MIL312 IP67 Industrial Ethernet Switch

Sixnet Military Series

RL RED LION®

►►► Military-Rated Gigabit Industrial Connectivity

Red Lion's Sixnet MIL312 has 12 Gigabit (10/100/1000) Ethernet copper ports.

This Layer 3 managed industrial Ethernet switch features military-style D38999 connectors and link speeds of 10/100/1000 Mbps. With an ultra-rugged case, protected circuitry and advanced software, this switch offers an ideal Commercial Off-The-Shelf (COTS) military solution for battlefield communications, combat vehicles and avionics shipboard. It can also be used with industrial applications that require hardened switches.
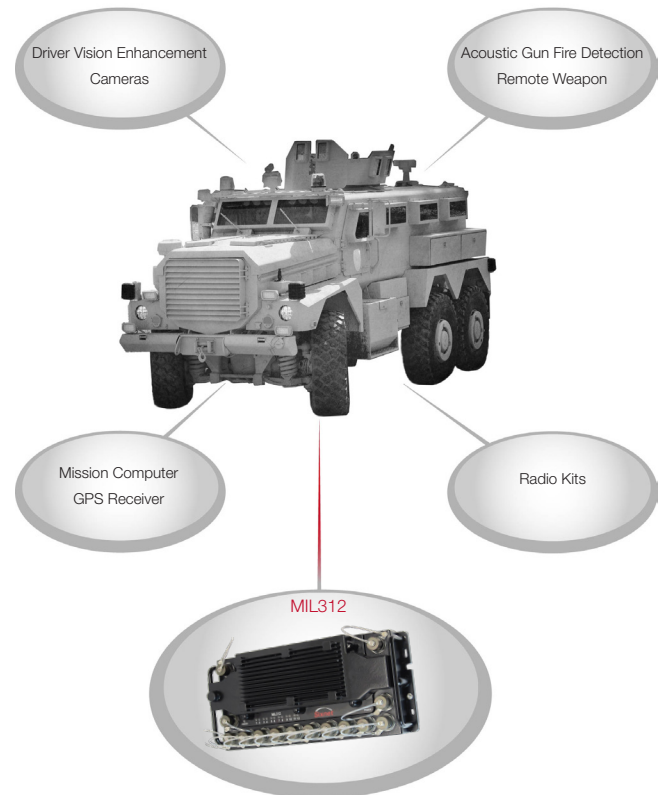
APPLICATIONS

> Industrial outdoors

> Marine and maritime

> Transportation

> Military in-vehicle

> Aerospace

PRODUCT HIGHLIGHTS

> Layer 3 Ethernet switch increases multi-service network performance

> IPv4 and IPv6 management

> IP67/NEMA 6 rated package protects against dust, water, oil, debris and more

> High-performance switch rated for MIL-STD-810G, MIL-STD-461F and MIL-STD-1275D

> Military-rated MIL-DTL-38999 Series III connectors protect against vibration, shock, water and more

> Tough corrosion-proof aluminum case

Driver Vision Enhancement Cameras

Acoustic Gun Fire Detection Remote Weapon

Mission Computer GPS Receiver

Radio Kits

MIL312

industrial
networking

RoHS compliant

ENHANCED SECURITY

Red Lion's Sixnet MIL312 provides enhanced security features for connectivity and access control, including Access Control Lists (ACL), authentication and port-level security with IEEE 802.1X. ACL can be used to restrict access to sensitive network resources by denying packets based on L2/L3/L4 headers. SSH and RADIUS authentication protect data communications and ensure data privacy. IEEE 802.1X port-based access control ensures dynamic, port-based security and user authentication for network access. IP source guard prevents a malicious user from spoofing or taking over another user's IP address by creating a binding table between client IP and MAC address, port and VLAN.

ADVANCED ROUTING

Red Lion's Sixnet MIL312 supports hardware-based IPv6 and IPv4 routing for maximum performance. The switches provide a seamless migration path from IPv4 to IPv6 for future network upgrades and investment protection. Advanced routing protocols such as RIP and OSPF provide dynamic routing by exchanging routing information with other Layer 3 switches or routers. Multicast routing is supported under independent multicast protocols, including PIM-DM and PIM-SM.

COMPREHENSIVE QoS

Red Lion's Sixnet MIL312 offers advanced QoS for marking, classification and scheduling to deliver best-in-class performance for data, voice and video traffic at wire speed. Eight egress queues per port enable differentiated management of up to eight traffic types across the stack. Traffic is prioritized according to 802.1p, DSCP, IP precedence and TCP/UDP port number to provide optimal performance for real-time applications. Weighted Round Robin (WRR) and strict priority ensure differential prioritization of packet flows and avoid congestion of ingress and egress queues. With bidirectional rate-limiting, per port or traffic class, the MIL312 preserves network bandwidth and allows full control of network resources.

Layer 2

- 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)
  - Loopback detection
  - Auto edge port
  - BPDU filter/guard
- Virtual Local Area Network (VLAN)
  - IP subnet based VLAN
  - Private VLAN isolated
  - Private VLAN
  - GVRP/GARP
  - 802.1v protocol
  - Voice VLAN
  - VLAN translation
  - IPv6 VLANs
  - VLAN trunking
- Jumbo Frame: 9K
- IGMP Snooping v1/v2/v3
- Select Q-in-Q

Layer 3

- Host table: 8K
- Route table: 8K
- Static route table: 512
- Multicast table: 1K
- Unicast routing
  - Static unicast routes
  - RIP v1/v2
  - OSPF
  - BGP
- Multicast routing
  - PIM-DM
  - PIM-SM
  - IGMP v1/v2/v3
  - IGMP v3 proxy
- IP redundancy
- Proxy ARP
- UDP Helper

Switch Properties

- Ethernet Ports: 12 x 10/100/1000 Mbps (copper)
- Switching capacity: 128 Gbps/176 Gbps
- Forwarding Rate: 95.2 Mpps/130.9 Mpps
- MAC Address Table Size: 16K
- Packet Buffer Size: 2 MB

Security

- Port security
- IP Source Guard
- Supports IEEE 802.1X port-based and MAC-based access control
- IP filter configuration for management interface (SNMP, Telnet, Web)
- RADIUS authentication
- Access Control List
- SSH v2
- HTTPS/SSL
- MAC filter
- Dynamic ARP Inspection
- Link detection package protection

Management

- Switch Management
  - CLI via console port or Telnet
  - Web management
  - SNMP v1, v2c, v3
  - IGMP snooping (v1/v2)
- Firmware and Configuration:
  - CLI via console port or Telnet
  - Web management
  - SNMP v1, v2c, v3
  - IGMP snooping (v1/v2)
- Supports RMON (groups 1, 2, 3 and 9)
- Supports BOOTP, DHCP for IP address assignment
- DHCP Snooping
- DHCP option 66, 67
- Supports SNTP
- Supports event/error log, system log
- Cable diagnostics
- ATC traffic control
- Delay reload
- sFlow
- CPU Process Utilization
- Cable Diagnostics
- IP Clustering
- Port Mirroring

QoS

- Priority Queues: 8 hardware queues per port
- Traffic classification based on IEEE 802.1p CoS, IP Precedence, DSCP, TCP/UDP port number, ACL and marking
- DiffServ
- Supports WRR and strict priority
- Port rate limiting

IPv6

- IPv4/IPv6 Dual Protocol Stack
- IPv6 Address Types: Unicast, Multicast
- ICMPv6
- ICMPv6 Redirect
- IPv6 Path MTU Discovery
- IPv6 Neighbor Discovery
- SNMP over IPv6
- HTTP over IPv6
- SSH over IPv6
- Support IPv6 Telnet
- Support IPv6 DNS Resolver
- Support IPv6 syslog
- Support IPv6 SNTP
- Support IPv6 TFTP
- Remote IPv6 ping
- Ping over IPv6
- Trace route over IPv6
- IPv6 DHCP relay
- sFlow over IPv6
- IPv6 ACL
- IPv6 DiffServ
- PIM-DMv6
- PIM-SMv6
- MVRv6

SNMP & Ethernet Standards
- Ethernet, Fast Ethernet, Gigabit Ethernet
- Full-duplex flow control
- IEEE 802.3-2005
- IEEE 802.3D Spanning Tree Protocol
- IEEE 802.1w Rapid Spanning Tree Protocol
- IEEE 802.1s Multiple Spanning Tree Protocol
- IEEE 802.1Q Virtual LAN
- IEEE 802.1X IEEE8021-PAE-MIB
- RFC 1907 SNMPv2-MIB (MIB-II)
- RFC 2011 IP-MIB (MIB-II)
- RFC 2012 TCP-MIB (MIB-II)
- RFC 2013 UDP-MIB (MIB-II)
- RFC 1493 Bridge MIB
- RFC 2863 IF-MIB
- RFC 2819 RMON MIB
- RFC 2618 RADIUS MIB
- RFC 2665 Etherlike MIB
- RFC 2737 Entity MIB
- RFC 2674 P-bridge, Q-bridge
- V-Bridge MIB
- RFC 3036 MAU MIB
- RFC 1612 DNS Reslover MIB
- RFC 3411 SNMP Framework
- RFC 3412 SNMP MPD MIB
- RFC 3413 SNMP Target MIB, SNMP Notify MIB
- RFC 3415 SNMP View-Based ACM MIB
- SNMP Trap Supported:
- RFC 1215, 1907, 2863, 1493, 1757, 2819
- Private MIB

Environmental
- MIL-STD-810G and MIL-STD-108E for environmental performance (see table)
- Operating temperature: -40 to +75° C (cold startup at -40° C)
- Storage temperature: -40 to +85° C
- Humidity: 5 to 95% RH (non-condensing
- Vent plug for high-altitude operation

EMC
- MIL-STD-461F for EMI performance. CE101, CE102, RE102 (see table)
- MIL-STD-461F for EMC performance. CS101, CS114, CS115, CS116, RS101, RS103 (see table)
- MIL-STD-704 A/E/F and MIL-STD-1275 A/B/D for power protection (POWER INPUT)

Recommended Interface Plugs
- Ethernet Plug: Aero AE90-365-BN9-9PN
- Power Plug: D38999/26xA98SA (x = plating option)
- RS232 Plug: D38999/26xA35PA (x = plating option)
- Contact distributor for mating connectors

Warranty
- 5 years on design and manufacturing defects

Power Input
- Input voltage range: 18-36 VDC (continuous)
- Input power: 35 W (estimated max. under full load)
- Reverse polarity protection
- MIL-STD-1275 for power protection
- Surge protection: 100 volts for 1 second
- Transient protection: 15,000 watts peak
- Spike protection: 5,000 watts (10x for 10 uS) or 250 volts (50x for 100 uS)

Physical
- Dimensions (L x W x H): 13x6x3.75"
- Weight (including caps): 8.5 lbs
- IP67 dust, oil and water-tight package protection
- LED indicators: port, uplink, system, diagnostic
- Tough corrosion proof aluminum case
- Conductive cooling — no moving parts

All specifications are subject to change. Contact Red Lion to learn more

ORDERING GUIDE

| PART NUMBER	DESCRIPTION
MIL312-1	12 port Gigabit IP67 managed Layer 3 Ethernet switch
ET-CAT6M-XCG	Cordset, CAT6 100/1000 Ethernet MIL plug to RJ45, x=meters
ET-CAT5E-XCG	Cordset, CAT5e 100/1000 Ethernet MIL plug to RJ45, x=meters
ET-CAT6M-XGG	Cordset, CAT6 100/1000 Ethernet MIL plug to MIL plug, x=meters
ET-CAT5E-XGG	Cordset, CAT5e 100/1000 Ethernet MIL plug to MIL, x=meters
ET-MILPWR-C2	Cordset, power plug to leads, 2 meters
ET-MIL232-C2NU	Cordset, military-style plug to RS232 console port, 2 meters
Note: See separate datasheet for cable specs. Contact Sixnet for other cordset and cable options.	

EMI & EMC

| TEST	STANDARD	SPECIFICATION
Conducted Emissions	MIL-STD-461F	CE101: Power Leads, 30Hz to 10Hz
Conducted Emissions	MIL-STD-461F	CE102: Power Leads, 10 kHz to 10 MHz
Radiated Emissions	MIL-STD-461F	RE102: Electric Field, 2 MHz to 18 GHz
Conducted Susceptibility	MIL-STD-461F	CS101: Power Leads, 30 Hz to 150 kHz
Conducted Susceptibility	MIL-STD-461F	CS114: Bulk Cable Injection, 10 kHz to 200 MHz
Conducted Susceptibility	MIL-STD-461F	CS115: Bulk Cable Injection, Impulse Excitation
Conducted Susceptibility	MIL-STD-461F	CS116: Damped Sinusoidal Transients, Cables and Power Leads, 10 kHz to 100 MHz
Radiated Susceptibility	MIL-STD-461F	RS101: Electric Field, 30 Hz to 100 kHz
Radiated Susceptibility	MIL-STD-461F	RS103: Electric Field, 2 MHz to 40 GHz (50V/m)
Ripple Test	MIL-STD-1275D	2 V Peak and 7 V Peak Ripple Test
Spike Test (Imported)	MIL-STD-1275D	+/- 250 Volt Imported Spike Test
Spike Test (Exported)	MIL-STD-1275D	Voltage Spike Exported from the EUT
Surge Test	MIL-STD-1275D	40 V and 100 V Surges

ENVIRONMENTAL

| TEST	STANDARD	SPECIFICATION
Operating Temperature	MIL-STD-810G	Methods 501.5: Operating Temperature
Temperature Shock	MIL-STD-810G	Method 503.5: Temperature Shock
Humidity	MIL-STD-810G	Method 507.5: Humidity
Elevation	MIL-STD-810G	Method 500.5: Elevation
Functional Shock	MIL-STD-810G	Method 516.6: Functional Shock
General Vibration	MIL-STD-810G	Method 514.6, Proc. 1: General Vibration
Steam and Water Jet	MIL-STD-108E	Paragraph 4.10 Table II: Steam and Water Jet
Leakage (Immersion)	MIL-STD-810G	Method 512.5: Leakage (Immersion)
Salt and Fog	MIL-STD-810G	Method 509.5
Dust	MIL-STD-810G	Method 510.5 Proc. 1
Explosive Atmosphere	MIL-STD-810G	Method 511.5
Acceleration Test	MIL-STD-810G	Method 513.6 Proc. 1,2,3

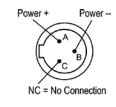## DIMENSIONS

Gigabit Ethernet

7 DD+
8 DD-   6 DB-
1 DA+   5 DC-
2 DA-   4 DC+
3 DB+
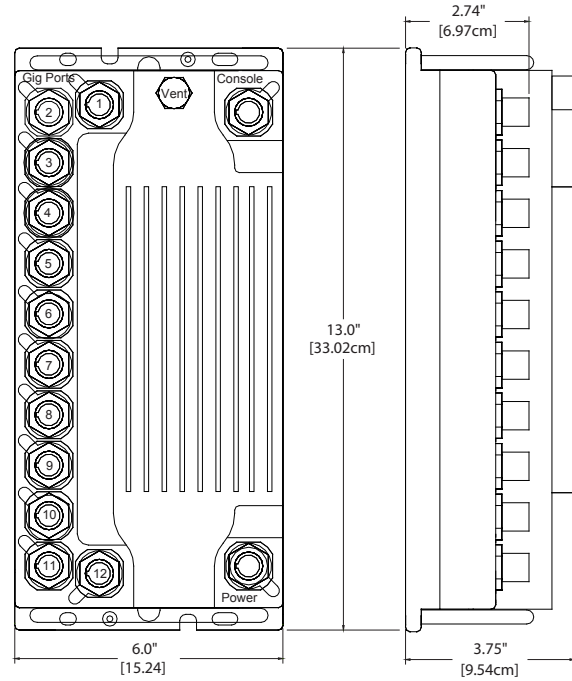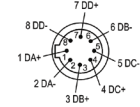
MIL-DTL-38999 Series III Receptacle:
Shell Size = A, Insert = Special,
Contacts = 8 Sockets, Keying = N

RS232 Console

LED CONTROL   NC
LED CONTROL   RS232-TD (output)
GND   RS232-RD (input)
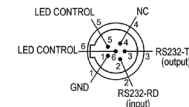
MIL-DTL-38999 Series III Receptacle:
Shell Size = A, Insert = 35,
Contacts = 6 Sockets, Keying = A

Power Input

Power +   Power –

A
B
C

NC = No Connection

MIL-DTL-38999 Series III Receptacle:
Shell Size = A, Insert = 98,
Contacts = 3 Pins, Keying = A