



Wireless unit for alarm loops expansion

«Ladoga BRSS-RK-485» ver. 1

Installation Guide

1 General information

Wireless alarm loop expansion unit «Ladoga BRSS-RK-485» ver.1, (hereinafter referred to as BRSS) is used for:

- monitoring the state of terminal devices (hereinafter referred to as TD);
- management of TD operation modes;
- relaying information from TD

over a two-way radio protocol «Rielta-Contact-R» and the transmission of received information over a wired communication line in the protocol «Ladoga-RK-485» to an external device (hereinafter - ED).

The BRSS can connect via USB with the CDC-ACM virtual serial port mode at a speed of 57,600 baud to set up and monitor the status of the TD.

2 Main technical specification

Table 1

Parameter	Value
Number of connected wireless devices	up to 31
Operating frequency range	433.05 – 434.79 MHz
Supply voltage	8 - 30 V
Consumed current	50 mA
Output power	10 mW
IP rating	IP20
Overall dimensions	82x57x32 mm
Weight	60 g
Average service life	10 years
Operational conditions	
Operating temperature range	-30... +50 °C
Permissible air humidity at temperature of +40 °C, without moisture condensation	93 %

BRSS is designed for continuous round-the-clock operation.

The level of industrial radio noise generated by the BRSS does not exceed the standards for technical equipment operated in residential buildings or connected to the electrical networks of residential buildings.

BRSS provides connection of:

- two-wire communication line with the ED (terminals block «AB»);
- two-wire power circuit (terminals block «+U»);
- circuits for monitoring the main and backup power supply of an external source (terminals blocks S1 and S2, respectively);
- external antenna (terminals block «Y»).

BRSS provides the assignment of the wired address in the range from 1 to 8 using dip switches.

BRSS has a case opening control feature.

3 Contents of the kit

Table 2

Name	Qty
Wireless alarm loops expansion «Ladoga BRSS-RK-485» ver. 1	1 pc.
Antenna	1 pc.
Screw 3-3x30.01	2 pcs.
Dowel NAT 5x25 SORMAT	2 pcs.
Wireless alarm loops expansion «Ladoga BRSS-RK-485» ver. 1. Installation guide	1 copy

4 BRSS indication modes

Table 3

Status of the indicators	BRSS status
Simultaneous activation of yellow, red and green LEDs for a few seconds	Test indication when BRSS is turned on
Yellow LED is on permanently	Power is supplied
Flashing yellow LED (frequency 1 Hz)	Linking mode
Flashing red LED (frequency 4 Hz)	Programming mode
Red LED is on for 3 seconds or more	Radio interference
Brief red LED	A message was received over the radio channel from the TD
Brief green LED	A message from the ED (PC) was received via the communication line (USB)

5 BRSS Operation Modes

5.1 Standby Mode

In this mode, the BRSS receives information about the status of the TD connected to it via a radio channel and transmits it to the ED, receives control commands from the ED and transmits them via a radio channel to the TD.

Features of working with different types of ED are given in the operating manual for the corresponding type of ED.

5.2 Programming mode

This mode is for the update of the firmware (FW) of the BRSS.

The Ladoga-RK Configurator software must be installed in order to program the BRSS using a personal computer. The configurator can be found on the RIELTA website in the Radio Channel-Software section (www.rielta.ru/radiokanal).

ATTENTION! Connection to the BRSS via the USB connector should be made only after turning off the main power of the BRSS.

5.3 Configuration Mode

This mode is used for setting up BRSS and TDs, removing or adding new TD. Within the frame of this mode the BRSS performs the following functions:

- assignment of network number and frequency letter;
- selection of communication period and TD control period;
- linking (adding) with new TD;
- removal of TD.

6 Commissioning procedure

The commissioning procedure for BRSS is described in the operating manual for the corresponding ED and may differ significantly when connected to various types of ED. This guide provides general guidelines that can be followed when using a PC with the installed software. Following these recommendations allows to perform the installation of a wireless system on site with the subsequent testing of its operation.

6.1 Selecting and setting the network number and frequency letter

Each wireless network installed on site must have a unique number (network number). The valid network number range is from 1 to 126. In addition to the network number, a frequency letter must be specified. It defines a pair of frequencies (main and backup) on which communication is carried out between the wireless devices of the network.

ATTENTION! After changing the network number and (or) frequency letter, it is necessary to re-link all previously configured TDs.

6.2 Setting the TD communication period and default monitoring period

BRSS monitors the status of each TD of the network. The wireless device is assigned a period of time to go on the air to provide this control, in accordance with which it transmits a message about its status. This period is called the «communication period» (T_{cp}). The communication period length can be selected from following: 10 sec, 15 sec, 30 sec, 1 min, 2 min, 5 min, 10 min. It is important to remember that the shorter the communication period is, the shorter is the service life of autonomous power sources in wireless devices and the higher is the air load, which creates an increased probability of collisions (communication errors). The allowable number of wireless devices working together («hearing each other») on one frequency letter, regardless of the network number, should not be more than 2 * T_{cp} (where T_{cp} is taken in seconds).

If during the «control period» BRSS does not receive messages from the TD then it informs the ED about the loss of communication with such TD. The monitoring period is defined as the specified number of missed communication periods plus one (N+1). With excellent communication quality, the recommended values of N are 3 or 4. If the communication quality is below this level, then the value of N can be increased. The maximum value of N is 15. Each TD provides an opportunity to check the quality of communication at the installation site (see the operating instructions for the corresponding wireless device).

Setting the values of the listed parameters will ensure their transfer to each TD at the time of linking.

ATTENTION! TD linking cannot be performed without setting the network number, frequency letter, TD communication period and monitoring period.

6.3 Linking of TD with BRSS

The linking procedure allows to connect wireless TDs to the network. In the process of linking, the BRSS transmits to the TD the network number, the working frequency letter, the communication period, the network address. The TD, in its turn, informs the BRSS of its type and serial number, which provides further identification of the TD.

Linking can be carried out both under the control of the BRSS from the ED (in accordance with the instructions for a specific ED), and with the help of the Ladoga-RK Configurator software. To eliminate crosstalk between simultaneously configured systems, it is recommended to communicate with the TD with the antenna turned off at the BRSS, placing the TD at a distance of 0.5–1 m from the BRSS.

The switching of BRSS to the linking mode is done by a command from the ED or from the PC. Periodic turning on of the yellow LED indicates the transition of the BRSS to this mode. The TD is connected in accordance with its operating instructions. Information about the connected TD will be stored in the memory of the BRSS. Linking mode is active for 100 sec.

ATTENTION! There must not be more than one TD in in the linking mode.

ATTENTION! After linking is completed, it is recommended to make a mark on the TD indicating the assigned zone (channel) number and turn off the TD by removing the main battery. This will ensure the longer life of the batteries of the TD when the power supply of the BRSS is turned off.

6.4 Selection of the installation site and mounting of the BRSS

The installation location of the BRSS significantly affects the quality of communication with the TD. It is recommended to install the BRSS so that the antenna orientation remains vertical and the BRSS is in the center of the radio system.

BRSS is not recommended to be installed:

- on massive metal structures and closer than 1 m from them;
- near sources of radio interference;
- inside metal structures.

Having previously chosen the location for the installation of the BRSS, fasten it there temporarily, connect the power supply and proceed to the selection of the location for the installation of the TD.

If, when choosing the installation location of the TD, satisfactory results of the communication quality are not obtained, then you should choose the other location for the installation of the BRSS or use a repeater (hereinafter referred to as RPR).

Having chosen the installation site, you should finally mount the BRSS.

6.5 Installation of wireless TDs on site

The installation of the TD should be carried out in accordance with the operating instructions for a specific device. However, in each case, it is recommended to make sure that the chosen location provides adequate communication quality. The method for checking the level of communication between the TD and the BRSS is given in the operating instructions for the TD.

ATTENTION! The offset of the TD by 10–15 cm from the selected location can either significantly improve or worsen the quality of the communication between the TD and the BRSS.

6.6 Using BRSS in repeater mode

Prepare BRSS for registration of a new device (clause 6.3 «Linking an TD with BRSS»). During the linking process, only one RPR and one BRSS, prepared for registration of a new device, should be in the radio visibility zone. Close the BOOT pins on the RPR board until the green indicator turns on. Perform the linking. Successful linking is indicated by a short red LED indication.

Notes:

1. Linking mode is indicated by fast flashing (4 Hz) of the green LED.
2. Linking mode is active for 100 seconds. To resume linking, the BOOT jumper must be re-closed.
3. To exit linking mode before it is over, close the BOOT pins again.
4. Do not leave the RPR with closed BOOT contacts after restarting the power supply, this will lead to a transition to the programming mode. Closed BOOT contacts are indicated by slow flashing (1 Hz) of the green LED.

6.7 Radio communication quality assessment in repeater mode

Bring the linked RPR to the intended location for installation and position it so that the antenna is vertical. Press and hold the tamper switch for a few seconds. Release the tamper switch. Within 5 seconds, RPR will display the quality of communication with the BRSS by turning on the LED indicators (see table 4).

Table 4 – Communication quality indication

Indication		Connection quality assessment	Recommendations
Color	Mode		
Green	Three blinks	Perfect	Installation in this location is allowed
Green	Two blinks	Good	
Green	One blink	Weak	Installation in this location is not allowed
Red	Multiple blinks	No connection	

7 Storage and Transportation

7.1 The BRSS in their original packing may be shipped by any transport means in covered vehicles (in railway, cars, trucks, ship cargo holds, etc). The BRSS is resistant to:

a) transport jolting with the acceleration 30 m/sec² with impact frequency from 10 to 120 impacts/sec or 15000 impacts with the same acceleration;

b) the ambient temperature minus 50 ... +50 °C;

c) relative air humidity (95 ± 3) % at the ambient temperature +35 °C.

7.2 After transportation under the conditions different to exploitation conditions the BRSS shall be ready to operate after a maximum of six hours.

7.3 The storage room shall be free from current-conducting dust, acid vapors, alkali and gases that cause corrosion and destroy insulation.

8 Manufacturer's Guarantees

The manufacturer guarantees conformity of the BRSS to the requirements of technical conditions provided the transportation, storage, installation and operation conditions are observed.

The guaranteed shelf life of the BRSS is 63 months since the date of manufacture. The guaranteed useful life is 60 months since the day of putting into operation.

The BRSS that is found non-conforming to the requirements of technical conditions shall be replaced by the manufacturer free of charge.

9 Packing Date

Wireless alarm loop expansion unit «Ladoga BRSS-RK-485» ver.1 has been manufactured in compliance with the active technical documentation and classified as fit for operation and packed by «Development and Production Enterprise RIELTA » LLC.

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