JetNet 5828G Appearance

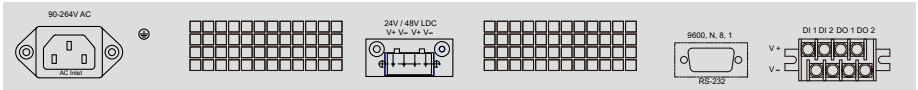


JetNet 5828G Dimensions (Unit = mm)



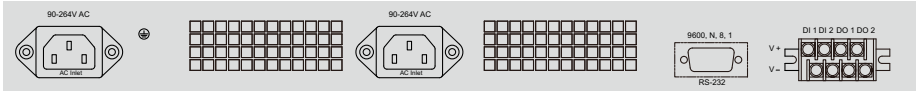
JetNet 5828G IEC61850-3 substation-rated 24+4G Layer 3 Modular Managed Ethernet Switch

Power Input: 1 x 85-264VAC/88-370VDC + 2 x 24/48VDC

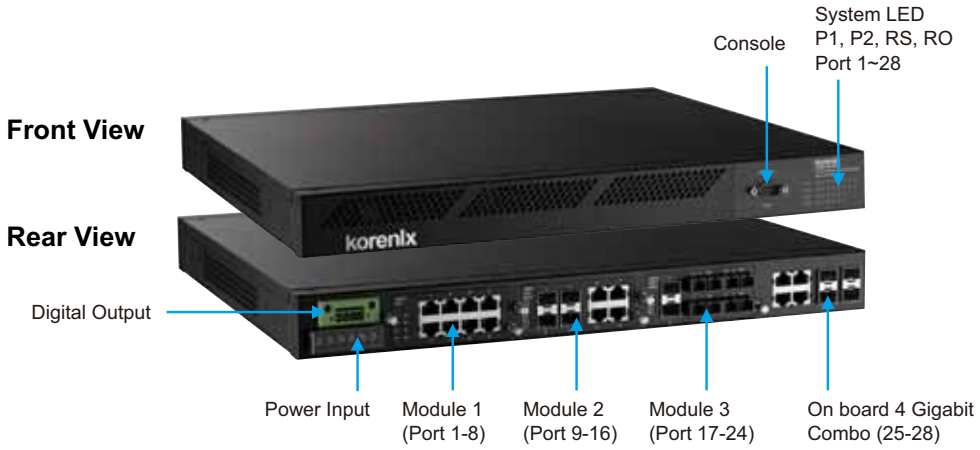


JetNet 5828G-2AC IEC61850-3 substation-rated 24+4G Layer 3 Modular Managed Ethernet Switch with Dual AC input

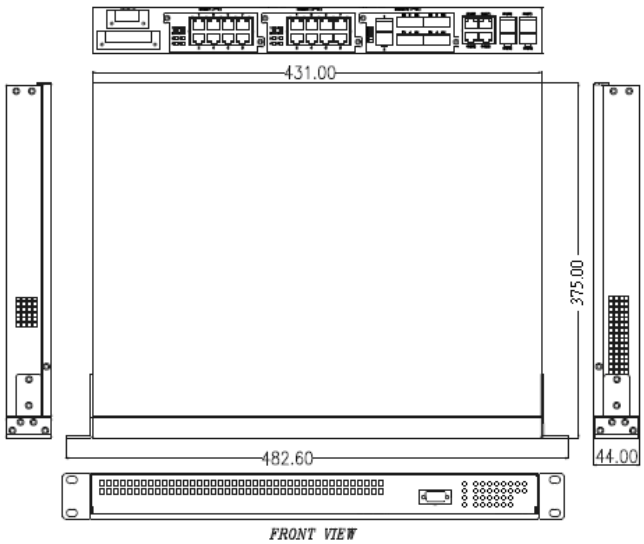
Power Input: 2 x 85-264VAC/88-370VDC, Standard three-pronged AC plug



JetNet 5828G-R Appearance



JetNet 5828G-R Dimensions (Unit = mm)



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Flexible Module Design

The JetNet 5828G provides several types of Fast Ethernet modules. There are 8 10/100Base-TX ports, 4 10/100Base-TX plus 4 100Base-FX and 4 100Base-FX/SC ports plus 2 100Base-FX SFP modules. By turning off the power at the front on the switch, it's becoming possible to insert the modules or exchange the module types.

The modular design is more flexible for purchasing, provides less storage of stock and field installations. Once the distance is over 100 meters, users can exchange modules without replacing the device. When purchasing the JetNet 5828G, please confirm the media type and the port volume.

Naming Rule: JNM5-ABBCC/ABBCC

JNM5	A: Port Volume	BB: RJ-45/Fiber	CC: Type of Fiber Connector
5: JetNet 5xxx Series Module	2: 2 Ports 4: 4 Ports 8: 8 Ports	TX: RJ45 M: Multi mode S: Single Mode	SC: SC Connector SFP: SFP socket

JNM5-8TX:
8 ports 10/100Base-TX module

JNM5–2SFP/4MSC:
2 100Base-FX SFP + 4 100Base-FX/SC Multi-mode 2KM
JNM5–2SFP/4SSC:
2 100Base-FX SFP + 4 100Base-FX/SC Single-mode 30KM

JNM5-4TX/4SFP: 4 ports 10/100TX + 4 100FX-SFP Socket

The examples:

Fast Ethernet module	On Board	Example
JNM5-4TX/4SFP x 1	4 10/100/1000 or 4G SFP	4 x 100M copper + 4 x 100M SFP + 4G, 8 x 100M copper + 4 x 100M SFP, 6 x 100M copper + 4 x 100M SFP + 2G …etc.
JNM5-8TX x 1	4 10/100/1000 or 4G SFP	8 x 100M copper + 4G Combo, 12 x 100M copper, 10 x 100M copper + 2G combo …etc.
JNM5-2SFP/4MSC	4 10/100/1000 or 4G SFP	6 x 100M Fiber + 4G Combo, 4 x 100M copper + 6 100M Fiber …etc.
JNM5-8TX x 2 + JNM5-4TX/4SFP x 1	4 10/100/1000 or 4G SFP	20 x 100M copper + 4 x 100M SFP + 4G combo 22 x 100M copper + 4 x 100M SFP + 2G combo …etc.

Purchasing Progress

JetNet 5828G (4G on board Combo Ports) → Confirm Port Media and Volume → Choose the Types of the modules → Choose the Types of SFP transceivers → Place order directly or contact with your saleswindow for help. Sales@korenix.com Korecare@korenix.com

Specification

Technology

Standard:
IEEE 802.3 10Base-TX, IEEE 802.3u 100Base-TX, IEEE 802.3ab 1000Base-T, IEEE 802.3z Gigabit Fiber, IEEE 802.3x Flow Control, IEEE 802.1p COS, IEEE 802.1Q VLAN, IEEE 802.1QinQ, IEEE 802.1D-2004 RSTP, IEEE 802.1s MSTP, IEEE802.3ad LACP, IEEE802.1X, IEEE802.1AB LLDP, IEEE 1588v1 PTP

RFC Documents:
RFC791 IP, RFC768 UDP, RFC 793 TCP, RFC 783 TFTP, RFC 854-859 TELNET, RFC 1157 SNMP, RFC 1213 MIB-II, RFC 1215 Traps, RFC 1493 Bridge MIB, RFC 1757 RMON, RFC 1866 HTML, RFC 2068 HTTP, RFC1112 IGMP V1, RFC2236 IGMP V2, RFC1058 RIPv1, RFC1723/2453 RIPv2, RFC1583 OSPF, RFC2328 OSPFv2

Performance

Switch Technology:
Store and Forward Technology, 12.8Gbps Switch Fabric.
System Throughput: 14,880pps for 10M Ethernet, 148,800pps for 100M Fast Ethernet, 1,488,100 pps for Gigabit Ethernet
Transfer packet size: Typical: 64 bytes to 1536 bytes,
Jumbo Frame Enabled: Up to 9,216bytes.
MAC Address: 16K MAC
Packet Buffer: 32Mbits
Relay Alarm: Dry Relay output with 1A@24V ability

Management

Configuration: Cisco-Like CLI, JetView, Web, HTTPS, SSH, Backup/Restore, DHCP Client, Warm reboot, Reset to default, Admin password, MAC address table display, Static MAC, Aging time, Traceroute
Port Configuration: Port Enable/Disable, Flow Control, Speed/Duplex, Status and Port Statistic
Port Trunk: Static Trunk and 802.3ad LACP, Up to 6 Trunk Group, 8 ports per trunk
LACP: IEEE 802.3ad Link Aggregation Control Protocol, Short/Long LACP Timeout
Port Mirroring: Online traffic monitoring on multiple selected ports
Jumbo Frame: Enable/Disable with Adjustable MTU size
SNMP: SNMP v1, v2c, v3 and Traps.
SNMP MIB: MIB-II, Ethernet-like, P-Bridge, Q-Bridge, Bridge, RSTP, RMON Group 1,2,3,9 and Private MIB
LLDP: Link Layer Discovery Protocol to advertise system/port identity and capability on the local network
Modbus/TCP: Industrial Communication protocol for monitoring
VLAN: IEEE802.1Q VLAN, GVRP. Up to 256 Tag VLAN, 4K Configurable VLAN ID
Private VLAN: Direct client ports in isolated/community VLAN to promiscuous port in Primary VLAN
Q-in-Q: Double VLAN Tag in an Ethernet frame
Quality of Service: 8 physical priority queues per port, IEEE802.1p COS and Layer 3 TOS/DiffServ
IGMP Snooping: IGMP Snooping V1/V2/V3 for multicast filtering and IGMP Query, up to 256 Multicast Groups
GMRP: GARP Multicast Registration Protocol
Rate Control: Ingress filtering for Broadcast, Multicast, Unknown DA or All packets, step by 64kbps.
IEEE1588 Precision Time Protocol (PTP): Synchronize time from the PTP server
NTP: Network Time Protocol to synchronize time from Internet
Embedded Watchdog: Embedded hardware watchdog timer to auto reset system when switch system failure
802.1x: Port_based Network Access Control
Radius: Login by Radius account/password, Key for Radius Server Authentication
Access Control List (ACL): Deny/Permit ACL Security policy for specific IP/MAC address and TCP/UDP port
DHCP Server: Can assign 255 IP address, support IP and MAC binding
DHCP Option 82: Relay DHCP Request to different IP subnet
E-mail Warning: Automatic warning by pre-defined events
System Log: Supports both Local mode and Server mode
Alarm Events: Power and Ports Failure, DI state, DO state, Ping Failure, Login Fail, Time Synchronize Fail, Super Ring Topology Change

Network Redundancy

Multiple Spanning Tree Protocol: IEEE802.1s MSTP, each MSTP instance can include one or more VLANs.
Rapid Spanning Tree Protocol: IEEE802.1D-2004 Rapid Spanning Tree Protocol. Compatible with Legacy STP and IEEE802.1w.
Multiple Super Ring (MSR)™ : New generation Korenix Ring Redundancy Technology, Includes Rapid Super Ring, Rapid Dual Homing, TrunkRing, MultiRing and backward compatible with legacy Super Ring
Rapid Dual Homing (RDH)™: Multiple uplink paths to one or multiple upper switch
TrunkRing™: Integrate port aggregate function in ring path to get higher throughput ring architecture
MultiRing™: Couple or multiple up to 12 100M rings and 2 Gigabit Rings in a single switch
Legacy Super Ring: Backward compatible in client mode

Layer 3 Routing Support

IP Routing: Supports Default, Static and Dynamic Route
IP Multi-Netting: More than one IP on a network interface
Virtual LAN Routing: Incorporates both 802.1Q bridging and Routing function
Routing Information Protocol: Hop-based IP routing protocol, supports RIPv1 and RIPv2
Open Shortest Path First: Link state based IP routing protocol, supports OSPFv1 and OSPFv2
IGMP: The multicast group management protocol, support IGMP v1,v2
MRoute: Multicast Routing among the local IP interfaces
DVMRP: Hop-based multicast routing protocol, short of Distance Vector Multicast Routing Protocol (Available Soon!)
PIM-DM: Multicast routing protocol, short of Protocol Independent Multicast -Dense Mode (Available soon!)
VRRP: Short of the Virtual Router Redundancy Protocol. Automatically backup routing route to specific router

Interface – On Board

Number of Fixed On-Board Gigabit Ports:
10/100/1000Base-TX: 4 x RJ-45, combo with SFP
1000Base-X: 4 x SFP with Hot Swappable, DDM (Digital Diagnostic Monitoring) SFP supported
Diagnostic LED (JetNet 5828G):
AC/HDC Power 1/2(Green), LDC Power 1/2 (Green), RDY(Ready) (Green), Digital Input 1/2(Green), Ring Master (Green), Digital Output 1/2(Red), Ring Fail (Red)
Gigabit Copper/SFP (Port 25-28): Link/Activity (Green/Green Blinking)
Diagnostic LED (JetNet 5828G-R):
PWR 1/2 (Green); DO 1(Red);
R.S. (Green: Ring state is normal;
Green Flashing: Incorrect configuration;
Amber: Ring state is abnormal;
Amber Flashing: One of the ring ports break has been detected.)
Port 1-28: Link/Activity (Green/Green Blinking)
Cables:
10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable (100m)
100 Base-TX: 2/4-pair UTP/STP Cat. 5 cable (100m)
1000 Base-T: 4-pair UTP/STP Cat. 5 cable (100m)
Power Switch: Easy to power off the switch when exchanging the module, (JetNet 5828G)
RS232 Console: DB9 Connector, Pin3: TxD, Pin2: RxD, Pin5:GND
Digital Input: 2 sets of Digital Input, (JetNet 5828G)
Logic Low (0): 0-10VDC/Logic High(1): 11-30VDC
Alarm: 1/2 sets (JetNet 5828G-R/JetNet 5828G) of Dry Relay outputs with 1A@24V for configurable events

Interface – Module

JNM5-8TX

Number of Ports in Modules: 8 x 10/100Base-TX, Auto MDI/MDI-X, Auto Negotiation

JNM5-4TX/4SFP

Number of Ports in Modules: 4 x 10/100Base-TX, Auto MDI/MDI-X, Auto Negotiation
SFP: 4 x 100M Base-FX SFP Socket

JNM5-2SFP/4MSC

Number of Ports in Modules: 2 x 100Base-FX SFP plus 4 x 100Base-FX Multi mode SC Transceiver
SFP: 2 x 100M Base-FX SFP Socket
100Base-FX Multi Mode SC Transceiver
Multi-mode SC duplex connector
Central Wavelength: 1310 nm
Output Optical Power:
62.5/125 um fiber: -20 ~ -14 dBm
50/125 um fiber: -23.5 ~ -14 dBm
Minimum Input Optical Power (Sensitivity): -31 dBm
Single power supply: 3.3V
Power Consumption: Per Port max. 1.6 Watt (4V*400mA)
Typical Distance: 2KM

JNM5-2SFP/4SSC:

Number of Ports in Modules: 2 x 100Base-FX SFP plus 4 x 100Base-FX Single mode SC Transceiver
SFP: 2 x 100M Base-FX, LC Type
100Base-FX Single Mode SC Transceiver (30KM)
Single-Mode SC duplex connector
Central Wavelength: 1310 nm
Output Optical Power:
9/125 um fiber: -15 ~ -8 dBm
Minimum Input Optical Power (Sensitivity): -34 dBm
Single power supply: 3.3V
Power Consumption: Per port max. 1.6 Watt (4V*400mA)
Typical Distance: 30KM
Port ID: Port ID of Slot 1 start from port 1 to 8, slot 2 start from port 9 to 16, slot 3 start from port 17 to 24
Port LED:
Link/Activity of connected port (Green/Green Blinking)
Note: When the operating temperature is higher than 55°C, choose Wide Temperature SFP(-40~85°C) instead of normal temperature SFP transceiver

Power Requirements

Power:
AC: 85-264VAC
HDC (High Voltage DC Input): 88-370VDC
LDC (Low Voltage DC input): 24/48VDC (5828G only)
Power Consumption: Max. 50 Watts, by modules
Power Connector:
JetNet 5828G: 1 x Standard 3-pronged AC plug +4 pin LDC Terminal Block
JetNet 5828G-2AC: 2 x Standard 3-pronged AC plug
JetNet 5828G-R: 1 x 6pin HDC Terminal Black

Mechanical

Installation:
19-inch, 1U Rack Mount, Ethernet Ports on the Front (JetN 5828G/5828G-2AC)
19-inch, 1U Rack Mount, Ethernet Ports on the Rear (JetNet 5828G-R)
Module: Exchangeable after powering off the switch
Case: Metal case
Dimension: 44mm(H) x 431mm (W) x 375mm (D)
Weight: 7 kg with package

Environmental

Operating Temperature & Humidity
Dry Heat: 85°C, 16hrs
Cold: -40°C, 16hrs; Cold Start requires 100VAC
Damp Heat: 50°C, 95% Humidity (non-condensing), 4 Cyclic, 96hrs
Above tests follows IEC 61850-3 clause 5.2&5.3, IEC 60870-2-2 and IEEE 1613 clause 4.1
Korenix Stress Test: -40 ~70°C with 95% Humidity, 3 Cyclic, 51hrs
Storage Temperature: -40 ~ 85°C
Operating Humidity: 5% ~ 95%
Hi-Pot: 1.5KV for AC power and Port

Regulatory Approvals

Power Substation: IEC 61850-3 and IEEE 1613 rated
Traffic Control: NEMA TS-2 rated
Railway: EN50121-4 rated
EMI: FCC Class A, CE/EN55022. Class A
EMS:
IEC 61000-4-2(ESD),
IEC 61000-4-3(RS),
IEC 61000-4-4(EFT),
IEC 61000-4-5(Surge),
IEC 61000-4-6(CS),
IEC 61000-4-8(RF Magnetic),
IEC 61000-4-9 (Pulsed magnetic field)
EN61000-10(Damped oscillator),
EN61000-4-11(Voltage Dips),
EN61000-4-16(Conducted command disturbances),
EN61000-4-17(Ripper on DC power),
EN61000-4-18(Damped oscillatory wave),
EN61000-4-29(Voltage Dips)
IEEE cl.5.3 Voltage Dip, IEEE 1613 cl.6.3 Impulse Voltage, IEEE 1613 cl.6.2 High Voltage Test
Shock: IEC 61850-3 clause 5.5, IEC 60870-2-2 table 3
Vibration: IEC 61850-3 clause 5.5, IEC 60870-2-2 table 3
Free Fall: IEC 61850-3 clause 5.5, IEC 60870-2-2 table 3
MTBF: Above 200,000 Hours, MIL-HDBK-217F GB standard
Warranty: 5 years

Ordering Information

- **JetNet 5828G IEC61850-3 rated 24+4G Layer 3 Modular Managed Ethernet Switch**

Power Input: 1 x 85-264VAC/88-370VDC + 2 x 24/48VDC

- **JetNet 5828G-2AC IEC61850-3 rated 24+4G Layer 3 Modular Managed Ethernet Switch with Dual AC input**

Power Input: 2 x 85-264VAC/88-370VDC, Standard 3 pronged AC plug

- **JetNet 5828G-R IEC61850-3 rated 24+4G Layer 3 Modular Managed Ethernet Switch with Ethernet Ports on the Rear (Available Soon!)**

Power Input: 2 x 85-264VAC/88-370VDC, 6 pin Terminal Block

	PWR 1	PWR 2	AC/HDC Connector	LDC 1	LDC 2
5828G	85~264VAC/ 88-370VDC		Standard 3 pronged AC plug	24/48VDC	24/48VDC
5828G-2AC	85~264VAC/ 88-370VDC	85~264VAC/ 88-370VDC	2 x Standard 3 pronged AC plug		
5828G-R	85~264VAC/ 88-370VDC	85~264VAC/ 88-370VDC	6 pin HDC Terminal Block		

Accessories:

JetNet 5828G Series (4G Combo on board, No Fast Ethernet modules, no SFP transceivers)

Rack Mount Kit, Quick Installation Guide, Document CD, Console Cable, Power code

Additional Modules:

JNM5-8TX: 8 ports 10/100Base-TX module

JNM5–2SFP/4MSC: 2 100Base-FX SFP + 4 100Base-FX/SC Multi-mode 2KM

JNM5–2SFP/4SSC: 2 100Base-FX SFP + 4 100Base-FX/SC Single-mode 30KM

JNM5-4TX/4SFP: 4 ports 10/100TX + 4 100FX-SFP Socket

Optional Accessories

100Base-FX Multi-Mode SFP Transceiver
100Base-FX Single-Mode SFP Transceiver
100Base-FX BIDI/WDM Single-Mode SFP Transceiver
Gigabit Multi-Mode SFP Transceiver
Gigabit Single-Mode SFP Transceiver
Gigabit BIDI/WDM Single-Mode SFP Transceiver
Gigabit DDM SFP Transceiver