

ExtremeSwitching™ X440-G2

Scalable Cost-Effective Edge Switch with ExtremeXOS Modular Operating System

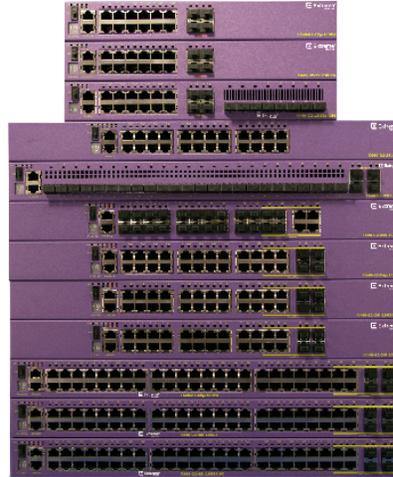
HIGHLIGHTS

HARDWARE MODELS

- 12, 24, and 48-port GbE models
- 4 x 1GbE available uplink ports — upgradeable to 10GbE via software license (except for extended temperature models)
- SFP, Copper PoE-Plus, non-PoE and 100Base-FX models
- Extended 0°C to 60°C operating range models
- Two SummitStack-V stacking ports (except for extended temperature models) enable up to 8 switches to be stacked together
- All configurations non-blocking full duplex
- 10GbE LRM support on 48-port switch models

FEATURES

- Side-to-side, left-to-right airflow
- Fixed power supplies, along with RPS
- Full PoE-Plus 30W power on 48-port models
- DC Power option
- Energy Efficient Ethernet
- 10MB/100MB half-duplex support
- Role-based policy capabilities allow individualized access to specific applications or services
- ExtremeCloud™ cloud-based management on select models



Product Overview

The ExtremeSwitching X440-G2 series is a scalable cost-effective family of edge switches powered by Extreme Networks ExtremeXOS, a highly resilient OS providing continuous uptime, manageability and operational efficiency. The X440-G2 series switches provide high-performance routing and switching, flexible stacking, PoE-plus support and comprehensive security, while extending the benefits of ExtremeXOS to the campus edge.

The X440-G2 Series easy-to-use, yet powerful, management services include role-based policies for controlled access to specific network applications. Select X440-G2 Series switches can also be cloud-managed via ExtremeCloud™, Extreme Networks innovative single-pane subscription-based management solution.

Intelligent Switching

The X440-G2 Series supports sophisticated and intelligent Layer 2 switching, as well as Layer 3 IPv4/IPv6 routing. They also support role-based policy capabilities, Provider Bridges, bidirectional Access Control Lists, as well as granular (8 Kbps) ingress/egress bandwidth control. Altogether, these enable fine-grained control over traffic flows, as well as controlled access to specific network services and application.

FLEXIBLE 10GBE PORT UPGRADES

All X440-G2 base models come equipped with 4 upgradeable 1GbE ports, resident on either the faceplate or rear panel of each model. These 1GbE ports can be upgraded to 10GbE Ethernet via a simple software license. This gives administrators the option to increase switch uplink speeds without replacing the entire switch.

Notes: 10GbE upgrades are not supported on extended temperature models. The two rear-panel 1GbE copper combo ports on the 48 port switches become 10GBase-T ports when either 10GbE license is applied to the rear-panel SFP/SFP+ ports.

HIGH-PERFORMANCE STACKING

ExtremeXOS SummitStack-V capabilities allow up to eight X440-G2 switches to be stacked together via two of the native X440-G2 stacking ports. SummitStack-V allows use of standard 10Gb Ethernet cabling and optics technologies, providing long-distance stacking connectivity of up to 40 Km while eliminating the cable complexity of non-standard stacking options. X440-G2 switches can be stacked with other X450-G2, X460-G2, X670-G2 and X770 switches via SummitStack-V so long as all are running the same version of ExtremeXOS.

Note 1: SummitStack-V uses two of the four available uplink ports on the X440-G2 and runs a 10Gb non-Ethernet stacking protocol. These stacking ports DO NOT require a 10GbE software license, and can take full advantage of standard SFP+ transceivers.

Note 2: Extended temperature range switches do not support stacking.

IEEE 802.3AT POE-PLUS

X440-G2 Series switches support both IEEE 802.3at PoE-Plus and IEEE 802.3af PoE to enable connection of standards-compliant PoE devices today and into the future. Power over Ethernet allows connection of Ethernet-powered devices, such as wireless access points, Voice over IP phones, and security cameras. The X440-G2 can also support full PoE-Plus 30W power across all 48 ports with an external redundant power supply (RPS).

ROLE-BASED POLICY

The X440-G2 supports role-based policies that can be centrally administered through the ExtremeManagement (formerly Netsight) policy manager. This policy framework empowers network administrators to define distinct roles or profiles to represent industry-specific operational groups that may exist in an education or a business environment (e.g., administrator, teacher, student, guest). Each defined role can then be granted individualized access to specific network services and applications and these access privileges remain associated with users as they move across both wired and wireless network access points.

EXTREMECLOUD™ MANAGEMENT

Provides a single plane of glass for cloud managing both the wired and wireless components of your network. Zero touch provisioning also significantly reduces deployment times. Select X440-G2 models have been enabled for use with ExtremeCloud. See the ExtremeCloud Data Sheet for details.

FUTURE USB 2.0 SUPPORT

All X440-G2 switches have a USB 2.0 port that is supported as a port to a storage device for all EXOS versions of 22.1 or higher.

EXTENDED TEMPERATURE RANGE SUPPORT

The X440-G2 include three switch models that support 0°C to 60°C operating range (Models 16539, 16540 and 16541) to address the unique environmental needs of specific industries and/or locations.

COMPREHENSIVE SECURITY MANAGEMENT

The X440-G2 provides comprehensive security, including:

- User policy and host integrity enforcement, and identity management
- Universal Port Dynamic Security Profiles for fine granular security policies across the network
- Threat detection and response instrumentation to react to network intrusion
- Denial of Service (DoS) protection and IP security against man-in-the-middle and DoS attacks

These features ensure both the security of the network and of users accessing the network.

AUDIO VIDEO BRIDGING (AVB)

The X440-G2 series supports IEEE 802.1 Audio Video Bridging to enable reliable, real-time audio/video transmission over Ethernet. AVB technology delivers the quality of service required for today's high-definition and time-sensitive multimedia streams.

Note: Only 24 ports on either the 24 or 48 port models support AVB.

Ordering Notes

- All X440-G2 switches ship with fixed fans and power supplies
- All the X440-G2 switches support optional external redundant power supplies (RPS)
- The following three switch models that support 0C to 60C are NOT upgradeable to 10GbE:
 - X440-G2-24x-GE4
 - X440-G2-12t8fx-GE4
 - X440-G2-24t-GE4

Specifications

SWITCH MODEL	MAXIMUM 10/100/1000BASE-T PORTS	MAXIMUM ACTIVE 1GBE SFP PORTS	MAXIMUM 10GBPS SFP+ PORTS	AGGREGATED SWITCH BANDWIDTH*	FRAME FORWARDING RATE*
X440-G2-12t-10GE4	12	4	4 via license	104 Gbps	77.4 Mpps
X440-G2-24t-10GE4	24	8 (4 + 4 Combo)	4 via license	128 Gbps	95.2 Mpps
X440-G2-48t-10GE4	48	8 (2 + 6 Combo)	4 via license ¹	176 Gbps	130.9 Mpps
X440-G2-12p-10GE4	12	4	4 via license	104 Gbps	77.4 Mpps
X440-G2-24p-10GE4	24	8 (4 + 4 Combo)	4 via license	128 Gbps	95.2 Mpps
X440-G2-48p-10GE4	48	8 (2 + 6 Combo)	4 via license ¹	176 Gbps	130.9 Mpps
X440-G2-24t-10GE4-DC	24	8 (4 + 4 Combo)	4 via license	128 Gbps	95.2 Mpps
X440-G2-48t-10GE4-DC	48	8 (2 + 6 Combo)	4 via license ¹	176 Gbps	130.9 Mpps
X440-G2-24x-10GE4	4 Combo	28 (24 + 4 Combo)	4 via license	128 Gbps	95.2 Mpps
X440-G2-24fx-GE4	24 100 Base-FX	4	0	12.8 Gbps	9.5 Mpps
X440-G2-12t8fx-GE4	12 10/100/1000 + 8 100 Base-FX	4	0	33.6 Gbps	25.0 Mpps
X440-G2-24t-GE4	24 10/100/1000	4	0	56 Gbps	41.7 Mpps

¹ 2 10GBase-T combo ports

*-with 10Gb licenses if available with license

- Less than 4 microsecond latency (64-byte)
- Layer 2/MAC Addresses: 16K
- IPv4 LPM Entries: 480
- IPv4 Hosts: 1000
- IPv6 LPM (64-bit) Entries: 240
- 4092 user-created VLAN/VMANs
- 9216 Byte Max Packet Size (Jumbo Frame)
- 128 load sharing trunks, up to 8 members per trunk
- 1,024 ingress bandwidth meters, 256 egress meters
- Ingress and egress bandwidth policing/rate limiting per flow/ACL
- 8 QoS egress queues/port
- Egress bandwidth rate shaping per egress queue and per port
- Rate Limiting Granularity: 8 Kbps
- Half-duplex 10/100 supported on the following 10/100/1000 ports:
 - 12 port switches: Ports 1-12
 - 24 port switches: Ports 1-16
 - 48 port switches: Ports 1-16 and Ports 25-40
- LRM support on rear-panel SFP/SFP+ ports on all 48-port switches
- Policy Capabilities
 - Policy Profiles: 63
 - Rules per Profile: Up to 440
 - Authenticated Policy Users per Switch: Up to 256
 - Authenticated Policy Users per Port: Up to 256
 - Unique Permit/Deny Rules per switch: 440
 - MAC Rules: N/A
 - IPv4 Rules: 256
 - IPv6 Rules: N/A
 - L2 Rules: 184
 - Rate Limiting: Per Class of Service

Specifications (cont.)

SWITCH HARDWARE	PORTS
X440-G2-12t-10GE4	<ul style="list-style-type: none"> • 12 x 10/100/1000BASE-T (RJ-45) • 4 x 1GBASE-X SFP (unpopulated front-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • Coaxial Barrel Connector RPS port
X440-G2-24t-10GE4	<ul style="list-style-type: none"> • 24 x 10/100/1000BASE-T (RJ-45) • 4 x 1GBASE-X SFP (unpopulated) combo ports • 4 x 1GBASE-X SFP (unpopulated rear-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-48t-10GE4	<ul style="list-style-type: none"> • 48 x 10/100/1000BASE-T (RJ-45) • 4 x 1GBASE-X SFP (unpopulated) combo ports • 2 x 1GbE copper combo ports upgradable to 10GbE on rear-panel • 4 x 1GBASE-X SFP (unpopulated rear-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-12p-10GE4	<ul style="list-style-type: none"> • 12 x 10/100/1000BASE-T PoE-Plus • 4 x 1GBASE-X SFP (unpopulated front-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-24p-10GE4	<ul style="list-style-type: none"> • 24 x 10/100/1000BASE-T PoE-Plus • 4 x 1GBASE-X SFP (unpopulated) combo ports • 4 x 1GBASE-X SFP (unpopulated rear-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-48p-10GE4	<ul style="list-style-type: none"> • 48 x 10/100/1000BASE-T PoE-Plus • 4 x 1GBASE-X SFP (unpopulated) combo ports • 2 x 1GbE copper combo ports upgradable to 10GbE on rear-panel • 4 x 1GBASE-X SFP (unpopulated rear-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-24t-10GE4-DC	<ul style="list-style-type: none"> • 24 x 10/100/1000BASE-T (RJ-45) • 4 x 1GBASE-X SFP (unpopulated) combo ports • 4 x 1GBASE-X SFP (unpopulated rear-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-48t-10GE4-DC	<ul style="list-style-type: none"> • 48 x 10/100/1000BASE-T (RJ-45) • 4 x 1GBASE-X SFP (unpopulated) combo ports • 2 x 1GbE copper combo ports upgradable to 10GbE on rear-panel • 4 x 1GBASE-X SFP (unpopulated rear-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-24x-10GE4	<ul style="list-style-type: none"> • 24 x SFP (unpopulated) • 4 x 10/100/1000 combo ports • 4 x 1GBASE-X SFP (unpopulated rear-panel ports) upgradeable to 10Gb Ethernet via licensing • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port

SWITCH HARDWARE	PORTS
X440-G2-24fx-GE4	<ul style="list-style-type: none"> • 24 x 100Base-FX - LC connectors • 4 x 1GBASE-X SFP (unpopulated front-panel ports) • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-12t8fx-GE4	<ul style="list-style-type: none"> • 12 x 10/100/1000BASE-T with 8 x 100Base-FX - LC connectors • 4 x 1GBASE-X SFP (unpopulated front-panel ports) • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port
X440-G2-24t-GE4	<ul style="list-style-type: none"> • 24 x 10/100/1000BASE-T (RJ-45) • 4 x 1GBASE-X SFP (unpopulated rear-panel ports) • 1 x Serial (console port RJ-45) with RTS/CTS modem control • 1 x 10/100/1000BASE-T out-of-band management port • 2x7 RPS port

Physical

SWITCH MODEL	WEIGHT	HEIGHT	WIDTH	DEPTH
X440-G2-12t-10GE4	5.82 lb (2.64 kg)	1 RU / 1.73 inches (4.4 cm)	12.01 inches (30.5 cm)	10.28 inches (26.1 cm)
X440-G2-24t-10GE4	8.07 lb (3.66 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	10.01 inches (25.4 cm)
X440-G2-48t-10GE4	11.22 lb (5.09 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	14.51 inches (36.85 cm)
X440-G2-12p-10GE4	6.66 lb (3.02 kg)	1 RU / 1.73 inches (4.4 cm)	12.01 inches (30.5 cm)	10.28 inches (26.1 cm)
X440-G2-24p-10GE4	9.44 lb (4.28 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	10.01 inches (25.4 cm)
X440-G2-48p-10GE4	14.55 lb (6.60 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	14.51 inches (36.85 cm)
X440-G2-24t-10GE4-DC	8.07 lb (3.66 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	10.01 inches (25.4 cm)
X440-G2-48t-10GE4-DC	11.20 lb (5.08 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	14.51 inches (36.85 cm)
X440-G2-24x-10GE4	8.22 lb (3.73 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	10.01 inches (25.4 cm)
X440-G2-24fx-GE4	8.66 lb (3.93 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	10.01 inches (25.4 cm)
X440-G2-12t8fx-GE4	6.50 lb (2.95 kg)	1 RU / 1.73 inches (4.4 cm)	12.01 inches (30.5 cm)	10.28 inches (26.1 cm)
X440-G2-24t-GE4	7.98 lb (3.62 kg)	1 RU / 1.73 inches (4.4 cm)	17.36 inches (44.1 cm)	10.01 inches (25.4 cm)

CPU/MEMORY

- 64-bit MIPS Processor, 1 GHz clock, single core
- 1GB ECC DDR3 DRAM
- 4GB eMMC Flash
- 1.5MB packet buffer on 12 - 24 port switches, 3.0MB packet buffer on 48 port switches

LED INDICATORS

- Per port status LED including power status
- System Status LEDs: management, fan and power
- 7 segment display of stack number - operational on switches that support stacking

STACKING

- SummitStack-V with support for up to eight switches per stack
- Mixed stacking with other Extreme X-Series switches, so long as all are running the same ExtremeXOS version
- Requires two of the four available X440-G2 uplink ports

Note: SummitStack-V stacking is enabled on two of the four X440-G2 uplink ports by default (no license required). All stacking ports operate at 10Gb, but do not use standard Ethernet protocols. X440-G2 uplink ports, when not used for stacking, run the standard Ethernet protocol. Non-stacking uplink ports are limited by default to 1GbE, unless upgraded via software license. 10GbE licenses are available, in both two- and four-port versions, that enable X440-G2 uplink ports to run the 10Gb Ethernet protocol.

Mapping of the two default X440-G2 stacking ports to their respective physical chassis interface #'s — by chassis type — are listed below.

X440-G2 SWITCHES*	STACK PORT #	PHYSICAL UPLINK PORT # ON CHASSIS
48 Port Models	1	49 (rear panel, dedicated SFP+ port)
	2	50 (rear panel, dedicated SFP+ port)
24 Port Models	1	27 (rear panel)
	2	28 (rear panel)
12 Port Models	1	15 (front panel)
	2	16 (front panel)

*The three extended temperature X440-G2 models (16539, 16540 and 16541) do NOT stack

POWER

SWITCH MODEL	MINIMUM ¹ HEAT DISSIPATION (BTU/HR)	MINIMUM ¹ POWER CONSUMPTION (WATTS)	MAXIMUM ² HEAT DISSIPATION (BTU/HR)	MAXIMUM ² POWER CONSUMPTION (WATTS)
X440-G2-12t-10GE4	52	15	109	32
X440-G2-24t-10GE4	87	26	136	40
X440-G2-48t-10GE4	141	41	208	61
X440-G2-12p-10GE4	72	21	216 (200W PoE)	264
X440-G2-24p-10GE4	121	35	410 (380W PoE)	500
X440-G2-48p-10GE4	196	53	755 (740W PoE)	961
X440-G2-24t-10GE4-DC	77	23	134	39
X440-G2-48t-10GE4-DC	137	40	207	61
X440-G2-24x-10GE4	87	26	172	51
X440-G2-24fx-GE4	166	49	223	65
X440-G2-12t8fx-GE4	108	32	159	47
X440-G2-24t-GE4	76	22	130	38

¹ Idle no ports linked

² fans high all ports 100% traffic

THE NON-POE EXTENDED TEMPERATURE SWITCHES (X440-G2-24FX-GE4, X440-G2-12T8FX-GE4, X440-G2-24T-GE4)

	FIXED INTERNAL POWER SUPPLY
Voltage Input Range	100-240 VAC †
Line Frequency Range	50 - 60 Hz +/- 5%
Power Supply Input Socket	IEC 320 C14
Power Cord Input Plug	IEC 320 C13
Operating Temperature	0° C to 60° C normal operation

THE 12, 24, AND 48 PORT 10/100/1000 MODELS (BOTH POE AND NON-POE)

	FIXED INTERNAL POWER SUPPLY
Voltage Input Range	100-240 VAC †
Line Frequency Range	50 - 60 Hz +/- 5%
Power Supply Input Socket	IEC 320 C14
Power Cord Input Plug	IEC 320 C13
Operating Temperature	0° C to 50° C normal operation

† - The power supplies will continue to operate +/- 10% of the rated input to accommodate temporary loss of input voltage regulation

SWITCH MODEL	POWER SUPPLY INPUT SOCKET	POWER CORD INPUT PLUG/ INPUT SOCKET	POWER SUPPLY CORD GAUGE	REDUNDANT POWER SUPPLY INPUT SOCKET
X440-G2-12t-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	Coaxial Barrel Connector
X440-G2-24t-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	2x7 terminal block
X440-G2-48t-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	2x7 terminal block
X440-G2-12p-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	2x7 terminal block
X440-G2-24p-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	2x7 terminal block
X440-G2-48p-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 16AWG/1.25mm ² (100-125VAC), Min 18AWG/.75mm ² (200-240VAC)	2x7 terminal block
X440-G2-24t-10GE4-DC	#6 Terminal Block	#6, Crimp lugs, 16/14 AWG	Min 14AWG/2.0mm ²	2x7 terminal block
X440-G2-48t-10GE4-DC	#6 Terminal Block	#6, Crimp lugs, 16/14 AWG	Min 14AWG/2.0mm ²	2x7 terminal block
X440-G2-24x-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	2x7 terminal block
X440-G2-24fx-GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	2x7 terminal block
X440-G2-12t8fx-GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	2x7 terminal block
X440-G2-24t-GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG/0.75mm ²	2x7 terminal block

POE-PLUS POWER BUDGET

SWITCH MODEL	INTERNAL POWER SUPPLY	EXTERNAL RPS
X440-G2-12p-10GE4	200 W	200 W - Redundant Power Only
X440-G2-24p-10GE4	380 W	380 W - Redundant Power Only
X440-G2-48p-10GE4	740 W	1440 W - Additive Power 740 W - Redundant Power

ENVIRONMENTAL SPECIFICATIONS

- EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage
- EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation
- EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational
- EN/ETSI 300 753 (1997-10) - Acoustic Noise
- ASTM D3580 Random Vibration Unpackaged 1.5 G

- Packaged Shock (half sine): 180 m/s² (18 G), 6 ms, 600 shocks
- Packaged Vibration: 5 to 62 Hz at velocity 5 mm/s, 62 to 500 Hz at 0.2 G
- Packaged Random Vibration: 5 to 20 Hz at 1.0 ASD w/-3 dB/oct. from 20 to 200 Hz
- Packaged Drop Height: 14 drops minimum on sides and corners at 42 inches (<15 kg box)

ENVIRONMENTAL COMPLIANCE

- EU RoHS - 2011/65/EU
- EU WEEE - 2012/19/EU
- China RoHS - SJ/T 11363-2006

OPERATING CONDITIONS

- Temp: 0° C to 50° C (32° F to 122° F) - all models
- Temp: 0° C to 60° C (32° F to 140° F) - extended temperature range models only (16539, 16540 and 16541)
- Humidity: 10% to 95% relative humidity, non-condensing
- Altitude: 0 to 3,000 meters (9,842 feet) - All switch models
- Shock (half sine): 30 m/s² (3 G), 11 ms, 6 shocks
- Random vibration: 3 to 500 Hz at 1.5 G rms

PACKAGING AND STORAGE SPECIFICATIONS

- Temp: -40° C to 70° C (-40° F to 158° F) Humidity: 10% to 95% relative humidity, non-condensing

REGULATORY AND SAFETY

North American ITE

- UL 60950-1 2nd Ed., Listed Device (U.S.)
- CSA 22.2 #60950-1-03 2nd Ed. (Canada)
- Complies with FCC 21CFR 1040.10 (U.S. Laser Safety)
- CDRH Letter of Approval (US FDA Approval)

European ITE

- EN 60950-1:2007 2nd Ed.
- EN 60825-1+A2:2001 (Lasers Safety)
- 2006/95/EC Low Voltage Directive

International ITE

- CB Report & Certificate per IEC 60950-1 2nd Ed. + National Differences
- AS/NZS 60950-1 (Australia /New Zealand)

EMI/EMC STANDARDS

North American EMC for ITE

- FCC CFR 47 part 15 Class A (USA)
- ICES-003 Class A (Canada)

European EMC Standards

- EN 55022:2006+A1:2007 Class A
- EN 55024:A2-2003 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 11
- EN 61000-3-2,8-2006 (Harmonics)
- EN 61000-3-3 2008 (Flicker)
- ETSI EN 300 386 v1.4.1, 2008-04 (EMC Telecommunications)
- 2004/108/EC EMC Directive

INTERNATIONAL EMC CERTIFICATIONS

- CISPR 22: 2006 Ed 5.2, Class A (International Emissions)
- CISPR 24:A2:2003 Class A (International Immunity)
- IEC 61000-4-2:2008/EN 61000-4-2:2009 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria A
- IEC 61000-4-3:2008/EN 61000-4-3:2006+A1:2008 Radiated Immunity 10V/m, Criteria A
- IEC 61000-4-4:2004 am1 ed.2./EN 61000-4-4:2004/A1:2010 Transient Burst, 1 kV, Criteria A
- IEC 61000-4-5:2005 /EN 61000-4-5:2006 Surge, 2 kV L-L, 2 kV L-G, Level 3, Criteria A
- IEC 61000-4-6:2008/EN 61000-4-6:2009 Conducted Immunity, 0.15-80 MHz, 10V/m unmod. RMS, Criteria A
- IEC/EN 61000-4-11:2004 Power Dips & Interruptions, >30%, 25 periods, Criteria C

COUNTRY SPECIFIC

- VCCI Class A (Japan Emissions)
- ACMA RCM (Australia Emissions)
- CCC Mark
- KCC Mark, EMC Approval (Korea)

TELECOM STANDARDS

- CE 2.0 Compliant

IEEE 802.3 MEDIA ACCESS STANDARDS

- IEEE 802.3ab 1000BASE-T
- IEEE 802.3z 1000BASE-X
- IEEE 802.3ae 10GBASE-X
- IEEE 802.3at PoE-Plus
- IEEE 802.3az
- IEEE 802.3u, 100Base-FX

FAN AND ACOUSTIC NOISE

SWITCH MODEL	ACOUSTIC INFORMATION	
	BYSTANDER SOUND PRESSURE*	DECLARED SOUND POWER (LWAD)*
X440-G2-12t-10GE4	0 dB(A) fan off	0 bels fan off
X440-G2-24t-10GE4	28.1 dB(A)	4.3 bels
X440-G2-48t-10GE4	37.9 dB(A)	5.4 bels
X440-G2-12p-10GE4	0 dB(A) fan off	0 bels fan off
X440-G2-24p-10GE4	39.4 dB(A)	5.5 bels
X440-G2-48p-10GE4	48.7 dB(A)	6.4 bels
X440-G2-24t-10GE4-DC	28.1 dB(A)	4.3 bels
X440-G2-48t-10GE4-DC	37.9 dB(A)	5.4 bels
X440-G2-24x-10GE4	26.8 dB(A)	4.0 bels
X440-G2-24fx-GE4	24.7 dB(A)	3.9 bels
X440-G2-12t8fx-GE4	23.3 dB(A)	4.0 bels
X440-G2-24t-GE4	28.1 dB(A)	4.3 bels

*- At 25°C and 50% PoE Load where applicable

EXTERNAL REDUNDANT POWER SUPPLIES FOR NON-POE SWITCHES

All X440-G2 series non-PoE switches ship with one fixed internal power supply. If redundancy is required, an external RPS can be attached to the switch.

MODEL NUMBER	DESCRIPTION
RPS-90	External redundant power supply Unit 90 Watts with cable for X440-G2-12t-10GE4 , Power cord ordered separately, order 10947 C5 to C14 Converter to utilize a C13 power cord
STK-RPS-150PS	150 watt non-PoE redundant power supply for A, B, C, X450-G2 and X440-G2 switches, Power cord ordered separately
STK-RPS-150CH2	2-Slot modular shelf for rack-mounting 150W redundant power supplies (STK-RPS-150PS)
STK-RPS-150CH8	8-Slot modular shelf for rack-mounting 150W redundant power supplies (STK-RPS-150PS)
RPS-150XT	External redundant power supply unit 150 Watts with cable - Extended Temperature Range from 0 to +60 degrees Celsius, Power cord ordered separately
STK-RPS-1005CH3	3-Slot modular shelf for rack-mounting 150W extended temperature redundant power supplies (RPS-150XT) or 1005W PoE+ redundant power supplies (STK-RPS-1005PS)
EPS-C2	External Power System Chassis 2. Accepts up to three 750W AC PoE PSU 48V power supplies. Accepts up to 5 EPS-CBL-2x7 or up to 1 EPS-CBL-2x9 cables. Ships with one EPS-CBL-2x7 cable.
EPS-CBL-2x7	External Power System Cable (1M) that connects EPS-C2 to any X440 or X450-G2 non-PoE switch for providing redundant DC power.
750W AC PSU	AC Power Supply module for EPS-C2 Chassis Redundant Power Supply, Power cord ordered separately

EXTERNAL REDUNDANT POWER SUPPLIES FOR POE X440-G2 SWITCHES

All X440-G2 series PoE switches ship with fixed internal power supplies.

RPS USE TABLE	RPS-90	STK-RPS-150PS	RPS-150XT	EPS-C2	RPS-500p	STK-RPS-1005PS
12t	X					
24t, 24x, 48t, 24fx, 12t8fx		X	X	X	X	
12p and 24p				X	X	
48p						X

RPS MODEL	REDUNDANT POWER SUPPLY OUTPUT
RPS-90	Coaxial Barrel Connector
STK-RPS-150PS	1 terminal block of 2x7 pins - provides system power and up to 150 watts of power
RPS-150XT	1 terminal block of 2x7 pins - provides system power and up to 150 watts of power
EPS-C2	1 terminal block of 2x9 pins - used for other Summit switches 5 terminal blocks of 2x7 pins - used for Summit X440-G2's
RPS-500p	1 terminal block of 2x7 pins - provides system power and up to 380 watts of IEEE802.3at power
STK-RPS-1005PS	1 terminal block of 2x7 pins - provides system power and up to 740 watts of IEEE802.3at power

RPS MODEL	ALLOWABLE PSU	POWER CORD INPUT PLUG / SOCKET	POWER CORD GAUGE
RPS-90	Not Applicable	IEC 320 C5/C14	Min 18AWG/0.75mm ²
STK-RPS-150PS	Not Applicable	IEC 320 C13/C14	Min 18AWG/0.75mm ²
RPS-150XT	Not Applicable	IEC 320 C13/C14	Min 18AWG/0.75mm ²
EPS-C2	Summit 750W PoE AC PSU	IEC 320 C13/C14	Min 18AWG/0.75mm ²
RPS-500p	Not Applicable	IEC 320 C13/C14	Min 18AWG/0.75mm ²
STK-RPS-1005PS	Not Applicable	IEC 320 C13/C16	Min 16AWG/1.25mm ² (100-125VAC), Min 18AWG/.75mm ² (200-240VAC)

RPS MODEL	WEIGHT	DIMENSIONS
RPS-90	0.73lb (0.33kg)	Height: 1.06 inches (2.69cm) Width: 5.20 inches (13.21cm) Depth: 2.25 inches (5.72cm)
STK-RPS-150PS	3.85lb (1.75kg)	Height: 2.04 inches (5.2cm) Width: 7.7 inches (19.6cm) Depth: 10.1 inches (25.7cm)
RPS-150XT	3.22lb (1.46kg)	Height:1.77 inches (4.50cm) Width: 6.07 inches (15.42cm) Depth: 13.00 inches (33.02cm)
EPS-C2	2.27lb (1.03 kg)	Height: 1RU, 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 15.1 inches (38.4 cm)
RPS-500p	8.06lb (3.66 kg)	Height: 1RU, 1.73 inches (4.4 cm) Width: 17.4 inches (44.1 cm) Depth: 7.9 inches (20.1 cm)
STK-RPS-1005PS	4.63lb (2.1 kg)	Height: 1.77 inches (4.5cm) Width: 6.07 inches (15.42cm) Depth: 13.39 inches (34.0cm)

Warranty

- Ltd. Lifetime with eAHR - 2
- For warranty details, visit: <http://www.extremenetworks.com/go/warranty>

Ordering Information

PART NUMBER	NAME	DESCRIPTION
16530	X440-G2-12t-10GE4	X440-G2 12 10/100/1000BASE-T, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license
16531	X440-G2-12p-10GE4	X440-G2 12 10/100/1000BASE-T POE+, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license
16532	X440-G2-24t-10GE4	X440-G2 24 10/100/1000BASE-T, 4 SFP combo, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license
16533	X440-G2-24p-10GE4	X440-G2 24 10/100/1000BASE-T POE+, 4 SFP combo, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license
16534	X440-G2-48t-10GE4	X440-G2 48 10/100/1000BASE-T, 4 SFP combo, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+ (2 combo/2 non-combo), 2 1GbE copper combo upgradable to 10GbE, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license
16535	X440-G2-48p-10GE4	X440-G2 48 10/100/1000BASE-T POE+, 4 SFP combo, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+ (2 combo/2 non-combo), 2 1GbE copper combo upgradable to 10GbE, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license
16536	X440-G2-24t-10GE4-DC	X440-G2 24 10/100/1000BASE-T, 4 SFP combo, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+, 1 Fixed DC PSU, 1 RPS port, ExtremeXOS Edge license
16537	X440-G2-48t-10GE4-DC	X440-G2 48 10/100/1000BASE-T, 4 SFP combo, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+ (2 combo/2 non-combo), 2 1GbE copper combo upgradable to 10GbE, 1 Fixed DC PSU, 1 RPS port, ExtremeXOS Edge license
16538	X440-G2-24x-10GE4	X440-G2 24 unpopulated 1000BASE-X SFP (4 combo), 4 10/100/1000 combo, 4 1GbE unpopulated SFP upgradable to 10GbE SFP+, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license
16539	X440-G2-24fx-GE4	X440-G2 24 fixed 100BASE-FX LC connectors, 4 1GBASE-X unpopulated SFP, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license, 0°C to 60°C operation
16540	X440-G2-12t8fx-GE4	X440-G2 12 10/100/1000BASE-T plus 8 fixed 100BASE-FX LC connectors, 4 1GBASE-X unpopulated SFP, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license, 0°C to 60°C operation
16541	X440-G2-24t-GE4	X440-G2 24 fixed 10/100/1000BASE-TX, 4 1GBASE-X unpopulated SFP, 1 Fixed AC PSU, 1 RPS port, ExtremeXOS Edge license, 0°C to 60°C operation
16521	X440 Adv. Edge License	ExtremeXOS Advanced Edge License for X440/X440-G2 series switches
16522	X440 OpenFlow Feature Pack	ExtremeXOS SDN - OpenFlow Feature Pack for X440/X440-G2 series switches
16523	X440 Multimedia(AVB) Feature Pack	ExtremeXOS Multimedia Service (Audio Video Bridging) Feature Pack for X440/X440-G2 series switches
16542	Dual 10GbE Upgrade License	License that converts the two non-stack 1GbE SFP ports to be 10GbE SFP+
16543	Quad 10GbE Upgrade License	License that converts four 1GbE SFP ports to be 10GbE SFP+
10301	10GBASE-SR SFP+	10GBASE-SR SFP+, 850nm, LC Connector, transmission length of up to 300m on MMF

PART NUMBER	NAME	DESCRIPTION
10302	10GBASE-LR SFP+	10GBASE-LR SFP+, 1310nm, LC Connector, transmission length of up to 10km on SMF
10309	10GBASE-ER SFP+	10GBASE-ER SFP+, 1550nm, LC connector, transmission length of up to 40km on SMF
10303	SFP+ LRM Module	10 Gigabit Ethernet SFP+ module, 1310nm, legacy MMF 220m link, LC connector
10948	RPS-90	External Redundant Power Supply Unit 90 Watts with cable , Power cord ordered separately
10947	C5 to C14 Converter	Power dongle for converting an IEC C5 plug to IEC C14 plug - enables the use of to utilize a C13 power cord
STK-RPS-150PS	150W Non-PoE RPS	150 watt non-PoE redundant power supply for A, B, C and X450-G2 switches
STK-RPS-150CH2	2-Slot Modular Shelf	2-Slot Modular Shelf for rack mounting up to two150 watt (STK-RPS-150PS) external redundant power supplies
STK-RPS-150CH8	8-Slot Modular Shelf	8-Slot Modular Shelf for rack mounting up to eight 150 watt (STK-RPS-150PS) external redundant power supplies
10932	RPS-150 XT	External Redundant Power Supply Unit 150 Watts with cable - Extended Temperature Range from 0 to +60 degrees Celsius, Power cord ordered separately
10923	RPS-500p	External PoE+ Redundant Power Supply Unit 500 Watts with cable, Power cord ordered separately
STK-RPS-1005PS	1005 W RPS	1005 watt 802.3at PoE external redundant power supply for C5 PoE and X440-48p switches
STK-RPS-1005CH3	3-Slot Modular Shelf	3-Slot Modular Shelf for rack mounting up to three of any combination of extended temperature 150 watt (10932 - RPS-150 XT) or STK-RPS-1005PS external redundant power supplies
10936	EPS-C2	External Power System Chassis 2. Accepts up to three 750W AC PoE PSU 48V power supplies. Accepts up to 5 EPS-CBL-2x7 or up to 1 EPS-CBL-2x9 cables
10939	EPS-CBL-2x7	External Power System Cable (1M with 2x7 pin) that connects EPS to any X440 or X450-G2 for providing redundant power
10931	750W AC PSU	AC Power Supply module for EPS-C2 Chassis Redundant Power Supply
10051H	1000BASE-SX SFP, Hi	1000BASE-SX SFP, MMF 220 & 550 meters, LC connector, Industrial Temp
10052H	1000BASE-LX SFP, Hi	1000BASE-LX SFP, MMF 220 & 550 meters, SMF 10km, LC connector, Industrial Temp
10053H	1000BASE-ZX SFP, Hi	1000BASE-ZX SFP, SMF 70km, LC connector, Industrial Temp
10056H	1000BASE-BX-D BiDi SFP, Hi	1000BASE-BX-D SFP, 1490-nm TX/1310-nm RX wavelength, Industrial Temp
10057H	1000BASE-BX-U BiDi SFP, Hi	1000BASE-BX-U SFP, 1310-nm TX/1490-nm RX wavelength, Industrial Temp
10060	100FX/1000LX SFP ²	100FX/1000LX SFP, SMF, LC Connector (Requires MCP and 6dB Attenuator for 100FX-MMF Operation) ²
10070H	10/100/1000BASE-T SFP, Hi ²	10/100/1000BASE-T, SFP, CAT 5 cable 100m, RJ-45 Connector, Industrial Temp ²
10071H	1000BASE-SX SFP 10 Pack, Hi	1000BASE-SX SFP 10 Pack, Industrial Temp
10072H	1000BASE-LX SFP 10 Pack, Hi	1000BASE-LX SFP 10 Pack, Industrial Temp
MGBIC-BX120-D	1000BASE-BX-D BiDi SFP 120Km	1 Gb, 1000Base-BX120-D Single Fiber SM, Bidirectional, 1590nm Tx / 1490nm Rx, 120 Km, Simplex LC SFP (must be paired with MGBIC-BX120-U), -40°C to +60°C
MGBIC-BX120-U	1000BASE-BX-U BiDi SFP 120Km	1 Gb, 1000Base-BX120-U Single Fiber SM, Bidirectional, 1490nm Tx / 1590nm Rx, 120 Km, Simplex LC SFP (must be paired with MGBIC-BX120-D), -40°C to +60°C
10063	100FX SFP ¹	100Mb, 100BASE-FX, MMF 2Km, LC ¹
10067	100BASE-FX SFP ¹	100BASE-FX SFP module, MMF 2km link, LC-connector for Fast Ethernet SFP Port ¹
10304	10GBASE-CR SFP+ 1m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 1m
10305	10GBASE-CR SFP+ 3m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 3m
10306	10GBASE-CR SFP+ 5m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 5m
10307	10GBASE-CR SFP+ 10m ³	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 10m ³
10GB-ZR-SFPP	10GB 80KM SFP+	10Gb, 10GBASE-ZR, SM, 1550nm, 80Km, LC SFP+
10GB-BX40-D	10 GB, SINGLE FIBER SM, -D 40 KM	10Gb, Single Fiber SM, Bidirectional, 1330nm Tx / 1270nm RX, 40Km, Simplex LC SFP+ (must be paired with 10GB-BX40-U)
10GB-BX40-U	10 GB, SINGLE FIBER SM, -U 40 KM	10Gb, Single Fiber SM, Bidirectional, 1270nm Tx / 1330nm RX, 40Km, Simplex LC SFP+ (must be paired with 10GB-BX40-D)
10GB-BX10-D	10 GB, SINGLE FIBER SM, -D 10 KM	10Gb, Single Fiber SM, Bidirectional, 1330nm Tx / 1330nm RX, 40Km, Simplex LC SFP+ (must be paired with 10GB-BX10-U)
10GB-BX10-U	10 GB, SINGLE FIBER SM, -U 10 KM	10Gb, Single Fiber SM, Bidirectional, 1270nm Tx / 1330nm RX, 10Km, Simplex LC SFP+ (must be paired with 10GB-BX10-D)
10GB-F10-SFPP	10 GB, ACTIVE OPTICAL DAC, 10 M	10Gb, Active optical direct attach cable with 2 integrated SFP+ transceivers, 10m
10GB-F20-SFPP	10 GB, ACTIVE OPTICAL DAC, 20 M	10Gb, Active optical direct attach cable with 2 integrated SFP+ transceivers, 20m

PART NUMBER	NAME	DESCRIPTION
MGBIC-BX40-D	1000BASE-BX40-D BIDIRECTIONAL SFP	1Gb, 1000Base-BX40-D Single Fiber SM, Bidirectional, 1490nm Tx / 1310nm RX, 40Km, Simplex LC SFP (must be paired with MGBIC-BX40-U), -40°C to +60°C
MGBIC-BX40-U	1000BASE-BX40-U BIDIRECTIONAL SFP	1Gb, 1000Base-BX40-U Single Fiber SM, Bidirectional, 1310nm Tx / 1490nm RX, 40Km, Simplex LC SFP (must be paired with MGBIC-BX40-D), -40°C to +60°C
MGBIC-BX10-D	1000BASE-BX-D SFP - 10KM	1Gb, 1000Base-BX10-D Single Fiber SM, Bidirectional, 1490nm Tx / 1310nm RX, 10Km, Simplex LC SFP (must be paired with MGBIC-BX10-U)
MGBIC-BX10-U	1000BASE-BX-U SFP - 10KM	1Gb, 1000Base-BX10-U Single Fiber SM, Bidirectional, 1310nm Tx / 1490nm RX, 10Km, Simplex LC SFP (must be paired with MGBIC-BX10-D)
I-MGBIC-LC03	Industrial 1000Base-LX 1310nm MMF Transceiver	-40°C to +60°C, 1Gb, 1000Base-LX, MM, 1310 nm, 2 km with 62.5 MMF, 1 km with 50 MMF, LC SFP
I-MGBIC-GSX	Industrial 1000Base-SX 850nm Transceiver	-40°C to +60°C, 1Gb, 1000Base-SX, IEEE 802.3 MM, 850nm Short Wave Length, 220/550 m, LC SFP
I-MGBIC-GLX	Industrial 1000Base-LX 1310nm SM Transceiver	-40°C to +60°C, 1Gb, 1000Base-LX, MM - 550m, SM - 10 km, 1310 nm Long Wave Length, LC SFP, LC SFP

¹ - Supported in 24 SFP ports in 16538, not supported on SFP combo ports or SFP/SFP+ uplink ports

² - Supported in 24 SFP ports in 16538, not supported on SFP combo ports, 1Gb Mode Only on SFP/SFP+ uplink port

³ - Supported on 48 port 10GbE ports only

ExtremeCloud Management - 16530, 16531, 16532, 16533, 16534 and 16535 switches are enabled for use with ExtremeCloud. For details and ordering part numbers for ExtremeCloud Management, see the [ExtremeCloud datasheet](#).



<http://www.extremenetworks.com/contact> / Phone +1-408-579-2800

©2016 Extreme Networks, Inc. All rights reserved. Extreme Networks and the Extreme Networks logo are trademarks or registered trademarks of Extreme Networks, Inc. in the United States and/or other countries. All other names are the property of their respective owners. For additional information on Extreme Networks Trademarks please see <http://www.extremenetworks.com/company/legal/trademarks>. Specifications and product availability are subject to change without notice. 10450-0217-03