EL326 Layer 3 Industrial Ethernet Switch

Sixnet Networking Series

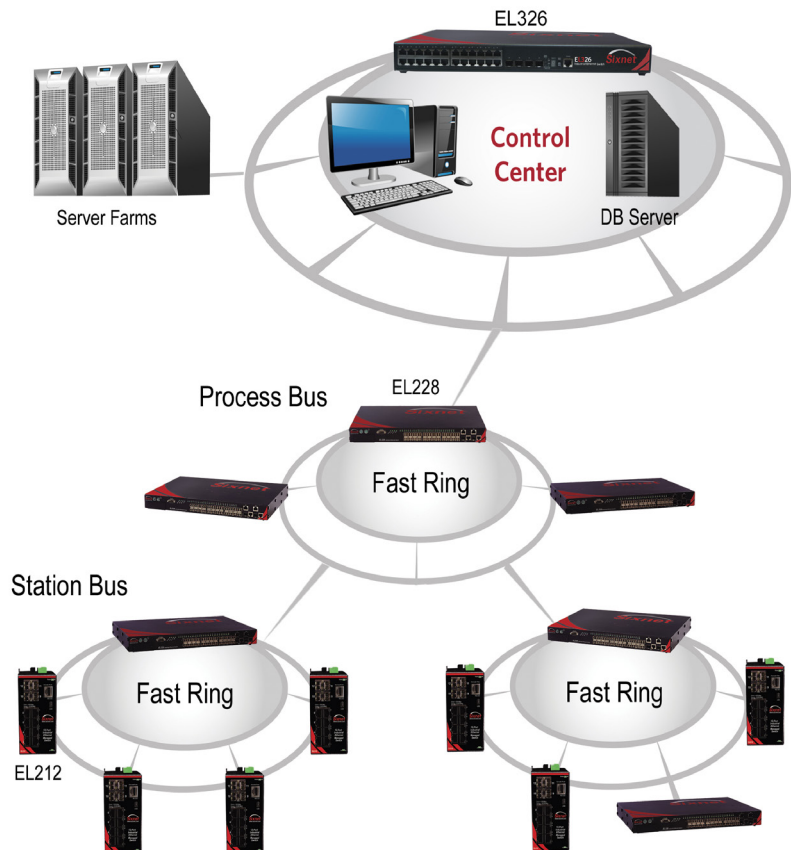►►► **Layer 3 Industrial Ethernet Switch**

PRODUCT HIGHLIGHTS

- Industrial-grade Layer 3 hardware functionality increases multi-service network performance
- 10Mb/s to 10Gb/s Ethernet provides flexible deployment options
- IPv4 and IPv6 management delivers infrastructure sustainability
- Enterprise-class functionality and advanced security future proofs the network
- Stackable design provides high scalability and investment protection

The Sixnet EL326 is a Layer 3 rack-mount managed industrial Ethernet switch with advanced capabilities, designed to meet the performance requirements of power substations, traffic control, railway and other mission-critical networks. Combining the high availability and security of an enterprise-class switch with rugged packaging and protected circuitry, the EL326 easily handles even the most bandwidth intensive applications.

Deployment flexibility is guaranteed through Ethernet link speeds ranging from 10Mb/s to 10Gb/s. With 24 ports of Gigabit Ethernet – including four combo SFP ports that support either copper or fiber links – the EL326 industrial switch seamlessly scales to address growing network requirements. Optional 10 Gigabit Ethernet uplinks and dedicated stacking ports enable the stacking of up to eight switches, providing the ability to add additional switch capacity and redundancy as required. This reduces initial infrastructure costs while providing longer term scalability.

APPLICATION SCENARIO: POWER INDUSTRY

INDUSTRIAL SWITCHING

Sixnet's industrial Ethernet switches combine enterprise-class performance with rugged reliability to provide a "best of both worlds" solution for many of today's industrial applications. Our hardened switches are ideally suited for harsh and outdoor environments that include power substations, Smart Grid, military, utility, transportation and other industries where real-time performance under extreme operating conditions is required. Built-in redundancy coupled with advanced security and network management ensures the infrastructure stays up and running while providing tools for monitoring and tracking.

industrial networking

FEATURES & BENEFITS

Dedicated High-Speed Stacking Ports

- **Provide pay-as-you-go capacity expansion**
- **Manage multiple switches as one stack to maximize efficiency**
  – Integrate switches without utilizing 1G and 10G Ethernet ports
  – Virtually stack up to eight EL326 switches for a total of 192 ports

Advanced Networking & Redundancy

- **Prioritizes converged traffic to ensure delivery**
- **Provides mission-critical redundancy**
  – RSTP (Rapid Spanning Tree) provides redundancy
  – MSTP (Multiple Spanning Tree) per VLAN
  – VLAN (GVRP, Q-in-Q) for convenient traffic segregation
  – Link Aggregation (LACP) increases bandwidth
  – IGMP for multicast filtering (snooping and querying v1, 2)
  – QoS for real-time data prioritization
  – Jumbo frame support

Powerful Management & Monitoring

- **Simplifies configuration and management**
- **Provides fast and easy troubleshooting**
  – Easy configuration via web or CLI
  – SNMP v1, v2, v3 network management
  – LLDP for universal network identification
  – sFlow for network-level monitoring
  – RMON and port mirroring for advanced diagnostics
  – Event/error/system logging and monitoring
  – UPnP, OAM and banner support

Rugged, Reliable Operation

- **Supports industrial environments**
- **Provides higher performance and reduces downtime**
  – Superior EMC performance and EMI immunity
  – Rugged corrosion-resistant metal enclosure
  – Sealed IP40 protects against dust, dirt and debris
  – UL/CSA, FCC and CE compliant
  – Dual-redundant power supplies

Hardware-Based Layer 3 Routing Support

- **Enables wire speed packet forwarding through advanced architecture**
- **Expands virtual switch capacity simply and efficiently**
  – RIP v1/2
  – Static routing
  – OSPF

Advanced Cyber Security

- **Prevents against unauthorized access**
- **Protects from unwanted intrusion**
  – Static and dynamic port security
  – Authentication: SNMPv3, 802.1x, RADIUS, TACACS+ AAA/3.0, web and MAC
  – Encryption: MD5, TLS, TTLS, TACACS+ AAA/3.0
  – Access Control List (ACL) per IP/MAC/ VLAN/TCP/UDP
  – Secure Web (HTTPS/SSL) and Telnet (SSH)
  – Rate limiting and multicast storm protection
  – IP Source Guard, DHCP Snooping and Option 82

Dedicated High Speed Stacking Ports Enable up to Eight Connected Switches

SPECIFICATIONS

Ethernet Performance
- Up to 26 total Ethernet ports
  - 20 copper GigE ports
  - 4 copper or SFP fiber GigE ports
  - Up to 2 optional 10 Mg/s GigE ports via XFP
- RJ45 ports: auto-negotiation (speed/duplex) and auto-crossover
- Non-blocking, store and forward, wire-speed
- Switching capacity and forwarding rate: 128 Gbps/95 Mpps
- Jumbo frame: 9K

Switching Features
- Flow control: IEEE 802.3x (full duplex) and back-pressure (half duplex)
- Spanning Tree Protocol (STP) per IEEE 802.1D plus
  - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- Virtual Local Area Networks (VLANs)
  - 802.1Q tag-based with 256 VLANs and 4K VLAN ID
  - 802.1v protocol and port-based VLAN
  - Voice and Private VLAN
  - GVRP and Q-in-Q (double tagging)
- Link Aggregation Control Protocol (LACP) per IEEE 802.3ad
  - Static trunk
  - Traffic load balancing
- Internet Group Management Protocol (IGMP)
  - IGMP v1, v2 with up to 255 multicast groups
  - IGMP snooping and querying (v1,2)
  - Immediate leave and leave proxy
  - Throttling and filtering
- Multicast VLAN Registration (MVR)
- IEEE 802.1ab Link layer Discovery Protocol (LLDP)
- Quality of Service (QoS) with 8 priority queues
  - Scheduling schemes: WRR and Strict priority
  - CoS per IEEE 802.1p and IP DSCP-based
  - DiffServ (DS): ingress, egress and remarking
- Rate limiting (ingress and egress)
  - 64Kbps to 100/1000 Mbps
  - Per port CoS

Security
- Enable and disable ports
- Port security (MAC-based): static and dynamic
- DHCP Snooping and Option 82
- IP Source Guard
- IEEE 802.1X Network Access Control (NAC)
  - Port-based with single or multiple host mode
  - Authentication: EAP-MD5, PEAP, TLS, TTLS
  - MAC and web authentication
  - Guest VLAN and auto VLAN assignment
- RADIUS and TACACS+ Authentication, Accounting and Authorization (AAA)
  - 5 servers for RADIUS, 1 server for TACACS+
  - Encryption: MD5, TLS, TTLS, TACACS+ AAA/3.0
- Access Control List (ACL)
  - IP and MAC-based
  - VLAN and TCP/UDP port
- Storm Control for broadcast and multicast messages
- HTTPS/SSL for secure web access
- SSH v1.5/2.0 for secure Telnet access
- SNMPv3 authentication and encryption
- Username and password authentication
- Management access filtering

Stacking
- 2 dedicated stacking ports (optional)
- Up to 8 switches can be stacked (192 ports GigE per logical switch)

Management & Monitoring
- IP Address assignment: Static, DHCP and BOOTP
- Command Line Interface (CLI) via console or Telnet
- Web interface (HTTP/HTTPS/SSL)
- SNMP (Simple Network Management Protocol) v1, v2, v3
- SNMP traps for event notification
- RMON (Remote Monitoring): Groups 1, 2, 3 and 9
- sFlow network-wide traffic monitoring
- Dual firmware update system
- Configuration download and upload
- Software upgrade via TFTP
- Port mirroring
- Event/error/system log
  - Local flash
  - Remote server via system log (Syslog RFC 3164)
  - SMTP (RFC 821) email alarming
- Network Time Protocol (NTP) for time synchronization
  - SNTP (RFC 2030) and NTP (RFC 1305)
- Domain Name Server (DNS) client
- Universal Plug and Play (UPnP)
- Banner commands

Power Input & Alarm Output
- Dual-redundant internal power supplies (optional)
- 10-pole screw block can be positioned in front or back
- Power input options:
  +/- 24-48 VDC (D option)(absolute min & max): +/- 20-59VDC
  +/- 110-250 VDC or 100-240 VAC (50/60 Hz)(A option)
  (absolute min & max): +/- 90-300 VDC or 85-264 VAC
- Power consumption: 120 Watts typ. with all ports linked
- Protection: current overload and reverse polarity
- Alarm output: form -C relay (NO and NC contacts)
  - Max. voltage: 250 VAC, 30 VDC
  - Max. current: 2A @ 30 VDC or 250 VAC

Routing
- Layer 3 switch routing
- Routing protocols: RIP v1/2, OSPF, static routing
- Virtual Routing Redundancy Protocol (VRRP)

Mechanical
- Rack-mount
- Dimensions (HxWxD): 1.75(1U)x17.3x12' (45x439x305mm)
- Weight (typical): 9.5 lbs (4.3 kg)

Environmental
- Operating temperature:
  AA/A0 models: -35° to +80°C per IEC 60068-2-1/2
  DD/D0 models: -35° to +75°C per IEC 60068-2-1/2
- Cold Start: -35° C
  With 10G module -5° C
- Storage temperature: -40° to +85°C
- Humidity: 5 to 95% RH (non-condensing) per IEC 60068-2-30
- Vibration: 20mm/s from 1 to 150 Hz per IEEE 1613 Class V.S.3
- Vibration: Amp: 3mm from 2-9 Hz, 1g from 9-200Hz, 1.5g from 200-500 Hz per IEC 61850-3
- Shock: 30g @ 11ms per IEC 61850-3

Standards & Compliance
- EMC immunity: IEC 61850-3, IEC 61000-6-2/4, CE
- EMC emissions: FCC Part 15; EN 55022 (CISPR22), CE
- Safety: UL508 / ISA12.12.01 / CSA C22.2 No. 142/213 Class I, Division 2, Groups A, B, C, D
- UL temperature specs:
  EL326AA/A0-1, T4 @ +80°C
  EL326DD/D0-1, T4 @ +75°C
- IEC61010-1, CE
- RoHS, WEEE and REACH compliant

Warranty
- 5 years on design and manufacturing defects

All specifications are subject to change. Contact Sixnet to learn more

ORDER GUIDE

PART NUMBER	DESCRIPTION
EL326-A0-1	26 ports (20 copper GigE, 4 copper or SFP fiber GigE, and 2 optional 10 GigE via XFP); Single power input for 85-264 VAC or 90-300 VDC (absolute min & max)
EL326-D0-1	26 ports (20 copper GigE, 4 copper or SFP fiber GigE, and 2 optional 10 GigE via XFP); Single power input for 20-59 VDC (absolute min & max)
EL326-AA-1	26 ports (20 copper GigE, 4 copper or SFP fiber GigE, and 2 optional 10 GigE via XFP); Dual power inputs for 85-264 VAC or 90-300 VDC (absolute min & max)
EL326-DD-1	26 ports (20 copper GigE, 4 copper or SFP fiber GigE, and 2 optional 10 GigE via XFP); Dual power inputs for 20-59 VDC (absolute min & max)

APPLICATION SCENARIO: SUBSTATION

EL212

EL228