

# ExtremeSwitching™ X440-G2

Scalable Cost-Effective Edge Switch with ExtremeXOS Modular Operating System

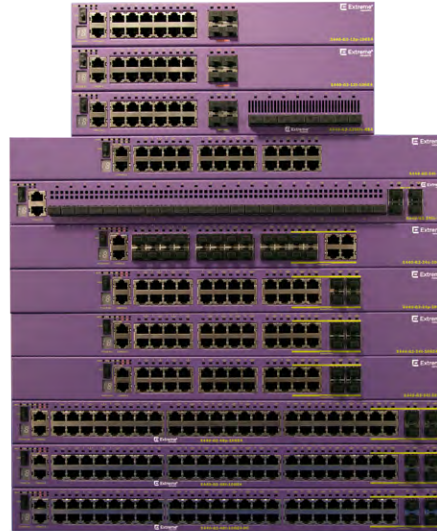
## HIGHLIGHTS

### PERFORMANCE

- 12, 24 and 48-port GbE models
- 4 ports of SFP 1GbE on front or back faceplate, upgradeable to 10Gb Ethernet on most models
  - Optional licenses to upgrade
- All configurations Non-blocking full duplex
- SFP, Copper PoE-Plus, non-PoE and 100Base-FX models
- Two SummitStack-V stacking ports on all models except for the extended temperature (0°C to 60°C) models

### FEATURES

- Side-to-side, left-to-right airflow
- Fixed power supplies with RPS
- Energy Efficient Ethernet
- Up to 740 watts of PoE power on 48 port models
- Extended 0°C to 60°C operating range on three models
- 10Mb/100Mb half-duplex support
- DC power option
- 100Base-FX models
- LRM support on 48 port models only



## Product Overview

The ExtremeSwitching X440-G2 series is based on Extreme Networks® ExtremeXOS®, a highly resilient OS that provides continuous uptime, manageability and operational efficiency. Each switch offers the same high-performance, non-blocking hardware technology, in the Extreme Networks tradition of simplifying network deployments through the use of common hardware and software throughout the network.

The ExtremeSwitching X440-G2 switches are cost-effective campus edge switches with IEEE 802.3at PoE-plus.

## COMPREHENSIVE SECURITY MANAGEMENT

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

## FLEXIBLE PORT CONFIGURATION

All models come equipped with 4 ports of SFP 1GbE resident on either the faceplate or rear panel of each model. These 1GbE ports on most models are upgradeable to 10Gb SFP+ Ethernet on the 12, 24 and 48 port 10/100/1000 models via software licensing. Please note that 10GbE upgrades are not supported on the extended temperature models. In addition, there are four 1GbE SFP combo ports on the front panel of the 24 and 48 port 10/100/1000 switches (not applicable to 16541).

## EXTENDED TEMPERATURE RANGE SUPPORT

The X440-G2 has three switch models that support 0°C to 60°C operating range (Models 16539, 16540 and 16541).

## HIGH-PERFORMANCE STACKING

Up to eight X440-G2 switches can be stacked using SummitStack-V. Each X440-G2 unit comes equipped with 2 stacking ports via an SFP+ interface except for the extended temperature range switches. Standard 10 Gb Ethernet Optics and passive and active cables can be used in the SFP+ ports for stacking X440-G2s together via SummitStack-V.

## SUMMITSTACK-V—FLEXIBLE STACKING OVER SFP+ PORTS

ExtremeXOS supports the SummitStack-V capability using 2 of the SFP+ ports on the X440-G2 as stacking ports, enabling the use of standard cabling and optics technologies used for 10 GbE SFP+, SummitStack-V provides long-distance stacking connectivity of up to 40 km while reducing the cable complexity of implementing a stacking solution. SummitStack-V is compatible with X450-G2 switches with 10Gb uplinks, X460-G2 with 10Gb uplinks, X670-G2 and X770 switches running the same version of ExtremeXOS (21.1 or higher). SummitStack-V enabled ports must be physically direct-connected.

*NOTE 1: The SFP+ stacking ports on the base X440-G2 switches are NOT 10Gb Ethernet ports in the base switch; they are 1Gb Ethernet ports. The switches run a 10Gb stacking protocol on two of these ports by default (no license required for stacking), but they do NOT run the 10Gb Ethernet protocol without licensed entitlement. Two and four port licenses are available to enable the SFP+ ports to run the 10Gb Ethernet protocol.*

*NOTE 2: SummitStack-V is NOT supported on the extended temperature range switch models 16539, 16540 and 16541*

## FUTURE USB 2.0 SUPPORT

All X440-G2 switches have a USB 2.0 port that will be supported with a future operating system upgrade.

## ROLE-BASED POLICY

Utilizing NetSight Policy Management, the role-based policy framework empowers a network administrator to define distinct roles or profiles that represent industry specific operational groups that may exist in an education or a business environment (e.g., administrator, teacher, student, guest). Each defined role is 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.

Users can be authenticated via IEEE 802.1X, MAC address, or web authentication, and then assigned a pre-defined operational role. Network operations can be seamlessly tailored to meet business-oriented requirements by providing each role with individualized access to network services and applications, thus aligning network resource utilization with business goals and priorities.

## INTELLIGENT SWITCHING

ExtremeSwitching X440-G2 supports sophisticated and intelligent Layer 2 switching, as well as Layer 3 IPv4/IPv6 routing including policy-based switching/routing, Provider Bridges, bidirectional ingress and egress Access Control Lists, and bandwidth control by 8 Kbps granularity both for ingress and egress.

## IEEE 802.3AT POE-PLUS

IEEE 802.3af Power over Ethernet has been widely used in the campus enterprise edge network for Ethernet-powered devices such as wireless access points, Voice over IP phones, and security cameras. Ethernet port extenders such as Extreme Networks ReachNXT™ 100-8t can also utilize PoE, making installation and management easier and reducing maintenance costs. The newer IEEE 802.3at PoE-plus standard expands upon Power over Ethernet by increasing the power limit up to 30 watts, and by standardizing power negotiation by using LLDP. X440-G2 supports IEEE 802.3at PoE-plus and supports standards-compliant PoE devices today and into the future.

## 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.

## ORDERING NOTES

- All X440-G2 switches ship with fixed fans and power supplies.
- All of the X440-G2 switches support optional external redundant power supplies (RPS).
- The following three switch models that support 0°C to 60°C are NOT upgradeable to 10GbE:
  - X440-G2-24fx-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 <sup>1</sup>	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	18	8 (2 + 6 combo)	4 via license <sup>1</sup>	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 <sup>1</sup>	176 Gbps	130.9 Mpps
X440-G2-24x-10GE4	24 SFP	4	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

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

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

## 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

### 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

## POWER

SWITCH MODEL	MINIMUM <sup>1</sup> HEAT DISSIPATION (BTU/HR)	MINIMUM <sup>1</sup> POWER CONSUMPTION (WATTS)	MAXIMUM <sup>2</sup> HEAT DISSIPATION (BTU/HR)	MAXIMUM <sup>2</sup> 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

<sup>1</sup> Idle no ports linked

<sup>2</sup> 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	Coaxial Barrel Connector
X440-G2-24t-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG	2x7 terminal block
X440-G2-48t-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG	2x7 terminal block
X440-G2-12p-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG	2x7 terminal block
X440-G2-24p-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG	2x7 terminal block
X440-G2-48p-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 16AWG	2x7 terminal block
X440-G2-24t-10GE4-DC	#6 Terminal Block	#6, Crimp lugs, 16/14 AWG	Min 14AWG	2x7 terminal block
X440-G2-48t-10GE4-DC	#6 Terminal Block	#6, Crimp lugs, 16/14 AWG	Min 14AWG	2x7 terminal block
X440-G2-24x-10GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG	2x7 terminal block
X440-G2-24fx-GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG	2x7 terminal block
X440-G2-12t8fx-GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG	2x7 terminal block
X440-G2-24t-GE4	IEC 320 C14	IEC 320 C13/C14	Min 18AWG	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

### 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/s<sup>2</sup> (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
- Packaged Shock (half sine): 180 m/s<sup>2</sup> (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)

### 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	14.7 dB(A) fan off	2.7 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	14.7 dB(A) fan off	2.7 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
	<b>BYSTANDER SOUND PRESSURE*</b>
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		
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
STK-RPS-150PS	Not Applicable	IEC 320 C13/C14	Min 18AWG
RPS-150XT	Not Applicable	IEC 320 C13/C14	Min 18AWG
EPS-C2	Summit 750W PoE AC PSU	IEC 320 C13/C14	Min 18AWG
RPS-500p	Not Applicable	IEC 320 C13/C14	Min 18AWG
STK-RPS-1005PS	Not Applicable	IEC 320 C13/C16	Min 16AWG

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
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 two 150 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

PART NUMBER	NAME	DESCRIPTION
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 <sup>1</sup>	100FX/1000LX SFP, SMF, LC Connector (Requires MCP and 6dB Attenuator for 100FX-MMF Operation) <sup>1</sup>
10070H	10/100/1000BASE-T SFP, Hi <sup>2</sup>	10/100/1000BASE-T, SFP, CAT 5 cable 100m, RJ-45 Connector, Industrial Temp <sup>2</sup>
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
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*	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 10m*
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, 1270nm Tx / 1330nm RX, 40Km, Simplex LC SFP+ (must be paired with 10GB-BX40-D)
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
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

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

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

\* - Supported on 48 port 10GbE ports only



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