

ReX 2 User Manual

Posted on April 19, 2022



ReX 2 is a radio signal range extender of a security system with support for alarm photo verification. ReX 2 expands the radio communication range between the Ajax devices and the hub up to 2 times. It is designed for indoor installation.

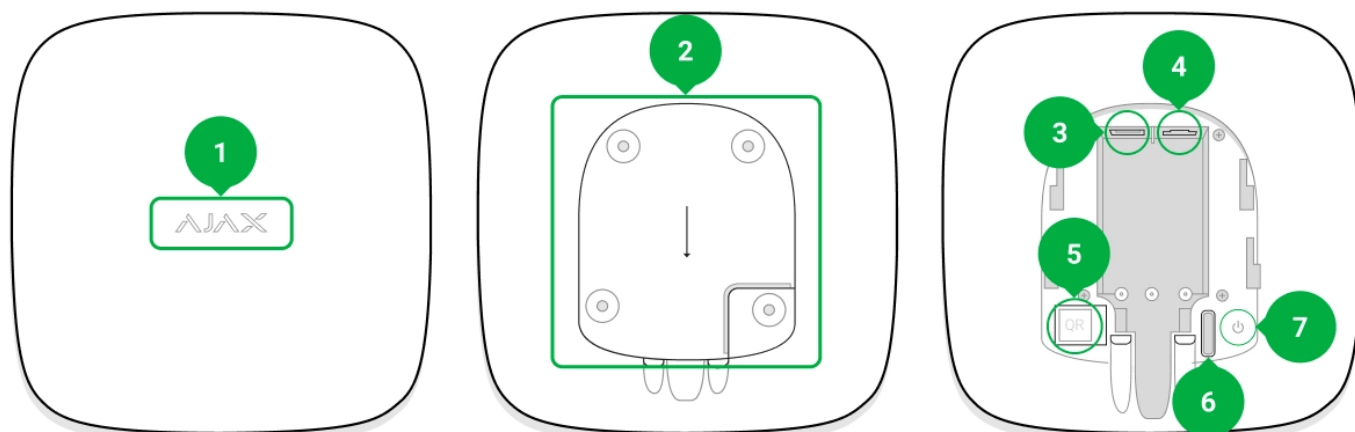
It has a built-in tamper for protection against tampering and is equipped with a backup battery for 38 hours of battery life.



The range extender is compatible with [Hub 2](#) and [Hub 2 Plus](#). Connection to other hubs, as well as [uartBridge](#) and [ocBridge Plus](#) integration modules, is not provided.

The device is added to the system and configured via iOS, Android, macOS, and Windows [apps](#). Users will know about ReX 2 events through push notifications, SMS, and calls (if enabled).

Functional elements



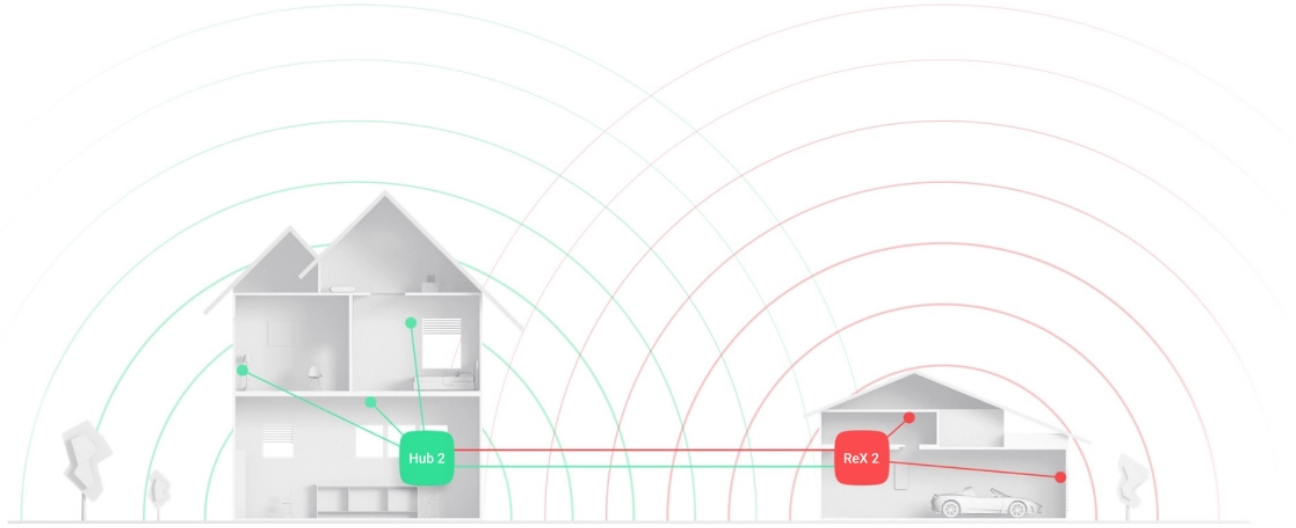
1. Logo with an LED indicator.
2. SmartBracket mounting panel. Slide it down with force to open.



The perforated part is necessary for tamper triggering in case of any attempt to detach the range extender from the surface. Do not break it off.

3. Power cable connector.
4. Ethernet cable socket.
5. QR code with the identifier (service number) of the range extender.
6. Tamper button.
7. Power button.

Operating principle

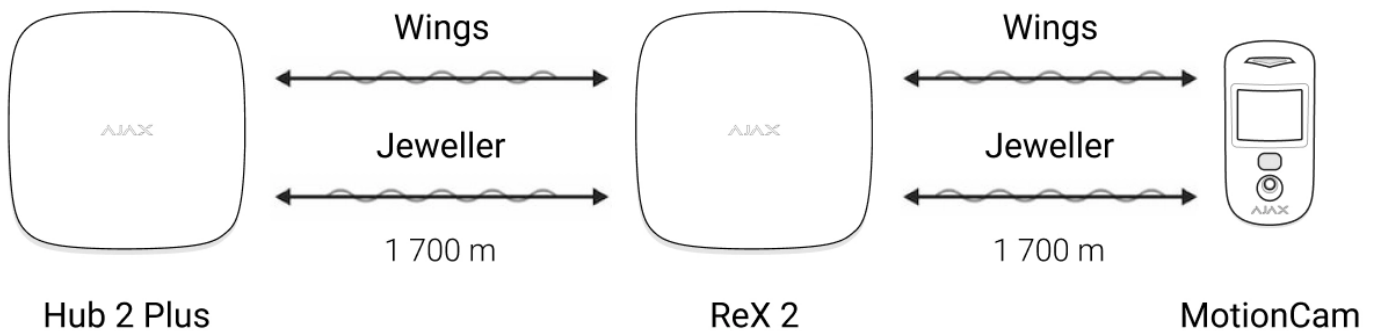


ReX 2 expands the radio communication range of the security system, allowing the installation of Ajax devices at a greater distance away from the hub.

ReX 2 receives hub signals, transmits them to the connected devices, and sends signals from devices to the hub. The hub polls range extender with the frequency of 12 to 300 seconds (depending on the settings, the default value is 36 seconds). ReX 2 range extender polls all connected devices with the same frequency.



Regardless of the settings, all alarms are delivered in no more than 0.3 seconds.



The communication range between ReX 2 and the device is limited by the radio signal range of the device. Radio signal range is indicated on the device page [on the website](#) and in the User Manual.

If the device loses communication with a range extender for some reason, it does not automatically connect to another range extender or hub.

Support of photo verification

ReX 2 radio signal range extender supports connection of detectors with photo verification: MotionCam and MotionCam Outdoor. ReX 2 range extender can transmit not only events and alarms but also photo confirmations.

The time of delivery of a photo via a range extender depends on the type of detector and the resolution of the images:

Detector	Photo resolution	Photo delivery time via range extender
MotionCam	160 × 120	Up to 9 seconds
	320 × 240 (default)	Up to 19 seconds
	640 × 480	Up to 36 seconds
MotionCam Outdoor	320 × 176 (default)	Up to 13 seconds
	640 × 352	Up to 30 seconds

** Values were calculated with a signal strength of 3 bars between ReX 2 and the detector or between the hub and ReX 2. The hub works via Ethernet or 4G.*

Features of photo verification in the Ajax security system

Number of connected range extenders and devices

Depending on the model, the following number of range extenders can be connected to the hub:

Hub model	ReX 2 quantity
Hub 2	5
Hub 2 Plus	5

It doesn't matter exactly what type of range extender is used: **ReX** or **ReX 2**. They can be connected to the system in any combination within the hub limitations.

ReX 2 connects to the hub only directly. Connection to another range extender is not provided.

Please note that ReX 2 does not increase the number of devices connected to the hub. The maximum number of devices connected to ReX 2 depends on the hub model.


Hub model	Number of connected devices
Hub 2	99
Hub 2 Plus	199



Sending events to the monitoring station

Ajax security system can connect to the CMS and transmit alarms and events in SurGard (Contact ID), SIA (DC-09), and other proprietary protocol formats. A complete list of supported protocols is [available here](#).

Which CMSs can the Ajax security system be connected to

The ReX 2 loop (zone) number can be found in the device states. In order to obtain it:

1. Sign in to the [Ajax app](#).
2. Select the hub if you have several of them or if you are using a PRO app.
3. Go to the **Devices**  menu.
4. Select **ReX 2**. The loop (zone) number is displayed at the very bottom of the page.

The ReX 2 loop (zone) number is also available in the **Groups** menu (Ajax app → Devices  → Hub → Settings  → Groups).

In order to find out the loop (zone) number, select the group in which the range extender is located. The Device Number corresponds to the loop (zone) number.

Connection



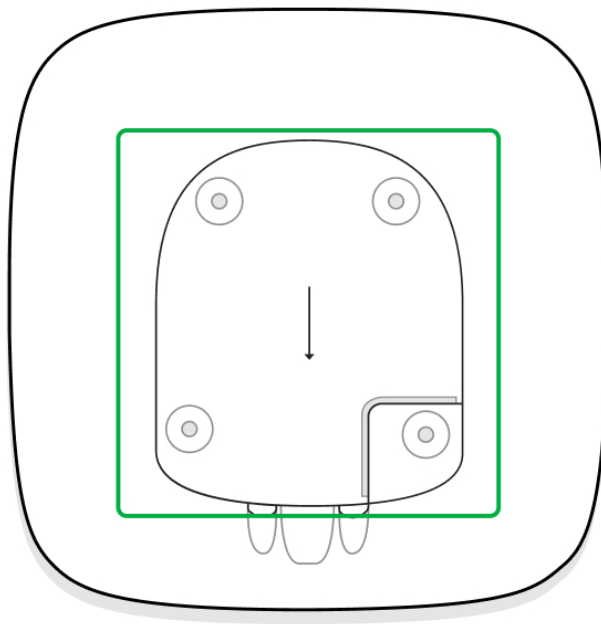
The range extender is compatible with [Hub 2](#) and [Hub 2 Plus](#). Connection to other hubs, as well as [uartBridge](#) and [ocBridge Plus](#) integration modules, is not provided.


Before connecting, make sure that:

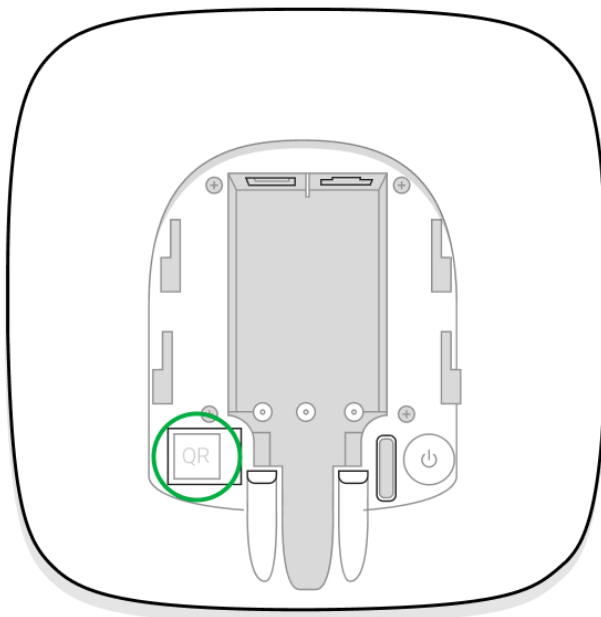
1. The [Ajax app](#) is installed.
2. An [account is created](#).
3. The required hub has been added to the Ajax app.
4. This hub is enabled and at least one room has been created for it.
5. You have administrator rights for this hub.
6. The hub has internet access via at least one communication channel: Ethernet, Wi-Fi, or a cellular connection. You can check this in the Ajax app or through the hub logo on the faceplate. The logo should light up white or green.
7. The hub is disarmed and is not being updated. You can check this through the status of the hub in the Ajax app.

In order to connect ReX 2 to the hub:

1. Remove the SmartBracket mounting panel by sliding it down with force. Do not damage the perforated portion as it is needed to trigger the tamper protecting the range extender from dismantling.

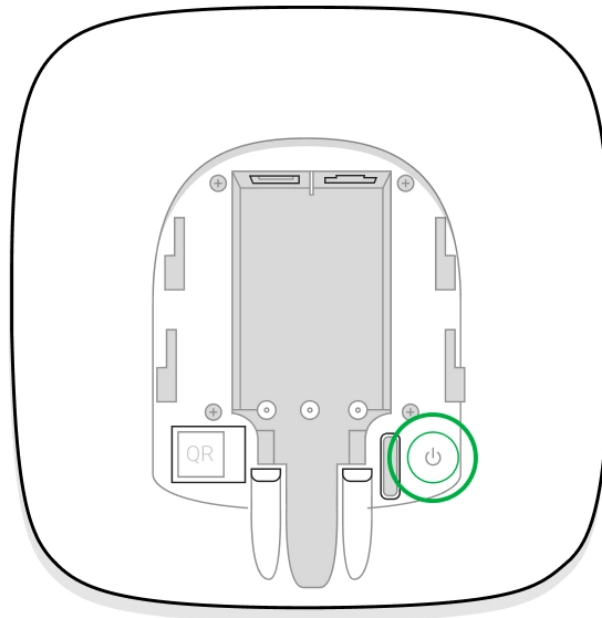


2. Connect ReX 2 to external power.
3. Sign in to the Ajax app.
4. Select the hub if you have several of them or if you are using a PRO app.
5. Go to the **Devices**  tab and click **Add Device**.
6. Name the range extender, scan or enter the QR code manually (indicated on the device body and packaging), and select a room and a group (if the group mode is activated).



7. Click **Add**; the countdown will begin.

8. Turn on ReX 2 by holding the power button for 3 seconds.



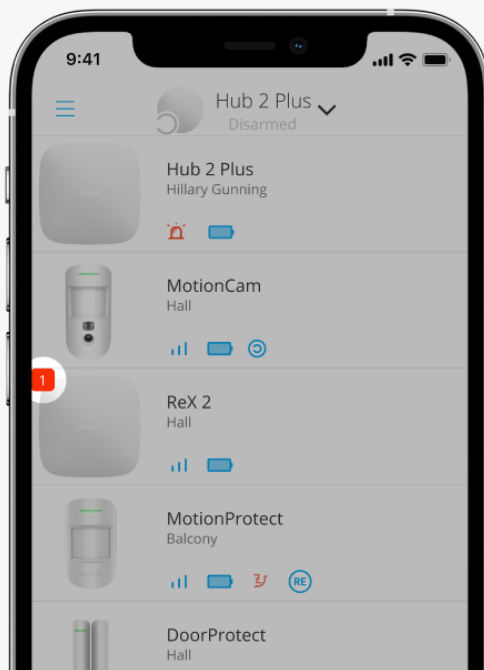
To make sure ReX 2 is connected to the hub, the range extender must be located at the same secured facility as the system (within the range of the hub's radio network).

After connecting to the hub, the logo will change its colour from red to white within 30 seconds. The connected range extender will appear in the list of hub devices in the Ajax app. The updating rate of the **range extender states** depends on the **Jeweller settings**; the default value is 36 seconds.

If the connection fails, turn off ReX 2 and try again after 5 seconds. Suppose the maximum number of devices has been added to the hub (depending on the hub model) when attempting to add the device. In that case, you will receive a corresponding notification in the Ajax app.

Please note that ReX 2 only works with one hub. When connected to a new hub, the range extender stops sending commands to the old one. Once added to a new hub, ReX 2 is not removed from the list of devices of the old hub. This has to be done in the Ajax app.

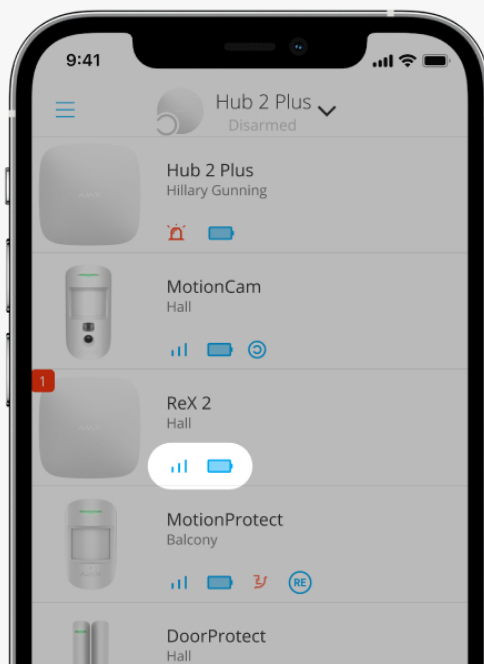
Malfunction badge









When the range extender detects a malfunction (for example, there is no external power supply), the Ajax app displays a badge with counter in the upper left corner of the device icon.

All faults can be seen in the **range extender states**. Fields with faults will be highlighted in red.

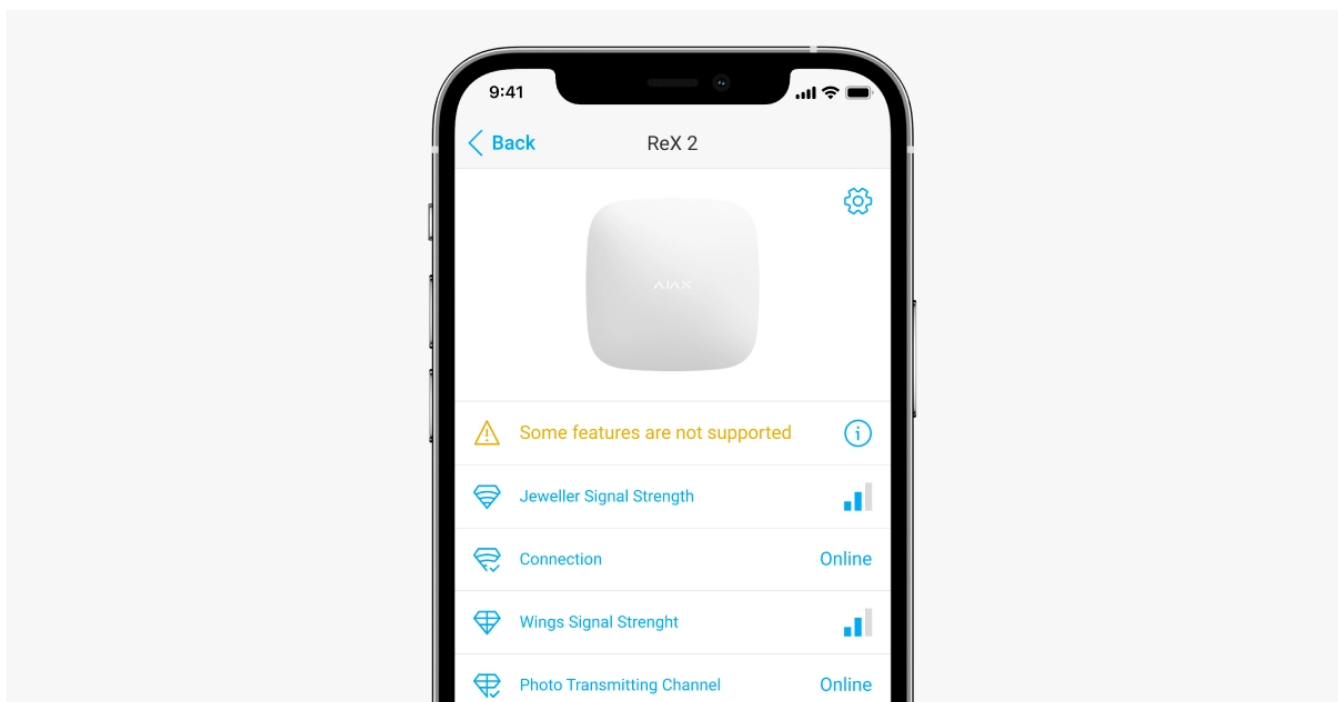
Icons




The icons display some of ReX 2 states. You can view them in the **Devices**  tab in the Ajax app.


Icon	Meaning
	Jeweller Signal Strength. Displays the signal strength between the hub and range extender. The recommended value is 2-3 bars.
	Battery charge level.
	Malfunction detected. A list and description of malfunctions is available in the range extender states.
	ReX 2 is temporarily disabled. <u>Learn more</u>
	ReX 2 has notifications about triggering of the tamper temporarily disabled. <u>Learn more</u>

States



The states include information about the device and its operating parameters. ReX 2 states can be found in the [Ajax app](#):

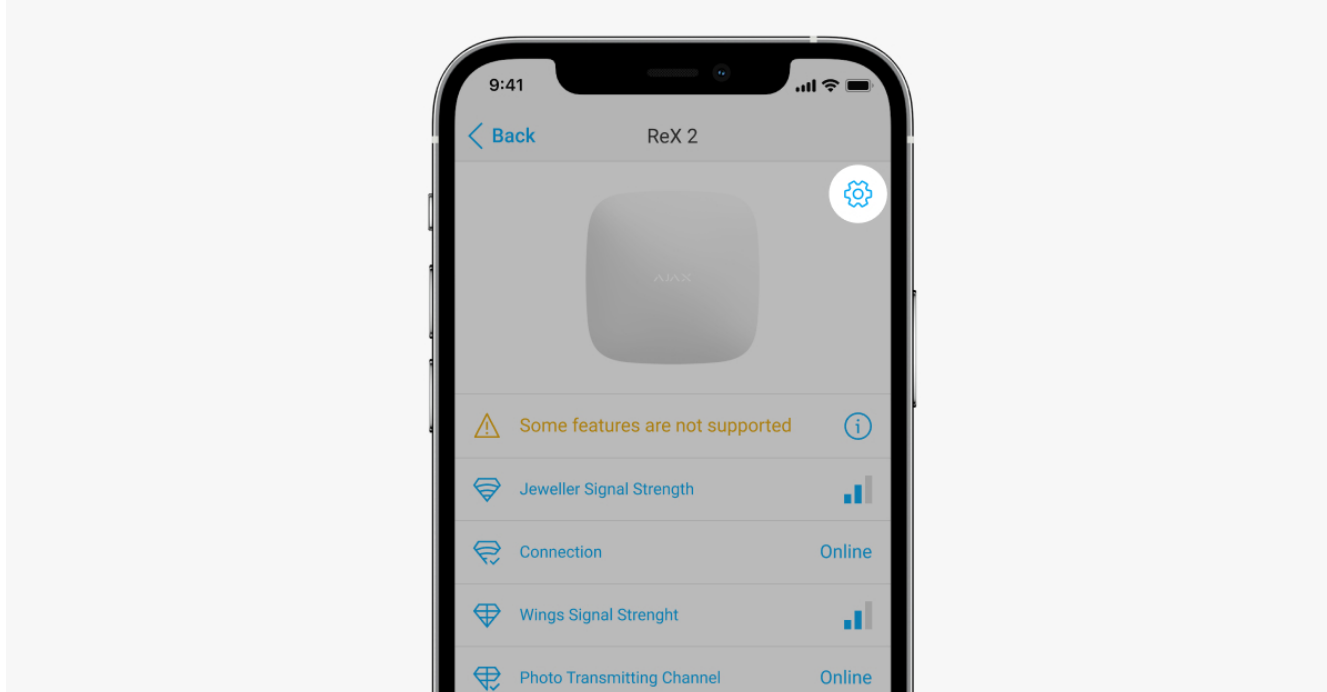
1. Select the hub if you have several of them or if you are using a PRO app.
2. Go to the **Devices**  tab.
3. Select **ReX 2** from the list.

Parameter	Meaning
Some functions do not work	<p>The field is displayed if the firmware versions of the hub and ReX 2 range extender do not match.</p> <p>Make sure that automatic updates are enabled in the hub settings. ReX 2 updates within half an hour if the system is disarmed and a new firmware version is available on the server.</p>
Malfunction	<p>Clicking on  opens the ReX 2 malfunctions list.</p> <p>The field is displayed if a malfunction is detected.</p>
Jeweller Signal Strength	<p>Jeweller signal strength between Hub and ReX 2. Recommended values – 2-3 bars.</p> <p>Jeweller is a protocol for the transmission of events and alarms.</p> <p>Learn more</p>
Connection	<p>Connection status between the hub and ReX 2 range extender:</p> <ul style="list-style-type: none">• Online – the range extender is connected.• Offline – no connection to the range extender.
Wings Signal Strength	<p>Wings signal strength between the hub and ReX 2. Recommended values – 2-3 bars.</p> <p>Wings is a protocol for transmitting MotionCam and MotionCam Outdoor photo verification upon alarm.</p>



	<p>Learn more</p>
Photo transmission channel	<p>Photo transmission channel status:</p> <ul style="list-style-type: none"> • Online – ReX 2 can transmit photos to the hub. • Offline – ReX 2 cannot transmit photos to the hub.
Radio transmitter power	<p>The field is displayed if the Attenuation Test is enabled.</p> <ul style="list-style-type: none"> • Maximum – the maximum power of the radio transmitter is set in the Attenuation Test. • Minimum – the minimum power of the radio transmitter is set in the Attenuation Test.
Battery charge	<p>The charge level of ReX 2 backup battery. Displayed in increments of 5%.</p> <p>Learn more</p>
Lid	<p>The tamper status of the range extender that responds to detachment or violation of the integrity of the body:</p> <ul style="list-style-type: none"> • Open – the range extender mounting panel was removed or the integrity of the device body was violated. • Closed – the range extender is installed on the mounting panel. <p>Learn more</p>
External power	<p>The presence of external power supply 110–240 V:</p> <ul style="list-style-type: none"> • Connected – the external power supply is connected. • Disconnected – the external power supply is disconnected.


Temporary Deactivation	<p>Shows the status of the device temporary deactivation function:</p> <ul style="list-style-type: none"> • No – the device operates normally and transmits all events. • Lid only – the hub administrator has disabled notifications about triggering of the device tamper button. • Entirely – the device is completely excluded from the system operation by the hub administrator. <p>When the range extender is completely turned off, the devices connected to it continue to operate normally via ReX 2.</p> <p><u>Learn more</u></p>
Firmware	<p>ReX 2 firmware version. Updated remotely as soon as the update is available on the Ajax Cloud server.</p> <p><u>Learn more</u></p>
ID	<p>ReX 2 ID/serial number. Also located on the device box, its board, and the body (under the SmartBracket mount).</p>
Device №	<p>Number of the device loop (zone).</p>

Settings



ReX 2 settings can be changed in the [Ajax app](#):

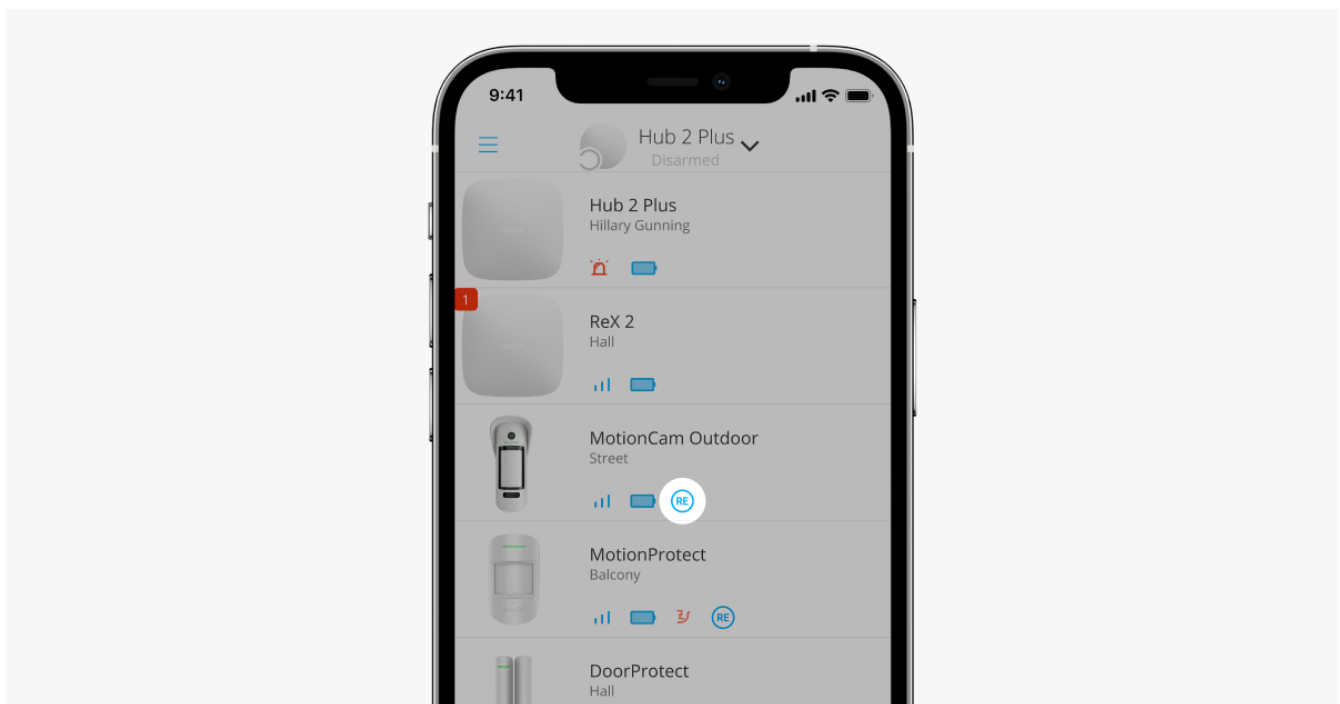
1. Select the hub if you have several of them or if you are using a PRO app.
2. Go to the **Devices**  tab.
3. Select **ReX 2** from the list.
4. Go to **Settings** by clicking on the gear icon  in the upper right corner.
5. Set the required parameters.
6. Click **Back** to save the new settings.

Settings	Meaning
First field	<p>ReX 2 name. Displayed in the text of SMS and notifications in the event feed.</p> <p>To change the device name, click on the pencil icon .</p> <p>The name can contain up to 12 Cyrillic characters or up to 24 Latin characters.</p>
Room	<p>Selecting the virtual room to which ReX 2 is assigned.</p>



	<p>The room name is displayed in the text of SMS and notifications in the event feed.</p>
LED Brightness	<p>Setting the brightness of the Ajax logo backlight on the range extender. Adjustable from 0 to 10 in increments of 1.</p> <p>The default value is 10.</p>
Jeweller Signal Strength Test	<p>Switches ReX 2 to the Jeweller signal strength test mode.</p> <p>The test checks the signal strength between the hub and ReX 2 through the channel for transmitting events and alarms and determines the optimal installation location.</p> <p><u>Learn more</u></p>
Wings Signal Strength Test	<p>Switches ReX 2 to the Wings signal strength test mode.</p> <p>The test checks the signal strength between the hub and ReX 2 through the photo transmission channel and determines the optimal installation location.</p> <p><u>Learn more</u></p>
Signal Attenuation Test	<p>Switches ReX 2 to the signal attenuation test mode.</p> <p>The test decreases or increases the radio transmitter power to simulate a change in the environment to check the stability of the communication between the range extender and the hub.</p> <p><u>Learn more</u></p>
Temporary Deactivation	<p>Allows the hub administrator to disable the device without removing it from the system.</p> <p>Two options are available:</p>


	<ul style="list-style-type: none"> • Entirely – the device will not execute system commands or participate in automation scenarios, and the system will ignore device alarms and other notifications. • Lid only – the system will ignore notifications about the triggering of the device tamper button only. <p>Learn more</p> <p>Please note that the system will only ignore the disabled device. At the same time, devices connected via ReX 2 will continue normal operation.</p>
User Manual	Opens ReX 2 User Manual in the Ajax app.
Unpair Device	<p>Unpairs ReX 2 from the hub and deletes its settings.</p> <p>If detectors have been connected to ReX 2, then after unpairing the range extender they will try to reconnect to the hub.</p>

Connecting devices to ReX 2





In order to assign a device to a range extender, in the Ajax app:

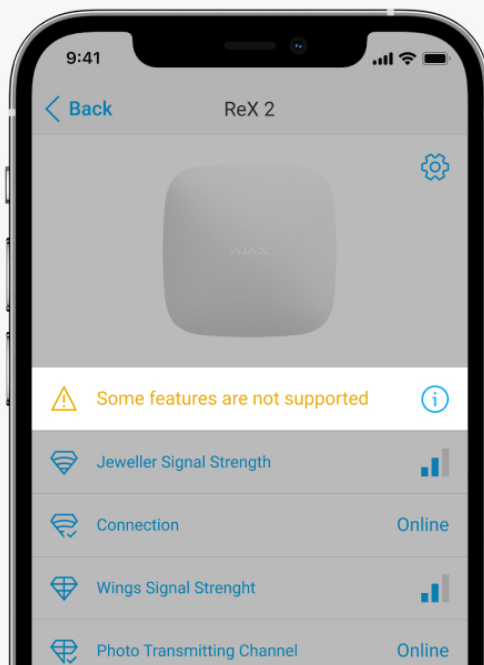
1. Select the hub if you have several of them or if you are using a PRO app.
2. Go to the **Devices**  tab.
3. Select **ReX 2** from the list.
4. Go to **Settings** by clicking on the gear icon  in the upper right corner.
5. Select the **Pair with device** menu item.
6. Select the devices that should operate via the range extender.
7. Click **Back** to save the settings.


Once connected, the selected devices in the Ajax app display the icon . Please note that the device can be paired with one ReX 2 only. When a device is assigned to a range extender, it is automatically disconnected from another connected range extender.

In order to assign a device to the hub, in the Ajax app:

1. Select the hub if you have several of them or if you are using a PRO app.
2. Go to the **Devices**  tab.
3. Select **ReX 2** from the list.
4. Go to **Settings** by clicking on the gear icon  in the upper right corner.
5. Select the **Pair with device** menu item.
6. Uncheck the devices that need to be reconnected to the hub.
7. Click **Back** to save the settings.

Malfunctions



ReX 2 can notify about malfunctions, if any. **Malfunctions** field is available in **Device States**. Clicking on  opens the list of all malfunctions. Note that the field is displayed if a malfunction is detected.

Malfunction	Description	Solution
Some functions do not work.	The field is displayed if the firmware versions of the hub and ReX 2 range extender do not match.	Make sure that automatic updates are enabled in the hub settings. ReX 2 updates within half an hour if the system is disarmed and a new firmware version is available on the server.

Indication



ReX 2 LED indicator may light up white, red, or green, depending on the status of the device.



Indication	Event	Note
Lights up white.	Connection is established with the hub through at least one of the channels: Jeweller or Wings.	If the external power supply is off, the indicator will flash every 10 seconds.
Lights up red.	No communication with the hub.	If the external power supply is off, the indicator will flash every 10 seconds.
Lights up for 3 minutes, then flashes every 10 seconds.	The external power supply is disconnected.	The colour of the indication depends on the presence of connection to the hub.

Functionality testing

ReX 2 functionality tests do not begin immediately, but not later than over a single ping period of the hub–detector (36 seconds with the standard settings of the hub). You can change the ping period of devices in the **Jeweller** menu of the hub settings.

To run a test, in an Ajax app:

1. Select the hub if you have several of them or if you are using a PRO app.

2. Go to the **Devices**  tab.
3. Select **ReX 2**.
4. Go to **Settings** .
5. Select one of the available tests:
 - [Jeweller Signal Strength Test](#)
 - [Wings Signal Strength Test](#)
 - [Signal Attenuation Test](#)

Selection of the installation site

When choosing a location, consider 2 main factors:

- **Jeweller Signal Strength.**
- **Wings Signal Strength.**

You should consider the signal strength both between the hub and the range extender and between the range extender and all devices connected to it.

Locate ReX 2 in a place with stable Jeweller and Wings signal strength (2-3 bars in the Ajax app). When choosing a site for installation, consider the distance between the range extender and the hub and any obstacles between the devices hindering the radio signal passage: walls, intermediate floors, or large-size objects located in the room.

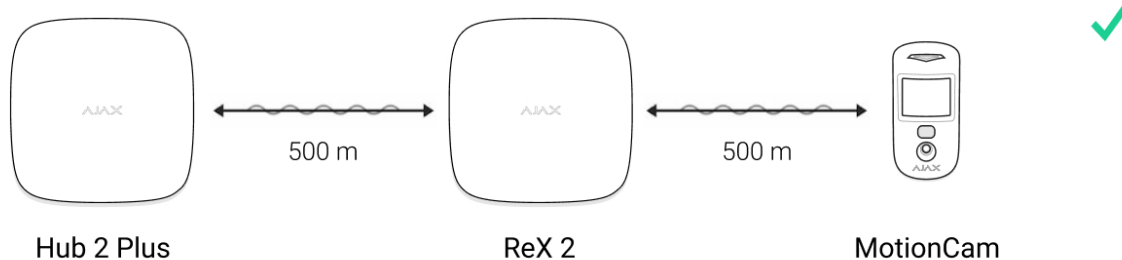
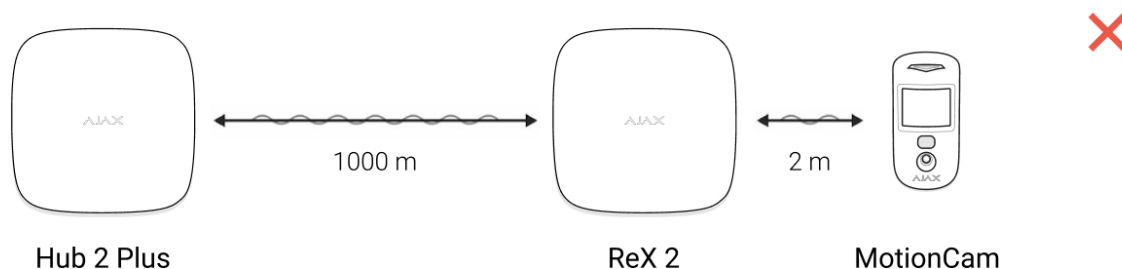


Be sure to check the Jeweller and Wings signal strength at the installation site. If the signal strength is low (a single bar), we cannot guarantee the stable operation of the security system. At the very least, relocate the device as repositioning even by 20 cm can significantly improve the signal reception.

To roughly calculate the signal strength at the place of installation, use our [radio communication range calculator](#).

ReX 2 should be hidden from direct view. This will help reduce the likelihood of sabotage or jamming. Also, keep in mind that the device is intended for indoor installation only.

ReX 2 should be placed between a hub and a device with a weak signal. The range extender does not amplify the radio signal, so if you install it near a hub or device with a signal strength of 1 or 0 bars, this will not give the desired result.



Do not place ReX 2:

- Outdoors. Doing so may cause the device to malfunction or not work properly.
- Near metal objects or mirrors (for example, in a metal cabinet). They can shield and attenuate the radio signal.
- Inside any premises with the temperature and humidity beyond the range of permissible limits. Doing so may cause the device to malfunction or not work properly.
- Close to radio interference sources: less than 1 meter from the router and power cables. This could result in the loss of connection with the hub or devices connected to the range extender.
- In places with low or unstable signal strength. This could result in the loss of connection with the hub or devices connected to the range extender.

Installation



Before installing the range extender, make sure that you have selected the optimal location and that it complies with the requirements of this manual.

When installing and operating the device, follow the general electrical safety rules for using electrical appliances and the requirements of electrical safety regulations.

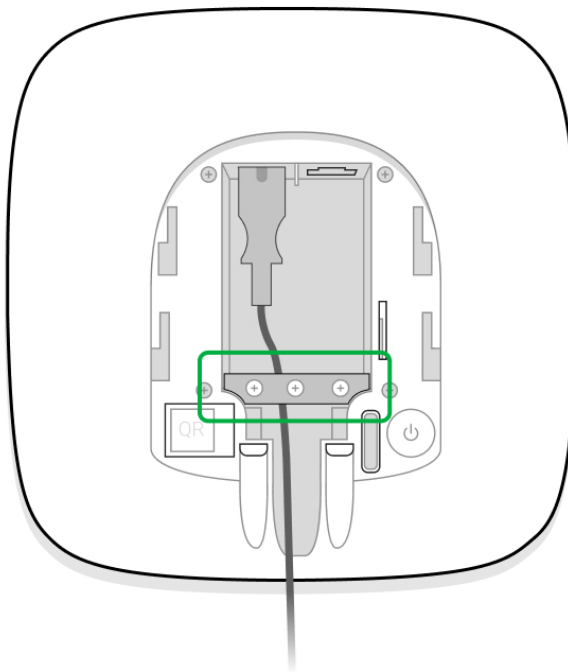
To install ReX 2:

1. Fix the SmartBracket mounting panel with the bundled screws. When using other fasteners, make sure they do not damage or deform the panel. When attaching, use at least two fixing points. To make the tamper react to attempts to detach the device, be sure to fix the perforated corner of SmartBracket.

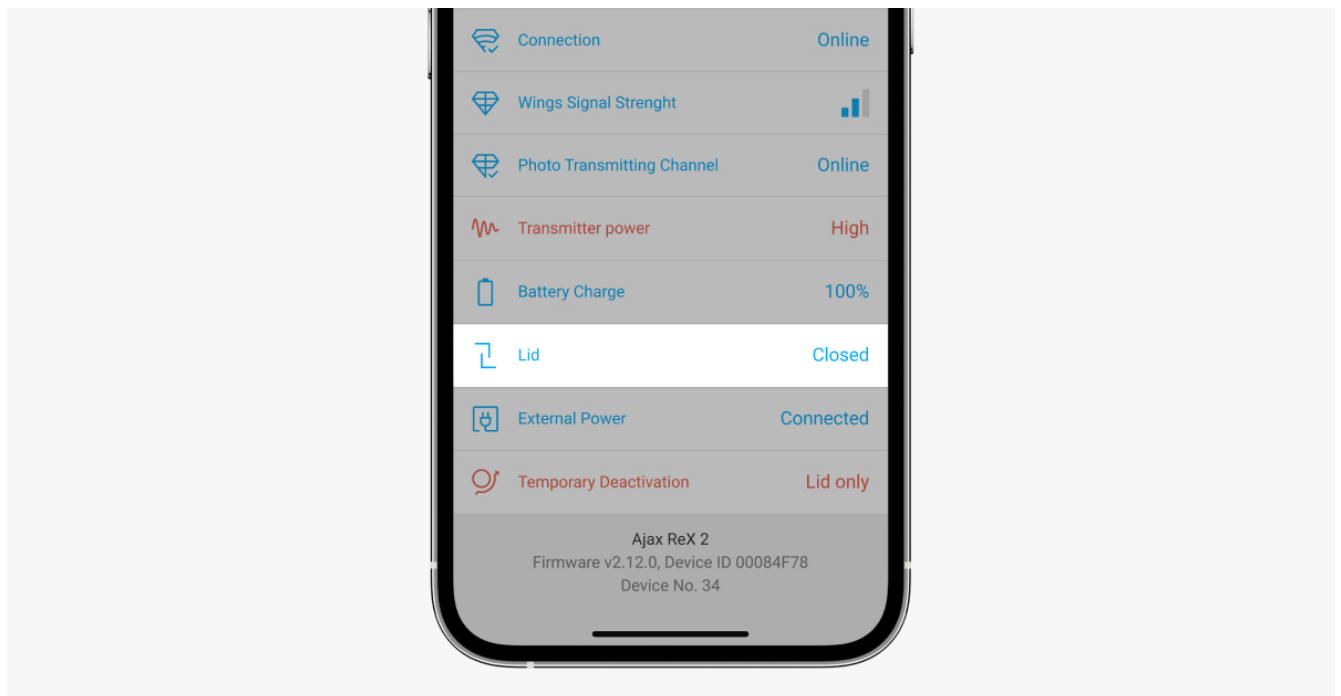


Do not use double-sided adhesive tape for mounting. This can cause the range extender to fall. The device may fail if hit.

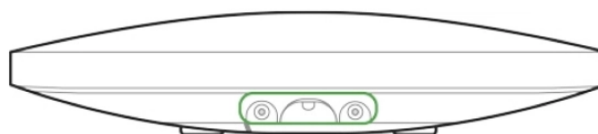
2. Connect the power cable to the range extender. Turn on the device.
3. Secure the cable with a plastic retainer plate. This will reduce the likelihood of sabotage as it takes a lot more to tear away a secured cable.



4. Slide ReX 2 onto the mounting panel. After installation, check the tamper status in the Ajax app and then the quality of the panel fixation. You will receive a notification if an attempt is made to tear the range extender off the surface or remove it from the mounting panel.



5. Fix ReX 2 on the SmartBracket panel with bundled screws.





Do not turn the range extender upside down or sideways when mounting it vertically (for example, on a wall). When properly fixed, the Ajax logo can be read horizontally.

Maintenance

Check the functionality of ReX 2 regularly. The optimal frequency of checks is once every three months. Clean the body from dust, cobwebs, and other contaminants as they emerge. Use a soft dry cloth that is suitable for equipment care.

Do not use any substances containing alcohol, acetone, gasoline and other active solvents for cleaning the range extender.

If ReX 2 battery becomes faulty and you wish to replace it, use the following guidance:

How to replace ReX 2 battery

Tech specs

General settings	
Classification	Radio signal range extender
Colour	White, black
Installation method	Indoors
Limitations	
Compatibility with hubs	<u>Hub 2</u>, <u>Hub 2 Plus</u>
Number of ReX 2 connected to the hub	<ul style="list-style-type: none">• Hub 2 – 5• Hub 2 Plus – 5
Number of devices connected to ReX 2	Depends on the hub model: <ul style="list-style-type: none">• Hub 2 – 99• Hub 2 Plus – 199

Communication	
Communication protocols	<p>Encrypted two-way radio protocols:</p> <ul style="list-style-type: none"> • <u>Jeweller</u> – for transmitting events and alarms • Wings – for transmitting photos
Radio communication range	<p>Up to 1,700 m without obstacles</p> <p><u>Learn more</u></p>
Radio frequency band	<p>866.0 – 866.5 MHz 868.0 – 868.6 MHz 868.7 – 869.2 MHz 905.0 – 926.5 MHz 915.85 – 926.5 MHz 921.0 – 922.0 MHz Depends on the region of sale.</p>
Radio signal modulation	GFSK
Maximum effective radiated power (ERP)	≤ 20 mW
Polling interval	12–300 s (set by administrator in the app)
Delivery speed of alarms from the detector to the hub via a range extender	0.3 s
Delivery speed of photos from the detector to the hub via a range extender	<p>18 seconds (depending on settings)</p> <p><u>Learn more</u></p>
Power supply	
Power supply source	110–240 V AC, 50/60 Hz
Backup battery	Li-Ion 2 Ah (up to 38 hours of battery life)
Anti-sabotage protection	
Tamper	+
Radio frequency hopping	+
Fraud protection	+

Lid	
Operating temperature range	From -10°C to +40°C
Operating humidity	Up to 75%
Dimensions	163 × 163 × 36 mm
Weight	410 g
Service life	10 years

Compliance with standards

Complete set

1. ReX 2.
2. SmartBracket mounting panel.
3. Power cable.
4. Installation kit.
5. Quick Start Guide.