

# Ethernet Aggregation switches MES33xx

## Description

MES33xx series switches can be used in service provider networks as aggregation or transport switches. They have a great margin of performance due to universal interfaces operating at speeds of 10Gbps or 1Gbps.

The features list of MES aggregation switches includes advanced L2 functions, static and dynamic routing, four 10 Gbps (SFP+) interfaces, stacking up to 8 devices and hotswappable redundant power supplies.

- Bandwidth up to 128 Gbps
- L2+ switch
- Front-to-Back cooling
- Stacking up to 8 devices
- Hot-swappable redundant power supplies
- Duplicate cooling system



MES3324F-AC

## Technical features

	MES3308F	MES3316F	MES3324F	MES3324
Packet processor	Marvel 98DX3336-A1 (PonCat3)			
1000BASE-X (SFP)	4	12	20	-
10/100/1000BASE-T	-	-	-	20
10/100/1000BASE-T/ 1000BASE-X (SFP) Combo	4	4	4	4
10GBASE-R (SFP+)/1000BASE-X (SFP)	4	4	4	4
10/100/1000BASE-T (OOB)	1			
Console port	RS-232/RJ-45			
Bandwidth	96 Gps	112 Gps	128 Gps	
Throughput for 64 bytes	71 MPPS	83 MPPS	95 MPPS	
Buffer memory	12 Mb			
RAM (DDR3)	512 MB			
ROM (RAW NAND)	512 MB			
VLAN table	4K			
MAC table	16K			
Quality of Service (QoS)	Traffic prioritization, 8 egress queues per port			
TCAM	For traffic processing: 3K x 24 B For routing: 13K			
L2 Multicast groups	4K			
ARP table <sup>1</sup>	4K			
Link Aggregation Groups (LAG)	16, up to 8 ports per LAG			
Jumbo frames size	10240 bytes			
Stacking	8 devices			
Max.power consumption	25 W	35 W	45 W	35 W
Cooling	Front-to-Back, 2 fans	Front-to-Back, 3 fans	Front-to-Back, 4 fans	Front-to-Back, 4 fans
Environmental parameters	Operating temperature from -10 to +45 C Storage temperature from -40 to +70 C Operating humidity - 80% max			
Dimesions	430 x 275 x 44 mm			
Weight	3.15 kg	3.25 kg	3.50 kg	3.25 kg
Power	AC power: 220 V+-20%, 50 Hz DC power: 36 ÷ 72V 2 Hot-swappable power supplies			

<sup>1</sup> For each host in the ARP table, an entry is created in the routing table

## Features and capabilities

### Interfaces functions

- Head-of-line blocking (HOL) prevention
- Back Pressure
- Auto MDI/MDIX
- Jumbo Frames
- Flow control (IEEE 802.3X)
- Port Mirroring
- Stacking

### MAC table functions

- Independent learning mode per VLAN
- MAC Multicast Support
- Configurable aging time of MAC addresses
- Static MAC Entries
- MAC Flapping logging

### VLAN functions

- Voice VLAN
- IEEE 802.1Q
- Q-in-Q
- Selective Q-in-Q
- GVRP

### L2 Multicast functions

- Multicast profiles
- Static Multicast groups
- IGMP Snooping v1,2,3
- Port/host-based IGMP Snooping Fast Leave
- IGMP proxy-report
- IGMP authorization via RADIUS
- MLD Snooping v1,2
- IGMP Querier
- MVR

### L2 functions

- STP (Spanning Tree Protocol, IEEE 802.1d)
- RSTP (Rapid Spanning Tree Protocol, IEEE 802.1w)
- MSTP (Multiple Spanning Tree Protocol, IEEE802.1s)
- STP Multiprocess
- PVSTP+
- Spanning Tree Fast Link option
- EAPS<sup>1</sup>
- STP Root Guard
- STP Loop Guard
- BPDU Filtering
- STP BPDU Guard
- VLAN-based Loopback Detection (LBD)
- ERPS (G.8032v2)
- Private VLAN
- Layer 2 Protocol Tunneling

### L3 functions

- Static IP routes
- Dynamic routing protocols RIPv2, OSPFv2, OSPFv3
- Address Resolution Protocol (ARP)
- VRRP
- PIM SM, PIM DM, IGMP Proxy
- ECMP Load Balancing
- IP Unnumbered

### Link Aggregation functions

- Static LAG
- Dynamic LAG (LACP)
- LAG Balancing Algorithm

### Service functions

- Virtual Cable Testing (VCT)
- Optical transceiver diagnostics
- Green Ethernet

### Security functions

- DHCP Snooping
- DHCP Option 82
- IP Source Guard
- Dynamic ARP Inspection
- sFlow
- MAC-based authentication, Port Security, Static MAC entries
- Port-based authentication IEEE 802.1x
- Guest VLAN<sup>1</sup>
- DoS attack prevention
- Traffic segmentation
- Protection against non-authorized DHCP servers
- DHCP clients filtering
- BPDU attacks prevention
- NetBIOS/NetBEUI filtering
- PPPoE Intermediate Agent

### ACL (Access Control Lists)

- L2-L3-L4 ACL
- Time-Based ACL
- IPv6 ACL
- ACL based on:
  - Physical port number
  - IEEE 802.1p
  - VLAN ID
  - EtherType
  - DSCP
  - Protocol type
  - TCP/UDP port number
  - User Defined Bytes

### Quality of Service (QoS)

- QoS statistics
- Shaping, Policing
- IEEE 802.1p Class of Service (CoS)
- Storm Control
- Bandwidth management
- Scheduling algorithms: Strict Priority/Weighted Round Robin (WRR)
- Three marking colors
- ACL-based CoS/DSCP assignment
- ACL-based VLAN assignment
- Setting the IEEE 802.1p priority for management VLAN
- DSCP to CoS/CoS to DSCP remarking
- 802.1p, DSCP mark assignment for IGMP

### OAM

- IEEE 802.3ah Ethernet OAM
- Dying Gasp
- IEEE 802.1ag Connectivity Fault Management (CFM)<sup>1</sup>
- IEEE 802.3ah Unidirectional Link Detection (UDLD)

### IPv6 functions

- IPv6 Host
- Dual-stack

<sup>1</sup> Not supported in the current firmware version 4.0.10.1

### Main management functions

- Download and upload of configuration file via TFTP
- Redirecting the output of CLI commands to an arbitrary file on ROM
- SNMP
- Command Line Interface (CLI)
- Web interface
- Syslog
- SNTP (Simple Network Time Protocol)
- Traceroute
- LLDP (802.1ab) + LLDP MED
- Access control – privilege levels
- Management interface blocking
- Local authentication
- IP addresses filtering for SNMP
- RADIUS and TACACS+ (Terminal Access Controller Access Control System) clients
- SSH server
- SSL
- Macrocommands
- CLI commands logging
- System log
- DHCP autoprovision
- DHCP Relay (IPv4 support)
- DHCP Option 12
- Debugging commands
- Rate limit of traffic to CPU
- Password encryption
- Password recovery
- Ping (IPv4/IPv6 support)
- FTP server<sup>1</sup>
- DNS server

### Monitoring functions

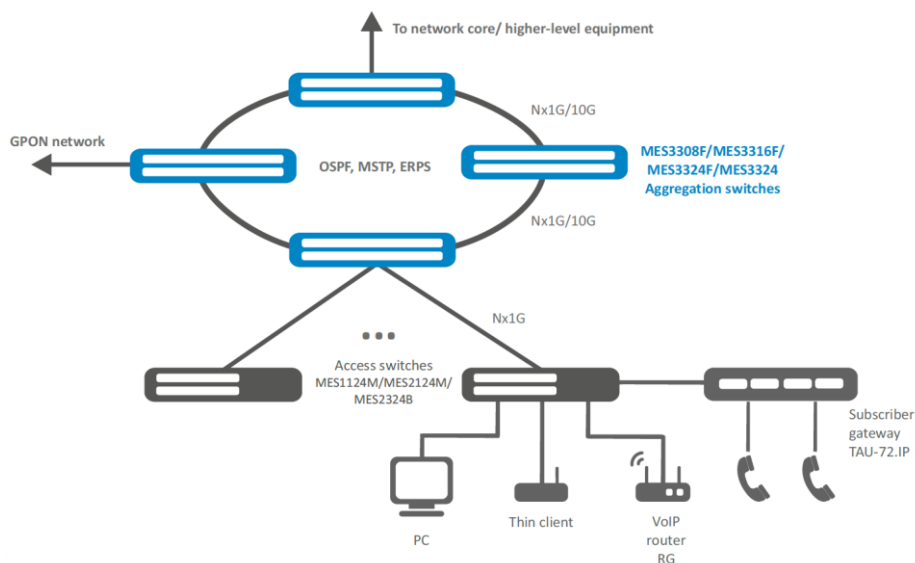
- Statistics on interfaces
- RMON/SMON
- CPU utilization monitoring per tasks and per traffic type
- RAM utilization monitoring
- Temperature monitoring
- TCAM utilization monitoring

### MIB/IETF







- RFC 1065, 1066, 1155, 1156, 2578 MIB Structure
- RFC 1212 Concise MIB Definitions
- RFC 1213 MIB II
- RFC 1215 MIB Traps Convention
- RFC 1493, 4188 Bridge MIB
- RFC 1157, 2571-2576 SNMP MIB
- RFC 1901-1908, 3418, 3636, 1442, 2578 SNMPv2 MIB
- RFC 271,1757, 2819 RMON MIB
- RFC 2465 IPv6 MIB
- RFC 2466 ICMPv6 MIB
- RFC 2737 Entity MIB
- RFC 4293 IPv6 SNMP Mgmt Interface MIB
- Private MIB
- RFC 3289 DIFFSERV MIB
- RFC 2021 RMONv2 MIB
- RFC 1398, 1643, 1650, 2358, 2665, 3635 Ether-like MIB
- RFC 2668 802.3 MAU MIB
- RFC 2674, 4363 802.1p MIB
- RFC 2233, 2863 IF MIB
- RFC 2618 RADIUS Authentication Client MIB
- RFC 4022 MIB for TCP
- RFC 4113 MIB for UDP
- RFC 3298 MIB for Diffserv
- RFC 2620 RADIUS Accounting Client MIB
- RFC 2925 Ping & Traceroute MIB
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMPv4
- RFC 2463, 4443 ICMPv6
- RFC 4884 Extended ICMP for Multi-Part messages support
- RFC 793 TCP
- RFC 2474, 3260 DS field in the IPv4 and IPv6 header
- RFC 1321, 2284, 2865, 3580, 3748 Extensible Authentication Protocol (EAP)
- RFC 2571, RFC2572, RFC2573, RFC2574 SNMP
- RFC 826 ARP

<sup>1</sup> Not supported in the current firmware version 4.0.7

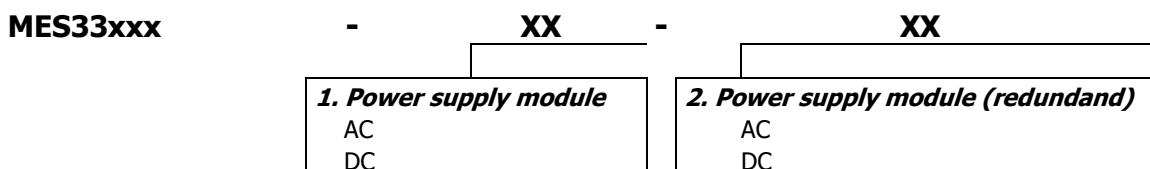
### Application diagram



## Ordering Information

Name	Description	Image
<b>MES3308F-XX<sup>1</sup>-XX<sup>2</sup></b>	<b>MES3308F</b> Ethernet switch, 4 ports of 1000BASE-X/100BASE-FX (SFP), 4 Combo ports of 10/100/1000BASE-T/1000BASE-X, 4 x 10GBASE-R(SFP+) ports, L2+	
<b>MES3316F-XX<sup>1</sup>-XX<sup>2</sup></b>	<b>MES3316F</b> Ethernet switch, 12 ports of 1000BASE-X/100BASE-FX (SFP), 4 Combo ports of 10/100/1000BASE-T/1000BASE-X, 4 ports of 10GBASE-R(SFP+), L2+	
<b>MES3324F-XX<sup>1</sup>-XX<sup>2</sup></b>	<b>MES3324F</b> Ethernet switch, 20 ports of 1000BASE-X/100BASE-FX (SFP), 4 Combo ports of 10/100/1000BASE-T/1000BASE-X, 4 ports of 10GBASE-R(SFP+), L2+	
<b>MES3324-XX<sup>1</sup>-XX<sup>2</sup></b>	<b>MES3324</b> Ethernet switch, 20 ports of 10/100/1000BASE-T, 4 Combo ports of 10/100/1000BASE-T/1000BASE-X, 4 ports of 10GBASE-R(SFP+), L2+	
<b>Related products</b>		
<b>PM160-220/12</b>	PM160-220/12 power module, 220V AC, 160W	
<b>PM100-48/12</b>	PM100-48/12 power module, 48V DC, 100W	
<b>Related software</b>		
<b>EMS-MES-3300</b>	EMS-MES-3300 option of EMS system for managing and monitoring of OPTOKON network elements: 1 MES-3300 network element.	

## Ordering Code



Note: The switch must be equipped at least with one power supply module

## Example of Orderig code

**MES3324-AC** The switch MES3324 with one power supply module PM160-220/12

**MES3324-DC** The switch MES3324 with one power supply module PM100-48/12

**MES3324-AC-AC** The switch MES3324 with two power supply modules PM160-220/12

**MES3324-AC-DC** The switch MES3324 with first power supply module PM160-220/12 and second power supply module PM100-48/12