

The JA-150R One-way signal repeater of JA-100 wireless components

The JA-150R is a component of the **JABLOTRON 100** system. It serves as the extension of communication range and it raises radio communication reliability in large installations. It selectively repeats signals from one-way detectors and keyfobs (including bi-directional JA-15xJ MS keyfobs). Devices meant to be repeated can be chosen in the repeater's internal settings. It can also repeat commands for non-addressable PG modules in the direction away from the JA-11xR radio module. The repeater is powered by mains electricity and is equipped with a backup battery (it is not included; it has to be bought separately). When the signal strength at the place of installation is too weak, use the AN-868 external antenna and place it at more appropriate place. The repeater occupies one position in the system and it should be installed by a trained technician issued with a valid certificate by an authorised Jablotron distributor.

Application

The repeater significantly extends the RF range of a wireless system. It serves for:

- The extension of communication range to up to the next 300 m (open area).
- Rises communication reliability for devices where the radio signal has to overcome a lot of obstacles.

There can be several repeaters in the system, see figure 1 (the number of repeaters in the system is limited by the number of available positions for devices). The RF signal from a repeater cannot be repeated by another repeater.

Caution! The product doesn't increase the number of positions used in the system meant for devices to be enrolled to.

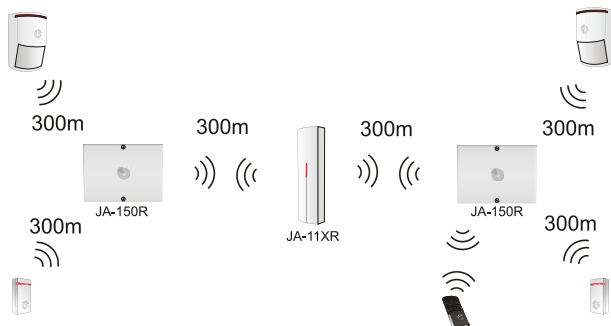


Figure 1: Extension of communication range

Description

It repeats signals from selected one-way devices (and bi-directional JA-15xJ MS keyfobs) enrolled to the control panel. If the repeated device is in RF range of the repeater and also the radio module, then it still works properly. The first received uncorrupted signal is always processed thanks to a unique control panel algorithm. The selection of devices meant to be repeated is done in the internal settings of the repeater from the list which is automatically read from the control panel and it includes only devices supported by repeater:

- Detectors of the JA-15x and JA-18x series
- Keyfobs - JA-154J MS, JA-152J MS, JA-164J, JA-162J

Repeating the signal for non-addressable wireless PG modules (JA-150N and JA-151N) can be enabled on only one repeater in the system (checked by the F-Link SW).

The product uses a backup battery (BAT-4V8-N900) to ensure its functioning when a mains power outage occurs (Caution! It is not included and it has to be ordered extra). When a long term mains power outage occurs, the backup battery is protected against deep discharging. If the voltage measured on the backup battery drops below 4.0 V, the repeater is turned off completely. Devices out of the RF range of any radio module will trigger a fault in the required time (see details in the *control panel installation manual*). Other devices remain working with no limitations.

The AN-868 external antenna helps stabilize the RF signal level when the repeater is installed at a place where the RF coverage is weak. It also serves for better reception of a wireless signal from detectors placed outside the protected premises (example: repeater placed inside the protected premises and the AN-868 external antenna outside on the wall). The antenna is connected to a special connector (10). If the antenna is connected to the repeater and remains connected for a minimum of 10 s, then the repeater starts to use it automatically. Communication is switched back to the internal antenna when an external antenna is tampered (disconnected or shorted out, the tamper indication remains active until the external antenna

is restored). Switching communication from an external to internal antenna can be done manually when the external antenna is not connected after a repeater voltage restart.

Briefly shorting the MAN (13) jumper causes a start-up of the repeater from the backup battery (BAT-4V8-N900). This function is appropriate to looking for the optimal place where the repeater should be installed. Permanent connection of the MAN (13) terminal is allowed during permanent powering from an external power supply without the requirement of a mains power connection. Such a power supply has to be connected instead of the backup battery to the ACCU (8) connector and it has to fulfil the specifications mentioned in the chapter *Technical specifications*. Mind the correct polarity otherwise you risk product damage! To enable this operation mode it is necessary to enable the option *Operation with no mains*, see the chapter *Setting the repeater properties*. Operation of the repeater in the mode of permanent powering from an external power supply doesn't comply with the EN 50131 norm in terms of backing up and fault reporting!

The repeater informs the control panel about a mains power outage, faults, tampers (self-tamper and also a connected external antenna), low backup battery and RF band interference / jamming. For operation mode indication see the LED indicators (14).

LED indication	Description
Yellow ON	Not enrolled to system yet
	No response with radio module
	Internal setting open
Red flashing	Radio communication in progress

Table 1: Description of LED indicators and operation

Installation

The repeater should be installed at the appropriate place where it is not influenced by any other radio devices. If necessary to install the module near bigger metal objects or near electronic appliances or switchboards, keep a minimum distance of 2 m away from them. Fixed installation near electrical cabling (on / under the wall) is unlimited. When several JA-11xR radio modules are installed in the system, they should not be placed next to each other and this is also valid for repeaters. Recommended distances:

- minimum 10 m in open area
- inside the building next to a dry wall or wooden wall, through one wall - min distance 5 m
- inside the building with all other wall types though one wall

Installation process:

1. Open the housing by unscrewing the 2 screws and swivelling the upper cover.
2. Punch the holes for power cables and for the external antenna if needed in the rear housing part (3).
3. Screw the rear housing part (3) on the wall. Or use an installation box to be mounted under the wall surface or use holes in the repeater box corners when you want to install it on a wall.
4. Connect the backup battery (1) at the mentioned position. Fix it by Velcro fastener.
5. Connect the backup battery cables to the connector (8).
6. When an external antenna is going to be used, connect it to its connector (10).
7. The mains power cable connects to its terminals (9). Fix it to the rear housing part using ties.

When connecting the module to the external power, always switch the power off.

To set the module to comply with security grade 2 use F-link SW, Parameters tab and the option "System profiles – EN50131, gr 2". (See the JA-10xK control panel installation manual)

The device can only be connected to mains electricity by a person who has an adequate electrotechnical qualification.



8. Proceed according to the control panel installation manual. Basic procedure:
 - a. When the device is switched on, the yellow LED (14) starts flashing repeatedly to indicate that the module has not been enrolled to the system yet.
 - b. Go to the **F-Link** software, select the required position in the **Devices** tab and launch the enrollment mode by clicking on the **Enroll** option.
 - c. Press the LEARN button on the module (12) – the repeater is thus enrolled to the system and the yellow LED (14) goes off.
9. Close the cover of the module and fix it by screwing the two screws.

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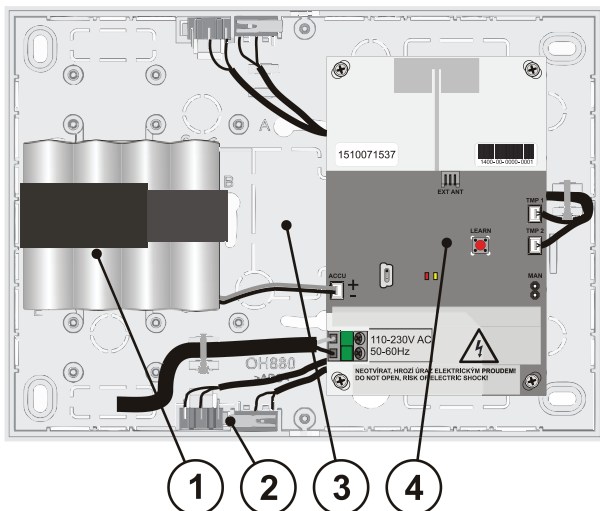


Figure 2: 1 – backup battery; 2 – tamper contacts; 3 – bottom part of the JA-194PL box; 4 – the JA-150R module

Notes:

- The repeater can be enrolled into the system by entering its production code (6) in the F-Link software. All numbers under the bar code shall be entered (example: 1400-00-0000-0001).

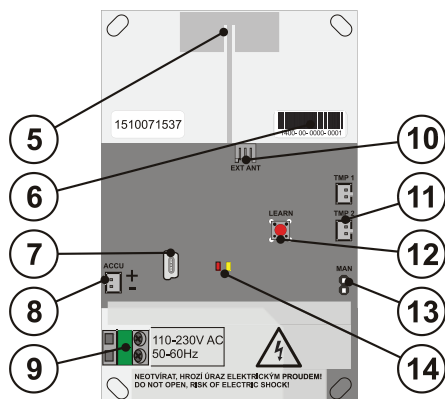


Figure 3: 5 – antenna; 6 – production code; 7 – miniUSB connector; 8 – backup battery connector; 9 – mains terminals and protective foil; 10 – external antenna connector; 11 – tamper contact connectors; 12 – LEARN button; 13 – MAN terminal for manual boot from powered backup battery; 14 – LED indicators

Setting the repeater properties

The repeater properties can be set in the **Devices** tab of the F-Link software. Use the **Internal settings** option at the module position to open a dialogue window where can be set:

Communication indicated by LED: Enabled by factory default. When the parameter is enabled, repeater communication with a wireless device is indicated by a red LED. Communication in service mode is always indicated.

Interference detection: Disabled by factory default. Can be pre-set to two levels – **Low** (jamming / interference lasts longer than 30 sec within one minute) and **High** (jamming / interference lasts longer than 10 sec within 20 sec). When detection is enabled and detected, the system reports an RF jamming / interference fault.

Rear tamper contact: Enabled by factory default. The parameter allows to enable / disable the function of the rear tamper contact. Marked as TMP 2 on the PCB.

Front tamper contact: Enabled by factory default. The parameter allows to enable / disable the function of the front tamper contact. Marked as TMP 1 on the PCB.

Repeats signals for wireless PG modules: Disabled by default. It repeats the signal for wireless modules such as the JA-150N and JA-151N when enabled. The parameter can be enabled in only one repeater in the whole system (checked by F-Link SW).

Operation with no mains: When enabled, the repeater doesn't trigger mains power and backup battery faults. The repeater can also be powered by an external backed-up power supply complying with the parameters mentioned in **Technical specifications**. CAUTION! Mind the correct polarity

otherwise there is a risk that the product could be damaged. The MAN jumper has to be permanently connected to make this operation mode work.

Repeated devices: No device selected by default. A list of all devices enrolled in the system which can be repeated. Checking selected devices, will cause that the repeater starts repeating their signal (the RF signal is received and transmitted again).

Diagnostics

Go to **F-Link** software, **Diagnostics** tab. Here you can get complete overview of the repeater status and of every single repeated wireless device.

On the repeater's position read the following current information:

- **Status:** Show current device status.
- **Battery status / voltage:** Show backup battery voltage - unloaded and loaded.
- **RF signal level:** Shows the repeater RF signal strength at the radio module.
- **Channel:** Shows via which communication path the control panel got the RF signal from the repeater.

Upgrade firmware

The repeater supports the wireless update of firmware, which is carried out using F-Link SW in Service mode.

1. Go to **Control panel** → **Upgrade firmware**. In the offered table the JA-150R module appears. If the F-Link SW includes the latest FW then the repeater is automatically checked for possible upgrading.
2. Press the **OK** button to perform an upgrade of the selected devices.
3. Check the repeater settings via **Devices** → **Internal settings**.
4. Test the repeater function.

Notes:

- The mini USB connector (7) serves firmware upgrading by a direct connection with the PC using a USB cable. This way is recommended when a wireless upgrade was not performed successfully.

Backup battery replacement

The repeater checks the battery status automatically. When a battery fault is triggered we strictly recommend replacing the battery in a very short time to prevent the repeater shutting down completely. Follow the instructions in the chapter Installation (points 4 & 5).

Notes:

- Enter the service mode of the control panel before you change the backup battery
- Use Only a BAT-4V8-N900 backup battery!

Technical specifications

Power	110 – 230 V AC/50 – 60 Hz, protection class II.
Consumption typ. / max.	approx. 0.5 W/1 W (at 230 V AC)
Galvanically separated	(test voltage 4 kV)
Communication frequency	868.1 MHz
Antenna	internal with an option to connect external type AN-868
Compatible with:	Radio module FW JA-11xR LR6x613+ Control panel FW LJ(MD)60420+ F-Link 1.4.0+
Backup battery 4.8V (BAT-4V8-N900)	900 mAh
Type of backup battery	NiCd
Low battery detection	≤ 4.2 V
Protection against discharging	≤ 4.0 V
External power supply voltage range	4,5-8.0 V DC ±10% / 200 mA
Typical battery lifetime	approx. 4 years
PCB dimensions	112 x 66 x 12 mm
JA-194PL dimensions	132 x 182 x 45 mm
Weight of PCB, backup battery, housing	363 g
Classification	security grade 2, ACE type B
According to	EN 50131-1, EN 50131-3, EN 50131-5-3, EN 50130-6
Environment	II. Indoor general (according to EN 50131-1)
Operational temperature range	-10 °C to +40 °C
Also complies with	ETSI EN 300 220, EN 50130-4, EN 55022, EN 60950-1
Can be operated according to	ERC REC 70-03
Certification body:	Trezor Test s.r.o.



JABLOTRON ALARMS a.s. hereby declares that the JA-150R is in a compliance with the relevant Union harmonisation legislation: Directives No: 2014/53/EU, 2014/35/EU, 2014/30/EU, 2011/65/EU. The original of the conformity assessment can be found at www.jablotron.com - Section Downloads.



Note: Although this product does not contain any harmful materials we suggest you return the product to the dealer or directly to the producer after use.