

# Hub Hybrid User manual

Updated May 15, 2023



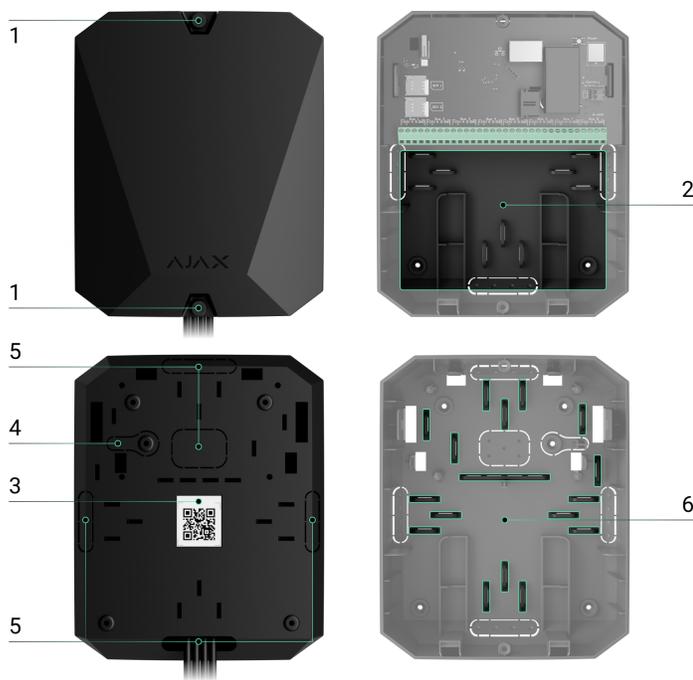
**Hub Hybrid** is a hybrid control panel of the Ajax security system. Compatible with wired and wireless Ajax devices. Controls the operation of connected devices, interacts with the user and the security company. Intended for indoor installation.

Hub Hybrid needs Internet access to connect to the Ajax Cloud service. Available communication channels: Ethernet and two SIM cards. The hub is available in two versions: with 2G and 2G/3G/4G (LTE) modem.

[Buy Hub Hybrid](#)

## Functional elements

## Casing elements



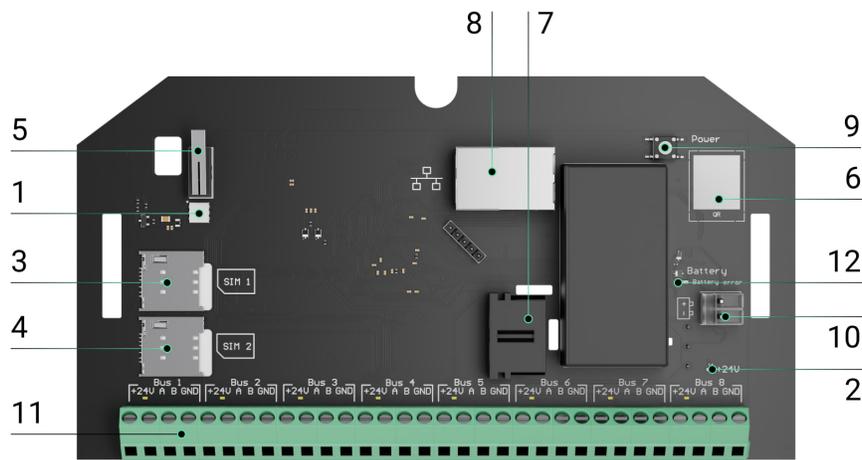
1. Screws that secure the casing lid. Unscrew with a bundled hexagon key ( $\varnothing$  4 mm).
2. A part with holders for a backup battery.



Battery not included.

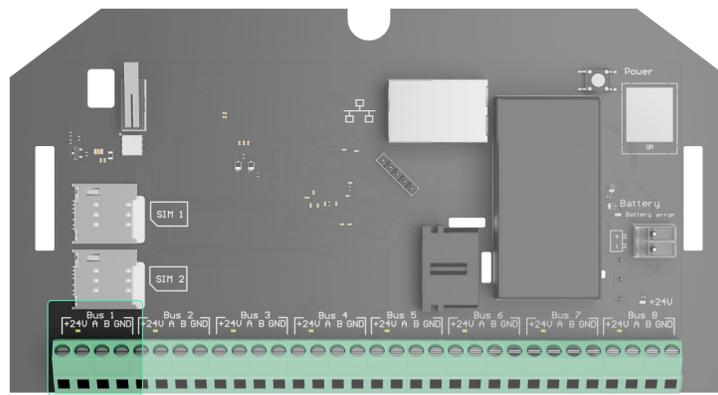
3. QR code and ID (serial number) of the control panel.
4. Perforated part of the casing. Necessary for tamper triggering in case of any attempt to detach the device from the surface. Do not break it off.
5. Perforated parts of the casing for the output of wires of the connected detectors and devices.
6. Cable fasteners.

## Board elements



1. LED status indicator of the hub and connected communication channels.
2. LED status indicator of devices connected to the hub Fibra lines.
3. Slot for micro SIM 1.
4. Slot for micro SIM 2.
5. Tamper button. Detects when the casing lid of Hub Hybrid (2G) / (4G) is removed.
6. QR code and ID (serial number) of the device.
7. Power cable connector.
8. Ethernet cable connector.
9. Power button.
10. Terminals for connecting a 12 V backup battery.
11. Fibra lines terminals for connecting wired devices.
12. **Battery error** indicator. Lights up in case of polarity reversal when connecting the battery (when the battery "-" is connected to the terminal "+" and vice versa).

## Fibra line terminals



Hub Hybrid (2G) / (4G) has 8 Fibra lines. Numbers from 1 to 8 are indicated on the control panel board.

### Fibra line terminals:

1. **+24 V** – power supply terminal of 24 V $\overline{\text{=}}$ .
2. **A** – first signal terminal.
3. **B** – second signal terminal.
4. **GND** – power ground terminal.



Observe the polarity and the order of connecting the wires when installing Fibra devices.

## Operating principle

Hub Hybrid is a hybrid control panel of the Ajax security system. It controls the operation of the entire system and connected devices.

You can connect up to 100 wired and wireless Ajax devices to Hub Hybrid. Connected devices protect against intrusion, fire, and flooding, and also allow you to control electrical appliances according to scenarios or manually – in a mobile app or by pressing the Button.

To monitor the operation of all security system devices, the hub communicates with the connected devices using three encrypted protocols:

1. **Jeweller** is a radio protocol for transmitting events and alarms from Ajax wireless devices. The communication range is up to 2,000 m without obstacles: walls, doors, or inter-floor constructions.

[Learn more about Jeweller](#)

2. **Wings** is a radio protocol for transmitting photos from MotionCam and MotionCam Outdoor detectors. The communication range is up to 1,700 m without obstacles: walls, doors, or inter-floor constructions.

[Learn more about Wings](#)

3. **Fibra** is a wired protocol for transmitting events and alarms from Ajax wired devices. The communication range is up to 2,000 m when connected via twisted pair U/UTP cat.5.

[Learn more about Fibra](#)

If a detector is triggered, the system raises an alarm in less than a second, regardless of the communication protocol. In case of an alarm, the hub activates the sirens, starts the scenarios, and notifies the security company's monitoring station and all users.

## Anti-sabotage protection

Hub Hybrid has 3 communication channels for connecting to the Ajax Cloud server: Ethernet and two SIM cards. This allows you to connect the device to three different communication providers at the same time. If one of the communication channels is unavailable, the hub will automatically switch to another one and inform the control panel of the security company and system users.

When a jamming attempt is detected, the system switches to an idle radio frequency and sends notifications to the control panel of the security company and to system users.

### What is security system jamming

The hub regularly checks the quality of communication with all connected devices. If any device loses connection with the control panel, upon expiry of the time specified by the administrator, all system users (depending on the settings), as well as the monitoring station of the security company, will receive a notification about the incident.

### Learn more

No one can turn off the hub unnoticed, even when the facility is disarmed. If an intruder tries to open the hub casing, the tamper button will trigger immediately. The alarm notification will be sent to the security company and to system users.

### What is a tamper

The hub rechecks Ajax Cloud connection at regular intervals. The ping period is specified in the hub settings. If a minimum ping period is set, the server may notify the users and the security company in as little as 60 seconds after the connection is lost.

### [Learn more](#)

The 7 A·h backup battery can be connected to the hub, which can provide a system of 30 detectors with backup power for 60 hours.

Use 12 V= batteries with a capacity of 4 or 7 A·h. There are special holders for batteries in the control panel casing.

You can use batteries of a different capacity, which suit the hub size and feature the full charging time of no more than 30 hours. The maximum battery charging current from the Hub Hybrid is 300 mA. The maximum dimensions of the battery to be installed in the casing are 151 × 65 × 94 mm, and the weight is 5 kg.

## **OS Malevich**

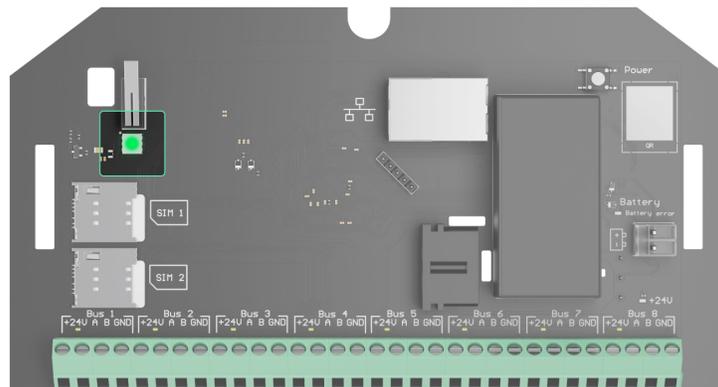
Hub Hybrid is run by the real-time operating system OS Malevich. It is protected from viruses and cyber-attacks.

OS Malevich brings new features and functionality to the Ajax security system through over-the-air updates. The update does not require the involvement of an installation engineer or user.

The update takes up to 2 minutes with the security system disarmed and the external power supply and backup battery connected.

### [How OS Malevich updates](#)

# Indication



Depending on the state of communication between the control panel and the Ajax Cloud server, the Hub Hybrid LED indicator lights up in three colours: white, red, or green.

The LED indicator is not visible when the casing lid is closed. It is used during the Hub Hybrid connection and setup phase. Later on, the state of the device can be monitored in the Ajax app.

Indication	Event	Note
Lights up white.	At least two communication channels are connected: Ethernet and one or two SIM cards.	When operating on a backup battery only, the indicator will blink every 10 seconds.
Lights up green.	One communication channel is connected: Ethernet or one/two SIM cards.  <a href="#"><u>Learn more</u></a>	When operating on a backup battery only, the indicator will blink every 10 seconds.
Lights up red.	The hub has no connection to the Internet or the Ajax Cloud service.	When operating on a backup battery only, the indicator will blink every 10 seconds.

The external power supply is disconnected  (if there is a connected backup battery).	Lights up continuously for 3 minutes, then blinks every 10 seconds.	The colour of the indication depends on the number of connected communication channels.
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If you see an indication while using the system that is not listed in this user manual, please contact the [Ajax support service](#).

## Ajax account

To set up the system, install the [PRO version of the app](#) and create an account if you don't have one. Don't create a new account for each hub since one account can manage multiple security systems. Where necessary, you can configure separate access rights for each hub.

### How to register a PRO

User settings, systems, and parameters of connected devices are stored in the hub. Changing the hub administrator, adding or removing users does not reset the settings of devices connected to the hub.



**Hub Hybrid** can only be added and configured in Ajax PRO apps.

## Connecting the hub to Ajax Cloud

Hub Hybrid needs Internet access to connect to the Ajax Cloud server. Connection is needed for the operation of Ajax apps, remote setup and management of the system, and for sending push notifications to users.

Hub Hybrid is connected to the Internet via Ethernet and two SIM cards. Connect all communication channels to achieve greater reliability and availability of the system.

**To connect the hub to Ajax Cloud:**

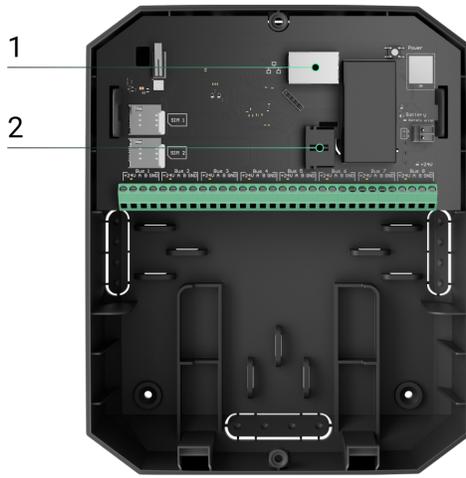
1. Unscrew the screws securing the casing, if installed. Unscrew with a  $\varnothing$  4 mm hexagon key. This hexagon key is included in the control panel set.



2. Remove the casing lid of the hub.



3. Connect the power and Ethernet cables to the appropriate connectors:



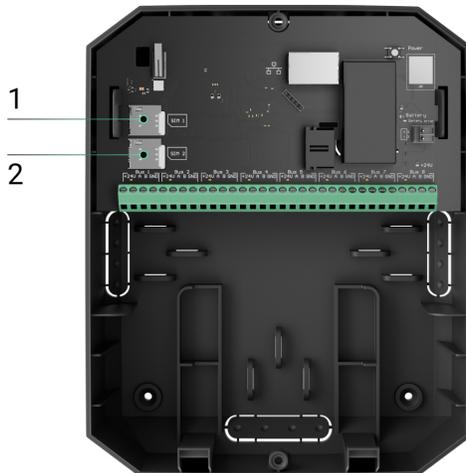
1 – Ethernet cable connector.

2 – power cable connector.



To comply with the INCERT requirements, use the Screw terminal block Adapter to connect the external power supply. [Read more.](#)

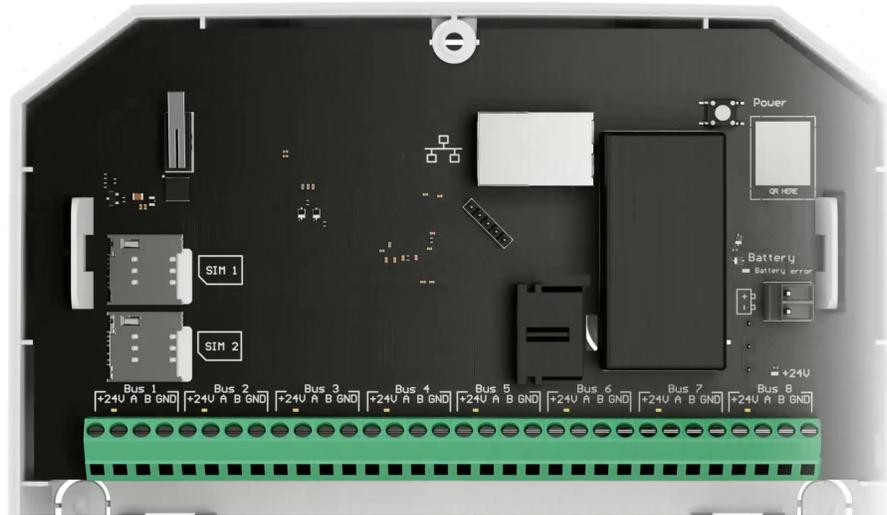
#### 4. Install SIM cards:



1 – first micro-SIM slot.

2 – second micro-SIM slot.

5. Connect a 12 V<sub>DC</sub> backup battery with a capacity of 4 or 7 A·h. The hub casing is designed for use with this type of battery.
6. Hold down the power button of the hub. As soon as the hub is on, the Fibr line LEDs on the hub board will light up.
7. Wait until the control panel is connected to the Internet. The green or white colour of the LED indicates that the hub is ready for operation.



## If Ethernet connection fails

If the Ethernet connection is not established, disable proxy and MAC address filtration and activate DHCP in the router settings. The hub will automatically receive an IP address. After that, you can assign a static IP address to the hub in the Ajax app.

## If SIM connection fails

To connect to the cellular network, you need to install a micro-SIM card with a PIN code request disabled and a sufficient amount of funds on the account to pay for services as per the operator's tariff. To disable the PIN code request, insert the SIM card into the phone.

If the hub fails to connect to the cellular network, use Ethernet to configure the network parameters: roaming, APN access point, user name, and password. To find out these parameters, contact the support service of your mobile operator.

### Adding a hub to the PRO version of the app



**Hub Hybrid** can only be added and configured in Ajax PRO apps.

After adding a hub to your account, you become the administrator of the device. Administrators can invite other users to the system and determine their rights. You can connect up to 50 users to Hub Hybrid.

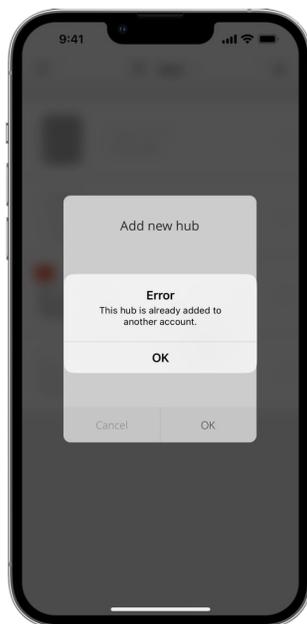
Each PRO account connected to the hub, as well as the security company profile is considered a user of the system.

Changing or removing the administrator from the list of hub users does not reset the settings of the system or connected devices.



If there are already users on the hub, the hub admin, PRO with full rights, or the installation company maintaining the selected hub can add your account. You will receive a notification that the hub is already added to another account. Contact with [Technical Support](#) to determine who has admin rights on the hub.

### User rights in the Ajax security system



### To add a hub to the PRO version of the app:

1. Connect external power, backup battery, Ethernet, and/or SIM cards to the hub.
2. Turn on the hub and wait until the connection status LED indicator lights up green or white.
3. Open the PRO version of the app. Allow the app to access the requested features. This will allow you to fully use the capabilities of the Ajax apps and not to miss notifications about alarms or events.
4. Click **Add Hub**.
5. Choose a suitable method: manually or using a step-by-step guidance. If you are setting the system up for the first time, use step-by-step guidance.

### If you have selected manual adding.

1. Assign the hub name.
2. Scan the hub QR code or enter the ID manually.
3. Wait until the hub is added. After binding, the hub will be displayed in the **Devices**  menu of the PRO version of the app.

### If you chose a step-by-step guidance.

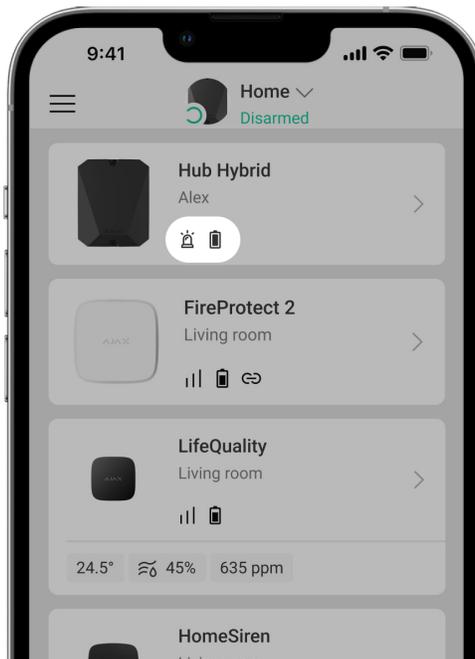
Follow the instructions in the app. Upon completion, the hub and connected devices will be displayed in the **Devices**  menu of the PRO version of the app.

## Fault counter

If a hub fault is detected (e.g., no external power supply is available), a fault's counter is displayed on the device icon in the Ajax app.

All faults can be viewed in the hub states. Fields with faults will be highlighted in red.

## Hub icons

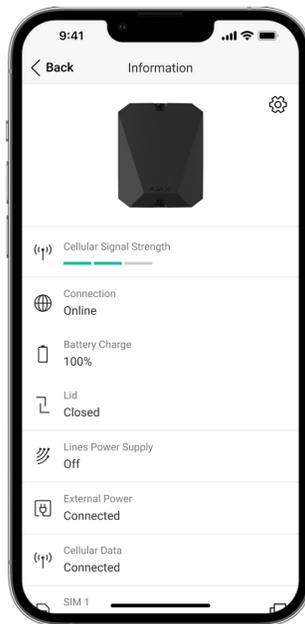


Icons display some of the Hub Hybrid statuses. You can view them in the Ajax app, in the **Devices**  tab.

Icon	Meaning
	Hub operates in the 2G network.
	Hub operates in the 3G network. Available for Hub Hybrid (4G) only.

	<p>The hub operates in the 4G (LTE) network.</p> <p>Available for Hub Hybrid (4G) only.</p>
	<p>No SIM cards. Insert at least one SIM card.</p>
	<p>The SIM card is faulty or has a PIN code set up. Check SIM card operation in the phone and disable the PIN code request.</p>
	<p>Hub Hybrid battery charge level. Displayed in 1% increments.</p>
	<p>Hub Hybrid malfunction detected. Open <b>hub states</b> for details.</p>
	<p>The hub is directly connected to the monitoring station of the security company. The icon is not displayed if direct connection is not available or not configured.</p> <p><a href="#"><u>Learn more</u></a></p>
	<p>The hub is not directly connected to the central monitoring station of the security company. The icon is not displayed if direct connection is not available or not configured.</p> <p><a href="#"><u>Learn more</u></a></p>

## Hub states



States can be found in the [Ajax app](#):

1. Go to the **Devices**  tab.
2. Select Hub Hybrid from the list.

Parameter	Meaning
Malfunction	<p>Click the  button to open the list of Hub Hybrid malfunctions.</p> <p>The field appears only if a malfunction is detected.</p>
Cellular Signal Strength	<p>The signal strength of the active SIM mobile network.</p> <p>Install the hub in places where the cellular communication level reaches 2-3 bars.</p> <p>If the hub is installed in a place with weak or unstable signal strength, it will not be able to call or send an SMS about an event or alarm.</p>
Connection	<p>The status of connection between the hub and Ajax Cloud:</p>

	<ul style="list-style-type: none"> <li>• <b>Online</b> – the hub is connected to Ajax Cloud.</li> <li>• <b>Offline</b> – the hub is not connected to Ajax Cloud. Check the hub Internet connection.</li> </ul> <p>If Hub Hybrid is not connected to the server, the icons of the hub and all connected devices become semi-transparent in the list of devices.</p>
Battery Charge	<p>Hub backup battery charge level. Displayed in 1% increments.</p> <p>At a charge level of 20% and below, the hub will report low battery charge.</p> <p><a href="#"><u>Learn more</u></a></p>
Lid	<p>The status of tampers that respond to demounting or opening of the control panel casing:</p> <ul style="list-style-type: none"> <li>• <b>Closed</b> – the hub lid is closed. Normal state of the hub casing.</li> <li>• <b>Open</b> – the casing of the hub is open or the integrity of the casing is otherwise compromised. Check the state of the control panel casing.</li> </ul> <p><a href="#"><u>Learn more</u></a></p>
Lines Power Supply	<p>Power supply status on the hub Fibra lines:</p> <ul style="list-style-type: none"> <li>• <b>On</b> – power supply is provided to all Fibra lines.</li> <li>• <b>Off</b> – power supply is not provided to all Fibra lines.</li> </ul>
External Power	<p>External power supply connection status:</p> <ul style="list-style-type: none"> <li>• <b>Connected</b> – the hub is connected to an external power supply.</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Disconnected</b> – no external power supply. Check the connection of the Hub Hybrid to the external power supply.</li> </ul>
Average Noise (dBm)	<p>Average noise in the radio channel. Measured in the place where the hub is installed.</p> <p>The first two values show the level at Jeweller frequencies, and the third – at Wings frequencies.</p> <p>The acceptable value is –80 dBm or lower. For example, –95 dBm is considered acceptable and –70 dBm is invalid.</p> <p><u><b>What is security system jamming</b></u></p>
Cellular Data	<p>Mobile Internet connection status of the hub:</p> <ul style="list-style-type: none"> <li>• <b>Connected</b> – the hub is connected to Ajax Cloud via mobile Internet.</li> <li>• <b>Not connected</b> – the hub is not connected to Ajax Cloud via mobile Internet. Check the Hub Hybrid connection to the Internet via the mobile network.</li> <li>• <b>Disabled</b> – the option is disabled in the hub settings.</li> </ul> <p>If the cellular signal strength reaches 1–3 bars, and the hub has enough funds and/or has bonus SMS/calls, it will be able to call and send SMS, even if this field displays the <b>Not connected</b> status.</p>
Active	<p>Displays active SIM card:</p> <ul style="list-style-type: none"> <li>• <b>SIM card 1</b> – the hub works with a SIM card installed in the first slot.</li> <li>• <b>SIM card 2</b> – the hub works with a SIM card installed in the second slot.</li> </ul>

SIM 1	<p>The number of the SIM card installed in the first slot.</p> <p>To copy the number, click on it.</p> <p>If the phone number is displayed as an Unknown number, the operator has not written it to the memory of the SIM card.</p>
SIM 2	<p>The number of the SIM card installed in the second slot.</p> <p>To copy the number, click on it.</p> <p>If the phone number is displayed as an Unknown number, the operator has not written it to the memory of the SIM card.</p>
Ethernet	<p>Internet connection status of the hub via Ethernet:</p> <ul style="list-style-type: none"> <li>• <b>Connected</b> – the hub is connected to Ajax Cloud via Ethernet. Normal state.</li> <li>• <b>Not connected</b> – the hub is not connected to Ajax Cloud via Ethernet. Check the Hub Hybrid connection to the Internet via the wired Internet.</li> <li>• <b>Disabled</b> – the option is disabled in the hub settings.</li> </ul>
Monitoring Station	<p>The status of direct connection of the hub to the central monitoring station of the security company:</p> <ul style="list-style-type: none"> <li>• <b>Connected</b> – the hub is directly connected to the central monitoring station of the security company.</li> <li>• <b>Not connected</b> – the hub is not directly connected to the central monitoring station of the security company.</li> </ul> <p>If this field is displayed, the security company uses direct connection to receive events and security system alarms.</p>

	<a href="#"><u>Learn more</u></a>
Hub model	Hub model name: Hub Hybrid (2G) or Hub Hybrid (4G).  <a href="#"><u>Differences between Ajax hubs</u></a>
Hardware version	Hub Hybrid hardware version. Not updated.
Firmware	Hub Hybrid firmware version. Updates remotely.  <a href="#"><u>Learn more</u></a>
Device ID	Identifier (first 8 digits of the serial number) of the Hub Hybrid.  The identifier is located on the device box and on the board under the QR code.

## Selecting the installation site

Fix Hub Hybrid casing on a vertical surface using bundled fasteners. All the necessary holes for fastening in the casing have already been made.



Hub vertical fixation is needed for the tamper to respond if someone tries to detach a device.. Learn the battery documentation before installing – some batteries can be mounted only vertically (with terminals upward). Another installation position could cause fast battery degradation.

It is advisable to choose an installation site where the hub is hidden from prying eyes – for example, in the pantry. This will help reduce the likelihood of sabotage or security system jamming. Note that the device is intended for indoor installation only.

Choose a site where the hub can be connected via all possible communication channels: Ethernet and two SIM cards. The cellular signal strength at the installation site should be stable and should reach 2-3 bars. We do not guarantee correct operation of the device with a low cellular signal strength.

When choosing an installation site, take into account the distance between the hub and wireless devices and the presence of obstacles between them hindering the radio signal passage: walls, intermediate floors, or large-size objects located in the room.

To roughly calculate the signal strength at the place of installation of wireless devices, use our [radio communication range calculator](#). Use [Fibra power supply calculator](#) to calculate the wired connection range.

Run the Jeweller, Wings, and Fibra signal strength tests. The stable signal strength of 2-3 bars with all connected devices should be provided at the chosen installation site. With a signal strength of 1 or 0 bars, we do not guarantee stable operation of the security system.

If the system has devices with signal strength of 1 or 0 bars, consider relocating the hub or device. If this is not possible or the device still has low or unstable signal strength after being moved, use [range extenders](#).

## Installation of the control panel



During installation and operation of the Ajax security system, adhere to the rules and requirements of regulatory legal acts on electrical safety. Do not disassemble the device while it is energized or use it with a damaged power cable.

Before installation, make sure that you have selected the optimal location for the device and that it complies with the requirements of this manual.

**To install Hub Hybrid:**

1. Prepare the cable outputs in advance by carefully breaking out the perforated parts of the Hub Hybrid casing.



2. Secure the casing on the vertical surface at the selected installation location with the bundled screws using all fixation points. One of them is in the perforated part above the tamper – it is required for tamper triggering in case of any attempt to detach the hub casing.



3. Place the Hub Hybrid board into the casing on the holders.
4. Connect the 12 V<sub>=</sub> backup battery. Do not connect third-party power supplies. This could result in a failure of the control panel.



Use a 12 V= battery with a capacity of 4 or 7 A·h. The maximum dimensions of the battery to be installed in the casing are 151 × 65 × 94 mm, and the weight is 5 kg. Special holders are provided for this battery configuration in the hub casing. You can use batteries of a different capacity if they are suitable in size and the charging time does not exceed 30 hours. The maximum battery charging current from the Hub Hybrid is 300 mA.

5. Turn on the hub.
6. Install the lid on the hub casing and fix it with the bundled screws.
7. Check the status of the hub casing in the PRO version of the app. If the app shows tamper alarm, check tightness of the Hub Hybrid casing.

## Do not install the hub

Outdoors. This could result in a failure of the control panel.

Near the metal objects and mirrors. They can cause attenuation or shielding of the radio signal. This could result in the loss of connection between the hub and wireless Ajax devices.

In places with high levels of radio interference. This could result in the loss of connection between the hub and wireless Ajax devices or false notifications about security system jamming.

Less than 1 meter away from the router and power cables. This could result in the loss of connection between the hub and wireless devices.

Less than 1 meter away from Jeweller devices. This could result in the loss of connection between the hub and these devices.

In places where the hub will have a signal strength of 1 or 0 bars with connected devices. This could result in the loss of connection between the hub and these devices.

Inside premises with temperature and humidity beyond the permissible limits. This could result in a failure of the control panel.

In places with no cellular signal or 1 bar signal strength. We do not guarantee correct operation of the device with a low cellular signal strength.

## Preparing to connect devices

Create at least one virtual room before adding devices to the system. Rooms are needed to group devices and to increase the information content of notifications. Names of devices and rooms are displayed in the text of events and alarms of the Ajax security system.

## Creating a virtual room

**To create a room in the Ajax app:**

1. Go to the **Rooms**  tab.

2. Click **Add Room**.
3. Assign a name to it and, if necessary, attach (or make) a photo – it will be easier to find the room in the list.
4. Click **Save**.
5. Repeat steps 2-4 to add as many rooms as needed.

To delete a room, change its avatar or name, go to room **Settings** by clicking on the gear icon .

## Connection of wireless devices



The hub is incompatible with other [hubs](#), [uartBridge](#), and [ocBridge Plus](#).

**To add a device to the hub, in the [PRO version of the app](#):**

1. Open the room and select **Add device**.
2. Name the device, scan or manually enter its QR code, select a group if the [group mode](#) is enabled.
3. Click **Add** – the countdown for adding a device will begin.
4. Follow the instructions in the app to connect the device.
5. Repeat steps 1-4 to add any required devices.

To pair (bind) a device to the hub, the device should be located within the hub's radio communication range – at the same secured premises.

## Wired devices connection



The hub is incompatible with other [hubs](#), [uartBridge](#), and [ocBridge Plus](#).

Fibra wire communication technology allows creating segments up to 2,000 meters long. Up to 8 segments in a single system under Hub Hybrid control.

Hub Hybrid features 8 lines compatible with all Fibra devices, regardless of the type. Security detectors, keypads, and sirens are connected to the same line and ensure the safety of a specific area of the facility.

## Design and preparation

For the system to work correctly, it is important to properly design the project and install all devices correctly. Failure to follow the basic installation rules and recommendations of the user manual may result in incorrect operation or loss of connection between the hub and installed devices.

When designing the layout scheme of the devices, consider the wiring diagram of the power cables laid on the site. Signal cables of Fibra devices must be laid at a distance of at least 50 cm from the power cables when lying parallel, and, if they intersect, it must be at a 90° angle.

In total, you can connect up to 100 Ajax devices to Hub Hybrid. The ratio of wired to wireless devices within the system is of no importance. For example, you can connect 50 wired and 50 wireless devices or 99 wired and 1 wireless device.

For facilities that are under construction or renovation, cables of wired devices are laid after the main wiring of the facility. Use protective tubes to route cables of wired devices to organize and secure the wires; ties, clips, and staples can be used to secure them.

Prevent external damage to the cables whenever possible. When laying wires externally (without mounting them inside the walls), use an electric channel raceway. Raceways should be no more than half-filled with cables. Do not allow cables to sag. The raceway should be hidden from view if possible – for example, behind furniture.

We recommend laying cables inside walls, floors, and/or ceilings. This will provide greater security: the wires will not be visible, it will be impossible to accidentally damage them, and it will be impossible for an intruder to access them.

When selecting a cable, consider the length of the connection lines and the number of devices to be connected; these parameters affect the signal strength. We recommend using shielded copper cables with a high-quality insulation layer. Check the cables for bends and physical damage before installation.

When installing, observe the bend radius that the manufacturer specifies in the cable specs. Otherwise, you risk damaging or breaking the conductor. The bend radius is specified by the manufacturer in the cable specifications.

## Signal strength and cable length

The Fibra signal level is determined by the number of undelivered or corrupted data packages over a certain period. The signal strength is displayed by the icon  in the **Devices**  tab:

- **Three bars** – excellent signal strength.
- **Two bars** – good signal strength.
- **One bar** – low signal strength, stable operation is not guaranteed.
- **Crossed out icon** – no signal.

The signal strength is influenced by the following factors: the number of devices connected to one line, the length and type of cable, and the proper connection of the wires to device terminals.

The maximum cable length depends on the cable type, material, and method of connecting the devices. When connected via the **Beam connection (Radial wiring)** (hub – devices – terminating resistor) using the U/UTP cat.5 (4x2x0.51) twisted pair, the wired connection length can reach up to 2,000 meters. The minimum cable length for connecting wired devices is 1 meter.

When connected via the **Ring connection method** (hub – devices – hub), the maximum cable length is 500 meters in case of using a twisted pair.



Hub Hybrid only supports **Beam (Radial) topology**. Connection via the **Ring topology** will be implemented in the next updates of OS Malevich.

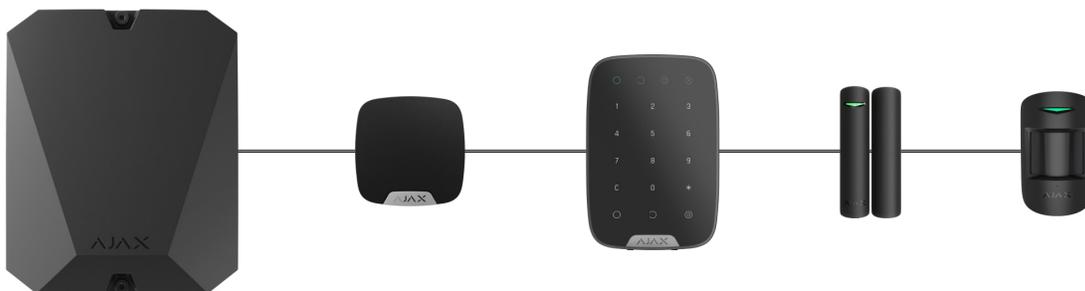
## Installation and connection



Before installing the detectors and devices, make sure that you have selected the optimal location and that it meets the conditions of the user manual. Wires must be hidden from view and located in a place that is difficult for intruders to access to reduce the likelihood of sabotage. Ideally, the wires should be set into the walls, floor, and/or ceiling. Before the final installation, test the [Fibra signal strength](#).

Connect the devices to the hub using a four-wire cable. Two wires provide power to the device (+24 V and GND), and the other (A and B) are used for data exchange between connected devices and the hub. When connecting, be sure to observe the polarity and connection order of the wires.

Devices are connected to the hub using two connection topologies: **Ring** and **Beam (Radial wiring)**. The devices are connected to the same Fibra line one by one, as shown on the figure.



We recommend distributing wired devices evenly across all the hub's Fibra lines to increase reliability.

We recommend connecting wired devices via the **Ring connection method**. If the line is broken, the devices will still be connected to Hub Hybrid via the **Beam (Radial wiring) connection** and will continue transmitting events and alarms to the hub. Notification about the line open fault will be sent to users and the security company.

When connecting via the **Ring connection method**, connect two lines per one segment and reduce the maximum length of the wired connection to 500 meters (when connected via the **Beam (Radial wiring) connection method** – to 2,000 meters).

Beam (Radial wiring)	Ring
<ul style="list-style-type: none"><li>• occupies one Fibra line of the hub</li><li>• up to 8 lines with the same hub</li><li>• up to 2,000 m of wired communication for the same line</li><li>• a terminating resistor is installed at the end of the line</li></ul>	<ul style="list-style-type: none"><li>• occupies two Fibra lines of the hub</li><li>• up to 4 rings with the same hub</li><li>• up to 500 m of wired communication for the same ring</li><li>• no terminating resistor is installed at the end of the line</li></ul>



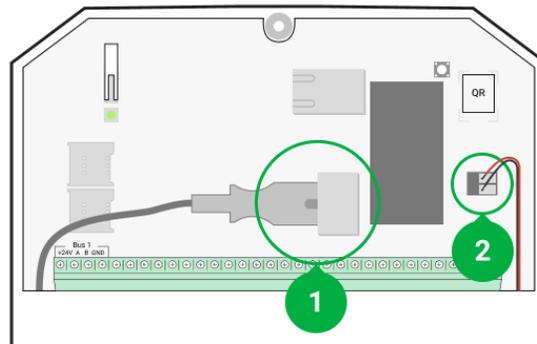
Hub Hybrid supports the **Beam connection (Radial wiring)** only. **Ring connection** will be implemented in the next OS Malevich updates.

When connecting devices, do not twist the wires together; solder them. The ends of the wires that will be inserted into the siren terminals should be tinned to increase the reliability of the connection.

Follow the polarity and connection order of the wires. Securely fasten the wires to the terminals. If the device body provides fasteners for cables, secure the cable with ties.

## To connect a detector or device:

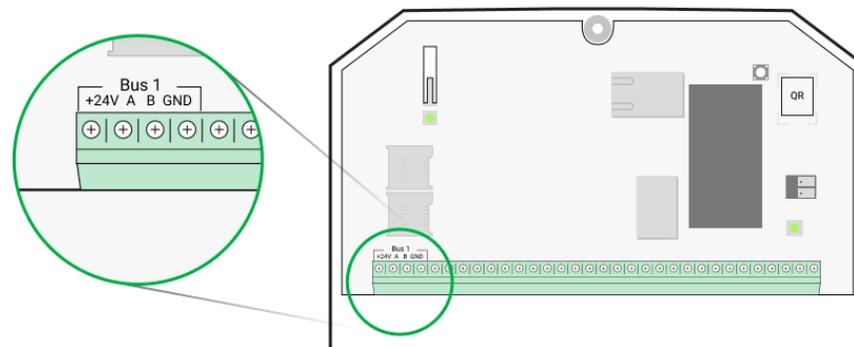
1. De-energize and turn off the hub. Disconnect the backup battery.



1 – External power supply

2 – Backup battery

2. Run the four-wire cables into the hub. Connect the wires to Hub Hybrid line terminals:

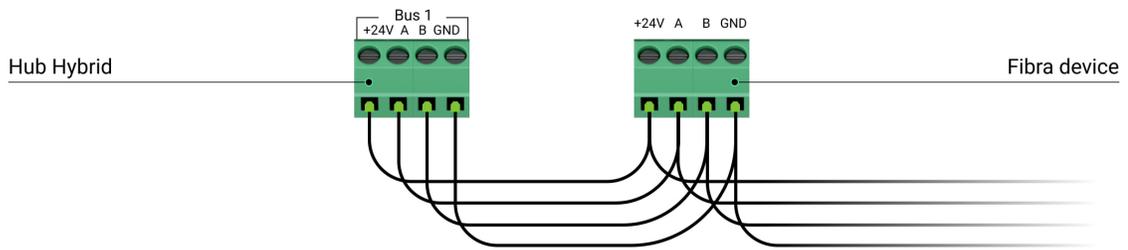


**+24V** – power supply terminal of 24 V $\overline{\text{=}}$ .

**A, B** – signal terminals.

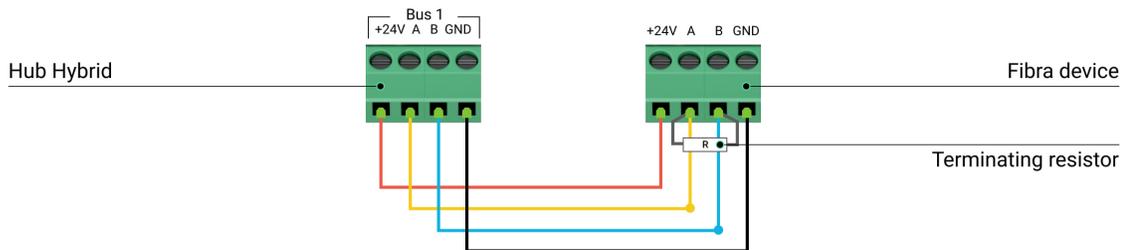
**GND** – ground.

3. Connect the other end of the four-wire cable to the terminals of the first device in the line, observing the polarity and the order of wiring. Securely fasten the cable to the terminals of the device.
4. If other devices are connected to the segment, prepare and wire the cable for the next device into the terminals.



**+24V** – power supply terminal of 24 V<sub>DC</sub>.  
**A, B** – signal terminals.  
**GND** – ground.

5. Connect other devices to the line, if necessary.
6. Install a 120 ohm terminating resistor for the last device in the line using the **Beam (Radial) topology**. A terminating resistor is installed between terminals A and B of the last device in the line.



With the **Ring topology**, a terminating resistor is not needed. In this case, connect the last device in the line to the next Fibra line of the hub.



The nominal value of terminating resistors is 120 Ω. Termination resistors are included in the complete set of Hub Hybrid.



Hub Hybrid supports the **Beam (Radial) topology** only. **Ring topology** will be implemented in the next OS Malevich updates.

## More about connection methods

7. Connect power to the hub and turn it on.
8. Add devices to the system manually or using line scanning.
9. Run the Fibra Signal Strength Test for each connected device. The recommended signal strength is two or three bars. Otherwise, check the connection and integrity of the wires or relocate the system devices.

## Adding wired devices

There are two ways to add wired devices: manually and using line scanning. It is useful to add a few devices manually – for example, when replacing a faulty detector with a new one. Automatic line scanning is useful when adding numerous devices.

### To add a wired device manually:

1. Open the PRO version of the app.
2. Select the object to which you want to add the device.
3. Go to the **Devices**  tab and click **Add Device**.
4. Name the device, scan, or type in the QR code (available on the device body and the packaging), select a room and a group (if the group mode is enabled).
5. Click **Add**.

### To add devices using line scanning:

1. Open the PRO version of the app.
2. Select the object to which you want to add the devices.
3. Go to the **Devices**  tab.
4. Click **Add Device**.
5. Click **Add All Fibra Devices**.

6. The hub will start the line scan process.

After line scanning, the PRO app will display a list of wired devices connected to the hub. The devices in the list are sorted by lines to which they are physically connected.

By default, the device designation includes its name and ID. To pair a device to the hub, edit its name, assign it to a room and a group if the group mode is activated.



Scanning is also available in the **Lines** menu (Hub → Settings → Lines → Add All Fibra Devices).

For the installation engineer to name the device correctly or assign a room and a group to it, we have provided two methods for device identification: by LED indication and by alarm.

### **Method 1: Identify device by blinking**

After line scanning, the PRO app will display a list of wired devices connected to the hub.

Click on any device in this list. After clicking, the LED indicator of the device will start blinking. After identifying the device, bind it to the hub.

#### **To pair a device to a hub:**

1. Click on the device in the list.
2. Assign a name to the device.
3. Specify a room and a group if the group mode is turned on.
4. Click **Save**.
5. The paired device will disappear from the list of devices available to be added.

### **Method 2: Add devices by alerts**

Select the toggle **Prioritize triggered devices**.

Trigger an alarm. For example, walk in front of a motion detector, press any button on the keypad, or trigger a siren tamper.

Once triggered, the detector will move to the top of the list in the **Recently triggered devices** category. The device will stay in this category for 5 seconds, and then move back to the line category. After identifying the device, bind it to the hub.

### **To pair a device to a hub:**

1. Click on the device in the list.
2. Assign a name to the device.
3. Specify a room and a group if the group mode is enabled.
4. Click **Save**.
5. The paired device will disappear from the list of devices available to be added.

Updating the statuses of wired devices depends on the ping period (adjusts in the Jeweller/Fibra settings).

If the hub already has the maximum number of devices added (for Hub Hybrid, the default is 100), you will get an error notification when you add one.

Connected Ajax devices work with one hub only. Once added to a new hub, these devices are not removed from the list of devices of the old hub. This must be done through the Ajax PRO app.

## **Hub Hybrid settings**

The control panel settings can be changed in Ajax PRO apps. In order to change the settings:

1. Log in to the PRO version of the app.
2. Select an object from the list.

3. Go to the **Devices**  menu.
4. Select a hub.
5. Go to its **Settings** by clicking on the gear icon .
6. Select a settings category and make changes. After making changes, click **Back** to save the new settings.

**Avatar** 

**Hub name** 

**Users** 

**Ethernet** 

**Cellular** 

**Geofence** 

**Keypad access codes** 

**Groups** 

**Security Schedule** 

**Detection Zone Test** 

**Jeweller/Fibra** 

<b>Lines</b>	▼
<b>Service</b>	▼
<b>Installers / Companies</b>	▼
<b>Security Companies</b>	▼
<b>User Guide</b>	▼
<b>Data Import</b>	▼
<b>Unpair hub</b>	▼

## Hub settings reset

Resetting the hub to the factory settings:

1. Turn on the hub if it is off.
2. Remove all users and installers from the hub.
3. Hold the power button for 30 s – the LED indicator on the hub board will start blinking red.
4. Remove the hub from your account.

## Events and alarms notifications

The Ajax security system informs users about alarms and events using push notifications, SMS, and phone calls.

[How Ajax notifies users of alerts](#)



Hub Hybrid does not support calls and SMS transmission using VoLTE (Voice over LTE) technology. Before buying a SIM card, please make sure that it only supports the GSM standard.

Causes of notifications	What are they used for	Types of notifications
Alarms	<p>System alarm:</p> <ul style="list-style-type: none"><li>• Intrusion</li><li>• Fire</li><li>• Leakage</li></ul> <p>Loss of connection between the hub and the Ajax Cloud server</p>	<ul style="list-style-type: none"><li>• Phone calls (not available for messages about the loss of connection between the hub and the Ajax Cloud server)</li><li>• Push notifications (siren sound)</li><li>• SMS</li></ul>
Malfunctions	<ul style="list-style-type: none"><li>• Loss of connection between the device and the hub</li><li>• <u>Jamming</u></li><li>• Low battery charge in device or hub</li><li>• <u>Masking</u></li><li>• Tampering with the device or hub casing</li><li>• Hub lost connection with server (<u>can notify as alert</u>)</li></ul>	<ul style="list-style-type: none"><li>• Push notifications (standard signal sound)</li><li>• SMS</li></ul>
Security Mode Change	<ul style="list-style-type: none"><li>• Arming/Disarming entire premises or group</li><li>• Turning on <u>Night Mode</u></li></ul>	<ul style="list-style-type: none"><li>• Push notifications (standard signal sound)</li></ul>

		<ul style="list-style-type: none"> <li>• SMS</li> </ul>
System Events	<ul style="list-style-type: none"> <li>• Hub updates</li> <li>• Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Push notifications (standard signal sound)</li> <li>• SMS</li> </ul>
Non-security Alerts	<p>The changing of the air quality parameters:</p> <ul style="list-style-type: none"> <li>• Temperature</li> <li>• Humidity</li> <li>• CO<sub>2</sub></li> </ul> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p> The non-security alerts settings are available with firmware version OS Malevich 2.15 or higher and in apps of the following versions or higher:</p> <ul style="list-style-type: none"> <li>• Ajax Security System 2.23.1 for iOS</li> <li>• Ajax Security System 2.26.1 for Android</li> <li>• Ajax PRO: Tool for Engineers 1.17.1 for iOS</li> <li>• Ajax PRO: Tool for Engineers 1.17.1 for Android</li> <li>• Ajax PRO Desktop 3.6.1 for macOS</li> <li>• Ajax PRO Desktop 3.6.1 for Windows</li> </ul> </div>	<ul style="list-style-type: none"> <li>• Push notifications (standard signal sound)</li> <li>• SMS</li> </ul>
Automation Devices	<ul style="list-style-type: none"> <li>• Turning on/off <u>WallSwitch</u>, <u>Relay</u>, <u>Socket</u>, <u>WaterStop</u>, <u>LightSwitch</u></li> </ul>	<ul style="list-style-type: none"> <li>• Push notifications (standard signal sound)</li> </ul>

- Pulse

- SMS



The settings of the automation devices notifications are available with firmware version OS Malevich 2.15 or higher and in apps of the following versions or higher:

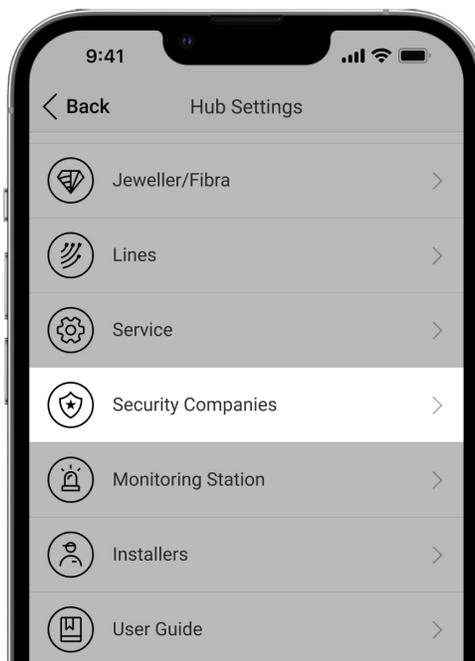
- Ajax Security System 2.23.1 for iOS
- Ajax Security System 2.26.1 for Android
- Ajax PRO: Tool for Engineers 1.17.1 for iOS
- Ajax PRO: Tool for Engineers 1.17.1 for Android
- Ajax PRO Desktop 3.6.1 for macOS
- Ajax PRO Desktop 3.6.1 for Windows



The hub does not notify users and the security company about the triggering of the opening detectors in the Disarmed mode when the Chime function is enabled and configured. Only the sirens connected to the system notify about the opening.

[What is Chime](#)

## Connecting to the monitoring station of security company



The list of companies that receive system notifications to the monitoring station can be found in the **Security companies** menu in the Ajax app:

Devices  → Hub → Settings  → Security companies.

Select a security company and click **Send Monitoring Request**. After that, the security company will contact you to discuss the connection terms. You can also contact the company representatives yourself to agree on the connection. The phone number, email address, and website of the security company are available in the Ajax app.

You can also connect the hub to the CMS by e-mail of the security company. To do this, in the **Security companies** menu, click on the letter icon, enter your e-mail, and click **Continue**. Confirm your choice of company and click **Send Request**.

## Additional features

### Video surveillance

Third-party cameras can be connected to the security system: thanks to the RTSP protocol support, integration with IP cameras and Dahua, Hikvision, Safire, EZVIZ, and Uniview DVRs is implemented.

You can connect up to 25 video surveillance devices to the system.

## How to add a camera to the Ajax security system

### Scenarios

Hub Hybrid allows creating 32 scenarios and minimizing the human factor impact on safety. The hub can manage the security of the entire facility or group according to a schedule; activate the smoke machine if intruders enter the room; de-energize the room and turn on emergency lighting in case of fire; shut off water in the event of a leak; control lighting devices, electric locks, roller shutters, and garage doors – when changing the security mode by pressing a button or by a detector alarm.

Scenarios can be used to reduce the number of routine actions and increase productivity. Ajax automation devices respond to changes in temperature and air quality. For example, configure the heating to turn on at low temperatures, control the supply system, humidifier, and air conditioner to maintain a comfortable climate.

## How to create and customize a scenario

### Photo verification

Hub Hybrid supports both MotionCam and MotionCam Outdoor wireless motion detectors. When triggered, the detectors take a series of shots you can use to evaluate the unfolding of the events at the facility over time. This relieves users of unnecessary anxiety and prevents security companies from sending unnecessary patrol dispatches.

The detector activates the camera when armed and detects movement. Only users with access to the events feed, as well as authorized employees of the security company can see visual alarm verifications provided that the security system is connected to the monitoring station.

If **Photo on Demand** function is activated, the detectors can take a photo upon the command of a system user or PRO user with the appropriate rights. The taking of a

photo is always registered in the hub's events feed.

The shots are protected by encryption at every stage of transmission. They are stored on the Ajax Cloud server and are not processed or analysed.

[Learn more](#)

## Maintenance

Check the functioning of Hub Hybrid and connected devices on a regular basis. The optimal frequency of checks is once every three months. Clean the hub casing from dust, cobwebs, and other contaminants as they emerge. Use a soft, dry cloth that is suitable for equipment care.

Do not use substances that contain alcohol, acetone, petrol, and other active solvents to clean the device.

## Technical specifications

[Learn more](#)

[INCERT installation compliance](#)

## Complete set

1. Hub Hybrid (2G) or Hub Hybrid (4G).
2. Power cable.
3. Screw terminal block Adapter (Only for INCERT compliance).
4. Ethernet cable.
5. Casing.
6. Eight 120  $\Omega$  terminating resistors.
7. Installation kit.

## 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](#)

Email



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