ARCHITECTURAL AND ENGINEERING SPECIFICATIONS

DESIGNED & ENGINEERED IN THE USA
ARMATURA

AHSC-1000 IP-Based Core Controller

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Date: 9 Apr 2025
Version 1.2

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Table of Contents

SECTION 1 GENERAL SPECIFICATIONS 3

1. PURPOSE 3
2. GOALS AND OBJECTIVES 3
3. KEY FEATURES AND REQUIREMENTS 3
4. DESIGN AND IMPLEMENTATION CONSTRAINTS 6
5. EXISTING STANDARDS AND REGULATIONS 7
6. SUBMITTALS 7
7. QUALIFICATIONS 7
8. WARRANTY 8

SECTION 2 TECHNICAL SPECIFICATIONS 9

1. KEY FEATURES AND REQUIREMENTS 9
2. MAINTENANCE AND SUPPORT 18
3. DOCUMENTATION 18
4. TECHNICAL SPECIFICATIONS 19
5. ARMATURA SYSTEM DIAGRAM 24
6. INSTALLATION AND CONFIGURATION 25
7. WARRANTY AND SUPPORT 25
8. INTEGRATION AND INTEROPERABILITY 25
9. TRAINING AND DOCUMENTATION 27

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

SECTION 1 GENERAL SPECIFICATIONS

1. PURPOSE

This architectural and engineering specifications document (A&E) outlines the minimum requirements for the design, supply, installation, and commissioning of the AHSC-1000 IP-Based Core Controller.

2. GOALS AND OBJECTIVES

The Access Control A&E specifications aim to achieve the following goals and objectives:

- Provide a highly secure and reliable IP-based core controller with advanced authentication and access control capabilities.
- Ensure scalability and flexibility to accommodate varying user and system requirements.
- Meet or exceed relevant industry standards and regulations.
- Provide a clear and detailed specification for the design, supply, installation, and commissioning of the AHSC-1000 IP-Based Core Controller.

3. KEY FEATURES AND REQUIREMENTS

The AHSC-1000 IP-Based Core Controller shall have the following key features and requirements:

- Power-over-Ethernet (PoE) compliant with IEEE 802.3at standards and 12-24VDC with a tolerance of +/-20%, drawing a maximum current of 550 mA (reader current not included).

- Authentication capabilities are enhanced with a maximum of 800,000 (1:1) and 400,000 (1:N) RFID card capacity, up to 400,000 (1:N) Bluetooth / NFC / Dynamic QR Code mobile credential, up to 100,000 (1:1) & 50,000 (1:N). Fingerprint template capacity supports a maximum of 100,000 (1:1) and 50,000 (1:N) as a door unit ; up to 100,000 (storage) as a primary controller. Facial template capacity supports up to 5,000 (1:N) and 100,000 (1:1) as a

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Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

door unit ; 100,000 (storage) as a primary controller. Palm capacity supports 5,000 (storage) as a primary controller; supports 3,000 (1:N) and 5,000 (1:1) as a door unit. Also, it supports features a transaction buffer capable of storing up to 5,000,000 events.

- Elevates building management capabilities with an optional Elevator Control Mode, requiring an additional license for activation. This feature enables management of up to 128 floors and seamlessly integrates with AHEB series expansion boards via OSDP over RS-485 for reliable and secure communication.

- This product complies with IEC EN/BS EN 60839 Grade 4 standards, meeting the highest requirements for security and performance in intrusion and access control systems.

- Include Dual Firmware Support, allowing smooth transitions between Access Control and Elevator Control modes through an onboard web server. Exclusively available on the AHEB-1616 board, advanced elevator control features such as automatic floor selection and Floor Selection History Logging leverage its 16 inputs and 16 outputs for unparalleled control and customization options, establishing a new benchmark in elevator management excellence.

- Supports up to 129 access points, with 32 AHDU-1460 door units and 258 readers with various authentication options including biometrics, RFID card and mobile credential authentication (Bluetooth / NFC / Dynamic QR Code). Supports up to 792 AHEB series IO expansion boards and 32 AHDU door units, ultimately supporting up to 12,801 inputs or outputs.

- Adopts MQTT based communication protocol enhances the controller's communication capabilities, allowing seamless interaction with various edge devices like Door Units, readers, and sensors within a shared network environment, thereby optimizing connectivity and operational efficiency.

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Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

- Supports BMS common communication protocols such as BACnet, Modbus, and OPC to integrate building management systems. Supports a range of reader protocols, including Armatura Explorer series reader, 3rd party biometric reader, 3rd party Wiegand / OSDP readers, and Assa Abloy Aperio™ Wireless Lock. Supports Kone, Schindler, Mitsubishi & Hitachi elevator DCS & DOP integration through Armatura One Security Platform & provides RESTful based API for 3rd Party integration.

- OSDP V2.2 communication over RS-485 with Advanced Encryption. AES 128-bit encryption between readers and I/O expansion boards to AHSC-1000 Security Core.

- Adopts AES256 encryption / TLS 1.2 communication between Armatura One server and edge devices through TCP/IP. Communication between the Armatura One server and web-client is protected by HTTPS / TLS1.2 (AES256 encryption) or above.

- Uses an additional crypto chip with EAL6+ certification for data protection.

- Support IP/Mac address filtering functions and VLAN isolation to enhance cybersecurity standards.

- Built with a dual ROM design for operation stability and protection. One of the ROMs acts as a primary ROM for the system start up, and the second layer ROM acts as a “Recover” ROM. When the primary ROM fails or malfunctions, the second layer ROM will automatically take over on your next controller board startup.

- Features the dual Ethernet ports with Port Failover capability, enabling automatic switching to the secondary port in the event of primary communication circuit failure. Each port is configured with separate network addresses. With 100 Base-TX Ethernet support, users can harness high-speed data transfer capabilities for efficient operation. Additionally, two out of three onboard RS-485 ports are dedicated for redundancy failover, allowing connected door units, IO expansion boards, and readers to

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Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

seamlessly switch to the secondary port if the primary connection is disrupted, ensuring uninterrupted functionality and system reliability.

- This controller has four inputs to monitor the circuit and avoid short circuits. It can detect changes below 5% and filter out attacks.
- The REX inputs and dedicated fire alarm inputs on the board are managed by isolated microchips. This ensures they can operate normally even if the motherboard does not function.
- The AHSC-1000 controller has two Ethernet ports. If the main communication circuit fails, the controller can switch to the secondary port. The AHSC-1000 controller includes 100 Base-TX Ethernet data transfer, allowing users to take full advantage of this high-speed network technology. Two out of three onboard RS-485 ports are dedicated and configurable for failover. RS-485 devices can failover to the secondary port if the current port is disconnected.
- The intelligent power monitoring capability supports flexible voltage inputs (9V-24V with automatic voltage detection) with multiple power supply options including PSU, board-only and Power Over Ethernet (PoE IEEE 802.3at). It can monitor onboard battery power supply, onboard battery health, PoE power supply status & PSU power supply status.
- The system shall comply with GDPR privacy standards, ensuring that the system meets all relevant privacy and data protection requirements.

4. DESIGN AND IMPLEMENTATION CONSTRAINTS

AHSC-1000 IP-based core controller shall be designed to comply with industry standards and regulations, including:

- The controller's compact size restricts the inclusion of extensive processing capabilities.

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Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

- The system heavily relies on third-party encryption libraries for secure communication, so it is crucial to maintain compatibility with these dependencies.
- Regulatory compliance with data protection laws requires strict adherence to encryption standards and user access controls.
- Ongoing maintenance and necessitate regular software updates and firmware patches to address security vulnerabilities and ensure system reliability.

5. EXISTING STANDARDS AND REGULATIONS

The AHSC-1000 IP-Based Core Controller shall comply with the following standards and regulations:

- IEEE Power over Ethernet (PoE) 802.3at standards
- FCC standards
- CE standards
- IEC EN/BS EN 60839 Grade 4
- UL294 standards

6. SUBMITTALS

The following submittals shall be provided by the manufacturer.

- Product data sheets
- Installation instructions
- Operation manuals
- Test reports

7. QUALIFICATIONS

The manufacturer shall have the following qualifications.

- ISO 9001, ISO27001, ISO27701, ISO27017, CMMI5 certification.
- Minimum of 5 years' experience in producing access control equipment.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

8. WARRANTY

The manufacturer shall provide a limited 36-month warranty for the product to be free of defects in material and workmanship.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

SECTION 2 TECHNICAL SPECIFICATIONS

1. KEY FEATURES AND REQUIREMENTS

1.1 The AHSC-1000 IP-Based Core Controller shall have the following key features and requirements:

i. Ultimate Authentication Performance

- As a main controller, supports up to 800,000 (storage) RFID card capacity; while as a door unit, the RFID card capacity supports up to 400,000 (1:N) / 800,000 (1:1). The maximum RFID card number length has a maximum of 256-bits.
- For mobile credential capacity, supports up to 400,000 (1:N) Bluetooth / NFC / Dynamic QR Code.
- For fingerprint capacity, supports up to 100,000 (storage) as a primary controller. As a door unit, fingerprint capacity supports up to 50,000 (1:N) / 100,000 (1:1)
- For face capacity, supports up to 100,000 (storage) as a primary controller. As a door unit, face capacity supports up to 50,000 (1:N) / 100,000 (1:1).
- For palm capacity, supports up to 5,000 (storage) as a primary controller. As a door unit, palm capacity supports up to 3,000 (1:N) / 5,000 (1:1).
- Supports up to million-grade (1:1) authentication capacity with online backend authentication server.
- The transaction buffer supports up to 300,000 events and the access level supports up to 100, 000 levels.

ii. High Scalability supports up to 129 access points, with 32 AHDU-1460 door units and 258 readers with various authentication options including biometrics, RFID card and mobile credential authentication (Bluetooth / NFC / Dynamic QR Code).

iii. Supports up to 792 AHEB series IO expansion boards and 33 AHDU door units, ultimately supporting up to 12,801 inputs or outputs.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

iv. The primary power requirements include Power Over Ethernet (PoE) 802.3at/af or 12-24 VDC ± 20%, with a maximum of 550 mA (excluding reader current).

v. This product complies with IEC EN/BS EN 60839 Grade 4 standards, meeting the highest requirements for security and performance in intrusion and access control systems.

vi. For primary host communication, Ethernet connection at 100Base-TX speed is utilized. And the secure communications are ensured through 256-bit AES symmetric encryption for Controller to Server and Inter-Controller data exchanges.

vii. The secondary host communication adopts Bluetooth 5.2 (optional).

viii. The third host communication adopt Wi-Fi connections at either 5GHz with IEEE 802.11ac or 2.4GHz/5GHz with IEEE 802.11n. It ensures secure communication through 256-bit AES symmetric encryption for Controller to Server and Inter-Controller interactions.

ix. Port 1 Ethernet network connection is at 100Base-TX speed is utilized. Port 2 Ethernet network connection is at 100Base-TX speed is utilized. It is configurable for port failover.

x. RS-485 port 1 supports Armatura RS-485 and OSDP V2.2. RS-485 port 2 supports Armatura RS-485 and OSDP V2.2. RS-485 port 3 supports Armatura RS-485 and OSDP V2.2. It is configurable for port redundancy dedicated on port 2 and port 3.

xi. AHDU-1160 has 2*TCP/IP; 3*RS-485; 2*Wiegand; 1*RS232. AHDU-1260 has 2*TCP/IP; 3*RS-485; 4*Wiegand; 1*RS232. AHDU-1460 has 2*TCP/IP; 3*RS-485; 4*Wiegand; 1*RS232.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

xii. It has 4-state supervision with resistor values at 5% tolerance. For normally open contacts, use resistors at 1.2k, 2.2k, 4.7k, or 10k.For normally closed contacts, use resistors at 1.2k, 2.2k, 4.7k, or 10k. Includes a dedicated Panel Tamper IO Input. Features dedicated Microchip Control Fire Alarm IO Input & REX Input for catastrophic situations.

xiii. AHDU-1160 has 1*Relay and 1*Form-C with dry contacts. AHDU-1260 has 2*Relay and 2*Form-C with dry contacts. AHDU-1460 has 4*Relay and 4*Form-C with dry contacts.

xiv. The Normally Open Contact Rating is 5A @ 30Vdc for resistive loads.

xv. The Normally Closed Contact Rating is 5A @ 30Vdc for resistive loads.

xvi. On-board monitor is a TFT monitor 2.4” with a resolution of 320*240. It can quickly view status of board, connected doors and for configuration information display.

xvii. On-board firmware supports dual firmware, access control mode (standard) and elevator control mode (optional and require extra license for activation).

xviii. On-board webserver can act as the webserver for System Configuration and Management, dashboard for controller status monitoring, device firmware swapping (access control mode / elevator control mode), device connection status monitoring & configuration, performance status, sever 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 sever setting, general status, controller information.

xix. AHDU-1160 has 1 access point on board. AHDU-1260 has 2 access point on board. AHDU-1460 has 4 access point on board.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

xx. AHDU-1160 On-board reader support 3 (OSDP over RS-485) or 1 (Wiegand) with on-board IO. AHDU-1260 On-board reader support 3 (OSDP over RS-485) or 2 (Wiegand) with on-board IO. AHDU-1460 support 3 (OSDP over RS-485) or 4 (Wiegand) with on-board IO.

xxi. AHDU-1160 maximum access points is 1. AHDU-1260 maximum access points is 2. AHDU-1460 maximum access points is 4.

xxii. AHDU-1160 support a maximum of 2 readers. AHDU-1260 support a maximum of 4 readers. AHDU-1460 support a maximum of 8 reader.

xxiii. A maximum of 384 inputs with the use of Armatura AHEB-1602 / AHEB-1616.

xxiv. A maximum of 385 outputs with the use of Armatura AHEB-1616.

xxv. In access control mode, the maximum number of IO board is up to 792 pieces. 24 pieces are directly connected via Armatura RS-485 connection. Support additional 768 pieces of IO board when connect through AHDU-1460 module by TCP/IP.

xxvi. In elevator mode, the maximum number of IO board supported is 8 pieces of AHEB-1616 and is directly connected through Armatura RS-485 connection for a maximum of 128 floors management. The maximum number of IO board supported is 16 pieces of AHEB-0808 and is directly connected through Armatura RS-485 connection for a maximum of 128 floors management. The maximum number of IO board supported is 24 pieces of AHEB-1602 and is directly connected through Armatura RS-485 connection for a maximum of 48 floors management.

xxvii. Supports up to 32 DU modules with 1*TCP/IP communication featuring AES-256 and TLS1.2 for an end-to-end secure channel, and up to 24 DU modules with Armatura RS-485 communication equipped with AES-256 for an end-to-end secure channel.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

xxviii. Input voltage for door unit controller interface is 12 to 24 VDC +/- 10% regulated, 500mA maximum each reader.

xxix. Maximum Input current for door unit controller interface 12 to 24 VDC +/- 10% regulated, 500mA maximum each reader.

xxx. Controller communication through TCP/IP mode over Ethernet at 100Base-TX speed.

xxxi. The controller supports connectivity through the TCP/IP Protocol with features such as 802.1X, VLAN, SSH, and compatibility with both IPv4, IPv6, and WebSocket protocols.

xxxii. The controller ensures secure communication through TCP/IP encryption, complying with TLS1.2 standards and employing AES-256 for end-to-end secured communication channels.

xxxiii. Utilizes Spada Protocol over WebSocket for TCP/IP communication.

xxxiv. Armatura RS-485 Secure Channel employs AES-256 encryption following the RS-485 Protocol for secure communication.

xxxv. The Armatura RS-485 Mode operates at 9600-115200 bps, utilizing asynchronous, half-duplex communication with 1 start bit, 8 data bits, and 1 stop bit.

xxxvi. Data inputs support TCP/IP standard and the maximum TCP/IP cable length is 330ft. (100m). Data inputs also support RS-485 standard with a maximum 3937ft.(1200m) for the RS-485 cable length.

xxxvii. Input voltage for RFID/ Biometrics reader interface is 12 -24 Vdc +/- 10% regulated; 500 mA maximum each reader.

xxxviii. Maximum input current for RFID/ Biometrics reader interface is 12 -24 Vdc +/- 10% regulated; 500 mA maximum each reader.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

xxxix. The RS-485 Protocol for RFID/ Biometrics reader interface features AES-128 encryption and utilizes an OSDP Secure Channel for secure communication.

xl. OSDP mode for RFID/ Biometrics reader interface has settings including 9600-115200 bps, asynchronous, half-duplex communication, 1 start bit, 8 data bits, and 1 stop bit. It supports the 3rd party reader with OSDP V2.2 or above.

xli. Wiegand for RFID/ Biometrics reader interface with support for reading up to 128 bits and writing in 26, 34, or 37-bit formats, as well as accommodating other customized card formats.

xlii. Tamper Input (Wiegand) for RFID/ Biometrics reader interface operates at TTL levels, with high levels above 3 V, low levels below 0.5 V, and a maximum source/sink current of 5 mA.

xliii. Buzzer Output (Wiegand) for RFID/ Biometrics reader interface operates at TTL levels, with high levels above 3 V, low levels below 0.5 V, and a maximum source/sink current of 5 mA.

xliv. LED Output (Wiegand) for RFID/ Biometrics reader interface operates at TTL levels, with high levels above 3 V, low levels below 0.5 V, and a maximum source/sink current of 5 mA.

xlv. Data inputs for RFID/ Biometrics reader interface support RS-485, OSDP and Wiegand standards. The maximum RS-485/ OSDP cable length is 3937ft. (1200m) and the maximum Wiegand cable length is 328ft. (100m).

xlvi. The RS-485 Protocol integrates TLS 1.2 encryption with AES-128 encryption alongside the secure channel of OSDP V2.2 for the IO Expansion Board Interface.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
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xlvii. OSDP mode for IO Expansion board interface consists of settings include 9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit.

xlviii. Data inputs for IO Expansion board interface supports OSDP standards and the maximum cable length is 3937ft. (1200m).

xlix. RS-485 Protocol integrates TLS 1.2 encryption with AES-128 encryption alongside the secure channel of OSDP V2.2 for the elevator control interface.

l. OSDP mode for elevator control interface consists of settings include 9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit. The maximum cable length is 2,000 ft. (609.6m).

li. For the elevator control mode, the supported IO Expansion board is AHEB-1616 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode). The supported IO Expansion board is AHEB-0808 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode) and AHEB-1602 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode).

lii. For elevator control mode, the maximum IO board is 8 pieces of AHEB-1616 (direct connection through Armatura RS-485connection) for up to 128 floors management. The maximum IO board is 16 pieces of AHEB-0808 (direct connection through Armatura RS-485connection) for up to 128 floors management. The maximum IO board is 24 pieces of AHEB-1602 (direct connection through Armatura RS-485connection) for up to 48 floors management.

liii. For elevator control interface, the advance elevator control functions encompass AHEB-1616 with dual function firmware for access control mode & elevator control mode.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

liv. For elevator control interface, the general elevator control functions of AHEB-0808 with dual function firmware for access control mode & elevator control mode. AHEB-1602 with dual function firmware for access control mode & elevator control mode. AHEB-1616 with dual function firmware for access control mode & elevator control mode.

lv. Data inputs of the elevator control interface support OSDP standards and the maximum cable length is 500ft. (152m).

lvi. The TCP/IP mode of the controller software interface over Ethernet is 100Base-TX speed.

lvii. TCP/IP Protocol for the software interface includes features such as NTP, SNMP V2/V3, 802.1X, VLAN, SSH, MQTT, IPv4, IPv6, DNS, and DDNS.

lviii. The software interface of the controller implements TCP/IP encryption compliant with TLS1.2 standards, ensuring an AES-256 end-to-end secure communication channel.

lix. Utilizes Spada Protocol over MQTT for TCP/IP communication for the controller software interface.

lx. Power and Relays requires one twisted pair of cable with 18-16AWG.

lxi. Ethernet requires the CAT-5 cable with a minimum length of 330ft. (100m).

lxii. Ethernet failover port requires the CAT-5 cable with a minimum length of 330 ft. (100m).

lxiii. RS-485 reader port support 9600-115200 bps, asynchronous, half-duplex communication with 1 start bit, 8 data bits, and 1 stop bit. It requires one twisted pair with a drain wire and shield, 120 ohm resistance, and 22-18 AWG, with a maximum cable length of 3937 ft (1200 m).

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

lxiv. RS-485 I/O device port support 9600-115200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit. One twisted pair with drain wire and shield, 120 ohm resistance, 22-18 AWG, with a maximum cable length of 3937ft (1200m).

lxv. RS-485 failover port support 9600-115200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit. One twisted pair with drain wire and shield, 120 ohm resistance, 22-18 AWG, with a maximum cable length of 3937ft (1200m).

lxvi. The Wiegand port requires a 20 AWG shielded Wiegand wire with a maximum cable length of 328 ft (100 m).

lxvii. It is 4.8” in width, 10.2” in length and 2.5” in height, which is equivalent to122mm in width; 260mm in length and 62.5mm in height.

lxviii. Its weight is approximately 1.67 pounds, which is equivalent to 756g.

lxix. Support DIN35 rail mounting. Compatible with UTA89 Din Rail Adapter for screwing on switchgear (sold separately) and wall mount.

lxx. The housing material consists of ABS-PC and UL-94 V2.

lxxi. The optimal operating and storage temperature is -22°F to 158°F (-30°C to 70°C). While the operating and storage humidity is 0% to 95%RH.

lxxii. Attained FCC, CE, RoHS and UL294 certifications.

lxxiii. Support Armatura One Security System.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

2. MAINTENANCE AND SUPPORT

The AHSC-1000 IP-Based Core Controller shall be supported by a comprehensive maintenance and support program, which shall include the following:

- Regular software updates and security patches.
- Technical support via phone and email.
- Spare parts availability.
- Training for system administrators and end-users.

3. DOCUMENTATION

The supplier shall provide the following documentation for the AHSC-1000 IP-Based Core Controller:

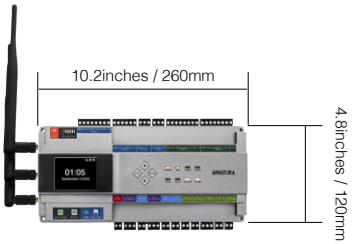
- User manual
- Installation guide
- Technical specifications
- Software release notes
- Warranty terms and conditions

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

4. TECHNICAL SPECIFICATIONS

Dimensions of Core Controller



AHSC-1000

General Information	
Primary Power	PoE 802.3at / 12-24 Vdc +/-20%, 550 mA maximum (reader current not included)
Primary Host Communication	Ethernet: 100Base-TX 256bit AES* symmetric encryption for Controller to Server and Inter-Controller communications
Secondary Host Communication	Bluetooth 5.2
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: Armatura RS-485 / OSDP V2.2 Port 2: Armatura RS-485 / OSDP V2.2 Port 3: Armatura RS-485 / OSDP V2.2 (Configurable for Port Redundancy dedicated on port 2 & 3)
Number of Ports	2*TCP/IP (IPv4 & IPv6) 3*RS-485 2*Wiegand 1*RS-232
Inputs	4 states 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
Normally Open Contact Rating	5A @ 30Vdc resistive
Normally Closed Contact Rating	5A @ 30Vdc resistive
On-Board Monitor	Dual Firmware Support, Access Control Mode (Standard) & Elevator Control Mode (Optional, Require Extra License for Activation)
On-Board Webserver	WebSever for System Configuration and Management Dashboard for Controller Status Mointoring, Device Firmware Swapping (Access Control Mode / Elevator Control Mode), Device Connection Status Monitoring & Configuration, Performanace Status, Sever 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 Sever Setting, General Status, Controler Information

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

RFID Card Capacity	As a Main-Controller: 800,000 (Storage) As a Door Unit: 400,000 (1:N) / 800,000 (1:1)
Maximum RFID Card Number Length	Supported up to 256-bits 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	As a Primary Controller: 100,000 (Storage) As a Door Unit: 50,000 (1:N) / 100,000 (1:1)
Face Capacity	As a Primary Controller: 100,000 (Storage) As a Door Unit: 5,000 (1:N) / 100,000 (1:1)
Palm Capacity	As a Primary Controller: 5,000 (Storage) As a Door Unit: 3,000 (1:N) / 5,000 (1:1)
Transaction Buffer	5,000,000 Events
Access Level	100,000 Levels
On-Board Access Point Control	1 access point on board
On-Board Reader Support	2 (OSDP over RS-485) or 2 (Wiegand) with on-board IO
Maximum Access Points	129 (with 32pcs AHDU-1460 modules through TCP/IP connection) 97 (with 24pcs AHDU-1460 modules through Armatura RS-485 over RS-485 connection)
Maximum Readers	258 (with 32pcs AHDU-1460 modules through TCP/IP connection) 194 (with 24pcs AHDU-1460 modules through Armatura RS-485 over RS-485 connection)
Maximum Inputs	12,801 (with AHSC-1000 on board IO and 32pcs AHDU-1460 modules through TCP/IP connection + 792pcs AHEB-1602 IO Expansion Board through OSDP over RS-485 connection)
Maximum Outputs	12,801 (with AHSC-1000 on board IO and 32pcs AHDU-1460 modules through TCP/IP connection + 792pcs AHEB-1602 IO Expansion Board through OSDP over RS-485 connection)
Maximum IO Board (Access Control Mode)	792pcs (24pcs direct connection through Armatura RS-485connection + 768 pcs through AHDU-1460 module through TCP/IP connection)
Maximum IO Board (Elevator Control Mode)	8pcs*AHEB-1616 (direct connection through Armatura RS-485 connection) for Max.128 floors Management 16pcs*AHEB-0808 (direct connection through Armatura RS-485 connection) for Max.128 floors Management 24pcs*AHEB-1602(direct connection through Armatura RS-485 connection) for Max.48 floors Management
Maximum DU Modules	32pcs (1*TCP/IP communication with AES-256 & TLS1.2 end to end secure channel) 24pcs (Armatura RS-485 communication with AES-256 end to end secure channel)

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

Door Unit Controller Interface	
Input Voltage	12 -24 Vdc +/- 10% regulated, 500 mA maximum each reader
Maximum Input Current	12 -24 Vdc +/- 10% regulated, 500 mA maximum each reader
TCP/IP Mode	Ethernet: 100Base-TX
TCP/IP Protocol	802.1X, VLAN, SSH, IPv4, IPv6, WebSocket
TCP/IP Encryption	Complied up to TLS1.2, AES-256 end to end secured communication channel
TCP/IP Communication	Spada Protocol over WebSocket
RS-485 Protocol	AES-256, Armatura RS-485 Secure Channel
Armatura RS-485 Mode	9600-115200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit.
Data Inputs	TCP/IP standard supported. Maximum TCP/IP cable length: 330ft. (100m) RS-485 standard supported. Maximum RS-485 cable length: 3937ft. (1200m)

RFID / Biometrics Reader Interface	
Input Voltage	12 -24 Vdc +/- 10% regulated, 500 mA maximum each reader
Maximum Input Current	12 -24 Vdc +/- 10% regulated, 500 mA maximum each reader
RS-485 Protocol	AES-128, OSDP Secure Channel
OSDP Mode	9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit. 3rd Party reader: support OSDP V2.2 or above
Wiegand	Read: support up to 128 bits / Write: Support 26 / 34 / 37 bit, and other customised card formats
Tamper Input (Wiegand)	TTL levels, high > 3 V, low < 0.5 V, 5 mA source/sink maximum
Buzzer Output (Wiegand)	TTL levels, high > 3 V, low < 0.5 V, 5 mA source/sink maximum
LED Output (Wiegand)	TTL levels, high > 3 V, low < 0.5 V, 5 mA source/sink maximum
Data Inputs	RS-485, OSDP and Wiegand standards supported. Maximum RS-485 /OSDP cable length: 3937ft. (1200m) Maximum Wiegand cable length: 328ft (100m)

IO Expansion Board Interface	
RS-485 Protocol	TLS 1.2, AES-128, OSDP V2.2 Secure Channel
OSDP Mode	9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit.
Data Inputs	OSDP standards supported. Maximum cable length: 3937ft. (1200m)

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

Elevator Control Interface	
RS-485 Protocol	TLS 1.2, AES-128, OSDP V2.2 Secure Channel
OSDP Mode	9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit.
Supported IO Expansion Board (Elevator Control Mode)	AHEB-1616 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode) AHEB-0808 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode) AHEB-1602 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode)
Maximum IO Board (Elevator Control Mode)	8pcs*AHEB-1616 (direct connection through Armatura RS-485connection) for Max.128 floors Management 16pcs*AHEB-0808 (direct connection through Armatura RS-485connection) for Max.128 floors Management 24pcs*AHEB-1602 (direct connection through Armatura RS-485connection) for Max.48 floors Management
Advanced Elevator Control Functions	AHEB-1616 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode) Advanced Functions: Automatic Floor Selection, Floor Selection History Logging
General Elevator Control Functions	AHEB-0808 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode) AHEB-1602 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode) AHEB-1616 (with Dual Function Firmware for Access Control Mode & Elevator Control Mode)
Data Inputs	OSDP standards supported. Maximum cable length: 3937ft. (1200m)

Software Interface	
TCP/IP Mode	Ethernet: 100Base-TX
TCP/IP Protocol	NTP, SNMP V2 /V3, 802.1X, vLan, SSH, MQTT, IPv4, IPv6, DNS, DDNS
TCP/IP Encryption	Complied up to TLS1.2, AES-256 end to end secured communication channel
TCP/IP Communication	Spada Protocol over MQTT

Cable Requirement	
Power & Relays	One twisted pair, 18-16 AWG
Ethernet	CAT-5, minimum 330 ft. (100m)
Ethernet Failover Port	CAT-5, minimum 330 ft. (100m)
RS-485 Reader Port	9600-115200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit. One twisted pair with drain wire and shield, 120 ohm resistance, 22-18 AWG, Maximum cable length: 3937ft (1200m)
RS-485 I/O Device Port	9600-115200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit. One twisted pair with drain wire and shield, 120 ohm resistance, 22-18 AWG, Maximum cable length: 3937ft (1200m)
RS-485 Failover Port	9600-115200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit. One twisted pair with drain wire and shield, 120 ohm resistance, 22-18 AWG, Maximum cable length: 3937ft (1200m)
Wiegand Port	20 AWG shielded Wiegand wire, 328ft. (100m)

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

Mechanical	
Dimensions	4.8” W x 10.2” L x 2.5” H in. (122 x 260 x 62.5mm)
Weight	1.67lb (756g)
Mounting	Supported DIN35 Rail Compatible with UTA89 Din Rail Adapter for screwing on switchgear (Sold Separately) Wall mount
Housing Material	ABS-PC UL-94 V2

Environmental	
Temperature	-22°F ~ 158°F (-30°C~70°C), Operating & Storage
Humidity	0-95%RHNC
Certifications*	Certification: CE, FCC, RoHS, UL294, IEC EN/ BS EN 60839 Grade 4
Security Rating	Secure Data Storage in EAL 6+ Certified Crypto Chip

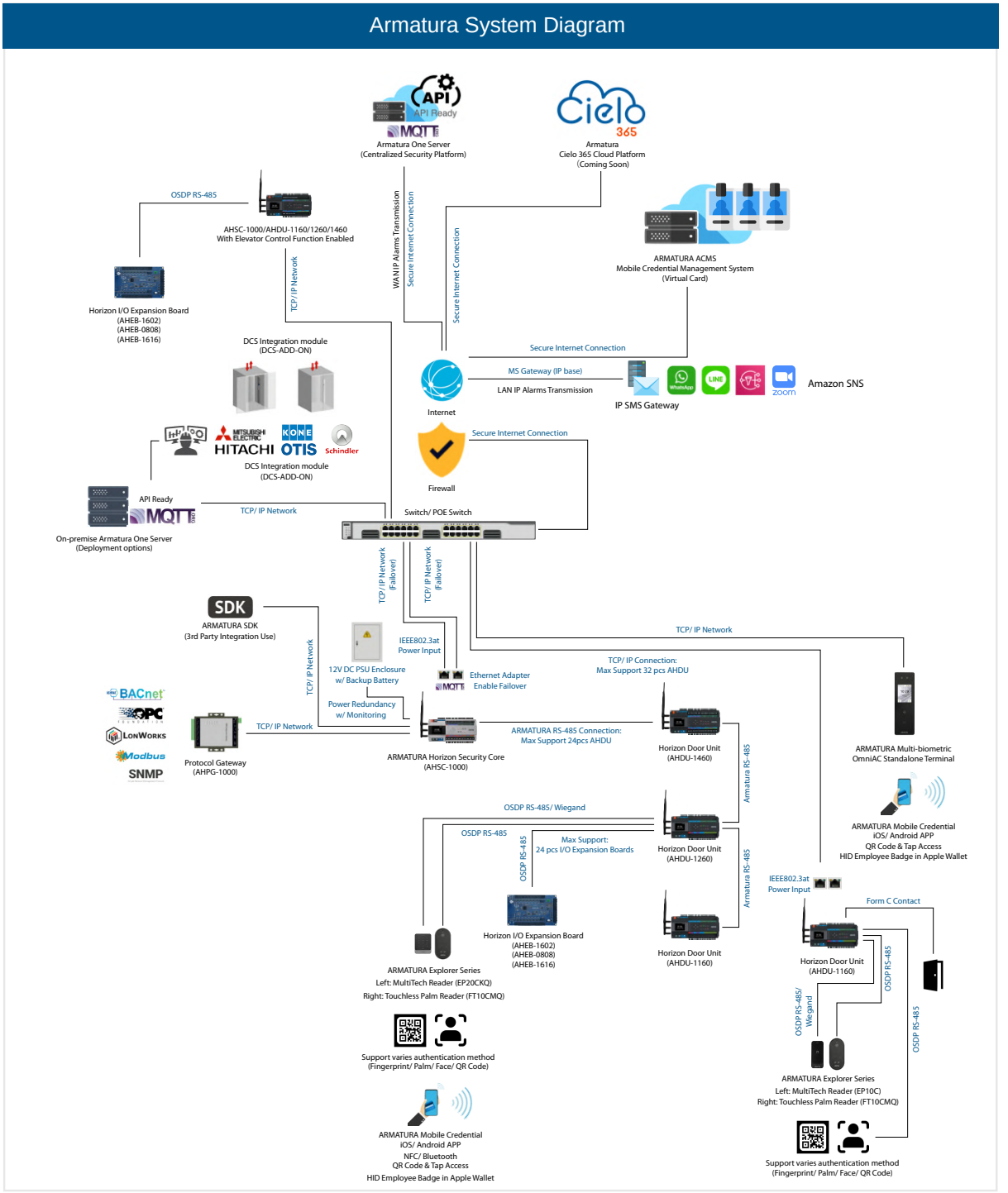
Software	
Supported Software	Armatura--One Security System

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

5. ARMATURA SYSTEM DIAGRAM

Armatura System Diagram



Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

6. INSTALLATION AND CONFIGURATION

The AHSC-1000 IP-Based Core Controller shall be installed and configured in accordance with the following requirements:

- The installation shall be carried out by qualified and experienced personnel in accordance with applicable codes, standards, and regulations.
- The controller shall be configured using the on-board webserver or through software provided by the manufacturer.
- The configuration shall include setting up access levels, user accounts, time schedules, and other relevant parameters.
- The controller shall be tested and commissioned to ensure proper operation and compliance with the specified requirements.

7. WARRANTY AND SUPPORT

The AHSC-1000 IP-Based Core Controller shall be covered by a minimum of 36 month manufacturer's warranty that covers defects in materials and workmanship. The manufacturer shall provide remote technical support and assistance to the installer and end-user during the installation and operation of the controller.

8. INTEGRATION AND INTEROPERABILITY

The AHSC-1000 IP-Based Core Controller shall support the following integration and interoperability requirements:

- The controller shall be able to integrate with third-party access control systems, security systems, and building automation systems using open protocols such as BACnet, OPC, Modbus, and RESTful APIs.
- The controller shall be able to interoperate with other AHSC-1000 controllers in a distributed architecture for large-scale access control systems.
- The controller shall be able to communicate with mobile devices running iOS or Android operating systems for mobile credential verification.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

- The controller shall support integration with LDAP and Active Directory for user authentication and management.
- The controller shall be able to integrate with elevator control systems for floor access control.
- The controller shall support integration with fire alarm systems for fire door release and emergency access control.
- The controller shall support integration with intercom systems for door release and visitor management.
- The controller shall be able to integrate with biometric enrollment and verification systems for multi-modal biometric authentication.
- The controller shall support integration with license plate recognition systems for vehicle access control.
- The software shall be compatible with the latest versions of popular web browsers such as Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge.
- The controller shall support remote software updates and firmware upgrades through the on-board webserver or through software provided by the manufacturer.
- The controller shall provide real-time monitoring and reporting of access events, system status, and performance metrics through the on-board webserver or through software provided by the manufacturer.
- The software shall support customized reporting and analytics for access control data.
- The software shall provide an audit trail of all access events, system changes, and user activities.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2

- The software shall support role-based access control for system administrators and operators.
- The controller shall provide an SDK for third-party software development and integration.

9. TRAINING AND DOCUMENTATION

The manufacturer shall provide the following training and documentation for the AHSC-1000 IP-Based Core Controller:

- User manuals and technical documentation for installation, configuration, and operation of the controller.
- Online training courses and videos for system administrators and operators.
- On-site or remote training sessions for system integrators and installers.
- Technical support and assistance for system integrators, installers, and end-users.

*Note Certifications may vary by region and country. Please consult the manufacturer for specific certifications applicable to your location.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005
Email: sales@armatura.us

Date: 9 Apr 2025
Version 1.2