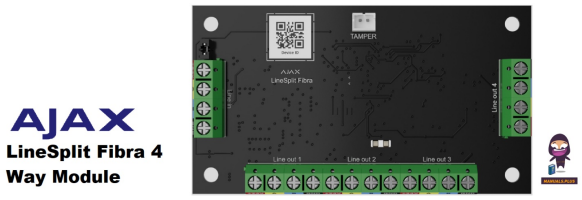

AJAX LineSplit Fibra 4 Way Module User Manual

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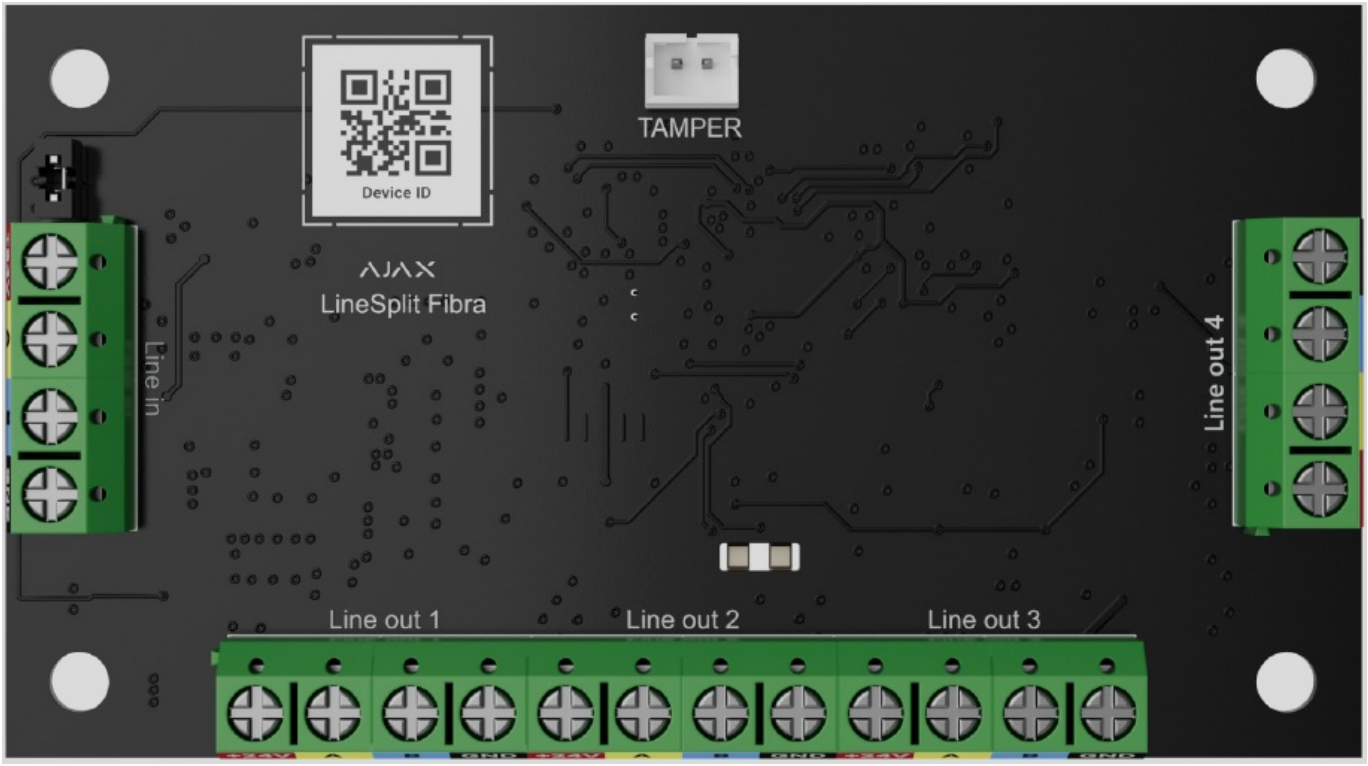
AJAX LineSplit Fibra 4 Way Module



Specifications

- Designed to split one Fibra line into four lines
- Each output line can have a length of up to 2,000 meters with U/UTP cat.5 cable
- Compatible with Hub Hybrid (2G) and Hub Hybrid (4G)
- Part of Ajax system using secure Fibra wired communication protocol
- Indoor installation recommended

Product Usage Instructions

Installation

1. Install LineSplit at any point of the Fibra line, particularly after another LineSplit if necessary.
2. Connect LineSplit using U/UTP cat.5 twisted pair cable for each output line.
3. Use terminating resistor jumper on two contacts if LineSplit is the last device, otherwise, use it on one contact.
4. Install LineSplit inside Case (casing sold separately) for protection.

Functionality

1. LineSplit splits the Fibra line into four lines.
2. Each output line can reach up to 2,000 meters in length.
3. LineSplit modules can be connected in series, with up to 10 modules in a chain.

Tamper Board

1. Connect the tamper board included in the Case set to the LineSplit module.
2. The tamper board triggers a notification if the casing lid is tampered with or opened.

Power Supply
LineSplit does not provide additional power supply to the line. Use LineSupply Fibra for this purpose if needed.

Compatibility
LineSplit is compatible with Hub Hybrid (2G) and Hub Hybrid (4G) within the Ajax system.

FAQ

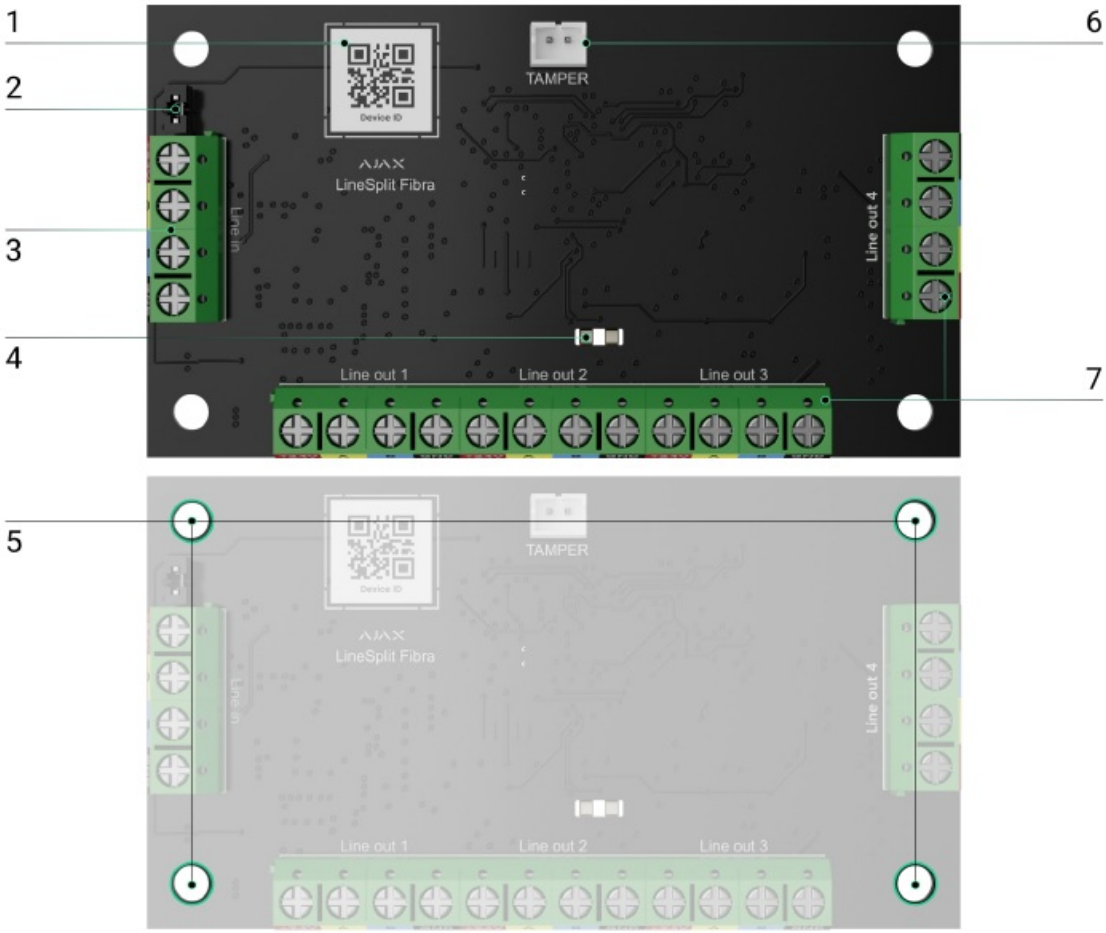
- What is the maximum length of each output line?
  Each output line can have a length of up to 2,000 meters when connected using U/UTP cat.5 twisted pair cable.
- How many LineSplit Fibra modules can be connected in series?
  Up to 10 LineSplit Fibra modules can be installed one after the other.
- Does LineSplit provide additional power supply to the line?
  No, LineSplit does not provide additional power supply. Use LineSupply Fibra for additional power requirements.

LineSplit Fibra is a module designed to split one Fibra line into four ones. Each device output line can have a length of up to 2,000 meters when connected using the U/UTP cat.5 twisted pair cable. LineSplit can be installed at any point of the line, in particular after another LineSplit.

- The device is compatible with Hub Hybrid (2G) and Hub Hybrid (4G) . Connection to other hubs, radio signal range extenders, ocBridge Plus and uartBridge is not provided.

LineSplit is part of an Ajax system and exchanges data with the hub using the secure Fibra wired communication protocol.
LineSplit relates to the Fibra product line of wired devices. Only accredited Ajax Systems partners can buy, install, and administer Fibra products.

Functional elements



1. QR code with the device ID. It is used to pair the device with an Ajax security system.
2. Terminating resistor jumper. It is installed on two contacts if LineSplit is the last device on the Fibra line. Otherwise, the jumper is installed on one contact.
3. LineSplit input terminals.
4. LED indicators.
5. Holes to install the device inside Case (the casing is sold separately).
6. Connector to fasten the tamper board to the module. The tamper board is in Case.
7. Output terminals for connecting wired devices.

Operating principle

- Do not connect Fibra output lines created with LineSplit in a Ring topology.
- LineSplit modules can be connected one after another. Up to 10 LineSplit Fibra modules can be installed one after the other, connecting each module to the output line of the previous one. The total output current on the hub lines and the hub specifications limits the number of connected devices. You can connect up to 100 devices to Hub Hybrid.
- LineSplit Fibra does not provide additional power supply to the line. To provide additional power supply to the line, LineSupply Fibra can be used.
- LineSplit is designed for indoor installation. We recommend installing LineSplit into Case (the casing is sold separately). The casing is available in multiple versions.
- The module is equipped with a connector for a tamper board (included in the Case complete set). The tamper reacts if someone tries to break or open the casing lid. If it triggers, the notification is sent to the Ajax apps.

What is the tamper

Fibra data transfer protocol
LineSplit uses Fibra technology to transmit alarms and events. It is a wired data transfer protocol for fast and reliable two-way communication between the hub and connected devices.

Learn more

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

LineSplit can transmit the following events:

1. Tamper alarm. Tamper recovery.
2. Low supply voltage and when voltage returns to normal.
3. Loss of communication between LineSplit and the hub. Reconnecting.
4. Temporary deactivation/activation of the device.
5. Short circuit on the Fibra line and when the power supply is restored.
6. Overvoltage on the Fibra line and when voltage returns to normal.

When an alarm is received, the CMS operator knows exactly what happened and where to send the rapid response team. The Ajax devices are addressable, meaning that PRO Desktop app and CMS receive events, device type, assigned name, and location (room, group). The list of transmitted parameters may differ depending on the type of CMS and the selected communication protocol.
You can find the device ID, loop (zone) number, and the line number in the device States

Selecting the installation site for LineSplit

When choosing a spot to install LineSplit, consider the parameters that affect the operation of the device:

- Fibra signal strength.
- The length of the cable used to connect LineSplit.
- Length of the cable used to connect wired devices to LineSplit.

Follow these recommendations when designing the Ajax system project for an object. The security system should be designed and installed by professionals. The list of authorized Ajax partners is available here.

Installing into Case

- LineSplit is designed for indoor installation only. It is recommended to install device into Case. The casing is available in multiple versions. Installing one LineSplit module or several devices into Case is possible. Use Case configurator to get the most optimal placement of your Fibra devices in the casing.
- Case has mounts for the modules, wire channels, and a tamper that connects to LineSplit. The CMS and users receive notifications if someone tries to break the casing or open the lid.
- Case is sold separately from LineSplit.

LineSplit cannot be installed

1. Outdoors. This could damage the module.
2. Inside premises with temperature and humidity values that do not correspond to the operating parameters. This could damage the module.

3. In places with low or unstable Fibra signal strength.
4. Without Case.

Fibra signal strength

Fibra signal strength is determined by the ratio of the number of undelivered or corrupted data packages to those expected over a specific time. The icon in the Devices tab in Ajax apps indicates the signal strength:

- 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; stable operation is not guaranteed.

The following factors affect the signal strength:

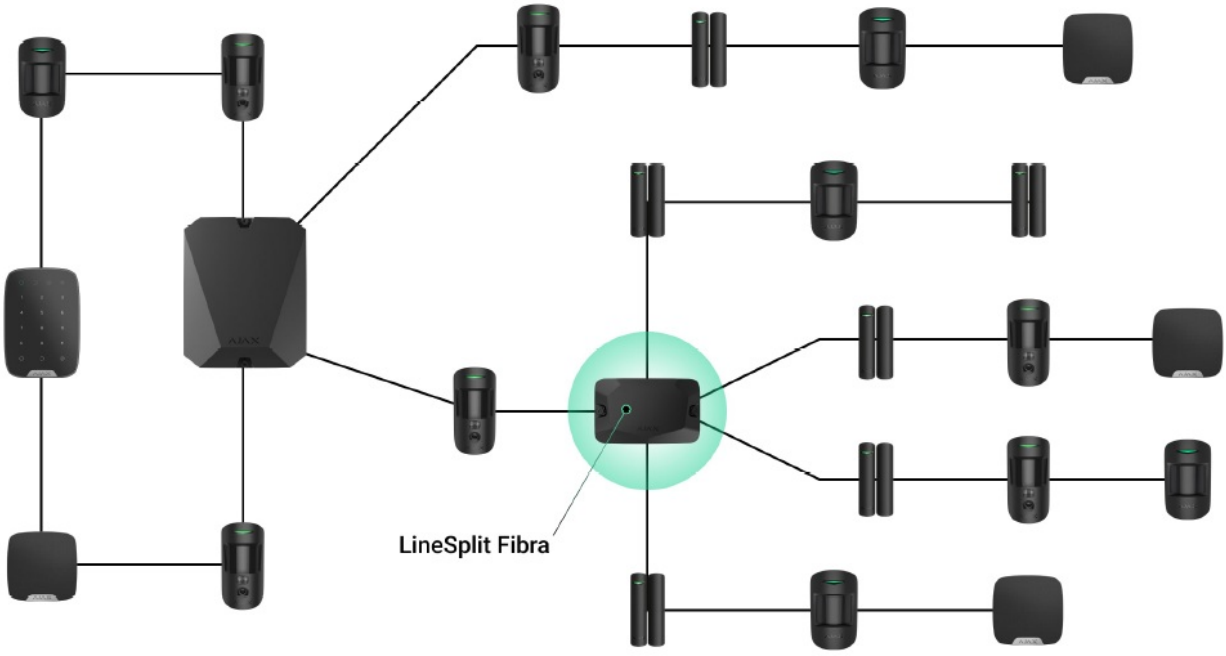
- The number of devices on the Fibra line.
- Cable length and type.
- The correctness of the wire connections to the terminals.

Lines Power Test
The test simulates the maximum energy consumption of devices connected to the control panel: the detectors give alarms, sirens turn on, and keypads activate. If the system passes the test successfully, all its devices have enough power in any situation.
If at least one Fibra line does not have enough power, the app displays a notification with the status of each line:

- Test passed.
- Test passed with malfunctions.
- Test failed.
- What is Lines Power Test

Designing the system project

- It is crucial to properly design the system project to install and configure the devices correctly. The project must take into account the number and types of devices at the object, their exact location and installation height, the length of wired Fibra lines, the type of cable used, and other parameters. Read the article to learn tips for designing the Fibra system project.
- LineSplit can be connected at any point of the Fibra line, splitting it into four lines. Each output line of the device can have a length of up to 2,000 meters when connected using the U/UTP cat.5 twisted pair cable.
- Different types of devices can be connected to the same Fibra line. For example, you can use opening detectors, motion detectors supporting photo verification, sirens, keypads, and LineSplit modules on the same line.



- Connecting multiple LineSplit modules one after the other allows you to expand the Ajax system by splitting lines. One Fibra line splits into four, four into sixteen, and so on. Up to 10 LineSplit Fibra modules can be installed one after the other, connecting each module to the output line of the previous one. The number of wired devices in the system is limited by the output current of the hub and its specifications. You can connect up to 100 devices to Hub Hybrid.
  LineSplit Fibra does not provide additional power supply to the line. To provide additional power supply to the line, LineSupply Fibra can be used.
- If LineSplit is the last device on the line, the terminating resistor jumper is installed on two contacts.
  Ajax systems also support Beam (Radial) and Ring topologies. The output lines created when using LineSplit do not support the Ring topology.

More about topologies Cable length and type

Recommended cable types:

- U/UTP cat.5, 4 × 2 × 0.51, copper conductor.
- Signal cable 4 × 0.22, copper conductor.

The wired connection range may vary if you use a different cable type. No other types of cables have been tested.

Verification using a calculator
To make sure that the project is designed correctly and that the system will work in practice, we have developed a Fibra power supply calculator. The calculator helps to check the communication quality and cable length for wired Fibra devices when designing the system project.

Preparing for installation

Cable arrangement
When preparing to lay cables, check the electrical and fire safety regulations in your region. Strictly follow these standards and regulations. Tips for cable arrangement are available in this article.

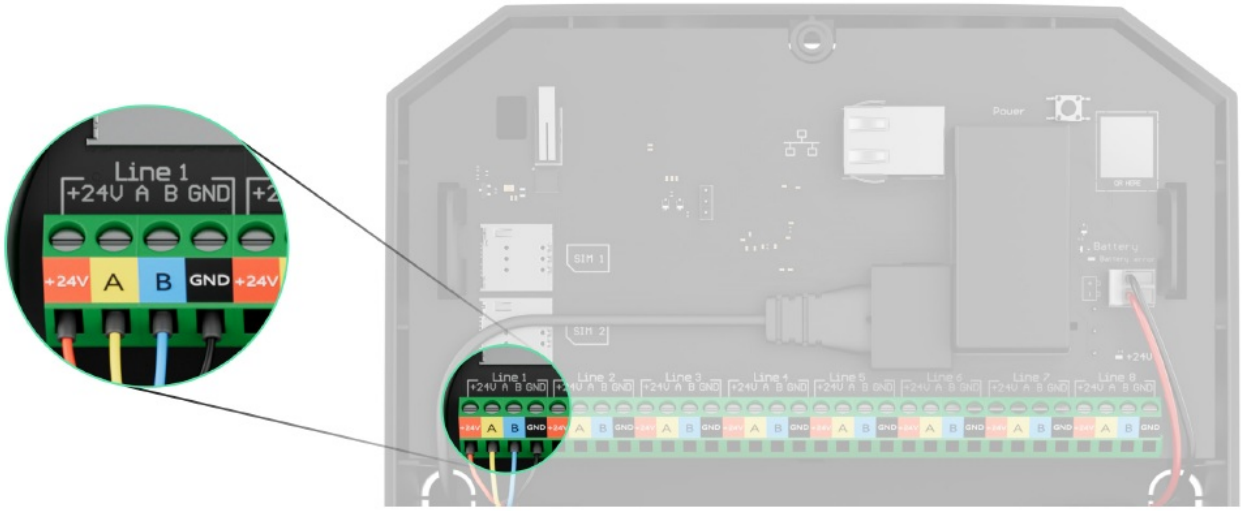
Cable routing
We recommend you to carefully read the Selecting the installation site section before installation. Avoid deviations from the system project. Violating the basic installation rules and the recommendations of this manual may lead to incorrect operation and loss of connection with LineSplit. Tips for cable routing are available in this article.

Preparing cables for connection
Remove the insulating layer and strip the cable with a special insulation stripper. The ends of the wires inserted into the device terminals must be tinned or crimped with a sleeve. This ensures a reliable connection and protects the conductor from oxidation. Tips for preparing the cables are available in this article.

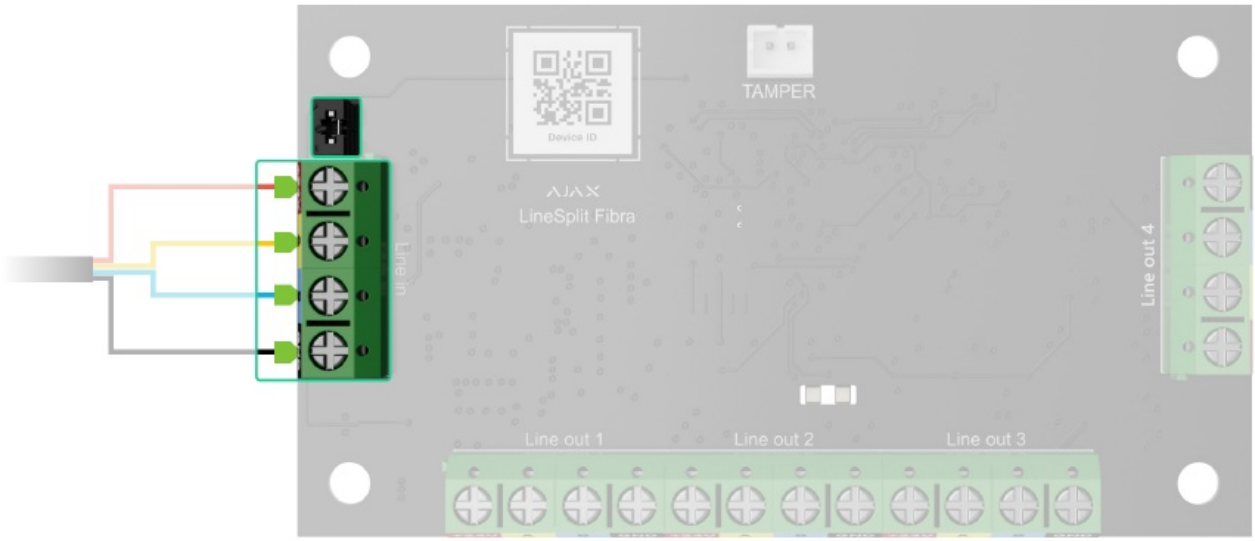
Installation and connection

Connecting LineSplit Fibra to the hub

1. Prepare cable holes in advance by carefully breaking out the perforated parts of Case.
2. Secure Case with the bundled screws using at least two fixing points. For the casing tamper to respond to disassembly attempts, fix Case at a point with a perforated area.
3. Turn off the power of lines in the Ajax PRO app . The function is available in the Lines menu:
    1. Hub → Settings → Lines → Lines Power Supply.
4. Route the cable to connect the LineSplit to the hub casing. Connect the wires to the required hub line.



    1. +24V — 24 V power terminal.
    2. A, B — signal terminals.
    3. GND — ground.
5. Connect the wires to the LineSplit input terminals according to the diagram below. Follow the polarity and connection order of the wires. Securely fasten the cable to the terminals.

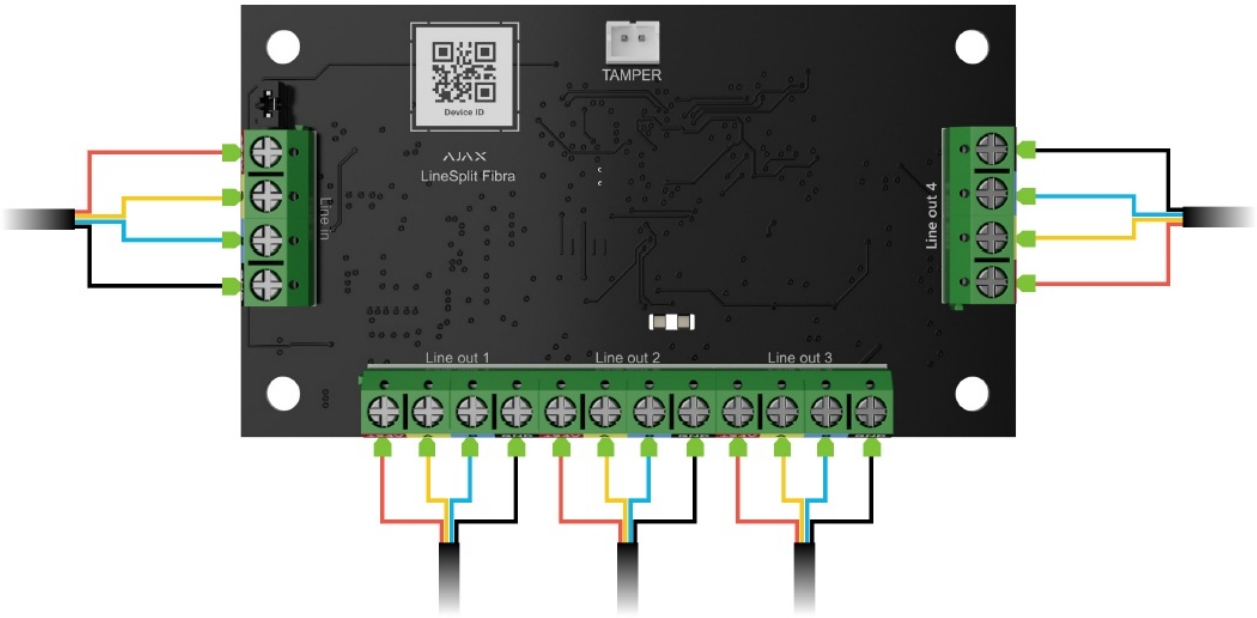


1. If LineSplit is the last on the line, install a terminating resistor jumper on the two contacts. Otherwise, the terminating resistor jumper should remain set on one contact.

6. Connect wired devices to LineSplit Fibra output lines.
    1. Secure the module in Case using the holes in the board. Secure the cable with ties.
7. Connect the Case tamper to the appropriate board connector.
8. Place the lid on the casing and fasten it with the bundled screws.
9. Turn on line power in the Ajax PRO app (Hub → Settings → Lines → Lines Power Supply). When power is applied, the green LED will indicate that the device is turned on.
10. Add LineSplit to the hub.
11. Perform the Fibra Signal Strength Test . The recommended signal strength is two or three bars. If the signal strength is one or zero bars, check the connection correctness and the cable integrity.
12. Run Lines Power Test.

Connecting wired devices to LineSplit Fibra

1. Turn off a line power in the Ajax PRO app . The function is available in the Lines menu:
    1. Hub → Settings → Lines → Lines Power Supply.
2. Connect the wires of the connectable devices to the LineSplit output terminals according to the diagram below. Observe the polarity and connection order of the wires. Securely fasten the cable to the terminals.



3. Turn on a line power in the Ajax PRO app (Hub → Settings → Lines → Lines Power Supply). When power is applied, the green LED will indicate that the device is turned on.
4. Add connected wired devices to the hub. The algorithm for adding and configuring is described in the user manual of each device.
5. Run the functionality testing.

Adding to the system

LineSplit Fibra is compatible with Hub Hybrid (2G) and Hub Hybrid (4G) only. Only verified partners can add and configure Fibra devices in Ajax PRO apps.
Types of accounts and their rights

Before adding a device

1. Install an Ajax PRO app.
2. Log in to a PRO account or create a new one.
3. Select a space or create a new one.

   What is a space

   How to create a space

   The space functionality is available for apps of such versions or later:

   1. Ajax Security System 3.0 for iOS;
   2. Ajax Security System 3.0 for Android;
   3. Ajax PRO: Tool for Engineers 2.0 for iOS;
   4. Ajax PRO: Tool for Engineers 2.0 for Android;
   5. Ajax PRO Desktop 4.0 for macOS;
   6. Ajax PRO Desktop 4.0 for Windows.
4. Add at least one virtual room.
5. Add a compatible hub to the space. Ensure the hub is switched on and has internet access via Ethernet, Wi-Fi, and/or mobile network.
6. Ensure the space is disarmed, and the hub is not starting an update by checking statuses in the Ajax app.

How to add LineSplit Fibra

Two ways to add devices are available in the Ajax PRO app: automatically and manually.

To automatically add a device:

1. Open the Ajax PRO app. Select the hub to which you want to add LineSplit Fibra.
2. Go to the Devices tab and click Add Device.
3. Select Add All Fibra Devices. The hub will scan the Fibra lines. After scanning, all devices connected to the hub that have not yet been added to the system will be shown.
4. Select the device from the list. After pressing, the LED indicator will flash to identify this device.
5. Set the device name, and specify the room and security group if Group Mode is enabled. Press Save.

To add a device manually:

1. Open the Ajax PRO app. Select the hub to which you want to add LineSplit Fibra.
2. Go to the Devices tab and click Add Device.
3. Assign a name to the device.
4. Scan the QR code or enter it manually. The QR code is located on the board.
5. Select a virtual room and a security group (if Group Mode is enabled).
6. Press Add.

If the connection fails, check the wired connection's correctness and try again. If the maximum number of devices (100 for Hub Hybrid) has already been added to the hub, you will receive an error notification while adding. LineSplit only works with one hub. When the device is paired with a new hub, the module stops exchanging data with the previous hub. When LineSplit is added to a new hub, it remains in the list of devices on the previous hub. You can remove the device manually.

Functionality testing
Available for LineSplit:

- Fibra Signal Strength Test – to determine the strength and stability of the signal at the device installation site.
- Lines Power Test – to determine if there is enough power for all devices connected to the hub.

How to run Fibra Signal Strength Test:

1. Select a hub in the Ajax PRO app.
2. Go to the Devices menu.
3. Select LineSplit.
4. Go to the LineSplit settings by clicking on the gear icon .
5. Select Fibra Signal Strength Test.
6. Run the test following the prompts on the screen.

How to run Lines Power Test:

1. Select a hub in the Ajax PRO app.
2. Go to the Devices menu.
3. Select a hub.
4. Go to the hub settings by clicking on the gear icon .
5. Open the Lines menu.
6. Select Lines Power Test.
7. Run the test following the prompts on the screen.

Icons
The icons show some statuses of the device. You can check them in the Ajax apps:

1. Select a hub in the Ajax app.
2. Go to the Devices tab.
3. Find LineSplit in the list.

Icon	Meaning
	Fibra Signal Strength — displays the signal strength between the hub and the detector. Recommended values: 2–3 bars. Learn more
	LineSplit is temporarily deactivated. Learn more
	In LineSplit, events of tamper triggering are temporarily disabled. Learn more
	The device was not transferred to the new hub. Learn more

States

The states display information about the device and its operating parameters. You can check the LineSplit states in the Ajax apps:

1. Select a hub in the Ajax app.

2. Go to the Devices tab.
3. Select LineSplit from the list of devices.

Parameter	Meaning
Temperature	Module temperature. The acceptable error between the value in the app and the temperature at the installation site: 2 °C. The value is updated as soon as the module detects a temperature change of at least 1 °C. You can create a scenario by temperature to control a utomation devices. Learn more
Fibra Signal Strength	Signal strength between the hub and LineSplit Fibra. Recommended values: 2–3 bars. Fibra is a protocol for transmitting events and alarms. Learn more

Connection via Fibra	The status of connection between the hub and the mo dule: **Online** — the module is connected to the hub. **Offline** — the module has lost connection with the hub . Check the module connection to the hub.
Line Voltage	The voltage value on the Fibra line to which the modul e is connected.

Lid	The tamper status that responds to the detachment of the device from the surface or violation of the device's casing integrity: **Not connected** — the tamper is not connected to Line Split. **Closed** — the module is installed into Case; the tamp er is connected. Normal state of the casing. **Front lid open** — the integrity of the casing is violated . Check the state of the casing. **Detached from surface** — the board is removed from the casing. Check the mounting. Learn more
Temporary Deactivation	Shows the status of the device temporary deactivation function: **No** — the device operates in normal mode and transmi ts all events. **Entirely** — the device does not follow system comman ds and does not report alarms or other events. **Lid Only** — notifications on the tamper triggering are d isabled. Learn more

Firmware	LineSplit firmware version.
Device ID	LineSplit ID/Serial Number. Also available on the device board and its packaging.
Device No.	LineSplit loop (zone) number.
Line No.	The Fibra line number of the hub to which LineSplit is connected.

Settings

To change module settings in an Ajax app:

1. Go to the Devices tab.
2. Select LineSplit from the list of devices.
3. Go to Settings by clicking on the gear icon .
4. Set the required parameters.
5. Click Back to save the new settings.

Settings	**Meaning**
Name	Name of the module. Displayed in the list of hub devices, text of SMS and notifications in the events feed. To change the name of the module, click on the text field. The name can contain up to 12 Cyrillic characters or up to 24 Latin characters.
Room	Selection of the LineSplit virtual room. The room name is displayed in the text of SMS and notifications in the events feed.
Alert with a siren if malfunction on output lines detected	If the option is enabled, the siren is activated in case of detection of a malfunction of the output lines.

Fibra Signal Strength Test	Puts the module into the Fibra Signal Strength Test mode. The test allows you to check the signal strength between the hub and LineSplit via the wired Fibra data transfer protocol to select the optimal installation site. Learn more
User Guide	Opens LineSplit User Manual in an Ajax app.
Temporary Deactivation	Allows the user to disable the device without removing it from the system. Three options are available: **No** — the device operates in normal mode and transmits all events. **Entirely** — the device will not execute system commands, and the system will ignore alarms and other notifications from the device. **Lid Only** — notifications on the tamper triggering are disabled. Learn more
Unpair Device	Unpairs LineSplit from the hub and deletes its settings.

Indication

Event	Indication	Note
Adding a module	**When added automatically** — the green LED flashes quickly when LineSplit is selected from the list. When you click Add device, the green LED flashes once.	

	When added manually — the green LED flashes once.	
Removing the module	The green LED flashes six times.	
Tamper triggering	The green LED flashes once.	
Lines Power Test	The green and red LEDs are glowing continuously during the tes t.	
Low voltage on the input line	The green LED lights up smoothly and goes out smoothly.	Voltage of 7 V or less is considered low.
Short circuit on the line	The red LED flashes 4 times per se cond for 12 seconds.	After 12 seconds, LineSplit attempt s to restore power to the output line s, but if the fault has not been clear ed, the module repeats turning off. The actions are repeated until the c orrect state of the line is restored.
Overvoltage on the line	The red LED flashes 4 times per se cond for 12 seconds.	After 12 seconds, LineSplit attempt s to restore power to the output line s, but if the fault has not been clear ed, the module repeats turning off. The actions are repeated until the c orrect state of the line is restored.

Maintenance
The device does not require maintenance.

Technical specifications

- All technical specifications of LineSplit Fibra
- Compliance with standards

Warranty

Warranty for products of Limited Liability Company “Ajax Systems Manufacturing” is valid for 2 years after purchase. If the device does not function correctly, please contact Ajax Technical Support first. In most cases, technical issues can be resolved remotely.

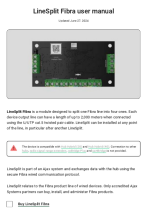
- Warranty obligations

- User Agreement

Contact Technical Support:

- e-mail
- Telegram

Documents / Resources

	AJAX LineSplit Fibra 4 Way Module [pdf] User Manual LineSplit Fibra 4 Way Module, LineSplit, Fibra 4 Way Module, Way Module, Module

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- Configurator of the optimal set of cases for an object
- Compatibility of Ajax devices with system control elements
- Warranty - Ajax Systems
- Where to buy — Ajax Systems
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- How to enable and configure group mode in the Ajax security system | Ajax Systems Support
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