– **Reliable and high-performance solution**
– **Support for MPLS**
– **Redundant PSU**

ME5000 is a series of high-performance routers with high port density designed to be used in telecommunication carrier networks centers as distribution, network edge, transport routers of IP/MPLS network core. The device can be used to build high-performance switching and routing nodes with a high level of reliability due to the use of redundancy functions, automatic switching and restoring of network connectivity. The device can be used on the networks of large telecommunication carriers.

The router is part of the ME series and is unified with other models in terms of software, network functions, and management interfaces. The ME5000 supports a wide range of switching, routing, and redundancy mechanisms: MPLS Layer3 VPN, VPLS in Kompella and Martini modes, VPWS with pseudowire backup, Multicast traffic routing with support for PIM-SM/PIM-SSM/MSDP/Anycast PIM/NG-MVPN protocols.

The device supports various traffic prioritization and quality of service processing schemes, allowing it to be used as an edge router for interfacing operator networks.

Modular design of ME5000 ensures scaling and creating of hardware configuration that meets various performance requirements, types and composition of network interfaces.

The router modules are installed in 19" 15U chassis. The chassis has 2 slots for installing management and switching modules and 12 slots for installing line cards.

The fault tolerance of the device is ensured by redundant PSU (the chassis has two DC -48V power inputs and a distributed power supply circuit) and the use of replaceable ventilation modules. All replaceable modules, including management and switching modules, line cards and ventilation modules are hot-swappable.

Modules specifications

Name	Ports	Performance	Power consumption
Routing and management modules			
FMC16	Routing and management module. RAM – up to 16 GB Interfaces: 2 × 1GbE RJ-45 management ports RS-232 (RJ-45) console port 1 × USB 2.0 port	1.4 Tbps	Up to 200 W
Line modules			
LC18XGE	10 GE interface module. Interfaces: 18 × 10Gbps (SFP+)	180 Gbps, 350 Mpps	Up to 200 W
LC20XGE	10 GE interface module. Interfaces: 20 × 10Gbps (SFP+)	200 Gbps, 720 Mpps	Up to 250 W
LC8XLGE	40 GE/100 GE interface module. Interfaces: 4 × 40GE (QSFP) + 4 × 100GE/40GE (QSFP28)	560 Gbps, 720 Mpps	Up to 250 W
ME5000-FB	Fan module	–	Up to 400 W

Technical features

Performance	
Switching performance management and switching module	1.4 Tbps
Switched fabric maximum performance	Up to 2.8 Tbps with two FMC16 modules
Maximum bandwidth per slot	Up to 138 Gbps with one FMC16 module Up to 276 Gbps with two FMC16 modules Line modules provide data processing at wirespeed with packets size not less than 256 bytes Slots 0 and 11 have the bandwidth of 46 Gbps with one FMC16 installed or 92 Gbps with two FMC16 modules
Line modules performance	Data processing at wirespeed with packets size not less than 256 bytes
Packet queues	96k per line module
FIB capacity	Up to 1M IPv4 routes or 512K IPv6 with LC18XGE modules Up to 2M IPv4 routes or 1.3M IPv6[1] with LC20XGE and LC8XLGE modules (actual FIB capacity depends on prefix length) Resource is shared with ARP and IPv6 ND cache tables
MAC table capacity	Up to 262144 per line module for LC18XGE Up to 750000 per line module for LC20XGE, LC8XLGE Resource is shared with MPLS switching tables and single-hop BFD session elements
RIB capacity	Up to 5.9M IPv4 routes Up to 4M IPv6 routes Defined by free RAM capacity
L3 subinterfaces	Up to 16k per device Up to 4k per line module for LC18XGE Up to 8k per line module for LC20XGE and LC8XLGE
MPLS VPN connections (L2/L3 service tunnels)	Up to 12k per device (with LC18XGE modules) Up to 16k per device (with only LC20XGE and LC8XLGE modules) Resource is shared with L3VPN/ARP interfaces
MPLS LSP (transport tunnels) number	Up to 6k per line module with LC18XGE Up to 16k per line module with only LC8XGE/LC20XGE
ARP entries	Up to 20k with LC18XGE Up to 57k with LC8XGE/LC20XGE
VRF (MPLS L3VPN) number	Up to 1000 (or up to 128 with BGP process instances running in each of the VRF)
Design	
Chassis composition	Up to 2 routing and management modules Up to 12 line interface modules
Modules position	Vertical
Redundancy	Routing and management modules redundancy Two power inputs, distributed power supply with “1+1" redundancy Fans modules redundancy

[1] In future firmware versions, the capacity will be increased to 4M/2.7M.

Features and capabilities[1]

Interfaces functions
– LAG and LACP
– Tunnel interfaces with IP-GRE and IP-IP support
– IP unnumbered, Proxy ARP
– Layer3 interfaces in bridge-domain (Bridge-domain Virtual Interfaces, BVI)
– Equal load balancing in group
– Multi-chassis LAG
– BFDoverLAG, single connection failure detection (RFC 7130)
– SPAN, RSPAN traffic mirroring, including ACL-based
– SyncE[2]
– QSFP-breakout with 4×10G and 4×25G partitioning
– Combining 4×10G interfaces into single 40G interface

L2 protocols and functions
– Ethernet switching via bridge domains and cross-connections
– IEEE bridging (IEEE 802.1d)
– VLAN (IEEE 802.1q)
– Q-in-Q (IEEE 802.1ad) with push/pop/swap/replace
– Spanning Tree protocols (STP, RSTP, MSTP)
– DHCP Snooping for bridge domains
– LLDP
– EVPN/MPLS
– EVPN/VXLAN
– Ethernet ACL[2]

L3 protocols and functions
– IPv4, IPv6 Static Unicast Routing
– IS-IS
– IS-IS multi-instance
– IS-IS multi-topology
– OSPFv2, OSPFv3
– OSPFv2 and OSPFv3 multi-instance
– OSPF multi-area adjacency (RFC 5185)
– Border Gateway Protocol (BGP)
– BGP FlowSpec for IPv4/IPv6 unicast (control-plane and data-plane) and for VPNv4/VPNv6 (only control-plane)
– BGP Route Reflector, BDP Additional Path
– Routes filtering (routemap, prefix-list)
– Policy-based routing (PBR)
– BFD support for routing protocols and static routes
– FastReroute/Loop Free Alternate for OSPF/IS-IS
– VRRP (version 3), DHCP relay agent, DHCPv4/DHCPv6 server
– IPv4 ACL (access control lists) for transit traffic
– IPv6 ACL (access control lists) for transit traffic[2]
– ECMP load balancing
– VRF
– Routing between VRF (Inter-VRF routing)
– RIPv2, RIPng

Multicast management
– PIM-SM, PIM-SSM, Anycast RP
– IGMP v2/v3, SSM mapping
– MSDP
– MulticastVPN over mLDP
– MulticastVPN over RSVP-TE P2MP LSP
– VRF-lite technology support for all protocols (PIM/IGMP/MSDP)
– BGP IPv4 multicast for PIM RPF

MPLS functions
– Label Distribution Protocol (LDP)
– LDP FRR
– mLDP
– LDP authentication (Md5)
– RSVP-TE: automatic tunneling with a given bandwidth requirement, semi-automatic tunneling with indication of intermediate nodes
– RSVP-TE authentication
– RSVP-TE FRR (detour, facility)
– RSVP-TE end-to-end protection
– RSVP-TE autobandwidth
– BGP IPv4 multicast for PIM RPF
– Multiprotocol extensions for BGP-4
– BGP labeled unicast
– MPLS pseudowire with PW backup
– MPLS FAT PW (flow-aware transport)
– MPLS L2VPN
  – VPWS
  – VPLS LDP signalling (”Martini”)
  – VPLS BGP autodiscovery/signalling (”Kompella”)
  – VPLS BGP autodiscovery + LDP signalling
  – L2VPN Inter-AS option B, option C
– MPLS L3VPN
  – L3VPN for AFI/SAFI vpnv4 unicast and vpnv6 unicast
  – BGP 6VPE
  – L3VPN Inter-AS option A, option B, option C
  – Label assignment in label-per-vrf mode
– LSP ping and LSP traceroute
– LDPoRSVP
– Carrier Supporting Carrier (CsC)

Quality of Service (QoS)
– Ingress policing, egress policing/shaping
– Strict Priority (SP) and Deficit weighted round-robin (DWRR) queue scheduling algorithms
– Up to 8 queues per interface, including up to 3 SP queues
– QoS queue counters
– Hierarchical QoS (HQoS)
– Queue limit and burst size setting
– Traffic classification based 802.1p, MPLS TC, IP DSCP fields with the ability to remark the corresponding fields
– ACL-based marking and QoS processing, ACL policing
– Storm Control

Management and monitoring
– Command Line Interface (CLI), SSH, Telnet for remote management
– SNMPv1/v2c/v3 for device status monitoring
– NETCONF protocol
– Statistic data export (Netflow v9, v5, IPFIX)[3]
– Configuration backup and restore (local, FTP, SFTP, TFTP)
– RADIUS, TACACS+ authentication and authorization, TACACS+ accounting
– Remote software change
– System parameters and resources monitoring

[1] The set of functions is for software version 3.9.1.
[2] Only for LC20XGE/LC8XLGE line modules.
[3] The statistics module on line cards with Netflow/IPFIX enabled is required.

Features and capabilities (continued)

Management and monitoring (continued)

– Syslog
– Clock synchronization, NTP, SNTP
– Control-plane filtering
– Limiting the rate of traffic interception on the CPU
– ELTEX IP SLA
– Device event-triggered script execution support (EEM, embedded event manager)

Reliability functions

– Management modules redundancy; module fault detection time is 300 ms max
– Synchronization of FIB/ARP tables between management modules
– Graceful Restart for routing protocols
– Non-stop forwarding
– In-service Software Upgrade
– Storage of two firmware versions on the internal drive
– Ability to restore the previous firmware version during update

Physical parameters

Physical parameters and environmental features	
Cooling	Front-to-back air flow 2 hot-swappable fan modules
Power supply	Two inputs for 36–72 V DC
Maximum power consumption	4200 W
Operation temperature	From 0 to 45 °C
Storage temperature	From -40 to 70 °C
Weight	Chassis without LC/FMC – 46.7 kg FMC16 – 3.4 kg LC18XGE – 3.6 kg LC20XGE – 3.7 kg LC8XLGE – 3.9 kg
Dimensions (W × H × D)	487 × 661 × 495 mm

Ordering information

Name	Description
	Chassis
ME5000 chassis	Chassis of the ME5000 universal edge router. Bandwidth up to 6.1 Tbps (up to 276 Gbps per slot)
	Routing and management module
FMC16	FMC16 routing and management module. The amount of CPU RAM is up to 16 GB
	Line cards
LC18XGE	LC18XGE line card. Interfaces: 18 × 10 Gbps 10GBASE-R/1000BASE-X (SFP+)
LC18XGE-STAT	LC18XGE line card with the statistics collection module installed. Interfaces: 18 × 10 Gbps 10GBASE-R/1000BASE-X (SFP+)
LC20XGE	LC20XGE line card. Interfaces: 20 × 10 Gbps 10GBASE-R/1000BASE-X (SFP+)
LC20XGE-STAT	LC20XGE line card with statistics collection module installed. Interfaces: 20 × 10 Gbps 10GBASE-R/1000BASE-X (SFP+)
LC8XLGE	LC8XLGE line card. Interfaces: 4 × 40 Gbps (QSFP) + 4 × 40/100 Gbps (QSFP28)
LC8XLGE-STAT	LC8XLGE line card with statistics collection module installed. Interfaces: 4 × 40 Gbps (QSFP) + 4 × 40/100 Gbps (QSFP28)
	Other modules
ME5000-mFC2	ME5000-mFC2 fan module. Installation of two modules in the chassis is obligatory
ME5000-FP	Slot plug for installation in unused chassis slots. Obligatory for the correct operation of the chassis ventilation system

Contact us

+7 (383) 274 10 01
+7 (383) 274 48 48

eltex@eltex-co.ru

www.eltex-co.com

About Eltex

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.