ELTEX
Integrated Networking Solutions

– **Reliable and high performance solution**
– **Support for MPLS switching mechanisms**
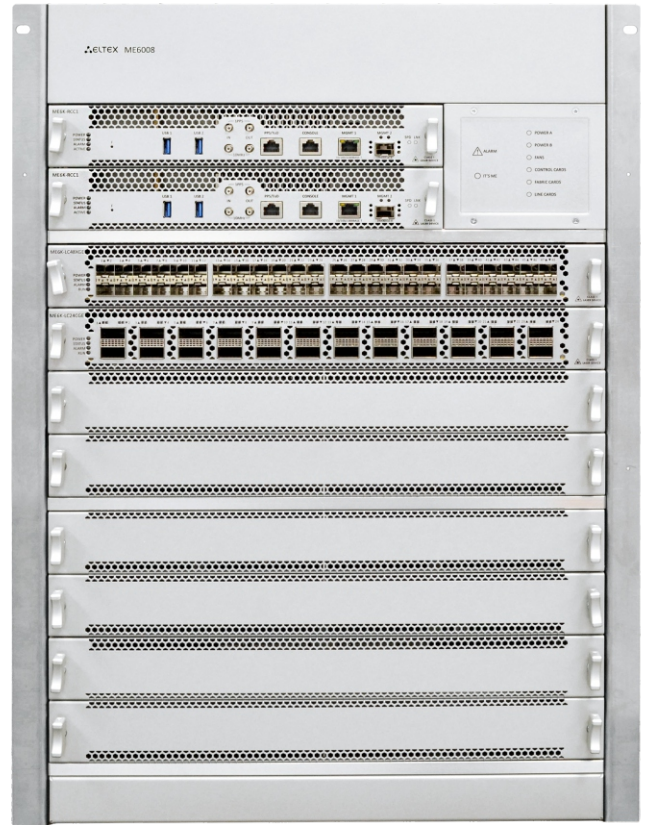– **Redundant hot-swappable modules**

ME6008 routers are multifunctional devices with a high port density intended for use in provider networks as aggregation and MPLS/network edge routers. This solution can be used to organize operator's points of presence when providing data services for large customers with high reliability requirements.

ME6008 routers support wide range of MPLS switching, routing, redundancy mechanisms: MPLS Layer3 VPN, VPLS (Kompella/Martini), VPWS with pseudowire backup capabilities, Multicast-traffic routing with support for PIM-SM/PIM-SSM/MSDP/Anycast PIM/NG-MVPN protocols, as well as extensive QoS capabilities. This set of functions allows using devices as network edge routers for termination of client services.

ME6008 modular architecture provides flexible scaling and the ability to create hardware configuration that meets various requirements both in terms of bandwidth and types of network interfaces.

The router modules are installed into standard 19" 15U eurorack. The chassis has 2 slots for routing and management modules (RCC), 4 slots for switch fabric (FC) modules, and 8 slots for line modules (LC).

Fault tolerance of the device is ensured by redundant power supply (the chassis is equipped with two -48V DC power inputs and distributed power supply diagram) and by redundant fan modules.

All redundant units including switch and management cards, line cards, and fan modules are hot-swappable.

Modules specification

Name	Ports	Performance	Power consumption
Routing and management modules			
ME6K-RCC1	Routing and management module Interfaces: 1GbE (RJ-45) management port 1GbE (SFP) management port RS-232 (RJ-45) console port PPS/ToD RS-232 (RJ-45) 1 PPS/10 MHz In/Out (SMB) 2 × USB 2.0	—	Up to 120 W
Switch fabric modules			
ME6K-FC96-8	Switch fabric module	4.8 Tbps	Up to 440 W
Line modules			
ME6K-LC48XGE	48 × 1/10/25 Gbps (SFP28)	1.2 Tbps 1000 Mpps	Up to 500 W (up to 650 W with ME6K-SM-STAT module)
ME6K-LC24CGE	24 × 40/100 Gbps (QSFP28)	2.4 Tbps 1000 Mpps	Up to 500 W (up to 650 W with ME6K-SM-STAT module)
Other modules			
ME6K-FAN	Fan module	—	Up to 350 W
ME6K-FAN-CNR	Ventilation panel controller	—	Up to 40 W

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Performance	
Maximum chassis switched fabric performance	Up to 19.2 Tbps with four ME6K-FC96-8 modules
Maximum bandwidth per slot	Up to 2.4 Tbps with four ME6K-FC96-8 modules Line modules provide data processing at wire speed with a packet size of at least 256 bytes

Design	
Chassis	Up to 2 routing and management modules Up to 4 switch fabric modules Up to 8 line modules
Modules position	Routing and management modules and line cards: horizontal (front access) Switch fabric modules: vertical (rear access)
Redundancy and reliability	Routing and management modules redundancy Switched fabric modules redundancy Software redundancy Distributed power supply diagram, two power inputs Fan modules redundancy

Features and capabilities[1]

Interfaces functions
– Static LAG, LACP
– Tunnel interfaces with IP-GRE and IP-IP support
– IP unnumbered interfaces, Proxy ARP functionality
– Layer 3 interfaces (Bridge-domain Virtual Interfaces, BVI)
– Equal load balancing in group
– Multi-chassis LAG
– BFD over LAG support, single connection failure detection (RFC 7130)
– SPAN, RSPAN traffic mirroring (including ACL-based one)

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

L3 protocols and functions
– IPv4, IPv6 Static Unicast Routing
– IS-IS protocol
– IS-IS multi-instance
– IS-IS multi-topology
– OSPFv2, OSPFv3
– OSPFv2, 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 (control-plane only)
– BGP Route Reflector, BGP Additional Path
– Route filtering (routemap, prefix-list)
– Policy-based routing, PBR
– BFD 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
– ECMP load balancing
– VRF

– Inter-VRF routing
– RIPv2 and RIPng protocols

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, including for all protocols (PIM/IGMP/MSDP)
– BGP IPv4 multicast for PIM RPF

MPLS funtions
– 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 auto-bandwidth
– 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-per-vrf
– LSP ping and LSP traceroute
– LDPoRSVP
– Carrier Supporting Carrier (CsC)

[1] *The device is under development, the list of features can be changed.*

Features and capabilities[1] (continued)

QoS

– Ingress policing, egress policing/shaping
– Strict priority (SP) and Deficit weighted round-robin (DWRR) queue scheduling algorithms
– Up to 8 queues per logical interface, including up to 3 SP queues
– QoS queue counters
– Configurable hierarchical QoS (HQoS)
– Queue limit and burst size setting
– Traffic classification based on the 802.1p, MPLS TC, IP DSCP fields with the ability to remark the corresponding fields
– QoS marking and handling based on access control lists (ACLs), ACL policing
– Storm Control

Management and monitoring

– Command Line Interface (CLI), SSH, Telnet for remote control
– SNMPv1/v2c/v3 for device status monitoring
– NETCONF protocol
– Configuration backup and restore (local, FTP, SFTP, TFTP)
– RADIUS, TACACS+ authentication and authorization, TACACS+ accounting
– Remote firmware change

– System parameters and resources monitoring
– Syslog
– Time Synchronization, NTP, SNTP protocols
– Control-plane filtering
– Ability to limit the speed of traffic interception on the CPU
– ELTEX IP SLA
– Embedded event manager (EEM)

Reliability functions

– Management module redundancy feature: max module fault detection time is 300 ms
– 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 specifications and environmental parameters	
Case ventilation	Front-to-back air flow 5 hot-swappable redundant fan modules
Power supply sources	Two 36–72 V power inputs
Maximum power consumption	9000 W
Operating temperature range	From 0 to 45 ˚C
Storage temperature	From -40 to 70 ˚C
Weight	Chassis assembly without RCC/FC/LC – 73.2 kg ME6K-RCC1 – 2.5 kg ME6K-FC96-1 – 6.8 kg ME6K-LC24CGE – 7 kg (7.4 kg with ME6K-SM-STAT module) ME6K-LC48XGE – 6.9 kg (7.3 kg with ME6K-SM-STAT module)
Dimensions (W × H × D)	Chassis – 486.4 × 665.5 × 883.9 mm ME6K-RCC1 – 304 × 50 × 252 mm ME6K-FC96-1 – 50 × 560 × 334.3 mm ME6K-LC24CGE – 430 × 50 × 388 mm ME6K-LC48XGE – 430 × 50 × 388 mm ME6K-FAN – 69 × 663.8 × 84.3 mm ME6K-FAN-CNR – 62 × 33.1 × 422.6 mm

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[1] *The device is under development, the list of features can be changed.*

Ordering information

Name	Description
Chassis	
ME6008 chassis	ME6008 universal edge router chassis equipped with fan modules and ventilation panel controller modules
Routing and management modules	
ME6K-RCC1	Routing and management module
Switch fabric modules	
ME6K-FC96-8	Switch fabric module for ME6008 chassis
Line and statistics modules	
ME6K-LC48XGE	Line module 48 × 1/10/25 Gbps (SFP28)
ME6K-LC24CGE	Line module 24 × 40/100 Gbps (QSFP28)
ME6K-SM-STAT	Statistics module
Other modules	
ME6K-FAN	Fan module
ME6K-FAN-CNR	Ventilation panel controller module