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AJAX Hub 2 4G Security System Control Panel User Manual

Contents

# AJAX Hub 2 4G Security System Control Panel

Hub 2 is a security system control panel that supports photo verification of alarms. It controls the operation of all connected devices and interacts with the user and the security company. The device is designed for indoor installation only. The hub reports doors opening, breaking of windows, the threat of fire or flood, and automates routine actions using scenarios. If outsiders enter the secure room, Hub 2 will send photos from MotionCam / MotionCam Outdoor motion detectors and notify a security company patrol. Hub 2 needs internet access to connect to the Ajax Cloud service. The control panel has three communication channels: Ethernet and two SIM cards. The hub is available in two versions: with 2G and 2G/3G/4G (LTE) modem.

WARNING

Connect all communication channels to ensure a more reliable connection with Ajax Cloud and secure against interruptions in the work of telecom operators. You can manage the security system and respond to alarms and event notifications through iOS, Android, macOS, and Windows. The system allows you to choose what events and how to notify the user: by push notifications, SMS, or calls.

- How to set up push notifications on iOS
- How to set up push notifications on Android
- Buy Hub 2 central unit

Functional elements
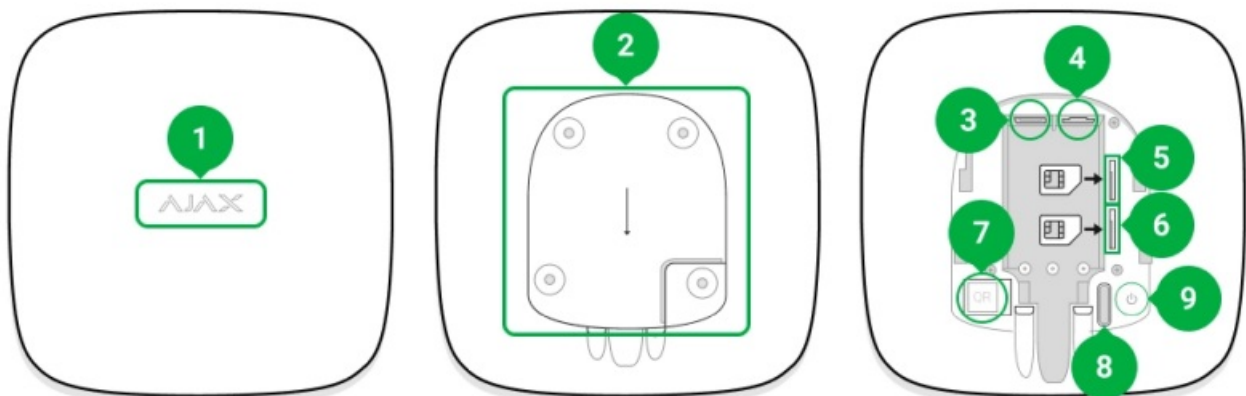
1. Ajax logo with an LED indicator.
2. SmartBracket mounting plate. Slide it down with force to open.
3. Power cable socket.
4. Ethernet cable socket.
5. Slot for micro SIM 2.
6. Slot for micro SIM 1.
7. QR code and ID/service number of the hub.
8. Tamper.
9. Power button.

Operating principle

Hub 2 supports up to 100 Ajax devices connected, which protect against intrusion, fire, or flooding and control electrical appliances according to scenarios or via an app. The hub controls operation of the security system and all connected devices. For this purpose, it communicates with the system devices via two encrypted radio protocols:
Jeweller — is a wireless protocol used to transmit events and alarms of Ajax wireless detectors. The communication range is 2000 m without obstacles (walls, doors, or inter-floor constructions).

Learn more about Jeweller

Wings is a wireless protocol used to transmit photos from MotionCam and MotionCam Outdoor detectors. The communication range is 1700 m without obstacles (walls, doors, or inter-floor constructions).

Learn more about Wings

Any time the detector triggers, the system raises the alarm in less than a second. In this case, the hub activates the sirens, starts the scenarios, and notifies the security company's monitoring station and all users.

Anti-sabotage protection
Hub 2 has three communication channels: Ethernet and two SIM cards. This allows connecting the system to Ethernet and two mobile networks. The hub is available in two versions: with 2G and 2G/3G/4G (LTE) modem. Wired internet and mobile network connection are maintained in parallel to provide more stable communication. This also allows switching to another communication channel without delay if any of them fails. If there is interference at Jeweller frequencies or when jamming is attempted, Ajax switches to a free radio frequency and sends notifications to the central monitoring station of the security company and system users.

What is security system jamming

No one can disconnect the hub unnoticed, even when the facility is disarmed. If an intruder attempts to dismount the device, this will trigger the tamper immediately. Every user and the security company will receive triggering notifications.
What is a tamper
The hub checks the Ajax Cloud connection at regular intervals. The polling period is specified in the hub settings. The server may notify the users and the security company in 60 seconds after the connection loss at minimum settings.

Learn more
The hub involves a backup battery providing 16 hours of battery life. This allows the system to continue operation even if the power supply is cut off at the facility. To increase battery life or connect the hub to 6V or 12V grids, use 12V PSU and 6V PSU.

OS Malevich

Hub 2 is run by the real-time operating system OS Malevich. The system is immune to viruses and cyberattacks. Over-the-air updates of OS Malevich open new opportunities for the Ajax security system. The update process is automatic and takes minutes when the security system is disarmed.

How OS Malevich updates

Video surveillance connection

You can connect Dahua, Hikvision, Safire, EZVIZ and Uniview cameras and DVRs to the Ajax security system. It is possible to integrate third-party video surveillance equipment thanks to the support of the RTSP protocol. You can connect up to 25 video surveillance devices to the system.

Learn more

Automation scenarios

Use scenarios to automate the security system and reduce the number of routine actions. Set up the security schedule, and program actions of automation devices (Relay, wall switch, or Socket) in response to an alarm, pressing the Button or by schedule. You can create a scenario remotely in the Ajax app.

How to create a scenario in the Ajax security system

Connecting to a security company

The Ajax security system can be connected to a central monitoring station (CMS) of the security company. The list of companies that connect the system to the central monitoring station is in the Security companies menu (Devices Hub-Settings Security companies). All events are transmitted in SurGard (Contact ID), SIA (DC-09), and other proprietary protocols. Select the company and click Send a request or contact the company's representatives offering services at your location to arrange for the connection.

LED indication

The Ajax logo on the hub front lights up red, white, or green depending on the status of the power supply and Internet connection.

Indication	Event	Note
Lights up white.	Two communication channels are connected: Ethernet and SIM card.	If the external power supply is off, the indicator will flash every 10 seconds. After a loss of power, the hub will not light up immediately, but will start flashing in 180 seconds.
Lights up green.	One communication channel is connected: Ethernet or SIM card.	If the external power supply is off, the indicator will flash every 10 seconds. After a loss of power, the hub will not light up immediately, but will start flashing in 180 seconds.
Lights up red.	The hub is not connected to the internet or there is no connection with the Ajax Cloud service.	If the external power supply is off, the indicator will flash every 10 seconds. After a loss of power, the hub will not light up immediately,

If your hub has different indication, please contact our technical support. They will help you.

Ajax account
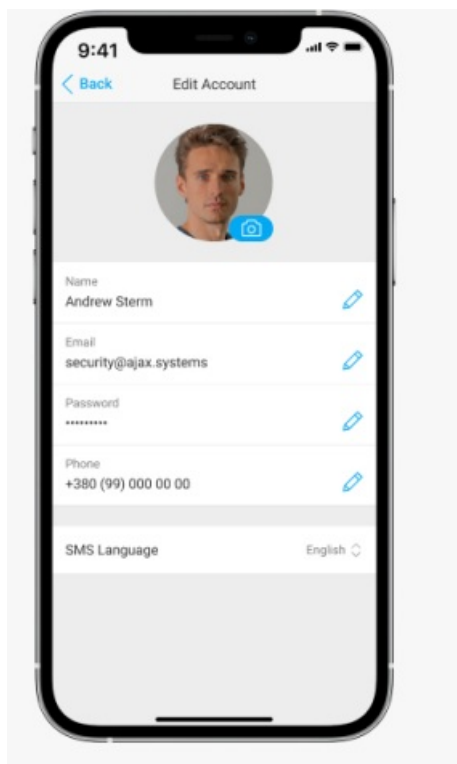
The security system is configured and managed via Ajax applications designed for i0S, Android, macOS, and Windows. Use the Ajax Security System app to manage one or several hubs. If you intend to operate more than ten hubs, please install Ajax PR0: Tool for Engineers (for iPhone and Android) or Ajax PRO Desktop (for Windows and macOS). You can learn more about Ajax apps and their features here. To configure the system, install the Ajax app and create an account. Please remember that there is no need to create a new account for each hub. One account can manage multiple hubs. Where necessary, you can configure individual access rights for each facility.

How to register an account
How to register a PRO account

Bear in mind that user and system settings and connected devices settings are stored in the hub memory. Changing the hub administrator does not reset the settings of the connected devices.

## Connecting the hub to Ajax Cloud

Security requirements
Hub 2 needs internet access to connect to the Ajax Cloud service. This is necessary for the operation of Ajax apps, remote setup and control of the system, and receipt of push notifications by the users. The central unit is connected via Ethernet and two SIM cards. The hub is available in two versions: with 26 and 2G/3G/4G (LTE) modem. We recommend that you connect all communication channels simultaneously for more stability and availability of the system.

To connect the hub to Ajax Cloud:

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 hub from dismantling.
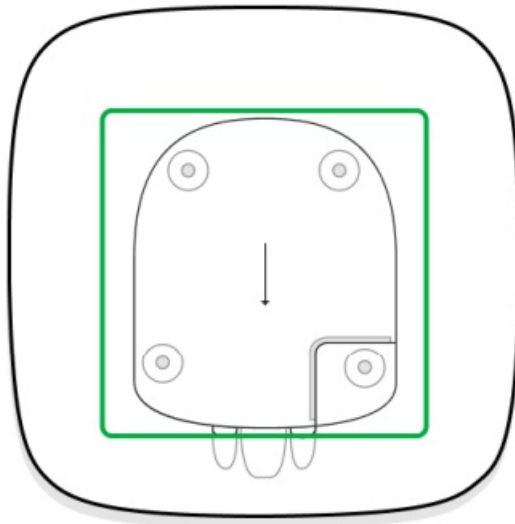
2. Connect power and Ethernet cables to the appropriate sockets and install SIM cards.
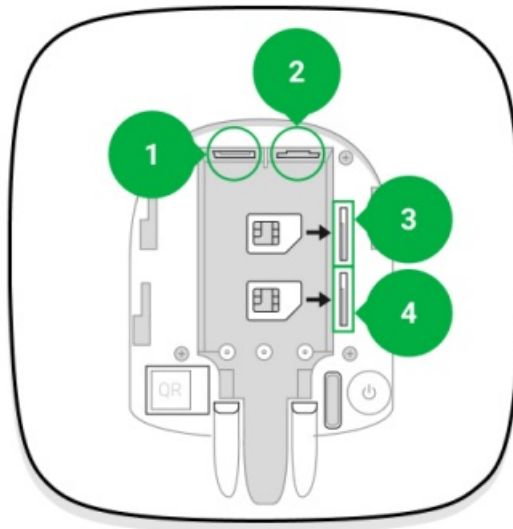
- Power socket
- Ethernet socket
- Slots for installing micro SIM cards
- Slots for installing micro SIM cards

3. Press and hold the power button for 3 seconds until the Ajax logo lights up.

WARNING

It takes up to 2 minutes for the hub to connect to the internet and upgrade to the latest version of OS Malevich, provided there is stable internet connection. A green or white LED indicates that the hub is running and connected to the Ajax Cloud. Also bear in mind that to be upgraded, the hub must be connected to the external power supply.

If the 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 will be able to set up a static IP address of the hub in the Ajax app.
If SIM card connection fails
To connect to the cellular network, you need a micro SIM card with a disabled PIN code request (you can disable it using a mobile phone) and a sufficient amount on your account to pay for the services at your operator's rates. If the hub does not connect to the cellular network, use Ethernet to configure the network parameters: roaming, APN access point, username, and password. Contact your telecom operator for support to find out these options.

How to set or change APN settings in the hub

Adding a hub to the Ajax app
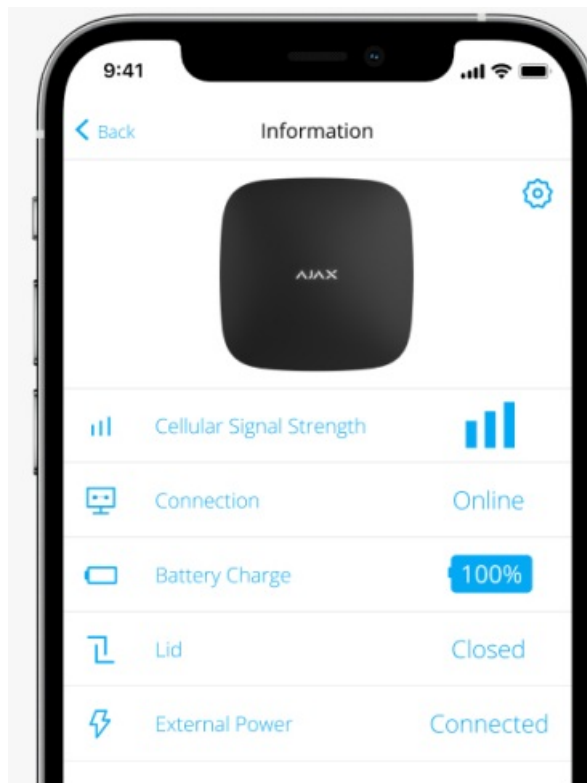
1. Connect the hub to the internet and power supply. Turn on the security central panel and wait until the logo lights up green or white.
2. Open the Ajax app. Give access to the requested system functions to fully use the capabilities of the Ajax app and not to miss alerts about alarms or events.
   - How to set up push notifications on iOSS
   - How to set up push notifications on Android
3. Click Add Hub.
4. Choose a suitable method: manually or using step-by-step guidance. If you are setting the system up for the first time, use step-by-step guidance.
5. Specify the name of the hub and scan the QR code or enter the ID manually.
6. Wait until the hub is added. The linked hub will be displayed in the Devices tab.

After adding a hub to your account, you automatically become the administrator of the device. Changing or removing the administrator does not reset the settings of the hub or delete connected devices. Administrators can invite other users to the security system and determine their rights. Hub 2 supports up to 100 users.
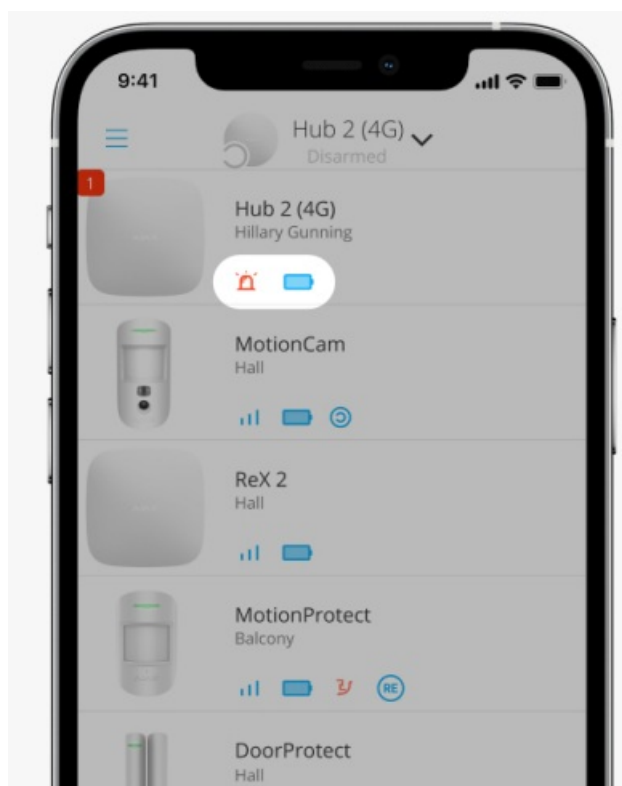
How to add new users to the hub
Ajax's security system user rights

Faults counter
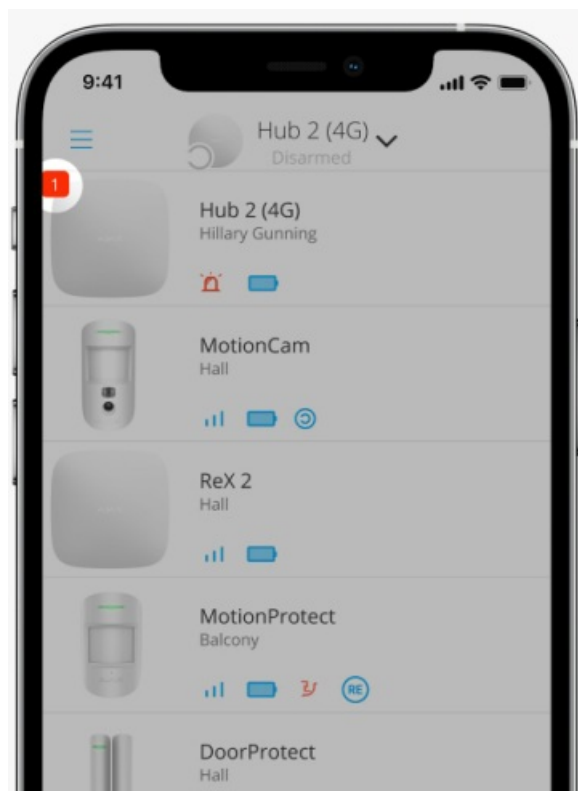
If a hub fault is detected (e.g., no external power supply is available), a faults counter is displayed on the device icon in the Ajax app. All faults can be viewed in the hub states. Fields with faults will be highlighted in red.

Hub icons

Icons display some of the Hub 2 statuses. You can see them in the Devices tab in the Ajax app.

Icon	Value
(2G)	SIM card operates in 2G network.
(3G)	SIM card operates in 3G network. **Available for Hub 2 (4G) only.**
(4G)	SIM card operates in 4G network. **Available for Hub 2 (4G) only.**
▯	No SIM cards.
▯	The SIM card is faulty, or PIN code has been set up for it.
▮	Hub battery charge level. Displayed in increments of 5%. ## Learn more
⊙	Hub failure detected. The list is available in the hub states list.
⛨	The hub is directly connected to the central monitoring station of the security company.
⛨	The hub is not directly connected to the central monitoring station of the security company.

Hub states
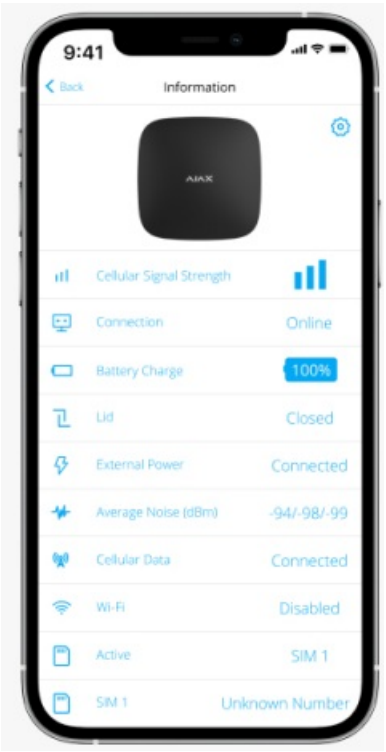
The states include information about the device and its operating parameters. Hub 2 states can be viewed in the Ajax app:

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 Hub 2 from the list.

Parameter	Value
Malfunction	Clicking on opens the hub malfunctions list. The field appears only if a malfunction is detected.
Cellular signal strength	Shows the signal strength of the mobile

|	
	network for the active SIM card. We recommend installing the hub in places with the signal strength of 2-3 bars. If the signal strength is 0 or 1 bar, the hub may fail to dial up or send an SMS about an event or alarm.
Battery charge	Battery charge level of the device. Displayed as a percentage. **Learn more**
Lid	Status of the tamper that responds to hub dismantling: **Closed** — the hub lid is closed. **Opened** — the hub is removed from SmartBracket holder. **Learn more**
External power	External power supply connection status: **Connected** — the hub is connected to external power supply. **Disconnected** — no external power supply is available.
Connection	Connection status between the hub and Ajax Cloud: **Online** — the hub is connected to Ajax Cloud. **Offline** — the hub is not connected to Ajax Cloud.

Cellular data	The hub connection status to the mobile Internet:
	Connected — the hub is connected to Ajax Cloud via mobile Internet.
	Disconnected — the hub is not connected to Ajax Cloud via mobile Internet.

	If the hub has enough funds on the account or has bonus SMS/calls, it will be able to make calls and send SMS messages even if the **Not connected** status is displayed in this field.
Active SIM card	Displays active SIM card:
	SIM card 1 — if the first SIM card is active.
	SIM card 2 — if the second SIM card is active.
	You cannot switch between the SIM cards manually.

SIM card 1	The number of the SIM card installed in the first slot. To copy the number, click on it. Bear in mind that the number is displayed if it has been hardwired into the SIM card by the operator.
SIM card 2	The number of the SIM card installed in the second slot. To copy the number, click on it. Bear in mind that the number is displayed if it has been hardwired into the SIM card by the operator.
Ethernet	Internet connection status of the hub via Ethernet: **Connected** — the hub is connected to Ajax Cloud via Ethernet. **Disconnected** — the hub is not connected to Ajax Cloud via Ethernet.
Average Noise (dBm)	Noise power level at the hub installation site. The first two values show the level at Jeweller frequencies, and the third — at Wings frequencies. The acceptable value is 80 dBm or lower. Installing the hub in places with higher noise levels may lead to loss of signal from connected devices or notifications on jamming attempts.

Monitoring Station	The status of direct connection of the hub to the central monitoring station of the security company: **Connected** — the hub is directly connected to the central monitoring station of the security company. **Disconnected** — the hub is not directly connected to the central monitoring station of the security company. If this field is displayed, the security company uses a direct connection to receive events and security system alarms. Even if this field is not displayed, the security company still can monitor and receive event notifications via the Ajax Cloud server. **Learn more**
Hub model	Hub model name.
Hardware version	Hardware version. Not updated.
Firmware	Firmware version. Can be updated remotely. **Learn more**
ID	Hub identifier (ID or serial number). Also located on the device box, on the device circuit board, and on the QR code under the SmartBracket lid.

Hub settings
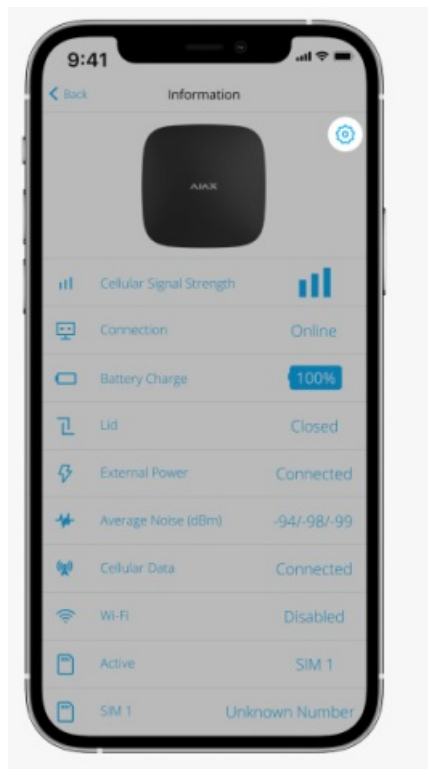
Hub 2 settings can be changed in the Ajax app:

1. Select the hub if you have several of them or if you are using a PRO app
2. Go to Devicestab and select Hub 2 from the list.
3. Go to Settings by clicking on the gear icon in the upper right corne.
4. Set the required parameters.
5. Click Back to save the new settings.

- Avatar
- Hub name
- Users
- Ethernet
- Cellular
- Geofence
- Groups
- Security schedule
- Detection Zone Test
- Jeweller
- Service
- Monitoring Station
- PRO
- Security companies
- User Guide
- Data Import
- Unpair 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 Ajax logo on the hub will start blinking red.
4. Remove the hub from your account.

Malfunctions
Hub 2 may notify about malfunctions if any. Malfunctions field is available in the Device States. Clicking on opens the list of all malfunctions. Note that the field is displayed if a malfunction is detected.
Connection of detectors and devices

The hub is incompatible with cartridge and Oxbridge Plus integration modules. You also cannot connect other hubs to it. When adding a hub using a step-by-step guidance, you will be prompted to add devices that will protect the premises. However, you can refuse and return to this step later. Prior to linking a detector or device to a hub, create at least one room. Rooms are used to group detectors and devices, as well as to increase the information content of notifications. Names of devices and rooms will be displayed in the text of the event or alarm of the security system.

To create a room in the Ajax app:

1. Select the hub if you have several of them or if you are using a PRO Ajax app.
2. Go to the Rooms tab.
3. Click Add Room.
4. Assign a name to it. If possible, attach or take a picture of the room-this will make it easier to find in the list.
5. Click Save.

To change the room picture or name or to remove it, go to the room settings by pressing the gear icon in the Rooms b menu.

How to connect a detector or device to the hub

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

2. Go to the Rooms 🔲 tab.

3. Open the room and select Add Device.

4. Name the device, scan its QR code (or enter it manually), select a group (if group mode is enabled).

5. Click Add – the countdown for adding a device will begin.

6. Follow the instructions in the app to connect the device.

In order to link a device to the hub, the device must be located within the hub's radio communication range (at the same secured premises). If connection fails, follow the instructions in the user guide for a respective device.

Events and alarms notifications
The Ajax security system informs the user about alarms and events using three types of notifications: push notifications, SMS, and phone calls. Notification settings can only be changed for registered users that are connected to the hub.

Type in app	System events	Notifications
Malfunctions	Loss of connection between the device and the hub	
	Jamming	Push notifications
	Low battery charge in device or hub	SMS
	Masking	
	Tampering with the detector body	
Alarm	Intrusion	
	Fire	Calls
	Flood	Push notifications
	Loss of connection between the hub and the Ajax Cloud server	SMS
Events	Turning on / off **WallSwitch**, **Relay**, **Socket**	Push notifications SMS
Arming / Disarming	Arming / Disarming entire premises or group Turning on **Night mode**	Push notifications SMS

How Ajax notifies users of alerts

Selection of location for installation

When choosing a location, consider three main factors:

- Jeweller signal strength,
- Wings signal strength,

- cellular signal strength.

Locate Hub 2 in a place with stable Jeweller and Wings signal strength of 2–3 bars with all connected devices (you can view the signal strength with every device in the list of states for a respective device in the Ajax app). When choosing a place for installation, consider the distance between the devices 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. To roughly calculate the signal strength at the place of installation, use our radio communication range calculator. The cellular signal strength of 2-3 bars is necessary for the correct stable operation of SIM cards installed in the hub. If the signal strength is 0 or 1 bar, we cannot guarantee all events and alarms by calls, SMS, or mobile internet. Be sure to check the Jeweller and Wings signal strength between the hub and all devices at the place of installation. If the signal strength is low (a single bar), we cannot guarantee a stable operation of the security system since a device with a low signal strength may lose connection with the hub. If the signal strength is insufficient, try moving the device (hub or detector) as repositioning by 20 cm can significantly improve the signal reception. If repositioning the device has no effect, try using a range extender. Hub 2 should be hidden from direct view to reducing the likelihood of sabotage or jamming. Also, keep in mind that the device is intended for indoor installation only.

Do not place Hub 2:

- Outdoors. Doing so may cause the device to malfunction or not work correctly.
- 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 connected devices.
- Less than 1 meter away from Ajax wireless devices. This could result in the loss of connection with the detectors.

Installation

Before installing the hub, 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 the hub:

1. Fix the SmartBracket mounting panel with 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 the SmartBracket.
2. Connect the power cable, Ethernet cable, and SIM cards to the hub. Turn on the device.
3. Secure the cables 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 Hub 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 hub off the surface or remove it from the mounting panel.
5. Fix the hub on the SmartBracket panel with bundled screws.

WARNING

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

Maintenance

Check the operational capability of the Ajax security system 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 and dry cloth that is suitable for equipment care. Do not use any substances containing alcohol, acetone, petrol, and other active solvents for cleaning the hub. If the hub battery becomes faulty, and you wish to replace it, use the following guidance:

How to replace hub battery

Technical Specifications

Classification	Security system control panel
Colour	White, black
Installation method	Indoors
Communication with Ajax Cloud	
Hub 2 (2G) communication channels	2 SIM cards 2G (GSM900/DCS1800 (B3/B8)) Ethernet
Hub 2 (4G) communication channels	2 SIM cards 2G (GSM900/DCS1800 (B3/B8)) 3G (WCDMA 850/900/2100 (B1/B5/B8)) LTE (FDD B1 /B3/B5/B7/B8/B20/B28) Ethernet
Communication with devices	
Communication protocols	Encrypted two-way radio protocols: **Jeweller** — for transmitting events and alarms. **Wings** — for transmitting photos.

Radio communication range	Up to 2000 m without obstacles **Learn more**
Radio frequency band	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 (depending on the sales region)
Radio signal modulation	GFSK
Maximum effective radiated power (ERP)	≤ 25 mW
Polling interval	12–300 s (set by administrator in the app)
Time for alarm delivery from detector to hub	0.15 s

Time for photo delivery from detector to hub	up to 9 s at default settings **Learn more**
Capabilities	
Number of connected devices	up to 100 including range extenders and sirens
Number of connected ReX	up to 5
Number of connected sirens	up to 10
Number of security groups	up to 9
Number of users	up to 50
Video surveillance	up to 25 cameras or DVRs
Number of rooms	up to 50
Number of scenarios	up to 32 **Learn more**

Central Monitoring Station communication protocols	SurGard (Contact ID) SIA (DC-09) Other proprietary protocols **Learn more**
Power supply	
Power supply	110–240 V with a pre-installed power supply unit 12 V with an alternative power supply unit **12V PSU** 6 V with an alternative power supply unit **6V PSU**
Backup battery	Li-Ion 2 Ah (up to 16 h of battery life with Ethernet disabled)
Energy consumption from the grid	10 W
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	362 g
Service life	10 years

Complete set

1. Hub 2 (2G) or Hub 2 (4G).
2. Power cable.
3. Ethernet cable.
4. Installation kit.
5. SIM card (supplied depending on the region).

6. Quick Start Guide.

Warranty

Warranty for the AJAX SYSTEMS MANUFACTURING Limited Liability Company products is valid for 2 years after the purchase.If the device does not function properly, we recommend that you first contact the support service as technical issues can be resolved remotely in half of the cases!

Contact Technical Support:

- e-mail
- Telegram

Documents / Resources

AJAX Hub 2 4G Security System Control Panel [pdf] User Manual
Hub 2 4G, Hub 2 2G, Security System Control Panel, System Control Panel, Control Panel, Security System, Hub 2 4G, Panel

References

- ☞ **How to set up alarm push notifications on Android | Ajax Systems Blog**
- ☞ **Ajax PRO Desktop: App for real PROs | Ajax Systems Blog**
- ☞ **Introducing Ajax PRO: A universal tool for professional installers | Ajax Systems Blog**
- ☞ **How OS Malevich updates | Ajax Systems Blog**
- ☞ **What jamming of a wireless security system is and how to resist it | Ajax Systems Blog**
- ☞ **Connecting Ajax to CMS**
- ☞ **End user agreement - Ajax Systems**
- ☞ **How to connect security cameras to the Ajax security system**
- ☞ **Hub 2 — Security control panel supporting detectors with photo**
- ☞ **ocBridge Plus — Module for Ajax devices integration with wired systems**
- ☞ **Signal range extenders in the security system | Ajax Systems**
- ☞ **Relay — Low current remote control relay with dry contact**
- ☞ **Socket (type F) — Wireless smart plug with energy monitor**
- ☞ **uartBridge — Module for Ajax devices integration with third-party wireless alarms systems**
- ☞ **Ajax WallSwitch — Wireless power relay with energy monitor**
- ☞ **Jeweller and Wings radio protocols in the Ajax security system**
- ☞ **Jeweller and Wings radio protocols in the Ajax security system**
- ☞ **Software | Ajax Systems**
- ☞ **Ajax devices standards compliance list**
- ☞ **Warranty - Ajax Systems**
- ✉ **User account types and rights | Ajax Systems Support**

Manuals+,