

User Manual

Armatura Horizon Controller IP-Based Biometric Door Unit

Applicable Models: AHSC-1000, AHDU-Series, AHEB Series

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About the Manual

This manual introduces the operations of **Armatura Horizon Controller IP-Based Biometric Door Unit**.

All figures displayed are for illustration purposes only. Figures in this manual may not be exactly consistent with the actual products.

Features and parameters with ★ are not available in all devices.

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1. Safety Instructions

1.1 Important Security Instructions

1. Read and follow the instructions carefully before operation. Please keep the instructions for future reference.
2. **Accessories:** Please use the accessories recommended by the manufacturer or delivered with the product. Other accessories are not recommended, including major alarming systems and monitoring systems. The primary alarming and monitoring system should comply with the local applicable fire-prevention and security standards.
3. **Installation cautions:** Do not place this equipment on an unstable table, tripod mount, support, or base, lest the equipment falls and get damaged or any other undesirable outcome resulting in severe personal injuries. Therefore, it is essential to install the equipment as instructed by the manufacturer.
4. All peripheral devices must be grounded.
5. No external connection wires can be exposed. All the connections and idle wire ends must be wrapped with insulating tapes to prevent any damage to the equipment by accidental contact of the exposed wires.
6. **Repair:** Do not attempt to have an unauthorized repair of the equipment. Disassembly or detachment is risky and likely to cause shock. All repairs should be done by a qualified technician.
7. If any of the following cases arise, disconnect the power supply from the equipment first and intimate the technician immediately.
 - *The power cord or connector appears to be damaged.*
 - *Any liquid or material spilled into the equipment.*
 - *The equipment is wet or exposed to inclement weather conditions (rain, snow, etc.).*
 - *If the equipment cannot function properly, even when operated as instructed, please make sure to adjust only the control components specified in the operating instructions. Making incorrect adjustments to other control components may cause damage to the equipment or result in permanent operational failure.*
 - *The equipment falls, or its performance changes dramatically.*
8. **Replacing components:** If it is necessary to replace a component, only an authorized technician can replace the accessories specified by the manufacturer.
9. **Security inspection:** After the equipment is repaired, the technician must conduct a security inspection to ensure the proper working condition of the equipment.
10. **Power supply:** Operate the equipment only with the type of power supply indicated on the label. If there is any uncertainty about the type of power supply, please contact the technician.



Violation of any of the following cautions is likely to result in personal injury or equipment failure. We will not be responsible for the damages or injuries caused thereby.

- Before installation, switch off the external circuit (that supplies power to the system), including locks.
- Before connecting the equipment to the power supply, ensure the output voltage is within the specified range.
- Never connect the power before completion of installation.

1.2 Installation Instructions

1. The conduits of wires under the relay must match with the metal conduits; for other wires, PVC conduits can be used to prevent failure caused by rodent damage. The control panel is designed with proper antistatic, lightning-proof, and leakage-proof functions. Ensure that its chassis and the AC ground wire are correctly connected and that the AC ground wire is physically grounded.
2. It is recommended not to plug/unplug connection terminals frequently when the system is powered on. Be sure to unplug the connection terminals before starting any relevant wiring job.
3. Do not detach or replace any control panel chip without permission, and an unauthorized operation may cause damage to the control panel.
4. It is recommended not to connect any other auxiliary devices without permission. All non-routine operations must be communicated to our engineers in advance.
5. A control panel should not share the same power outlet with any other high-current device.
6. It is recommended to install card readers and buttons at the height of **55.12 inches to 59.06 inches (1.4m to 1.5m)** above the ground or subject to customers' usual practice for proper adjustment.
7. It is recommended to install control panels in easily accessible locations to facilitate maintenance, such as in a well-ventilated electrical room.
8. For safety reasons, it is strongly recommended that the exposed part of any connection terminal should not exceed **0.16 inches (4mm)** in length. Consider using specialized clamping tools to prevent short-circuits or communication failures caused by accidental contact with excessively exposed wires.
9. To ensure access control event records are saved, regularly export the data from control panels.
10. Prepare appropriate countermeasures for unexpected power failures based on application scenarios, such as selecting a power supply with an uninterruptible power supply (UPS) system.
11. If an RS-485 reader is externally connected and shares the power supply with the device

(Note: The control panel does not support fingerprint verification of RS-485 reader), it is recommended to keep the connection between the RS-485 reader port and the reader no longer than **328 ft (100m)**. Alternatively, it is advised to use a separate power supply for the reader.

12. To safeguard the access control system from any self-induced electromotive force generated by an electronic lock during switching off/on, it is essential to **connect a diode in parallel** (FR107, supplied with the system) with the electronic lock. This diode will dissipate the self-induced electromotive force during onsite connection, ensuring the proper application of the access control system.
13. It is advisable to use separate power supplies for the electronic lock and the control panel.
14. It is recommended to use the power supply provided with the system as the control panel power supply.
15. In locations with significant magnetic interference, it is advisable to use galvanized steel pipes or shielded cables, and ensure proper grounding is implemented.
16. Wiring methods used shall be in accordance with the National Electrical Code, ANSI/NFPA 70.

2. Overview

2.1 Packing List

Please ensure that your box contains all the items listed. If any pieces are missing, kindly contact your distributor for assistance. It is advisable to retain the original box and packing materials in case you need to ship your equipment in the future.

AHSC-1000

- ARMATURA Horizon Controller (AHSC-1000) (1pc)
- 35mm DIN rail adapter: T=0.03" 9.39"x1.34"x0.25" (T=0.7mm 238.5x35x6.3mm) (1pc)
- WIFI external antenna (3pcs)
- Screwdriver (1pc)
- Fast Recovery Diode(FR107) (4pcs)
- Grub screw/Countersunk 7#1-5/8inch (KA3.6x40mm) self – tapping screws (2pcs) and Anchors (2pcs)
 - for mounting directly to a wall
- Grub screw/Countersunk TM3x6mm screw (1pc)

AHDU-1160/1260/1460

- ARMATURA Horizon Controller (AHDU-1160/1260/1460) (1pc)
- 35mm DIN rail adapter: T=0.03" 9.39"x1.34"x0.25" (T=0.7mm 238.5x35x6.3mm) (1pc)
- WIFI external antenna (3pcs)
- Screwdriver (1pc)
- Fast Recovery Diode(FR107) (4pcs)
- Grub screw/Countersunk 7#1-5/8inch (KA3.6x40mm) self – tapping screws (2pcs) and Anchors (2pcs)
 - for mounting directly to a wall
- Grub screw/Countersunk TM3x6mm screw (1pc)

AHEB-0808/AHEB-1602

- ARMATURA expansion board (AHEB-0808/AHEB-1602) (1pc)
- Screwdriver (1pc)
- Fast Recovery Diode(FR107) (8pcs)
- Mounting screws (4pcs)
- Hexagonal copper column (4pcs)

2.2 Introduction

The ARMATURA Horizon Controller Series is an access control system developed by ARMATURA LLC. It is designed for the enterprise-level market. Particularly for large projects with a large number of access points, and stringent security requirements. The entire product series offers comprehensive improvements in hardware, architecture, and system security encryption.

2.3 Features

- Ultimate Authentication Performance
- PoE and 3rd Party Integration
- Threat Levels and Port Failover
- Advanced Access Control Functions
- Supervised Inputs and NC/NO Configurable Ports

Key Features

Ultimate authentication performance

- Supports up to 400,000 (1:1) RFID card/mobile credentials and 100,000 (1:N) fingerprints authentications in a single controller.

PoE

- Supports Power-over-Ethernet (PoE) 802.3at/ 9-24VDC from power sourcing equipment (PSE) according to PoE 802.3at/af standards.

Threat Levels

- Unlimited threat levels, which are used to instantly adjust users access right during lockdown and lockout.

3rd Party Integration

- Supports various reader protocols, including ARMATURA Explorer series readers, along with 3rd party Wiegand and OSDP readers. ARMATURA One provides a RESTful API for seamless integration with 3rd Party software.

Advanced Access Control Functions

- The controller supports advanced access control functions such as multi-frequency RFID card support, multi-biometric authentication support, mobile credential support, anti-passback, multi-level authentication and cross panel linkage (global linkage).

Port Failover

- The AHDU controller series has dual ethernet ports. If the primary communication port fails, it will then switch to the secondary port automatically (the controller supports separate

network configurations for both ports). 100Base-TX Ethernet data transfer is included on the AHDU controller. 100Base-TX communication between the AHDU security core allows users to take full advantage of high-speed network technology.

- The AHDU controller series has 3 RS-485 ports on the board, which support port failover function dedicated on ports 2 & 3. If one of the RS-485 connections experiences problems, the other port will activate automatically to avoid disconnection.

Supervised Inputs

- The AHDU controller series is equipped with 4 state-monitoring inputs, which gradually avoids short circuit attacks. The AHDU controller can detect abnormal changes as low as 5% Ohms in the circuits and filter out all possible attacks.
- REX inputs and dedicated fire alarm inputs are independently managed by isolated microchips to ensure these inputs can work normally under various extreme and catastrophic situations, even if the motherboard isn't functioning properly

NC / NO Configurable Ports

- All on-board output ports can be configured to change their NO/NC status through the ARMATURA One security platform, which greatly enhances the flexibility.

Scalable

- At the maximum capacity, up to 384 inputs are supported between boards through OSDP V2.2 connection (when using AHEB-0216 IO expansion board). The AHDU can also act as an edge device under the AHSC-1000 security core, which supports cascading to manage up to 128 doors under single AHSC-1000 controller.

Innovative MQTT based communication protocol

- MQTT is a lightweight messaging protocol designed for IoT devices and its characteristics make it a perfect solution for intelligent security systems. This enables the controller to communicate with more edge devices (Door Unit, reader, sensor, etc.) under the same network environment.

Advanced Communication

- The serverless design enables the controller to operate independently.
- Peer-to-peer cross-controller linkage through the AHSC-1000 security core allows communication between controllers and can be active while the ARMATURA One server is unavailable. All the preset linkages/global linkage can operate normally.
- With the onboard webserver design, the controller can be configured and programmed through the Armatura Connect mobile app and web browser through TCP/IP connection. The simple diagnostics can also be done by the built-in monitor and keypad on the controller.

Advanced Security Protocols

- Connection between Software and Device: MQTT+One Way SSL (Two Way SSL optional), AES 256.

- Connection between Primary and Secondary Controller: MQTT+Two Way SSL, AES256.
- RS-485: OSDP Secure Channel v2.2, AES128.
- Controller Webserver: HTTPS with TLS 1.2.
- Crypto Chip Storage: EAL5+ chip (anti-tampering, anti-electronic attack, anti-copying) for securing important data on the controller and reader. Ensures private data desensitization and encrypted storage.
- The controller webserver has successfully undergone penetration testing and vulnerability assessment conducted by reputable brand products. All identified medium and high-risk vulnerabilities have been mitigated and resolved.
- Supports IP/MAC address filtering functions, and VLAN isolation to enhance cybersecurity standards.

Level

- Destructive attack level: I
- Line security level: II
- Endurance level: IV
- Standby power level: I

2.4 Appearance

2.4.1 AHSC-1000 Primary Controller

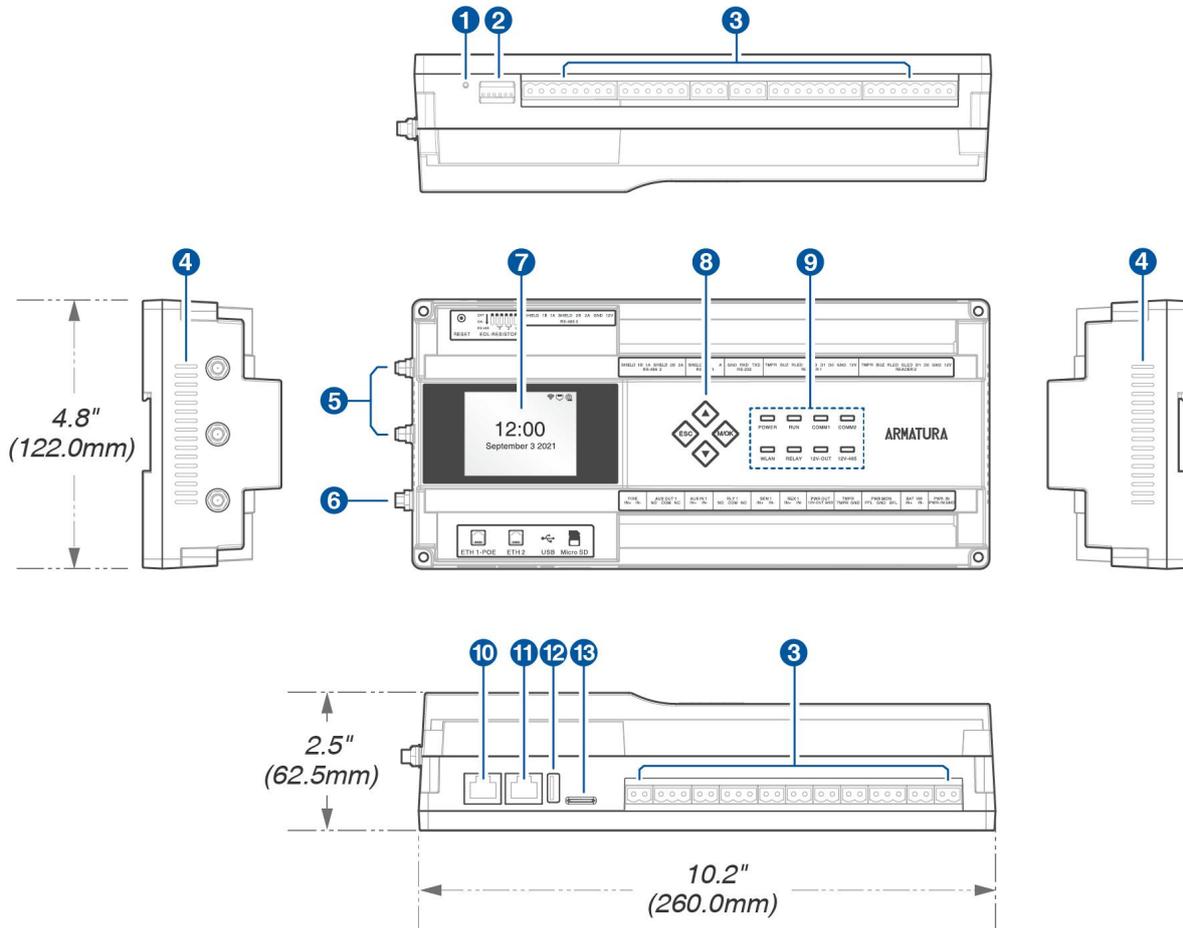


Figure 2-1 AHSC-1000 Primary Controller Appearance

NO.	Descriptions	NO.	Descriptions
1	Reset Button	8	Keypad
2	DIP Switch	9	Status LED Indicator
3	Terminal Block	10	Ethernet 1-POE
4	Heat Dissipation Hole	11	Ethernet 2
5	Wi-Fi Antenna Port	12	USB Port*
6	Bluetooth Antenna Port	13	Micro SD Slot
7	2.4" TFT LCD		

* **Note:**Hardware reservation function is currently not supported.

2.4.2 AHDU-1X60 Secondary Controller

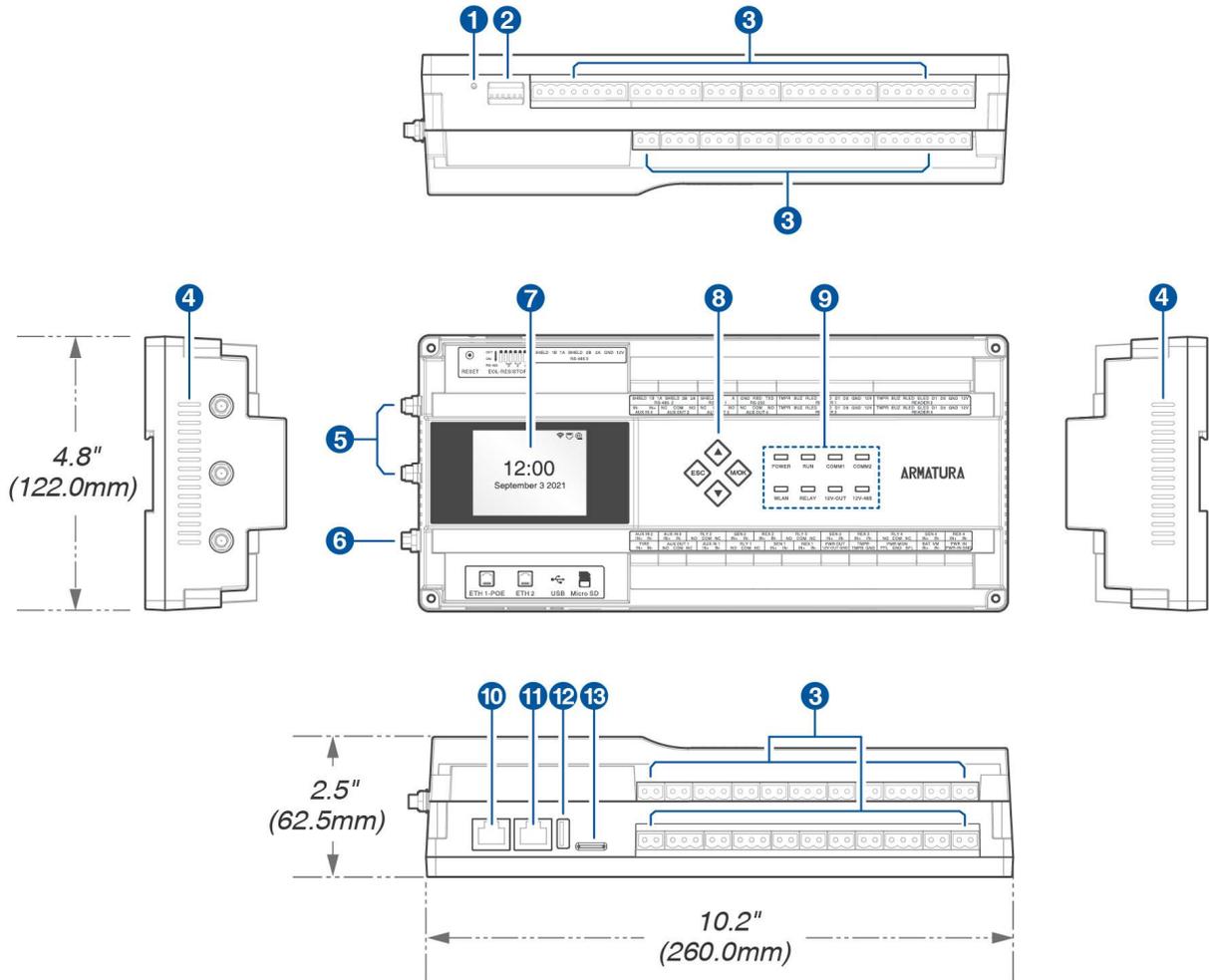


Figure 2-2 AHDU-1X60 Secondary Controller Appearance

NO.	Descriptions	NO.	Descriptions
1	Reset Button	8	Keypad
2	DIP Switch	9	Status LED Indicator
3	Terminal Block	10	Ethernet 1-POE
4	Heat Dissipation Hole	11	Ethernet 2
5	Wi-Fi Antenna Port	12	USB Port
6	Bluetooth Antenna Port	13	Micro SD Slot
7	2.4" TFT LCD		

Remarks:

- **Reset Button:** To restart the device, press and hold the reset button for **1 to 5 seconds**. To restore the factory settings, press and hold the reset button for **more than 5 seconds**.
- **DIP Switch:** When connecting an RS-485 reader for long-distance communication, it is necessary to enable End of Line (EOL) and configure the EOL resistance of RS-485 using DIP switches.

2.4.3 AHEB-0808 Expansion Board

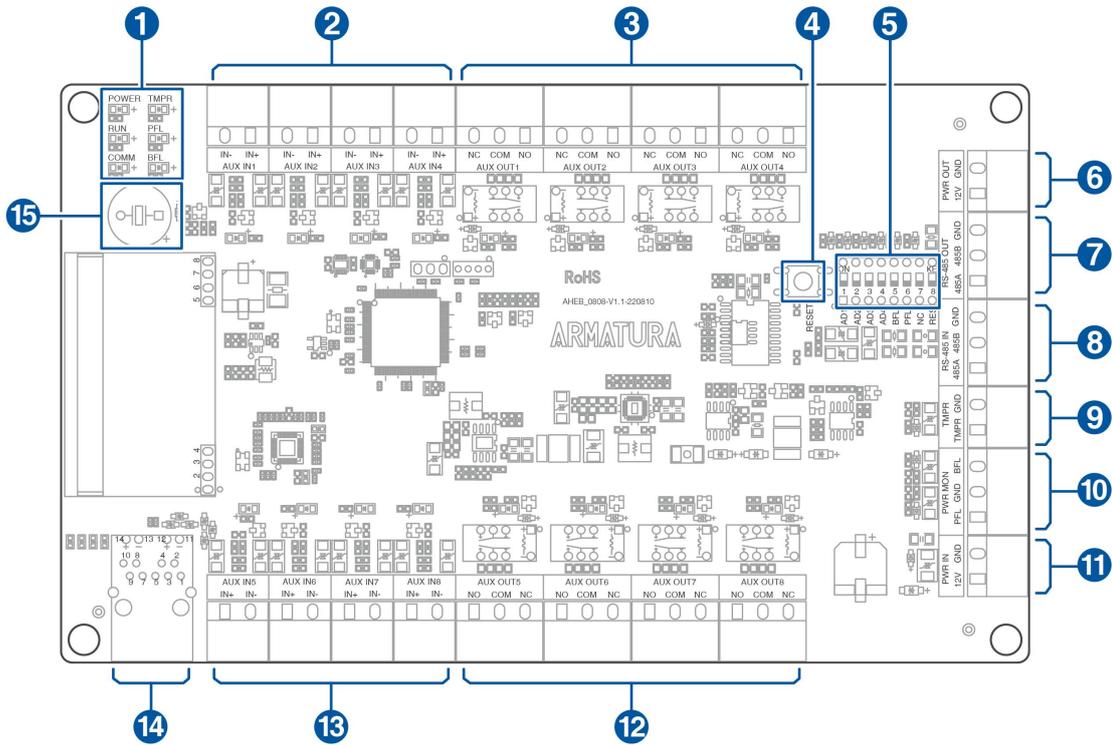


Figure 2-3 AHEB-0808 Appearance

NO.	Descriptions	NO.	Descriptions
1	Status LED Indicator	9	Tampering Alarm
2	Auxiliary Input (1-4)	10	Power MON
3	Auxiliary Output (1-4)	11	Power Input
4	Reset Button	12	Auxiliary Output (5-8)
5	DIP Switch	13	Auxiliary Input (5-8)
6	Power Output	14	Ethernet Port
7	RS-485 Out	15	Buzzer
8	RS-485 In		

2.4.4 AHEB-1602 Expansion Board

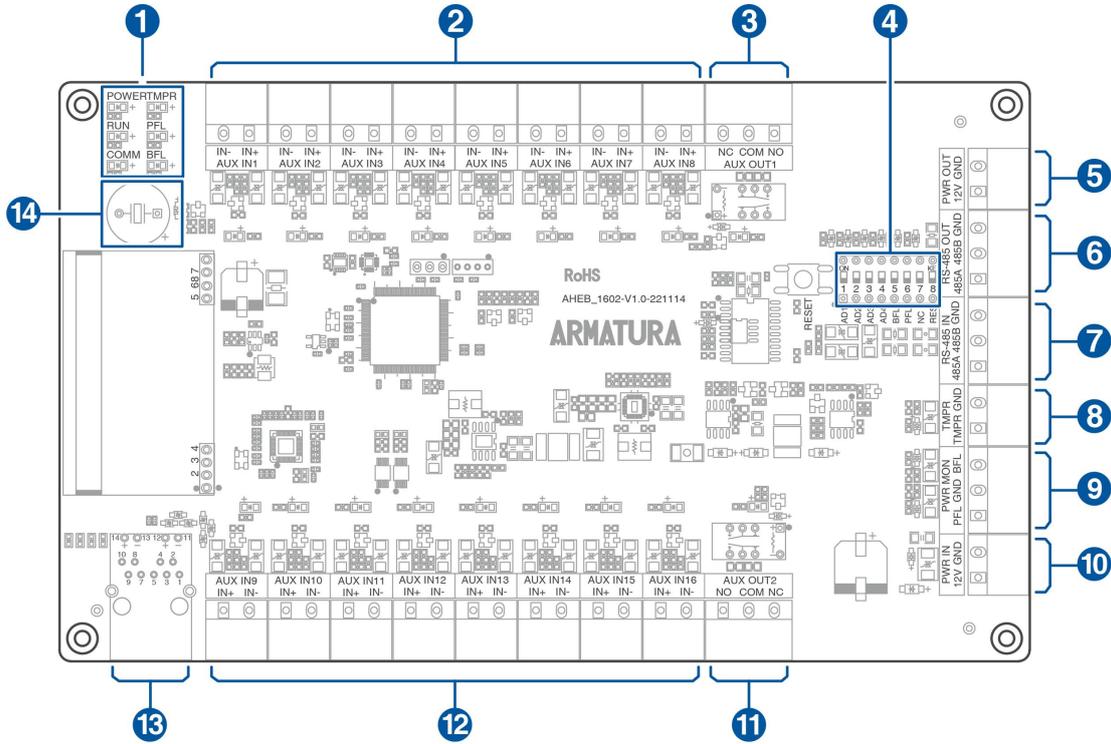


Figure 2-4 AHEB-1602 Appearance

NO.	Descriptions	NO.	Descriptions
1	Status LED Indicator	8	Tampering Alarm
2	Auxiliary Input (1-8)	9	Power MON
3	Auxiliary Output 1	10	Power Input
4	DIP Switch	11	Auxiliary Output 2
5	Power Output	12	Auxiliary Input (9-16)
6	RS-485 Out	13	Ethernet Port
7	RS-485 In	14	Buzzer

2.4.5 ENC1 Enclosure (optional)

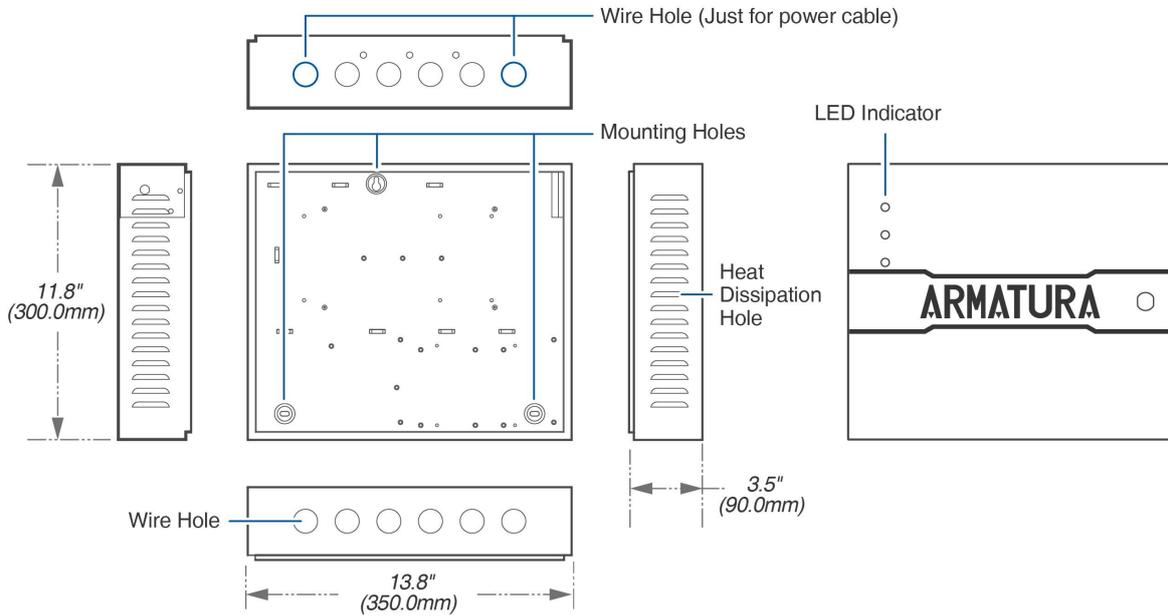


Figure 2-5 ENC1 Enclosure Appearance

Remarks:

- **Input Voltage:** 100 - 240 VAC
- **LED Indicator:** There is 3 LED indicator present in the enclosure, they are POWER (Red), RUN (Green) & COMM. (Yellow). When the device is powered on, normally the POWER indicator (Red) is lit constantly and the RUN indicator (Green) flashes slowly (indicating the system is functioning normally). COMM. indicator (Yellow) flashes when the system is communicating with other devices (e.g., PC). When the indicator is flashing rapidly it indicates data transmission. When the indicator is flashing slowly, it indicates real-time monitoring status.
- **Wire Hole(Just for power cable):** Other low voltage cables should not be routed through it. And the power cables need to be separated from other cables.

2.5 General Information

	AH DU-1160	AH DU-1260	AH DU-1460
Primary Power	PoE 802.3at/af / 9 - 24 VDC ± 20%, 550 mA maximum (reader current not included)		
PoE	PoE Standard: IEEE 802.3at PoE Input Voltage: DC50-57 V PoE Input Current: 10-600 mA		

Primary Host Communication	Ethernet: 100Base-TX 256bit AES* symmetric encryption for Controller to Server and Inter-Controller communications		
Secondary Host Communication	Bluetooth 4.2+HS, BLE		
Third Host Communication	Wi-Fi IEEE 802.11ac 5GHz , or 2.4GHz/5GHz IEEE 802.11n 256bit AES* symmetric encryption for Controller to Server and Inter-Controller communications		
Ethernet network connection	Port 1: Ethernet: 100Base-TX Port 2: Ethernet: 100Base-TX (Configurable for Port Failover)		
RS-485 connection	Port 1: RS-485 standard / OSDP V2.2 Port 2: RS-485 standard / OSDP V2.2 Port 3: RS-485 standard / OSDP V2.2 (Configurable for Port Failover dedicated on port 2 & 3)		
Number of Ports	2*TCP/IP 3*RS-485 2*wiegand	2*TCP/IP 3*RS-485 4*wiegand	2*TCP/IP 3*RS-485 4*wiegand
Inputs	4 state supervision, resistor values (5% tolerance), Normally open contact: use 1.2k, 2.2k, 4.7k or 10k/ Normally closed contact: use 1.2k, 2.2k, 4.7k or 10k/ Dedicated Panel Tamper IO Input* Dedicated Microchip Control Fire Alarm IO Input & REX Input for catastrophic situation		
Outputs	1 relay, 1* Form-C with dry contacts	2 relay, 2* Form-C with dry contacts	4 relay, 4* Form-C with dry contacts
Normally Open Contact Rating	5A @ 30Vdc resistive		
Normally Closed Contact Rating	5A @ 30Vdc resistive		
On-Board Monitor	Size: 2.4", Resolution: 320*240, TFT Monitor Quickly view status of board, connected doors and for configuration information display		
On-Board WebServer	Webserver for System Configuration and Management Dashboard for Controller Status Monitoring, Device Connection Status Monitoring & Configuration, Performance Status, server Primary Controller Setting, Network Status Monitoring & Setting, IP Access Filter, SSL / TLS Certificates Setting, Access Log Export, Controller Reset, Debug Status Monitoring, Operation Log Monitoring, User Management, Date & Time Setting, Daylight Saving Time Setting, NTP server Setting, General Status, Controller Information		
RFID Card Capacity	400,000 (1:N) / 800,000 (1:1)		

Maximum RFID Card Number Length	Supports up to 512bits card number length		
Mobile Credential Capacity	400,000 (1:N) (Bluetooth) 400,000 (1:N) (NFC) 400,000 (1:N) (Dynamic QR Code)		
Fingerprint Capacity	100,000 (1:N)		
Transaction Buffer	300,000 Events		
Access Level	100,000 Levels		
On-Board Access Point Control	1 Access point on board	2 Access point on board	4 Access point on board
On-Board Reader Support	3 (OSDP over RS-485) or 2 (wiegand) with on-board IO	3 (OSDP over RS-485) or 4 (wiegand) with on-board IO	3 (OSDP over RS-485) or 4 (wiegand) with on-board IO
Maximum Access Points	1	2	4
Maximum Readers	2	4	8
Maximum Inputs	388 (using Armatura AHEB-0216)		
Maximum Outputs	388 (using Armatura AHEB-0216)		
Maximum IO Board	24pcs (3*High Speed RS-485 communication)		

2.6 Power Specification

2.6.1 Product Main Specifications

Items	Specifications
Maximum Output Power	68.5W
Input Voltage Range	90 - 264Vac
Output Voltage	13.7Vdc
Maximum Output Current	0.5A, 4.5A

2.6.2 Environmental Conditions

Items	Specifications
Operating Temperature	-20°C - 50°C
Storage Temperature	-40°C - 80°C
Relative Humidity	10% - 95%, non-condensing
Heat Dissipation Method	Natural Cooling

2.6.3 Electrical Characteristics

Items	Specifications	Remarks
Input Characteristics		
Rated Input Voltage	100 - 240Vac	
Input Voltage Range	90 - 264Vac	Normal Operation
Input Voltage Frequency	47 - 63Hz	
Maximum Input Current	1.5A	90Vac
Input Inrush Current	≤30A	110Vac, Full capacity, 25°C
	≤60A	220Vac, Full capacity, 25°C
Output Characteristics		
Output Rated Voltage	13.7Vac	
No-Load Output Voltage Range	13.6 - 13.8Vac	Battery full voltage
Maximum Output Current	5A	
Output Power	0 - 68.5W	Maximum battery charge output included
Output Efficiency	≥85%	Rated Voltage 220Vac / Rated Load

Protecting Characteristics		
Output Overvoltage	20.55V	Not recoverable after overvoltage protection.
Current Limiting Protection	6 - 9A	Automatic recovery is possible with other circuits carrying full load at the same time.
Output Short Circuit Protection	Can be short-circuited for a long time without damage, short-circuit removal can be automatically restored.	
Battery Management		
Constant Current Charge Output	0.5A ± 0.2A	No output from the battery terminal when no battery is connected. When the battery voltage is greater than 6V ± 0.3V, battery charging is turned on.
Battery Charging Alert	Normal charging output, green light flashes. Green light is always on when the battery is fully charged.	When the battery is charging, the charging indicator is always on when the battery voltage reaches 13.5V ± 0.2V.
Ac Indicator	The green light is on when the AC input is normal and off when the battery is discharged.	
Reverse Battery Protection	Reverse battery connection does not damage any components, light up red LED3.	
Battery Pre-Undervoltage Alarm	BAT_FAIL outputs low when the battery voltage is less than 10.8V ± 0.2V.	
Battery Overdischarge Protection	The output is turned off when the battery voltage is less than 10.2V ± 0.2V.	
Battery Output Short Circuit Protection	Can be short-circuited for a long time without damage, short-circuit removal can be automatically restored.	

3. Installation and Connection

Ensure that the device is installed following the provided installation instructions. Failure to do so may result in voiding of the devices warranty.

3.1 Installation Procedure

Users have the flexibility to select from various installation methods based on their specific requirements.

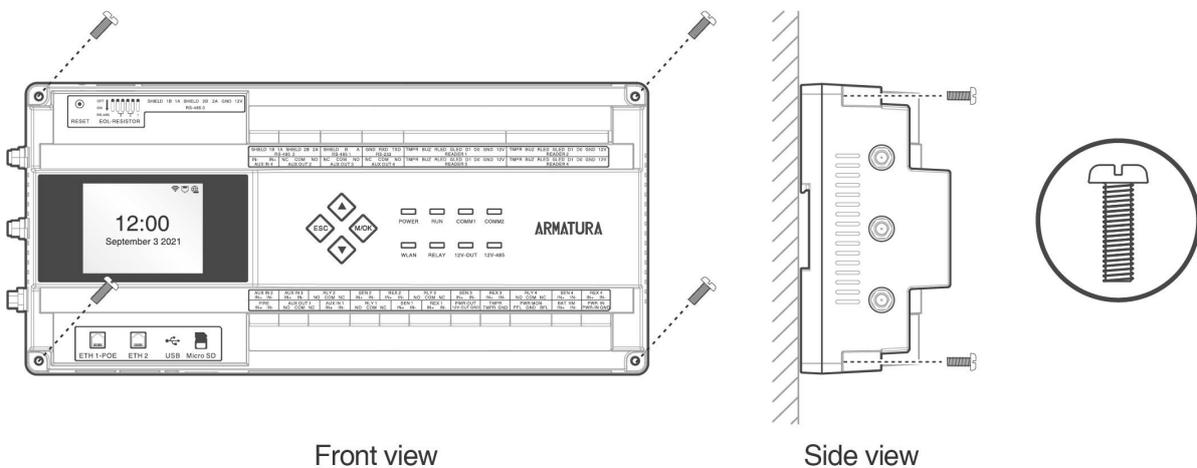
Remarks:

1. *The AHDU Series (1160/1260/1460) share the same casing, installation, and wiring methods. This document will refer to the AHDU-1460 model as a reference for wiring and connections.*
2. *The images in this manual are for reference purposes only. The actual product may vary depending on the model.*

3.1.1 Installation with screws

Mount the controller or expansion board securely to the enclosure or a flat surface using screws, as illustrated in the figure below.

Mount the controller on a flat surface using screws



Mount the expansion board to the enclosure using screws

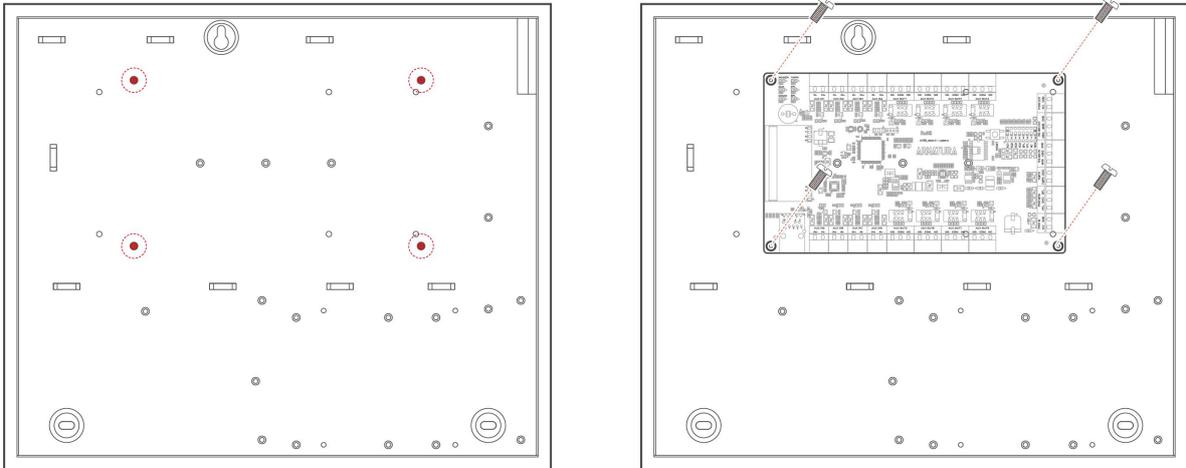


Figure 3-1 Schematic diagram of screw installation

Remarks:

- **Screw specification:** Cross recessed pan head screws M3.5*23mm
- **Applicable Models:** AHSC-1000, AHDU-1160/1260/1460, AHEB-0808, AHEB-1602

3.1.2 Installation with original 35mm DIN rail

1. Mount the original DIN rail directly onto the enclosure or a flat surface, as illustrated in the figure below.

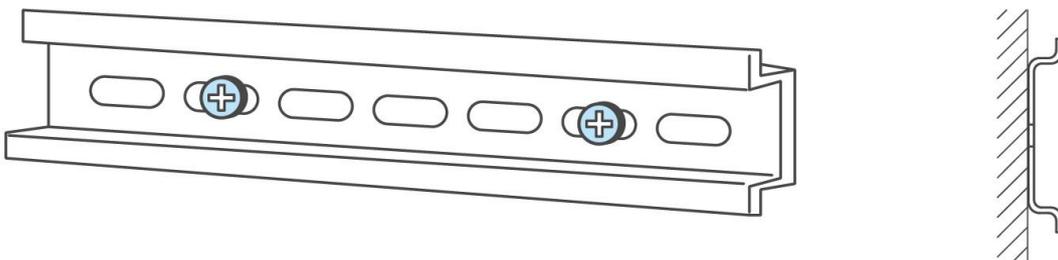


Figure 3-2 Mount the DIN rail

2. Engage the hooks on the top of the controller with the DIN rail and firmly press the controller onto the rail until it locks into place, as depicted in **Figure 3-3** below.

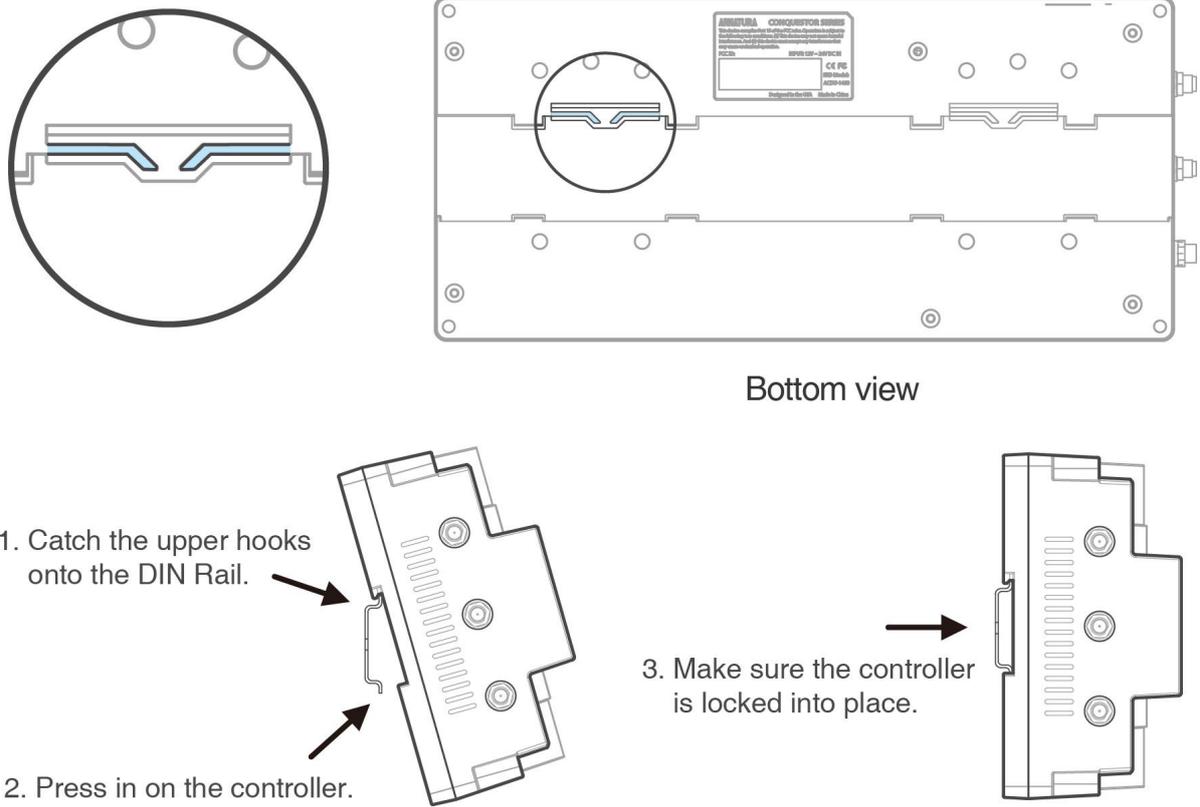


Figure 3-3 Mount the controller to the DIN rail adapter

Remarks:

- **DIN rail specification:** $T=0.03"$ 9.39"*1.34"*0.25" ($T=0.7mm$ 238.5mm*35mm*6.3mm)
- **Applicable Models:** AHSC-1000, AHDU-1160/1260/1460

3.1.3 Installation with extended 35mm DIN rail adapter

If required, users have the option to purchase a third-party rail adapter to mount the controller, and then securely snap it onto the original 35mm DIN rail, as demonstrated in the figure below.

1. Refer to the steps of section 3.1.2 to install the original DIN rail to the enclosure or flat surface.
2. Mount the two extended 35mm DIN rail adapters in the locations, as shown in **Figure 3-4** below.
3. Snap the mounted units into the original 35mm DIN rail, as shown in **Figure 3-5** below.

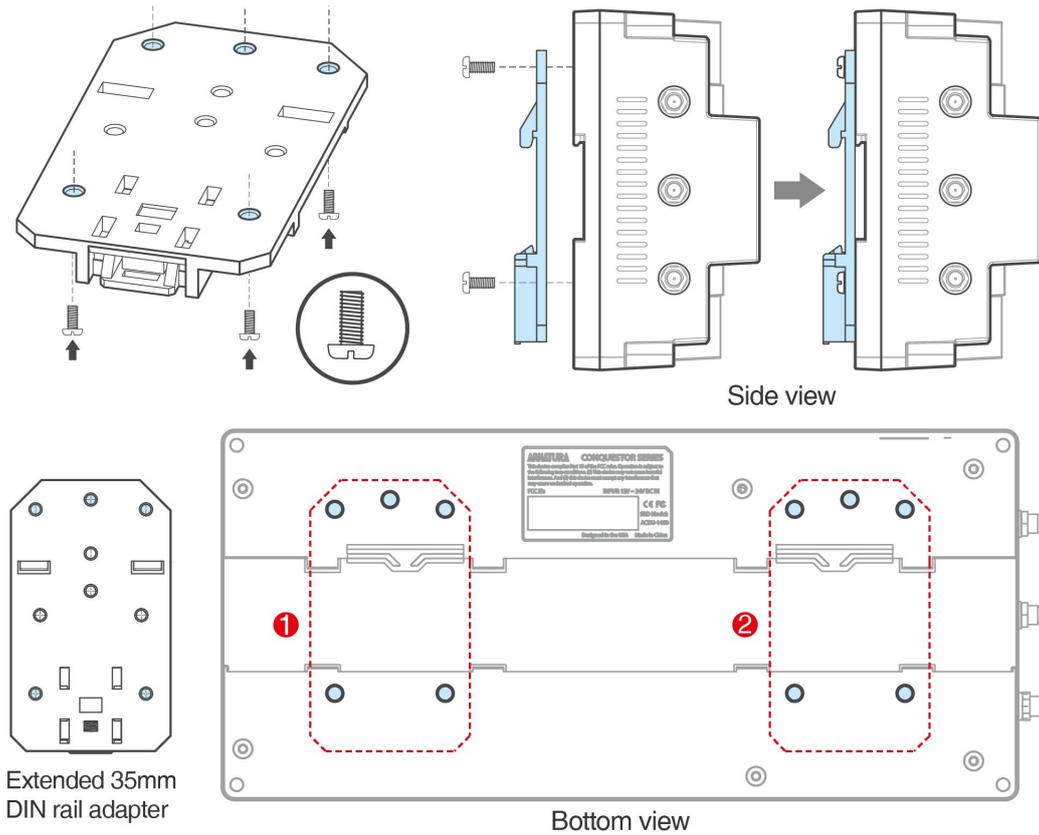


Figure 3-4 Mount the extended 35mm DIN rail adapters to the controller

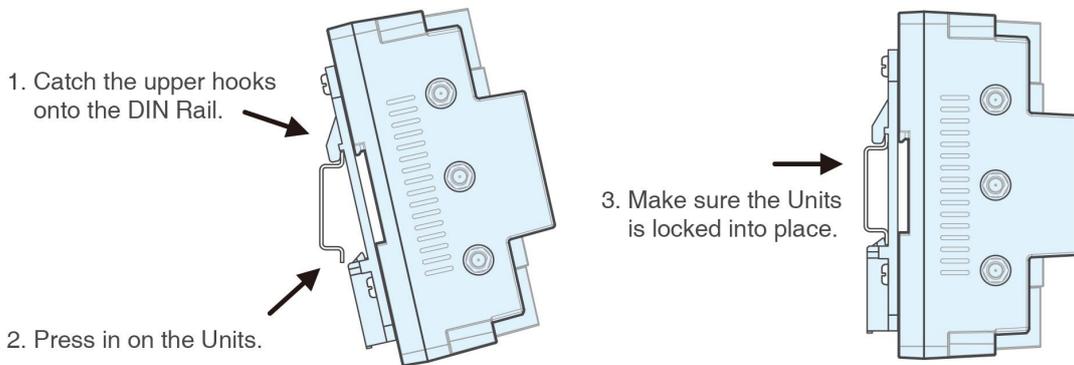


Figure 3-5 Mount the Units to the original 35mm DIN rail

Remarks:

- **Recommended the extended 35mm DIN rail adapter specifications:**
 UTA89 Phoenix Contact, Part Number: 2853970. Link URL:
<https://www.phoenixcontact.com/zh-cn/products/din-rail-adapter-uta-89-2853970>.
- Users have the option to purchase third-party rail adapters as required. Please note that the pictures in the manual are for reference purposes only.
- **Screw specification:** Cross recessed pan head screws M3*7mm
- **Applicable Models:** AHSC-1000, AHDU-1160/1260/1460

3.2 Installation the ENC1 enclosure on the wall

Users can refer to the following installation steps to install the ENC1 enclosure (optional) on the wall.

1. Based on the mounting hole positions of the enclosure, drill three suitable holes in the wall, ensuring they are approximately **114 inches (2.9m)** above the ground. The height can be adjusted according to specific requirements.
2. Position the anchors in the designated mounting holes.
3. Next, secure the enclosure using the provided self-tapping screws, as demonstrated in the illustration below.

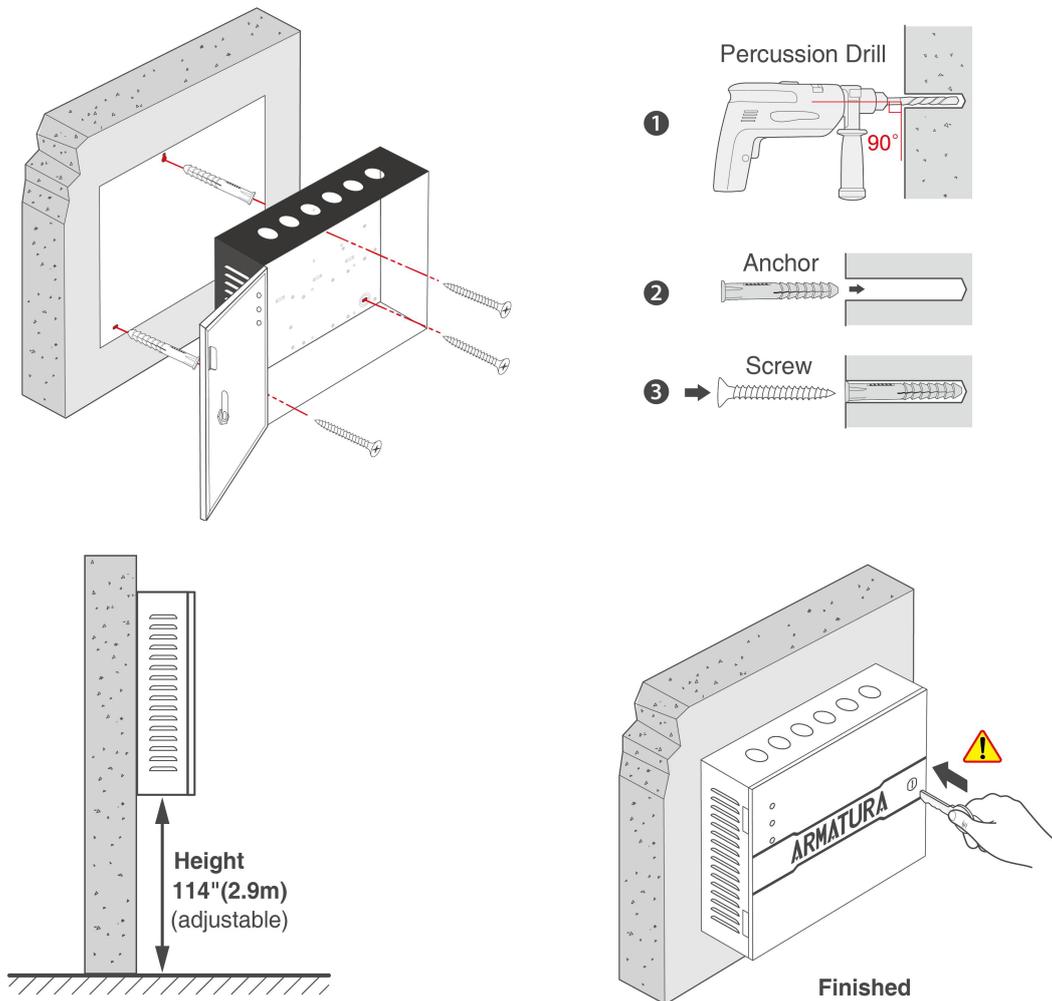


Figure 3-6 Installation the ENC1 enclosure on the wall

Notes:

- The enclosure is equipped with tamper monitoring. Please ensure that the enclosure remains closed while the equipment is in normal operation.
- To ensure the security of the equipment, make sure the enclosure is locked during normal operation of the device. The key is kept by the manager.

3.3 Access Control System Installation

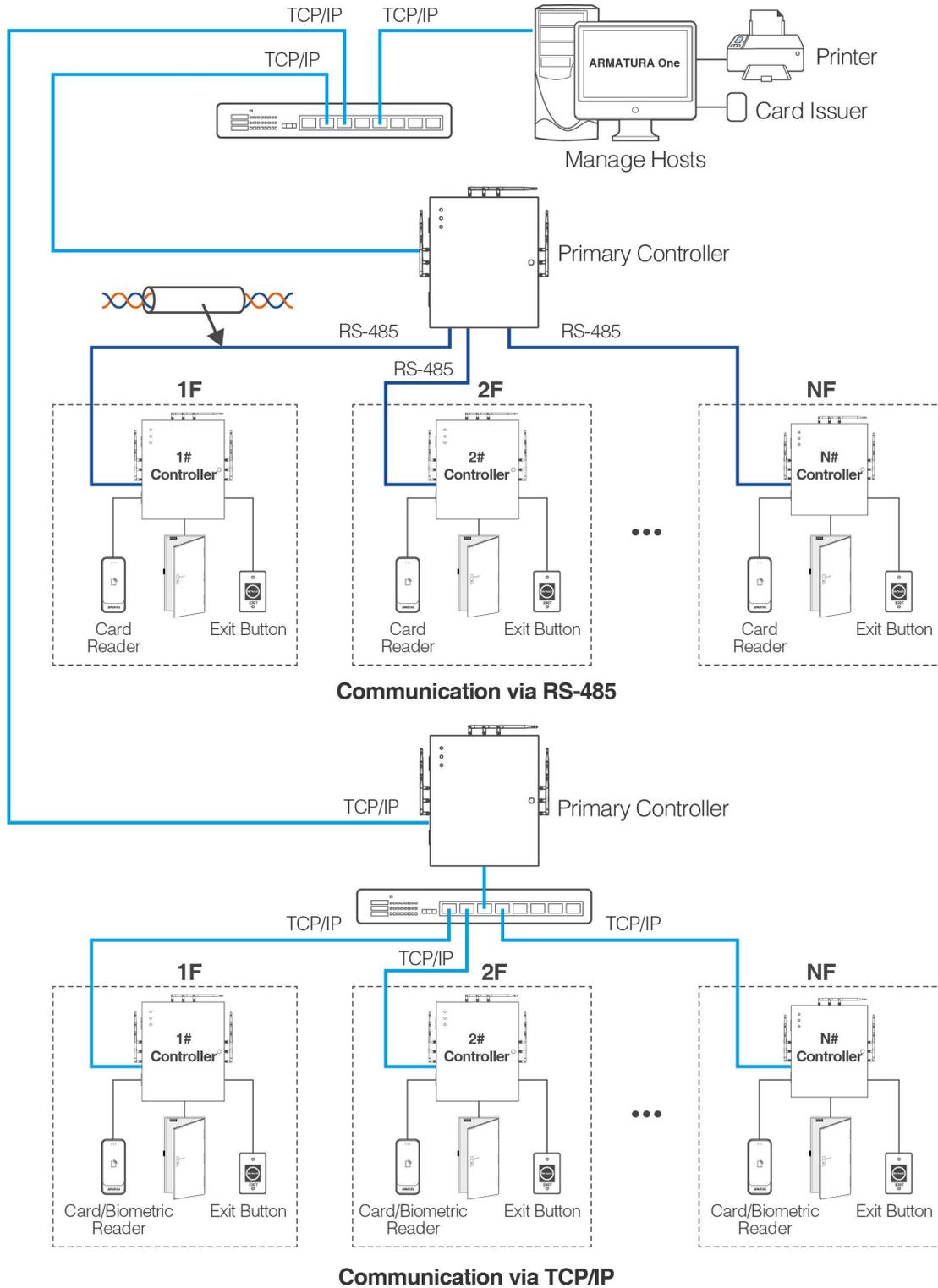


Figure 3-7 Schematic Diagram of Access Control System Installation

Remarks:

1. The access control management system comprises two main components: the Management Workstation (PC) and the Controller. These two parts communicate with each other via TCP/IP.
2. The communication wires should be kept as far away as possible from high voltage wires, and they should not be routed in parallel with or bundled together with power wires.
3. The management workstation is a network-connected PC. Access control management personnel can perform various management functions remotely by running the access control management software installed on the PC. These functions include adding/deleting a user, viewing event records, opening/closing doors, and monitoring the real-time status of each door.
4. When the controller communicates via TCP/IP, card/biometric readheads can be connected. When the controller communicates with primary controller via RS-485, only pure card readers can be connected.

3.4 Controller System Installation

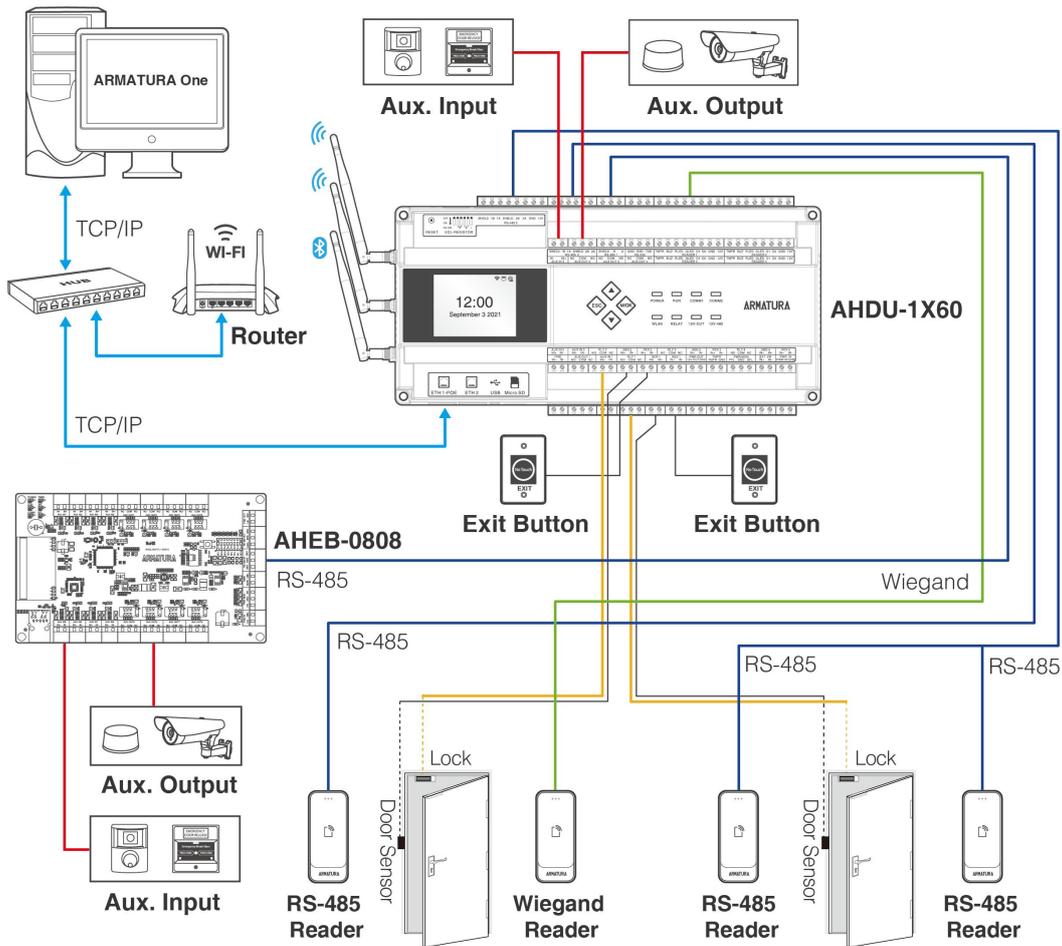


Figure 3-8 Schematic Diagram of AHDU-1X60 System Installation

3.5 Access Control System Power Supply Structure

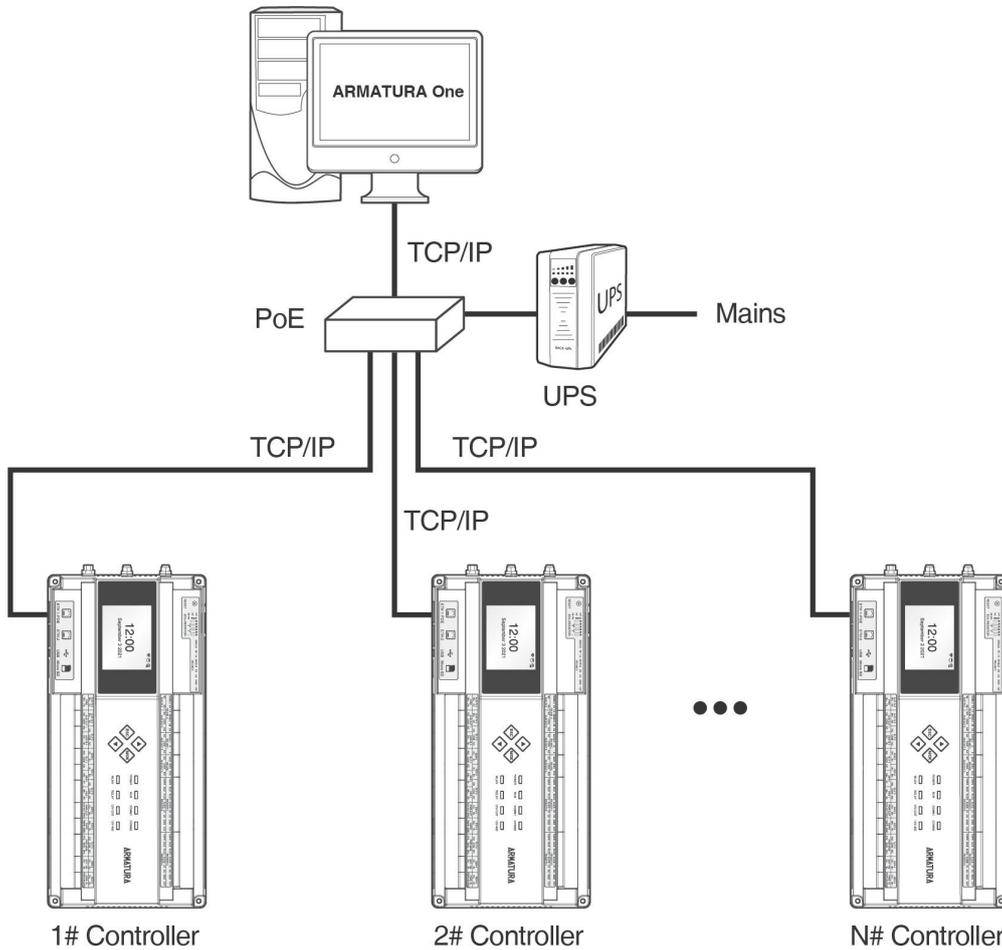


Figure 3-9 PoE System

Remarks:

1. The Armatura Horizon Controller can be powered through either a +12V DC power adapter or PoE, depending on availability.
2. If using a +12V DC power adapter, it is recommended to power each controller separately to minimize power interference between controllers.
3. If using PoE, the TCP/IP network interface of the access controller can function as both a PoE interface and a PC communication interface. The PoE switch must comply with IEEE 802.3at standards.
4. To prevent controller power failures that may lead to the entire system's inability to function, it is essential for the access control management system to have at least one UPS (Uninterruptible Power Supply). Additionally, access control locks are powered externally to ensure that the access control management system can operate normally during power outages.

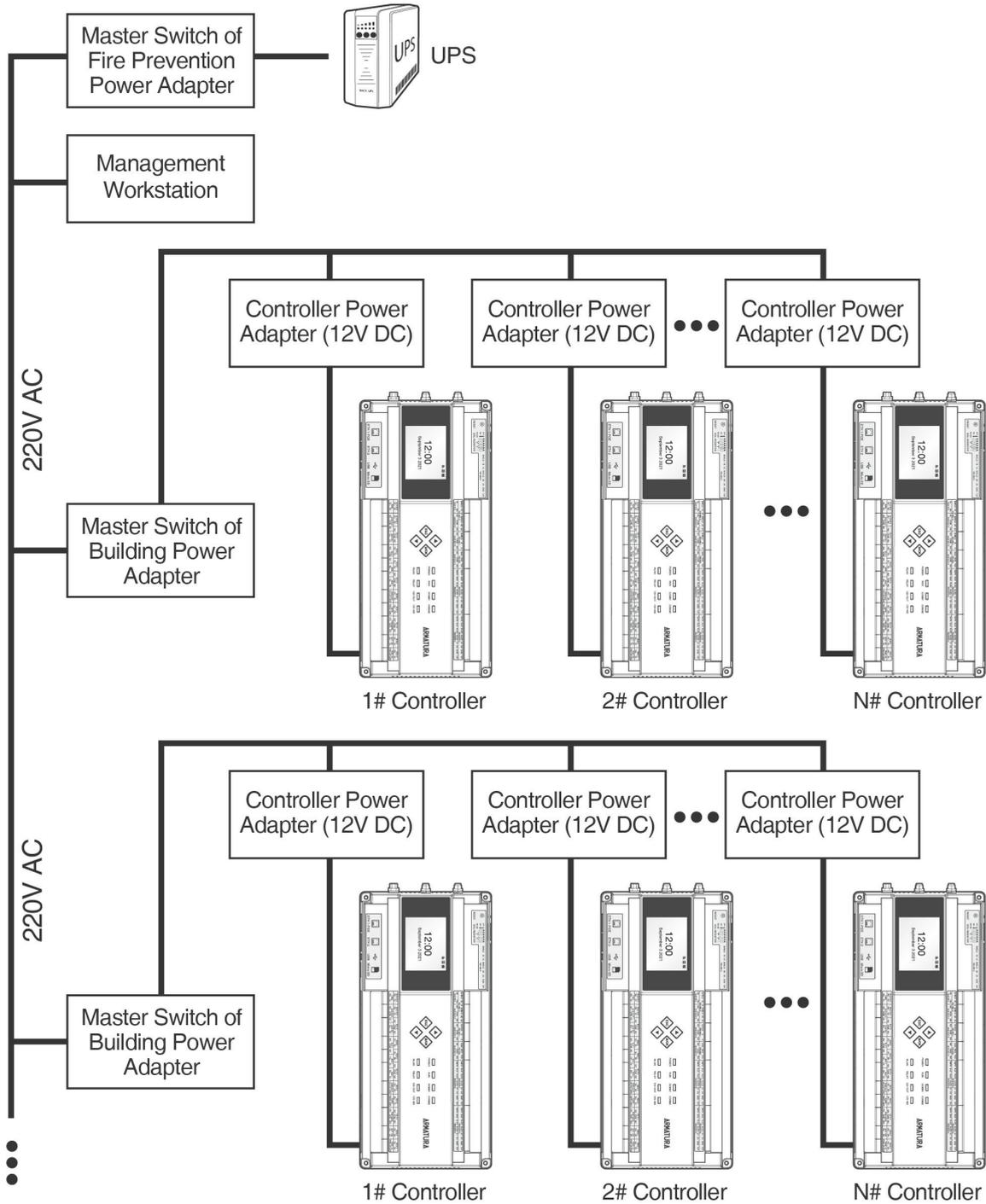


Figure 3-10 Access Controller System Power Supply

4. Terminal and Wiring Description

4.1 Controller Connection Terminals

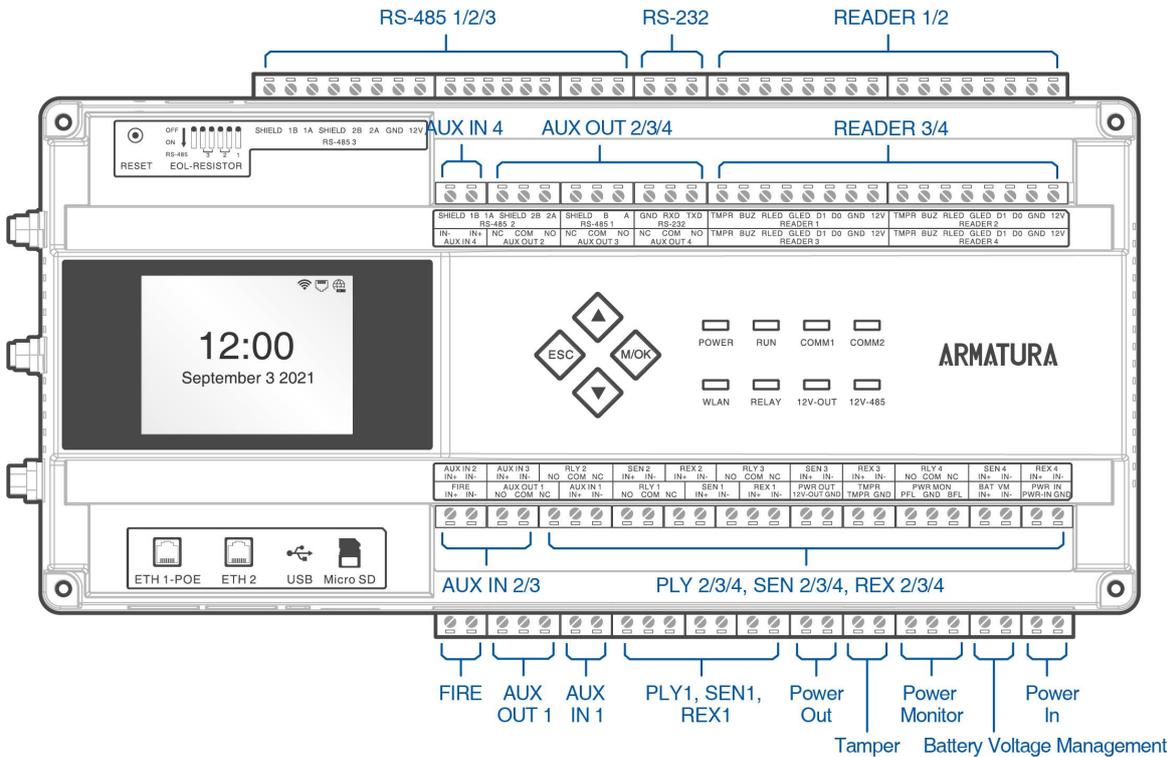


Figure 4-1 AHDU-1X60 Terminal connection diagram

Description of the terminals:

1. **RS-485:** The RS-485 reader port allows for external connection to a RS-485 reader.
2. **READER:** The reader port allows for external connection to a wiegand reader.
3. **Auxiliary Input (AUX IN):** The auxiliary input may connect to external monitoring devices such as fire alarms, door & window contacts, smoke detectors & more.
4. **Auxiliary Output (AUX OUT):** The auxiliary output may connect to alarms, doorbells, etc.
5. **FIRE, Auxiliary Input (AUX IN), Sensor (SEN), Request to Exit (REX):** The fire, auxiliary input, sensor and request to exit ports all support line monitoring. To enable the line monitoring function, you can configure this from the ARMATURA One software. For a supervised circuit, it is recommended to add two resistors as close to the sensor as possible. Custom End of Line (EOL) resistances can be configured through the software.
6. The terminals above are set through the relevant access control software. Please see the respective software manual for further details.

4.2 Terminal Description

4.2.1 AHSC-1000

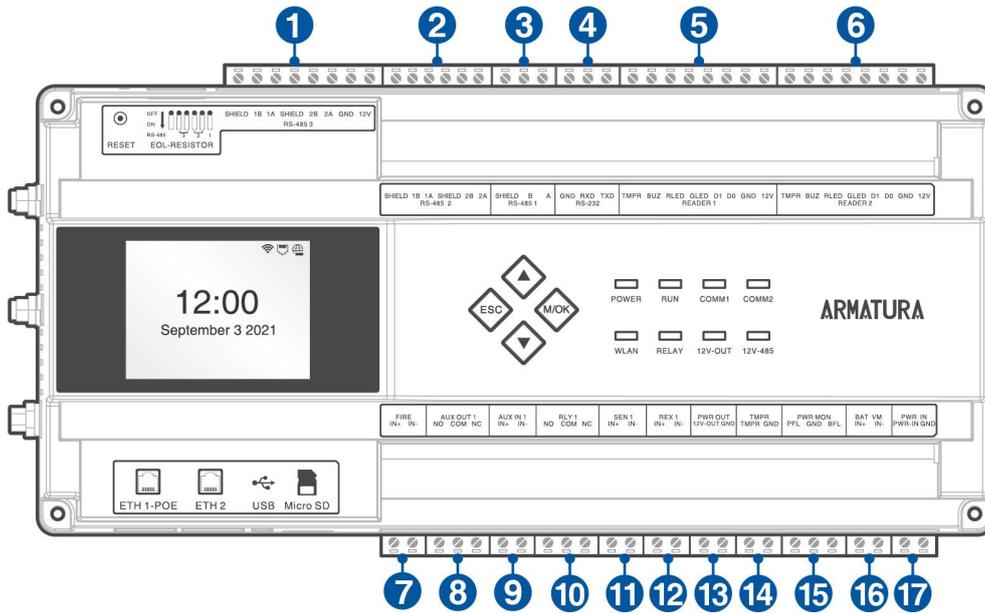


Figure 4-2 AHSC-1000 terminal description

NO.	Terminal	NO.	Terminal
1	RS-485 3	10	Relay 1
2	RS-485 2	11	Sensor 1
3	RS-485 1	12	Request to Exit 1
4	RS-232	13	Power Output
5	Reader 1	14	Tamper
6	Reader 2	15	Power Monitor
7	FIRE	16	Battery Voltage Management
8	Auxiliary Output 1	17	Power Input
9	Auxiliary Input 1		

4.2.2 AHDU-1160

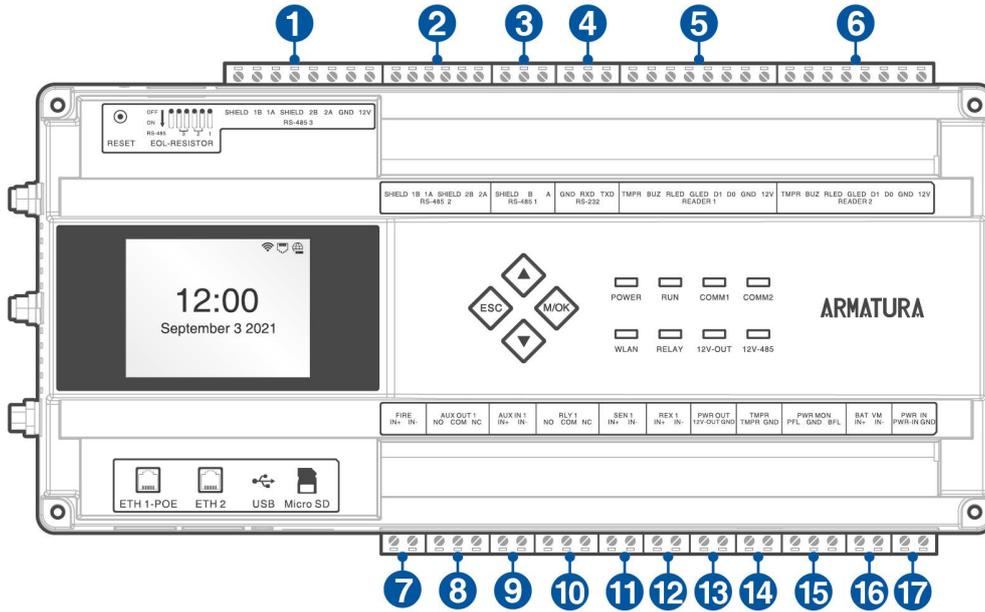


Figure 4-3 AHDU-1160 terminal description

NO.	Terminal	NO.	Terminal
1	RS-485 3	10	Relay 1
2	RS-485 2	11	Sensor 1
3	RS-485 1	12	Request to Exit 1
4	RS-232	13	Power Output
5	Reader 1	14	Tamper
6	Reader 2	15	Power Monitor
7	FIRE	16	Battery Voltage Management
8	Auxiliary Output 1	17	Power Input
9	Auxiliary Input 1		

4.2.3 AHDU-1260

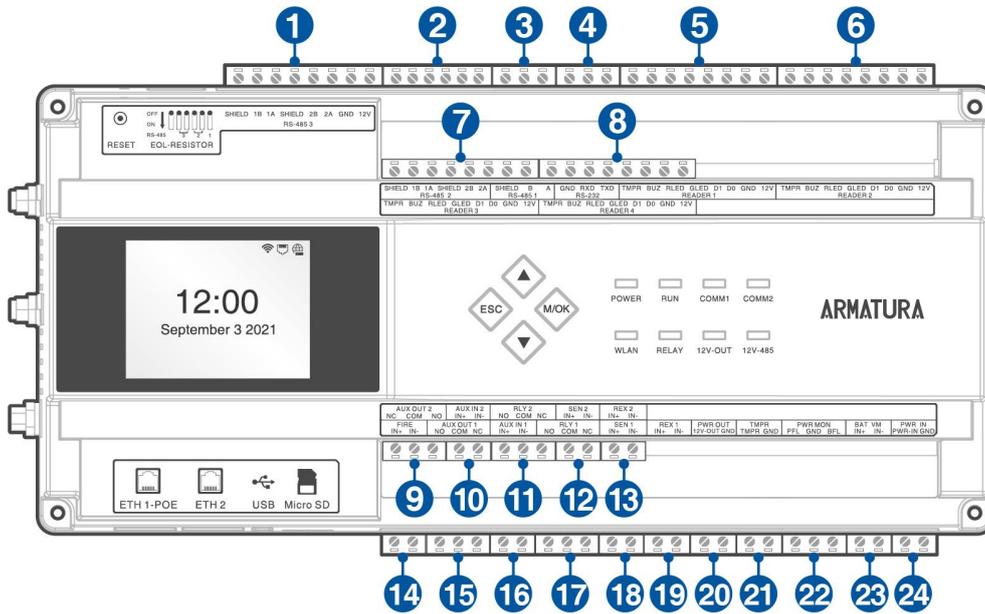


Figure 4-4 AHDU-1260 terminal description

NO.	Terminal	NO.	Terminal
1	RS-485 3	13	Request to Exit 2
2	RS-485 2	14	FIRE
3	RS-485 1	15	Auxiliary Output 1
4	RS-232	16	Auxiliary Input 1
5	Reader 1	17	Relay 1
6	Reader 2	18	Sensor 1
7	Reader 3	19	Request to Exit 1
8	Reader 4	20	Power Output
9	Auxiliary Output 2	21	Tamper
10	Auxiliary Input 2	22	Power Monitor
11	Relay 2	23	Battery Voltage Management
12	Sensor 2	24	Power Input

4.2.4 AHDU-1460

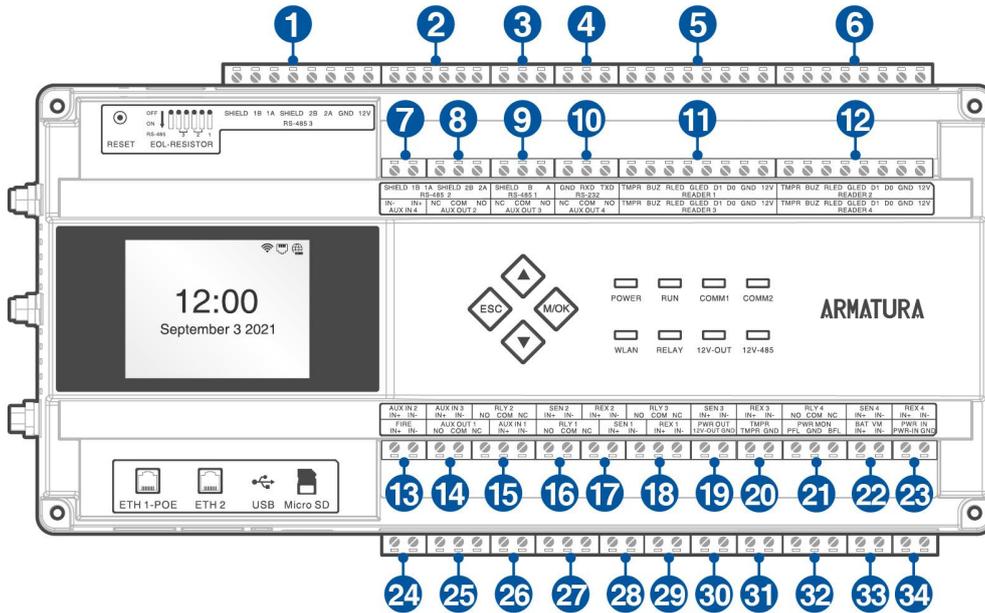


Figure 4-5 AHDU-1460 terminal description

NO.	Terminal	NO.	Terminal
1	RS-485 3	18	Relay 3
2	RS-485 2	19	Sensor 3
3	RS-485 1	20	Request to Exit 3
4	RS-232	21	Relay 4
5	Reader 1	22	Sensor 4
6	Reader 2	23	Request to Exit 4
7	Auxiliary Input 4	24	FIRE
8	Auxiliary Output 2	25	Auxiliary Output 1
9	Auxiliary Output 3	26	Auxiliary Input 1
10	Auxiliary Output 4	27	Relay 1
11	Reader 3	28	Sensor 1
12	Reader 4	29	Request to Exit 1
13	Auxiliary Input 2	30	Power Output
14	Auxiliary Input 3	31	Tamper
15	Relay 2	32	Power Monitor
16	Sensor 2	33	Battery Voltage Management
17	Request to Exit 2	34	Power Input

4.2.5 AHEB-0808

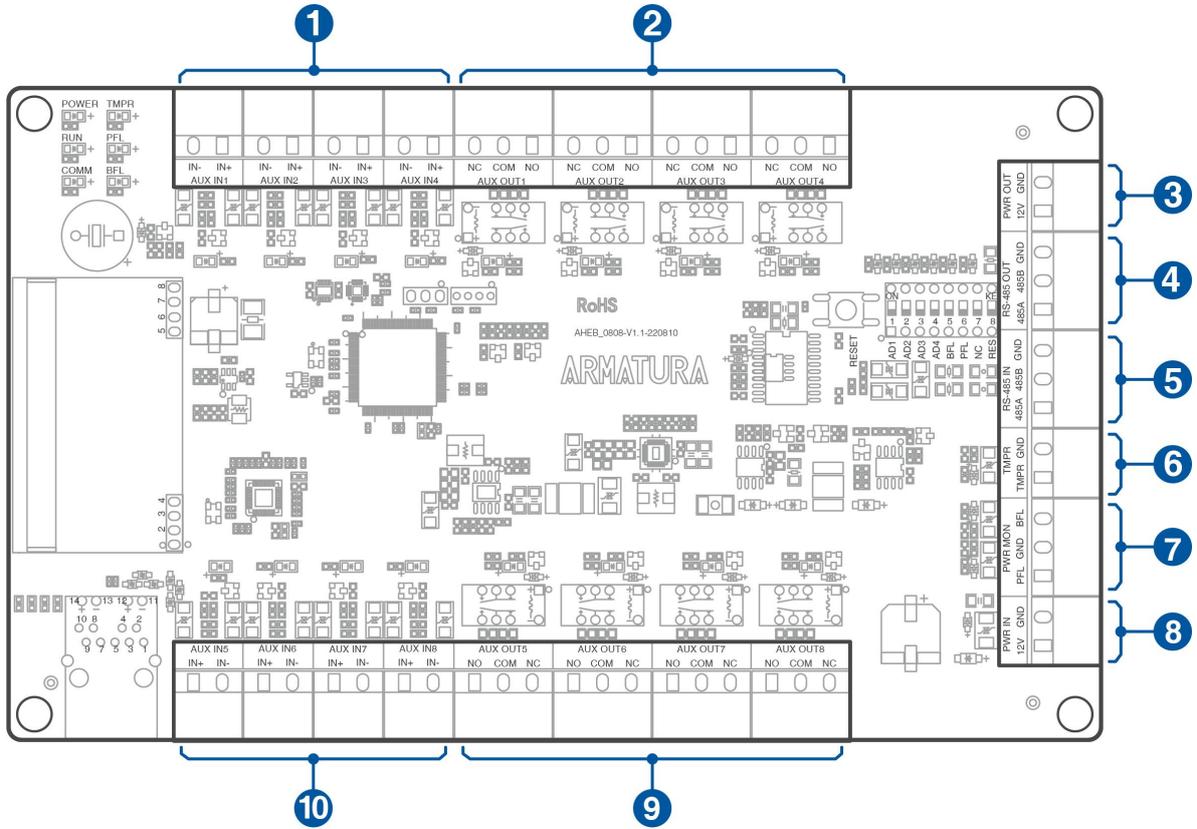


Figure 4-6 AHEB-0808 terminal description

NO.	Terminal	NO.	Terminal
1	Auxiliary Input (1-4)	6	Tampering Alarm
2	Auxiliary Output (1-4)	7	Power MON
3	Power Output	8	Power Input
4	RS-485 Out	9	Auxiliary Output (5-8)
5	RS-485 In	10	Auxiliary Input (5-8)

4.2.6 AHEB-1602

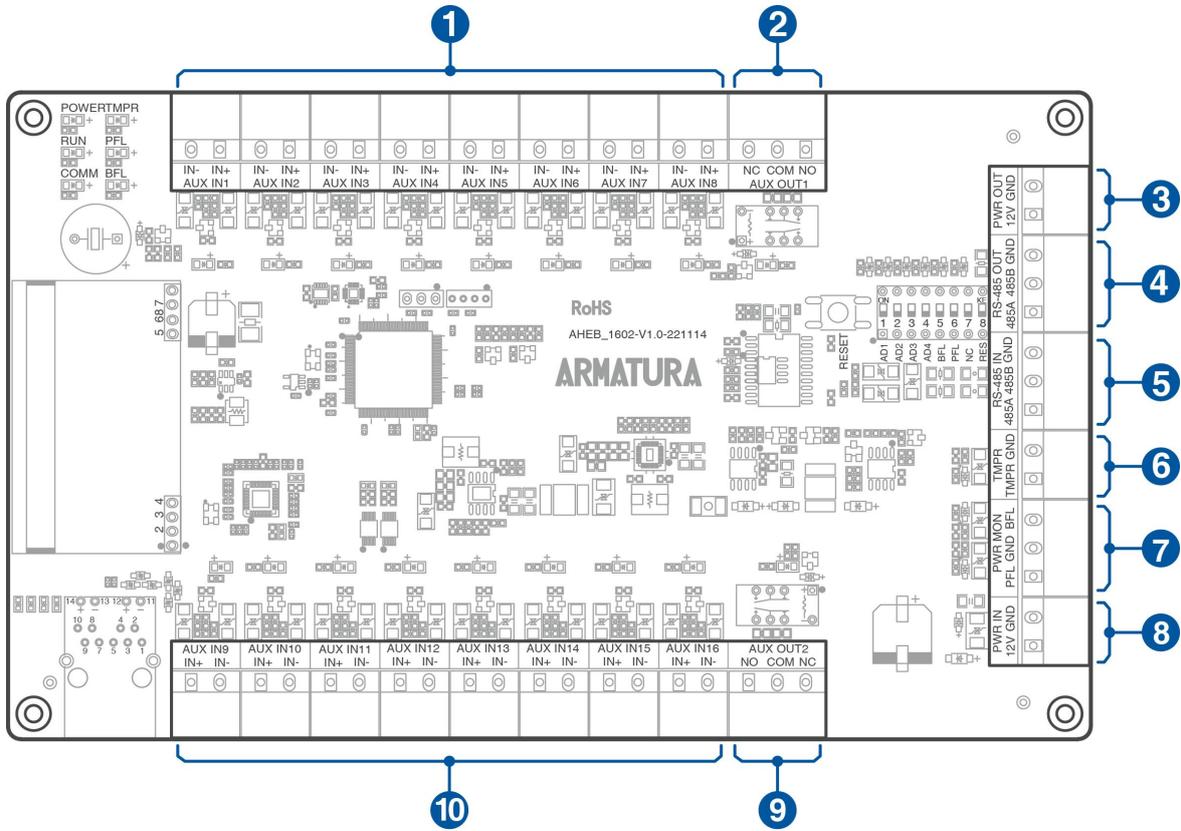


Figure 4-7 AHEB-1602 terminal description

NO.	Terminal	NO.	Terminal
1	Auxiliary Input (1-8)	6	Tampering Alarm
2	Auxiliary Output 1	7	Power MON
3	Power Output	8	Power Input
4	RS-485 Out	9	Auxiliary Output 2
5	RS-485 In	10	Auxiliary Input (9-16)

4.3 Wiring Description

4.3.1 Power Wiring

The Armatura Horizon Controller can be powered using either a 12V-24V DC power adapter or PoE, depending on availability. The wiring diagram is illustrated below:

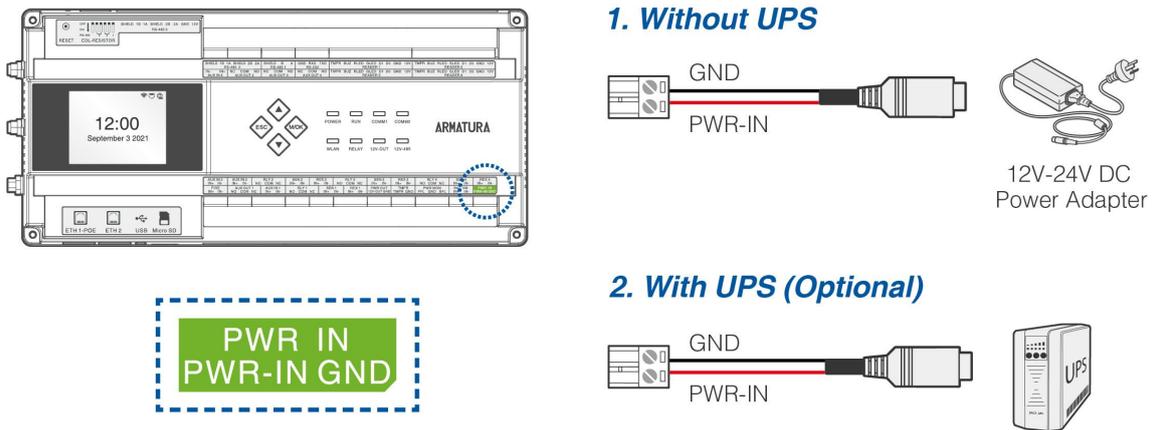


Figure 4-8 Power Wiring

Recommended Power Supply:

- 12V-24V DC ±20%, minimum 1.5A.
- Use an AC adapter with higher current ratings if power needs to be shared with other devices.

4.3.2 Network Wiring

Establish the connection between the device and the software using an Ethernet cable. An illustrative example is provided below:

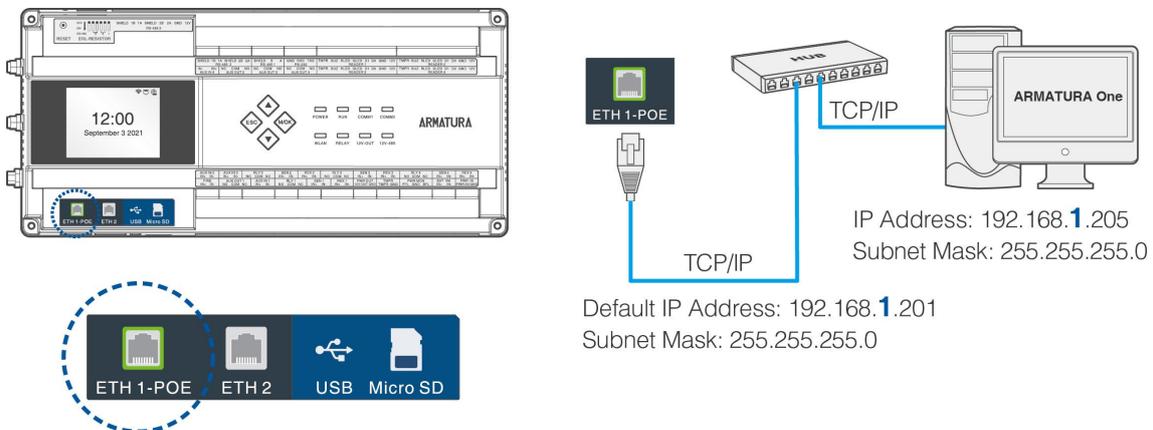


Figure 4-9 Network Wiring

Note:

1. In LAN, the IP addresses of the server (PC) and the device must be in the same network segment when connecting to the **ARMATURA One** software.
2. Dual Ethernet interfaces: the default IP address **192.168.1.201** for the primary NIC and **192.168.2.202** for the expansion NIC.

4.3.3 Auxiliary Output Wiring

The auxiliary output interface which may connect to alarms, monitors and doorbells, etc.

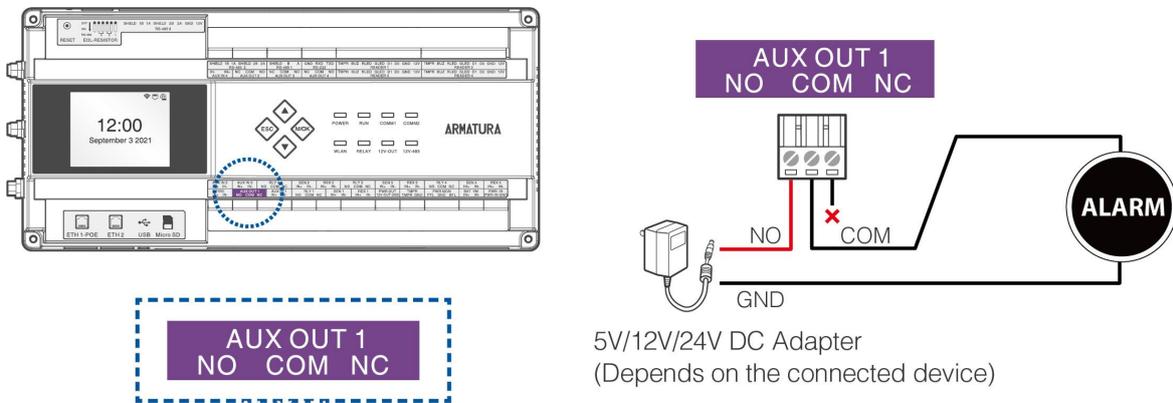


Figure 4-10 Auxiliary Output Wiring

Note:

1. For proper operation, the device must be connected to a separate power adapter.
2. Select an appropriate power adapter source based on the device's specifications.

4.3.4 Auxiliary Input Wiring

The auxiliary input interface may connect to external monitoring devices such as smoke detectors, air quality sensors, door & window contacts, wireless exit switches, etc. Auxiliary inputs are configured through the relevant access control software. For further details, please refer to the respective software manual.

The auxiliary input ports support line monitoring with both unsupervised and supervised circuit options, as depicted in the figure below. When using a supervised circuit, it is recommended to add two resistors, such as R1 and R2 shown in the figure, as close to the sensor as possible.

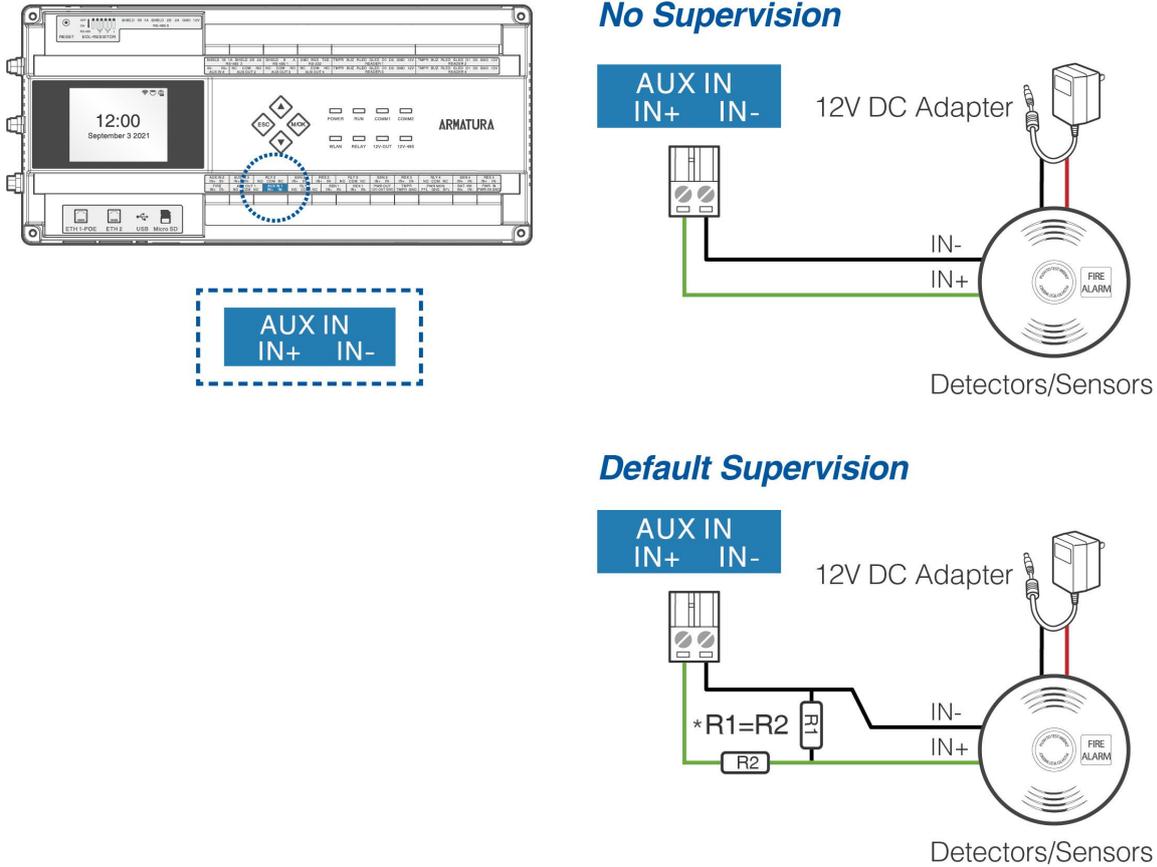


Figure 4-11 Auxiliary Input Wiring

Note:

Custom End of Line (EOL) resistances can be configured using the host software. The system supports 1.2K, 2.2K, 4.7K, and 10K resistors. For more information, refer to section [4.3.11 Line Monitoring](#).

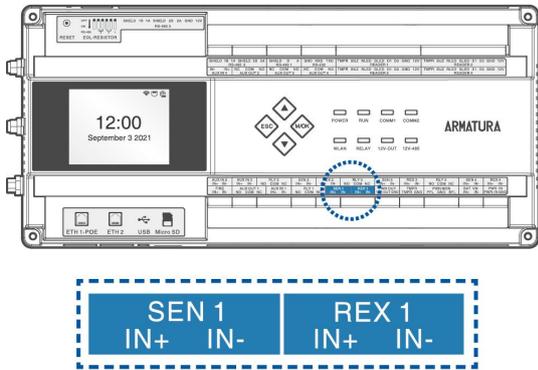
4.3.5 Door Sensor, Exit Button Wiring

A door sensor is utilized to detect the open/close status of a door. When connected to a door sensor, an access control panel can detect unauthorized door openings and trigger an alarm output. Additionally, if a door remains open for an extended period of time, the door control panel can trigger an alarm as well. It is recommended to use two-core wires with a gauge over 0.22mm² for this purpose. However, if there is no need to monitor the open/closed status of a door, trigger alarms for prolonged open durations, track unauthorized access, or use the interlock function, a door sensor can be omitted.

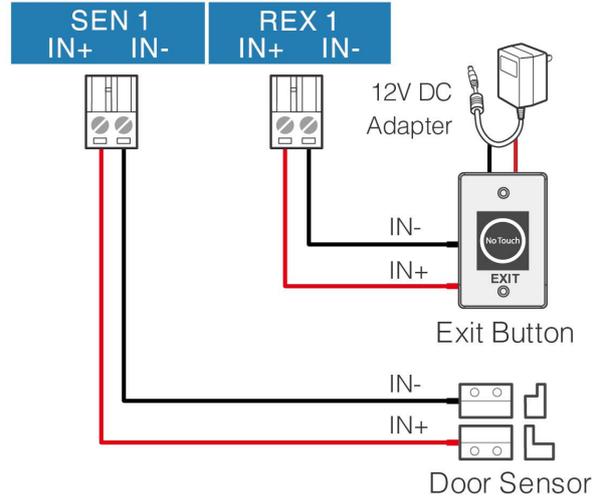
An exit switch is installed indoors to open a door. When switched on, the door will be opened. The exit button should be fixed at a height of about **55.12 inches (1.4m)** above the ground, ensuring it is in the correct position without any slant and securely connected. Any unused wire should have its exposed end cut off and wrapped with insulating tape. Be cautious of electromagnetic interference, such as from light switches and computers. For the connection wire between an exit switch and the controller, it is recommended to use two-core wires with a gauge over 0.3mm².

The sensor and request to exit ports both support line monitoring. The figure below illustrates both the unsupervised circuit and the supervised circuit.

For a supervised circuit, add two resistors as close to the sensor as possible, similar to R1 and R2 shown in the figure below.



No Supervision



Default Supervision

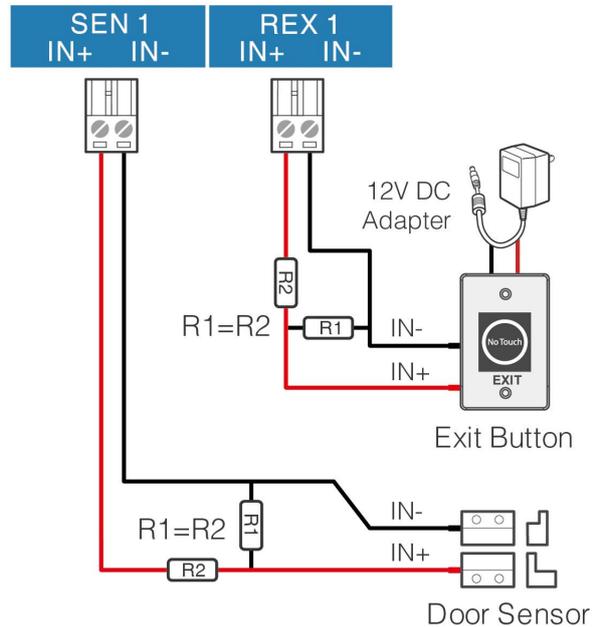


Figure 4-12 Door Sensor, Exit Button Wiring

Note:

Custom End of Line (EOL) resistances can be configured using the host software. The system supports 1.2K, 2.2K, 4.7K, and 10K resistors. For more information, refer to section [4.3.11 Line Monitoring](#).

4.3.6 Wiegand Reader Wiring

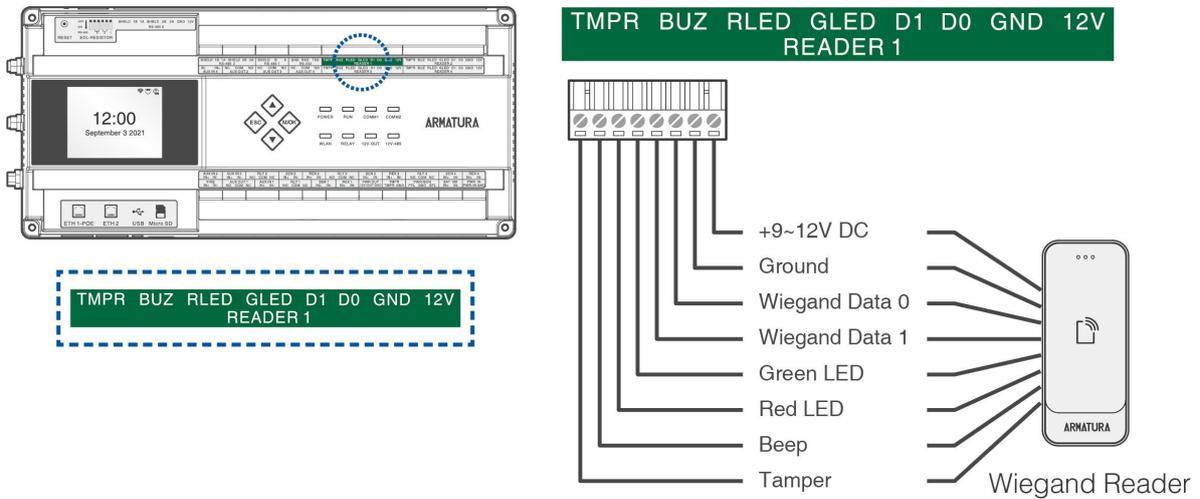


Figure 4-13 Wiegand Reader Wiring

4.3.7 Lock Relay Wiring

1. The ARMATURA Horizon Controller provides one or multiple electronic lock outputs. The **COM** and **NO** terminals are used for locks that unlock when power is connected and lock when power is disconnected. The **COM** and **NC** terminals are used for locks that lock when power is connected and unlock when power is disconnected.
2. The system supports both **Normally Opened Lock** and **Normally Closed Lock**. The **NO Lock** (Normally Opened when powered) is connected with '**NO**' and '**COM**' terminals, and the **NC Lock** (Normally Closed when powered) is connected with '**NC**' and '**COM**' terminals. The device does not share power with the lock, as shown in the example with NC Lock below:

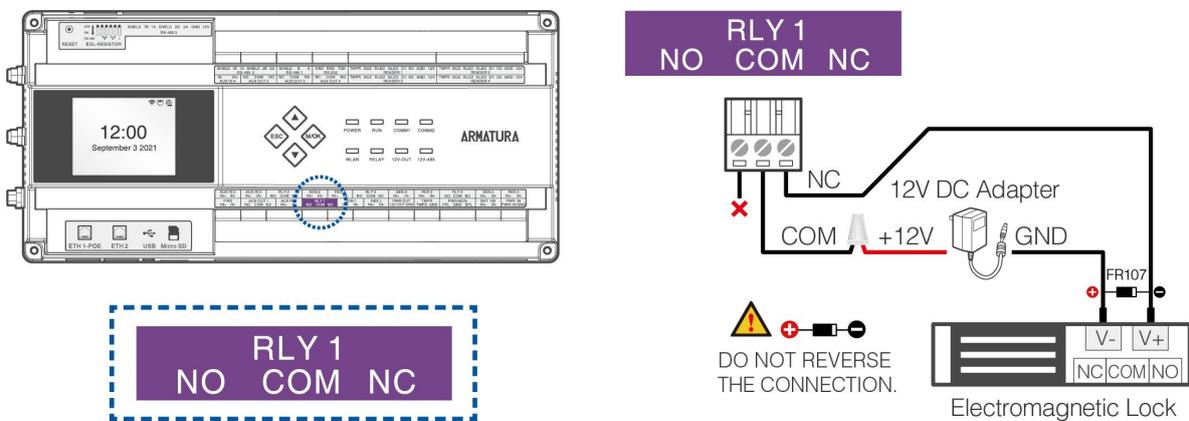


Figure 4-14 Wiring diagram of lock connection

3. Our access control panel is powered by standard PoE or access control power. You can choose either one of the power supplies as needed.
4. To protect the access control system against the self-induced electromotive force generated by an electronic lock at the instant of switching off/on, it is necessary to connect a diode in parallel (please use FR107 delivered with the system) with the electronic lock to release the self-induced electromotive force during the onsite connection for application of the access control system.

4.3.8 Fire Alarm Monitoring Wiring

The Input FIRE port circuits can be configured in either No Supervision mode or Default Supervision mode, with the default being No Supervision mode, where all doors are normally open in case of a short circuit. After connecting the ARMATURA One software and enabling line monitoring, custom End of Line (EOL) resistances can be configured. The FIRE wiring method is illustrated in the figure below. For a monitored circuit, it is advised to add two resistors as close to the sensor as possible.

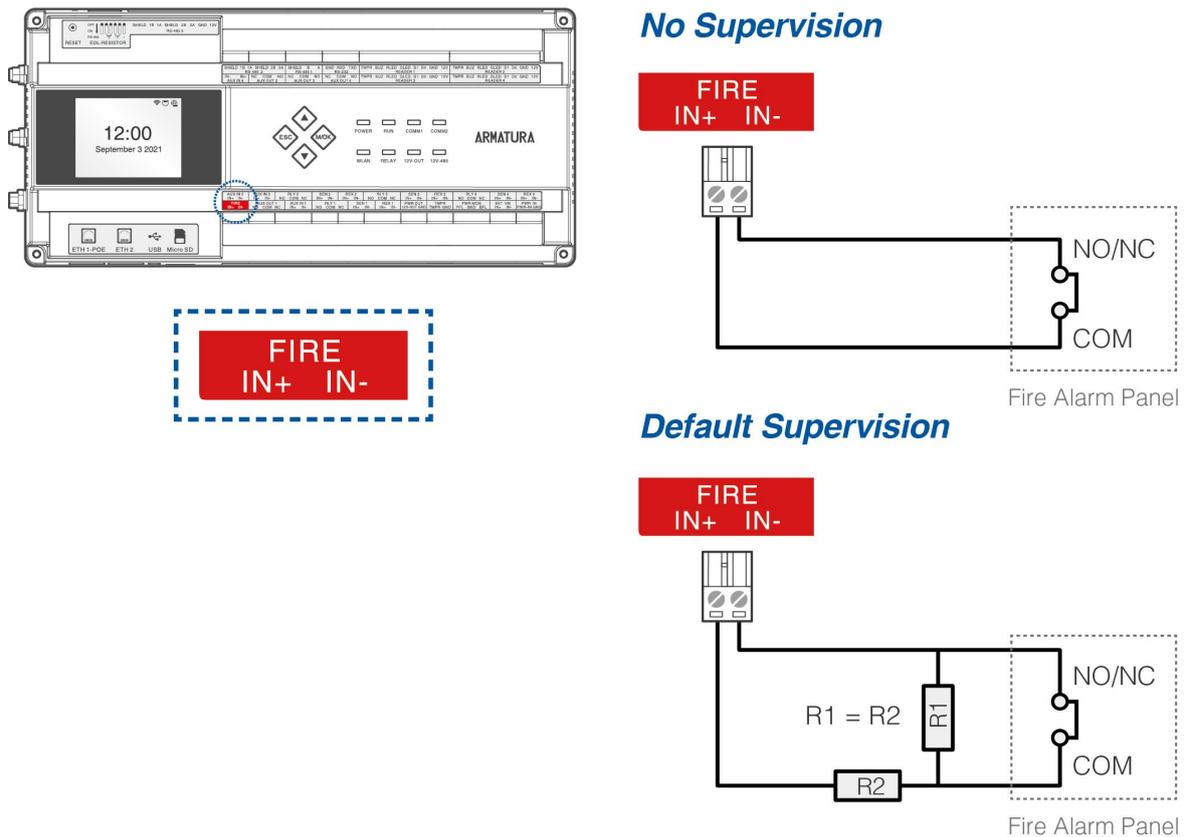


Figure 4-15 Fire Alarm Monitoring Wiring

Note:

Custom End of Line (EOL) resistances can be configured using the host software. The system supports 1.2K, 2.2K, 4.7K, and 10K resistors. For more information, refer to section [4.3.11 Line Monitoring](#).

4.3.9 RS-485 Reader Wiring

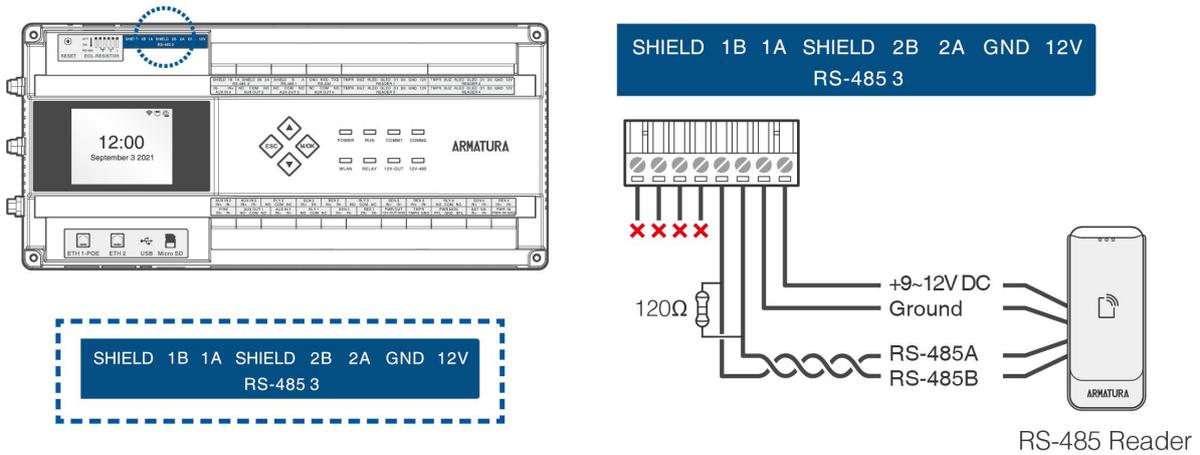
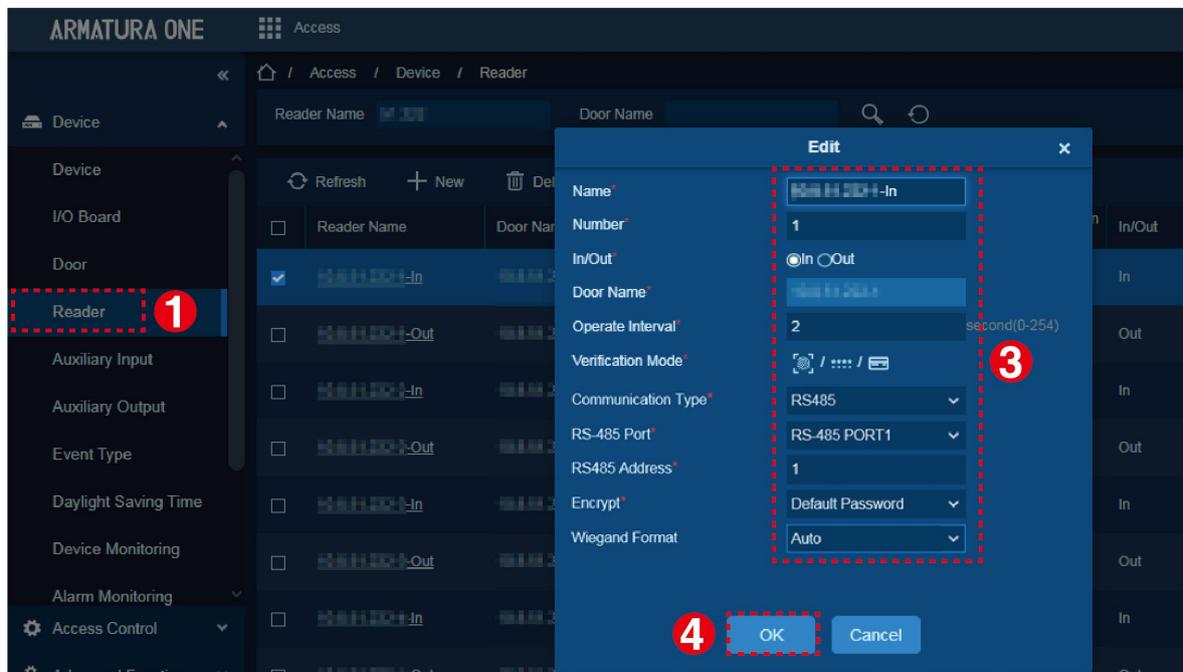


Figure 4-16 RS-485 Reader Wiring

Important Notes

When connecting the RS-485 reader, please follow the instructions carefully and adhere to the following guidelines.

1. The RS-485 port supports using the OSDP protocol, but it requires configuring the parameters on the ARMATURA One software. To make the necessary changes, follow the modification path: **Access > Device > Reader > New**, as illustrated below:



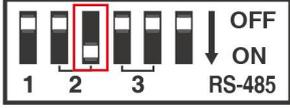
In the pop-up edit window, configure each parameter of the RS-485 reader. Once done, click **OK** to finalize the configuration.

- **RS-485 Port:** Select the port that the RS-485 reader is connected.
- **RS485 Address:** Each RS-485 port is associated with a specific terminating resistor bit number.

Note: The RS485 address set by the software must match the RS-485 address of the reader.

2. EOL needs to be enabled when communicating over longer distances. Please refer to the following DIP switch settings to configure the EOL resistor of RS-485.

Table 1 - Configure EOL Resistor of RS-485

EOL-RESISTOR	DIP Number	DIP Switch Settings
RS-485 1 (A, B)	1	
RS-485 2 (1A, 1B)	2	
RS-485 2 (2A, 2B)	3	
RS-485 3 (1A, 1B)	4	
RS-485 3 (2A, 2B)	5	
Reserve	6	

3. When connecting the RS-485 reader, shielded twisted pair communication wires with a maximum length of **3937ft (1200m)** are recommended. A maximum of **8** readers can be connected.
4. For communication distances equal to or exceeding **984ft (300m)**, configure the EOL resistor of the RS-485 through the dip switch to enable the terminal. Simultaneously, connect a **120-ohm** terminal matching resistor between the RS-485+ and RS-485- terminals of the last terminal device.

5. The figure below illustrates two methods of RS-485 reader connection.

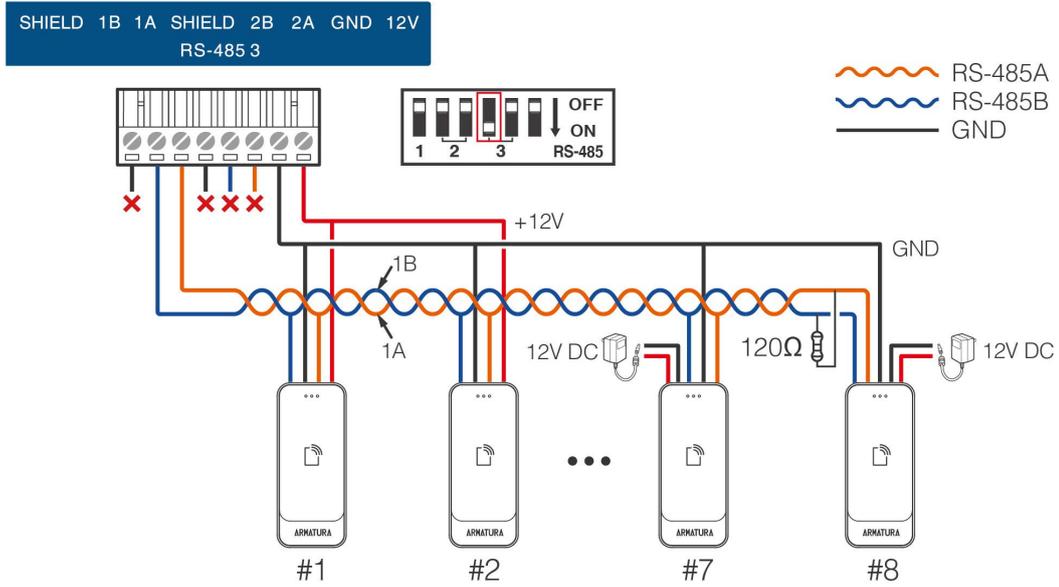


Figure 4-17 Hand-to-hand connection of controller and RS-485 readers

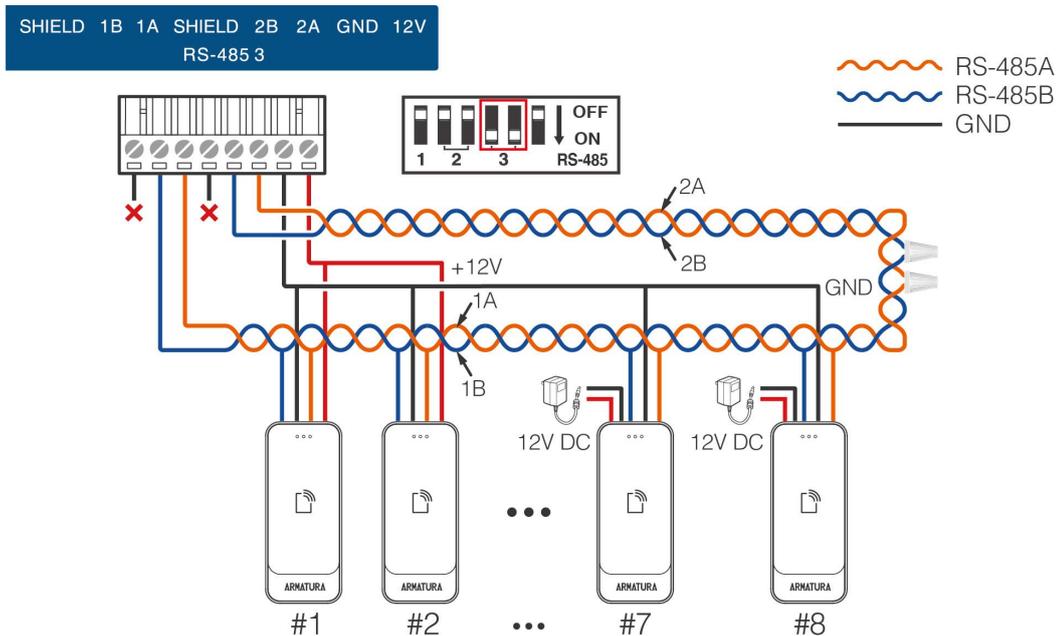


Figure 4-18 RS-485 redundancy backup connection of controller and RS-485 readers

Note:

1. When using RS-485 redundant backup mode, ensure that the DIP switches of the connected ports are simultaneously turned to the **ON** position.
2. When the DIP switch is set to the **ON** position, it is the equivalent to adding a 120 ohm terminal resistor between the 485+ and 485- terminals.

4.3.10 I/O Board Wiring

4.3.10.1 Connect AHEB-0808 / AHEB-1602 via RS-485

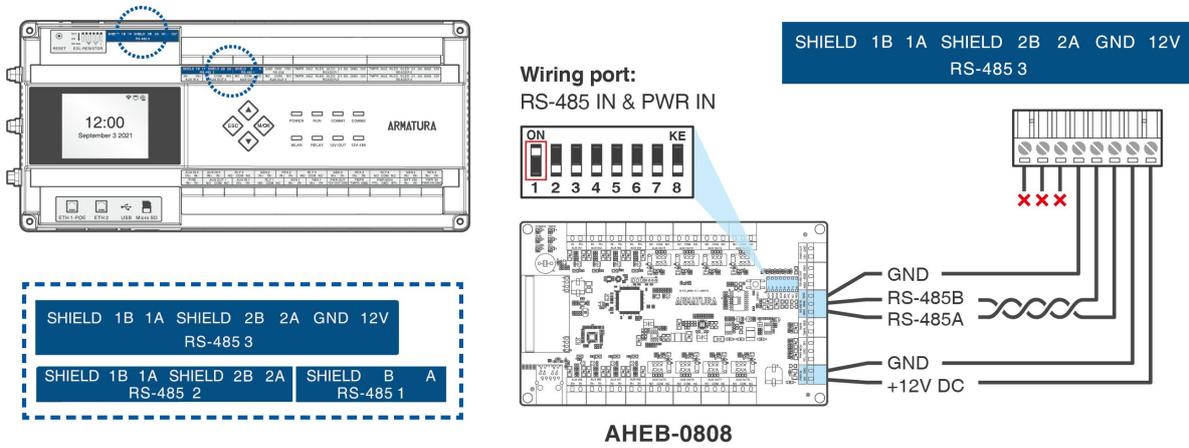


Figure 4-19 I/O Board Wiring

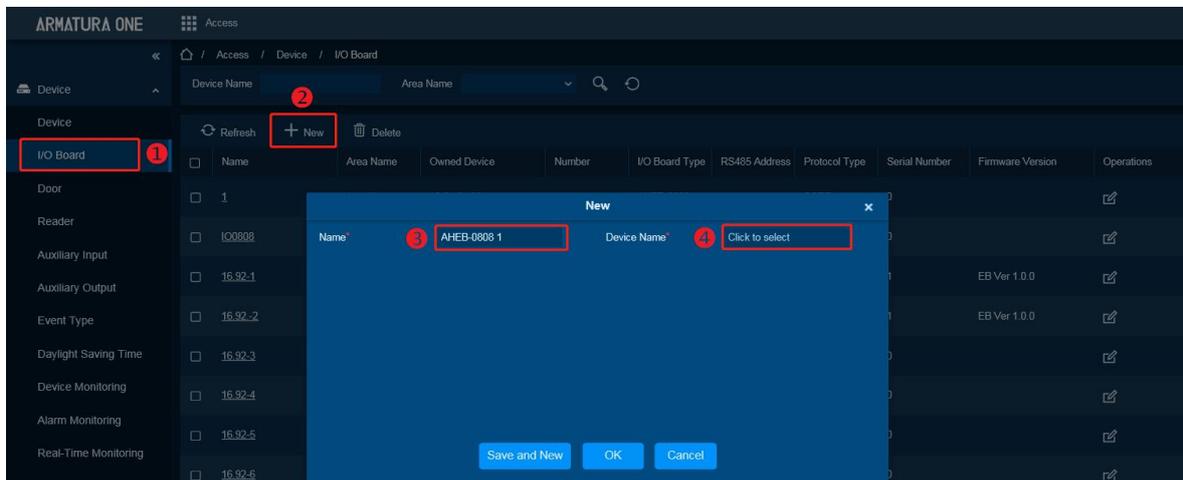
Remarks:

- The AHEB-0808 & AHEB-1602 share the same installation, and wiring methods. This document will refer to the AHEB-0808 model as a reference for wiring and connections.

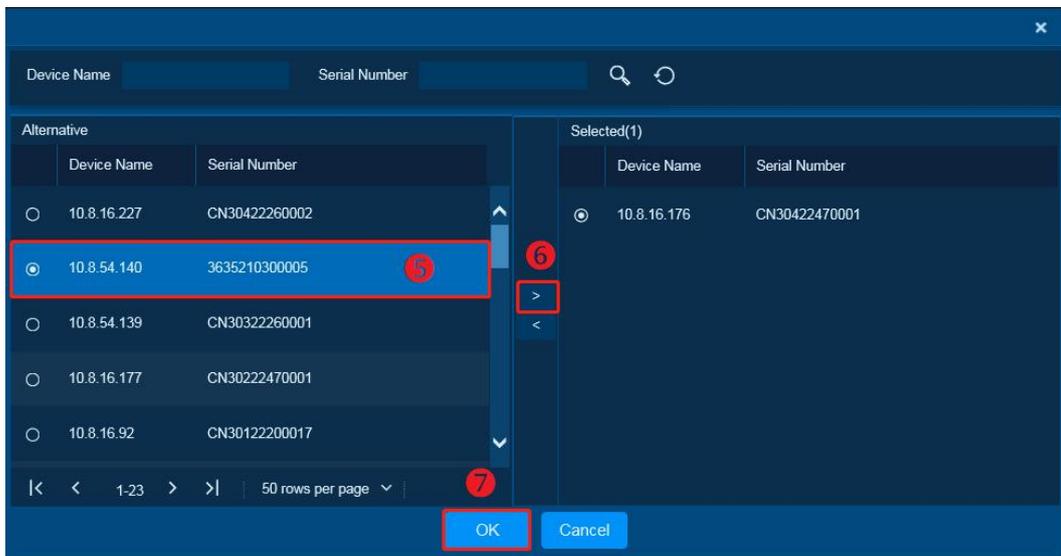
Operating Steps

When connecting the AHEB-0808/ AHEB-1602 expansion board to the controller, please follow the steps below.

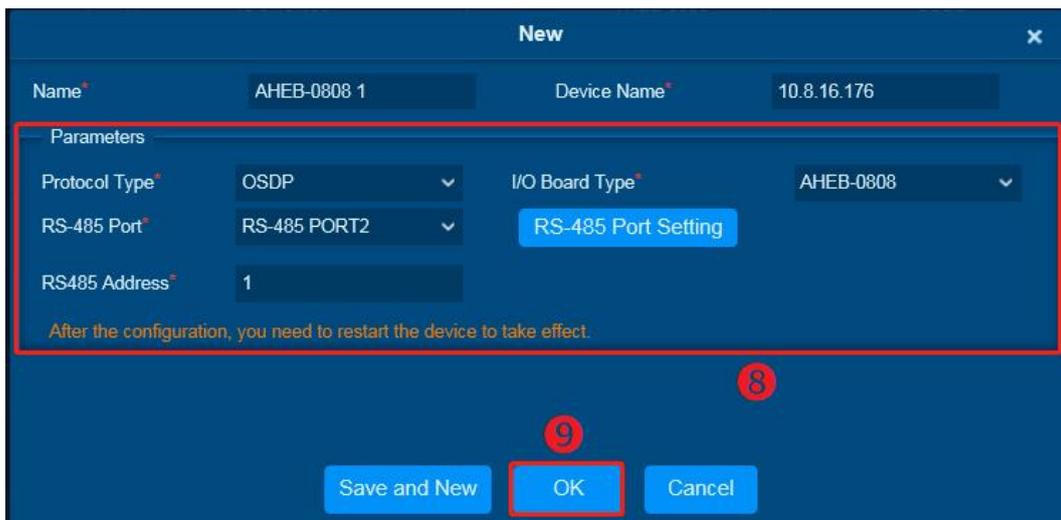
1. Connect the AHEB-0808/AHEB-1602 to the AHSC-1000 or the AHDU-1X60 using the RS-485 interface. It can be connected to any of the RS-485 1, RS-485 2, and RS-485 3 wiring ports.
2. Login to the ARMATURA One software using the current account with the necessary authority. Then, follow the instructions in Section 6.3 'Adding Devices' to add the controller to the software.
3. Then click **Access > Device > I/O Board > New** to display the new page.



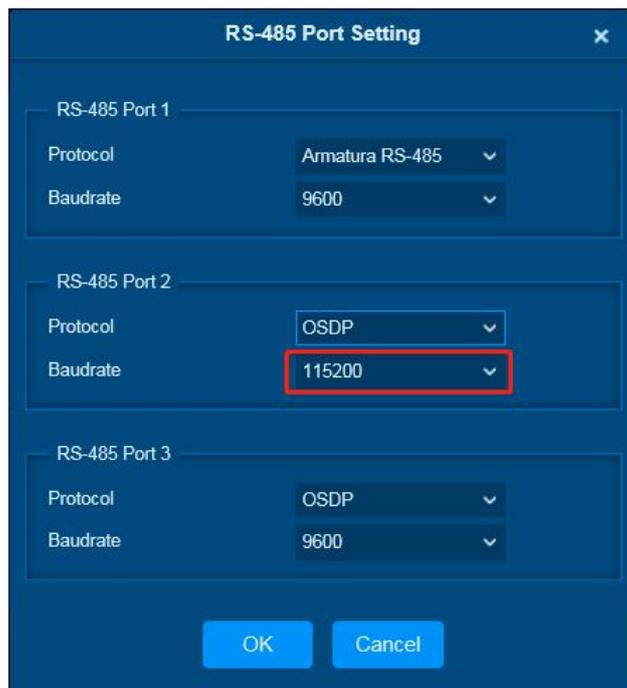
- Click on '**Device Name**' to open a device selection window. Choose the added controller from the list, and then click '**OK**' to save and exit.



- Enter corresponding parameters and click **OK** to save the expansion board.



- RS-485 Port:** Select the port to which the expansion board is connected.
- RS485 Address:** The RS-485 address of expansion board.
Note: The RS485 address set by the software must match the RS-485 address of the expansion board.
- I/O Board Type:** Select AHEB-0808/ AHEB-1602 expansion board.
- RS-485 Port Setting:** Make sure the baudrate of the corresponding port is the same as that of the expansion board. The default baud rate for AHEB-0808/ AHEB-1602 is 115200.



Port Introduction

Parameter		Introduction
RS-485 Port 1	Protocol	Armatura RS-485/OSDP/Aperio
	Baudrate	4800/9600/19200/38400/57600/115200
RS-485 Port 2	Protocol	Armatura RS-485/OSDP/Aperio
	Baudrate	4800/9600/19200/38400/57600/115200
RS-485 Port 3	Protocol	Armatura RS-485/OSDP/Aperio
	Baudrate	4800/9600/19200/38400/57600/115200

Protocol Introduction

Protocol	Purpose	Supported Device
OSDP	For Reader/Expansion Board	AHSC1000, AHDU1X60
Armatura RS-485	For primary and secondary controllers	AHSC1000, AHDU1X60
Aperio	For ASSA ABLOY Aperio AH30	AHSC1000

Remarks:

1. A maximum of eight AHEB-0808/ AHEB-1602 expansion boards can be connected to each RS-485 port.
2. Each AHEB-0808 can support up to eight auxiliary input devices and eight auxiliary output devices. While each AHEB-1602 can accommodate a maximum of sixteen auxiliary input devices and two auxiliary output devices.
3. Configure the RS-485 addresses of each AHEB-0808/AHEB-1602 using the DIP switch before supplying power.
4. The RS-485 interface can supply a maximum current of 3A (12V). Therefore, when the expansion boards share power with the panel, the total current consumption should not exceed this maximum value. For calculations, please consider the maximum current of the expansion board, keeping in mind that the starting current is typically more than twice the normal working current. If the total current consumption exceeds the maximum limit or to avoid potential issues with starting current, it is recommended to power the expansion board separately.
5. Please find the wiring instructions for connecting multiple expansion boards below.

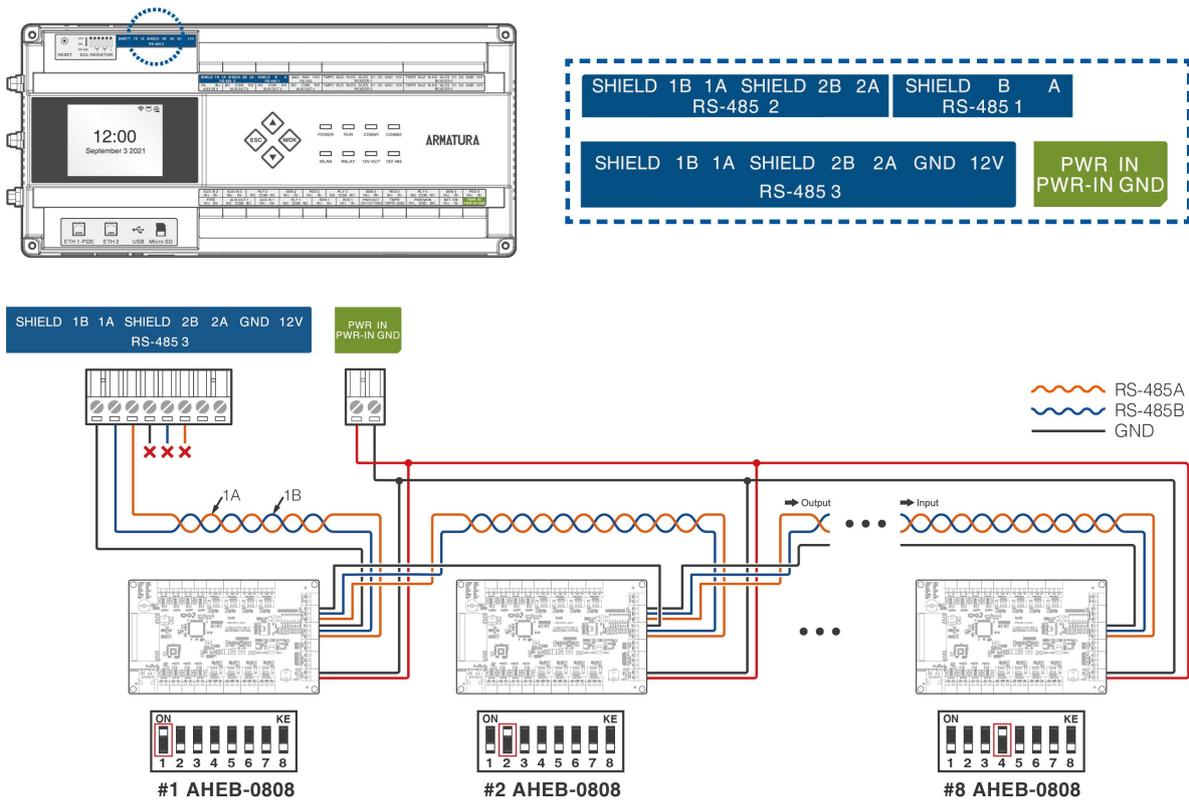


Figure 4-20 I/O Board Wiring

4.3.10.2 Connecting the Aperio AH30 hub to AHSC-1000 via RS-485

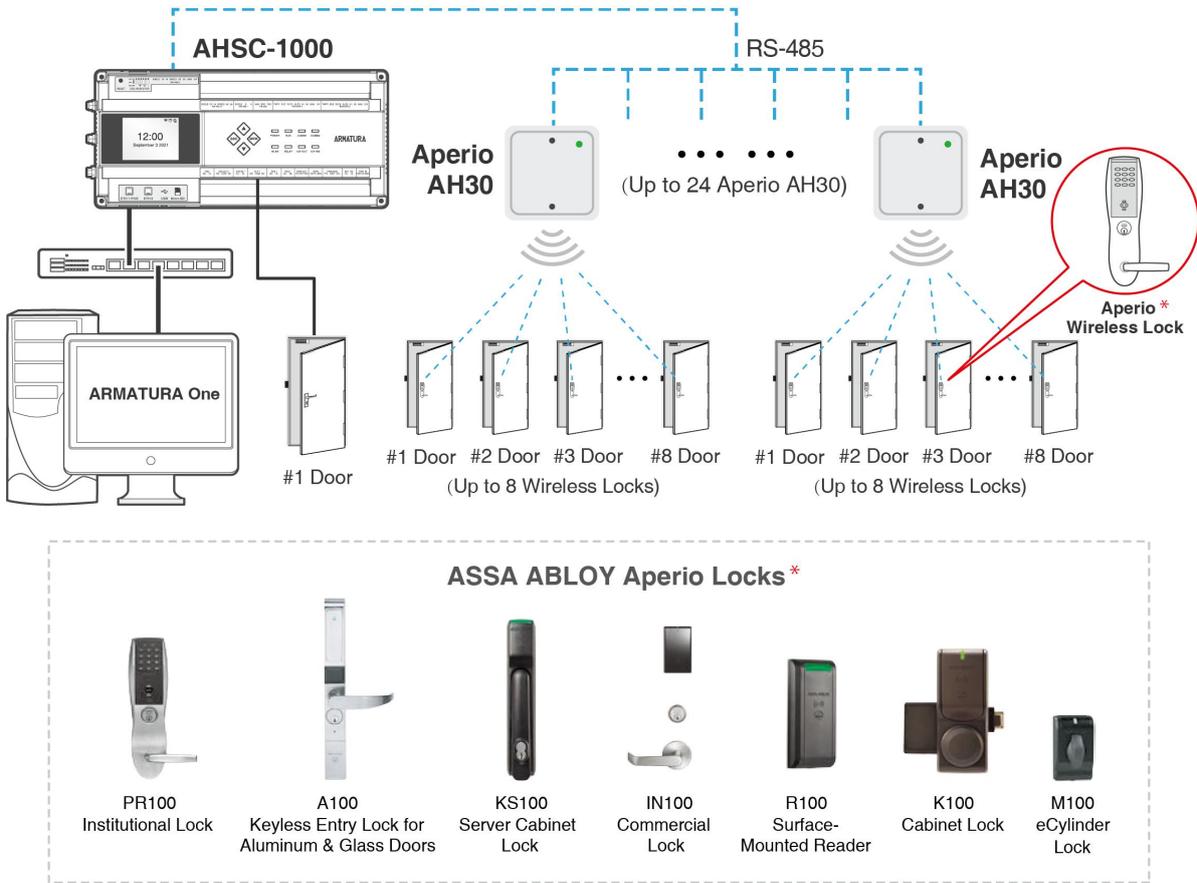
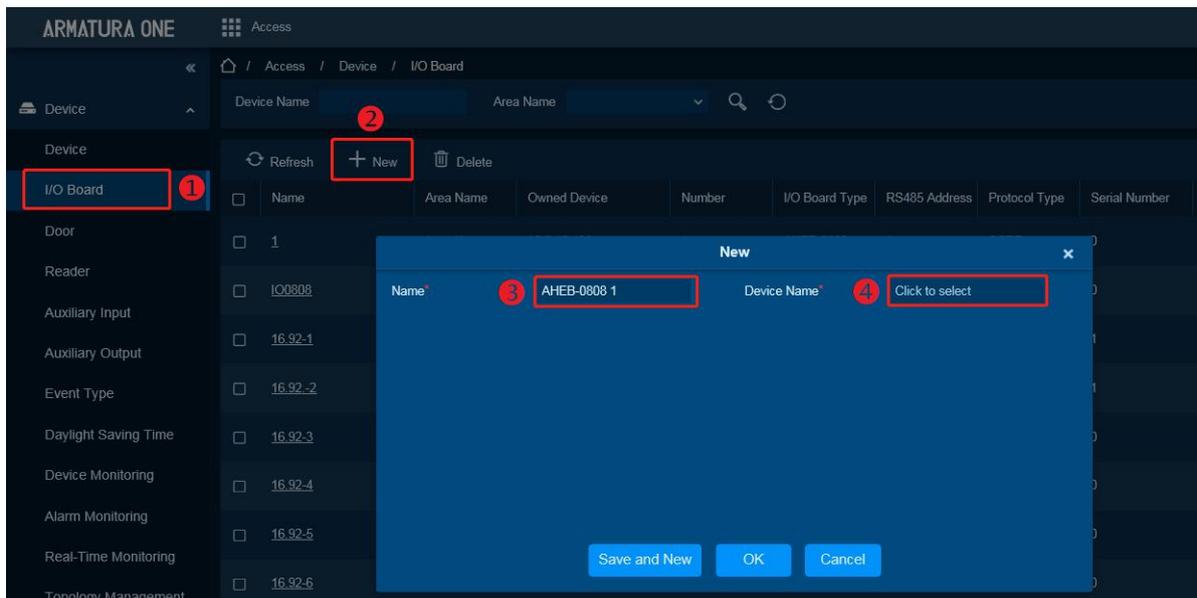
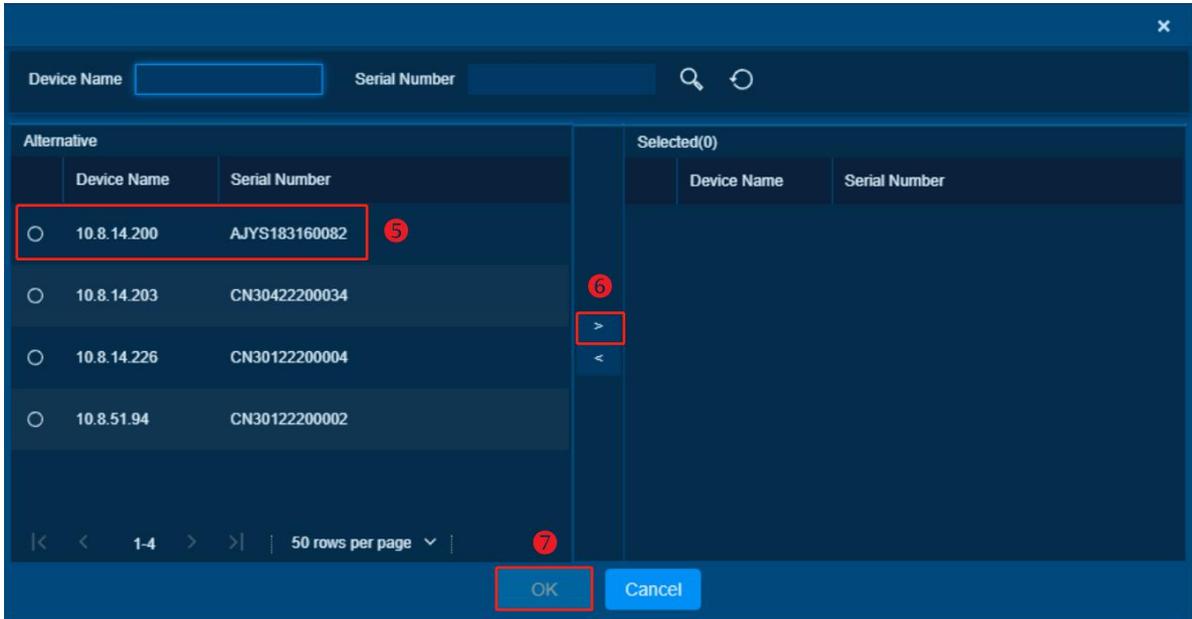


Figure 4-21 Aperio AH30 hub Wiring

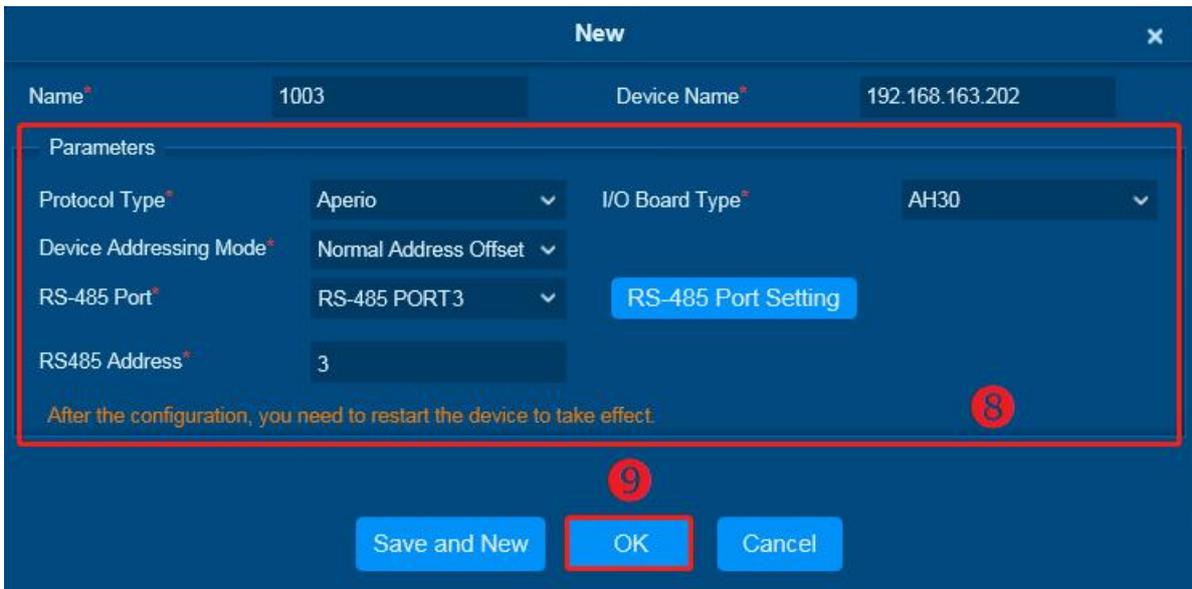
1. Click **Access > Device > I/O Board > New** to display the new page.
2. Enter **Name**.



- Click on 'Device Name' to open a device selection window. Choose the added controller from the list, and then click 'OK' to save and exit.



- Enter each corresponding parameters.



- **Device Addressing Mode:**
 - Normal Address Offset

Addressing table – normal address offset

An AH30 communication hub can pair with up to 8 locks. When pairing several locks to a communication hub, the following addresses are used for the address range 1-15. Above this range only one lock can be paired.

DIP 4 – DIP 1	AH30 Hub address	Lock addresses
0000		Reserved
0001	0x01	0x01, 0x11, 0x21, 0x31, 0x41, 0x51, 0x61, 0x71
0010	0x02	0x02, 0x12, 0x22, 0x32, 0x42, 0x52, 0x62, 0x72
0011	0x03	0x03, 0x13, 0x23, 0x33, 0x43, 0x53, 0x63, 0x73
0100	0x04	0x04, 0x14, 0x24, 0x34, 0x44, 0x54, 0x64, 0x74
0101	0x05	0x05, 0x15, 0x25, 0x35, 0x45, 0x55, 0x65, 0x75
0110	0x06	0x06, 0x16, 0x26, 0x36, 0x46, 0x56, 0x66, 0x76
0111	0x07	0x07, 0x17, 0x27, 0x37, 0x47, 0x57, 0x67, 0x77
1000	0x08	0x08, 0x18, 0x28, 0x38, 0x48, 0x58, 0x68, 0x78
1001	0x09	0x09, 0x19, 0x29, 0x39, 0x49, 0x59, 0x69, 0x79
1010	0x0A	0x0A, 0x1A, 0x2A, 0x3A, 0x4A, 0x5A, 0x6A, 0x7A
1011	0x0B	0x0B, 0x1B, 0x2B, 0x3B, 0x4B, 0x5B, 0x6B, 0x7B
1100	0x0C	0x0C, 0x1C, 0x2C, 0x3C, 0x4C, 0x5C, 0x6C, 0x7C
1101	0x0D	0x0D, 0x1D, 0x2D, 0x3D, 0x4D, 0x5D, 0x6D, 0x7D
1110	0x0E	0x0E, 0x1E, 0x2E, 0x3E, 0x4E, 0x5E, 0x6E, 0x7E
1111	0x0F	0x0F, 0x1F, 0x2F, 0x3F, 0x4F, 0x5F, 0x6F, 0x7F

When configuring installations that differ from the default configuration described in section DIP 1-5 – Selecting the EAC address/Automatic pairing on page 38, use this table to keep track of what

addresses are used by the locks/sensors in your installation in order to avoid addressing conflicts according to section "Installation examples" on page 44 for mixed installations.

Aperio® Online Mechanical Installation Guide, Document No: ST-001323-E Date: 30 mars 2016

➤ Legacy Address Offset

Addressing table – legacy address offset

Legacy addressing mode is an alternative addressing mode that can be set by the Programming Application in the configuration wizard. The lock addresses in this mode are set consecutively. For example, if communication hub has address 1, the locks will get address 1-8, 9-16, 17-24 etc.

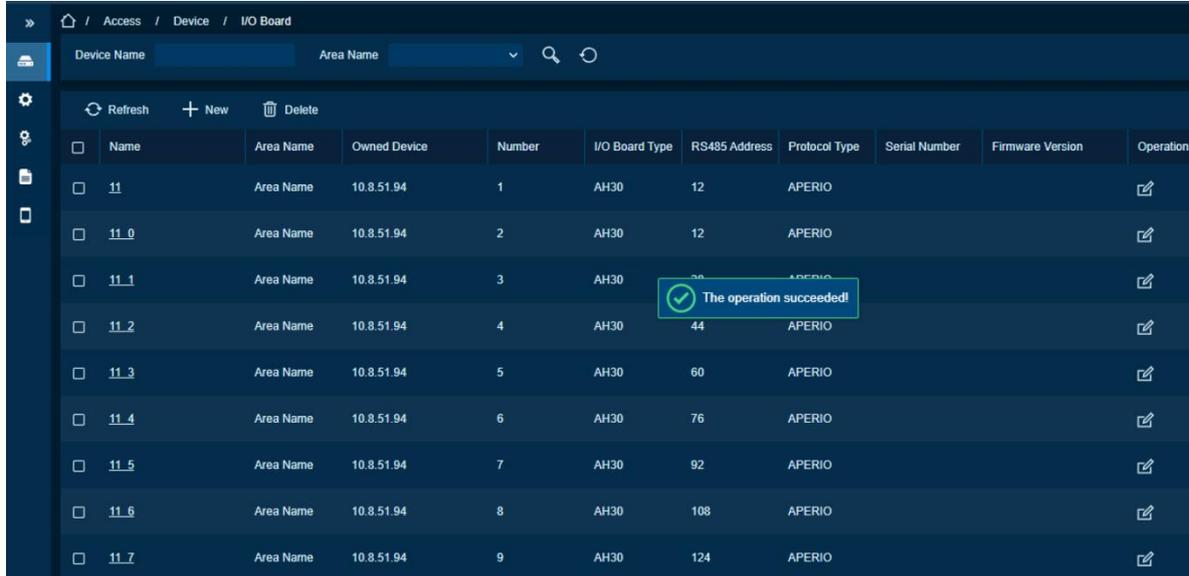
DIP 5 – DIP 1	AH30 Hub address	Lock addresses
0000		Reserved
0001	0x01	0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07, 0x08
0010	0x02	0x09, 0x0A, 0x0B, 0x0C, 0x0D, 0x0E, 0x0F, 0x10
0011	0x03	0x11, 0x12, 0x13, 0x14, 0x14, 0x16, 0x17, 0x18
0100	0x04	0x19, 0x1A, 0x1B, 0x1C, 0x1D, 0x1E, 0x1F, 0x20
...		

This mode is used for older EAC systems that cannot handle high EAC addresses where the limit for example is 32 or 64.

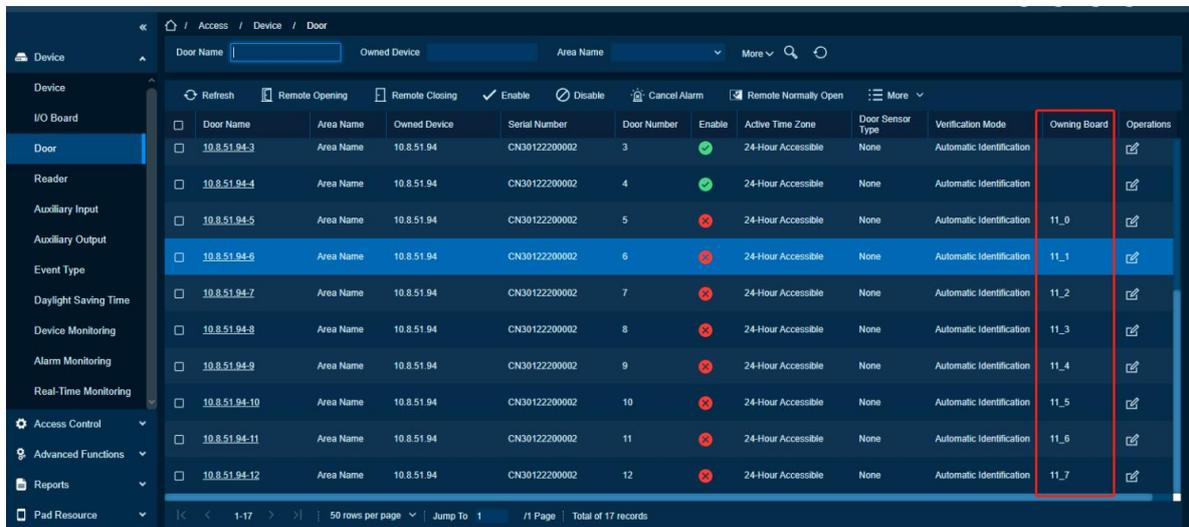
Note: Image references the ST-001323-Aperio Online Mechanical Installation Manual-E-US.pdf.

- **RS-485 Port:** The system will perform filtering based on the protocol.
- **RS-485 Address:** The RS-485 address range for Aperio AH30 is from 1 to 15.

5. Click **OK** to save and exit.



6. The system will generate several virtual devices in the I/O Board.



7. The system will automatically generate several doors that are bound to the corresponding owning board, which is created in the I/O Board Page.

Remarks:

1. Only the AHSC-1000 supports the connection with the Aperio AH30
2. **Feature Trigger Result:** This action will generate multiple virtual I/O Boards in [I/O Board] and Virtual Doors in [Door].

4.3.11 Line Monitoring

This device supports monitoring the status of various lines, such as the door sensor, exit button, and auxiliary input (e.g., alarm inputs). It can detect four types of line statuses: open, closed, short circuit, and broken circuit. The open and closed states represent the normal switching conditions of the line.

As depicted in the figure below, in case of a short circuit, the lines in positions 1 and 2 are connected, and in the event of a broken circuit, either the line in position 1 or 2 is disconnected.

Note:

The line monitoring feature requires the installation of two resistors on the door sensor, exit button, and auxiliary input lines. Custom End of Line (EOL) resistances can be configured via the host software, supporting resistors of 1.2K, 2.2K, 4.7K, and 10K.

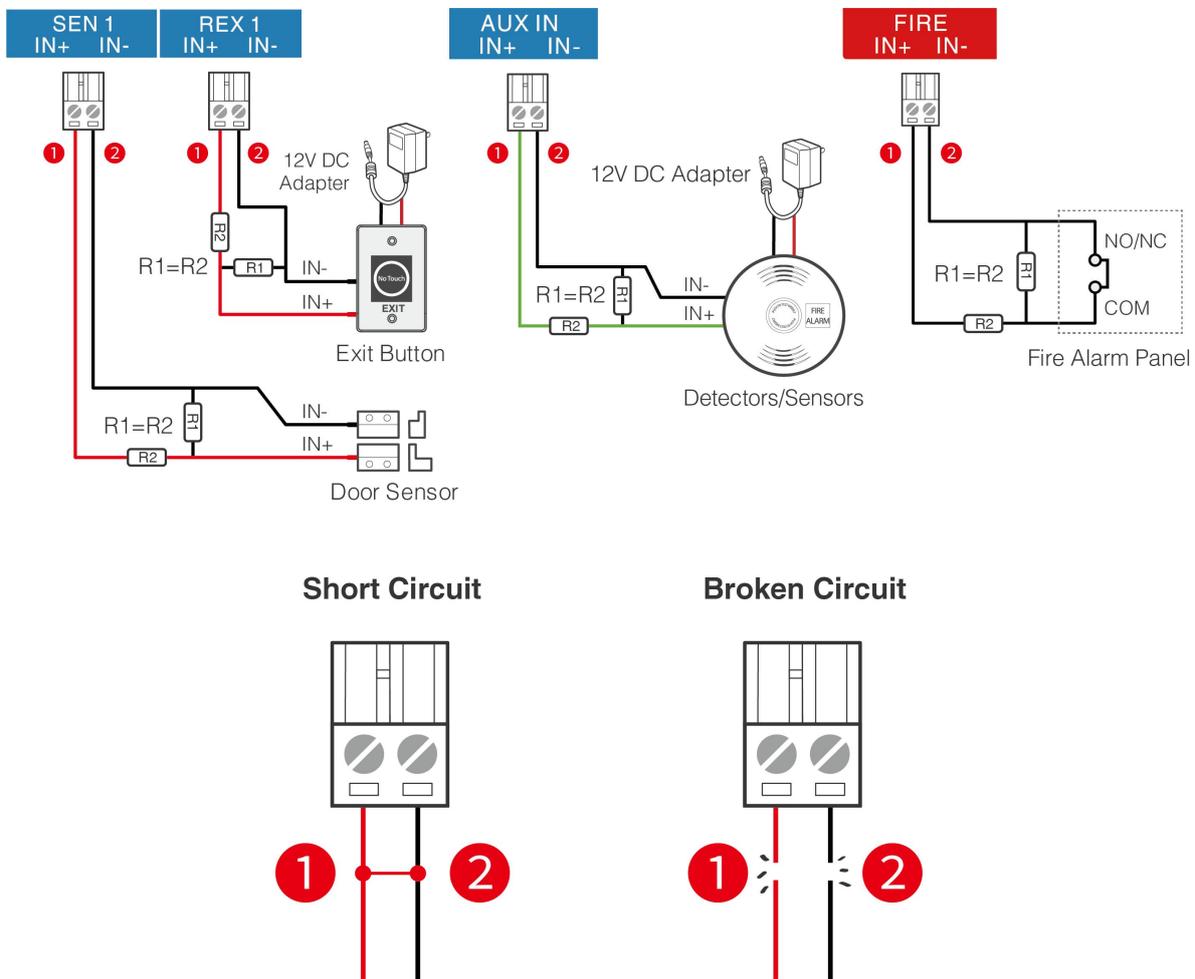


Figure 4-22 Line monitoring diagram

5. Equipment Communication

The server-based software can communicate with the system using two protocols (TCP/IP and Wi-Fi) for data exchange and remote management.

5.1 Access Control Network Wires and Wiring

1. The power supply is 12V DC converted from 220V or PoE.
2. Wiegand readers utilize 6-core shielded communication wires (RVVSP 6×0.5mm) to minimize interference during transmission. Users can choose between 6-core, 8-core, and 10-core options based on the available ports.
3. Due to its significant current, an electronic lock generates strong interference signals during operation. To mitigate this effect, it is recommended to use 4-core wires (RVVP 4×0.75mm²), with two cores dedicated to the power supply and two for the door sensor.
4. RS-485 readers use 4-core communication shielded wires (RVVSP 4×0.5mm).
5. Other device cabling, such as exit switches, are typically constructed with 2-core wires (RVVSP 2×0.5mm²).
6. Wiring Notes:
 - Signal wires, such as network cables, must not be run in parallel or share a casing pipe with large-power electric wires like electronic lock wires and power cables. If parallel wiring is necessary due to environmental constraints, ensure a minimum distance of 50cm between them.
 - Attempt to minimize the use of connectors when distributing conductors. If a connector is necessary, it must be crimped or welded. Avoid applying any mechanical force to the joint or branch of conductors.
 - For installations within a building, distribution lines must be laid either horizontally or vertically. To ensure proper protection, these lines should be encased in suitable casing pipes, such as plastic or iron water pipes, chosen based on the technical requirements of indoor distribution. For ceiling wiring, metal hoses can be used, provided they are securely fastened and have an aesthetically pleasing appearance.
 - Shielding Measures and Shielding Connection: If a survey before construction reveals significant electromagnetic interference in the wiring environment, it is essential to incorporate shielding protection for data cables when designing the construction plan. In cases where there is a substantial radioactive interference source or the wiring needs to run parallel to a large-current power supply on the construction site, overall shielding protection becomes necessary. Generally, shielding measures involve maintaining a maximum distance from any interference source and utilizing metal wiring troughs or galvanized metal water pipes to ensure reliable grounding of the connection between the shielding layers of data cables and the metal troughs or pipes. It is important to note that a shielding enclosure can only provide effective shielding when it is reliably.

- Ground Wire Connection Method: To establish a reliable ground wire connection in compliance with applicable national standards, employ sturdy large-diameter ground wires at the wiring site. Connect these ground wires in a tree-like configuration to avoid DC loops. Ensure these ground wires are positioned far away from lightning fields to prevent interference. Note that lightning conductors should not be used as ground wires, and precautions must be taken to prevent any lightning current from passing through ground wires during a lightning event.

Metal wiring troughs and pipes must be continuously and securely connected, linking them to ground wires through large-diameter wires. The impedance of this wire section should not exceed 2 ohms. Additionally, the shielding layer must be connected reliably and grounded at one end to ensure a uniform current direction. Connect the ground wire of the shielding layer using a large-diameter wire, not smaller than 2.5mm².

5.2 TCP/IP Communication

100BASE-TX: For twisted pair connections, use either two unshielded twisted pairs or two Category 1 shielded twisted pairs, with a transmission distance of up to 328ft (100m). The Controller to Server and Inter-Controller communications are secured with 256-bit AES* symmetric encryption.

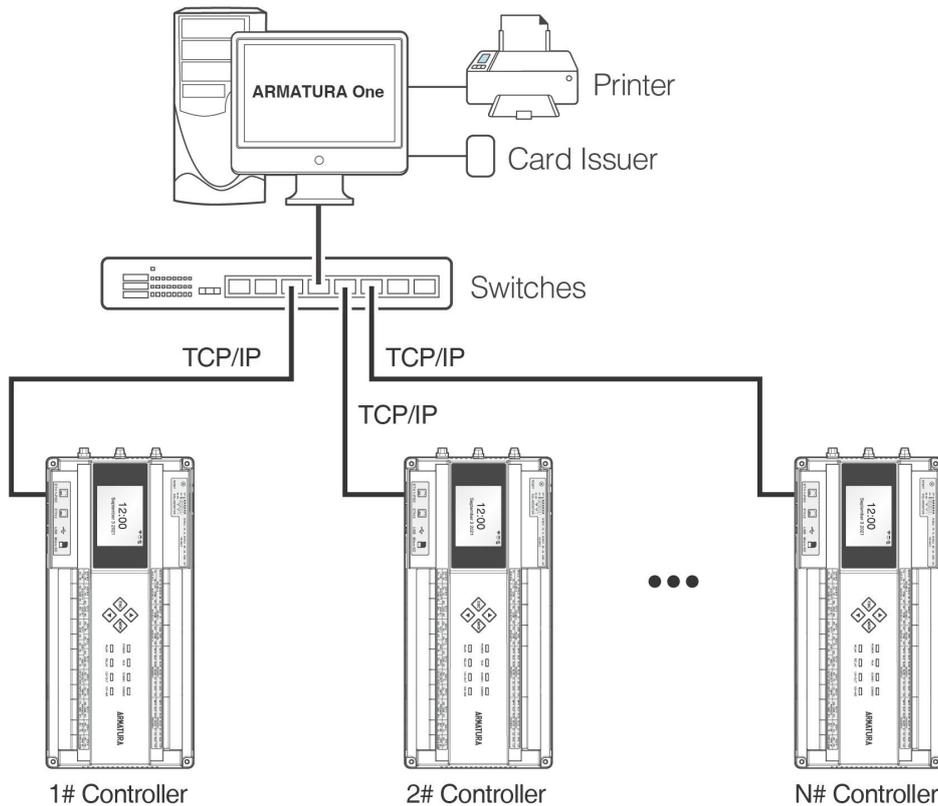


Figure 5-1 TCP/IP Communication System Networking

In the **ARMATURA One** software: Click **Access > Device > Device > Search** to find access controllers in the network, and directly add from the searching result.

5.3 Configuring Network Settings on the Controller Webserve

System admins can perform the following tasks by accessing the device's webserver.

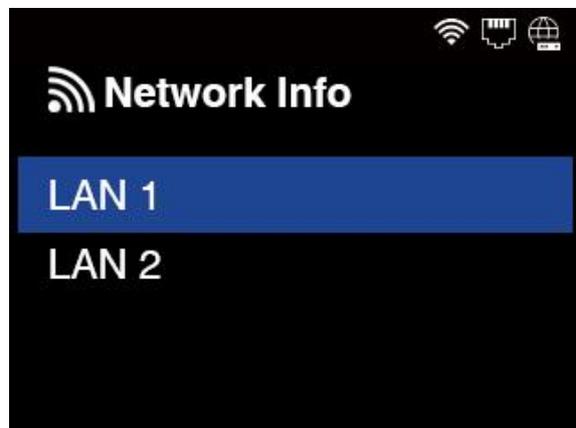
- 1) Configuring the network and connecting to the software server.
- 2) Real-time monitoring and troubleshooting of expansion devices, such as card readers, IO expansion boards, etc.
- 3) Perform equipment maintenance. Such as pulling debug records, remote initialization, reset parameters, and restart the equipment.

5.3.1 Opening the Webserver on the Browser

After powering on the controller, connect it using a network cable. Access the web server by entering the IP address and server port in the address bar of your browser. The IP address is set as follows:

https://device's IPv4(or IPv6) address:port (for example: https://192.168.1.201:443). By default, the port is **443**. The default port 443 for HTTPS service can be ignored.

You can also click the **M/OK** button > **Network Info** > **LAN1/LAN2** to view the device IP address on the screen of the controller. As shown below.

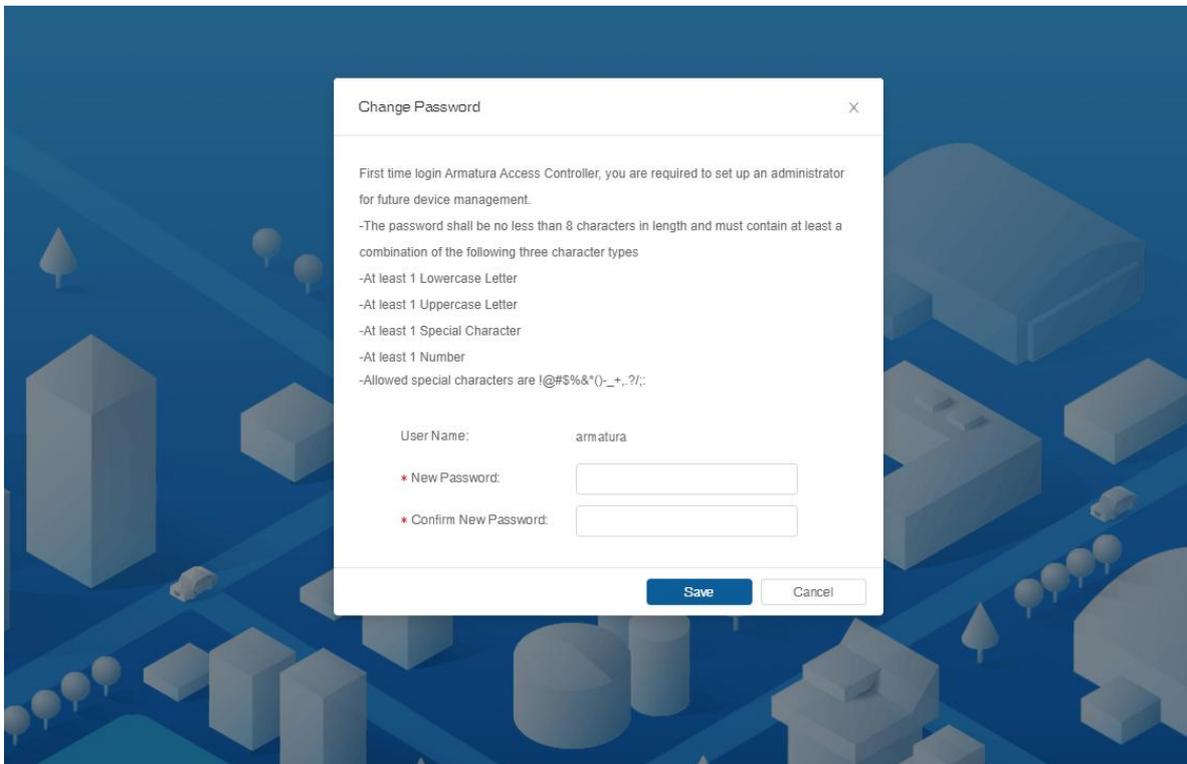


Status of Icons:

Status Icon	Name	Description
	Wi-Fi signal	The Wi-Fi connection is normal.
	Ethernet	Indicates that the connection to Ethernet has been established.
	ADMS Server	Indicates that the connection between device and ADMS server is successful.

5.3.2 Login to the Webserver

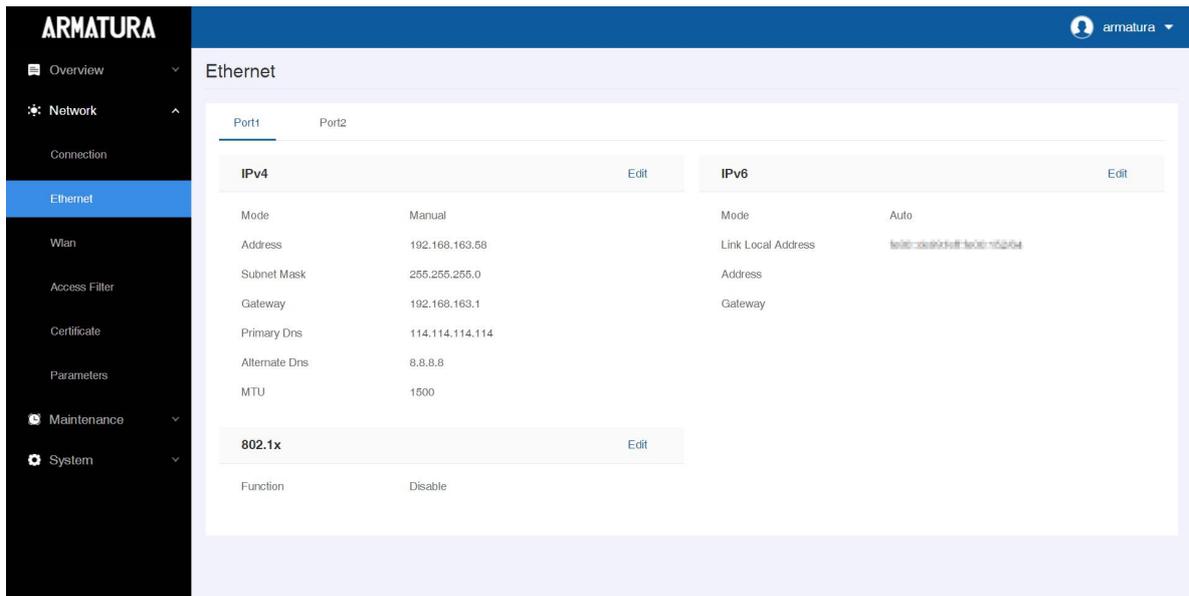
To begin, access the login interface and enter the default administrator account and password (default is "armatura"). Click on the "Login" button. Upon the first-time login to the web server, you will be prompted to modify the admin's password.



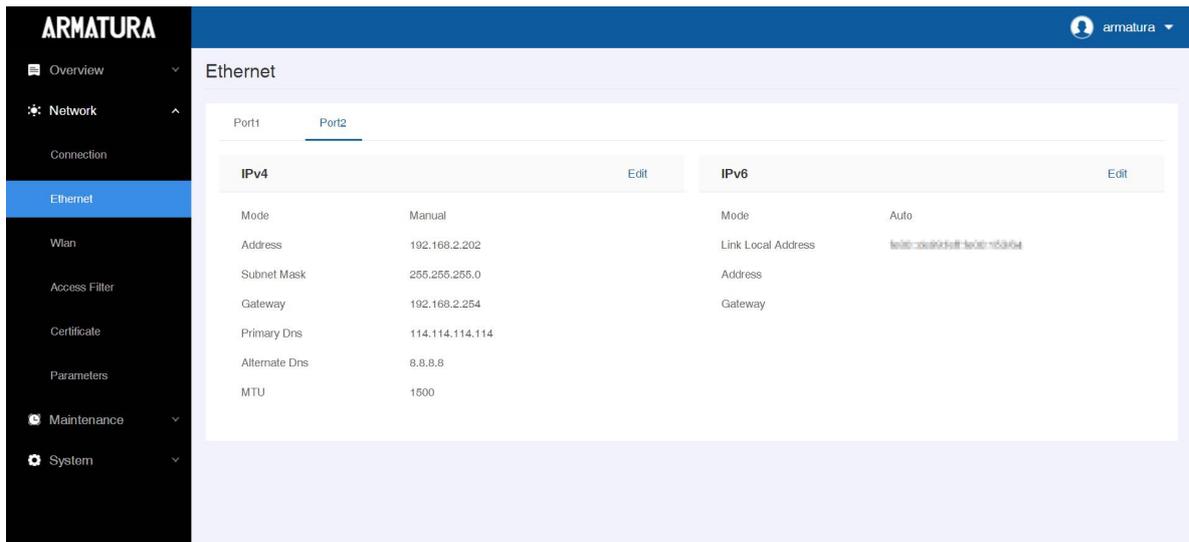
5.3.3 TCP/IP Settings

The ARMATURA Horizon Controller features dual Ethernet interfaces, and configuration of the IP addresses for both Port 1 and Port 2 is required. It's essential to ensure that the gateways of Port 1 and Port 2 are different, and their IP addresses must also be distinct. When connecting the controller to a TCP/IP reader, it is necessary to set the IP address of the expansion network card.

To access the setting interface for Ethernet, click on **Network > Ethernet**. Modify the IP address and gateway address, as shown below.



For ETH 1, the parameters for IPv4, IPv6, and 802.1x configurations can be accessed and modified on the Port 1 page.



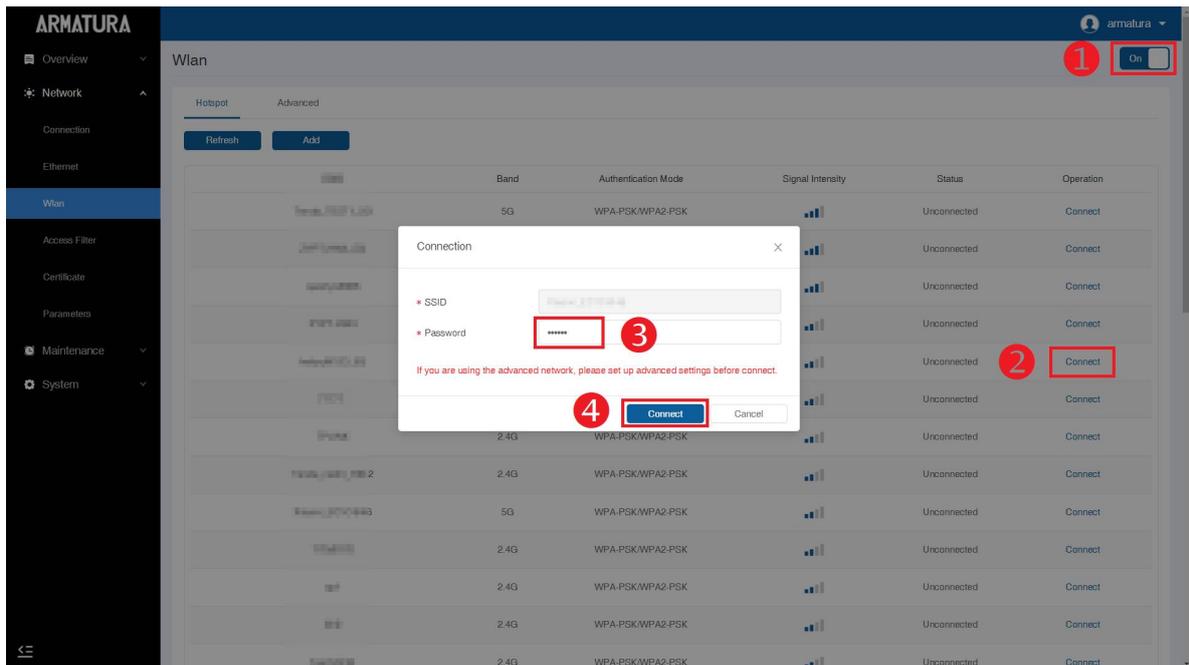
For ETH 2, the parameters for IPv4, IPv6, and 802.1x configurations can be accessed and modified on the Port 2 page.

5.3.4 Wireless Network Settings

The Wi-Fi module facilitates data transmission via the Wi-Fi antenna, creating a wireless network environment. The controller comes with Wi-Fi enabled by default. If Wi-Fi is not required, you can toggle the Wi-Fi using the enable/disable button.

Searching the Wi-Fi Network

1. Click **Network > Wlan** to enter the wlan setting interface on the webserver. Then click the  switch in the upper right corner of the interface to turn on the wireless network function.
2. Once the Wi-Fi is turned on, the controller will automatically search for the available Wi-Fi within the network range.
3. Select the required Wi-Fi SSID from the available list and click **Connect**, and then input the correct password in the pop-up password interface, and click **Connect** when complete.

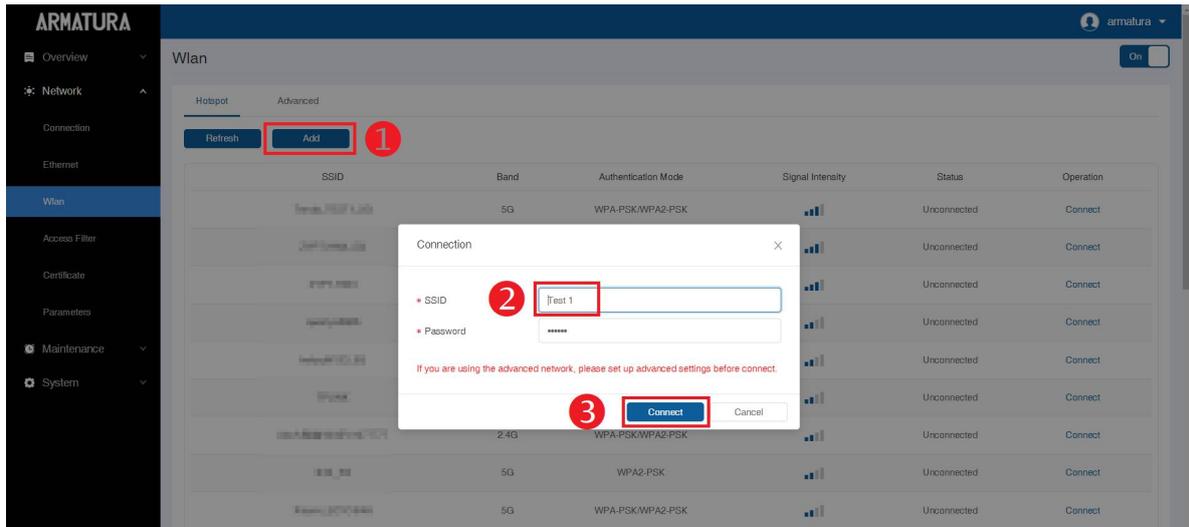


4. When the Wi-Fi is connected successfully, the Wi-Fi status shows as **Connected**.

Adding Wi-Fi Network Manually

The Wi-Fi can also be added manually if the preferred Wi-Fi does not show on the list.

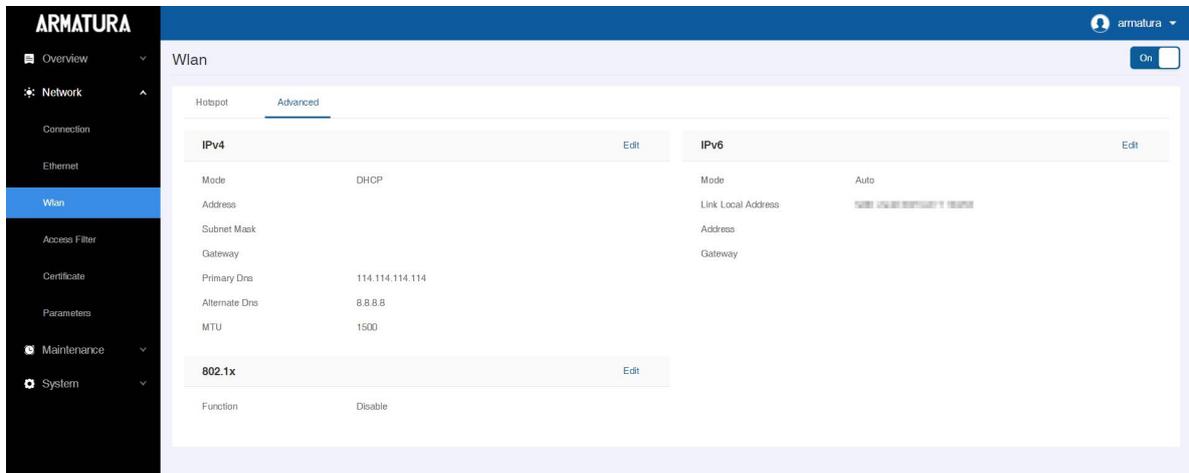
Click **Add** on the wlan setting interface. On the pop-up interface, enter the Wi-Fi network parameters. (The added network must exist.)



Note: After the preferred Wi-Fi is successfully added manually, click **Refresh** to search for this Wi-Fi and then click **Connect** to enter the password to connect.

Advanced Setting

To configure the relevant parameters as required, navigate to the Advanced settings on the Wireless Network interface. In the advanced settings interface, you can configure the parameters for IPv4, IPv6, and 802.1x as needed.



Remarks:

1. The PC (server) must share the same network segment with the router (wireless network).
2. You must add the control panel to the software through TCP/IP before setting Wi-Fi parameters.

5.3.5 Setting up the Server/Primary Controller

The Armatura Horizon Controller can only be configured to connect with either a server or a primary controller.

Click on "Network" and then select "Connection" to access the Server/Primary Controller Setting interface on the web server.

Server Connection Configuration

Server/Primary Controller Setting

Connection Server Primary Controller

Server MQTT

Port

Key File Upload

ProductKey

DeviceName

DeviceSecret

Host Certificate

Please download the certificate and import in Device Management in software Download

Software Certificate

After Upload with Key file, Certificate will import automatically View

Save

- **Server:** The protocol and address of the server.
- **Port:** The port of the server, the default is **1884**.
- **Key File:** Click 'Upload' to upload the key file exported from the ARMATURA One software. The system will automatically backfill any other relevant information.
- **Host Certificate:** For two-way authentication, download the controller certificate and import it into the software. The default setting is one-way authentication.
- **Software Certificate:** To view the software certificate.

Primary Controller Connection

The primary controller has two communication methods, including TCP/IP and RS-485. As shown below.

Server/Primary Controller Setting

Connection Server Primary Controller

Comm TCPIP RS485

Address

Port

Host Certificate

Please download and upload in primary controller 'secondary controller' setting page

Primary Controller Certificate

Please download from primary controller 'secondary controller' setting page and upload here

Server/Primary Controller Setting

Connection Server Primary Controller

Comm TCPIP RS485

Port

Address

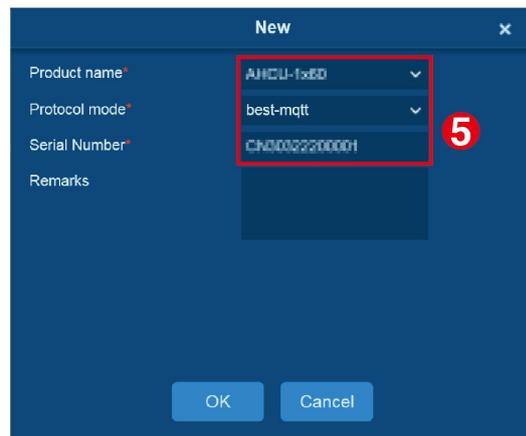
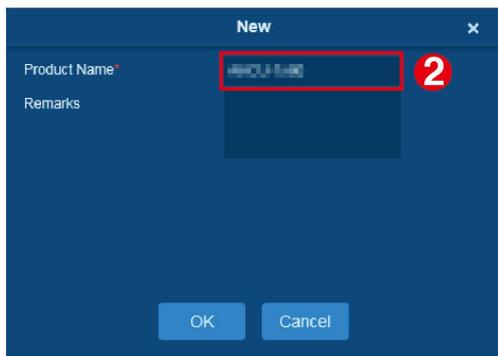
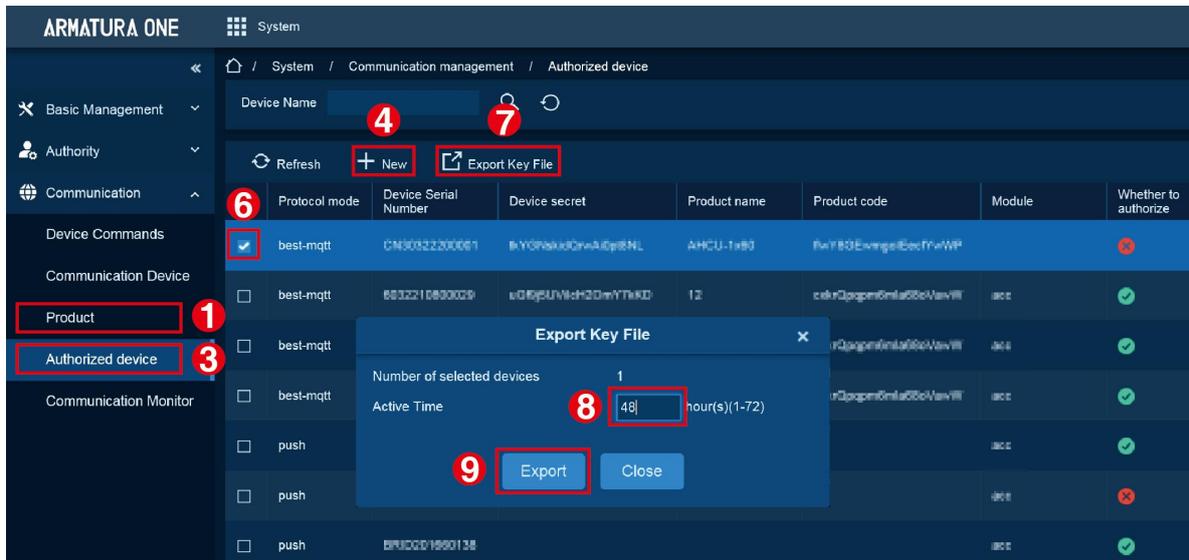
Baudrate

6. Connect to the ARMATURA One Software

6.1 Export the Key File

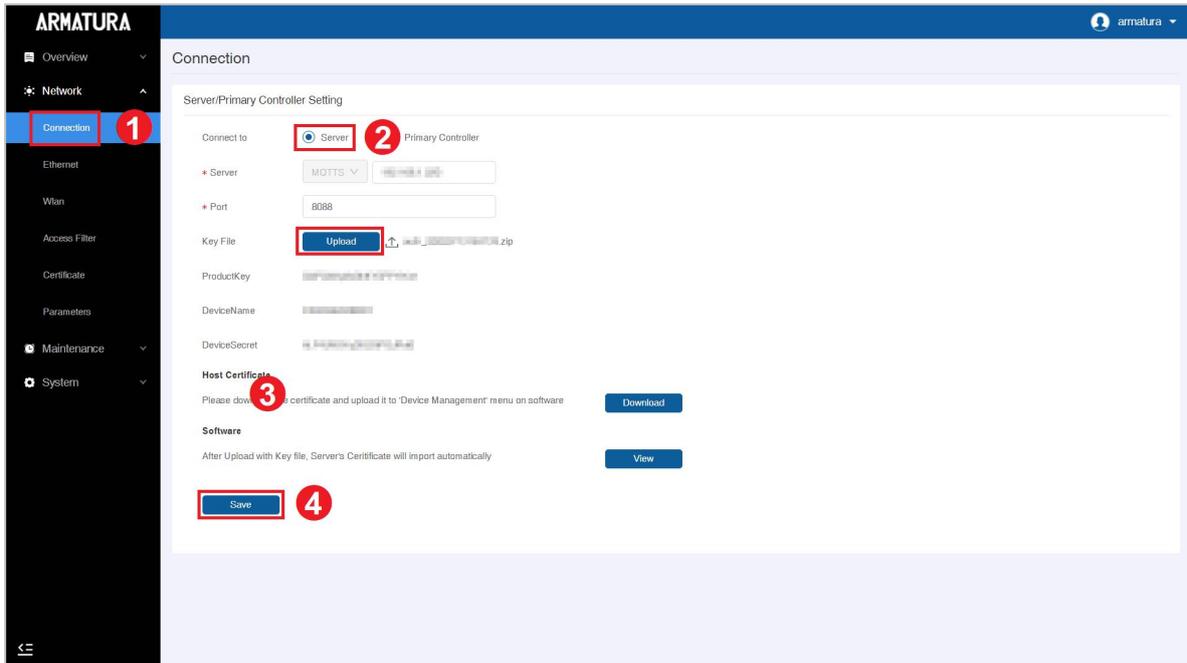
Log in to the ARMATURA One software and perform the following steps.

1. Click **System > Communication > Product > New** to add a new product name.
2. Click **System > Communication > Authorized device > New** to add a new authorized device. You can click **System > About** to view the serial number.
3. To export the device key, check the key to be exported, click 'Export Key File', enter the active time, and then click 'Export'. This action will generate a key file.



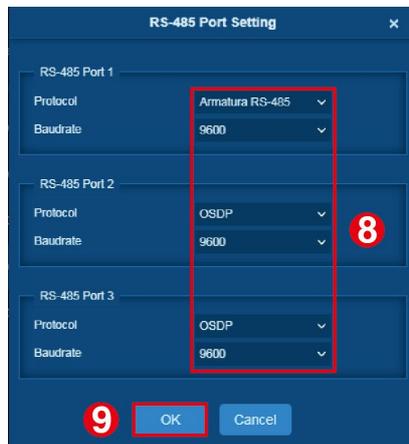
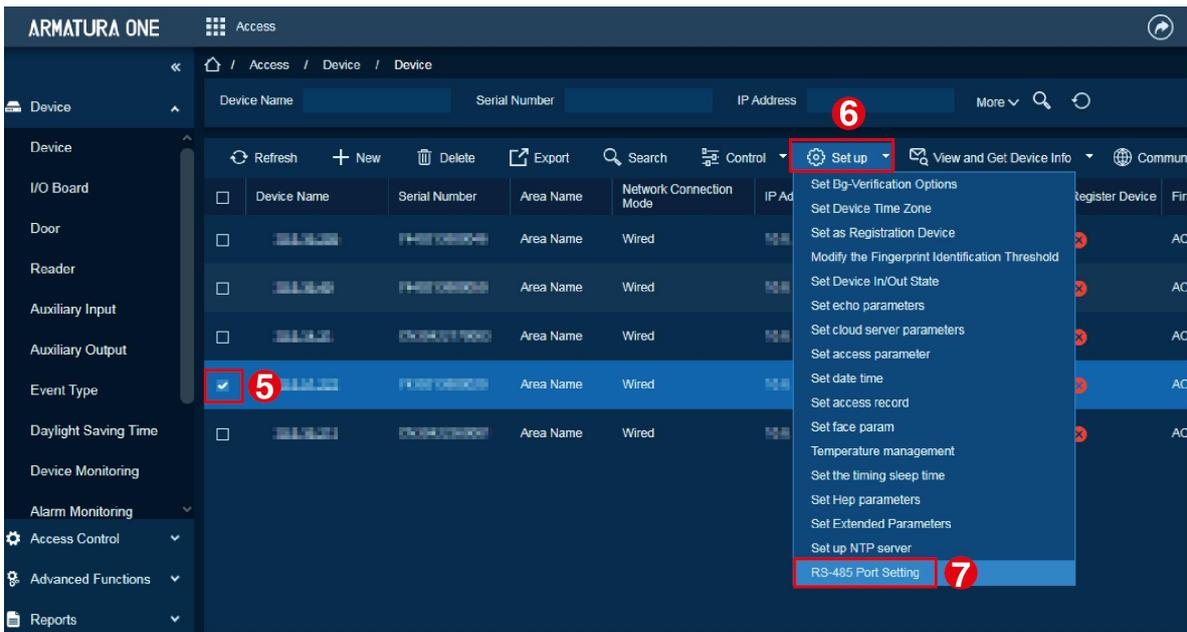
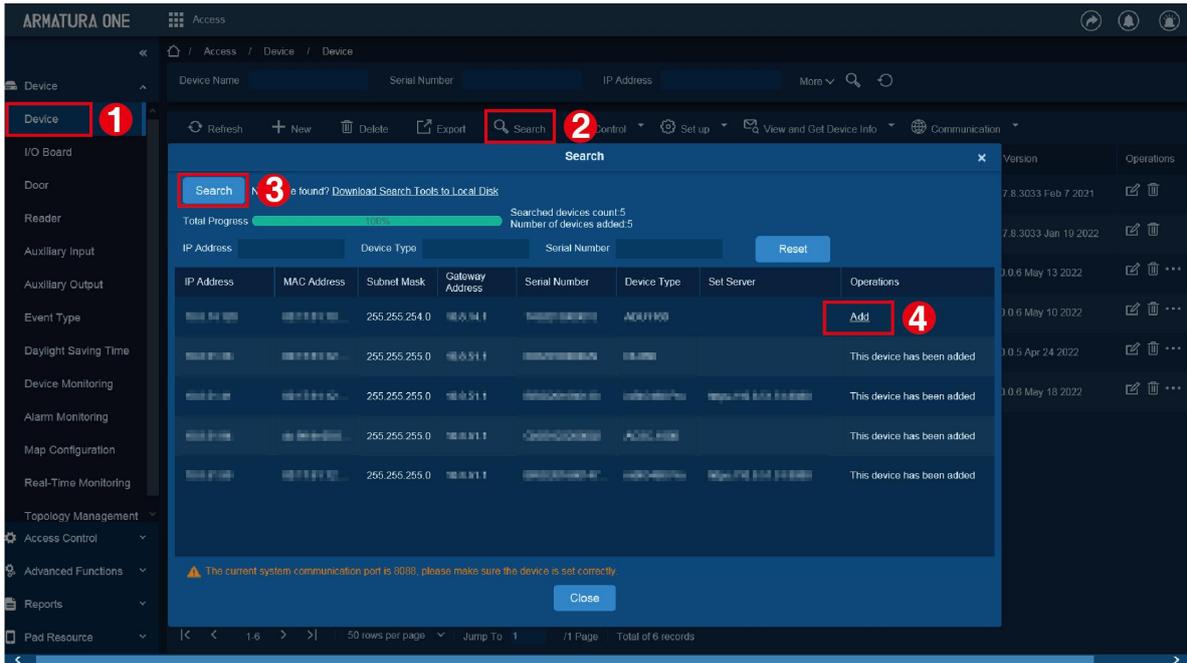
6.2 Server Connection Configuration

1. Click **Network > Connection > select Server** to enter the Server/Primary Controller Setting interface on the webserver.
2. Enter the address and port of the server.
3. Click **Upload** to upload the key file obtained in step 1, then click **Save**.



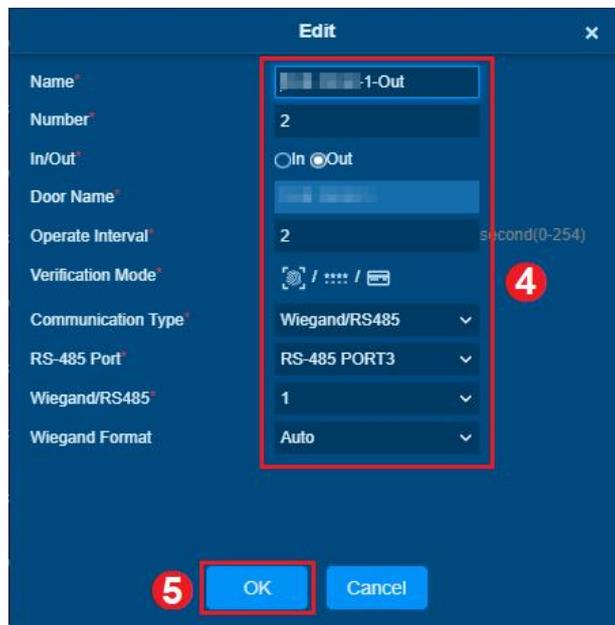
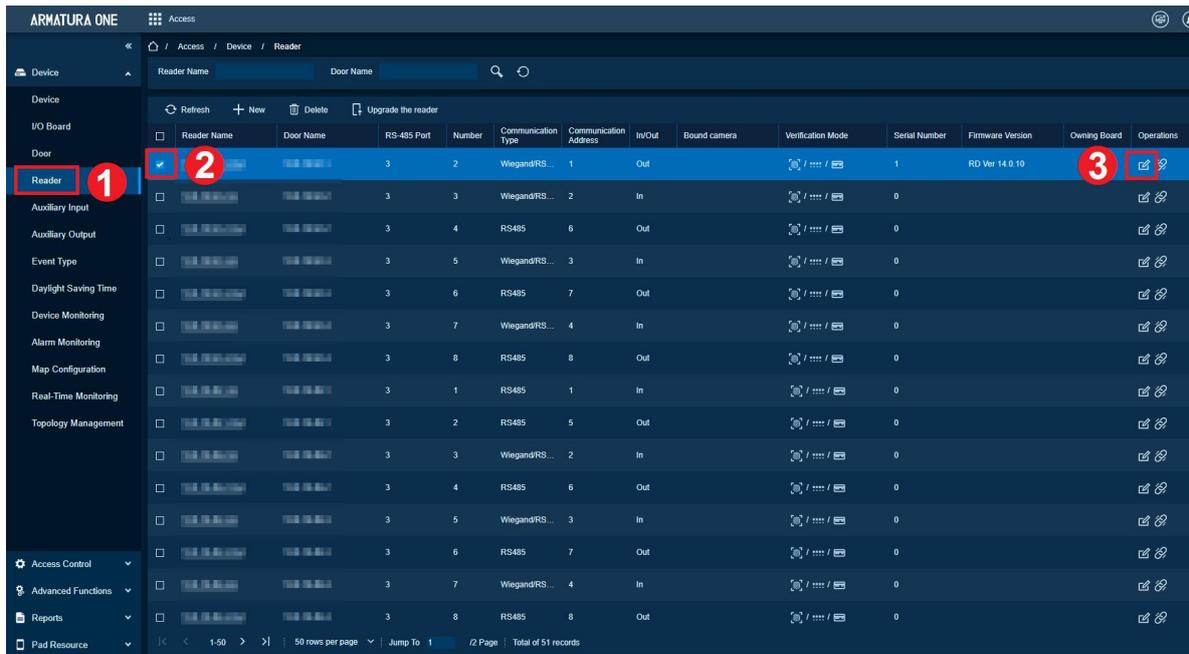
6.3 Add Device on the Software

1. Click **Access > Device > Device > Search**, to open the Search interface.
2. After clicking **Search**, the list and the total number of Access Control Devices will be displayed.
3. Click the **Add** button next to the Device to add the Device.
4. Click **Set up > RS-485 Port Setting** to configure the device's RS-485 port.



6.4 Configuring the Reader

1. When an RS-485 reader is connected. Refer to [4.2.7 RS-485 Reader Wiring](#) to configure the EOL resistor for the RS-485 port.
2. Click **Access > Device > Reader**, to configure the parameters of the reader. As shown in the figure below.



3. After the configuration is completed, the reader can be used normally.

6.5 Add Personnel on the Software

1. Click **Personnel > Personnel > New** to add a new personnel.
2. Fill in all the required fields and click **OK** to register a new user.

The screenshot shows a 'New' personnel registration window. The form includes the following fields:

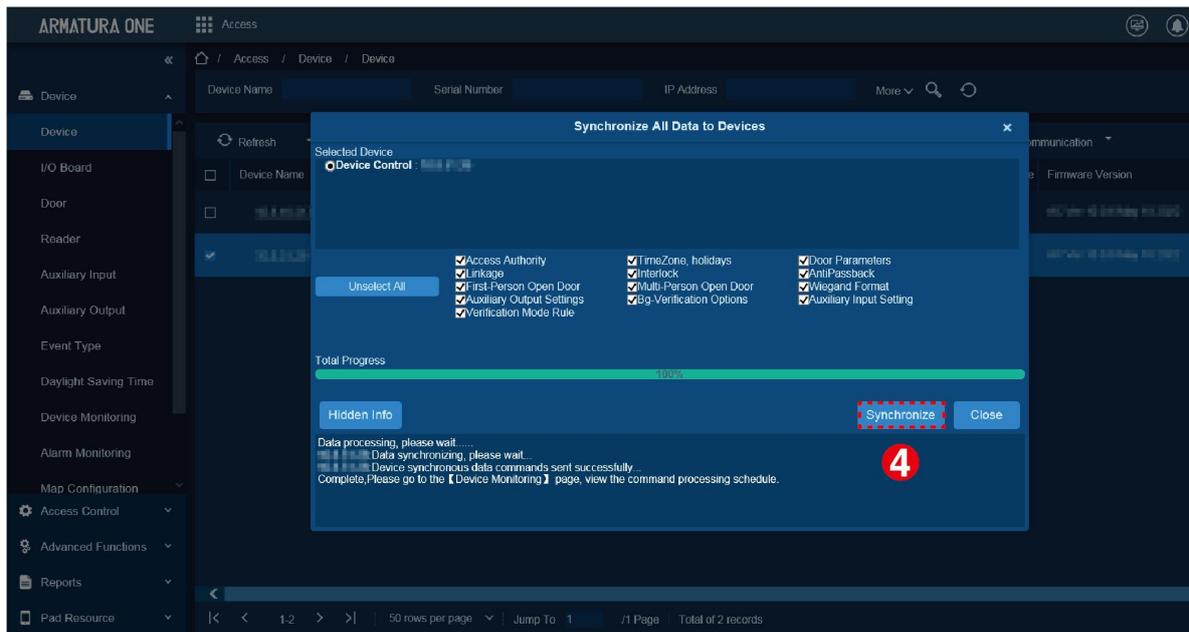
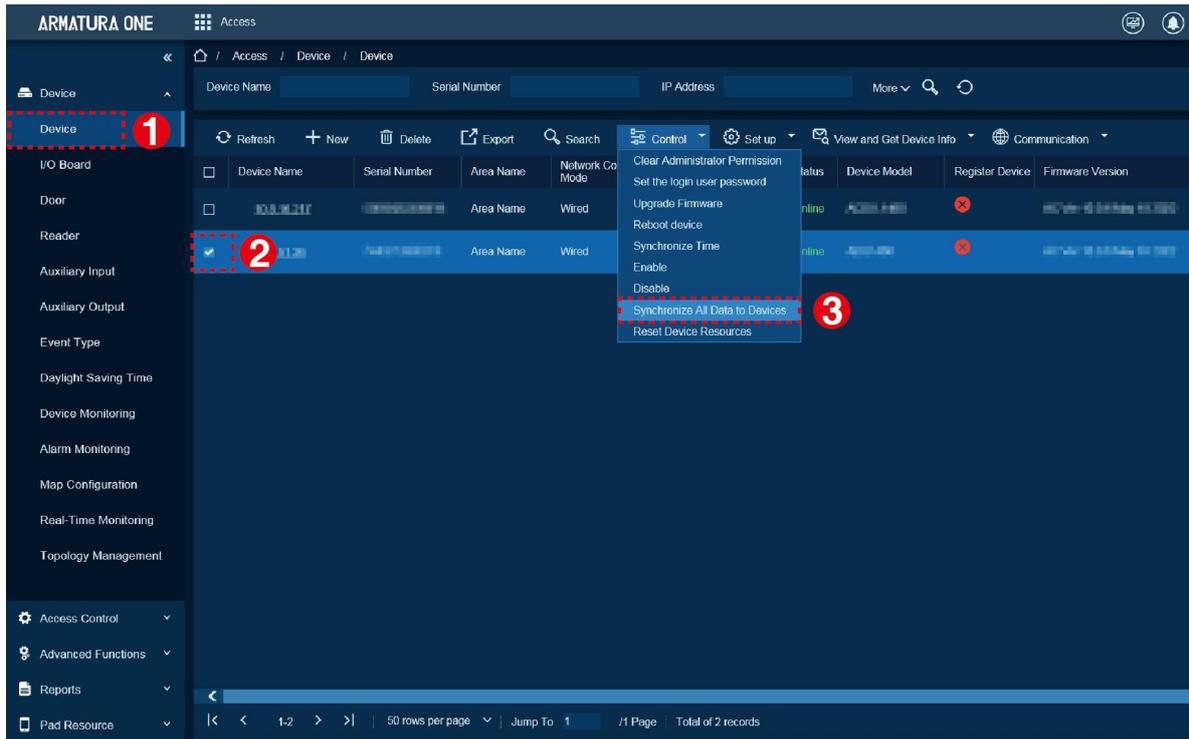
- Personnel ID*: 4
- First Name: Lee
- Gender: [Dropdown]
- Certificate Type: [Dropdown]
- Birthdate: [Date Picker]
- Hire Date: [Date Picker]
- Device Verification Password: [Text Field]
- Person Type: Employee [Dropdown]
- Threat Level: [Dropdown]
- Department*: Department Name [Dropdown]
- Last Name: Mick
- Mobile Phone: 12345678 [Text Field]
- Certificate Number: [Text Field]
- Email: [Text Field]
- Position Name: [Dropdown]
- Card Number: [Text Field]
- Biological Template Quantity: [Icons for fingerprint, face, etc.]
- Mobile Credential: [Text Field]

Below the form, the 'Personnel Detail' section is active, showing:

- Levels Settings: General
- Personnel Library: [Dropdown]
- Superuser: No [Dropdown]
- Device Operation Role: Ordinary User [Dropdown]
- Delay Passage:
- Disabled:
- Set Valid Time:

Buttons at the bottom: Save and New, OK, Cancel.

3. Click **Access > Device > Control > Synchronize All Data to Devices** to synchronize all the data to the device including the new users.



Note: For other specific operations, please refer to the relevant software user manual.

7. System Management Mode Connection

The system supports standard security levels for adding Horizon Series controllers. It also provides support for both Primary-Secondary Modes and Primary management modes.

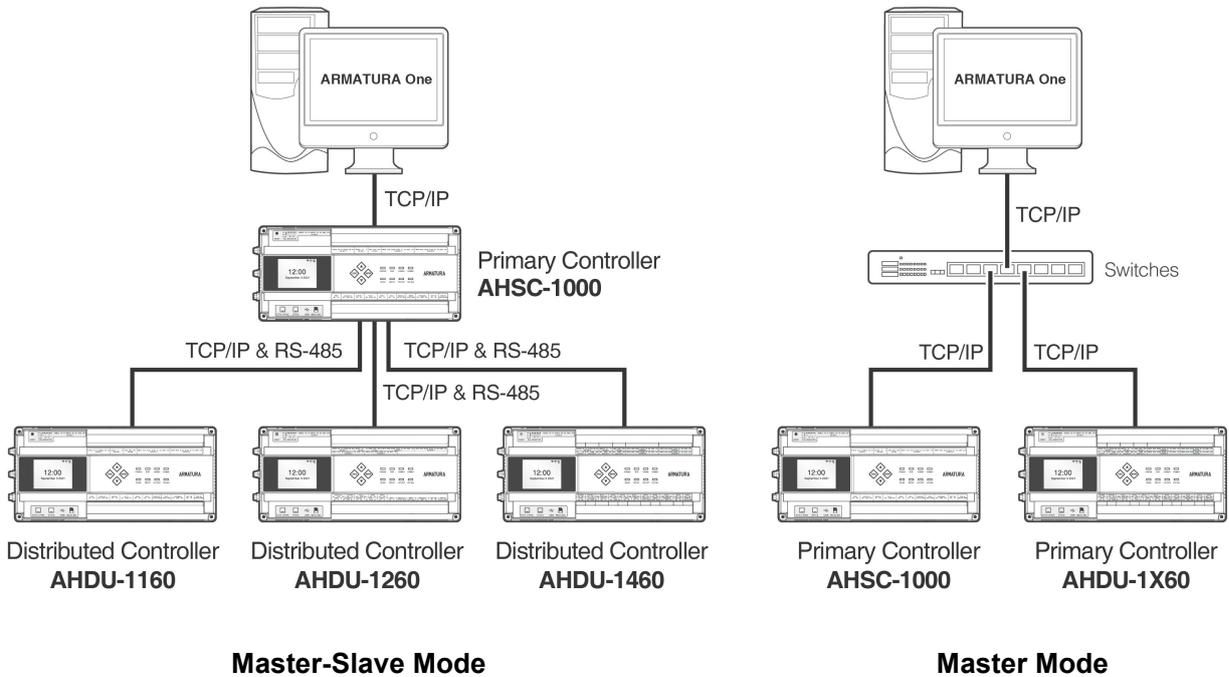


Figure 7-1 Schematic Diagram of System Management Mode

Remarks:

- **Horizon Series Controller:** Horizon Series Controllers including AHSC-1000/AHDU-1X60
- **Normal Security Level:** MQTTs, One-Way SSL authentication

7.1 Master-Slave Mode

An AHDU-1X60 can be connected to AHSC-1000 via TCP/IP or RS-485.

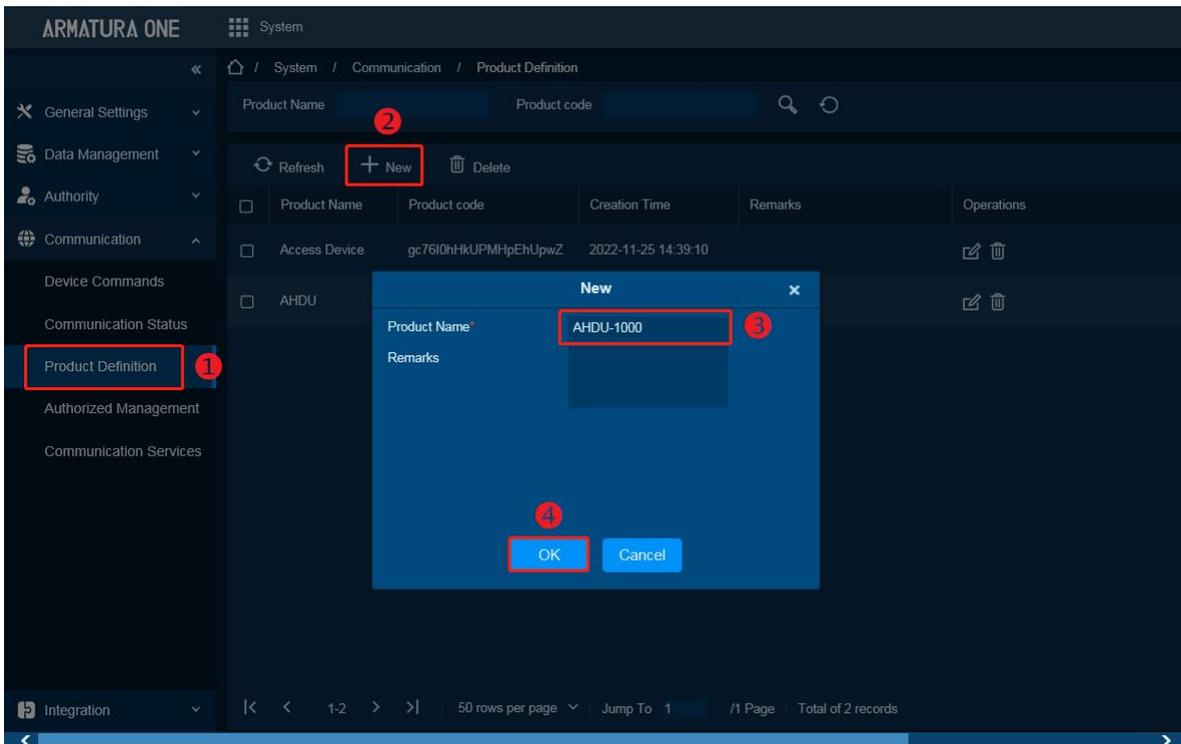
7.1.1 Connect AHDU-1X60 to AHSC-1000 via TCP/IP

7.1.1.1 Adding the Primary Controller

1. Add a product

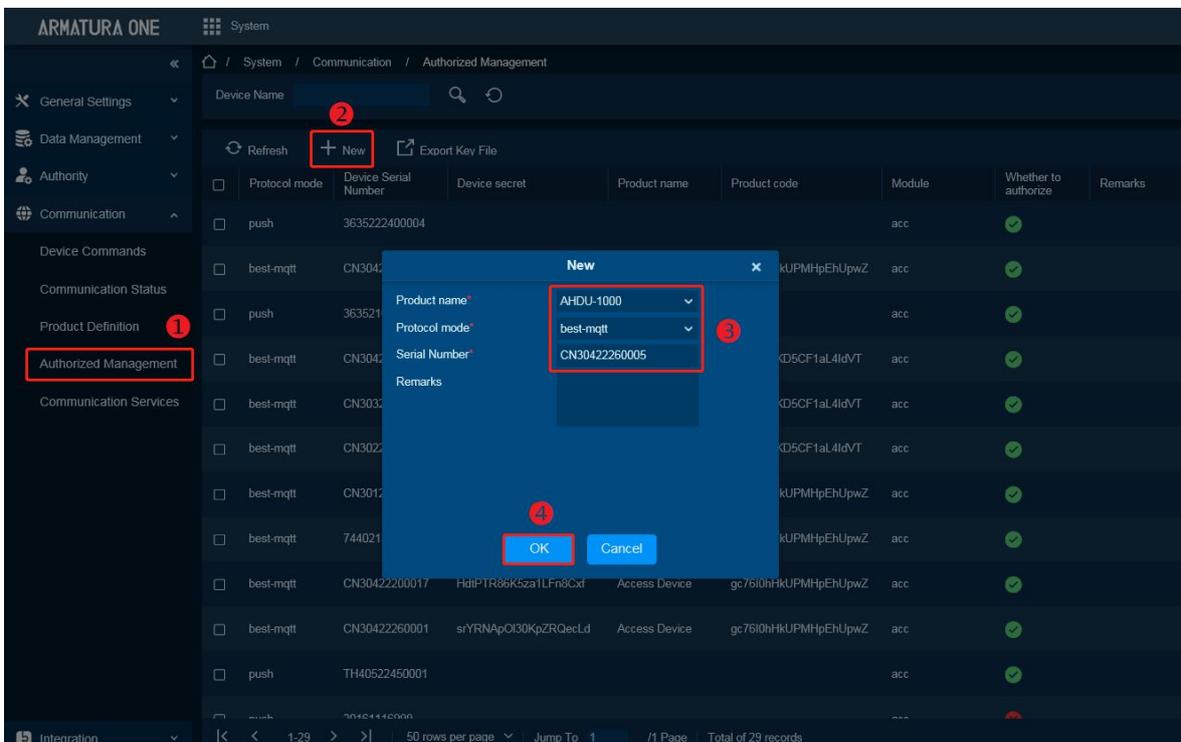
Click **System > Communication > Product Definition > New** to add a product on the software.

Enter the product name and click **OK** to save and exit.



2. Add a device

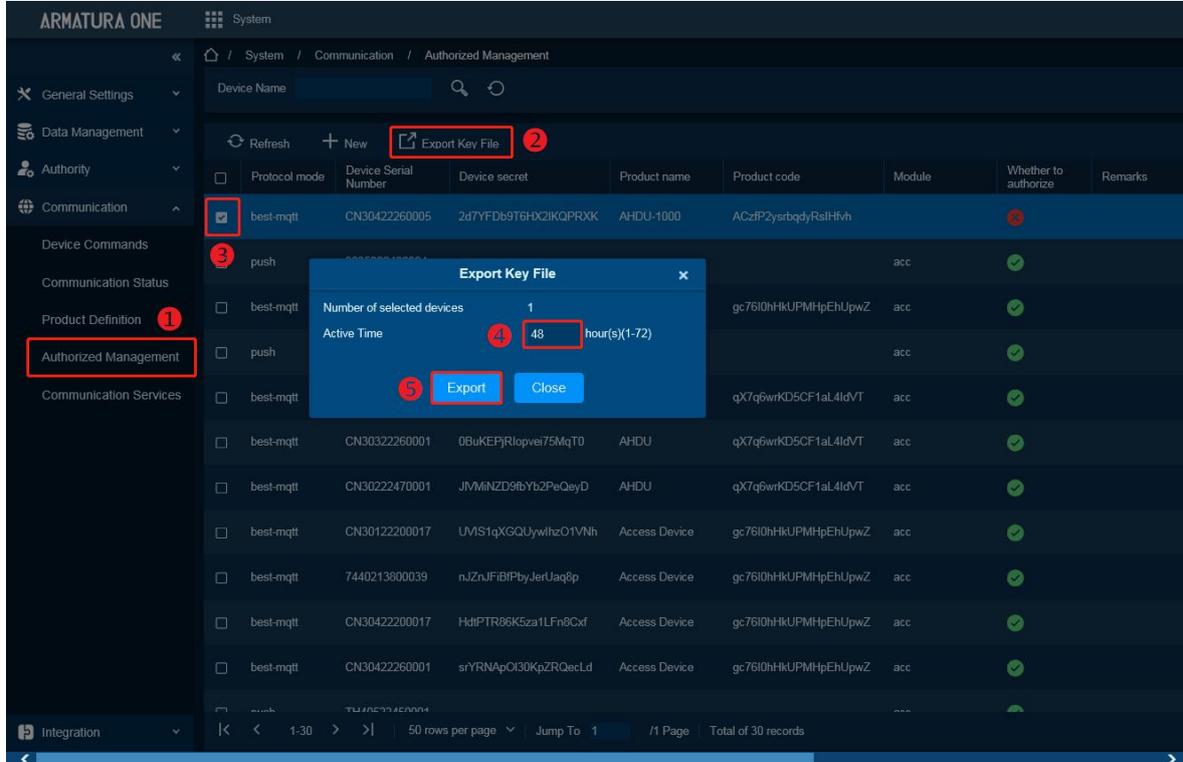
Click **System > Communication > Authorized Management > New** to add a device on the software.



Select the product you just created and input the serial number. Click '**OK**' to save and exit.

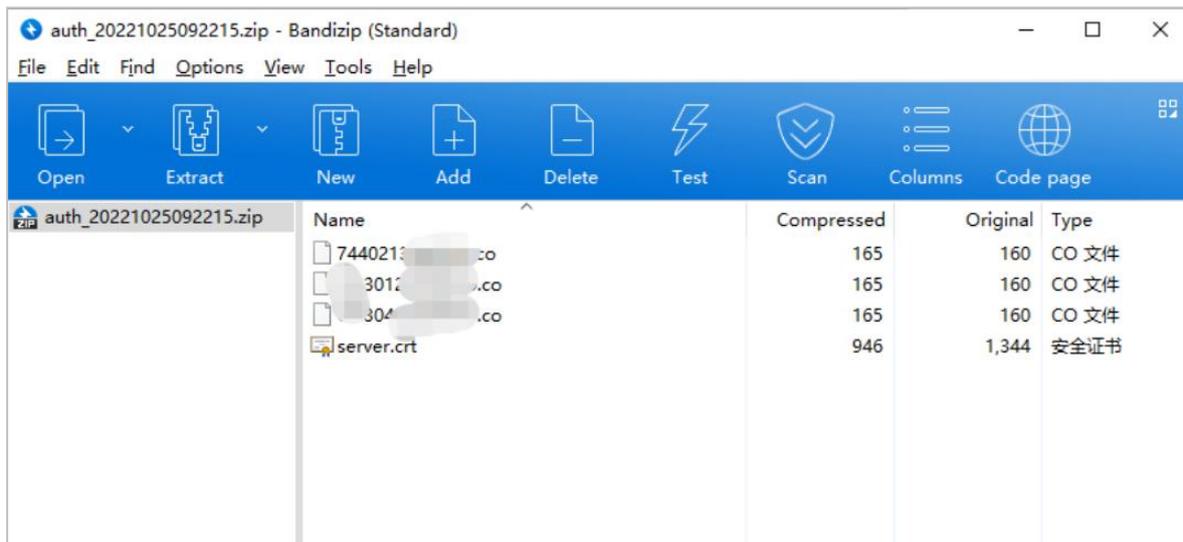
3. Export Key File

Navigate to **System > Communication > Authorized Management** to check the recently added devices, then click on "Export Key File".



- **Active time:** Key file validity, value can be 1-72 Hours.

After clicking **Export**, the browser will download the .zip file.



Note: This function supports selecting multiple devices and clicking on the icon to generate all controller.co files and server certificates in a .zip package. Simply upload this .zip package to the controller webserver.

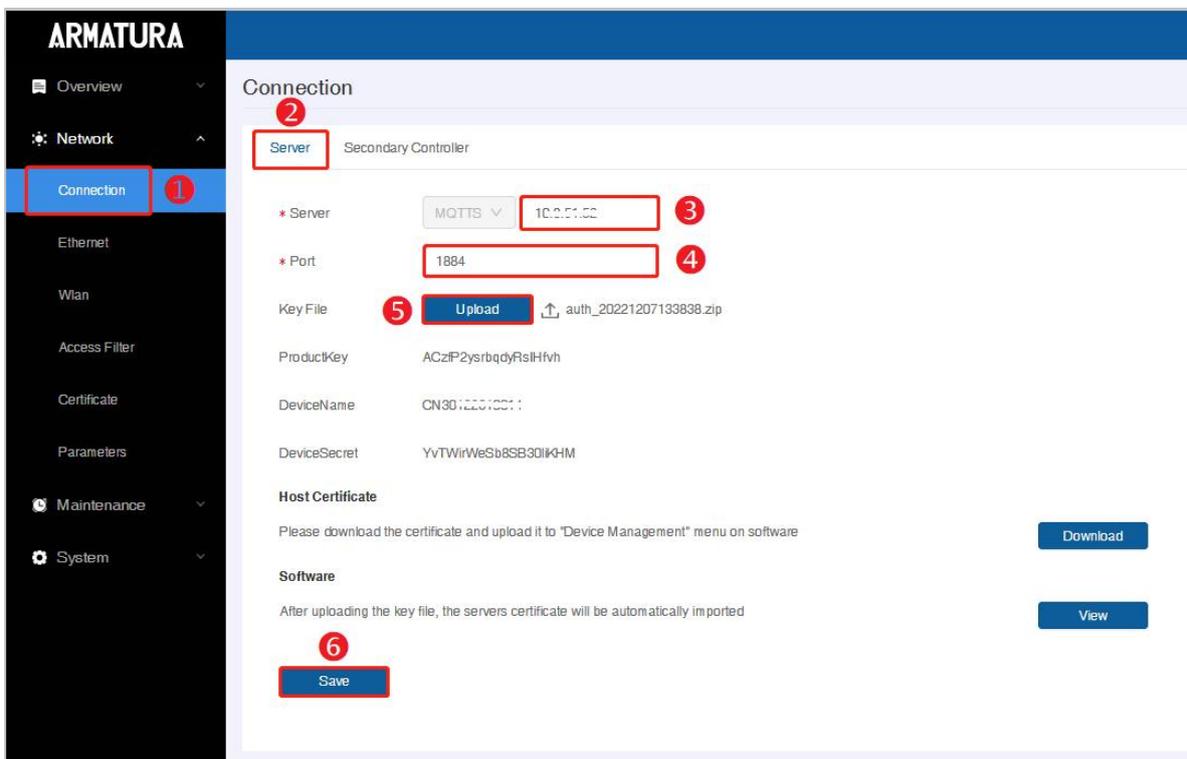
4. Import Key file to the controller

- 1) Open your web browser and enter the controller's IP address in the URL ([https://\[controller's IP address\]](https://[controller's IP address])) to access the login interface.

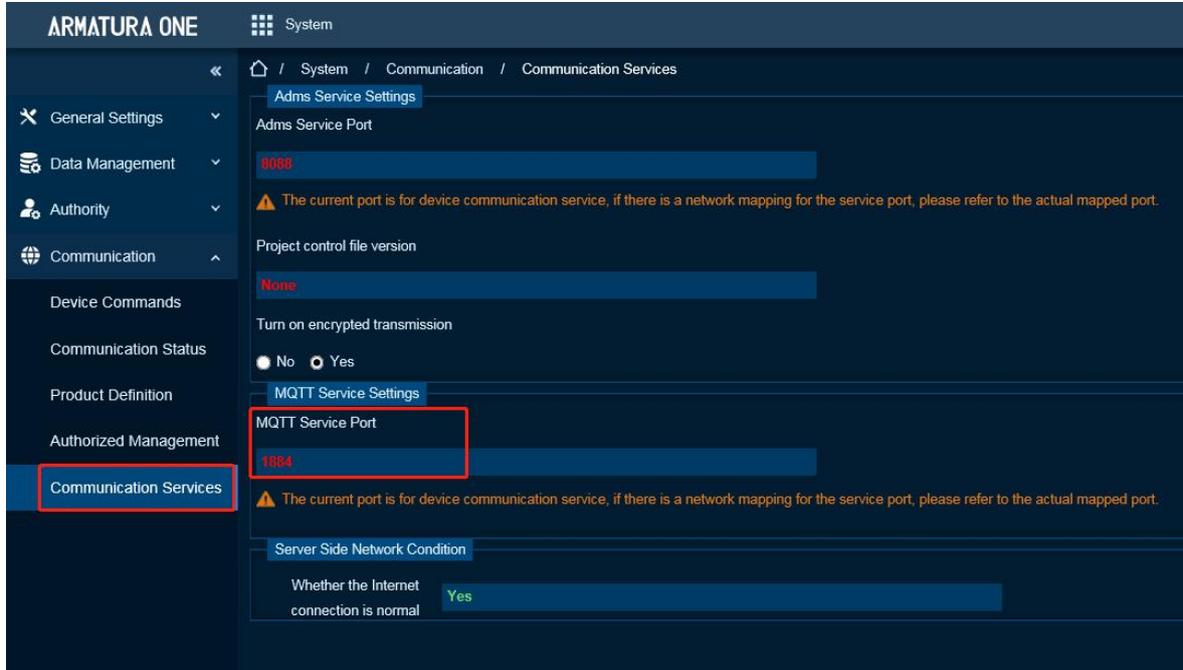


For the first-time login, use 'armatura' as the default username and password. Upon login, you will be prompted to change the password for the admin account.

- 2) Click **Network > Connection > Server** on the Webserver interface.



- **Server:** The default protocol is MQTTs, and the address should be set to the server address.
- **Port:** The default port is 1884. You can verify this port by navigating to **System > Communication > Communication Services > MQTT Service Port**.

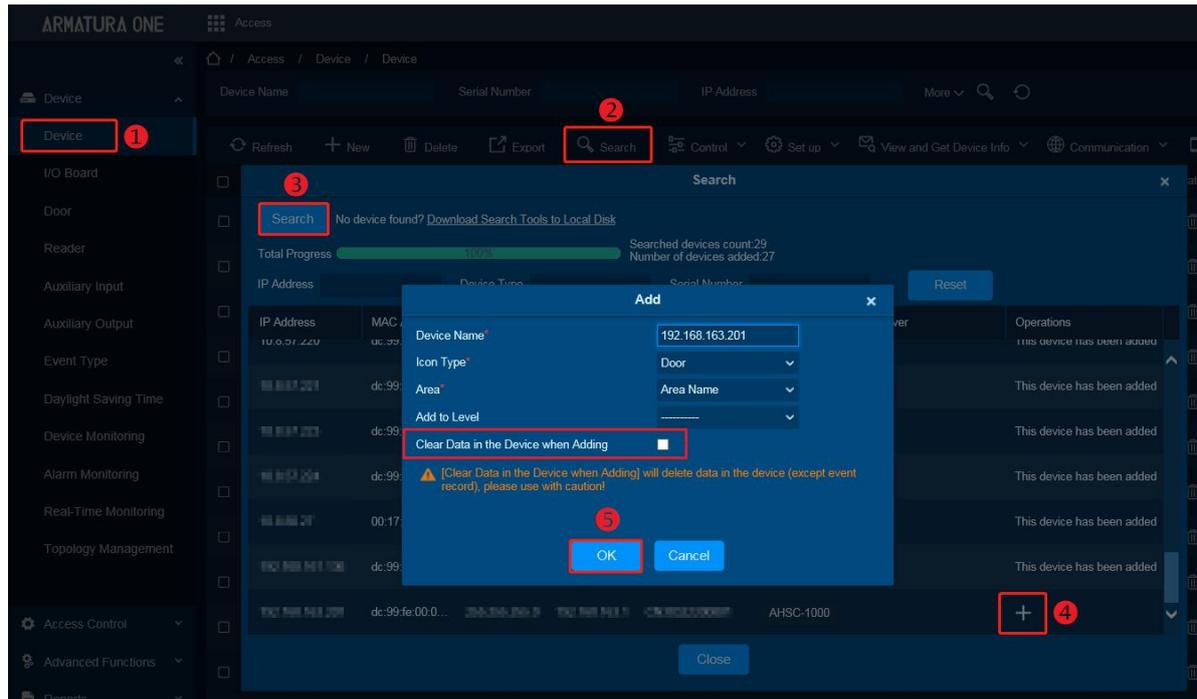


- **Key File:** This file is exported from **System > Communication > Authorized Management**. After successfully connecting the controller to MQTT, the Column Module will display 'acc'. However, since the device is not yet authorized to access the Access Module, it will show .

Device Name	Protocol mode	Device Serial Number	Device secret	Product name	Product code	Module	Whether to authorize
	best-mqtt	01004008804	4C48F5L...h4dMj76s	Access Device	g:750dnt40Pm9p[0]qsd/	acc	
	best-mqtt	01004008804	2F7F0247340302F403	#H03-1008	AC4FF0yrd4y[0]4444		
	push	38010048804				acc	
	best-mqtt	01004008804	4884404[0]4444444444	Access Device	g:750dnt40Pm9p[0]qsd/	acc	
	push	38010048804				acc	
	best-mqtt	01004008804	4000000000000000	#H03	g:750dnt40Pm9p[0]qsd/	acc	
	best-mqtt	01004008804	4844444444444444	#H03	g:750dnt40Pm9p[0]qsd/	acc	
	best-mqtt	01004008804	J4444444444444444	#H03	g:750dnt40Pm9p[0]qsd/	acc	
	best-mqtt	01004008804	4444444444444444	Access Device	g:750dnt40Pm9p[0]qsd/	acc	
	best-mqtt	01004008804	4444444444444444	Access Device	g:750dnt40Pm9p[0]qsd/	acc	

5. Adding The Controller To The Software

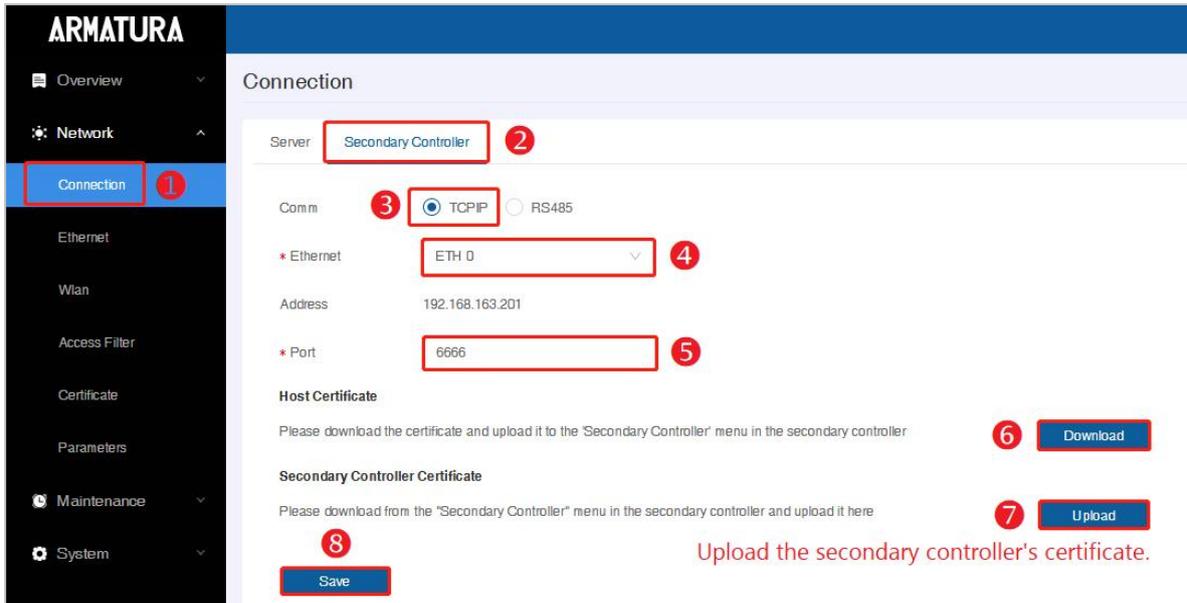
- 1) Click **Access > Device > Device > Search**, to open the Search interface.
- 2) After clicking **Search**, the list and the total number of Access Control Devices will be displayed.
- 3) Click the **"Add"** button located next to the Device to add it.
- 4) Click **OK** to save and exit.



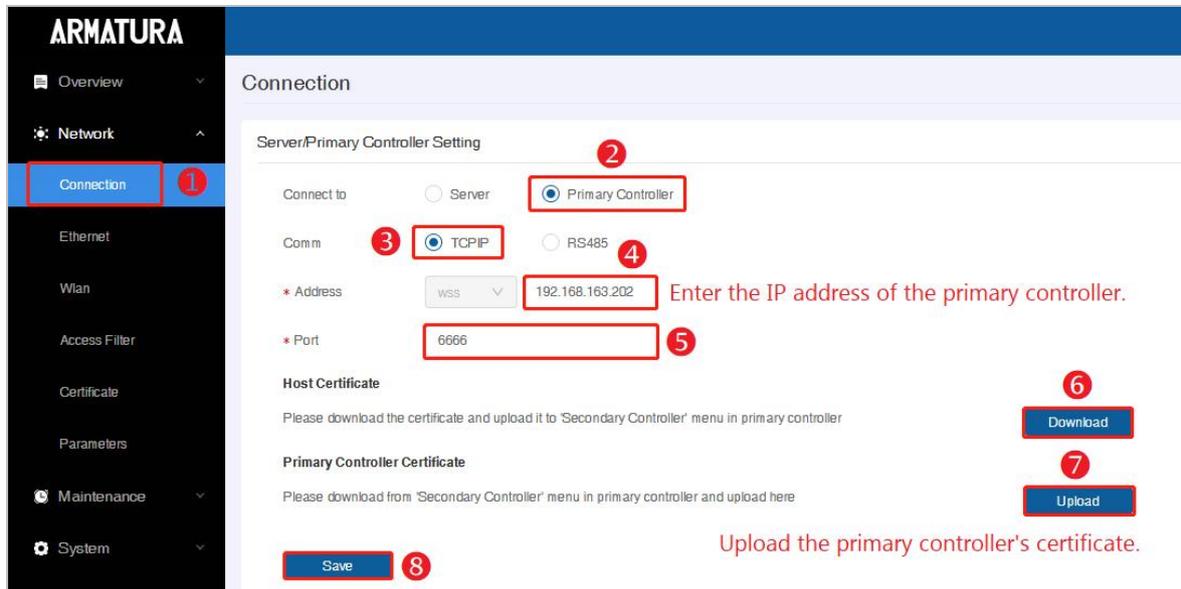
Note: Suggest select **[Clear Data in Device when Adding]** to clear device data.

7.1.1.2 Set the Secondary Controller Communication Port

1. Click **Network > Connection > Secondary Controller** on the Webserver screen of the Primary Controller.
2. Select **TCP/IP** button in Comm.
3. Click **Download** to download the Host Certificate of the primary controller.
4. Click **Upload** to upload the secondary controller's certificate.
5. Click **Save** to complete the configuration..
6. Then click **Network > Connection > Primary Controller** on the Webserver screen of the secondary controller.
7. Click **Upload** to upload the primary controller's certificate.
8. Click **Save** to exit.



- **Ethernet:** Select 'Eth 0' or 'Eth 1'.
- **Address:** The IP address will be displayed for confirmation after selection.
- **Port:** This port serves as a connection point for the secondary controller to utilize the WSS protocol.
- **Secondary Controller:** Download the [Host Certificate] and upload it on the Primary Controller page under [Secondary Controller Certificate].

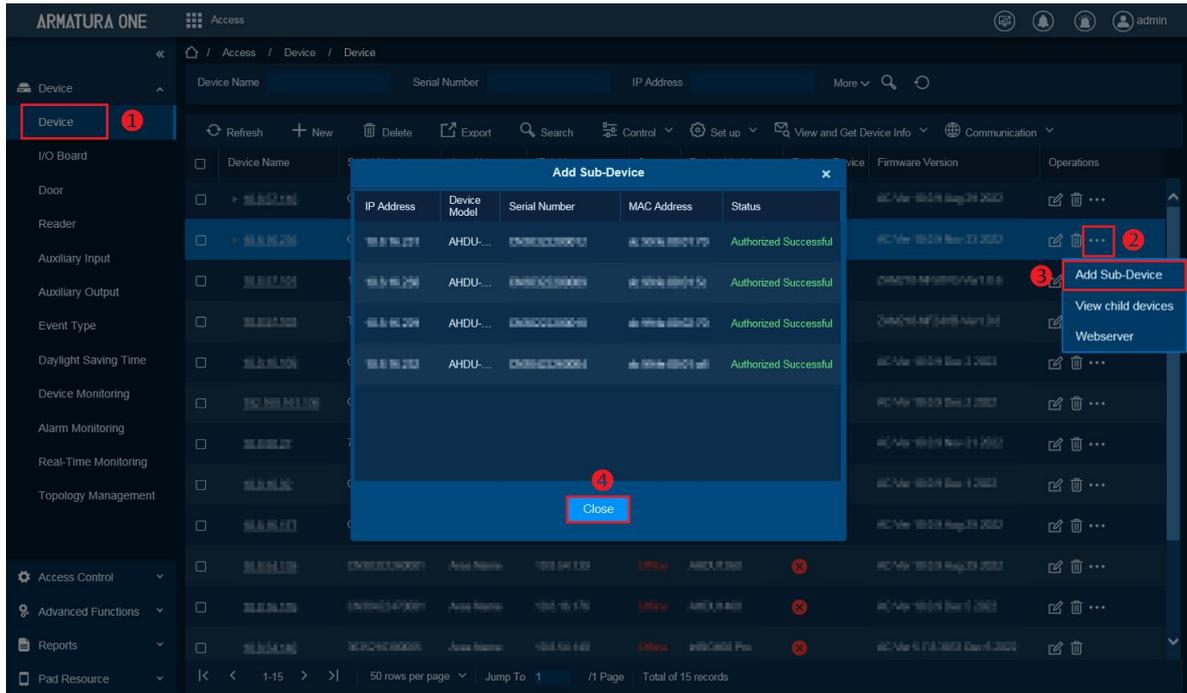


- **Address:** Enter the IP address of the primary controller.
- **Port:** This port serves as a connection point for the secondary controller to utilize the WSS protocol.
- **Primary Controller:** Download the [Host Certificate] and upload it on the Secondary Controller page as the [Primary Controller Certificate].

9. After uploading the certificates to each other, proceed to add the secondary controller.

7.1.1.3 Add the Secondary Controller

1. Click **Access > Device > Device** to enter the device list interface.
2. Select a primary controller and click **⋮ > Add Sub-Device** to add the secondary controller.
3. Click **Close** to save and exit.



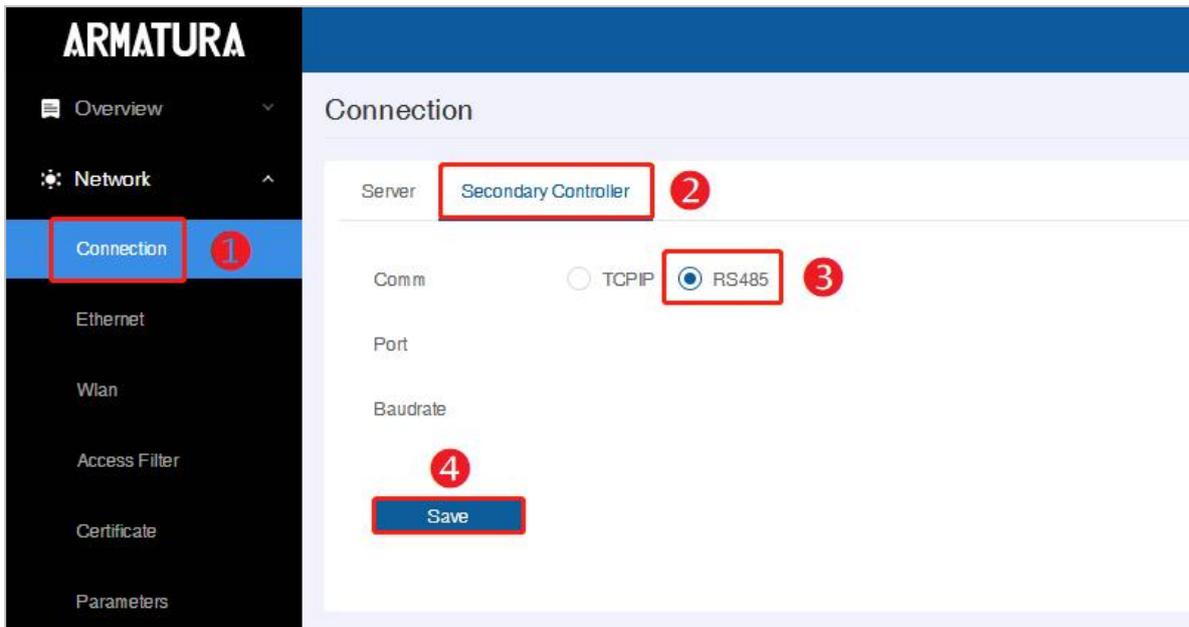
7.1.2 Connect AHDU-1X60 to AHSC1000 via RS-485

7.1.2.1 Step 1 Add Primary Controller

The method of adding a primary controller is the same as that of **7.1.1 Connecting the AHDU-1X60 to AHSC-1000 via TCP/IP**, please see [7.1.1.1 Step 1 Add Primary Controller](#) for details on how to add it.

7.1.2.2 Step 2 Set Secondary Controller Communication Port

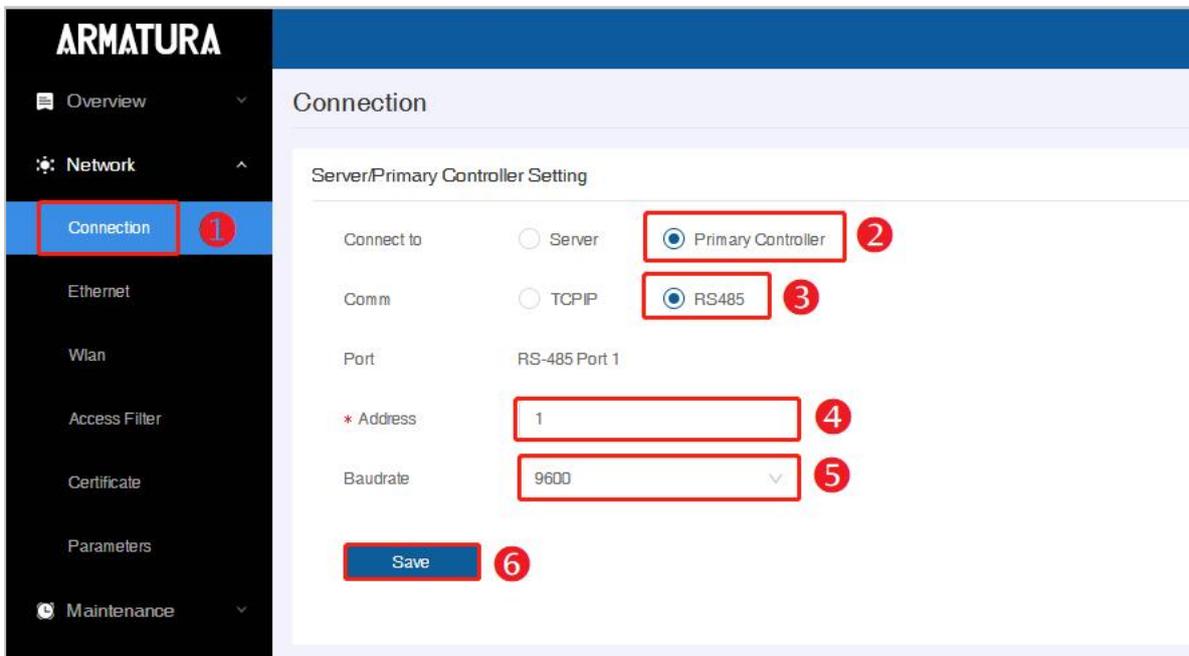
1. Click **Network > Connection > Secondary Controller** on the Webserver screen of the primary controller.
2. Select the RS-485 button in the Communication settings.
3. Click **'Save'** to save your options and exit.



Port: This is the RS-485 port used for connecting the secondary controller. The specific port to be used depends on the setting in Armatura RS-485 Port Settings.

Baudrate: This is parameter for RS-485 communication. This depends on which port is set Armatura RS-485 in RS-485 Port Settings.

4. Click **Network > Connection > Primary Controller** on the Webserver screen of the secondary controller. Then select the RS-485 button in Comm.

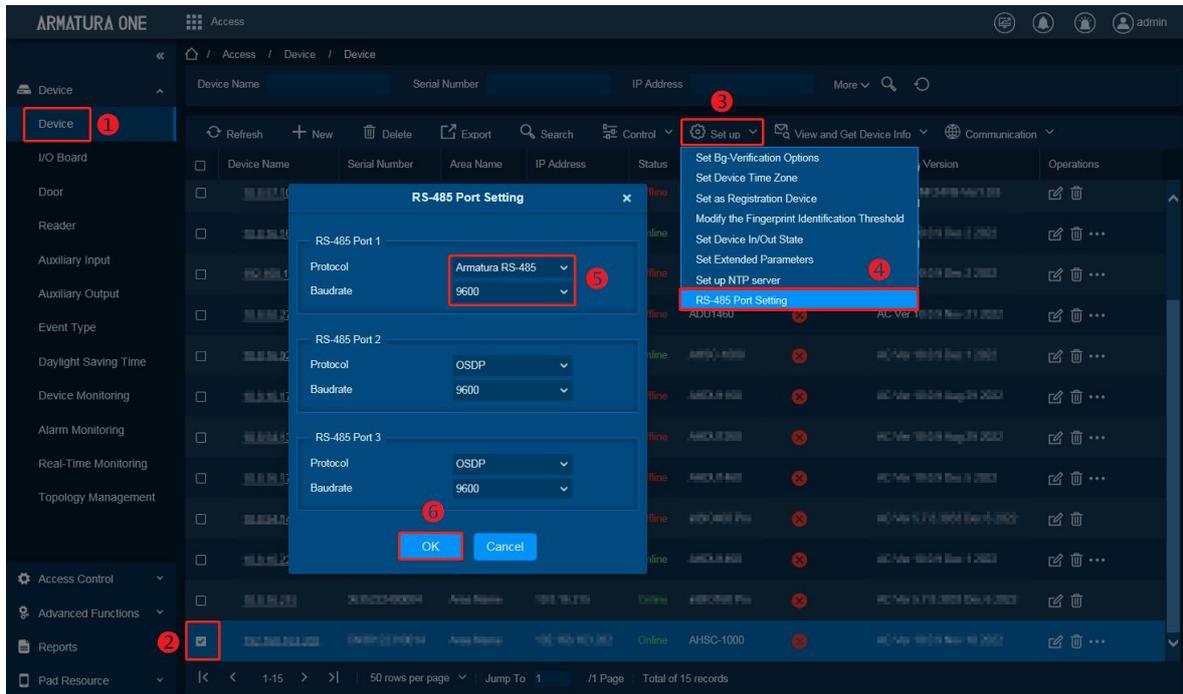


Port: The default system wiring for the primary and secondary controller is RS-485 Port 1.

Address: Enter the device address of the secondary controller.

Baudrate: Must be the same baudrate as the primary controller.

5. In the software, navigate to **Access > Device > Device**, select the desired device, and then click on "Set up" in the operation bar. Next, click on "RS-485 Port Setting".

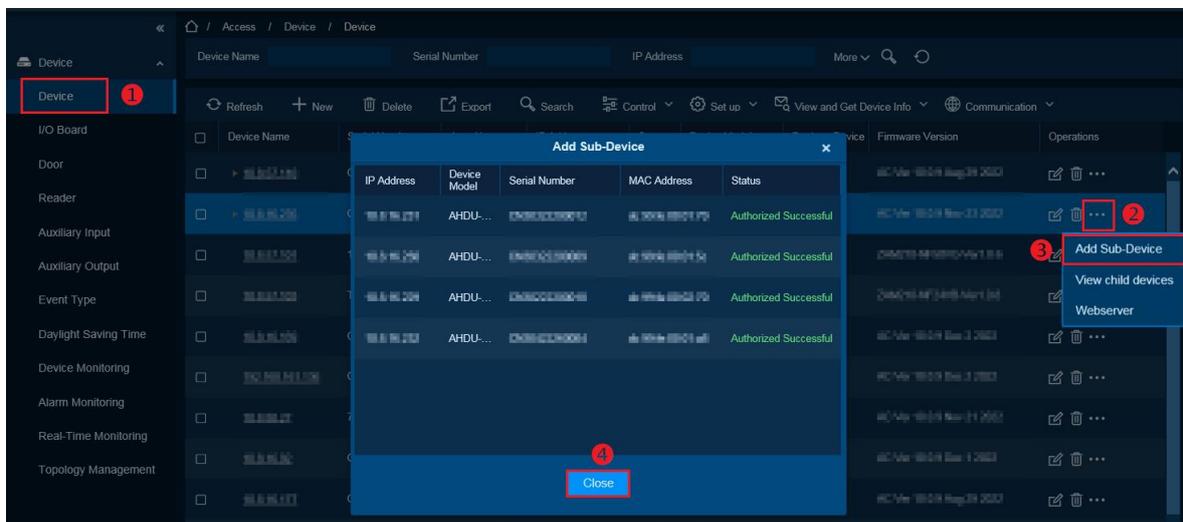


Device has three physical interface, RS-485 Port 1/Port 2/Port 3.

Armatura RS-485 is the Protocol used for primary-secondary connection.

7.1.2.3 Step 3 Add Secondary Controller

1. Click **Access > Device > Device** to enter the device list interface.
2. Select a primary controller and click **...** > **Add Sub-Device** to add the secondary controller.
3. Click **Close** to save and exit.



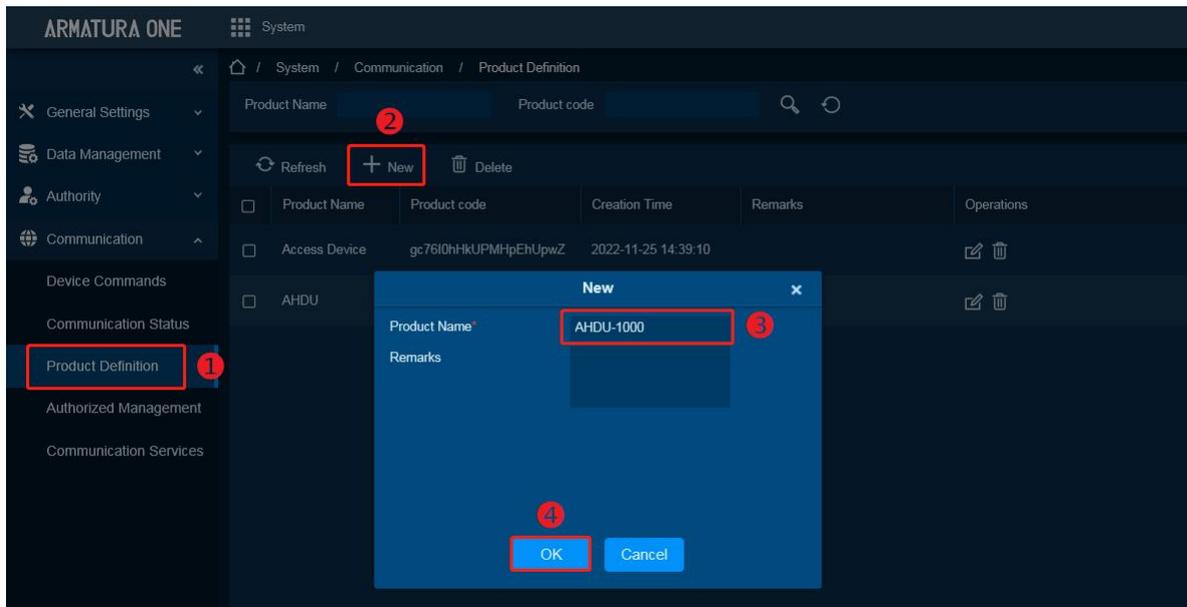
7.2 Master Mode

7.2.1 Adding a Primary Controller

1. Add a product

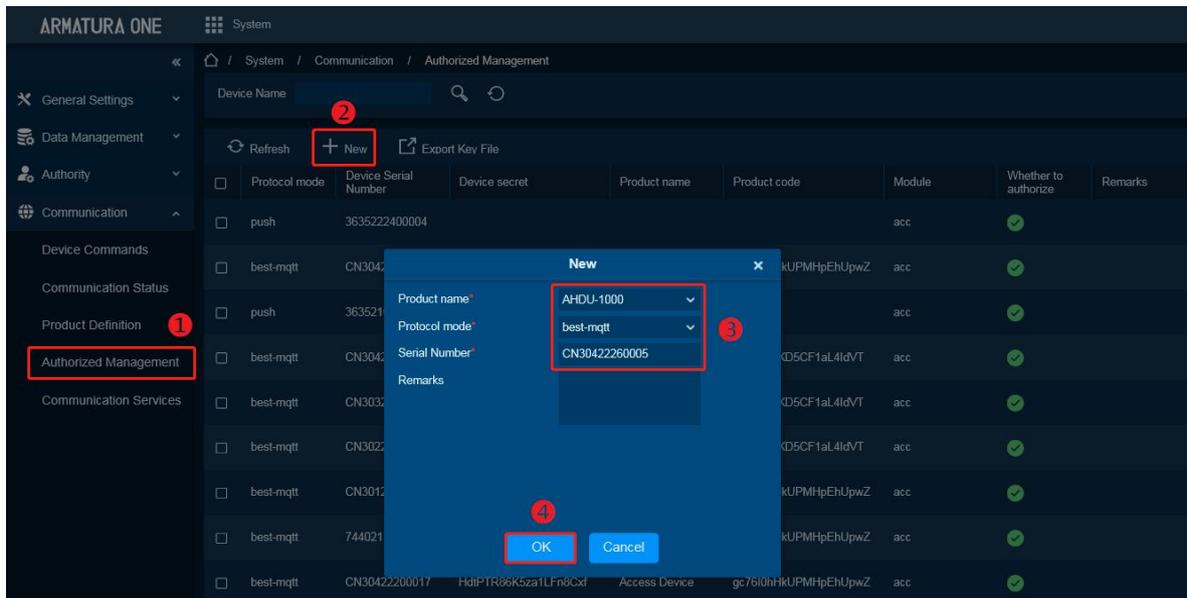
Click **System > Communication > Product Definition > New** to add a product on the software.

Enter the product name and click **OK** to save and exit.



2. Add a device

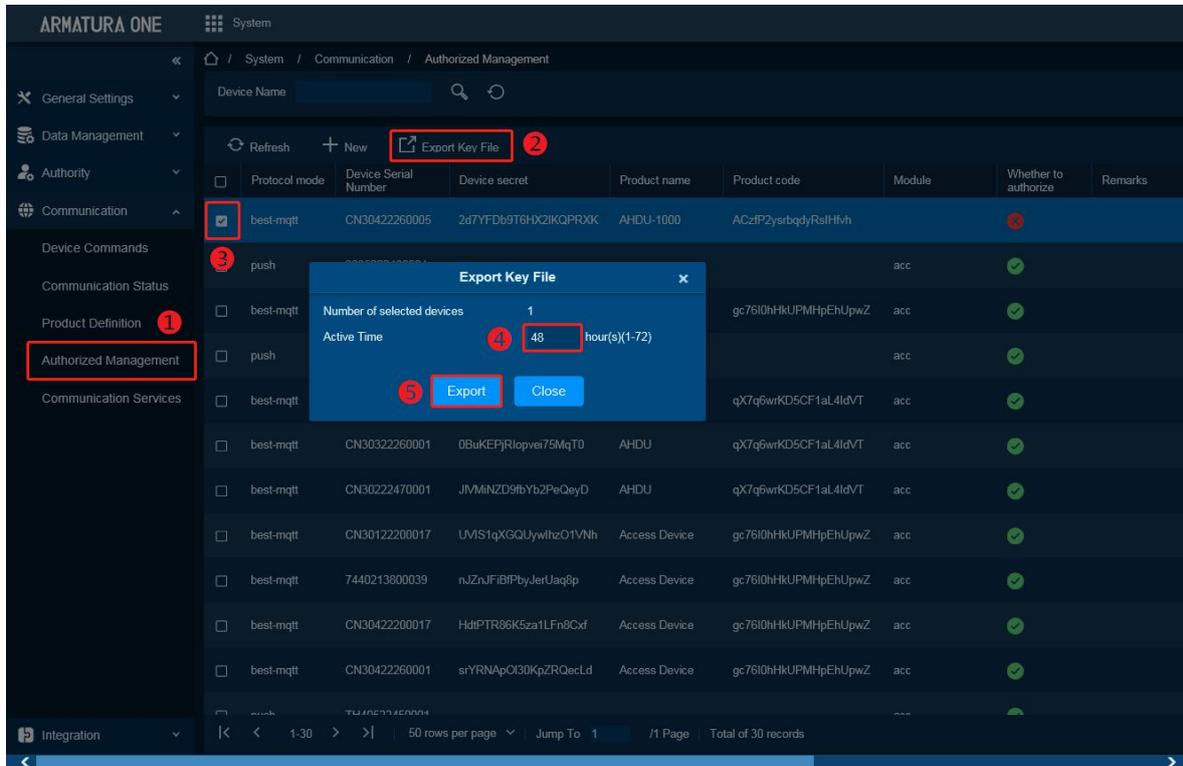
Click **System > Communication > Authorized Management > New** to add a device on the software.



Select the newly created product and enter the serial number. Click 'OK' to save and exit.

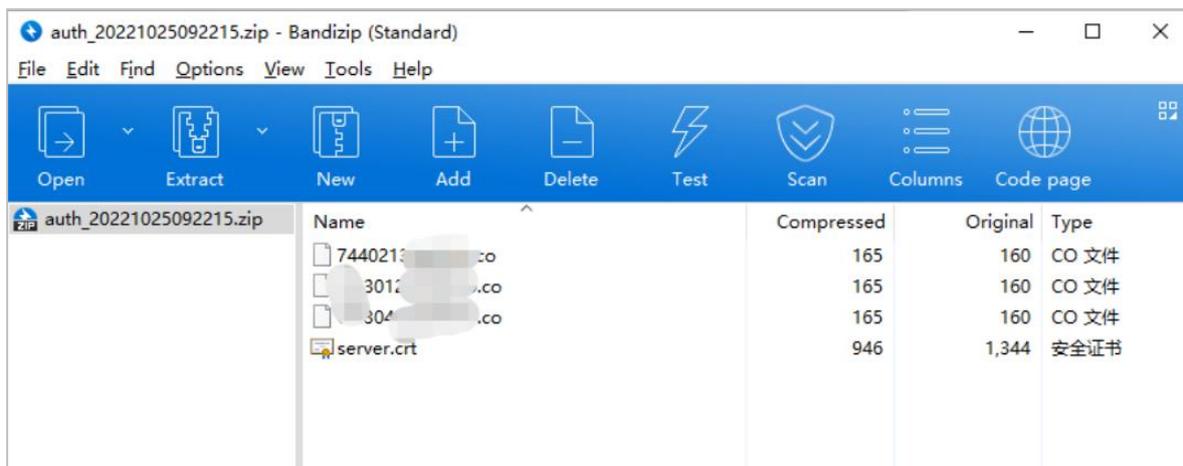
3. Export Key File

Go to **System > Communication > Authorized Management** to verify the newly added device, and then select **Export Key File**.



- **Active time:** Key file validity, value can be 1-72 Hours.

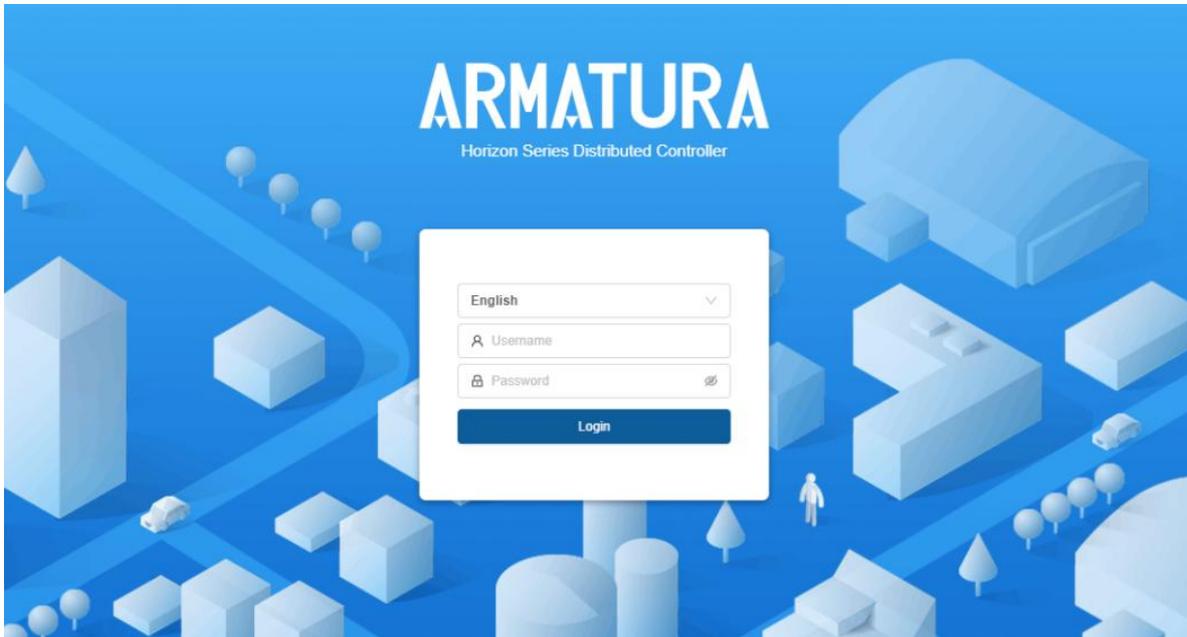
After clicking 'Export', the browser will download a .zip file.



Note: This function supports selecting multiple devices. By clicking the icon, it will generate all controller .co files and server certificates in a .zip package. Simply upload this .zip package to the controller webserver.

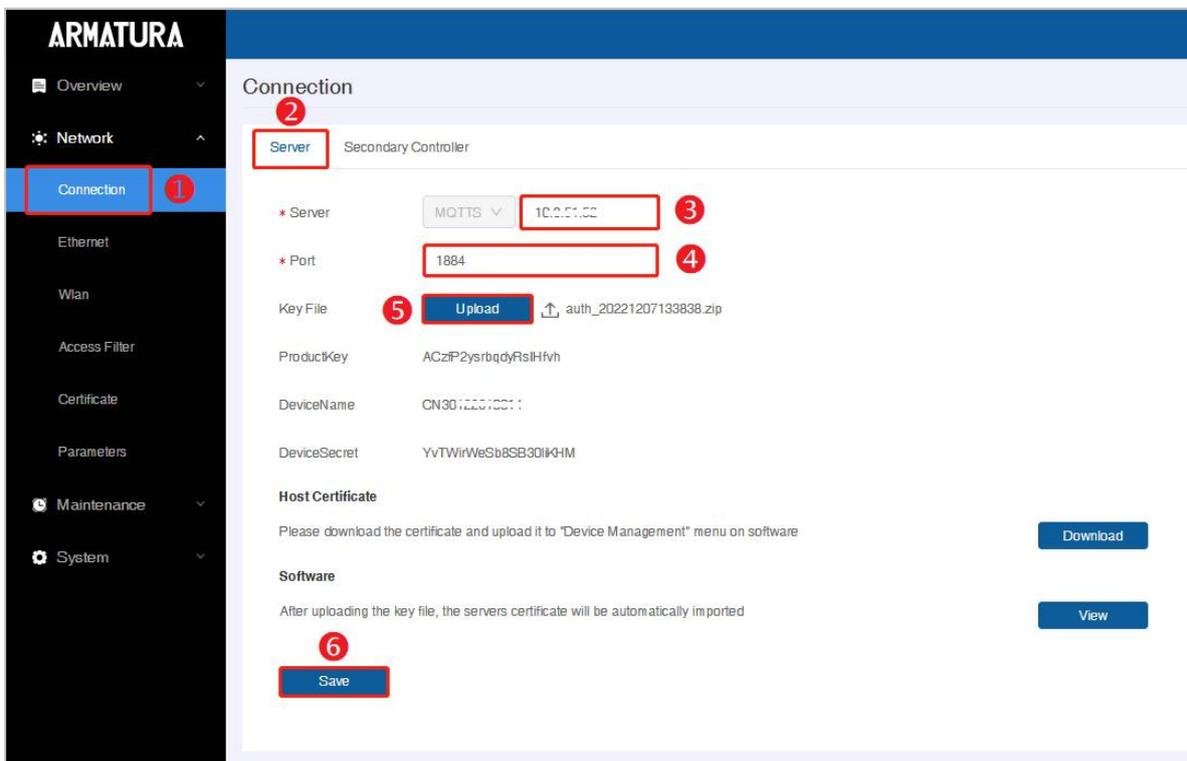
4. Import Key file to controller

- 1) Open https:// [controller's IP address] in browser to enter the login interface.



During the first login, use 'armatura' as the default username and password. The system will prompt the admin to change the password upon logging in.

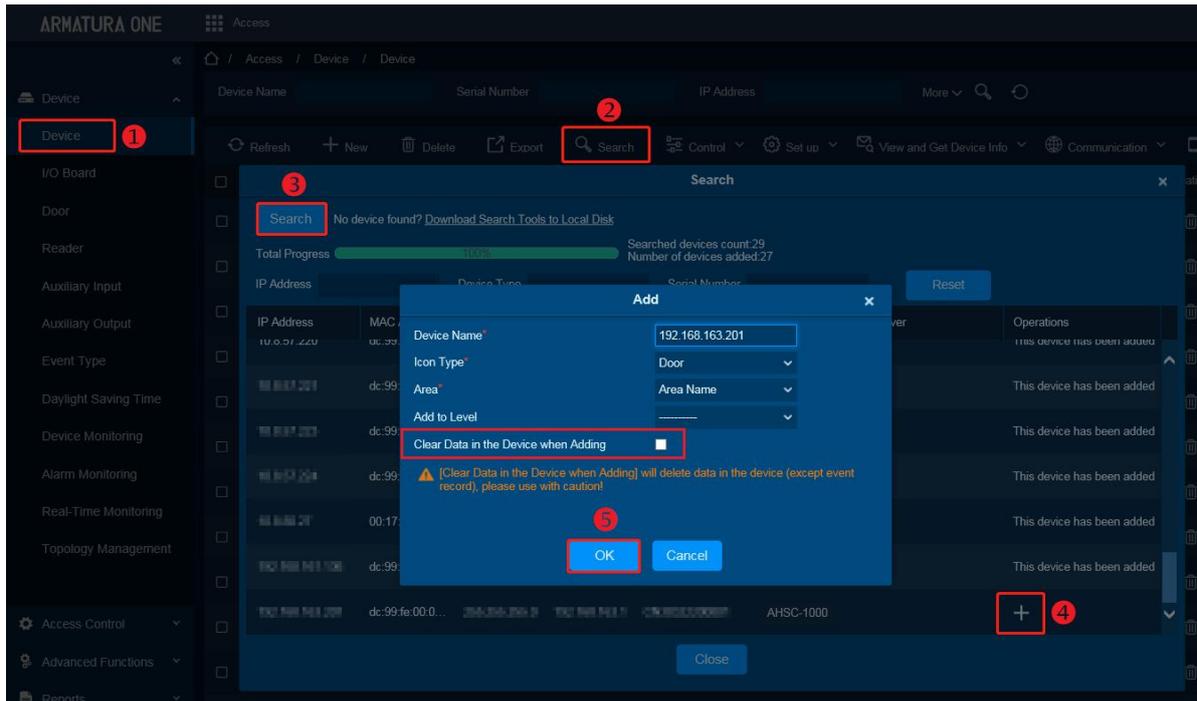
- 2) Click **Network > Connection > Server** on the Webserver interface.



- **Server:** The default protocol is MQTTs, and the address is the server address.

5. Add Controller on the Software

- 1) Click **Access > Device > Device > Search**, to open the Search interface.
- 2) After clicking **Search**, the list and the total number of Access Control Devices will be displayed.
- 3) Click the **"Add"** button adjacent to the Device to include it
- 4) Click **OK** to save and exit.



Note: We recommend selecting **[Clear Data in Device when Adding]** to clear device data during the addition process.

8. FAQ

Q1: How to retrieve the IP address of the device if it is forgotten?

A: To view the device IP address on the controller screen, follow these steps:
Click the **M/OK** button > **Network Info** > **LAN1/LAN2/WLAN**.

Q2: How to reset the network settings?

A: To reset the network settings, follow these steps on the controller screen:

1. Click the **M/OK** button.
2. Go to **Reset > Reset Network Settings > M/OK**.

Please be aware that all network settings will be reset to their default values.

The default IP address for the main NIC is **192.168.1.201**, and for the extended NIC, it is **192.168.2.202**.

Q3: How to reset the administrator password of the web server?

A: To restore the device to factory settings, you have two options:

1. Click the **M/OK** button on the controller screen, then select **Reset > Factory Reset**.
2. Alternatively, you can press and hold the **Reset** button for more than **5** seconds to restore the factory settings.

9. Appendix

9.1 Privacy Policy

Notice:

To help you better use the products and services of Armatura LLC, hereinafter referred to as "we", "our", or "us", the smart service provider, we consistently collect your personal information. Since we understand the importance of your personal information, we took your privacy sincerely and we have formulated this privacy policy to protect your personal information. We have listed the privacy policies below to precisely understand the data and privacy protection measures related to our smart products and services.

Before using our products and services, please read carefully and understand all the rules and provisions of this Privacy Policy. If you do not agree to the relevant agreement or any of its terms, you must stop using our products and services.

I. Collected Information

To ensure the normal product operation and help the service improvement, we will collect the information voluntarily provided by you or provided as authorized by you during registration and use or generated as a result of your use of services.

- 1. User Registration Information:** At your first registration, the feature template (**Fingerprint template/Face template/Palm template**) will be saved on the device according to the device type you have selected to verify the unique similarity between you and the User ID you have registered. You can optionally enter your Name and Code. The above information is necessary for you to use our products. If you do not provide such information, you cannot use some features of the product regularly.
- 2. Product information:** According to the product model and your granted permission when you install and use our services, the related information of the product on which our services are used will be collected when the product is connected to the software, including the Product Model, Firmware Version Number, Product Serial Number, and Product Capacity Information. **When you connect your product to the software, please carefully read the privacy policy for the specific software.**

II. Product Security and Management

1. When you use our products for the first time, you shall set the Administrator privilege before performing specific operations. Otherwise, you will be frequently reminded to set the Administrator privilege when you enter the main menu interface. **If you still do not set the Administrator privilege after receiving the system prompt, you should be aware of the possible security risk (for example, the data may be manually modified).**
2. All the functions of displaying the biometric information are disabled in our products by default. You can choose Menu > System Settings to set whether to display the biometric

information. If you enable these functions, we assume that you are aware of the personal privacy security risks specified in the privacy policy.

3. Only your user ID is displayed by default. You can set whether to display other user verification information (such as Name, Department, Photo, etc.) under the Administrator privilege. **If you choose to display such information, we assume that you are aware of the potential security risks (for example, your photo will be displayed on the device interface).**
4. The camera function is disabled in our products by default. If you want to enable this function to take pictures of yourself for attendance recording or take pictures of strangers for access control, the product will enable the prompt tone of the camera. **Once you enable this function, we assume that you are aware of the potential security risks.**
5. All the data collected by our products is encrypted using the AES 256 algorithm. All the data uploaded by the Administrator to our products are automatically encrypted using the AES 256 algorithm and stored securely. If the Administrator downloads data from our products, we assume that you need to process the data and you have known the potential security risk. In such a case, you shall take the responsibility for storing the data. You shall know that some data cannot be downloaded for sake of data security.
6. All the personal information in our products can be queried, modified, or deleted. If you no longer use our products, please clear your personal data.

III. How we handle personal information of minors

Our products, website and services are mainly designed for adults. Without consent of parents or guardians, minors shall not create their own account. If you are a minor, it is recommended that you ask your parents or guardian to read this Policy carefully, and only use our services or information provided by us with consent of your parents or guardian.

We will only use or disclose personal information of minors collected with their parents' or guardians' consent if and to the extent that such use or disclosure is permitted by law or we have obtained their parents' or guardians' explicit consent, and such use or disclosure is for the purpose of protecting minors.

Upon noticing that we have collected personal information of minors without the prior consent from verifiable parents, we will delete such information as soon as possible.

IV. Others

You can visit www.armatura.us to learn more about how we collect, use, and securely store your personal information. To keep pace with the rapid development of technology, adjustment of business operations, and to cope with customer needs, we will constantly deliberate and optimize our privacy protection measures and policies. Welcome to visit our official website at any time to learn our latest privacy policy.

9.2 Eco-friendly Operation

	<p>The product's "eco-friendly operational period" refers to the time during which this product will not discharge any toxic or hazardous substances when used in accordance with the prerequisites in this manual.</p> <p>The eco-friendly operational period specified for this product does not include batteries or other components that are easily worn down and must be periodically replaced. The battery's eco-friendly operational period is 5 years.</p>					
Hazardous or Toxic substances and their quantities						
Component Name	Hazardous/Toxic Substance/Element					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr6+)	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Chip Resistor	×	○	○	○	○	○
Chip Capacitor	×	○	○	○	○	○
Chip Inductor	×	○	○	○	○	○
Diode	×	○	○	○	○	○
ESD component	×	○	○	○	○	○
Buzzer	×	○	○	○	○	○
Adapter	×	○	○	○	○	○
Screws	○	○	○	×	○	○
<p>○ indicates that the total amount of toxic content in all the homogeneous materials is below the limit as specified in SJ/T 11363—2006.</p> <p>× indicates that the total amount of toxic content in all the homogeneous materials exceeds the limit as specified in SJ/T 11363—2006.</p> <p>Note: 80% of this product's components are manufactured using non-toxic and eco-friendly materials. The components which contain toxins or harmful elements are included due to the current economic or technical limitations which prevent their replacement with non-toxic materials or elements.</p>						

9.3 Attachment

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Supplier's Declaration of Conformity

Unique Identifier

Trade Name: ARMATURA

Model No.: AHSC-1000, AHDU-1160, AHDU-1260, AHDU-1460, AHDU-1860, AHDU-11660; AHEB-0808, AHEB-1602, AHEB-1616; EP10C, EP20, EP30CF, VG10, VG20, FT10CMQ, EP20/VG10/VG20 may be followed by C/CK/CQ/CKQ. All the readers may be followed by [LF]/[HF]/[LHF]/[NI]/[NP]/[NO]/[DF]/[SFMH]/[IDL]/[ICH]/[RNI]/[RNP]/[RNPL]/[NIH]/[NISH]/[NPL]/[NPSL]/[MNO]/[MNP]/[MNPSL], etc.

Responsible Party – U.S. Contact Information

US Company Name: Armatura LLC.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005 USA

Telephone number or internet contact information: 678-831-3345

"Hereby, Armatura LLC declares that this Product is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: www.Armatura.us

The functions of Wireless Access Systems including Radio Local Area Networks(WAS/RLANs) within the band 5150-5350 MHz for this device are restricted to indoor use only within all European Union countries (BE/BG/CZ/DK/DE/EE/IE/EL/ES/FR/HR/IT/CY/LV/LT/LU/HU/MT/NL/AT/PL/PT/RO/SI/SK/FI/SE/TR/NO/CH/IS/LI/UK(NI))

Customer: ZKTECO EUROPE SL

Customer Address: Crta.de Fuencarral 44. Edificio 1. Planta 2.28108, Alcobendas.

Madrid.SPAIN

ARMATURA

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