Layer 3 Multiple 10Gbps+ Managed Ethernet Switch

NMS is integrated to Improve Layer 3 10Gbps Network Switch Management Efficiency

PLANET XGS-6311 series is a **fully managed**, **all-port 10Gbps Ethernet switch** that can be **combined with PLANET UNI-NMS** to make network management easier and more efficient. It is designed for Wi-Fi 6/6E/7 wireless APs, NAS and workstations that require high bandwidth. It features **8 10GBASE-T RJ45 ports and 4 10GBASE-X SFP+ fiber optic ports** that are flexibly designed to extend the connection distance.

The XGS-6311 series provides high-density performance, **Layer 3 IPv4/IPv6 static routing, RIP (Routing Information Protocol) and OSPF (Open Shortest Path First)**, with **10Gbps** interfaces.

With such a favorable data link capability, hardware-based Layer 3 routing performance, Layer 2 switching engine and user-friendly yet advanced IPv6/IPv4 management interfaces, it helps to accelerate the deployment of the next-generation high-bandwidth required network for metro, smart cities and enterprises. The hardware specifications of these models are shown below:

Models	Copper Port	SFP+ Port	Power Input
XGS-6311-8T4XR	8 100/1G/2.5G/5G/10G	4 1G/2.5G/10G	AC+AC
XGS-6311-12X	--	12 1G/10G	AC

Through the **PLANET UNC-NMS**, administrators can centrally manage a network of up to **102,400 nodes** from a central office, thereby greatly improving network and power management efficiency. With its user authentication management, combined with the **UNI-NMS**, the security of data transmission in modern factory automation systems is enhanced.

High Performance 10Gbps Ethernet Capacity

The eight RJ45 ports and four SFP+ slots built in the XGS-6311-8T4XR support dual-speed, **10GBASE-SR/LR** or **1000BASE-SX/LX**. With 10Gbps interfaces, the XGS-6311-8T4XR boasts a high-performance switch architecture that is capable of providing non-blocking switch fabric and wire-speed throughput as high as

Physical Ports

- **XGS-6311-8T4XR**
  - 8 100/1G/2.5G/5G/**10GBASE-T** RJ45 auto-negotiation copper ports (Ports 1 to 8)
  - **4 10GBASE-X SFP+** slots, compatible with 1G/2.5GBASE-SX/LX/BX SFP (Ports 9 to 12)
  - RJ45 type RS232 console interface for switch basic management and setup
- **XGS-6311-12X**
  - **12 10GBASE-X SFP+** slots, compatible with 1GBASE-SX/LX/BX SFP (Ports 1 to 12)
 - RJ45 type RS232 console interface for switch basic management and setup

IP Routing Features

- IPv4 routing protocol supports **RIPv1/v2** and **OSPFv2**
- IPv6 routing protocol supports **RIPng** and **OSPFv3**
- Routing interface provides per VLAN routing mode
- Supports route redistribution

Layer 2 Features

- Complies with the IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3z Gigabit Ethernet standard
- Prevents packet loss flow control
  - IEEE 802.3x pause frame flow control in full-duplex mode
  - Back pressure flow control in half-duplex mode
- High performance Store-and-Forward architecture, broadcast storm control, port loopback detection
- 32K MAC address table, automatic source address learning and aging
- Supports VLAN
  - IEEE 802.1Q tag-based VLAN
  - GVRP for dynamic VLAN management
  - Provider Bridging (VLAN Q-in-Q, IEEE 802.1ad) supported
  - Private VLAN Edge (PVE) supported
  - GVRP protocol for Management VLAN
  - Protocol-based VLAN
  - MAC-based VLAN

240Gbps, which greatly simplifies the tasks of upgrading the LAN for catering to increasing bandwidth demands.
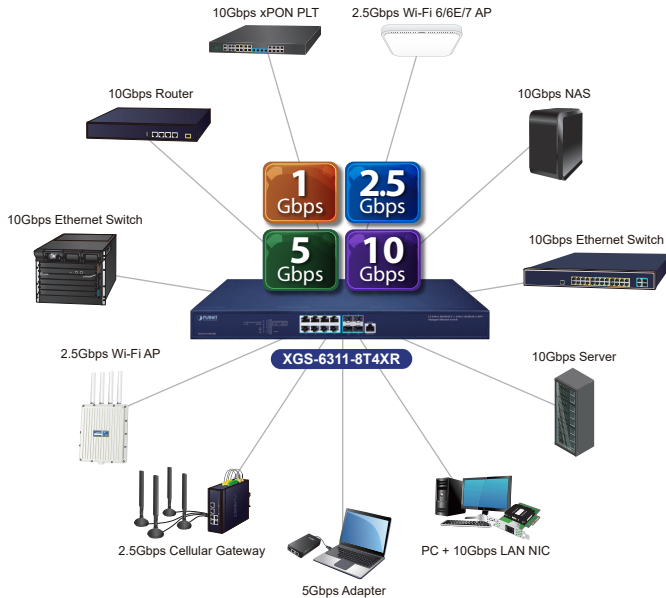
UNI-NMS Remote Management Solution

The XGS-6311 series supports PLANET's Universal Network Management System (UNI-NMS) helping IT staff by remotely managing all network devices and monitoring PDs' operational statuses. Thus, they're designed for both the enterprises and industries where deployments of PDs can be as remote as possible, without having to go to the actual location once a bug or faulty condition is found. With the UNI-NMS, all kinds of businesses can now be speedily and efficiently managed from one platform.

Powerful NMSViewerPro Solution that Meets Evolving Network Management Challenges

The XGS-6311 series Managed Ethernet Switch, known for such features as QoS, Link aggregation, PoE, VLANs, IGMP, and so on, provides an eye-catching feature called NMS developed by PLANET to easily and remotely manage and monitor network devices in the local environment from mobile app. This feature not only improves operational convenience, but also ensures users to have real-time control over their network infrastructure. It provides users with an unparalleled experience.

– IP subnet VLAN
- Supports Link Aggregation
  – Maximum 64 trunk groups, up to 8 ports per trunk group
  – IEEE 802.3ad LACP (Link Aggregation Control Protocol)
  – Cisco ether-channel (static trunk)
- Supports Spanning Tree Protocol
  – STP, IEEE 802.1D (Classic Spanning Tree Protocol)
  – RSTP, IEEE 802.1w (Rapid Spanning Tree Protocol)
  – MSTP, IEEE 802.1s (Multiple Spanning Tree Protocol, spanning tree by VLAN)
  – Supports BPDU & root guard
- Port mirroring to monitor the incoming or outgoing traffic on a particular port (many to many)
- Provides port mirror (many-to-1)
- Supports G.8032 ERPS (Ethernet Ring Protection Switching)

Quality of Service
- 8 priority queues on all switch ports
- Support for strict priority and WRR (Weighted Round Robin) CoS policies
- Traffic classification
  – IEEE 802.1p CoS/ToS
  – IPv4/IPv6 DSCP
  – Port-based WRR
- Strict priority and WRR CoS policies

Multicast
- Supports IPv4 IGMP snooping v1, v2 and v3
- Supports IPv6 MLD v1 and v2 snooping
- Querier mode support
- Supports Multicast VLAN Register (MVR)

Security
- IEEE 802.1x port-based network access authentication
- MAC-based network access authentication
- Built-in RADIUS client to cooperate with the RADIUS servers for IPv4 and IPv6
- TACACS+ login users access authentication
- IP-based Access Control List (ACL)
- MAC-based Access Control List
- Supports DHCP snooping
- Supports ARP inspection
- IP Source Guard prevents IP spoofing attacks

The intuitive interface of the local NMSViewerPro allows administrators to easily perform a variety of tasks, including monitoring traffic, setting configuration, troubleshooting, and more. At the same time, PLANET UNI-NMS application provides real-time alerts and notifications, allowing administrators to respond to any emergency situations anytime, anywhere to ensure the stable operation of the network.

NMSViewerPro meets users' requirements for managing a network more flexibly and efficiently. It helps users to know what the current statuses of the nodes are and to effectively manage the situations.

PLANET NMS and NMSViewerPro app, along with PLANET's free cloud service, allows users to quickly and easily detect, configure, deploy and manage devices remotely. Users can just scan the NMS agent's (NMS-500/NMS-1000V) QR code using the mobile application to easily monitor and control the remote network devices via the private cloud.

XGS-6311 Series

Redundant Ring, Fast Recovery for Critical Network Applications

The XGS-6311 series supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced ITU-T **G.8032 ERPS** (Ethernet Ring Protection Switching) technology and Spanning Tree Protocol (802.1s MSTP) into customer's network to enhance system reliability and uptime in harsh environments. In a simple Ring network, the recovery time could be less than 15ms to quickly bring the network back to normal operation.

ERPS Ring for Metropolitan Area Network Application
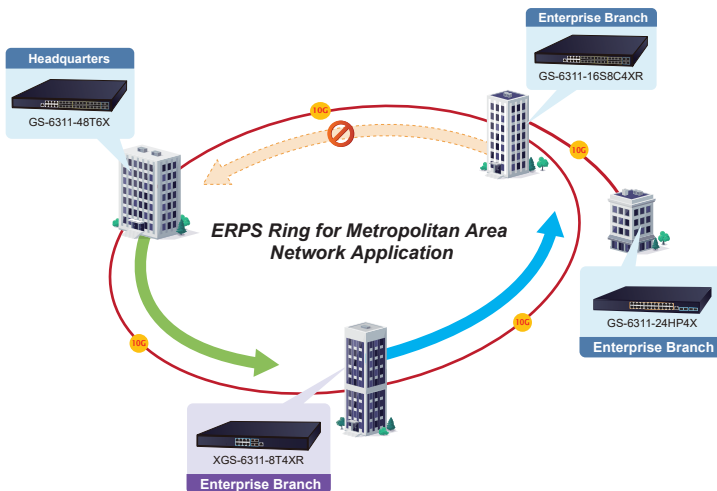
- Dynamic ARP Inspection discards ARP packets with invalid MAC address to IP address binding

Management

- Management IP for IPv4 and IPv6
- Switch Management Interface
  - Console/Telnet Command Line Interface
  - Web switch management
  - SNMP v1, v2c, and v3 switch management
  - SSH/SSL/TLS secure access
- BOOTP and DHCP for IP address assignment
- Firmware upload/download via TFTP or HTTP Protocol for IPv4 and IPv6
- SNTP (Simple Network Time Protocol) for IPv4 and IPv6
- User privilege levels control
- Syslog server for IPv4 and IPv6
- Supports DDM
- Four RMON groups 1, 2, 3, 9 (history, statistics, alarms and events)
- Supports sFlow
- Supports ULDP
- Supports ULPP (Uplink Protection Protocol)
- Supports ULSM (Uplink State Monitor protocol)
- Supports LLDP/LLDP MED
- Supports DHCP Option82/43/60/61/67
- Supports ping, trace route function for IPv4 and IPv6
- PLANET Smart Discovery Utility for deployment management
- PLANET NMS for deployment management
- PLANET NMSViewerPro for deployment management

Layer 3 Routing Support

The XGS-6311 series enables the administrator to conveniently boost network efficiency by configuring Layer 3 static routing manually, and the **RIP** or **OSPF** settings automatically. The RIP can employ the hop count as a routing metric and prevent routing loops by implementing a limit on the number of hops allowed in a path from the source to a destination. The OSPF is an interior dynamic routing protocol for autonomous system based on link state. The protocol creates a database for link state by exchanging link states among Layer 3 switches, and then uses the Shortest Path First algorithm to generate a route table based on that database.

Strong Multicast

The XGS-6311 series supports abundant multicast features. In Layer 2, it features IPv4 IGMPv1/v2/v3 snooping and IPv6 MLD v1/v2 snooping. With Multicast VLAN Register (MVR), multicast receiver/sender control and illegal multicast source detection, the XGS-6311 series is great for any robust networking.

Full IPv6 Support

The XGS-6311 series provides **IPv6 management** and enterprise-level secure features such as **SSH**, **ACL**, **WRR** and **RADIUS** authentication. It thus helps the enterprises to step in the IPv6 era with the lowest investment. In addition, users don't need to replace the network facilities when the IPv6 FTTx edge network is built.

Robust Layer 2 Features

The XGS-6311 series can be programmed for basic switch management functions such as port speed configuration, port aggregation, VLAN, Multiple Spanning Tree Protocol, WRR and bandwidth control. This switch provides 802.1Q tagged VLAN, **Q-in-Q**, voice VLAN and GVRP Protocol functions. By supporting port aggregation, the XGS-6311 series allows the operation of a high-speed trunk combined with multiple ports.
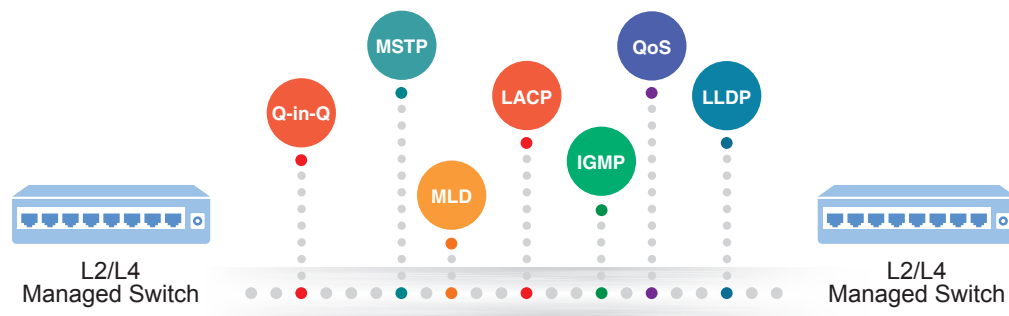
Excellent Layer 2 to Layer 4 Traffic Control

The XGS-6311 series is loaded with powerful traffic management and WRR features to enhance services offered by telecoms. The WRR functionalities include wire-speed Layer 4 traffic classifiers and bandwidth limitation which are particularly useful for multi-tenant unit, multi-business unit, Telco, or network service applications. It also empowers the enterprises to take the full advantage of the limited network resources and guarantees the best in VoIP and video conferencing transmission.

Powerful Security

The XGS-6311 series offers comprehensive Layer 2 to Layer 4 **Access Control List** (ACL) for enforcing security to the edge. It can be used to restrict network access by denying packets based on source and destination IP address, TCP/UDP ports or defined typical network applications. Its protection mechanism also comprises 802.1x Port-based user and device authentications, which can be deployed with RADIUS, to ensure the port level security and block illegal users.

Advanced IP Network Protection

The XGS-6311 series also provides DHCP Snooping, IP Source Guard and Dynamic ARP Inspection functions to prevent IP snooping from attack and discard ARP packets with invalid MAC address. The network administrators can now construct highly-secure corporate networks with considerably less time and effort than before.

Efficient and Secure Management

For efficient management, the XGS-6311 series is equipped with console, Web and SNMP management interfaces.

■ With the built-in Web-based management interface, the XGS-6311 series offers an easy-to-use, platform-independent management and configuration facility.

■ For text-based management, it can be accessed via Telnet and the console port. For reducing product learning time, the XGS-6311 series offers Cisco-like command and customer doesn't need to learn new command from these switches

■ For standard-based monitor and management software, it offers SNMPv3 connection which encrypts the packet content at each session for secure remote management.

Moreover, the XGS-6311 series offers secure remote management by supporting SSHv2 and SSLv3 connection which encrypts the packet content at each session.
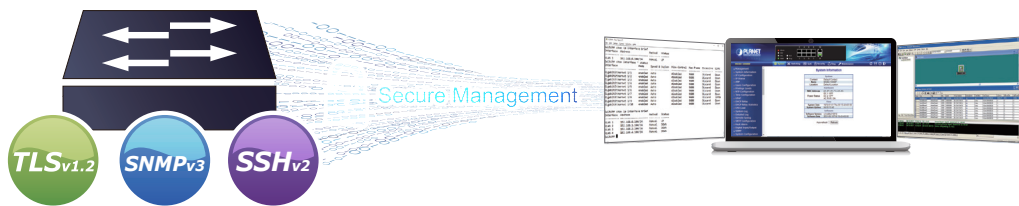
Intelligent SFP Diagnosis Mechanism

The XGS-6311 series supports **SFP-DDM (Digital Diagnostic Monitor)** function that greatly helps network administrator to easily monitor real-time parameters of the SFP and SFP+ transceivers, such as optical output power, optical input power, temperature, laser bias current, and transceiver supply voltage.

SFP DDM (Digital Diagnostic Monitor)

| Voltage | Ammeter | Temperature | Power Transceiver | Power Receiver |
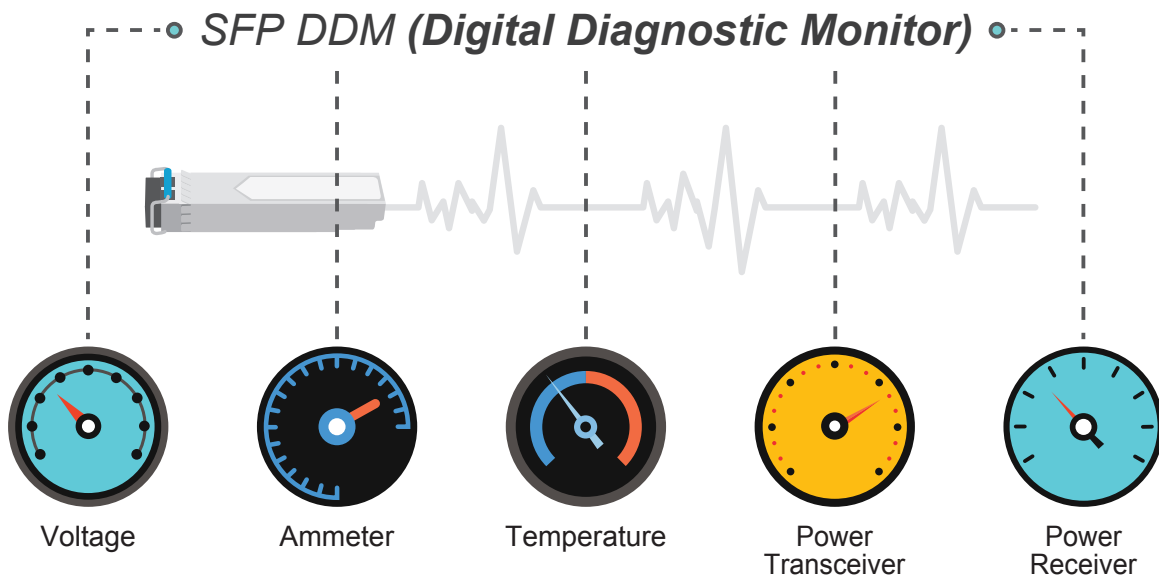
Applications

PLANET NMSViewerPro Networking Solution

The XGS-6311 series effortlessly integrates the functionalities of PLANET NMS and NMSViewerPro, providing users with a seamless and intuitive experience. Leveraging the internet connectivity feature of smartphones enables real-time monitoring of network traffic, configuration settings, and troubleshooting execution. It can access a wealth of device information stored in the cloud, allowing for a comprehensive understanding of your network. Users can benefit from real-time monitoring and control of access points, regardless of their location or time zone.
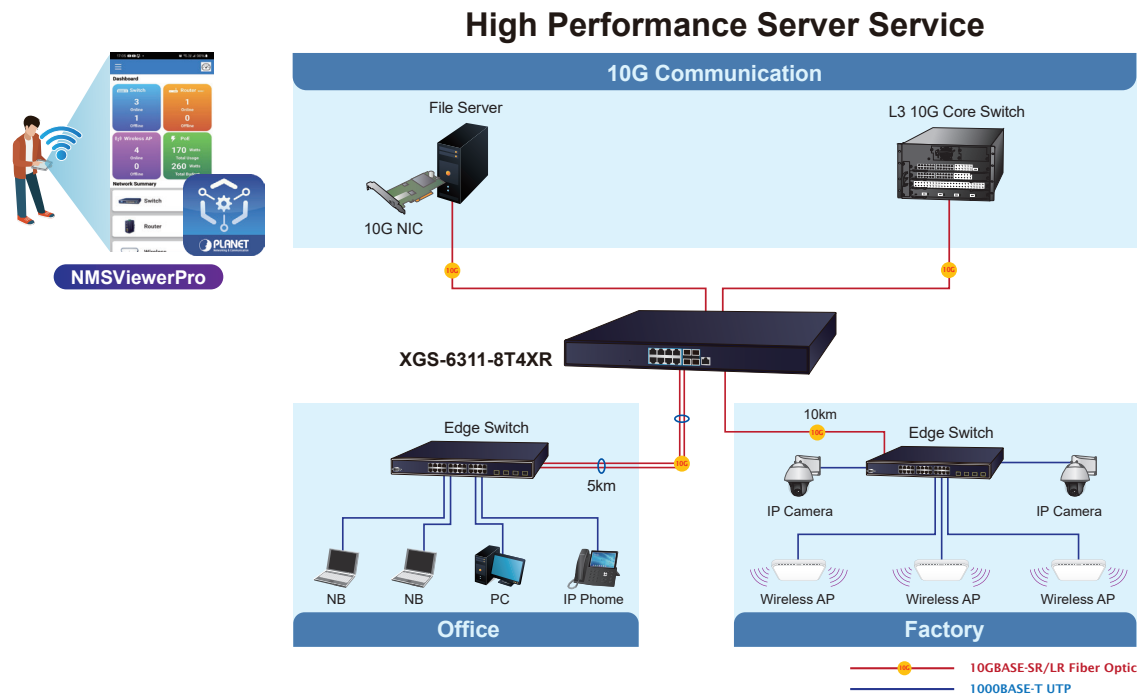
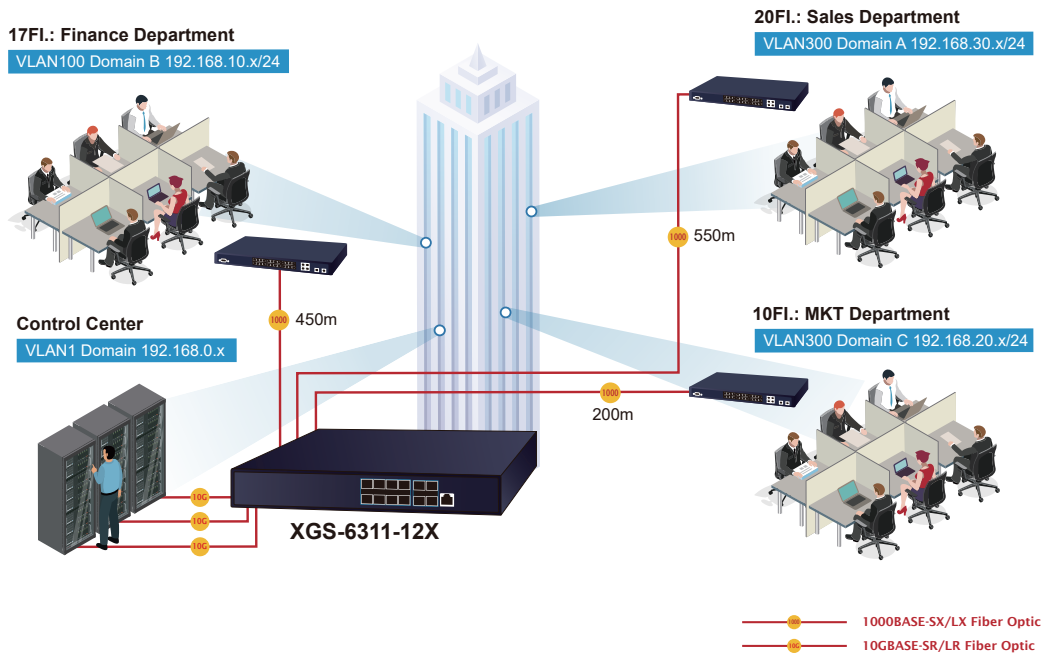## High Availability Mesh Networking Solution for Big Data System

With highly-flexible, highly-extendable and easy-to-install features, the XGS-6311 series offers up to **240Gbps** data exchange speed via optical fiber interface and the transmission distance can be extended to 120km. The XGS-6311 series features strong, rapid, self-recovery capability to prevent interruptions and external intrusions. It incorporates **IEEE 802.1s MSTP (Multiple Spanning Tree Protocol, spanning tree by VLAN)** into customer's automation network to enhance system reliability and uptime. The XGS-6311 series is the ideal solution for data centers, service providers and telecoms to build redundant connection and establish high bandwidth for **Big Data** server farm.

Layer 3 VLAN Routing

With the built-in robust Layer 3 traffic routing protocols, the XGS-6311 series ensures reliable routing between VLANs and network segments. The routing protocols can be applied via VLAN interface. The XGS-6311 series is certainly a cost-effective and ideal solution for enterprises.

VLAN Routing + 10G Uplink Applications

Specifications

Product	XGS-6311-8T4XR	XGS-6311-12X
Hardware Specifications		
Copper Ports	8 100/1G/2.5G/5G/10GBASE-T RJ45 auto negotiation ports (Ports 1 to 8)	--
SFP+ Slots	4 10GBASE-X SFP+ interfaces (Ports 9 to 12) Compatible with 1G/2.5GBASE-SX/LX/BX SFP transceiver	12 10GBASE-X SFP+ interfaces (Ports 1 to 12) Compatible with 1GBASE-SX/LX/BX SFP transceiver
Console	1 x RJ45-to-RS232 serial port (9600, 8, N, 1)	
CPU	MIPS 800MHz	
RAM	512Mbytes	
Flash Memory	32Mbytes	
Dimensions (W x D x H)	441.5 x 207.5 x 44 mm, 1U height	330 x 230 x 43.6 mm, 1U height
Weight	2831g	1988g
Power Consumption	Max. 22.3 watts/76BTU (Power on without any connection) Max. 56 watts/190.96 BTU (Full loading)	Max. 16.4 watts/55.9 BTU (Power on without any connection) Max. 30.2 watts/102.9 BTU (Full loading)
Power Requirements	Dual AC 100~240V, 50/60Hz	AC 100~240V, 50/60Hz
Fan	2	1
LED	**System:** PWR (Green), SYS (Green) **Ports:** **10GBASE-T RJ45 Ports (Ports 1 to 8)** 10G LNK/ACT (Green) 100/1G/2.5G/5G LNK/ACT (Amber) **10GBASE-X SFP+ Ports (Ports 9 to 12)** 10G LNK/ACT (Green) 1G/2.5G LNK/ACT (Amber)	**System:** PWR (Green), SYS (Green) **Ports:** **10GBASE-X SFP+ Ports (Ports 1 to 12)** 10G LNK/ACT (Green) 1G LNK/ACT (Amber)
Switching Specifications		
Switch Architecture	Store-and-forward	
Switch Fabric	240Gbps/non-blocking	
Switch Throughput	178.56Mpps	

Address Table	32K MAC address table with auto learning function
ARP Table	8K
Routing Table	12K
IP Interface	1024
ACL Table	4K
Shared Data Buffer	16MB
Flow Control	Back pressure for half duplex IEEE 802.3x pause frame for full duplex
Jumbo Frame	12KB
IPv4 Layer 3 Functions	
IP Routing Protocol	Static route RIPv1/v2 OSPFv2 BGP4 Hardware-based Layer 3 routing
Layer 3 Protocol	ARP ARP Proxy IGMP Proxy
IPv6 Layer 3 Functions	
IP Routing Protocol	IPv6 Static Route RIPng OSPFv3 BGP6 (BGP4+) PIM6 IPv6 RA (Router Advertisement) IPv6 LPM Routing Hardware-based Layer 3 routing SNMP over IPv6 Support IPv6 IPSec Support IPv6 ACL
Other	ICMPv6,ND,DNSv6 DNS over IPv6 Support
Layer 2 Function	
Port Configuration	Port disable/enable Flow control disable/enable Bandwidth control on each port Port loopback detect
Port Status	Display each port's speed duplex mode, link status, flow control status and auto negotiation status
VLAN	802.1Q tagged based VLAN, up to 4K VLAN groups 802.1ad Q-in-Q (VLAN stacking) GVRP for VLAN management Private VLAN Edge (PVE) supported Protocol-based VLAN MAC-based VLAN IP subnet VLAN
Bandwidth Control	TX/RX/Both
Link Aggregation	IEEE 802.3ad LACP/static trunk Supports 64 groups with 8 ports per trunk group

QoS	8 priority queues on all switch ports
	Supports strict priority and Weighted Round Robin (WRR) CoS policies
	Traffic classification:
	  - IEEE 802.1p CoS/ToS
	  - IPv4/IPv6 DSCP
	  - Port-based WRR

Multicast	IPv4 IGMP v1/v2/v3 snooping IPv4 Querier mode support IPv6 MLD v1/v2 snooping Multicast VLAN Register (MVR) Up to 1024

Security Function	
Access Control List	Supports Standard and Expanded ACL
	IP-based ACL/MAC-based ACL
	Time-based ACL
	Up to 2K entries
Security	Port isolation
	Supports IP + MAC + port binding
	Identification and filtering of L2/L3/L4 based ACL
	Defend against DOS or TCP attacks
	Suppression of broadcast, multicast and unknown unicast packet
	DHCP Snooping, DHCP Option 82/43/60/61/67
	Command line authority control based on user levels
AAA	TACACS+ and IPv4/IPv6 over RADIUS
Authentication	IEEE 802.1x port-based network access control
Management Function	
System Configuration	Console, Telnet, Web browser, SNMP v1, v2c
Secure Management Interfaces	SSHv2, TLSv1.2, SNMPv3
Management	IPv4 and IPv6 dual stack management
	SNMP over IPv6 Support
	User IP security inspection for IPv4/IPv6 SNMP
	SNMP v1, v2c and v3
	SNMP MIB and TRAP
	SNMP RMON 1, 2, 3, 9 four groups
	HTTP over IPv6 Supports
	IPv4/IPv6 FTP/TFTP
	IPv4/IPv6 SNTP/NTP
	Supports ping, trace route function for IPv4 and IPv6
	RADIUS authentication for IPv4/IPv6 Telnet user name and password
	IPv4/IPv6 SSH`
	IPv4/IPv6 Telnet
	IPv6 Radius+ Support
	The right configuration for users to adopt RADIUS server's shell management
	CLI, console, Telnet
	Security IP safety net management function: avoid unlawful landing at nonrestrictive area
	Syslog server for IPv4 and IPv6
	IPv6 TACACS+ support
	PLANET Smart Discovery Utility
	PLANET NMS
	PLANET NMSViewerPro
SNMP MIBs	RFC 1213 MIB-II
	RFC 1215 Internet Engineering Task Force
	RFC 1271 RMON
	RFC 1354 IP-Forwarding MIB
	RFC 1493 Bridge MIB
	RFC 1643 Ether-like MIB
	RFC 1907 SNMP v2
	RFC 2011 IP/ICMP MIB
	RFC 2012 TCP MIB
	RFC 2013 UDP MIB
	RFC 2096 IP forward MIB
	RFC 2233 if MIB
	RFC 2452 TCP6 MIB
	RFC 2454 UDP6 MIB
	RFC 2465 IPv6 MIB
	RFC 2466 ICMP6 MIB
	RFC 2573 SNMP v3 notify
	RFC 2574 SNMP v3 vacm
	RFC 2674 Bridge MIB Extensions (IEEE 802.1Q MIB)
	RFC 2674 Bridge MIB Extensions (IEEE 802.1P MIB)

Standard Conformance	
Regulatory Compliance	FCC Part 15 Class A, CE
Standards Compliance	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3z Gigabit 1000BASE-SX/LX IEEE 802.3ab Gigabit 1000BASE-T IEEE 802.3ae 10Gb/s Ethernet IEEE 802.3x flow control and back pressure IEEE 802.3ad port trunk with LACP IEEE 802.1ag CFM IEEE 802.1D Spanning Tree Protocol IEEE 802.1w Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol IEEE 802.1p Class of Service IEEE 802.1Q VLAN tagging IEEE 802.1X port authentication network control IEEE 802.1ab LLDP RFC 768 UDP RFC 783 TFTP RFC 793 TCP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP v1 RFC 2236 IGMP v2 RFC 3376 IGMP v3 RFC 2710 MLD v1 FRC 3810 MLD v2 RFC 2328 OSPF v2 RFC 1058 RIP v1 RFC 2453 RIP v2 ITU-T G.8032 ERPS Ring

Environment	
Operating	Temperature: 0 ~ 50 degrees C Relative Humidity: 5 ~ 90% (non-condensing)
Storage	Temperature: -10 ~ 70 degrees C Relative Humidity: 5 ~ 90% (non-condensing)

Ordering Information

XGS-6311-8T4XR	L3 8-Port 10GBASE-T + 4-Port 10GBASE-X SFP+ Managed Ethernet Switch with Dual 100~240V AC Redundant Power
XGS-6311-12X	Layer 3 12-Port 10GBASE-X SFP+ Managed Ethernet Switch

Related Products

XGS-6311-12X	Layer 3 12-Port 10GBASE-X SFP+ Managed Ethernet Switch
XGS-6350-12X8TR	Layer 3 12-Port 10G SFP+ + 8-Port 10/100/1000T Managed Switch with Dual 100~240V AC Redundant Power
XGS-6320-12X4TR	Layer 3 12-Port 10GBASE-X SFP+ + 4-Port 10GBASE-T Managed Ethernet Switch with 48V DC Redundant Power
XGS-6320-8X8TR	Layer 3 8-Port 10GBASE-X SFP+ + 8-Port 10GBASE-T Managed Ethernet Switch with 48V DC Redundant Power
MGS-6320-2T6S2X	L3 2-Port 100/1000T + 2-Port 100/1000X SFP + 4-Port 2.5G SFP + 2-Port 10G SFP+ Metro Ethernet Switch
SGS-6310-24T4X	L3 24-Port 10/100/1000T + 4-Port 10G SFP+ Stackable Managed Switch
SGS-6310-24P4X	L3 24-Port 10/100/1000T 802.3at PoE + 4-Port 10G SFP+ Stackable Managed Switch

Available Modules for XGS-6311 Series

10Gigabit Ethernet Transceiver

MTB-LB40	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 40km (TX:1330nm RX:1270nm)
MTB-LA40	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 40km (TX:1270nm RX:1330nm)
MTB-LB20	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 20km (TX:1330nm RX:1270nm)
MTB-LA20	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 20km (TX:1270nm RX:1330nm)
MTB-SR	1-Port 10GBASE-SR SFP+ Fiber Optic Module - 300m
MTB-LR	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 10km
MTB-LA60	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 60km (TX:1270nm RX:1330nm)
MTB-LB60	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 60km (TX:1330nm RX:1270nm)
MTB-RJ	1-Port 10GBASE-T SFP+ Copper Fiber Optic Module - 30m
MTB-LR40	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 40km
MTB-SR2	1-Port 10GBASE-SR SFP+ Fiber Optic Module – 2km
MTB-LR20	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 20km
MTB-LR60	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 60km
MTB-LR80	1-Port 10GBASE-LR SFP+ Fiber Optic Module - 80km
MTB-LA10	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 10km (TX:1270nm RX:1330nm)
MTB-LB10	1-Port 10GBASE-BX SFP+ Fiber Optic Module - 10km (TX:1330nm RX:1270nm)

2.5Gigabit Ethernet Transceiver

MGB-2GTSR	2.5G SFP Transceiver (Multi-mode, 850nm, DDM, -40~85 degrees C) - 300m
MGB-2GTLA20	2.5G SFP Transceiver (Single mode WDM, TX:1310nm RX:1550nm, DDM, -40~85 degrees C) - 20km
MGB-2GTLB20	2.5G SFP Transceiver (Single mode WDM, TX:1550nm RX:1310nm, DDM, -40~85 degrees C) - 20km
MGB-2GSR	2.5G SFP Transceiver (Multi-mode, 850nm, DDM, 0~70 degrees C) - 300m
MGB-2GLA20	2.5G SFP Transceiver (Single mode WDM, TX:1310nm RX:1550nm, DDM, 0~70 degrees C) - 20km
MGB-2GLB20	2.5G SFP Transceiver (Single mode WDM, TX:1550nm RX:1310nm, DDM, 0~70 degrees C) - 20km
MGB-2GLR20	2.5G SFP Transceiver (Single mode, 1310nm, DDM) - 20km
MGB-2GLR2	2.5G SFP Transceiver (Single mode, 1310nm, DDM) - 2km
MGB-2GTLR20	2.5G SFP Transceiver (Single mode, 1310nm, DDM, -40~85 degrees C) - 20km
MGB-2GTLR2	2.5G SFP Transceiver (Single mode, 1310nm, DDM, -40~85 degrees C) - 2km

Gigabit Ethernet Transceiver (1000BASE-X SFP)

MGB-GT	SFP-Port 1000BASE-T Module
MGB-LX	SFP-Port 1000BASE-LX mini-GBIC module - 20km
MGB-SX	SFP-Port 1000BASE-SX mini-GBIC module - 550m
MGB-SX2	SFP-Port 1000BASE-SX mini-GBIC module - 2km
MGB-L40	SFP-Port 1000BASE-LX mini-GBIC module - 40km
MGB-L80	SFP-Port 1000BASE-LX mini-GBIC module - 80km
MGB-L120	SFP-Port 1000BASE-LX mini-GBIC module - 120km
MGB-LA10	SFP-Port 1000BASE-BX (WDM, TX:1310nm) mini-GBIC module - 10km
MGB-LB10	SFP-Port 1000BASE-BX (WDM, TX:1550nm) mini-GBIC module - 10km
MGB-LA20	SFP-Port 1000BASE-BX (WDM, TX:1310nm) mini-GBIC module - 20km
MGB-LB20	SFP-Port 1000BASE-BX (WDM, TX:1550nm) mini-GBIC module - 20km
MGB-LA40	SFP-Port 1000BASE-BX (WDM, TX:1310nm) mini-GBIC module - 40km
MGB-LB40	SFP-Port 1000BASE-BX (WDM, TX:1550nm) mini-GBIC module - 40km
MGB-LA80	SFP-Port 1000BASE-BX (WDM, TX:1490nm) mini-GBIC module - 80km
MGB-LB80	SFP-Port 1000BASE-BX (WDM, TX:1550nm) mini-GBIC module - 80km

Gigabit Ethernet Transceiver (100BASE-X SFP)

MFB-FX	SFP-Port 100BASE-FX Transceiver (1310nm) -2km
MFB-F20	SFP-Port 100BASE-FX Transceiver (1310nm) - 20km
MFB-FA20	SFP-Port 100BASE-BX Transceiver (WDM,TX:1310nm) -20km
MFB-FB20	SFP-Port 100BASE-BX Transceiver (WDM,TX:1550nm) -20km
MFB-F40	SFP-Port 100BASE-FX Transceiver (1310nm) - 40KM
MFB-F60	SFP-Port 100BASE-FX Transceiver (1310nm) - 60KM
MFB-F120	SFP-Port 100BASE -FX Transceiver (1550nm) - 120km

XGS-6311 Series