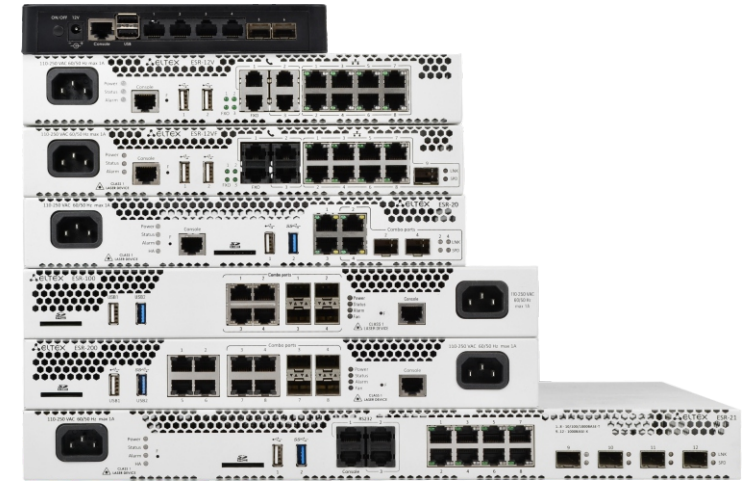


- Data routing
- Hardware acceleration of data processing
- Multiprotocol Label Switching (MPLS)
- Building a secure network (NAT, Firewall)
- Intrusion Detection and Prevention System (IDS/IPS)<sup>1</sup>
- Service Level Agreement (SLA)
- Filtering of network data by various criteria (including filtering by applications)
- Organization of secure network tunnels between company branches
- Remote connection of employees to an office
- Internet channel management and bandwidth allocation within an office using QoS
- Organization of backup connection (wired or via 3G/LTE modem)
- Subscriber termination and bandwidth limitation BRAS (IPoE)<sup>1</sup>



**ESR-10, ESR-12V(F), ESR-20, ESR-21, ESR-100 and ESR-200** are service routers designed for connection of small and middle-sized offices in enterprise networks. The firewall and router functions ensure security with various Internet connection options. The device supports advanced routing, WAN organization and network security functions.

The key elements of the series are hardware-accelerated data processing. Optimal distribution of data processing functions among the device parts maximizes performance.

- ESR-12V and ESR-12VF have FXS ports, which allows to install up to three analog telephone sets in the office and connect them to the corporate telephone network without using separate telephone gateways. The FXO port allows to reserve a telephone connection via analog line in case of lack of connection to the central PBX.
- ESR-20 and ESR-21 are versatile service routers designed in accordance with the requirements of the energy and oil and gas industries. A distinctive feature of the ESR-21 model is its additional RS-232 ports, which can be used to realize additional functions – remote console access to nearby equipment (AUX mode), connection of wired and GSM modems to the service router.
- ESR-100 and ESR-200 have 4 Combo ports of 10/100/1000BASE-X with the possibility of using transceivers for optical connection or RJ-45 for electrical. ESR-200 has 4 additional ports of 10/100/1000BASE-T.

<sup>1</sup> Activated by a license.

Technical features

	ESR-10	ESR-12V	ESR-12VF	ESR-20	ESR-21	ESR-100	ESR-200
<b>Interfaces</b>							
Combo 10/100/1000BASE-T/1000BASE-X SFP (LAN/WAN)	—	—	—	2	—	4	4
Ethernet 10/100/1000BASE-T (LAN/WAN)	4	8	8	2	8	—	4
Ethernet 1000BASE-X SFP (LAN/WAN)	2	—	1	—	4	—	—
Serial (RS-232)	—	—	—	—	3	—	—
Console RS-232 (RJ-45)	1	1	1	1	1	1	1
FXS	—	3	3	—	—	—	—
FXO	—	1	1	—	—	—	—
USB 2.0	2	2	2	1	1	1	1
USB 3.0	—	—	—	1	1	1	1
SD card slot	—	—	—	1	1	1	1

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Technical features (continued)

	ESR-10	ESR-12V	ESR-12VF	ESR-20	ESR-21	ESR-100	ESR-200
<b>Performance</b>							
Firewall routing (1518B frames)	987 Mbps; 81.2k pps	980 Mbps; 80.7k pps		3.73 Gbps; 307k pps	2.56 Gbps; 210k pps	1.34 Gbps; 107k pps	1.96 Gbps; 161k pps
Firewall routing (IMIX)	695.2 Mbps; 126k pps	635.8 Mbps; 115k pps		1.74 Gbps; 316k pps	1.35 Gbps; 245k pps	598.9 Mbps; 108k pps	902.4 Mbps; 164k pps
L2 switching (1518B frames)	978.8 Mbps; 80.6k pps	1.86 Gbps; 153k pps		13.87 Gbps; 1141k pps	13.93 Gbps; 1147k pps	–	–
IPsec VPN (1456B frames)*	207.8 Mbps; 17.7k pps	186.5 Mbps; 15.9k pps		504 Mbps; 43.2k pps	510.9 Mbps; 43.8k pps	259.1 Mbps; 25.1k pps	452.8 Mbps; 38.7k pps
IPsec (IMIX)*	131.7 Mbps; 23.5k pps	118.2 Mbps; 22.1k pps		290.3 Mbps; 54.2k pps	289.5 Mbps; 54.2k pps	167.1 Mbps; 31.5k pps	253.3 Mbps; 47.4k pps
1 IPsec tunnel (1456B frames)*	83.4 Mbps; 7.16k pps	74.9 Mbps; 6.43k pps		264.3 Mbps; 22.6k pps	264.5 Mbps; 22.6k pps	194.8 Mbps; 16.6k pps	294.6 Mbps; 25.2k pps
1 IPsec tunnel (IMIX)*	62.6 Mbps; 11.7k pps	56.2 Mbps; 10.5k pps		151.6 Mbps; 28.3k pps	149.8 Mbps; 28k pps	102.2 Mbps; 19k pps	153.4 Mbps; 28.6k pps
IPS/IDS 10k rules (IMIX)	102.1 Mbps; 18.2k pps	102.1 Mbps; 18.2k pps		349.2 Mbps; 63.1k pps	259 Mbps; 46.9 pps	89.35 Mbps; 16.2k pps	133.7 Mbps; 24.2k pps
MPLS L2VPN switching (IMIX)	723.4 Mbps; 132k pps	714.5 Mbps; 130k pps		2.09 Gbps; 382k pps	2.02 Gbps; 371k pps	856 Mbps; 154k pps	1.25 Gbps; 229k pps
MPLS L3VPN switching (IMIX)	510 Mbps; 93k pps	488.5 Mbps; 89.1k pps		1.15 Gbps; 211k pps	1.08 Gbps; 198k pps	479.1 Mbps; 85.6k pps	698.7 Mbps; 127k pps
Max simultaneous connections to RA L2TP server	80	80		270	310	170	210

For firmware version 1.34.

IMIX traffic format (number per second : size of each frame) - 8:74; 5:512; 7:1518.

\*Measured using the authentication algorithm MD5 and the encryption algorithm AES128.

Technical features (continued)

	ESR-10	ESR-12V	ESR-12VF	ESR-20	ESR-21	ESR-100	ESR-200
<b>Number of CPU by role</b>							
Control CPU <sup>1</sup>				0			
Balancing CPU <sup>2</sup>		–			3		
Service CPU <sup>3</sup>		0–1			1–2		
<b>Switching</b>							
Interfaces		bridge – 50 sub – 64 QinQ – 64			bridge – 250 sub – 1024 QinQ – 1024		
LLDP				interfaces port policies – 8 network policies – 64			
<b>Label switching</b>							
MPLS		LDP neighbors – 128 pseudowires – 128 pseudowire classes – 64 Ethernet over MPLS – 64			LDP neighbors – 1024 pseudowires – 1024 pseudowire classes – 64 Ethernet over MPLS – 256		
<b>System features</b>							
Static routes		1k			11k		
Maximum number of competitive sessions		440k		2.940M	2.940M	1.570M	2.250M
VLAN				up to 4k active VLANs in accordance with 802.1Q			
FIB size		1M			1.4M		
VRF				32			
PBR		instances – 10 rules for all instances – 50			instances – 50 rules for all instances – 512		

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<sup>1</sup> Processor core that runs the operating system and processes control-plane traffic.

<sup>2</sup> Separate core dedicated to balancing transit sessions between service CPUs.

<sup>3</sup> Cores that process data-plane.

Technical features (continued)

	ESR-10	ESR-12V	ESR-12VF	ESR-20	ESR-21	ESR-100	ESR-200
<b>Object-groups</b>							
Object-group network		instances – 50 ip prefixes in group – 1024 ip ranges in group – 1024			instances – 500 ip prefixes in group – 1024 ip ranges in group – 1024		
Object-group address:port		instances – 50 address:port in group – 8			instances – 500 address:port in group – 64		
Object-group service		instances – 50 ports ranges in group – 6			instances – 500 ports ranges in group – 64		
Object-group application		instances – 50 apps in group – 128			instances – 50 apps in group – 128		
Object-group content filter		instances – 50 categories per vendor – 500			instances – 64 categories per vendor – 500		
Object-group URL		instances – 31 plain URL in group – 32 regex URL in group – 32			instances – 31 plain URL in group – 32 regex URL in group – 32		
Object-group MAC		instances – 500 macs in group – 64			instances – 500 macs in group – 64		

Technical features (continued)

	ESR-10	ESR-12V	ESR-12VF	ESR-20	ESR-21	ESR-100	ESR-200
<b>Routing</b>							
BGP		instances – 64 networks in instance – 12 neighbors – 100 RIB – 1M			instances – 64 networks in instance – 128 neighbors – 1000 RIB – 2,5M		
OSPF(v3)		instance, neighbors in interface – 6 summaries in instance – 10 areas – 25 networks in area – 6 virtual links – 128 RIB – 30k			instance, neighbors in interface – 64 summaries in instance – 128 areas – 256 networks in area – 64 virtual links – 1024 RIB – 300k		
IS-IS		instances, circuits – 6 RIB – 30k			instances, circuits – 64 RIB – 300k		
RIP(ng)		neighbors – 16 summaries – 8 networks – 12 RIB – 1k			neighbors – 16 summaries – 8 networks – 128 RIB – 10k		
<b>QoS</b>							
QoS limitations		class-maps – 50 policy-maps – 25 classes in policy-map – 76			class-maps – 256 policy-maps – 256 classes in policy-map – 768		
<b>Tunneling</b>							
Configured VPN tunnels		IPIP – 10 GRE – 10 Ethernet over GRE – 10 GRE SUB – 10 SoftGRE – 500 L2TPv3 – 10 LT – 128 IPsec VTI – 64			IPIP – 250 GRE – 250 Ethernet over GRE – 250 GRE SUB – 250 SoftGRE – 500 L2TPv3 – 250 LT – 128 IPsec VTI – 256		IPIP – 250 GRE – 250 Ethernet over GRE – 250 GRE SUB – 250 SoftGRE – 500 L2TPv3 – 250 LT – 128 IPsec VTI – 256
Configured IPsec VPN tunnels		64			64		256

For firmware version 1.34.

Technical features (continued)

	ESR-10	ESR-12V	ESR-12VF	ESR-20	ESR-21	ESR-100	ESR-200
<b>Remote access</b>							
Remote Access				L2TP tunnels (client) – 10 PPTP tunnels (client) – 10 OpenVPN tunnels (client) – 10 OpenVPN remote addresses per tunnel – 8 OpenVPN concurrent users – 64			
WireGuard tunnel, RA		instance – 16 peers per instance 16 local addresses – 1 addresses per peer (address-range & obj-group) – 10k		instance – 16 peers per instance 64 local addresses – 1 addresses per peer (address-range & obj-group) – 10k			
<b>Services</b>							
Source NAT		ruleset – 20 rules in ruleset – 100 pool – 20		ruleset – 512 rules in ruleset – 512 pool – 512			
Destination NAT		ruleset – 20 rules in ruleset – 100 pool – 20		ruleset – 512 rules in ruleset – 512 pool – 512			
DHCP Server		pools – 20 (ESR-1X), 100 (ESR-2X, ESR-100, ESR-200) pool size – 10k static address in pool – 128 (ESR-1X), 1024 (ESR-2X, ESR-100, ESR-200)					
<b>Security</b>							
ACL		instances – 153 rules – 153		instances – 1533 rules – 1533			
Firewall		zone – 12 zone-pair – 48 rules – 1024		zone – 128 zone-pair – 512 rules – 10k			
IPS		user update servers – 32 ips-categories – 20 rules – 500					

For firmware version 1.34.

Technical features (continued)

IKE (v1/v2), IPsec (esp/eh)	
Authentication	md5, sha1, sha2-256, sha2-384, sha2-512
Encryption	des, blowfish128, aes128, camellia128, aes128ctr (IKEv2 only), blowfish192, aes192, camellia192, 3des, aes192ctr (IKEv2 only), blowfish256, aes256, camellia256, aes256ctr (IKEv2 only)
Diffie Hellman	Regular Groups: 1, 2, 5, 14-18. Modulo Prime Groups with Prime Order Subgroup: 22-24. NIST Elliptic Curve Groups: 19-21, 25-26. Brainpool Elliptic Curve Groups: 27-30. Elliptic Curve 25519: 31
VoIP <sup>1</sup>	
Dial rules	5
Call groups	5
Pickup groups	1
SIP profiles	5
SIP Proxy	5
SIP Proxy registrations	4

For firmware version 1.34.

<sup>1</sup> For ESR-12V/12VF.

## Features and capabilities

### Switching

- Up to 4094 VLAN (802.1Q)
- Voice-VLAN
- Q-in-Q (802.1ad)
- MAC-based VLAN
- Bridge domain
- LAG/LACP (802.3ad)
- Port-security, protected port
- Jumbo frames

### MPLS

- LDP
- L2VPN VPWS
- L2VPN VPLS Martini Mode, Kompella Mode
- L3VPN MP-BGP (Option A, B, C)
- L2VPN/L3VPN over GRE, DMVPN
- Transparent transmission of service protocols

### Routing

#### **BGP:**

- IPv4, IPv6, VPNv4, L2VPN, IPv4 label-unicast, Flow-spec
- Support for Conditional Advertisement, Route Aggregation and Local-AS mechanisms
- Support for peer-group, dynamic neighbor, as-range and Route-reflector
- Fall over based on BFD protocol and Fast Error Peer Detection
- Graceful restart
- Authentication
- Flexible redistribution from/to BGP process of other protocol routes
- Running up to 64 processes simultaneously
- ECMP
- Support for policy-based routing

#### **OSPF(v3):**

- Normal, Stub, Totally stub, NSSA, Totally NSS
- Broadcast, NBMA, Point-to-point, Point-to-multipoint non-broadcast
- Summarizing and filtering of route information
- Authentication
- ECMP
- Passive interface
- Flexible redistribution from/to OSPF process of other protocol routes
- Running up to 64 processes simultaneously
- Support for BFD protocol
- Auto cost calculation
- Support for policy-based routing

#### **IS-IS:**

- Broadcast, Point-to-point
- Setting the L1-/L2-levels neighboring
- Metric style: narrow, wide, transition
- Authentication
- Routing information filtering
- Flexible redistribution from/to the IS-IS process of other protocol routes
- Running up to 64 processes simultaneously
- Support for policy-based routing

#### **RIP(ng):**

- Broadcast, Multicast, Unicast modes (RIP only)
- Summarizing and filtering of route information
- Route metrics management
- Authentication
- Passive interface
- Flexible redistribution from/to the RIP process of other protocol routes
- Support for policy-based routing

#### **Static:**

- Support for BFD protocol
- Recursive search
- Route metrics management
- Selecting the option to notify the sender when traffic is blocked

#### **Quality of Service (QoS)**

- Up to 8 priority or weighted queues per port
- L2 and L3 traffic prioritization (802.1p (CoS), DSCP, IP Precedence (ToS))
- Hierarchical QoS
- Management of RED, GRED, SFQ, CBQ, WFQ, WRR queues
- Inlet and outlet labeling
- Policing, shaping

## Features and capabilities (continued)

### IPsec

- Policy-based and route-based modes
- Tunnel and transport modes
- Pre-shared key, public key, xauth (ikev1 only), eap (ikev2)
- Support for mobike (ikev2 only)
- Support for ike ikering authentication key sets

### Remote Access

- Remote access to the corporate network via PPTP, L2TP over IPsec, OpenVPN, WireGuard
- Support for PPPoE-/PPTP-/L2TP client
- User authentication
- Connection encryption

### Security

- ACL based on L2-/L3-/ L4 fields
- Zone-based Firewall in stateful and stateless modes. Rule triggering logging, counters
- Filtering by applications
- Protection against DoS/DDoS/Spoof attacks and their logging
- Intrusion detection and prevention system (IDS/IPS) and its logging<sup>1</sup>
- Signature analysis via IPS in transit and mirrored traffic analysis modes<sup>1</sup>
- Interaction with Eltex Distribution Manager to obtain licensed content - rule sets provided by Kaspersky SafeStream II<sup>2</sup>

### Management and monitoring

- Support for standard and extended SNMP MIB, RMONv1
- Zabbix agent/proxy

- User authentication using local database via RADIUS, TACACS+, LDAP
- Protection against configuration errors, automatic configuration recovery
- CLI
- Syslog
- System resource usage monitoring
- Ping, monitor, traceroute (IPv4/IPv6), output packet information in console
- Firmware upgrade, configuration upload and download via TFTP, SCP, FTP, SFTP, HTTP(S)
- Support for NTP
- Netflow v5/v9/v10 (exporting of URL statistics for HTTP, host for HTTPS)
- Remote management, Telnet, SSH (IPv4/IPv6)
- LLDP, LLDP MED
- Local and remote saving of router configurations

### SLA

- SLA-responder for Cisco-SLA-agent
- Eltex SLA
  - Delay (one-way/double-way)
  - Jitter (forward/backward)
  - Packet loss (forward/backward/duplex)
  - Duplicate packet detection
  - Packet delivery sequence violation detection (forward/backward/duplex)

### Backup and clustering

- VRRP v2, v3
- Tracking based on VRRP or SLA test
- VRRP v2, v3
- Tracking based on VRRP or SLA test

- VRRP parameter management
- PBR parameter management
- Administrative interface status management
- Static route activation and deactivation
- Managing AS-PATH and preference attribute in route-map
- DHCP failover for IP addresses base backup issued by the DHCP server
- Firewall failover for Firewall and NAT session backup
- MultiWAN
- Dual-Homing

### Fault-tolerant cluster:

- Easy administration and integration: synchronization of configurations, time, versions, licenses; Zero Touch Provisioning (ZTP)
- Backup all connections in the cluster
- Router backup ("1+1" backup is supported in the current version)

For firmware version 1.34.

<sup>1</sup> Activated by a license.

<sup>2</sup> Rule sets are provided by subscription. The minimum subscription period is 1 year.

## Features and capabilities (continued)

### Services

- DHCP client, service
- DHCP Relay Option 82
- DNS resolver
- NTP
- TFTP server
- E1/multilink, modems

### VoIP<sup>1</sup>

- Support for SIP protocol
- Internal connection switching
- Operation without SIP server
- Flexible dial plan
- Configuration profiles for ports
- Applying settings without rebooting
- Voice codecs
  - G.711 a-law,  $\mu$ -law
  - G.723.1
  - G.729 (A/B)
- Fax transmission
  - T.38 UDP Real-Time Fax
  - a-law,  $\mu$ -law G.711 pass-through
- Voice standards
  - VAD (Voice Activity Detection)
  - CNG (Comfort Noise Generation)
  - AEC (echo cancellation, G.165, G.168 recommendations)
- DTMF
  - DTMF signal detection and generation
  - Transmission via INBAND, RFC 2833, SIP INFO

### – Value Added Services

- Call Hold
- Call Transfer
- Call Waiting
- Call Forward on Busy (CFB)
- Call Forward on No Reply (CFNR)
- Call Forward Unconditional (CFU)
- Caller ID
- Calling line identification restriction (CLIR)
- Hotline/Warmline
- Call Group
- 3-Way conference

### BRAS<sup>2</sup>

- User termination
- URL whitelists/blacklists
- Quoting by traffic volume, by session time, by network applications
- HTTP/HTTPS Proxy
- HTTP/HTTPS Redirect
- Netflow
- AAA, PCRF
- Bandwidth management by office, SSID and user sessions
- User authentication by MAC or IP address

### DMVPN

- NHRP
- DMVPN phase 1,2,3
- Per-Tunnel QoS
- IPsec

### Tunnelling

- IPoGRE, EoGRE
- IPIP
- L2TPv3
- LT (inter VRF routing)

For firmware version 1.34.

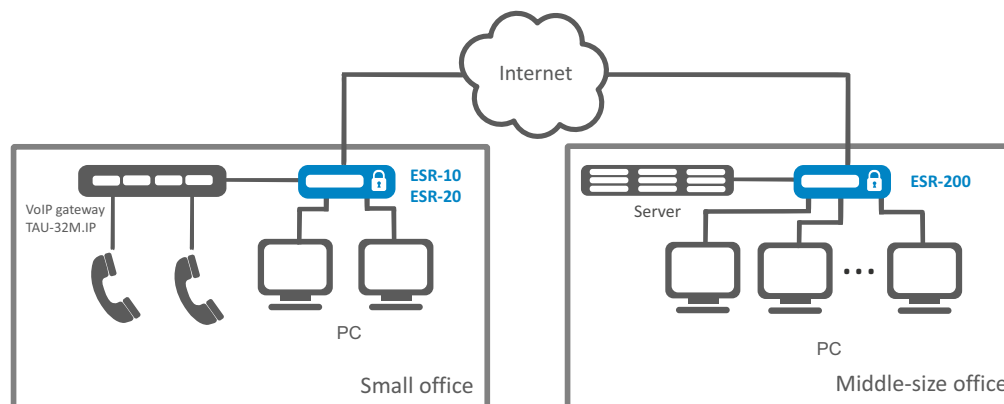
<sup>1</sup> For ESR-12V/12VF.

<sup>2</sup> Activated by a license.

## Physical parameters

	ESR-10	ESR-12V	ESR-12VF	ESR-20	ESR-21	ESR-100	ESR-200
<b>Physical specifications and environmental parameters</b>							
RAM	1 GB DDR3			4 GB DDR4		4 GB DDR3	
Flash	512 MB NAND Flash			8 GB eMMC		1 GB NAND Flash	
Maximum power consumption	9 W	22 W	22 W	25 W	32 W	22 W	35 W
Power supply	230 V AC (12 V, 1.5 A power adapter)	100–264 V AC, 50–60 Hz	100–264 V AC, 50–60 Hz	100–264 V AC, 50–60 Hz	100–264 V AC, 50–60 Hz	100–264 V AC, 50–60 Hz	100–264 V AC, 50–60 Hz
Operating temperature	from 0 to +40 °C	from 0 to +40 °C	from 0 to +40 °C	from -10 to +45 °C	from -10 to +45 °C	from -10 to +45 °C	from -10 to +45 °C
Storage temperature	from -40 to +70 °C						
Operating humidity	no more than 80 %						
Storage humidity	from 10 to 95 %						
Dimensions (W × H × D)	185 × 32 × 118 mm	267 × 43.6 × 160.5 mm	267 × 43.6 × 160.5 mm	267 × 44 × 212 mm	430 × 44 × 225 mm	310 × 44 × 240 mm	310 × 44 × 240 mm
Weight	0.28 kg	1.23 kg	1.23 kg	2 kg	3.13 kg	2.5 kg	2.5 kg
Service life	no less than 15 years						

## Use case



## Ordering information

Name	Description
ESR-10	ESR-10 service router, 4 × Ethernet 10/100/1000BASE-T (RJ-45), 2 × 1000BASE-X (SFP), 1 × Console RS-232 (RJ-45), 2 × USB 2.0, 1 GB DDR3 RAM, 512 MB NAND-Flash, 12 V DC (230 V AC via 12 V, 1.5 A power adapter).
ESR-12V	ESR-12V service router, 8 × Ethernet 10/100/1000BASE-T (RJ-45), 1 × Console RS-232 (RJ-45), 2 × USB 2.0, 3 × FXS, 1 × FXO, 1 GB DDR3 RAM, 512 MB NAND-Flash, 100–264 V AC.
ESR-12VF	ESR-12VF service router, 8 × Ethernet 10/100/1000BASE-T (RJ-45), 1 × 1000BASE-X (SFP), 1 × Console RS-232 (RJ-45), 2 × USB 2.0, 3 × FXS, 1 × FXO, 1 GB DDR3 RAM, 512 MB NAND-Flash, 100–264 V AC.
ESR-20	ESR-20 service router, 2 × Ethernet 10/100/1000BASE-T (RJ-45), 2 × Combo 10/100/1000BASE-T/1000BASE-X (SFP), 1 × Console RS-232 (RJ-45), 1 × USB 2.0, 1 × USB 3.0, 1 × SD card slot, 4 GB DDR4 RAM, 8 GB eMMC, 100–264 V AC.
ESR-21	ESR-21 service router, 8 × Ethernet 10/100/1000BASE-T (RJ-45), 4 × 1000BASE-X (SFP), 1 × Console RS-232 (RJ-45), 1 × USB 2.0, 1 × USB 3.0, 1 × SD card slot, 3 × Serial RS-232, 4 GB DDR4 RAM, 8 GB eMMC, 100–264 V AC.
ESR-100	ESR-100 service router, 4 × Combo 10/100/1000BASE-T/1000BASE-X (SFP), 1 × Console RS-232 (RJ-45), 1 × USB 2.0, 1 × USB 3.0, 1 × SD card slot, 4 GB DDR3 RAM, 1 GB NAND-Flash, 100–264 V AC.
ESR-200	ESR-200 service router, 4 × Ethernet 10/100/1000BASE-T (RJ-45), 4 × Combo 10/100/1000BASE-T/1000BASE-X SFP, 1 × Console RS-232 (RJ-45), 1 × USB 2.0, 1 × USB 3.0, 1 × SD card slot, 4 GB DDR3 RAM, 1 GB NAND-Flash, 100–264 V AC.

## Related software

ESR-10	ECCM-ESR-10 option of Eltex ECCM management system for management and monitoring of Eltex network element: ESR-10
ESR-12V	ECCM-ESR-12V option of Eltex ECCM management system for management and monitoring of Eltex network element: ESR-12V
ESR-12VF	ECCM-ESR-12VF option of Eltex ECCM management system for management and monitoring of Eltex network element: ESR-12VF
ESR-20	ECCM-ESR-20 option of Eltex ECCM management system for management and monitoring of Eltex network element: ESR-20
ESR-21	ECCM-ESR-21 option of Eltex ECCM management system for management and monitoring of Eltex network element: ESR-21
ESR-100	ECCM-ESR-100 option of Eltex ECCM management system for management and monitoring of Eltex network element: ESR-100
ESR-200	ECCM-ESR-200 option of Eltex ECCM management system for management and monitoring of Eltex network element: ESR-200

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## 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.