



## EdgeSwitch™ 16 XG

10G 16-Port Managed Aggregation Switch

Model: ES-16-XG

Non-Blocking Throughput Switching

Maximum Performance and Low Latency

10G Ethernet SFP+ and RJ45 Ports





## Advanced Switching Technology for the Masses

Build and expand your network with Ubiquiti Networks® EdgeSwitch™ XG, part of the EdgeMAX® line of products. The EdgeSwitch XG is a fully managed, 10G fiber switch that enhances network capacity and provides high-bandwidth services to growing networks.

The EdgeSwitch XG offers an extensive suite of advanced Layer-2 switching features and protocols, and also provides Layer-3 routing capability.

## Switching Performance

The EdgeSwitch XG offers the forwarding capacity to simultaneously process traffic on all ports at line rate without any packet loss.

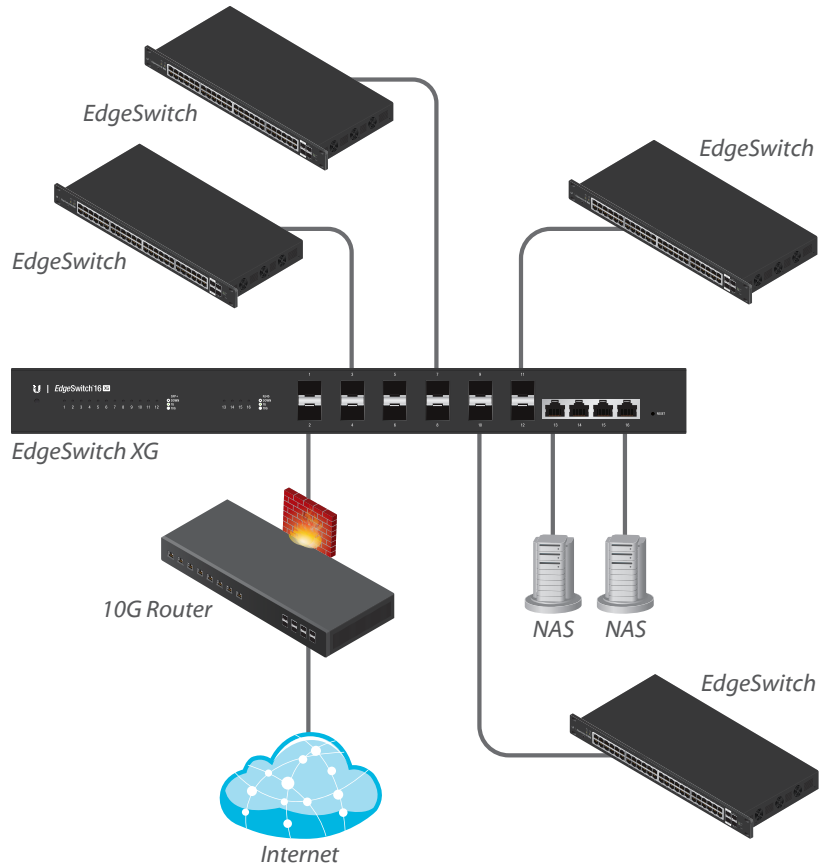
For its total, non-blocking throughput, the EdgeSwitch XG supports up to 160 Gbps.

## 10G High-Capacity Links

The EdgeSwitch XG offers maximum performance and low latency as an aggregation switch.

For fiber connectivity, it features 12 SFP+ ports. For copper connectivity, the EdgeSwitch XG offers four RJ45 ports that support 10GBASE-T, the standard for 10 Gbps connections using Cat6 (or higher) cabling and RJ45 connectors.

## Deployment Example



The EdgeSwitch XG connects to the following:

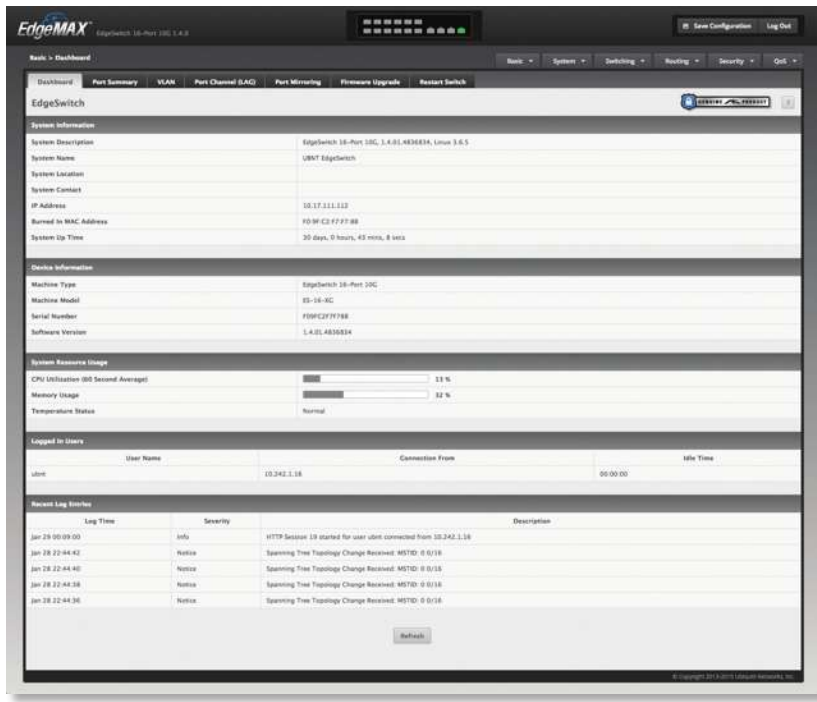
- Multiple EdgeSwitches and a 10G router via SFP+ ports
- NAS (Network-Attached Storage) devices via 10G RJ45 ports



# Comprehensive User Interface

Designed for convenient management, the EdgeSwitch Configuration Interface allows administrators to configure and monitor switch features in a graphical user interface.

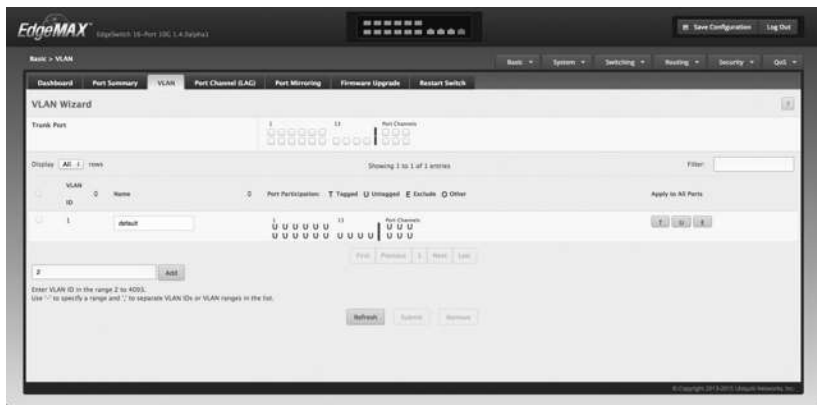
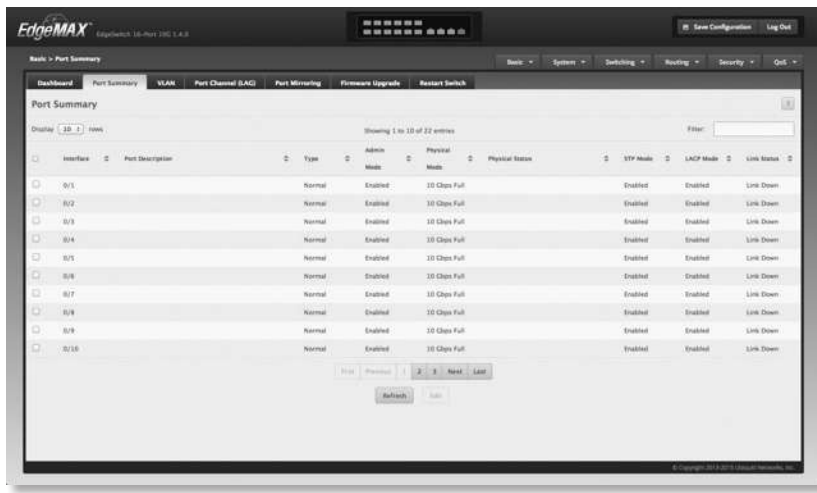
For advanced users, an industry-standard command-line interface (CLI) is available through the serial console port, telnet, and SSH.



# Powerful Functionality

The EdgeSwitch XG uses a sophisticated operating system that provides basic switching features and a variety of advanced features including:

- MSTP/RSTP/STP
- VLAN, Private VLAN, Voice VLAN
- Link Aggregation
- DHCP Snooping, IGMP Snooping
- TACACS+, RADIUS, 802.1X, MAC Filtering, ACL
- DiffServ, CoS
- Static Routing, Policy-Based Routing
- DHCP Server Functionality



# Models

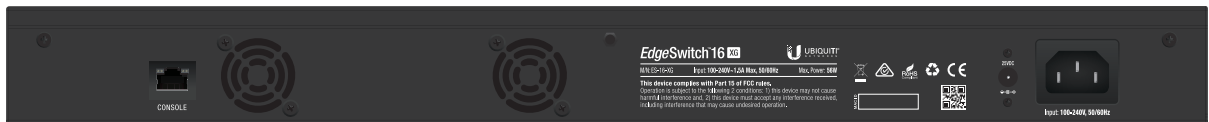
## EdgeSwitch 16 XG

Model: ES-16-XG

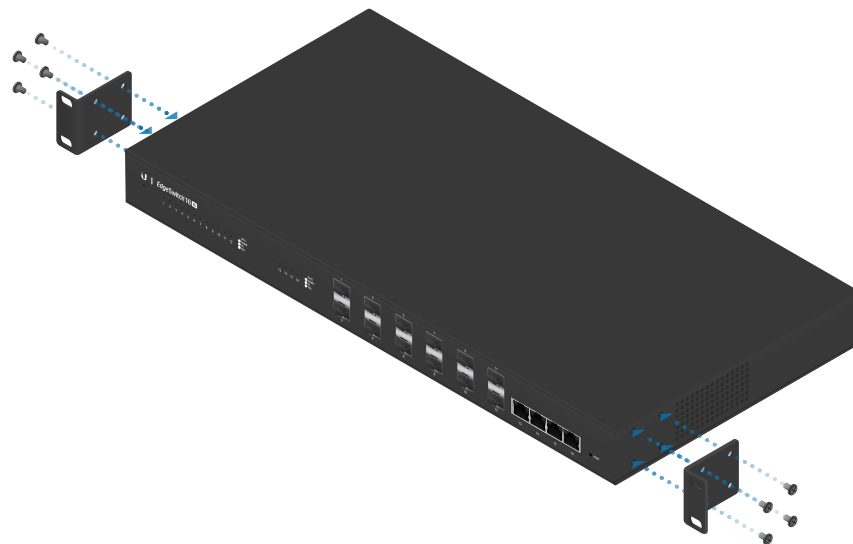
- (12) SFP+ Ports
- (4) 10G RJ45 Ports
- (1) RJ45 Serial Console Port
- Non-Blocking Throughput: 160 Gbps
- Switching Capacity: 320 Gbps
- Forwarding Rate: 238.10 Mpps
- Rack Mountable with Rack-Mount Brackets (Included)
- DC Input Option (Redundant or Stand-Alone)



Front Panel



Back Panel



Attaching Rack-Mount Brackets to the EdgeSwitch XG

# EdgeSwitch™ 16 XG

## Hardware Specifications

ES-16-XG		
Dimensions	443 x 221 x 43 mm (17.44 x 8.70 x 1.69")	
Weight	Rack-Mount Brackets Included	Rack-Mount Brackets Excluded
	2.71 kg (5.97 lb)	2.62 kg (5.78 lb)
Enclosure Characteristics	SGCC Steel	
Total Non-Blocking Throughput	160 Gbps	
Switching Capacity	320 Gbps	
Forwarding Rate	238.10 Mpps	
Max. DC Power Consumption	36W (Excludes SFP/SFP+ Modules)	
Power Method	AC	DC
	100-240VAC/50-60 Hz, Universal Input	DC 56W, 25 to 16V, with 2.5 mm DC Power Inline Connector
Supported Voltage Range	100 to 240VAC	25 to 16VDC
Power Supply	AC/DC, Internal, 56W DC	
LEDs Per Data Port	Speed/Link/Activity	
Networking Interfaces	(12) 1/10 Gbps SFP+ Ethernet Ports (4) 1/10 Gbps RJ45 Ethernet Ports	
Management Interface	(1) RJ45 Serial Port, Ethernet In/Out Band	
Certifications	CE, FCC, IC	
Rack Mount	Yes, 1U High	
ESD/EMP Protection	Air: ± 24 kV, Contact: ± 24 kV	
Operating Temperature	-5 to 40° C (23 to 104° F)	
Operating Humidity	5 to 95% Noncondensing	
Shock and Vibration	ETSI300-019-1.4 Standard	



## Software Specifications

Software Information	
Core Switching Features	<ul style="list-style-type: none"><li>• ANSI/TIA-1057: LLDP-Media Endpoint Discovery (MED)</li><li>• IEEE 802.1AB: Link Layer Discovery Protocol (LLDP)</li><li>• IEEE 802.1D: Spanning Tree Compatibility</li><li>• IEEE 802.1S: Multiple Spanning Tree Compatibility</li><li>• IEEE 802.1W: Rapid Spanning Tree Compatibility</li><li>• IEEE 802.1Q: Virtual LANs with Port-Based VLANs</li><li>• IEEE 802.1p: Ethernet Priority with User Provisioning and Mapping</li><li>• IEEE 802.1X: Port-Based Authentication with Guest VLAN Support</li><li>• IEEE 802.3: 10BASE-T</li><li>• IEEE 802.3u: 100BASE-T</li><li>• IEEE 802.3ab: 1000BASE-T</li><li>• IEEE 802.3an-2006: 10GBASE-T</li><li>• IEEE 802.1ak: Virtual Bridged Local Area Networks - Amendment 07: Multiple Registration Protocol</li><li>• IEEE 802.3ac: VLAN Tagging</li><li>• IEEE 802.3ad: Link Aggregation</li><li>• IEEE 802.3x: Flow Control</li><li>• IEEE 802.1D-2004: Generic Attribute Registration Protocol: Clause 12 (GARP)</li><li>• IEEE 802.1D-2004: Dynamic L2 multicast registration: Clause 10 (GMRP)</li><li>• IEEE 802.1Q-2003: Dynamic VLAN registration: Clause 11.2 (GVRP)</li><li>• RFC 4541: Considerations for Internet Group Management Protocol (IGMP) Snooping Switches</li><li>• RFC 5171: Unidirectional Link Detection (UDLD) Protocol</li></ul>
Advanced Layer 2 Features	<ul style="list-style-type: none"><li>• Broadcast Storm Recovery</li><li>• Broadcast/Multicast/Unknown Unicast Storm Recovery</li><li>• DHCP Snooping</li><li>• IGMP Snooping Querier</li><li>• Independent VLAN Learning (IVL) Support</li><li>• Jumbo Ethernet Frame Support</li><li>• Port MAC Locking</li><li>• Port Mirroring</li><li>• Protected Ports</li><li>• Static MAC Filtering</li><li>• TACACS+</li><li>• Voice VLANs</li><li>• Unauthenticated VLAN</li><li>• Internal 802.1X Authentication Server</li></ul>

Software Information

<p>Platform Specifications</p>	<ul style="list-style-type: none"> <li>• DHCP Server                             <ul style="list-style-type: none"> <li>• Maximum Number of Pools: 128</li> <li>• Maximum Number of Leases (Total): 2048</li> </ul> </li> <li>• Routing                             <ul style="list-style-type: none"> <li>• Number of Routes: 16</li> <li>• Number of Routing Interfaces: 15</li> </ul> </li> <li>• VLANs: 255</li> <li>• MAC Addresses: 8k</li> <li>• MSTP Instances: 4</li> <li>• LAGs: 6</li> <li>• ACLs: 100 with 10 Rules per Port</li> <li>• Traffic Classes (Queues): 8</li> </ul>
<p>System Facilities</p>	<ul style="list-style-type: none"> <li>• Event and Error Logging Facility</li> <li>• Run-Time and Configuration Download Capability</li> <li>• PING Utility</li> <li>• FTP/TFTP Transfers via IPv4/IPv6</li> <li>• Malicious Code Detection</li> <li>• BootP and DHCP</li> <li>• RFC 2021: Remote Network Monitoring Management Information Base Version 2</li> <li>• RFC 2030: Simple Network Time Protocol (SNTP)</li> <li>• RFC 2819: Remote Network Monitoring Management Information Base</li> <li>• RFC 2865: RADIUS Client</li> <li>• RFC 2866: RADIUS Accounting</li> <li>• RFC 2868: RADIUS Attributes for Tunnel Protocol Support</li> <li>• RFC 2869: RADIUS Extensions</li> <li>• RFC 3579: RADIUS Support for EAP</li> <li>• RFC 3580: IEEE 802.1X RADIUS Usage Guidelines</li> <li>• RFC 3164: BSD Syslog Protocol</li> </ul>
<p>Management</p>	<ul style="list-style-type: none"> <li>• Web UI</li> <li>• Industry-Standard CLI</li> <li>• IPv6 Management</li> <li>• Password Management</li> <li>• Autoinstall Support for Firmware Images and Configuration Files</li> <li>• SNMP v1, v2, and v3</li> <li>• SSH 1.5 and 2.0</li> <li>• SSL 3.0 and TLS 1.0</li> <li>• Secure Copy (SCP)</li> <li>• Telnet (Multi-Session Support)</li> </ul>
<p>Layer 3 Routing</p>	<ul style="list-style-type: none"> <li>• Static Routing</li> <li>• Policy Based Routing</li> </ul>

Software Information

QoS	<ul style="list-style-type: none"> <li>• Access Control Lists (ACLs), Permit/Deny Actions for Inbound IP and Layer 2 Traffic Classification Based on:             <ul style="list-style-type: none"> <li>• Time-Based ACL</li> <li>• Source/Destination IP Address</li> <li>• TCP/UDP Source/Destination Port</li> <li>• IP Protocol Type</li> <li>• Type of Service (ToS) or Differentiated Services (DSCP) Field</li> <li>• Source/Destination MAC Address</li> <li>• EtherType</li> <li>• IEEE 802.1p User Priority</li> <li>• VLAN ID</li> <li>• RFC 1858: Security Considerations for IP Fragment Filtering</li> </ul> </li> <li>• Optional ACL Rule Attributes             <ul style="list-style-type: none"> <li>• Assign Flow to a Specific Class of Service (CoS) Queue</li> <li>• Redirect Matching Traffic Flows</li> </ul> </li> <li>• Differentiated Services (DiffServ)             <ul style="list-style-type: none"> <li>• Classify Traffic Based on Same Criteria as ACLs</li> <li>• Mark the IP DSCP or Precedence Header Fields, Optional</li> <li>• Police the Flow to a Specific Rate with Two-Color Aware Support</li> <li>• RFC 2474: Definition of the Differentiated Services Field (DS field) in the IPv4 and IPv6 Headers</li> <li>• RFC 2475: An Architecture for Differentiated Services</li> <li>• RFC 2597: Assured Forwarding Per-Hop Behavior (PHB) Group</li> <li>• RFC 3246: An Expedited Forwarding PHB</li> <li>• RFC 3260: New Terminology and Clarifications for DiffServ</li> </ul> </li> <li>• Class of Service (CoS) Queue Mapping Configuration             <ul style="list-style-type: none"> <li>• AutoVoIP: Automatic CoS Settings for VoIP</li> <li>• IP DSCP-to-Queue Mapping</li> <li>• Configurable Interface Trust Mode (IEEE 802.1p, DSCP, or Untrusted)</li> <li>• Interface Egress Shaping Rate</li> <li>• Strict Priority versus Weighted Scheduling per Queue</li> </ul> </li> </ul>
-----	--