Relay User manual

Updated September 6, 2024



Relay is a dry contact relay to control a power supply remotely. The relay's dry contacts are electrically isolated to the power supply circuit of the device. Relay can be used in both low-voltage and domestic power grids. The device features two types of protection: voltage and temperature.

Only a qualified electrician or installer should install Relay.

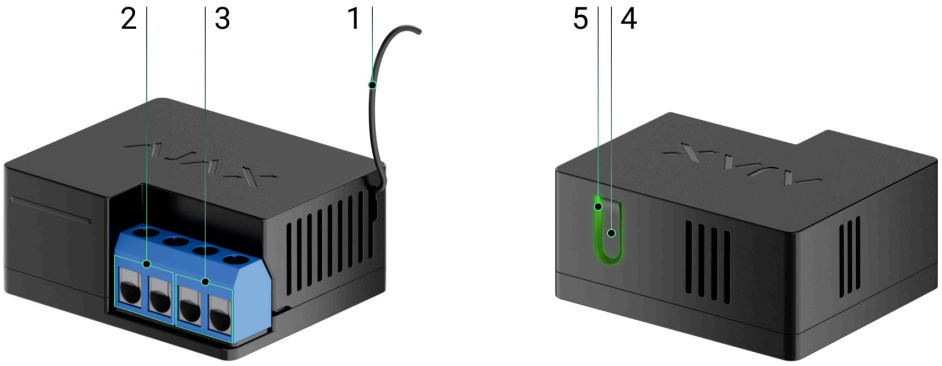
The relay can control the power supply of electrical appliances connected to the circuit via the **Ajax apps**, **automation scenarios**, via relay function button, or by pressing **Button**.

Relay is connected to the Ajax system via the Jeweller radio protocol. The communication range is up to 1,000 meters in an open space. The device works

only with Ajax **radio signal range extenders** and **hubs**.

Buy Relay

Functional elements



1. Antenna.

2. Power supply terminal block.

3. Terminal block to connect appliances.

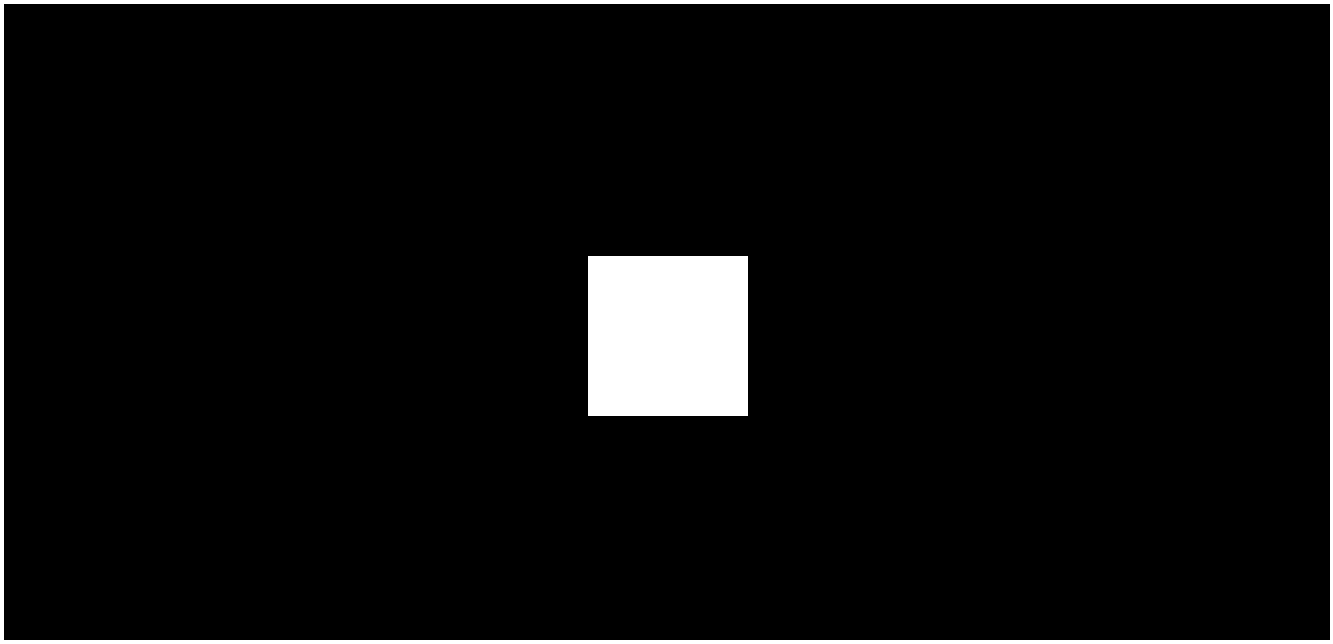
4. Function button.

5. LED indicator.



- **PS IN terminals** — “+” and “-” connection terminals of a 7–24 V⎓ power supply.
- **Relay terminals** — output potential-free terminals of Relay contacts to connect appliances.

Operating principle



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Relay is a dry contact relay to control a power supply remotely. The relay is installed in the electrical circuit gap to control the power supply of devices connected to this circuit. Relay is controlled via the device function button (by pressing and holding it for 2 seconds), the Ajax app, **Button**, and **automation scenarios**.

Relay is powered by a 7–24 V⎓ power supply. Recommended power supply voltages: 12 V⎓ and 24 V⎓.

Relay features potential-free (dry) contacts. Dry contacts are electrically isolated to the relay's power supply. Thus, this device can be used in low-voltage and household networks, for example, to simulate a button, a toggle switch, or to control water shut-off valves, electromagnetic locks, irrigation systems, gates, barriers, and other systems.

Relay commutes one single pole of the electrical circuit. The relay can operate in bistable or pulse mode. In pulse mode, you can set its duration: from 0.5 to 255 seconds. The operating mode is selected by users or PRO with admin rights in the Ajax apps.

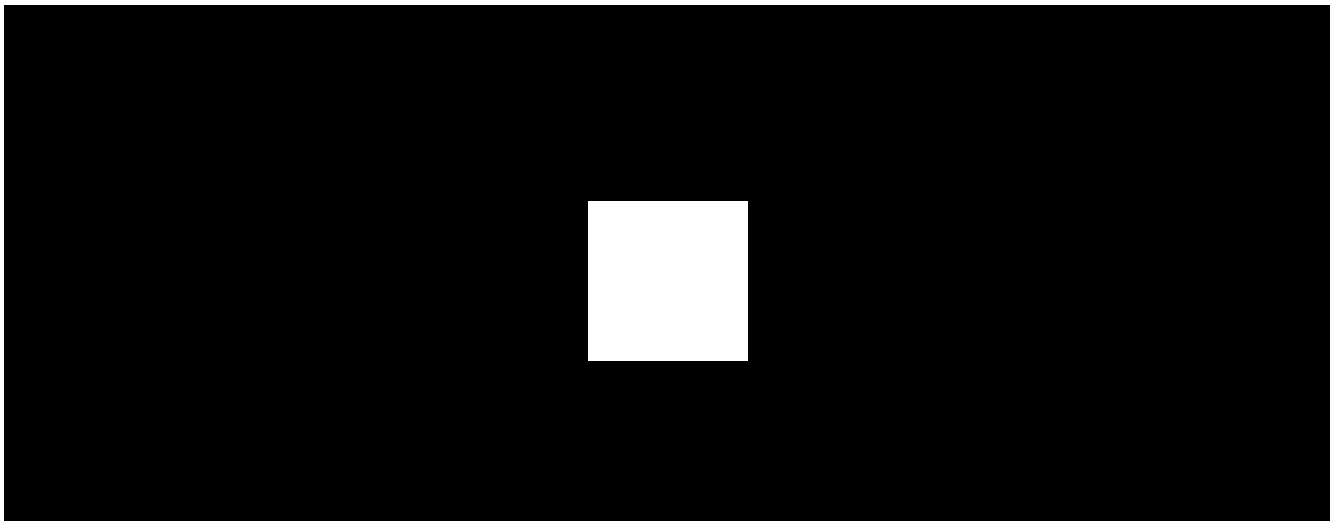
A user or a PRO with admin rights can select the normal state of the relay contacts:

- **Normally closed** — the relay stops supplying power when activated and resumes when deactivated.
- **Normally open** — the relay supplies power when activated and stops when deactivated.

Relay measures supply voltage. This data, along with other operating parameters of the relay, is available in the device **States**. Relay states update frequency depends on the **Jeweller** or **Jeweller/Fibra** settings. The default value is 36 seconds.

Relay maximum resistive load is 5 A at 36 V⎓ and 13 A at 230 V~.

Automation scenarios



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Ajax's scenarios offer a new level of security. With them, the security system not only notifies about threats, but also actively resists them.

Scenario types with Relay and examples of usage:

- **By alarm.** Lighting is switched on when an opening detector activates the alarm.

- **By security mode change.** The electric lock is automatically blocked when the object is armed.
- **By schedule.** The irrigation system in the yard is switched on according to the schedule at the specified time. Lighting and TV are switched on when the owners are away, so the house doesn't seem empty.
- **By pressing Button.** Switching on night lighting by pressing the smart button.
- **By temperature.** The heating is turned on when the temperature in the room is lower than 20°C.
- **By humidity**. The humidifier is switched on when the humidity level drops below 40%.
- **By CO_2 concentration**. Supply ventilation is turned on when the carbon dioxide concentration level exceeds 1000 ppm.



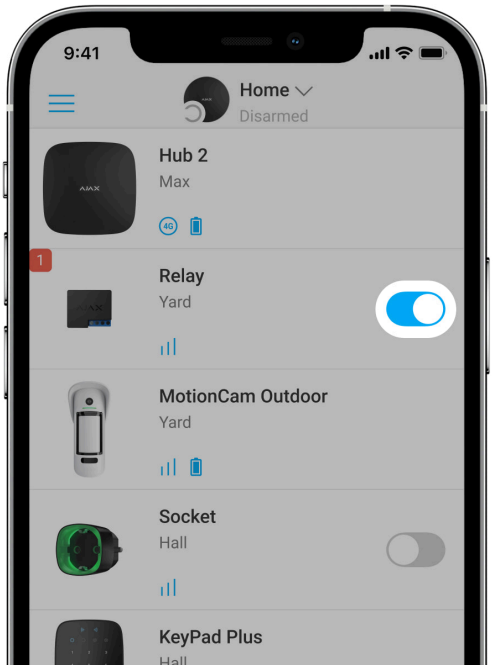
Scenarios by the Button pressing are created in the Button settings, scenarios by the humidity and CO_2 concentration levels are created in the LifeQuality settings.

If the device is offline, it will not execute the scenario as it misses the scenario trigger (e.g., during a power outage or when the connection between the hub and device is lost).

Use case: The automated action is scheduled for 10 a.m., so it must start at 10 a.m. The electrical power goes out at 9:55 a.m. and is restored ten minutes later. The automation scenario won't start at 10 a.m. and will not start immediately after the power is back on. This scheduled action is missed.

More about scenarios

Control via the app



In **Ajax apps**, you can switch on and off electrical appliances connected to an electrical circuit controlled by Relay.

Click the toggle in the Relay field in the **Devices** menu: the state of the relay contacts will change to the opposite, and the connected electrical device will switch off or on. This way, a security system user can remotely control the power supply, for example, for lighting or an electric lock.

When Relay is in pulse mode, the toggle will change from on/off to pulse.

Protection types

Relay has two types of protection that operate independently: voltage and temperature.

Voltage protection: is activated if the relay supply voltage exceeds the range of 6.5–36.5 V⎓. Protects Relay from voltage surges.

Temperature protection: is activated if the relay heats up to temperatures above 65°C. Protects relay from overheating.

When voltage or temperature protection is activated, the power supply through Relay is stopped. Power supply resumes automatically when voltage or temperature parameter returns to normal.

Jeweller communication protocol

Relay uses the Jeweller radio protocol to transmit alarms and events. This wireless protocol provides fast and reliable two-way communication between the hub and connected devices.

Jeweller supports block encryption with a floating key and authentication of devices at each communication session to prevent sabotage and device spoofing. The protocol involves regular polling of devices by the hub at intervals of 12 to 300 seconds (set in the Ajax app) to monitor communication with all devices and display their statuses in the Ajax apps.

Learn more about Jeweller

More about Ajax encryption algorithms

Sending events to the monitoring station

The Ajax security system can transmit alarms and events to the **PRO Desktop** monitoring app as well as the central monitoring station (CMS) via SurGard (Contact ID), SIA DC-09 (ADM-CID), ADEMCO 685, and other proprietary protocols.

Which CMSs Ajax hubs can be connected to

With PRO Desktop, the CMS operator receives all Relay events. In other cases, a monitoring station receives only notification about connection loss between Relay and the hub (or range extender).

The addressability of Ajax devices allows sending not only events but also the type of the device, its assigned name, and room to PRO Desktop/CMS (the list of transmitted parameters may vary depending on the type of the CMS and the protocol selected for communication with the CMS).

The device ID and zone number can be found in the Relay States in the Ajax app.

Selecting the installation spot



A 39 × 33 × 18 mm device is connected to the circuit gap. Relay dimensions allow installing the device into the deep junction box, inside the electrical appliance enclosure, or in the distribution board. A flexible external antenna ensures stable communication. To install Relay on a DIN rail, we recommend using a **DIN Holder**.

Relay should be installed in a place with a stable Jeweller signal strength of 2–3 bars. To roughly calculate the signal strength at the place of installation, use a **radio communication range calculator**. Use a **radio signal range extender** if the signal strength is less than 2 bars at the intended installation location.

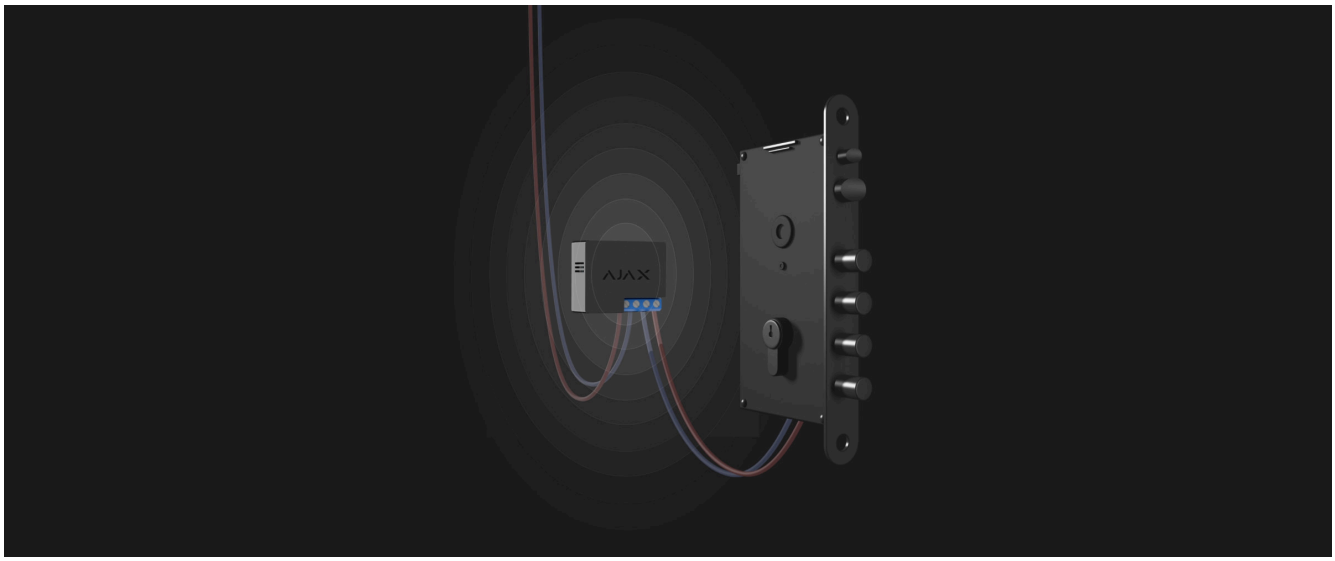
If you install Relay outdoors, place the device in a sealed box. This will protect against the condensation, which can damage Relay.

Do not place Relay:

1. In rooms where the humidity and temperature indicators do not correspond to the operating parameters. This may damage the device or cause it to malfunction.

2. Near sources of radio interference: for example, at a distance of less than 1 meter from a router. This can lead to a loss of connection between Relay and the hub (or range extender).
3. In places with low or unstable signal strength. This can lead to a loss of connection between the relay and the hub (or range extender).

Installing



Only a qualified electrician or installer should install Relay.

Before installing the relay, ensure 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.

It is recommended to use cables with a cross-section of 0.75–1.5 mm² (22–14 AWG). Relay should not be connected to circuits with more than 5 A load at 36 V⎓ and 13 A at 230 V~.

To install Relay:

1. If you install Relay on a DIN rail, fix **DIN Holder** on it first.

2. De-energize the power cable to which Relay will be connected.
3. Connect the “**+**” and “**–**” to the power supply terminal block of Relay.
4. Connect the Relay terminals for appliance connection to the circuit. We recommend using cables with a cross-section of 0.75–1.5 mm² (22–14 AWG).
5. When installing the device in a distribution box, lead the antenna out. The bigger the distance between the antenna and metal structures, the lower the risk of interfering with the radio signal.
6. Place the relay in DIN Holder. If the relay is not mounted on the DIN rail, we recommend securing the device with double-sided tape if it’s possible.
7. Secure the cables if necessary.



Do not shorten or cut the antenna. Its length is optimal for operation in the Jeweller radio frequency range.

After installing and connecting the relay, be sure to run the Jeweller Signal Strength Test and also test the overall operation of the relay: how it responds to commands and whether it controls the power of the devices.

Connecting

Before connecting the device

1. Install the **Ajax app**. Log in to your account or **create a new account** if you don’t have one.
2. Add a compatible hub to the app, configure the necessary settings, and create at least one **virtual room**.
3. Ensure that the hub is on and has Internet access via Ethernet, Wi-Fi, and/or cellular network. You can do this in the Ajax app or by checking the hub LED indicator. It should light up white or green.

4. Ensure the hub is not armed and does not start updates by checking its status in the Ajax app.

> Only a user or a PRO with admin rights can connect the relay to the hub.

To pair Relay with the hub

1. Connect Relay to a 7–24 V⎓ supply circuit if you haven't done this before.
2. Sign in to the Ajax app.
3. Select a hub if you have several of them or if you are using the PRO app.
4. Go to the **Devices** menu and click **Add Device**.
5. Name the device, select the room, scan the QR code (can be found on the relay body and packaging), or type the device ID.



6. Click **Add**. The countdown will begin.
7. Press the Relay function button.

For the relay to connect, it must be within the range of the hub's radio coverage. If the connection fails, try again in 5 seconds.

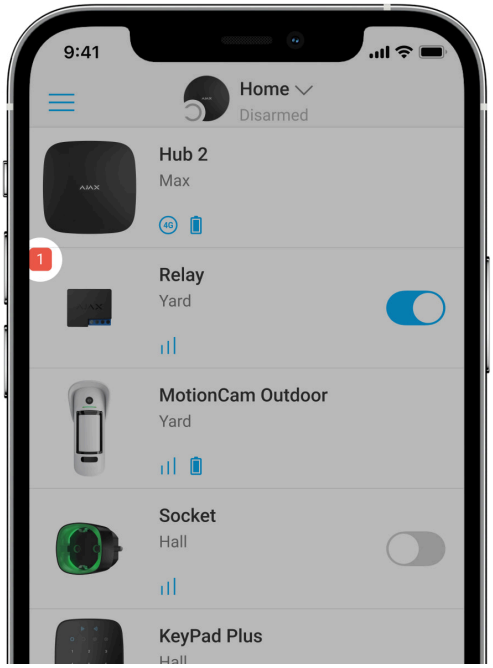
If the maximum number of devices is already added to the hub, you will get a notification about exceeding the device limit in the Ajax app when you try to add the relay. The maximum number of devices connected to the hub depends on the model.

Hub models and their differences

Relay works with one single hub; when connected to a new hub, it does not send notifications to the previous one. Once added to a new hub, Relay is not removed from the list of devices of the old hub. This has to be done in the Ajax app.

After pairing with the hub and removing from the hub the relay contacts are open.

Malfunction counter



In case of Relay fault (e.g., no Jeweller signal between the hub and the relay), the Ajax app displays a malfunction counter in the upper-left corner of the device icon.

Malfunctions are displayed in the relay **States**. Fields with malfunctions will be highlighted in red.

Malfunction is displayed if:

- Temperature protection was activated.
- Voltage protection was activated.

- There is no connection between Relay and the hub (or radio signal range extender).

Icons

The icons display some Relay states. You can check them in the Ajax app in the **Devices** tab.

Icon	Meaning
	Jeweller signal strength between Relay and the hub or a radio signal range extender. The recommended value is 2–3 bars. **Learn more**
	The device is connected via a **radio signal range extender**. The field is not displayed if Relay works directly with the hub.
	Voltage protection was activated. **Learn more**
	Temperature protection was activated. **Learn more**
	The device was not transferred to the new hub. **Learn more**

States

The states include information about the device and its operating parameters. Relay states are available in the Ajax app. To access them:

1. Go to the **Devices** tab.

2. Select **Relay** in the list.

Parameter	Meaning
Jeweller Signal Strength	The signal strength of connection via Jeweller between the hub/range extender and the device. Recommended values: 2–3 bars. Jeweller is the protocol for transmitting events and alarms. **Learn more about Jeweller**
Connection via Jeweller	The state of connection via Jeweller between the hub/range extender and the device: • **Online** — the relay is connected with the hub or the range extender. • **Offline** — no connection with the hub or the range extender.
ReX	Displays the status of the device connection to the **radio signal range extender**: • **Online** — the device is connected. • **Offline** — no connection with the device. The field is displayed if the device is operated via the radio signal range extender.
Active	The relay state: • **Yes** — relay contacts are closed. The connected electrical appliance is energized. • **No** — relay contacts are open. No current is being supplied to the connected appliance.

	The field is displayed if Relay operates in the bistable mode.
Voltage	The current voltage value at the Relay input. The frequency of value updates depends on the Jeweller settings. The default value is 36 seconds. The voltage values are displayed in increments of 0.1 V.
Deactivation	Displays the state of the device permanent deactivation function: • **No** — the device operates normally, responds to commands, runs scenarios, and transmits all events. • **Entirely** — the device is excluded from the system operation. The device doesn't respond to commands, doesn't run scenarios, and doesn't transmit events. Learn more
Firmware	Device firmware version.
Device ID	Device identifier. Also available via the QR code applied to the device body and packaging.
Device №	The number of the Relay loop (zone).

Settings

To change the Relay settings in the Ajax app:

1. Go to the **Devices** tab .
2. Select **Relay** in the list.
3. Go to **Settings** by clicking on the gear icon .

4. Set the necessary parameters.

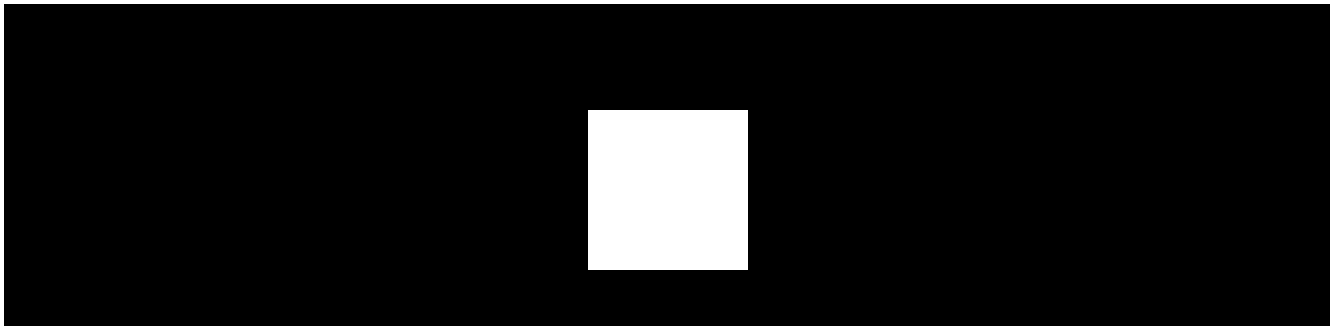
5. Click **Back** to save the new settings.

Settings	Meaning
Name	Device name. It is displayed in notifications in the event feed, the list of hub devices, and SMS texts. Click on the pencil icon . The name can contain up to 12 Cyrillic characters or 24 Latin characters.
Room	Selecting the virtual room for Relay. The room name is displayed in SMS and notifications in the event feed.
Notifications	Selecting the relay notifications: • **When switched on/off** — the user receives notifications from the device switching its state. • **When scenario executed** — the user receives notifications about the execution of scenarios involving this device. The setting is available when the relay is connected to all hubs (except for the Hub model) with firmware version OS Malevich 2.15 or higher and in apps of the following versions or higher: • Ajax Security System 2.23.1 for iOS • Ajax Security System 2.26.1 for Android • Ajax PRO: Tool for Engineers 1.17.1 for iOS • Ajax PRO: Tool for Engineers 1.17.1 for Android • Ajax PRO Desktop 3.6.1 for macOS

	• Ajax PRO Desktop 3.6.1 for Windows
Relay Mode	Selecting the Relay operating mode: • **Pulse** — Relay generates a pulse of a specified duration when activated. • **Bistable** — Relay changes the state of the contacts to the opposite (e.g., closed to open) when activated.
Pulse Time	The pulse duration selection: 0.5 to 255 seconds. The configuring is available when Relay operates in the pulse mode.
Contact State	Selecting the normal state of the relay contacts: • **Normally closed** (NC) — the relay contacts are closed in the normal state. The connected electric appliance is supplied with current. • **Normally open** (NO) — the relay contacts are open in the normal state. The connected electric appliance is not supplied with current.
Scenarios	Opens the menu for creating and configuring automation scenarios. Scenarios offer a brand-new level of property protection. With them, the security system not only notifies about a threat but also actively resists it. Use scenarios to automate security. For example, switch on lighting at the facility when an opening detector raises the alarm. **Learn more**
Jeweller Signal Strength Test	Switches the relay to the Jeweller Signal Strength Test mode.

	The test allows checking the Jeweller signal strength and the stability of the connection between a hub or a range extender and a relay to choose the best place for installing the device. **Learn more**
User Guide	Opens the Relay User Manual in the Ajax app.
Deactivation	Allows disable the device without removing it from the system. Two options are available: • **No** — the device operates normally, responds to commands, runs scenarios, and transmits all events. • **Entirely** — the device is excluded from the system operation. The relay doesn't respond to commands, doesn't run scenarios, and doesn't transmit events. **After deactivation, Relay will keep the previous state: active or inactive.** **Learn more**
Unpair Device	Remove Relay from a hub and delete its settings.

Indication



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Relay LED indicator flashes periodically if the device is not connected to the hub. When you press the Relay function button, the LED indicator lights up green.

Functionality testing

Relay functionality tests do not begin immediately but not later than over a single hub—device polling interval (36 seconds with default **Jeweller** or **Jeweller/Fibra** settings). You can change the device polling period in the **Jeweller** or **Jeweller/Fibra** menu in the hub settings.

To run a test in the Ajax app:

1. Select the hub if you have several of them or if you are using the PRO app.
2. Go to the **Devices** tab.
3. Select Relay.
4. Go to **Settings**.
5. Select and run the **Jeweller Signal Strength Test**.

Maintenance

The device requires no technical maintenance.

Technical specifications

If you use inductive or capacitive load, the maximum switching current decreases to 3 A at 24 V⎓ and 8 A at 230 V~.

All technical specifications of Relay Jeweller

Compliance with standards

Complete set

1. Relay.
2. Double-sided tape.
3. Quick Start Guide.

Warranty

Warranty for the Limited Liability Company “Ajax Systems Manufacturing” products is valid for 2 years after the purchase.

If the device does not function correctly, please contact the Ajax Technical Support first. In most cases, technical issues can be resolved remotely.

Warranty Obligations

User Agreement

Contact Technical Support:

- **e-mail**
- **Telegram**
- Phone number: 0 (800) 331 911

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