

# USER GUIDE

## Router iRZ RUH3





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## 1. Introduction

### 1.1. Document description

This document is part of the “iRZ Router Instructions Package” and contains explanatory information only about the technical specifications of iRZ router and some examples of the settings. For more information please see section 1.2.

| Document version |                              | Issue date  |             |
|------------------|------------------------------|-------------|-------------|
| 1.03             |                              | 16.02.2016  |             |
| Prepared by      | D.S. Afanasiev, V.N. Golovin | Approved by | D.S. Pavlov |

### 1.2. Instructions packet overview

For comprehensive operating information, please read the full set of iRZ router documentation. The full documentation package is available in the "Support" section of the website [www.irz.net](http://www.irz.net).



### 1.3. Terms and abbreviations

**Router** - iRZ RUH3 Router;

**3G** – a general description of a set standards describing the work in UMTS and GSM networks: GPRS, EDGE, HSPA;

**Server** – this term can be used to mean:

- a server part of a software package used in a computing complex;
- roles of a component or an object in a structurally functional technical solution diagram being deployed using the router;
- a computer providing certain services (network services, data processing and storage, etc.);

**Technical solution** – an idea or a document describing a set of technical measures and/or activities to perform a specific task that requires functionality of components used in this solution, which are interconnected and interacting in a certain way;

**External IP address** – an Internet IP address assigned by an internet connection provider to customers for use on their equipment to ensure the possibility of a direct communication with customers' equipment via the Internet;

**Static external IP address** – an external IP address, which may not change in any circumstances (changing a customer's equipment type, etc. ) or events (reconnection to a network service provider, etc.); the only possibility to change a static IP address is by sending an application to the service provider;

**Authentication** – a procedure for authentication of a user/customer/node by comparing their details with the respective details of this user name/login in the database at the time of the connection;

**Router web-interface router** – a management tool built into the Router that provides a possibility to control and customize its functions, and to monitor the status of these functions;

**Remote device (remote site)** – a device, geographically remote from a particular place, or object/node.



## 2. Device information

### 2.1. Purpose

A router is a multidisciplinary radio-technical subscriber device that works in cellular GSM/UMTS networks. Router allows solving challenges of data transfer, reception, protection, and computer network support.

### 2.2. Communications standards

- HSPA (speed: data transfer - up to **5.76** Mbps, reception - up to **7.2** Mbps);
- EDGE;
- GPRS;
- USSD;
- SMS;
- Wi-Fi (optional, by using an external adapter).

### 2.3. Hardware specifications

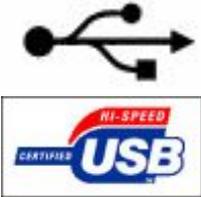
**Table 2.1:** Key features

| Тип                   | Feature                                    |
|-----------------------|--|
| Processor             | ARM920T                                    |
| Dynamic RAM           | 64 MB                                      |
| Flash memory capacity | 8 MB + possibility to expand to up to 2 GB |
| Ethernet connector    | 10/100Mbit, 100BASE-TX, MDI                |
| COM connector         | RS232 (TX, RX, GND)                        |
| Terminal connector    | 9GPIO, RS422, RS485                        |
| USB connector         | USB 1.1                                    |



## 2.4. Compliance with the standards

Table 2.2: Standards

| Standard   | Description  |
|--|--|
|   | <b>Ethernet (IEEE 802.x)*</b><br><br>The hardware that provides the router operation in Ethernet computer networks, designed in accordance with the recommendations of the international standard IEEE 802.  |
|   | <b>RS232 / RS422 / RS485 (EIA-232 / EIA-422 / EIA-485)*</b><br><br>The interface used in routers to transfer user data designed in accordance with the standard RS232 / RS485 recommended by the International Association of the Electronics Industry - EIA.  |
|  | <b>USB*</b><br><br>Universal Serial Bus interface (the current version - USB 1.1) designed primarily to connect a USB drive to the router. This allows to increase the volume of service information registered by the router during operation (the system log, <b>Status and log</b> → <b>System Log</b> ). It can also be used to enhance the router functionality by connecting to the USB port adapters USB-Ethernet, and USB-COM. |

\* radio-technical implementation of the Ethernet interfaces, RS232 / RS422 / RS485 and USB was implemented on the basis of Atmel micro controller (series 9200)



## 2.5. Physical Characteristics

**Table 2.3:** Physical Characteristics

| Type                                     | Feature  |
|--|--|
| Body dimensions (without connectors)     | maximum 162x110x37 mm. (LxWxH)   |
| Product dimensions (with the connectors) | maximum 162x119x37 mm. (LxWxH)   |
| Product weight                           | maximum 310 grams  |
| Working temperature range                | from -30°C to +65°C  |
| Storage temperature range                | from -40°C to +85°C  |
| Allowable humidity                       | the relative humidity should not exceed 80%, and the temperature should not exceed 25°C for the device to operate as designed. |

## 2.6. Storage and operating conditions

The device should be stored in a dry, humidity-proof place. A risk of the influence of static voltage (lightning, static electricity) must be eliminated.

The tamper-protection class corresponds to IP20 GOST 14254-96.

Allowable vibration:

The device can retain its mechanical properties under mechanical loads of the 15 level of hardness for sinusoidal vibration as per GOST 30631-99; the vibration frequency of 80 Hz should not be exceeded for the equipment operating in motion, installed on tractors, track machines and on water transport (speed boats, hydrofoil boats, etc.), and on technological equipment and ground transport.

Vibration insulation elements are not available.

## 2.7. Electrical characteristics

Power supply specifications:

- power supply voltage from 8 to 30 V (DC);
- maximum current consumption:
  - at the power voltage +12 V - 800mA;
  - at the power voltage +24 V - 400mA.

The maximum operating voltage is 35 V (DC)



## 2.8. GSM/3G Device Specifications

**Table 2.4:** Operating frequency bands of GSM/3G-module of the router

| Operation mode | Band(s), MHz      |
|----------------|-------------------|
| GPRS/EDGE      | 850/900/1800/1900 |
| HSPA (3G)      | 850/1900/2100     |

## 2.9. Safety rules

Restrictions on the use of the device near other electronic devices:

- Turn off the router in hospitals or when located near medical equipment (for example: pacemakers and hearing aids); interference with medical equipment may occur;
- The router off when on an airplane. Take measures against accidental turning on;
- Turn the router off in the vicinity of gas stations, chemical plants, and places where demolition work is conducted. May interfere with technical devices; at a close range, the router can produce interference for television sets and radio transmitters

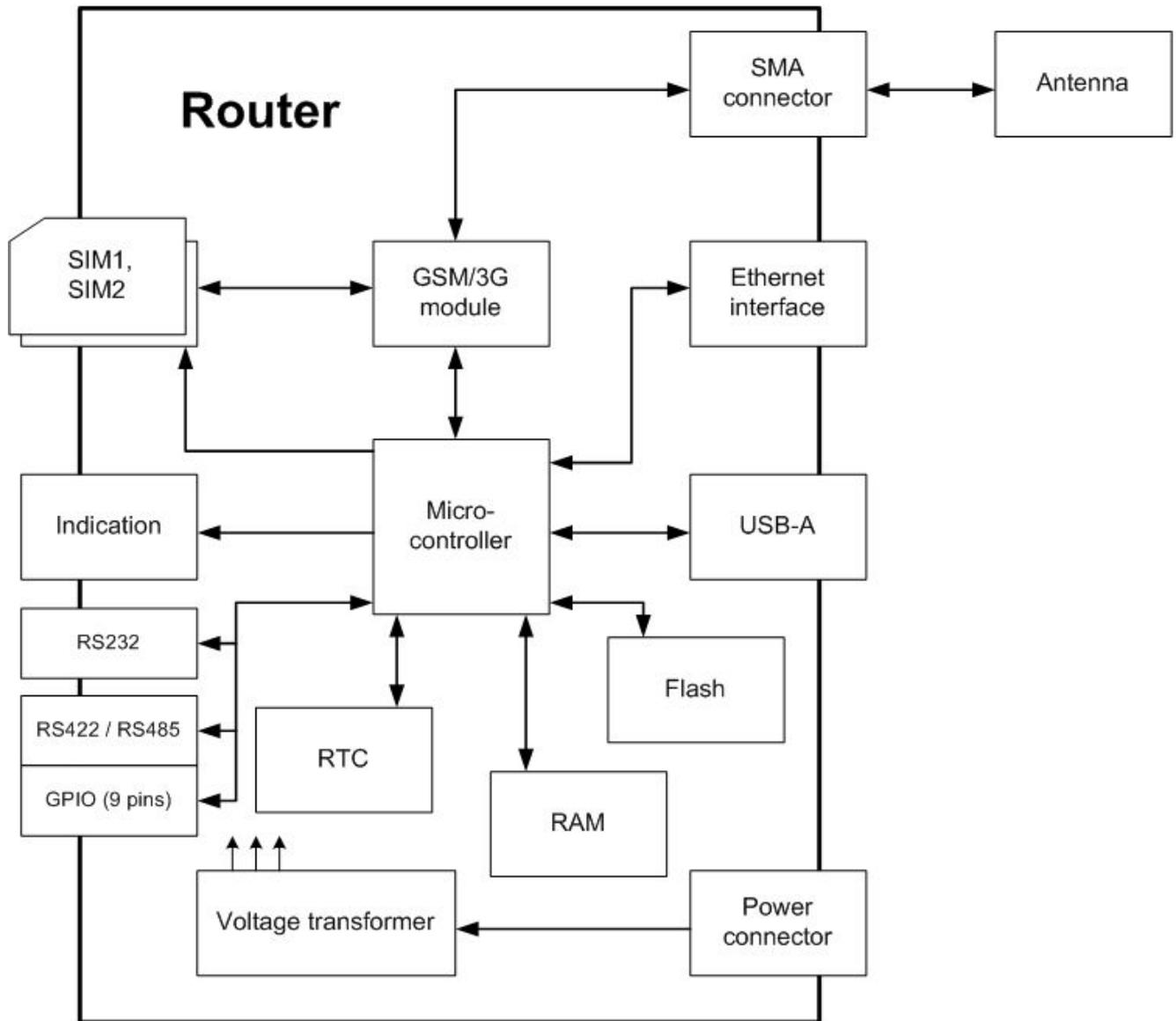
Protect the router against dust and water.

Please comply with the allowable power and vibration requirements at the device installation location.

## 2.10. Device functional diagram

The main functional router nodes (see Fig. 2.1):

- Power supply connector;
- Voltage converter;
- GSM/3G-module;
- SMA-connector for an external antenna;
- Micro controller (MC);
- USB-A;
- RS232 Interface;
- Combined unit GPIO with interfaces RS422 and RS485;
- Ethernet-interface;
- SIM card-1 holder;
- SIM card-2 holder;
- Operating indicator unit - LEDs.



**Fig. 2.1.** Functional diagram of RUH3 router

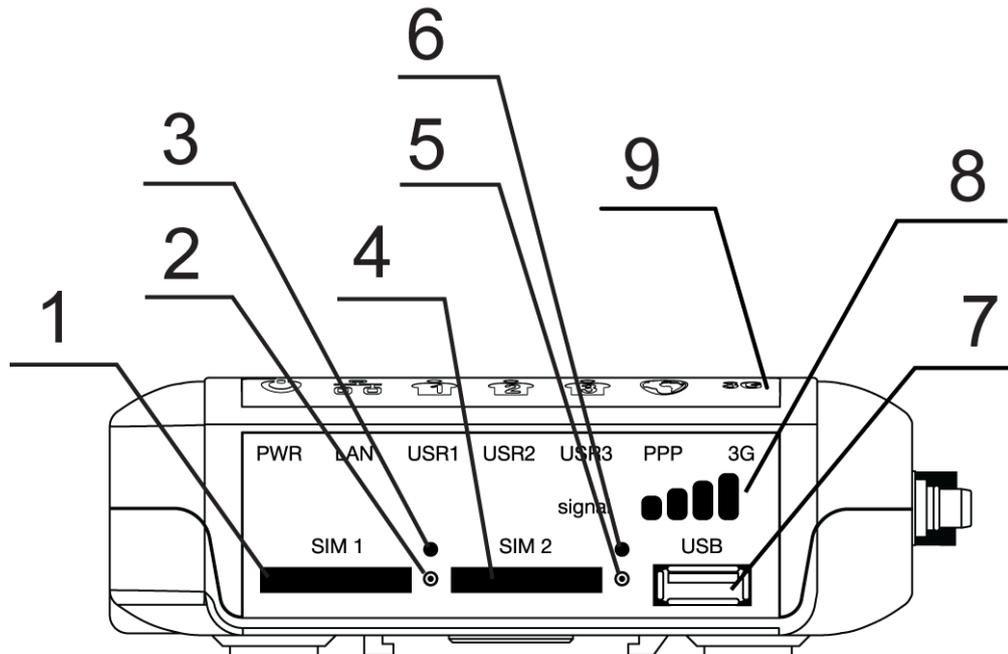


### 3. Appearance and interfaces

#### 3.1. Appearance

##### 3.1.1. Connectors and external elements

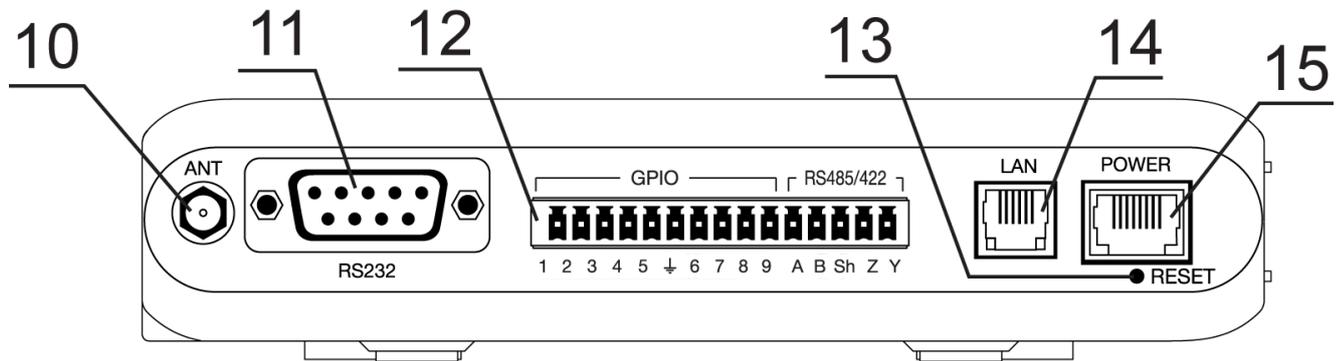
The router is designed in industrial version in a firm and lightweight plastic body.



**Fig. 3.1.** View from the SIM card side

Figure 3.1 numbers indicate:

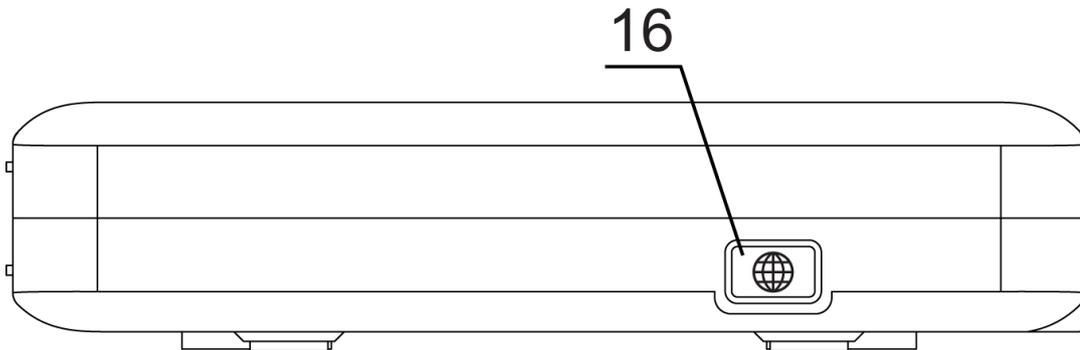
1. SIM card #1 tray;
2. SIM card #1 tray eject button;
3. SIM card #1 LED;
4. SIM card #2 tray;
5. SIM card #2 tray eject button;
6. SIM card #2 LED;
7. USB Host connector;
8. Reception LED;
9. Main display panel;



**Fig. 3.2.** View from the antenna connector side

Figure 3.2 numbers indicate:

- 10. SMA antenna connector, GSM antenna connections;
- 11. Interface DB-9 connector (RS232);
- 12. Terminal connector, 9 GPIO pins, connecting interface cable (RS232);
- 13. Reset settings button;
- 14. Ethernet network connector;
- 15. 6P6C power supply connector.



**Fig. 3.3.** View from the reset Internet connection button

Figure 3.3 numbers indicate:

- 16. Reset (enable/disable) Internet connection button.

 button is aligned with the LED and is used to enable/disable Internet connection without the need to reboot of the router.



Fig. 3.4. Top view (main display panel)

### 3.1.2. Decoding device label

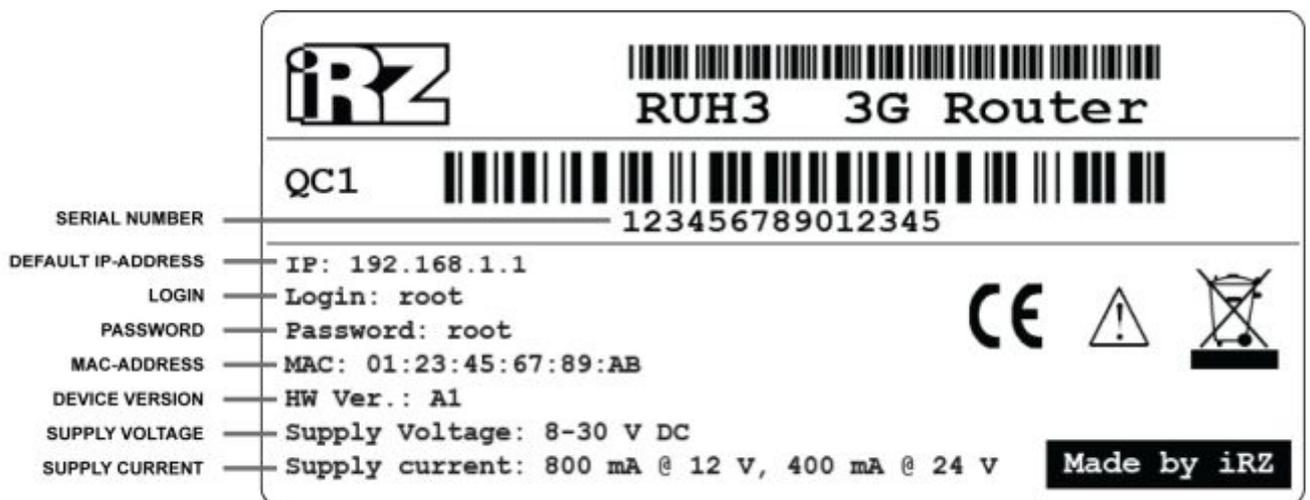


Fig. 3.5. Product label



### 3.1.3. Routers indicators

Router's LEDs is located in the upper part of the body (Figure 3.1 labeled with the number "9", see also Fig. 3.4), on the side with SIM-cards (Figure 3.1 - "3", "6", "8") and buttons enable/disable Internet connection (Figure 3.3 - "16"). Explained signal values and colors of indicators are shown in Table 3.1. The first column for each indicator shows the name and a brief description of its purpose.

**Table 3.1:** Router main display panel explanation

| RUH3 router external main indicators  |                                   |                                    |     |                            |                                       |
|---|-----------------------------------|------------------------------------|-----|----------------------------|---------------------------------------|
| Color   |                                   | Green                              | Red | Blinking<br>(green or red) | No light                              |
| Description   |                                   |                                    |     |                            |                                       |
|    | <b>PWR</b><br>power supply        | power supply is on                 | --- | device switching on        | no power                              |
|   | <b>LAN</b><br>local network       | network cable is connected         | --- | data transfer              | network cable is disconnected         |
|  | <b>USR1</b><br>user mode 1        | Reserved for user functions        |     |                            |                                       |
|  | <b>USR2</b><br>user mode 2        | Reserved for user functions        |     |                            |                                       |
|  | <b>USR3</b><br>user mode 3        | Reserved for user functions        |     |                            |                                       |
|  | <b>PPP</b><br>Internet connection | Internet connection is established | --- | ---                        | no Internet connection is established |
| <b>3G</b>   | <b>3G</b><br>3G mode              | operation in 3G mode               | --- | ---                        | 2G connection, or GSM/3G modem is off |



**Table 3.2:** Router additional indicators explanation

| RUH3 router external additional indicators  |   |  |   |   |   |              |
|---|---|--|---|---|---|--------------|
| Color   |   | Green  |   |   |   | No light     |
| Description   |   |  |   |   |   |              |
|    | <b>Signal</b><br>signal strength indication | <br>great reception | <br>good reception | <br>sufficient reception | <br>no signal / poor reception | modem is off |
|   | <b>SIM 1</b><br>local network               | SIM #1 selected  |   |   | SIM #1 is not used  |              |
|   | <b>SIM 2</b><br>local network               | SIM #2 selected  |   |   | SIM #2 is not used  |              |
|  | Internet connection                         | Internet connection is established   |   |   | no Internet connection is established   |              |

\* – the indicator is combined with the button, see fig. 3.3.



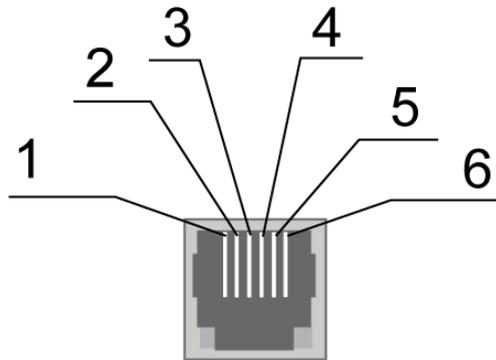
## 3.2. Interfaces

### 3.2.1. Power supply

The power supply of the iRZ RUH3 router must be from a stabilized power supply with a voltage output in the range 8-30 Volts and the maximum current not less than:

- 800 mA at the voltage +12V;
- 400 mA when the voltage is +24V.

A standard connector 6P6C (RJ-25) is used as a power connector. Please see table 3.3 for connectors description.



**Fig. 3.6.** Power supply connector

**Table 3.3:** Purpose of connectors

| Contact | Signal   | Purpose  |
|---------|----------|--|
| 1       | + U sup. | The positive pole of the DC power supply. It is protected by fused circuit and overvoltage protection (when applied to the input voltage of over 30V) and reverse polarity |
| 2       | not used | -  |
| 3       | not used | -  |
| 4       | not used | -  |
| 5       | not used | -  |
| 6       | GND      | System body (negative pole "-")  |



### 3.3. Serial port (COM-port, DB-9 connector)

A serial port defines the router functionality and allows solving telemetry and telemechanics challenges. It can be used for:

- Collecting data or controlling the equipment on the network with additional software;
- Connecting two remote devices with COM interfaces via the Internet.

There are three serial ports available in RUH3 router, they are RS232, RS422 and RS485 interfaces. DB-9 connector (Fig. 3.7) is used to connect COM ports; please see Table 3.4 for the connector purpose. For using RS422 and RS485 interfaces see chapter 3.2.3.

**Note:** You can use external converters to communicate with external devices via RS422, RS485, CAN.

**ATTENTION!** Connecting the device to the router serial port is allowed only when both devices are turned off.

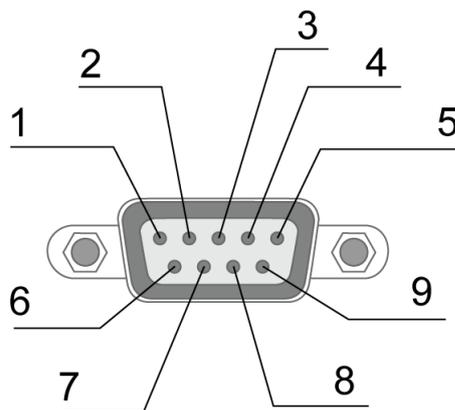


Fig. 3.7. Interface connector

Table 3.4: Purpose of interface connectors pins

| Pin | Signal      | Direction       | Purpose       |
|-----|-------------|-----------------|---------------|
| 1   | not used    | -               | -             |
| 2   | RS232 - RXD | Device → Router | Data receive  |
| 3   | RS232 - TXD | Router → Device | Data transfer |
| 4   | not used    | -               | -             |
| 5   | GND         | general         | Ground        |
| 6   | not used    | -               | -             |
| 7   | RS232 - RTS | Router → Device | -             |
| 8   | RS232 - CTS | Device → Router | -             |
| 9   | not used    | -               | -             |



### 3.3.1. Terminal connector

Terminal connector (see Fig. 3.8) in the router RUH3 used to output GPIO pins, RS422 and RS485 serial port interfaces. Please see Table 3.5 for pins description.

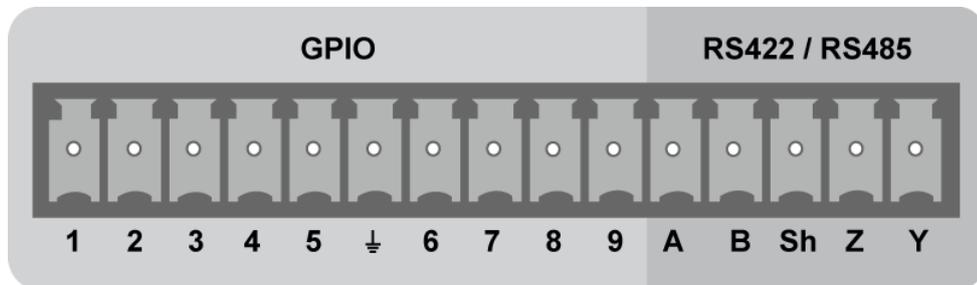


Fig. 3.8. Terminal connector

Table 3.5: Purpose of terminal connector pins

| Pin                    | Direction       | Purpose                     |
|------------------------|-----------------|-----------------------------|
| 1                      | Router ↔ Device | GPIO1                       |
| 2                      | Router ↔ Device | GPIO2                       |
| 3                      | Router ↔ Device | GPIO3                       |
| 4                      | Router ↔ Device | GPIO4                       |
| 5                      | Router ↔ Device | GPIO5                       |
| ⏏                      | GND             | Ground                      |
| 6                      | Router ↔ Device | GPIO6                       |
| 7                      | Router ↔ Device | GPIO7                       |
| 8                      | Router ↔ Device | GPIO8                       |
| 9                      | Router ↔ Device | GPIO9                       |
| <i>RS422 interface</i> |                 |                             |
| A                      | Device → Router | Receive Rx-                 |
| B                      | Device → Router | Receive Rx+                 |
| Sh                     | -               | Shield                      |
| Z                      | Router → Device | Transmit Tx+                |
| Y                      | Router → Device | Transmit Tx-                |
| <i>RS485 interface</i> |                 |                             |
| A                      | Device → Router | half-duplex transfer with Y |
| B                      | Device → Router | half-duplex transfer with Z |
| Sh                     | -               | Shield                      |
| Z                      | Router → Device | half-duplex transfer with B |
| Y                      | Router → Device | half-duplex transfer with A |



In Figures 3.9 and 3.10 shows the connection via RS422 interface and RS485. In this case, the contacts are used from the right side of terminal connector (see Figure 3.8), certain "A", "B", "Z" and "Y". For more details on these contacts, see Table 3.5.

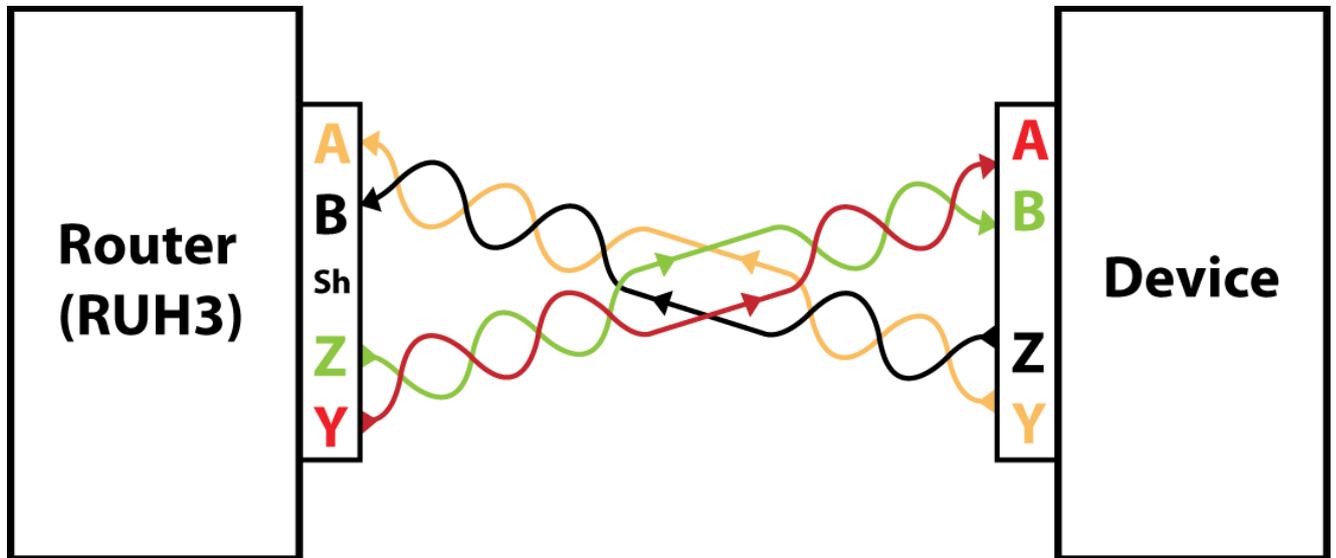


Fig. 3.9. Connection via RS422 interface

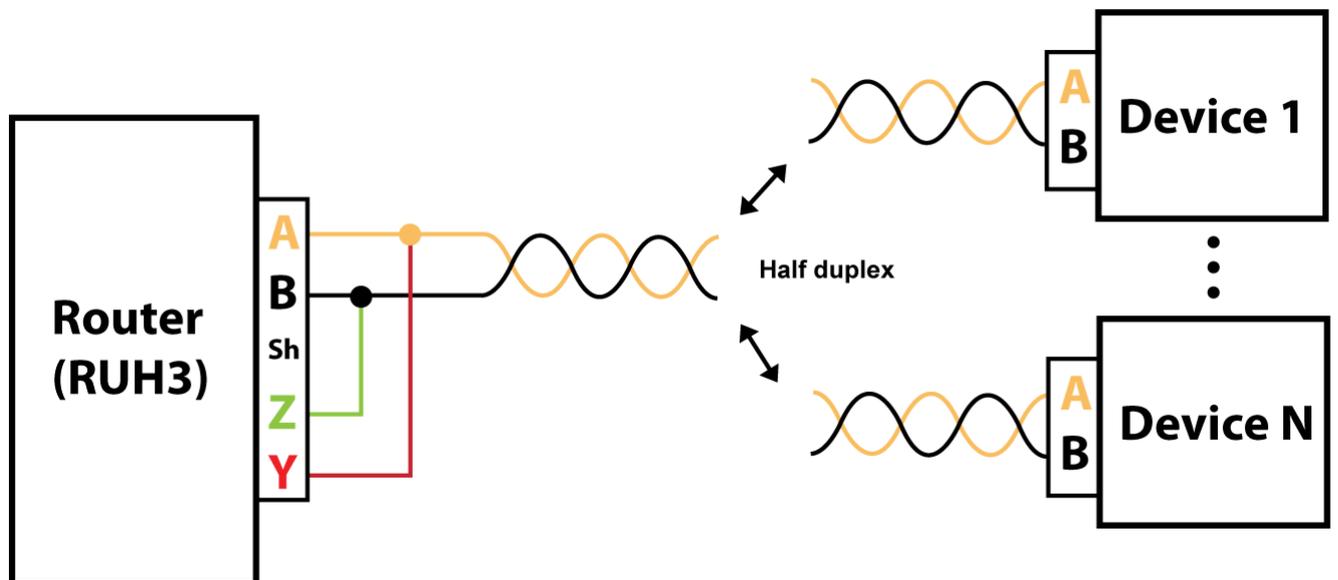


Fig. 3.10. Connection via RS485 interface



In Figures 3.11 and 3.12 shows shield for interfaces RS422 and RS485. Contact “**Sh**” is used for shielding of terminal connector (see Fig. 3.8).

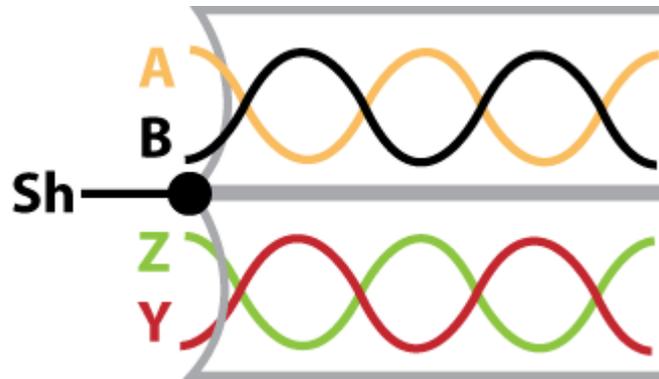


Fig. 3.11. Shield (RS422 interface)

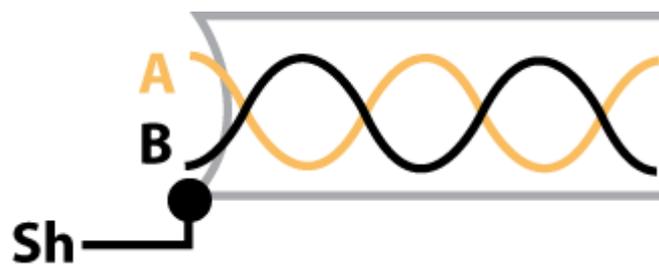
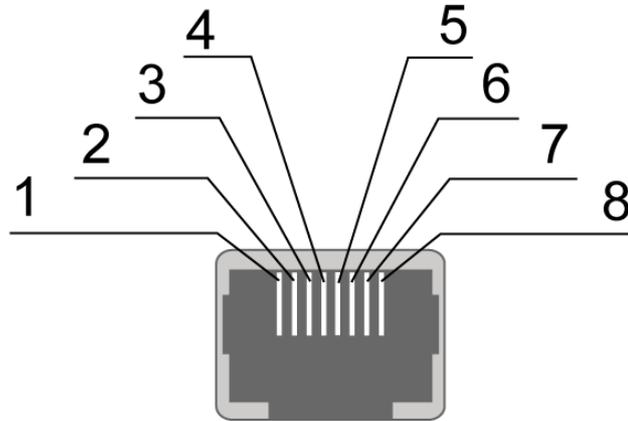


Fig. 3.12. Shield (RS485 interface)



### 3.3.2. Ethernet interface

The Ethernet interface is designed using a standard connector 8P8C (“RJ-45”). Please see table 3.6. for the description of the connector pins.



**Fig. 3.13.** Ethernet connector

**Table 3.6:** Purpose of Ethernet connectors pins

| Pin | Signal   | Direction   | Purpose                  |
|-----|----------|-------------|--------------------------|
| 1   | ETX P    | Router → PC | Transfer, positive pole  |
| 2   | ETX N    | Router → PC | Transfer, negative pole  |
| 3   | ERX P    | PC → Router | Reception, positive pole |
| 4   | not used | -           | -                        |
| 5   | not used | -           | -                        |
| 6   | ERX N    | PC → Router | Reception, negative pole |
| 7   | not used | -           | -                        |
| 8   | not used | -           | -                        |



### 3.3.3. USB interface

The USB interface is designed using a standard USB-A "female" connector, and it works in accordance with the USB 1.1 specification standard. Please see Table 3.7. for the descriptions of the connector pins.

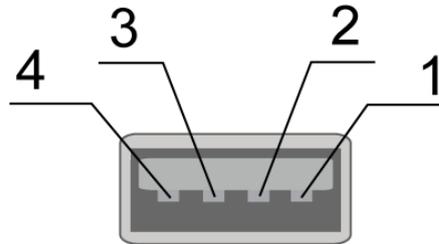


Fig. 3.14. USB connector

Table 3.7: Purpose of USB connector pins

| Pin | Signal | Purpose  |
|-----|--------|--|
| 1   | VBUS   | +5 Volts<br>Power supply to peripheral devices       |
| 2   | D-     | Differential data signal                             |
| 3   | D+     | Differential data signal                             |
| 4   | GND    | "Body" circuit<br>Power supply to peripheral devices |

### 3.3.4. SMA antenna connector, GSM/3G-antenna

The router is equipped with SMA type antenna connector.

When selecting an antenna, first please pay attention to the positions for operating on UMTS network, as RUH2b router is designed primarily to operate on UMTS networks. Other antenna models can also provide a normal operation in cellular networks, but will not provide a full use of the router functionality, and communication channels speed will be limited.

The process of connecting the antenna to the device is one of the key points for the quality of a computing complex built on the basis of GSM-routers. Before connecting an antenna, it is recommended to install/check the following settings:

- Antenna cable connector quality;
- Cable length and antenna sensitivity;
- Antenna purpose (i.e. a miniGSM antenna is not always suited for tasks that require a broad bandwidth).



**Fig. 3.15.** SMA connector and antennas

To simplify the process of determining the quality of connection, please see the table 3.6 for approximate level of GSM/3G signal.

**Note:** It is not recommended to use a very long antenna cable. When using RG-58U cable, please take into account the signal attenuation rate, using the calculation of ~1 dB per meter.

**Reminder:** If the signal level is low, or there are connection problems, please refer to the document “Diagnostics and Troubleshooting of iRZ Routers”



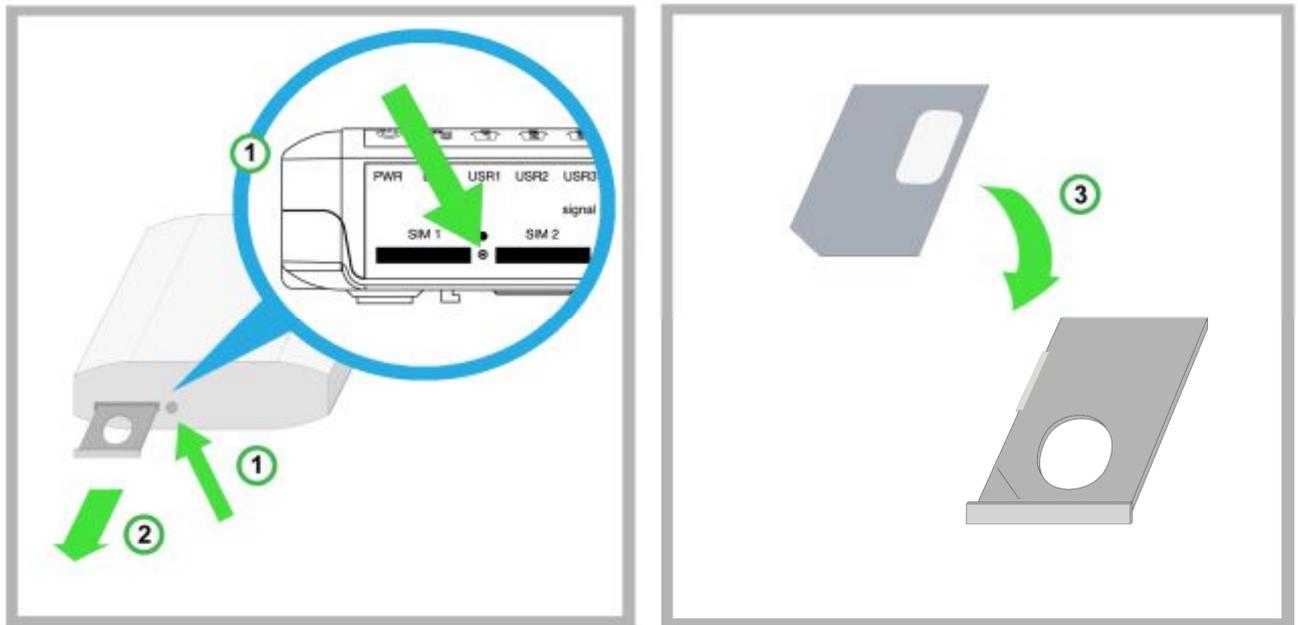
## 4. Preparing for operation

### 4.1. Connecting a SIM card

To ensure the connectivity of the router to the Internet through a cellular network you will require a SIM card of a mini-SIM format. Prepare the SIM card (mini-SIM), reset your PIN code if necessary.

**Please note:** SIM card of a mini-SIM format is different from other cards in size. Please make sure you receive a correct card from your provider, as the router is not designed to work with SIM cards of other formats.

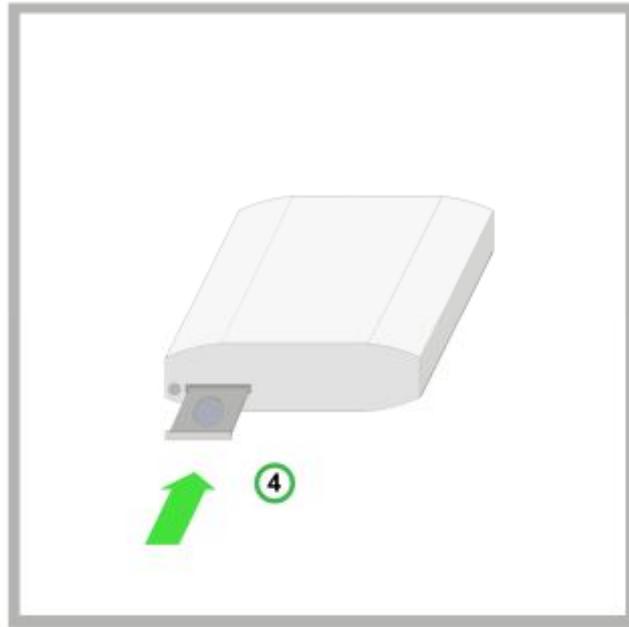
Please perform the following steps to ensure the router connectivity to the internet via a cellular network:



1. Remove the tray from the device, by pushing the appropriate button;
2. Fully extract the tray by pulling it towards you;
3. Place the SIM card in the tray;



4. Insert the tray with your SIM card in the slot for SIM #1 (slot on the router end).



If you require a redundant connection to the Internet, please repeat all the steps with the second SIM card and place it in the tray slot for SIM #2.

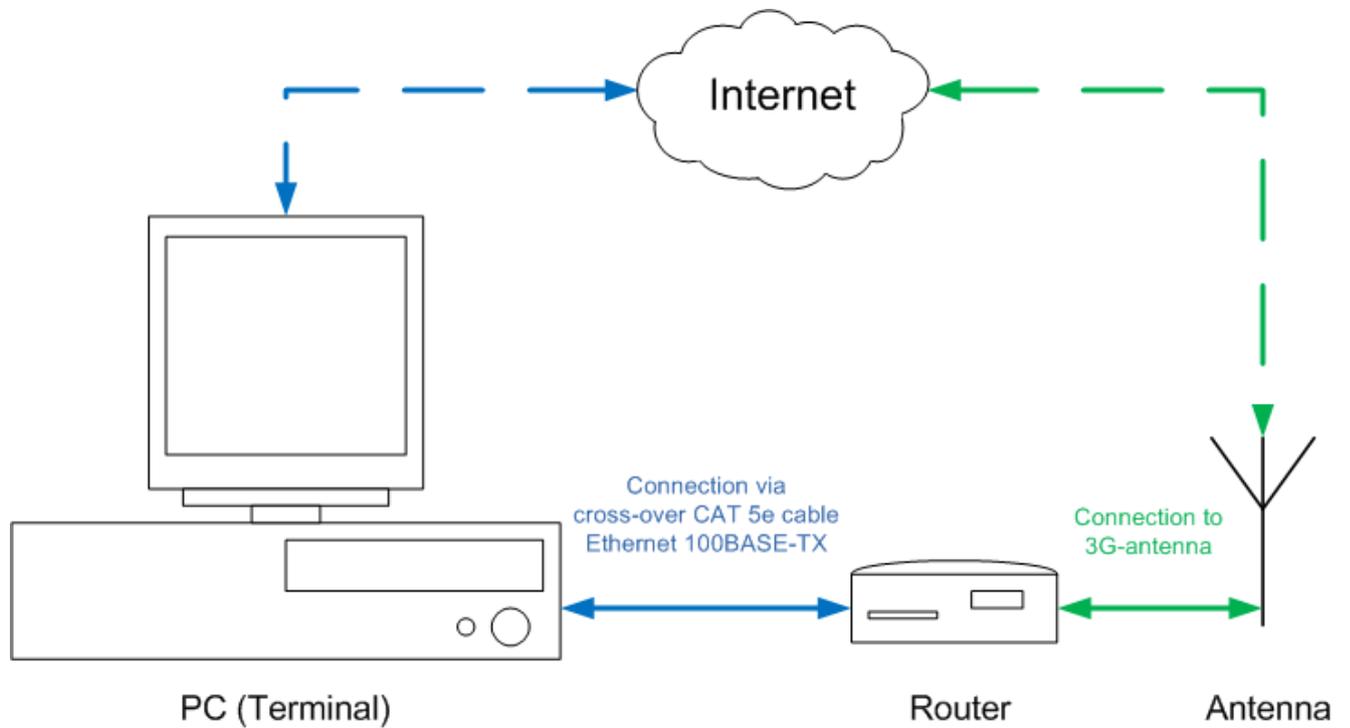
**Note:** If the shutdown of the PIN verification on the SIM card is undesirable, please refer to the Internet Connection Settings section of the document [“Control and Monitoring of iRZ Routers”](#)

**Note:** If the PIN-code test of the SIM card was not turned off, you can always do it through the router web-interface. Please see "Disable PIN" section of the [“Control and Monitoring of iRZ Routers”](#)



## 4.2. Device access

The device access can be remote (via the Internet, after the router is connected on GPRS/EDGE/3G) and locally (use an Ethernet cable), connecting the router directly to a computer.



**Fig. 4.1.** Device operation diagram



#### 4.2.1. Web interface access

To obtain access to the router web-interface, please use any standard Internet browser that supports HTTP 1.0, for example, Opera, Firefox, IE, Chrome.

Open the browser and perform the following steps:

1. Enter the router IP address into the browser address line;



**Note:** The IP address to access the router settings used by default is listed on the sticker on the bottom side of the router body.

If router is switched on, you will see a welcome page.

The welcome page contains a brief information about the device status and the network: The device name (unit name), the uptime since the device connection, the provider name, GSM connection type, GSM signal level, the IP address, the connection speed, the number of transmitted and received data, etc.

2. Enter your login and password;

**Please Enter Your Authentication Information**

Server: 192.168.1.1

Message: IRZ-RUH3-ROUTER

User Name: root

Password: \*\*\*\*

Password will be transmitted unencrypted

Save password

Send Cancel

If your login and the password are correct, the access to the device main control interface opens.

**Note:** If you have forgotten the password to change the settings, you can reset the router to the default factory settings with a standard login and password (see section 4.3 "Return to the factory settings" of this guide).



#### 4.2.2. Internet connection via 3G/GSM channel

To connect the router to the Internet you will require:

- 3G antenna, SMA antenna cable connector;
- SIM card with a the Internet access service package, and settings documentation;
- SIM card tray (supplied with the router).

**Note:** If you plan to connect the router to the Internet through an Ethernet connector, it may require a cable (preferably CAT 5e) for connecting to the device with the provider's equipment

**Recommendation:** In order to avoid an unexpected loss of connection with the router because of a zero balance, it is recommended to have a corporate agreement with your cellular service provider allowing post-payment

For the router to connect to the Internet, please follow these steps:

1. Place the SIM card in a SIM card tray;
2. Place the SIM card into the slot (at the end of the router);
3. Connect the antenna;
4. Turn the unit power on;
5. Wait for 2 to 5 minutes.

The router must connect to the Internet. To obtain the Internet access, please connect the computer with the router via the Ethernet interface (IP address will be issued automatically as per DHCP).

#### 4.3. Return to the factory settings

Please follow these steps to return to the factory settings:

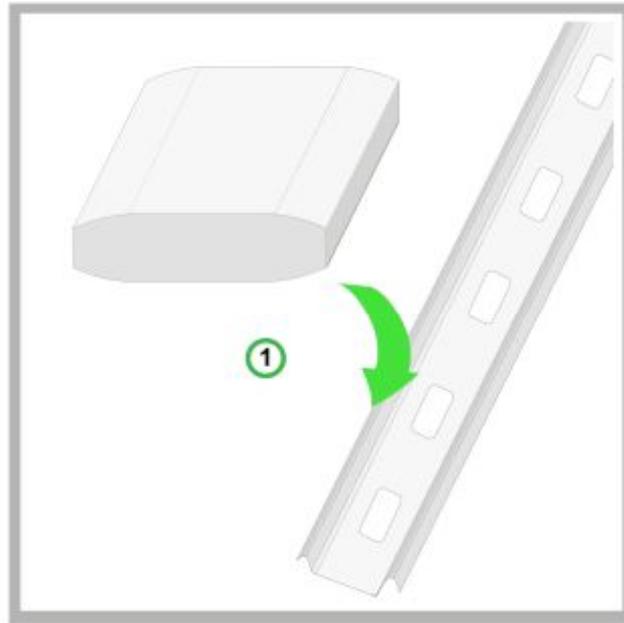
1. Turn off the power (the router must be off);
2. Connect the power, turn the router on;
3. Press and hold "RESET" button (indicated by digit "13" on Figure 3.2);
4. In 25 seconds, "USR1", "USR2" and "USR3" LEDs must are blink 3 times;
5. This means that the settings have been changed and you can release "RESET" button.

After this, the router will be reset to the factory settings. Please note that in this case the router IP address is **192.168.1.1**



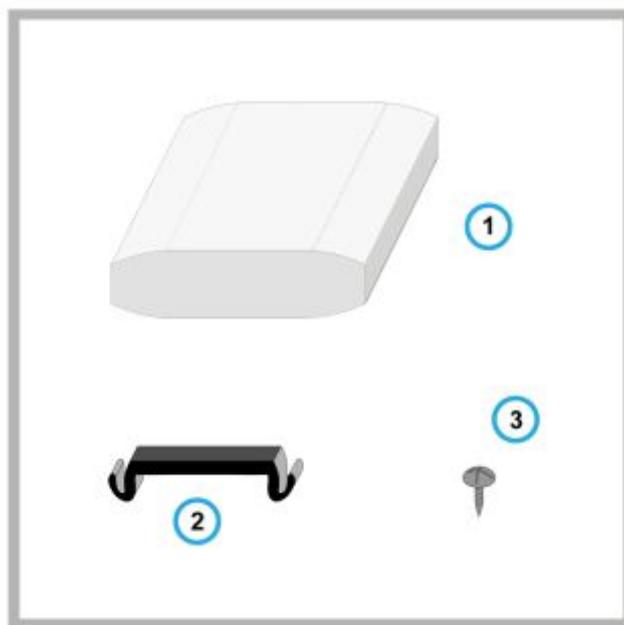
#### 4.4. Device installation

RUH3 router has special slots on the bottom of its body to enable mounting it on a DIN-rail without any additional tools:



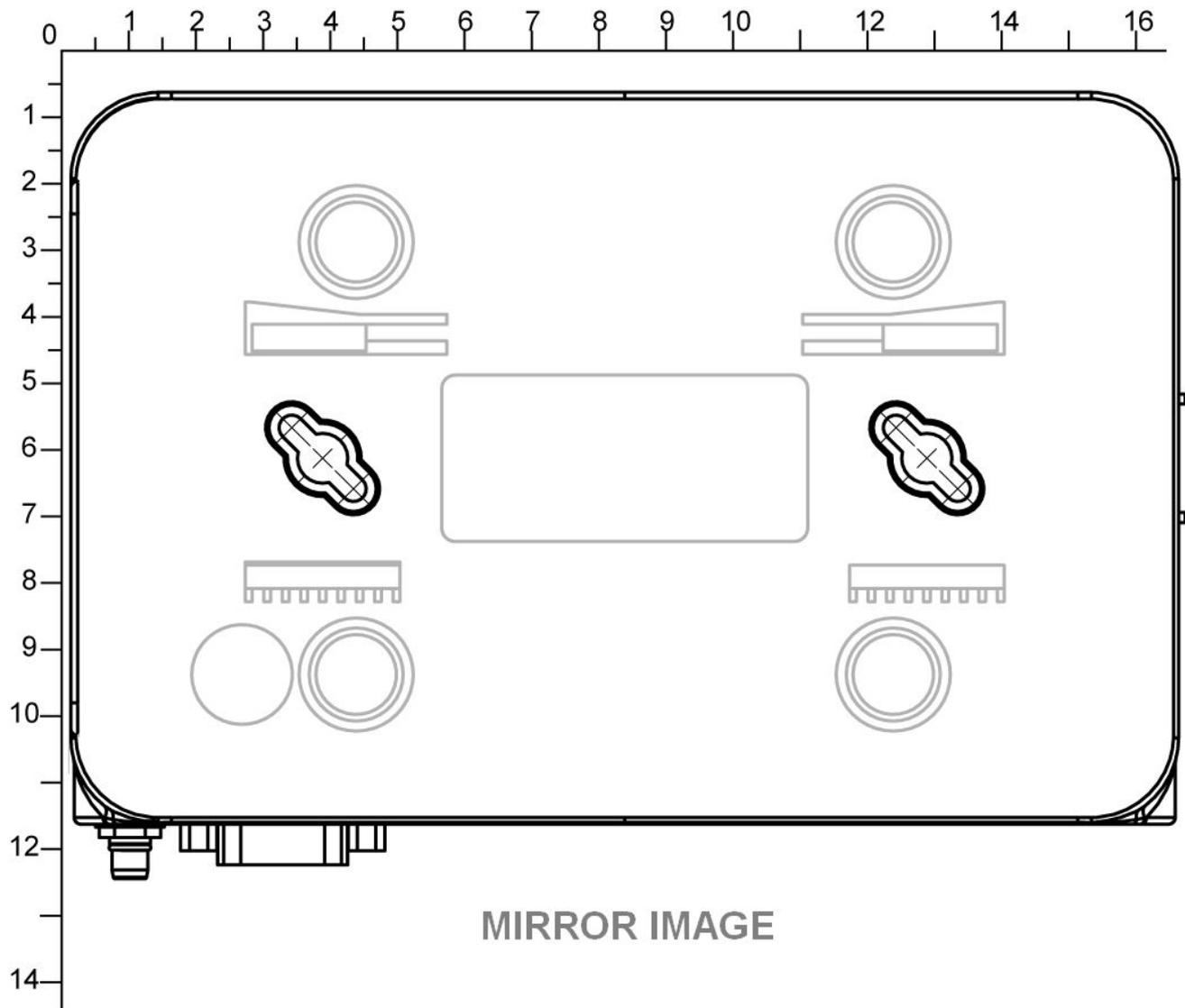
1. Take your router and simply clip its bottom part to a DIN-rail;

The second option involves the installation of a more compact side mounting the router (see below). The figure shows a kit for fixing device for DIN-rail mounting:



1. **Device** (for example, modem or router);
2. **DIN rail fixer**;
3. **Screws** – 2 pcs.





When installing the router on a wall, you can use a special pad, please see above. You can print out this figure, cut it out, and easily determine the distance for the openings without any additional measurements.

**Attention:** Printers can distort the dimensions when printing. After printing page, please make sure that the information provided in scale on the figure (the size is specified in centimeters) is the same as the actual size.



## 4.5. Software functionality

**Table 4.1:** Router functionality description

| Name                                     | Brief description                      | Explanation and operating principle  |
|--|--|--|
| <u>Key functions</u>                     |  |  |
| <b>OpenVPN</b>                           | Secure network tool                    | <p>OpenVPN is one of the core services, defining iRZ router functionality. OpenVPN service has many facets, and its setting depends on a specific application. Key features are:</p> <ul style="list-style-type: none"> <li>■ Secure data channel possibility;</li> <li>■ Combining multiple geographically separated points in a single virtual space (a virtual IP-network);</li> <li>■ Cost reduction for external IP addresses by changing the role of nodes at the connection time (client - server)</li> </ul> |
| <b>2 SIM</b>                             | Reserving the SIM card                 | Protects against the loss of communication with the object by automatically transitioning to the second SIM card   |
| <b>Serial Port</b>                       | Processing COM port data               | Provides and monitors operation with data going through the COM port. Defines the primary router functionality using the possibility of a transparent communication channel between the connected device and a remote object (dispatch, or other device)   |
| <u>Deployment and network protection</u> |  |  |
| <b>IPSec</b>                             | Transmitted data security              | A high-reliability data protection tool often used in the banking communications. It allows creating a point-to-point connection between two nodes, while consolidating subnets dispersed in space.  |
| <b>Firewall</b>                          | Built-in network screen                | The network screen is one of the main components of any network border device. It provides protection against the penetration into the internal network space that the router is connected to. It can also perform tasks, such as ports redirection (port forwarding)  |
| <b>GRE</b>                               | Point-to-point data tunnelling.        | Virtual channel connection tool between two IP network nodes. It can be used to connect networks.  |
| <b>DHCP</b>                              | The service of providing IP addresses. | It provides and monitors the network address space that the router is connected to.  |
| <b>Port Forwarding</b>                   | TCP/UDP ports forwarding               | It allows communicating with devices located in the inner IP network to which the router is connected by forwarding traffic from the external interface to the initially designated internal node.   |
| <b>Static Routes</b>                     | Static routing                         | It stores user specified routes to a subnet, or a node.  |



**Table 4.1:** Router functionality description (continuation)

| Name   | Brief description                         | Explanation and operating principle  |
|--|---|--|
| <u>Redundancy and fault-tolerance</u>          |   |  |
| <b>Watchdog</b>                                | Watchdog timer                            | It constantly monitors the state of the operating system for deadlocks. The function is relevant in solutions with an increased requirement for fault-tolerance.   |
| <b>Reserve Link</b>                            | Reserving an Internet channel             | Allows using a GSM connection as a reserve channel when there is no wired Internet connection.   |
| <b>USB-LAN</b>                                 | Additional Ethernet interface via USB     | It provides the possibility to use a USB interface as a network (Ethernet) interface. It may be included in the operation with the Reserve link function.  |
| <b>Alias</b>                                   | A virtual IP address on the main Ethernet | It allows using a second IP address on a single physical Ethernet interface.   |
| <b>Daily Reboot</b>                            | Daily reset                               | It can be used for a daily reboot of the router. It is used as a preventive measure for the device deadlock.   |
| <b>Backup/Restore</b>                          | Save / restore the configuration          | It ensures the safety of all the device settings, and allows recovering them on this or other devices.   |
| <b>VRRP</b>                                    | Reserving the main network gateway        | VRRP protocol is designed to provide a possibility to maintain a network performance through the use of multiple replaceable routers in the event of a failure of one of them.   |
| <u>Management, maintenance and diagnostics</u> |   |  |
| <b>Web-interface</b>                           | Remote access to web interface            | The main tool for the router management, setting and status monitoring   |
| <b>Telnet</b>                                  | Remote access to the console              | <p>It provides the user with the ability to control the router using Linux commands. The use of the management console greatly expands the router control possibilities.</p> <div data-bbox="919 1491 1533 1570" style="border: 1px solid black; padding: 5px;"> <p><b>Note:</b> You can see the list of available commands in the document <a href="#">“Control and Monitoring of iRZ Routers”</a></p> </div> |
| <b>SSH</b>                                     | Secure remote access to the console       | Equivalent to Telnet, all the data input and output is performed through a secure channel  |
| <b>SNMP</b>                                    | Monitor the status in the network         | A dedicated protocol for the control and monitoring of the network devices. In the current version, it only allows monitoring the interfaces status, and receiving more information about the device   |
| <b>Send Report</b>                             | Generating all the debug information      | Page to send the debug information. Please use It when contacting iRZ support team to reduce the time required to identify the issue   |
| <b>Ping Test</b>                               | Check the connection with the node        | A standard command to check the connection to the node at the IP level, may be made via a web interface  |



**Table 4.1:** Router functionality description (continuation)

| Name                        | Brief description                         | Explanation and operating principle  |
|-----------------------------|---|--|
| <b>System Log</b>           | System events registration service        | System log page allows monitoring all system events. Several modes of registering messages are accessible.   |
| <b>Connection Log</b>       | Internet connections registration service | Internet connection log It allows to obtain information on the past connections and connection errors.   |
| <u>Functional expansion</u> |   |  |
| <b>Startup Script</b>       | Autorun Script                            | It allows to significantly increase the in-built functionality of the router. Commands/script saved on this page will be performed every time the device starts. |
| <b>IP-Up Script</b>         | Autorun Script                            | It is equivalent to Startup-Script , but run script/command occurs after a successful GPRS connection  |
| <b>IP-Down Script</b>       | Autorun Script                            | It is performed when the GPRS connection is off  |
| <u>Additional functions</u> |   |  |
| <b>Send SMS</b>             | Send user SMS messages                    | It allows sending a short message to a specified number. Only Latin letters are supported  |
| <b>Disable PIN</b>          | Disable PIN verification on SIM card      | It disables protection of PIN-code access on a SIM card  |
| <b>NTP / Clock</b>          | Clock setting and synchronization         | It allows specifying the exact time, and set up an integrated NTP "server time". It supports synchronization with external root NTP servers                      |
| <b>Unit Name</b>            | Device unique name                        | A string specified on this page is used to make the router recognizable within the project   |



## 5. Contacts and Support

New document versions and software are available using:

| St. Petersburg                  |  |
|---------------------------------|--|
| The company's website:          | <a href="http://www.radiofid.ru">www.radiofid.ru</a>           |
| Phone number in St. Petersburg: | +7 (812) 318 18 19   |
| E-mail:                         | <a href="mailto:support@radiofid.ru">support@radiofid.ru</a>   |
| Moscow                          |  |
| The company's website:          | <a href="http://www.digitalangel.ru">www.digitalangel.ru</a>   |
| Phone number in Moscow:         | +7 (495) 974 74 22   |
| E-mail:                         | <a href="mailto:info@digitalangel.ru">info@digitalangel.ru</a> |

Our support team is ready to assist you with any questions you might have when installing, configuring or solving issues with our equipment.

In the event of an issue, when contacting our technical support, please indicate the router software version. We also recommend that you attach to your email the logs of issues you have experienced with the service, screen shots, and any other useful information. The more information you can provide to the support team, the faster they can resolve the issue.

**Note:** Before contacting the technical support, it is strongly recommended that you update the router software.

**Attention!** The violation of conditions of use (misuse of the router) voids the device warranty.