

- Bandwidth up to 176 Gbps
- Non-blocking architecture
- Advanced L2 functions
- 4 ports of 10G in basic configuration
- L3 switch
- Multicast support (IGMP Snooping, MVR)
- Advanced security functions (L2-L4 ACL, IP Source Guard, Dynamic ARP Inspection, etc.)
- Hot-swappable redundant power supplies
- Dual ventilation system
- Front-to-back cooling
- Up to 8 devices in a stack



The new generation switches MES3400-48 can be used in service provider networks as aggregation or transport switches. They ensure high performance due to the interfaces operating at data rates of 10 Gbps or 1 Gbps. MES aggregation switches' feature set includes advanced L2 functions, static routing, dynamic routing, redundant and hot swappable power supplies.

The switches support physical stacking, Virtual Local Area Networks (VLAN), multicast groups and advanced security features.

#### Technical features

| Interfaces                           |                                                                                          |
|--------------------------------------|------------------------------------------------------------------------------------------|
| 10/100/1000BASE-T (RJ-45)            | 48                                                                                       |
| 1000BASE-X (SFP)/10GBASE-R (SFP+)    | 4                                                                                        |
| Console port RS-232 (RJ-45)          | 1                                                                                        |
| Performance                          |                                                                                          |
| Bandwidth                            | 176 Gbps                                                                                 |
| Throughput for 64 bytes <sup>1</sup> | 130.95 MPPS                                                                              |
| Buffer memory                        | 2 MB                                                                                     |
| RAM (DDR3)                           | 1 GB                                                                                     |
| ROM (SPI Flash)                      | 64 MB                                                                                    |
| MAC table                            | 32768                                                                                    |
| ARP table                            | 1000                                                                                     |
| VLAN table                           | 4094                                                                                     |
| L2 Multicast groups (IGMP Snooping)  | 4094                                                                                     |
| L3 Multicast groups (IGMP Proxy)     | 2048                                                                                     |
| SQinQ rules                          | 2048 (ingress <sup>2</sup> ), 1024 (egress)                                              |
| MAC ACL rules                        | 765                                                                                      |
| IPv4/IPv6 ACL rules                  | 640/320                                                                                  |
| L3 IPv4 Unicast routes               | 2048                                                                                     |
| L3 IPv6 Unicast routes               | 512                                                                                      |
| VRRP routes                          | 32                                                                                       |
| L3 interfaces                        | 20 VLANs, up to 5 IPv4 addresses in each VLAN, up to 512 IPv6 GUA in total for all VLANs |
| Link Aggregation Groups (LAG)        | 64 groups, up to 8 ports in one LAG                                                      |
| QoS                                  | 8 egress queues per port                                                                 |
| Jumbo frames                         | 12288 bytes                                                                              |
| Stacking                             | 64 groups, up to 8 ports in one LAG                                                      |

<sup>1</sup> Values are given for one way transmission.

<sup>2</sup> MAC-based VLAN and SQinQ share hardware resources.

## Features and capabilities

### Interface functions

- Head-of-line blocking (HOL) protection
- Auto MDI/MDIX
- Jumbo frames
- Flow control (IEEE 802.3X)
- Port Mirroring (SPAN, RSPAN)
- Stacking

### MAC table functions

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

### VLAN functions

- Voice VLAN
- IEEE 802.1Q
- Q-in-Q
- Selective Q-in-Q
- GVRP
- MAC-based VLAN
- Protocol-based VLAN

### L2 Multicast functions

- Multicast profiles
- Static Multicast groups
- IGMP Snooping v1,2,3
- IGMP Snooping fast-leave
- IGMP Proxy-report
- IGMP authorization via RADIUS
- 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, IEEE 802.1s)
- Rapid-PVST+
- STP Root Guard
- STP Loop Guard
- STP BPDU Guard
- BPDU Filtering
- Spanning Tree Fast Link option
- Loopback Detection (LBD)
- Port isolation
- Storm Control for different types of traffic (broadcast, multicast, unknown unicast)
- Layer 2 Protocol Tunneling (L2PT)
- ERPS (G.8032v2)

### L3 Multicast functions

- IGMP proxy (RFC 4605)
- IGMP proxy fast-leave

### L3 functions

- Static IPv4, IPv6 routes
- Dynamic routing protocols RIPv1/2, OSPFv2/3
- VRRP

### Link Aggregation functions

- LAG
- LACP
- LAG Balancing Algorithm

### Service functions

- Virtual Cable Testing (VCT)
- Optical Transceiver Diagnostics

### IPv6 support

- IPv6 Host
- IPv4, IPv6 Dual stack

### Security functions

- DHCP Snooping
- DHCP Option 82
- MAC-based authentication, MAC address limitation, Static MAC entries
- Port-based authentication IEEE 802.1x
- Guest VLAN
- DoS attack prevention
- Traffic segmentation
- DHCP clients filtering
- BPDU attacks prevention
- PPPoE Intermediate agent
- IP Source Guard
- Dynamic ARP Inspection
- DHCPv6 Snooping
- IPv6 Source Guard
- IPv6 ND Inspection
- IPv6 RA Guard

### ACL (Access Control Lists)

- L2-L3-L4 ACL (Access Control List)
- IPv6 ACL
- ACL based on:
  - Switch port
  - IEEE 802.1p
  - VLAN ID
  - EtherType
  - DSCP
  - IP Protocol type
  - TCP/UDP port number
  - User Defined Bytes

### QoS (Quality of Service)

- Shaping
- Policing according to sr-TCM and tr-TCM
- IEEE 802.1p Class of Service
- Scheduling algorithms: Strict Priority (SP)/Weighted Round Robin (WRR)
- Setting the IEEE 802.1p priority for VLAN management
- ACL-based traffic classification
- ACL-based CoS/DSCP assignment
- DSCP to CoS remarking
- CoS to DSCP remarking
- ACL-based VLAN assignment

## Features and capabilities (continued)

### OAM

- IEEE 802.3ah, Ethernet OAM
- IEEE 802.3ah Unidirectional Link Detection (UDLD)

### Time synchronization

- SNTP (Simple Network Time Protocol)

### Management functions

- Download and upload of configuration file via TFTP/SFTP
- Automatic backup of configuration file via TFTP/SFTP
- SNMP
- Command Line Interface (CLI)
- Web interface
- Syslog
- LLDP (IEEE 802.1ab) + LLDP MED
- Processing traffic management with two IEEE 802.1Q headers
- Authorization of entered commands using TACACS+ server
- IPv4/IPv6 ACL support for device management
- Access control — privilege levels
- Management interface blocking
- Local authentication
- IP addresses filtering for SNMP
- RADIUS, TACACS+ client
- Telnet server and client
- SSH server and client
- Macrocommands
- Logging of input commands via TACACS+
- DHCP autoconfiguration
- DHCP Relay (IPv4 support)
- DHCP Relay Option 82
- DHCP server
- Adding PPPoE Circuit-ID tag
- Flash File System
- Debugging commands
- Rate limit of traffic to CPU
- Password encryption
- Ping (IPv4/IPv6 support)
- Traceroute
- IPv4/IPv6 static routes
- Support for multiple versions of configuration file

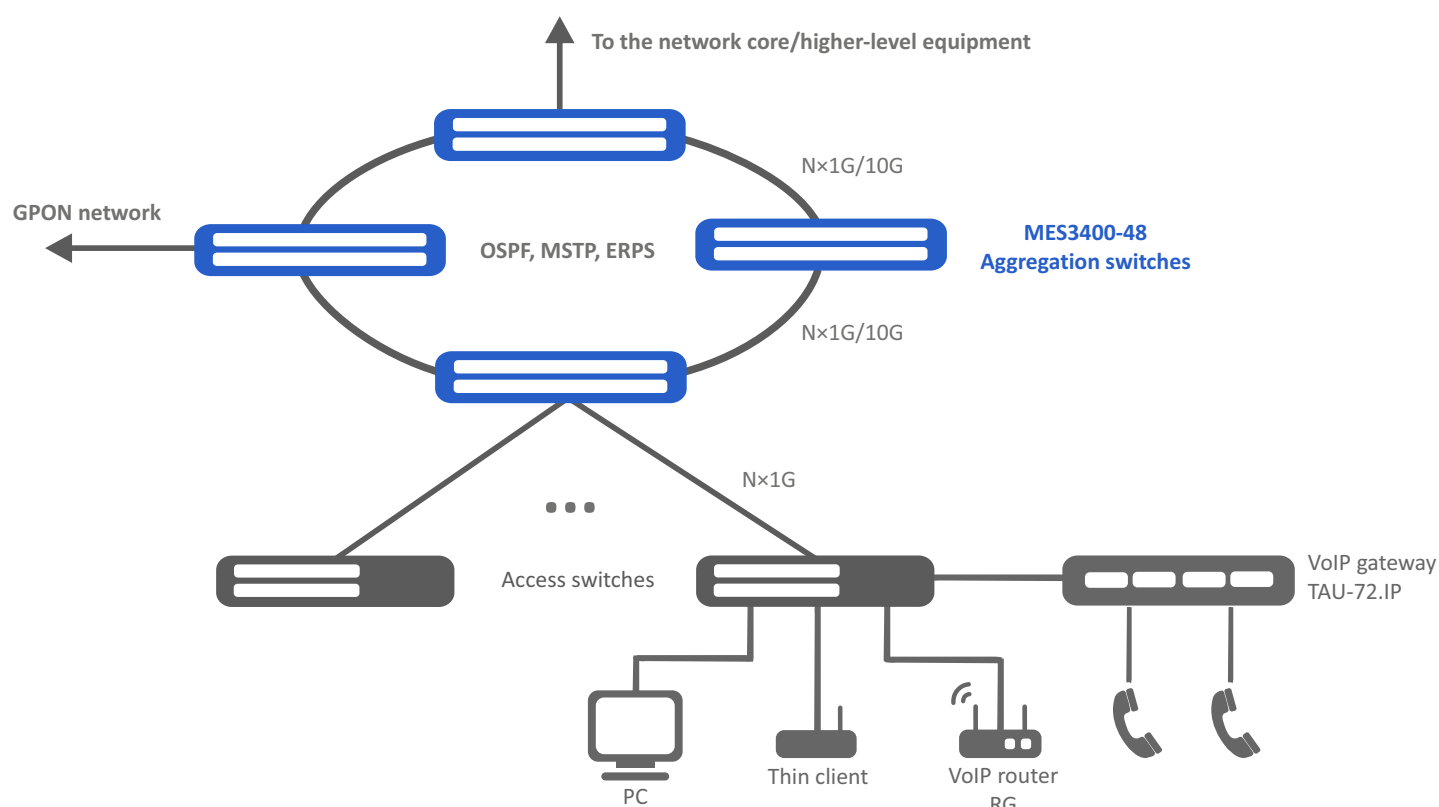
### Monitoring functions

- Statistics of interfaces
- CPU utilization monitoring per task and per traffic type
- RAM utilization monitoring
- Temperature monitoring
- TCAM 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 2465 IPv6 MIB
- RFC 2737 Entity MIB
- RFC 4293 IPv6 SNMP Mgmt Interface MIB
- Private 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 3289 MIB for Diffserv
- RFC 2620 RADIUS Accounting Client MIB
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMPv4
- RFC 2463, 4443 ICMPv6
- 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, RFC 2572, RFC 2573, RFC 2574 SNMP
- RFC 826 ARP
- RFC 854 Telnet
- IEC 61850

## Use Case



## Physical parameters

### Physical parameters and environmental features

|                                                    |                                                                                                                                                                                                                                                                      |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply                                       | 100–240 V AC, 47–63 Hz (for PM65-220/12 <sup>1</sup> , PM160-220/12, PM165-220/12;<br>36–72 V DC (for PM100-48/12)<br>Power supply options: <ul style="list-style-type: none"> <li>• 1 AC/DC power supply</li> <li>• 2 AC/DC hot-swappable power supplies</li> </ul> |
| Maximum power consumption                          | 52 W                                                                                                                                                                                                                                                                 |
| Heat dissipation                                   | 52 W                                                                                                                                                                                                                                                                 |
| Input current                                      | 0.6–0.3 A for AC<br>1.3–0.6 A for DC                                                                                                                                                                                                                                 |
| Hardware support for Dying Gasp                    | no                                                                                                                                                                                                                                                                   |
| Operating temperature                              | from -10 to +45 °C                                                                                                                                                                                                                                                   |
| Storage temperature                                | from -40 to +70 °C                                                                                                                                                                                                                                                   |
| Cooling                                            | active, Front-to-Back, 4 fans                                                                                                                                                                                                                                        |
| Maximum acoustic noise level from front/rear panel | 52.2 dB/54.2 dB                                                                                                                                                                                                                                                      |
| Operating humidity                                 | no more than 80 %                                                                                                                                                                                                                                                    |
| Form factor                                        | 19", 1U                                                                                                                                                                                                                                                              |
| Dimensions (W × H × D)                             | 440 × 44 × 330 mm                                                                                                                                                                                                                                                    |
| Weight                                             | 5.6 kg                                                                                                                                                                                                                                                               |

<sup>1</sup> For the PM65-220/12 power module, it is permissible to use a DC power source with a voltage range of 120–370 V DC.

## Ordering information

| Name                   | Description                                                                                                                     |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>MES3400-48</b>      | MES3400-48 Ethernet aggregation switch, 48 ports of 10/100/1000BASE-T (RJ-45), 4 ports of 1000BASE-X (SFP)/10GBASE-R (SFP+), L3 |
| Related products       |                                                                                                                                 |
| <b>PM160-220/12</b>    | PM160-220/12 power module, 100–240 V AC, 160 W                                                                                  |
| <b>PM100-48/12</b>     | PM100-48/12 power module, 36–72 V DC, 100 W                                                                                     |
| <b>PM65-220/12</b>     | PM65-220/12 power module, 100–240 V AC, 65 W                                                                                    |
| <b>PM165-220/12</b>    | PM165-220/12 power module, 100–240 V AC, 165 W                                                                                  |
| Related software       |                                                                                                                                 |
| <b>ECCM-MES3400-48</b> | ECCM-MES3400-48 option of Eltex ECCM control system to manage and monitor Eltex network elements: 1 network element MES3400-48  |

## Contact us

## About Eltex



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**Eltex** Enterprise is a leading Russian developer and manufacturer of communication equipment with 30 years of history. Complete solutions and their seamless integrability into the Customer's infrastructure are the priority growth areas of the company.