



# ELTEXALATAU

Complete solutions for networking

## **ESR series routers**

**ESR-100, ESR-200, ESR-1000, ESR-1200**

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**Quick start and installation guide**

**Software version 1.2.0**

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## 1. ANNOTATION

This guide covers instruction of connection to power supply, factory device configuration and basic ESR series router configuration recommendations (hereafter referred to as the device).

The guide is destined for technical staff that performs installation, configuration and putting the device into operation.

## 2. DESIGN

The design of the devices is described in this section. The front, back, side panels' images are represented, and the connectors, light indicators and controls are described below.

The device enclosed in metal case available for 19" form-factor rack-mount, case height 1U.

### 2.1. ESR-1000, ESR-1200 design

#### ESR-1200 front panel

The front panel of ESR-1200 is represented in figure 2.1.

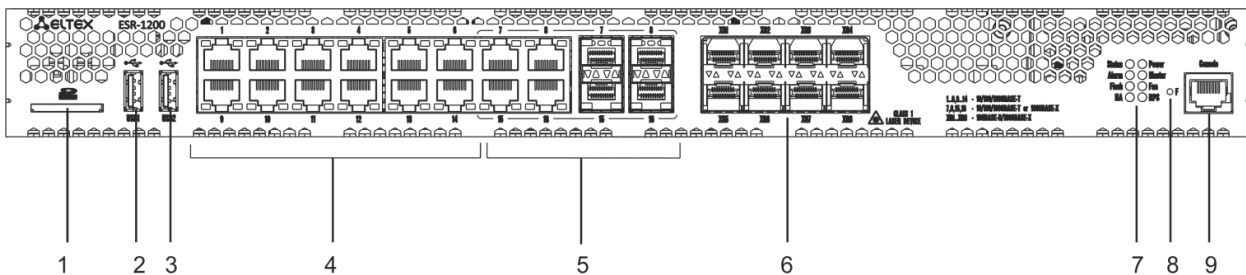


Figure 2.1 - Front panel of ESR-1200

The list of connectors, light indicators and controls that are located on the front panel of ESR-1200 are described in Table 2.1.

Table 2.1– Description of connectors, light indicators and controls located on the front panel of ESR-1200

№	Front panel element	Description
1	SD	SD-card connector.
2	USB1	USB-device port.
3	USB2	USB-device port.
4	[1 .. 12]	12 x Gigabit Ethernet 10/100/1000Base-T (RJ-45) ports.
5	Combo Ports	4 x Gigabit Ethernet 10/100/1000Base-X (SFP) ports.
6	XG1 - XG8	10G SFP+/ 1G SFP transceiver installation slots.
7	Status	Indicator of device's current state.
	Alarm	indicator of alarm existence and emergency level.
	HA	HA operation mode indicator.
	Flash	Activity indicator of exchange with data storages (SD-card or USB Flash).
	Power	Device power indicator.
9	Console	Console port.

	Master	Indicator of failover modes operation.
	Fan	Fan alarm indicator.
	RPS	Backup power source indicator.
8	F	Functional key that reboots the device and resets it to factory settings: <ul style="list-style-type: none"> <li>– Pressing the key for less than 10 seconds reboots the device;</li> <li>– Pressing the key for more than 10 seconds resets the terminal to factory settings.</li> </ul>
9	Console	Console port RS-232 for local management of the device.

## ESR-1000 front panel

The front panel of ESR-1000 is represented in Figure 2.2

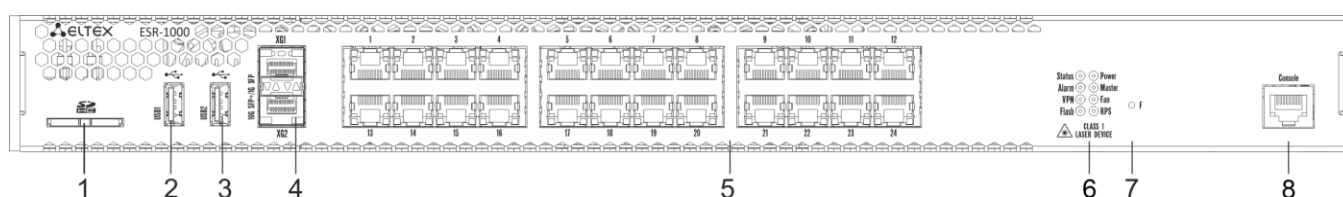


Figure 2.2– Front panel of ESR-1000

The list of connectors, light indicators and controls that are located on the front panel of ESR-1000 are described in Table 2.2

Table 2.2 – Description of connectors, light indicators and controls located on the front panel of ESR-1000

No	Front panel element	Description
1	SD	SD-card connector.
2	USB1	USB-device port.
3	USB2	USB-device port.
4	XG1, XG2	10G SFP+/ 1G SFP transceiver installation slots.
5	[1 .. 24]	24 Gigabit Ethernet 10/100/1000 Base-T (RJ-45) ports.
6	Status	Indicator of device's current state
	Alarm	Existence and emergency level indicator of the device.
	VPN	Existence indicator of active VPN-sessions
	Flash	Activity indicator of exchange with data storages (SD-card or USB Flash).
	Power	Device power indicator.
	Master	Operation indicator in failover-modes.
	Fan	Emergency indicator of fans.
	RPS	Reserve power supply indicator.
7	F	Functional key that reboots the device and resets it to factory settings: <ul style="list-style-type: none"> <li>– Pressing the key for less than 10 seconds reboots the device;</li> <li>– Pressing the key for more than 10 seconds resets the terminal to factory settings.</li> </ul>
8	Console	RS-232 console port for local device control.

## ESR-1000, ESR-1200<sup>1</sup> back panel

The back panel of ESR-1000/ESR-1200 is represented in figure 2.3<sup>1</sup>.

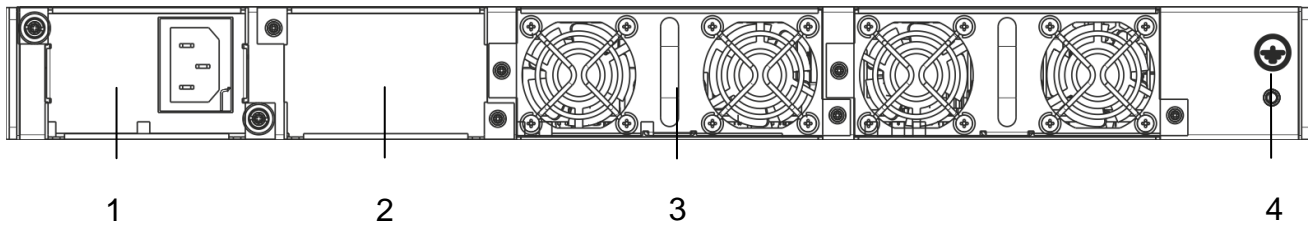


Figure 2.3 – Back panel of ESR-1000, ESR-1200

The list of connectors located on the back panel of ESR1000/1200 is described in Table 2.3.

Table 2.3 – Description of connectors located on back panel of ESR-1000, ESR-1200

No	Description
1	Primary power supply source.
2	Place for reserve power supply installation.
3	Removable ventilation modules with hot swapping.
4	Device earth bonding point.

## Side panel

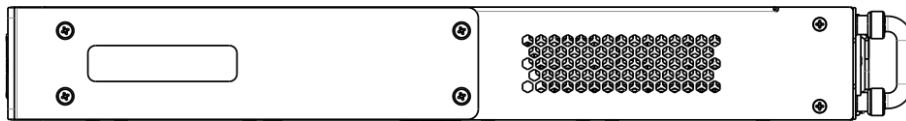


Figure 2.4 - ESR-1000, ESR-1200 right-side panel

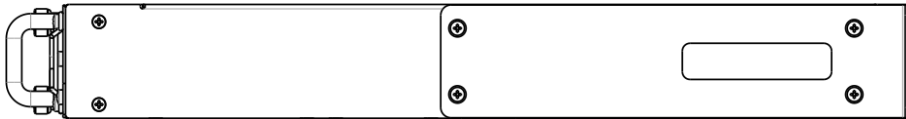


Figure 2.5 - ESR-1000, ESR-1200 left-side panel



**Side panels of the device have air vents for heat removal. Do not block air vents. This may cause components overheating which may result in terminal malfunction. You can find recommendations on the device installation in 'Installation and connection' section in user manual.**

<sup>1</sup> The picture shows router configuration with one AC power supply.

## 2.2. ESR-100 and ESR-200 designs

### ESR-100 front panel

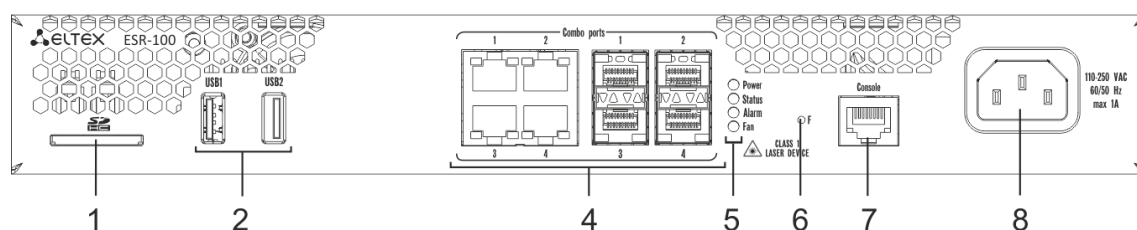


Figure 2.6 - Front panel of ESR-100

### ESR-200 front panel

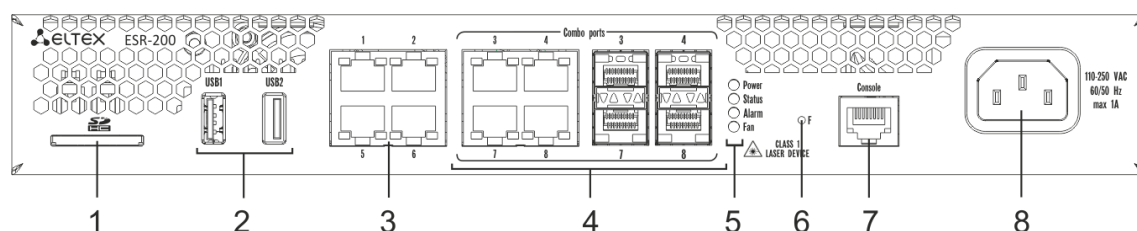


Figure 2.7 - Front panel of ESR-200

The list of connectors, light indicators and controls that are located on the front panel of ESR-100, ESR-200 are described in the Table 2.4.

Table 2.4 – Description of connectors, light indicators and controls located on the front panel of ESR-100, ESR-200

No	Front panel element	Description
1	SD	SD-card connector.
2	USB1, USB2	2 ports for USB-device connection.
3	[1 .. 4]	4 ports for Gigabit Ethernet 10/100/1000 Base-T (RJ-45).
4	Combo Ports	4 ports for Gigabit Ethernet 10/100/1000 Base-X (SFP).
5	Power	Device power indicator.
	Status	Currency device indictor.
	Alarm	Existence and emergency level indicator of the device.
	Fan	Emergency indicator of fans.
6	F	Functional key that reboots the device and resets it to factory settings: <ul style="list-style-type: none"> <li>– Pressing the key for less than 10 seconds reboots the device;</li> <li>– Pressing the key for more than 10 seconds resets the terminal to factory settings.</li> </ul>
7	Console	RS-232 console port for local device control.
8	110-250 VAC 60/50 Hz max 1A	Power supply.

## ESR-100 and ESR-200 back panels

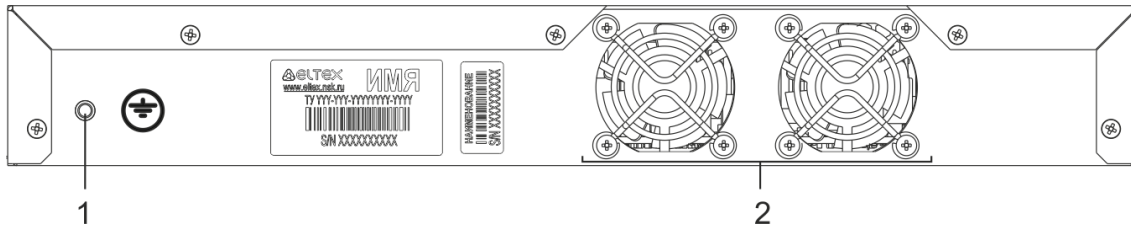


Figure 2.8 - Back panel of ESR-100, ESR-200

The list of connectors located on the back panel of ESR100/200 is described in Table 2.5

Table 2.5 – Description of connectors located on back panel of ESR-100, ESR-200

№	Description
1	Device earth bonding point.
2	Ventilation module.

## ESR-100 and ESR-200 side panels



Figure 2.9 - ESR-100 and ESR-200 right-side panels



Figure 2.10 - ESR-100 and ESR-200 left-side panels



## 2.3. Light indication

### ESR-1000 light indication

Metal interfaces state of GigabitEthernet is represented by two LED indicators: *LINK/ACT* - green and *SPEED* -amber:

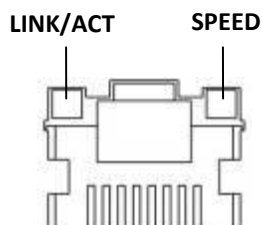


Figure 2.11 - RJ-45 socket appearance

SFP-interface status is represented by two RX/ACT and TX/ACT indicators:

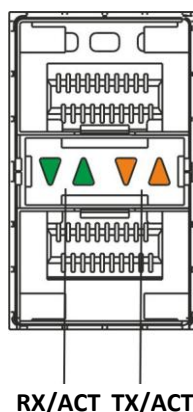


Figure 2.12 - Optical interfaces' indicators

Table 2.6 - Light state indication of metal interfaces and SFP- interfaces

SPEED indicator is lit	LINK/ACT indicator is lit	Ethernet interface state
Off	Off	Port is disabled or connection is not established
Off	Solid on	10Mbps or 100Mbps connection is established
Solid on	Solid on	1000Mbps connection is established
X	Flashes	Data transfer is in progress

Table 2.7 - SFP/SFP+ interfaces states light indication

Glowing of RX/ACT indicator	Glowing of TX/ACT indicator	Ethernet interface state
Off	Off	Port is disabled or connection is not established
Solid on	Solid on	Connection is established
Flashes	X	Receive data is in progress
X	Flashes	Data transfer is in progress

Table 2.8 - System indicator states

Indicator name	Indicator functions	Indicator state	Device state
<i>Status</i>	Currency device indicator.	Green	Device operates properly.
		Orange	Device is in the software loading state
<i>Alarm</i>	Existence and device emergency level indicator	-	-
<i>VPN</i>	Active VPN-session indicator.	-	-
<i>Flash</i>	Indicator of active exchange with data storages (SD-card or USB Flash).	Orange	Carrying out read/write operation by «copy» command
<i>Power</i>	Device power indicator.	Green	Device power supply is proper. Primary power supply, if it is installed, operates properly.
		Orange	Disability of primary power supply, primary network fault or default.
		Off	Fault of the device internal power supplies.
<i>Master</i>	Operation indicator in failover - modes.	-	-
<i>Fan</i>	Emergency indicator of fans	Off	All fans are operational.
		Red	One or more fans failed. The cause of emergency may be fault of even one fan (for example, stopping or under-frequency rotation).
<i>RPS</i>	Reserve power supply operation mode.	Green	Reserve power supply is installed and in normal operation.
		Off	Reserve power supply is not installed.
		Red	Reserve power supply is missing or failed

## ESR-100 and ESR-200 light indication

Metal interface states of GigabitEthernet and SFP-interfaces are represented by two LED indicators: *LINK/ACT* - green and *SPEED* - amber. Location of copper interfaces indicators is depicted in the Figure 2.11. Location of SFP interfaces indicators is depicted in the Figure 2.13. Description of light indication is represented in the Table 2.9.

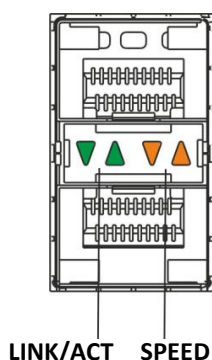


Figure 2.13 - Socket appearance with SFP-transceiver

Table 2.9 - Light state indication of metal interfaces and SFP- interfaces

SPEED indicator is lit	LINK/ACT indicator is lit	Ethernet interface status
Off	Off	Port is disabled or connection is not established
Off	Solid on	10Mbps or 100Mbps connection is established
Solid on	Solid on	1000Mbps connection is established
X	Flashes	Data transfer is in progress

Table 2.10 - System indicator states

Indicator names	Indicator functions	Indicator state	Device state
Status	Currency device indicator.	Green	Device operates properly.
		Orange	Device in software loading state.
Alarm	Existence and device emergency level indicator. <sup>1</sup>	-	-
Power	Device power indicator.	Green	Device power supply is proper. Primary power supply, if it is installed, operates properly.
		Orange	Disability of the primary power supply, primary network fault or default.
		Off	Breakdown of the device internal power supplies.
Fan	Emergency indicator of fans.	Off	All the ventilators are fault free.
		Red	Breakdown of one or more ventilators. The cause of the emergency can be disability at least one of the ventilator (for example, stopping or under-frequency rotation).

<sup>1</sup> It is not supported in the current software version.

### 3. CONNECTION TO POWER SUPPLY

1. Ground the case of the device prior to connecting it to the power supply. An insulated multiconductor wire should be used for earthing. The device grounding and the earthing wire cross-section should comply with Electric Installation Code (EIC).
2. If a PC or another device is supposed to be connected to the switch console port, the device should be also securely grounded.
3. Connect the power supply cable to the device. Depending on the delivery package, the device can be powered by AC or DC electrical network. To connect the device to AC power supply, use the cable from the delivery package. To connect the device to DC power supply, use the cable with cross-section not less than 1mm<sup>2</sup>.
4. Turn the device on and check the front panel LEDs to make sure the terminal is in normal operating conditions.

## 4. ROUTER FACTORY DEFAULT MODEL

Initially, factory configuration, that consist of the minimum necessary basic settings, is loaded to the device. Factory configuration allows you to use the router as a gateway with SNAT function without the need to apply extra settings. Factory configuration includes settings that allow getting network access to the device to make a extended configuration.

### Factory configuration description

For network connection configuration describes 2 buffer zones with «trusted» name for local network and «untrusted» name for public network (WAN).

All interfaces are separated between two buffer zones (safety area):

«**Untrusted**» area is destined for connection to Wide Area Networking (WAN). DHCP-protocol ports for getting of the dynamic IP-address from provider is opened in this area. All incoming connections from this area to the router are forbidden. The buffer zone includes the next interfaces:

**ESR-100/ESR-200:** GigabitEthernet1/0/1;

**ESR-1000/ESR-1200:** GigabitEthernet1/0/1, TengigabitEthernet1/0/1, TengigabitEthernet1/0/2.

Area interfaces are integrated into one L2 segment by *Bridge 2* network bridge.

«**Trusted**» area is destined for connection to Local Area Networking (LAN). Telnet and SSH protocol ports are opened in the area for remote access, ICMP-protocol port is opened for checking router availability and DHCP-protocol port to get IP-addresses by users from router. Outgoing connections from the area to outside area are permitted. The safety area includes the next interfaces:

**ESR-100:** GigabitEthernet1/0/2-4;

**ESR-200:** GigabitEthernet1/0/2-8;

**ESR-1000:** GigabitEthernet1/0/2-24;

**ESR-1200:** GigabitEthernet1/0/2-16, TengigabitEthernet1/0/3-8.

The area interfaces are integrated into one L2 segment by *Bridge1* network bridge.

DHCP-client for getting of dynamic IP-address from provider is turned on at the *Bridge 2* interface. Static IP-address 192.168.1.1/24. is configured at the *Bridge 1*. Created IP-interface is a gateway for Local Area Network users. 192.168.1.2-192.168.1.254 DHCP address pool with 255.255.255.0. mask is adjusted for Local Area Network users.

Source NAT Service is turned on at the router to get access by LAN users.

Settings of the safety area policy:

Table 4.1 - Settings of the safety area policy

Area of the transmitted traffic	Area of the received traffic	Traffic type	Action
trusted	untrusted	TCP, UDP, ICMP	enabled
trusted	trusted	TCP, UDP, ICMP	enabled
trusted	self	TCP/23(Telnet), TCP/22(SSH), ICMP, UDP/67(DHCP Server), UDP/123(NTP)	enabled
untrusted	self	UDP/68(DHCP Client)	enabled



User account with name '*admin*' and password '*password*' is created in the router configuration to provide configuring capability during the first router connection. It is strongly recommended to change administrator password in the case of the beginning router configuring.



192.168.1.1/24 -static IP-address at the *Bridge 1* interface is assigned in the case of the first connection in the configuration for network access to the router control.

## 5. ROUTER COMMAND LINE INTERFACE CONNECTION (CLI)

### 5.1. Ethernet local network connection



The router loads with the factory configuration during the first start. Factory configuration is described in chapter 4 of the document.

**Step 1.** Connect data transmission network cable (patch-cord) to any port of «*trusted*» area and to the computer assigned for management.

**Step 2.** DHCP-server with IP-address pool in **192.168.1.0/24** subnet is activated in the factory router configuration.

Network interface of control computer should get network address from server during the connection.

If IP-address is not received for any reason than you should manually set interface address by using any address in 192.168.1.0/24 subnet except 192.168.1.1.

### 5.2. Connection through RS-232 console port

**Step 1.** Connect «**Console**» port of the router to computer port by RJ-45/DB-9 cable that is included in the device delivery package.

**Step 2.** Run terminal program (for example, HyperTerminal or Minicom) and create new connection. You must use emulation mode of VT100 terminal.

Run the next RS-232 interface settings:

- Bit rate: 115200 bps;
- Data bit: 8 bit;
- Parity: No;
- Stop bits: 1;
- Flow control: No.

## 6. ROUTER BASIC SETTINGS

During the first connection, router settings procedure includes the next stages:

1. Changing of the user password («admin»).
2. New user creation.
3. Destination of the device name (Hostname).
4. Parameters settings of the connection to WAN in accordance with provider requirements.
5. Remote access settings to the router.
6. Basic settings application.



User «admin» with password «password» is created by default.

### 6.1. Administrator password reset

For secure system access you should reset password of superuser «admin». Username and password are required for login during the device administration sessions.

To reset user password «admin» the next commands are used:

```
esr-1000# configure
esr-1000(config)# username admin
esr-1000(config-user)# password <new-password>
esr-1000(config-user)# exit
```

### 6.2. New user creation

Use the following commands to create a new system user or configure the username, password, or privilege level:

```
esr-1000(config)# username <name>
esr-1000(config-user)# password <password>
esr-1000(config-user)# privilege <privilege>
esr-1000(config-user)# exit
```



**1-9 privilege levels allow access to the device and view its operational status, but deny its configuration. 10-14 privilege levels permit both access and adjustment of the most device functions. 15 privilege level allows both access and configuration of all the device functions.**

- Examples of command to create «fedor» user with «12345678» password and 15 privilege level and «ivan» user with «password» password and 1 privilege level:

```
esr-1000# configure
esr-1000(config)# username fedor
esr-1000(config-user)# password 12345678
esr-1000(config-user)# privilege 15
esr-1000(config-user)# exit
esr-1000(config)# username ivan
esr-1000(config-user)# password password
esr-1000(config-user)# privilege 1
esr-1000(config-user)# exit
```

### 6.3. Device name destination

The next commands are used to assign device name:

```
esr-1000# configure
esr-1000(config)# hostname <new-name>
```

After applying of the configuration, command prompt will be changed to value that is assigned by <new-name> parameter.

### 6.4. WAN parameters settings

You need to assign device parameters determined by a provider (IP-address, subnet mask and gateway address by default) to adjust router network interface in public network (WAN).

- Command examples of the Static IP-address configuring for subinterface **GigabitEthernet 1/0/2.150** to access the router through **VLAN 150**.

Interface parameters:

- Buffer zone – **untrusted**
- IP address – **192.168.16.144**;
- Subnet mask – **255.255.255.0**;
- Gateway IP-address by default – **192.168.16.1**.

```
esr-1000# configure
esr-1000(config)# interface gigabitethernet 1/0/2.150
esr-1000(config-subif)# security-zone untrusted
esr-1000(config-subif)# ip address 192.168.16.144/24
esr-1000(config-subif)# exit
esr-1000(config)# ip route 0.0.0.0/0 192.168.16.1
```

Enter the next command after applying of the configuration to check that the address was assigned to interface:

```
esr-1000# show ip interfaces
```

IP address	Interface	Type
192.168.16.144/24	gi1/0/2.50	static

Provider can use dynamically assigned addresses in network. DHCP-protocol can be used to get IP-address if DHCP-server is in network.

- Adjustment example assigned for getting of the dynamic IP-address from DHCP-server on the **GigabitEthernet 1/0/4** interface:

```
esr-1000# configure
esr-1000(config)# interface gigabitethernet 1/0/4
esr-1000(config-if)# ip address dhcp
esr-1000(config-if)# end
esr-1000# commit
esr-1000# confirm
```

Enter the next command after configuration applying to check that the address was assigned to interface:

```
esr-1000# show ip interfaces
```



IP address	Interface	Type
-----	-----	-----
192.168.11.5/25	gi1/0/4	DHCP

## 6.5. Router remote configuration

The default configuration has a remote access to the router via Telnet or SSH protocols from the **«trusted»** zones. To permit remote access from the other zone (for example, WAN) you need to create corresponding rules in Firewall.

Rules are created for couple zones when you configure the access to the router:

- **source-zone** – zone for realizing of the remote access;
- **self** – zone where router control interface is located.

Use the next command to create feeding rule:

```
esr-1000# configure
esr-1000 (config)# security zone-pair <source-zone> self
esr-1000 (config-zone-pair)# rule <number>
esr-1000 (config-zone-rule)# action permit
esr-1000 (config-zone-rule)# match protocol tcp
esr-1000 (config-zone-rule)# match source-address <network object-group>
esr-1000 (config-zone-rule)# match destination-address <network object-group>
esr-1000 (config-zone-rule)# match source-port any
esr-1000 (config-zone-rule)# match destination-port <service object-group>
esr-1000 (config-zone-rule)# enable
esr-1000 (config-zone-rule)# exit
esr-1000 (config-zone-pair)# exit
```

- Command examples to permit connection to the router with IP-address **40.13.1.22** by SSH-protocol for user from **«untrusted»** zone with IP-addresses: **132.16.0.5-132.16.0.10**

```
esr-1000# configure
esr-1000 (config)# object-group network clients
esr-1000 (config-object-group-network)# ip address-range 132.16.0.5-132.16.0.10
esr-1000 (config-object-group-network)# exit
esr-1000 (config)# object-group network gateway
esr-1000 (config-object-group-network)# ip address-range 40.13.1.22
esr-1000 (config-object-group-network)# exit
esr-1000 (config)# object-group service ssh
esr-1000 (config-object-group-service)# port-range 22
esr-1000 (config-object-group-service)# exit
esr-1000 (config)# security zone-pair untrusted self
esr-1000 (config-zone-pair)# rule 10
esr-1000 (config-zone-rule)# action permit
esr-1000 (config-zone-rule)# match protocol tcp
esr-1000 (config-zone-rule)# match source-address clients
esr-1000 (config-zone-rule)# match destination-address gateway
esr-1000 (config-zone-rule)# match source-port any
esr-1000 (config-zone-rule)# match destination-port ssh
esr-1000 (config-zone-rule)# enable
esr-1000 (config-zone-rule)# exit
esr-1000 (config-zone-pair)# exit
```

## 6.6. Basic setting application

Enter next commands from command interface root section to confirm router configuration changes.

```
esr-1000# commit  
esr-1000# confirm
```

If you used remote access to the device and network parameters of a control interface were changed than connection with the device could be lost after entering of **commit** command. Use new network parameters specified by configuration for connection to the device and enter **confirm** command.

If you couldn't enter **confirm** command then the device configuration returns back into the previous state (state before entering of the **commit** command) after the end of the acknowledgment timer.

## 6.7. Checking the adjustment

Try to get access to the website <http://eltex.nsk.ru> from the «**trusted**» zone for settings verification. If you got access it means traffic passes through a service router. If you didn't get access – check settings verification.

## TECHNICAL SUPPORT SERVICE

For technical assistance in issues related to handling of EltexAlatau Ltd. equipment please address to Service Centre of the company:

9 Ibragimova street, Almaty, Republic of Kazakhstan, 050032,

Phone:

+7(727) 320-18-40

+7(727) 320-18-38

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In official website of the EltexAlatau Ltd. you can find technical documentation and software for products, refer to knowledge base, consult with engineers of Service center:

<http://www.eltexalatau.kz/en>