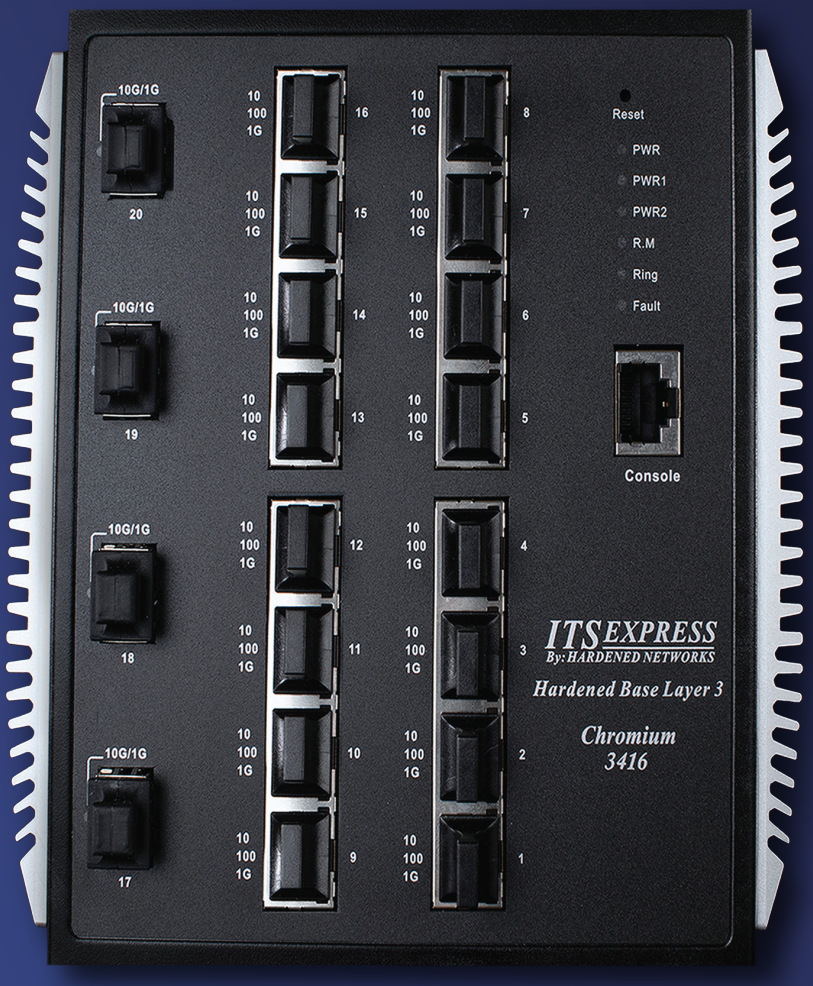
HARDENED NETWORKS



ITS- 3416

ITS-3416 V3 Overview V3 Technology

Where Innovation Meets Reliability

New Flex-Technology

- Hardened Base Layer 3
- Exceeds NEMA TS-2 Specifications
- 10 Gb USFP+ (Ultra SFP+)
- 1000Mb Copper Ports
- Static Routing
- 156 GB Back- Plane
- V3 Technology
- Advanced V3 Diagnostics, Security, and Redundancy

Our exciting new Flex-Technology revolutionizes speed upgrades in hardened switches!

Now you can purchase switches with any higher speed SFPs 10gig /2.5 gig and connect them to your existing slower speed 100 or 1000 optics without requiring like optics. Make your upgrade path fast, simple, and pain-free!

Ask your sales representative today!

- Designed for heavy video use in unicast/multi-cast in extreme environments
- Layer 3 management, 802.1x authentication
- Exceeds NEMA TS-2 specifications
- 4 USFP+ ports 1Gb/10Gb (Ultra SFP+ ports)
- 16 copper ports 10Mb/100Mb/1000TX
- Remote monitoring of utilization and data flow with RMON
- Easy to configure web interface designed by ITS users
- VeriPHY (advanced real-time copper cable testing)
- Optical monitoring with mapping capabilities
- File transfer options include SFTP, FTP, SCP, TFTP, HTTP, and HTTPS
- Ring Protocols: STP, RSTP, MSTP, RPVST +, R-RVST+, ITS- Ring, Moxa/ Herschman/ Advatech Rings (PVST+ or RPVST+ Cisco compatibility)
- Fast ITS ring recovery time < 10ms over 250 units of connections
- ESFP/USFP+ mix and match all speeds single or multi-mode, dual strand (LX,EX,ZX, ZR) or single strand fiber (BX, BR) 100Mb/1000Mb/2.5Gb/10Gb
- Notifications for link up, link down, SFP power/temperature, topology change ring environment, SMTP, SNMP, and relay output
- Swapable primary and secondary software instances with multiple configuration storage
- Separate memory for forwarding plane, firmware, and startup configuration

ITS Express/ Hardened Networks switches have been specifically engineered to handle the challenging demands of extreme environmental conditions and 5k multi-cast high bandwidth video applications.

A vast array of redundancy protocols combined with dual redundant power capabilities ensure maximum uptime for mission-critical applications.

Hardened Networks provides state-of-the-art designed switches, which all feature next-generation ASICs, robust backplanes, and dependable firmware. This gives you the “best-of-breed” in environmentally challenging switch products.

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Switch Model	ITS-3416
Physical Ports	
USFP+ 1G/10GB Base-XSFP+	4
Copper TX 10Mb/100Mb/1000Mb Ports in RJ45 Auto MDI/MDIX	16
Technology	
Ethernet Standards	-IEEE 802.3-2018 for 10/100/1000 Base- T(X), 100/1000/2.5Base- (F)X, 10G Base-R -IEEE 802.3ab for 1000Base-T -IEEE 802.3z for 1000Base-X -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-2014 for VLAN Tagging, STP, RSTP, and MSTP -IEEE 802.1w R-PVST+ Cisco natively compatible for all VLANs -IEEE 802.1x for Authentication -IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)
MAC Table	64k
Processing	Adaptive cut-through / store-and-forward
Priority Queues	8
Packet Buffer	64Mbits
Jumbo Frame	Up to 9k Bytes
Flash Memory	128 MB
DRAM Size	512MB
Switch Properties	-Switching latency: 7 us -Switching backplane: 156Gbps -Mpps: port throughput (packet per second): 152 @ 64 bytes per packet -Maximum number of available VLANS: 4095 -IGMP multicast groups: 256 for each VLAN -Port rate limiting: user definable -Static routing
Security Features	-Device binding security features -MAC based port security, device binding, alive check -Port based network access control (802.1x) -MAC-based authentication -MAC address limit -VLAN (802.1Q) to segregate and secure network traffic -AAA RADIUS/TACACS+ User/Password management selectable by management method -SNMPv3 encrypted authentication and access security HTTPS/SSH/SSL to encrypt network management traffic -Access management enabled by method with whitelisted network/ host

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Security Features	-Profile based authorization (15 levels per criteria) profile assigned to user -IP source guard DHCP address snopping and protection -DOS/DDOS auto prevention
Multicast Features	-IGMP v1, 2, 3 - RFCs 1112, 2236, 4604 -IPv6 multicast listener discovery protocol (MLDv2) -IGMP snooping globally or per VLAN -Configurable SSM range designation -Selectable auto mode or IGMP/MLD version per VLAN -IGMP snooping port group filtering profiles -IGMP/MLD Querier Election per VLAN
Traffic Prioritization	-TOS/Diffserv supported -CoS -Application based QoS -IP based bandwidth management -Port rate limiting: user define -Storm Control -Port Classification -Port Tag Remarking -Port DSCP -Port Policing -Queue Policing -Port Shaping -DSCP- based QOS -WRED (Weighted Random Early Detection) for congestion avoidance
Software Features	-Context based help available in GUI and CLI -Layer 3 static routing / multiple interface IPs -VRRP RFC 3768 -Redundant ring (ITS Ring) with recovery time less than 30ms over 250 units -QOS with storm center -VLAN (802.1Q) with VLAN tagging -Port configuration, status, statistics, monitoring, security -DHCP Server/Client/Relay -Modbus TCP -SMTP Client -NTP server
Network Redundancy	-ITS-Ring -Express-Chain -Express-Ring (Express Ring now integrates with Moxa, Advantech, and Hirchmann ring protocols) -STP/RSTP/MSTP(IEEE 802.1 d/w/s)/ (PVST+ or RPVST+ Cisco compatibility)
RS-232 Serial Console Port	RS-232 in RJ45 connector with console cable. 115200bps, 8, N, 1

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LED Indicator	
System Ready Indicator (PWR)	Green: Indicates that the system ready. The LED is blinking when the system is upgrading firmware
Power Indicator (PWR1/PWR2)	Green : Power LED x 2
Ring Master Indicator (R.M.)	Green : Indicates that the system is operating in ITS Ring Master mode
ITS Ring Indicator (Ring)	-Green: Indicates that the system operating in ITS Ring mode -Green Blinking: Indicates that the ITS Ring is broken.
Fault Indicator (Fault)	Amber : Indicate unexpected event occurred
Power	
Redundant power input modular	Dual DC inputs. 12~48VDC (Max. rating : 60VDC) at terminal block
Power Consumption (Typ.)	35 Watts
Overload Current Protection	Present
Reverse Polarity Protection	Present
Fault Contact	
Relay	Relay output to carry capacity of 1A at 24VDC
Reset Button	<5 sec: system reboot; >5 sec: factory default
Physical Characteristics	
Enclosure	IP-30
Weight (lb/g)	6.17lb/2799g
Dimension (W x D x H)	115 (W) x 154 (D) x 170 (H)mm (4.53 x 6.26 x 6.06 inch)
Environmental	
Storage Temperature	-40 to 90C (-40 to 194F)
Operating Temperature	-40 to 85C (-40 to 185F)
Operating Humidity	5% to 95% Non-condensing
Regulatory Approvals	
Power Automation	IEC 61850-3, IEEE 1613
EMC	EN 55022, EN 55024(CE EMC),EN 50121-5,FCC, EN 50121-3-2(EN50155), EN 61000-6-2, EN 61000-6-4, IEC 61000-3-2 ,IEC 61000-3-3
EMI	CISPR 22, EN 55011, FCC Part 15B Class A
EMS	-EN 61000-4-2 (ESD) -EN 61000-4-3 (RS) -EN 61000-4-4 (EFT) -EN 61000-4-5 (Surge) -EN 61000-4-6 (CS) -EN 61000-4-8 (PFMF) -EN 61000-4-11 (DIP)
Shock	IEC 60068-2-27, IEC 61373 (EN50155)
Free Fall	IEC 60068-2-31 (IEC 60068-2-32)
Vibration	IEC 60068-2-6, IEC 61373(EN50155)
Safety	EN60950-1
Warranty	5 Years

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Other Solutions

Hardened Networks has created variety of high quality products to fit your needs. If you did not find what you needed in the ITS- 3416 V3, please browse our other solutions.

Ethernet Switches

ITS-8012-24 V3

- 4 Ultra Fiber Ports SFP+ 100Mb/1000Mb/2.5Gb/10Gb
- 4 Enhanced Fiber Ports SFP 100Mb/1000Mb/2.5Gb
- 16 Copper Ports 10Mb/100Mb/1000Mb
- 176 GBPS Back-Plane

ITS-8042 V3

- 2 Ultra Fiber Ports SFP+ 100Mb/1000Mb/2.5Gb/10Gb
- 2 Enhanced Fiber Ports SFP 100Mb/1000Mb/2.5Gb
- 8 Copper Ports 10Mb/100Mb/1000Mb
- 96 GBPS Back-Plane

ITS-8012-24+ V3

- 4 Ultra Fiber Ports SFP+ 100Mb/1000Mb/2.5Gb/10Gb
- 4 Enhanced Fiber Ports SFP 100Mb/1000Mb/2.5Gb
- 16 Copper Ports 10Mb/100Mb/1000Mb
- Two sets of bypass fiber ports
- 176 GBPS Back-Plane

ITS-8042+ V3

- 2 Ultra Fiber Ports SFP+ 100Mb/1000Mb/2.5Gb/10Gb
- 2 Enhanced Fiber Ports SFP 100Mb/1000Mb/2.5Gb
- 8 Copper Ports 10Mb/100Mb/1000Mb
- Two sets of bypass fiber ports
- 96 GBPS Back-Plane

Communications

ITS- MC-1000

- 10Mb/100Mb/1000tMbps Ethernet BASE-T/TX to SFP (MM or SM)
- Optical port supports 100Mb or 1000Mb full duplex data

ITS- MC-100

- 10Mb/100Mbps Ethernet BASE-T/TX to SFP (MM or SM)
- Flexible power 18-46VAC/12-60 VDC

ITS- VC-100

- High Speed VDSL-2 Technology
- 10Mb/100Mbps Ethernet BASE-T/TX to a pair of copper cables
- Flexible power 18-46VAC/12-60 VDC

We here at Hardened Networks are proud to carry products that are certified by:

Express Supply, Inc. www.expresssupply.net (407) 497-8614

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