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ARCHITECTURAL AND ENGINEERING SPECIFICATIONS

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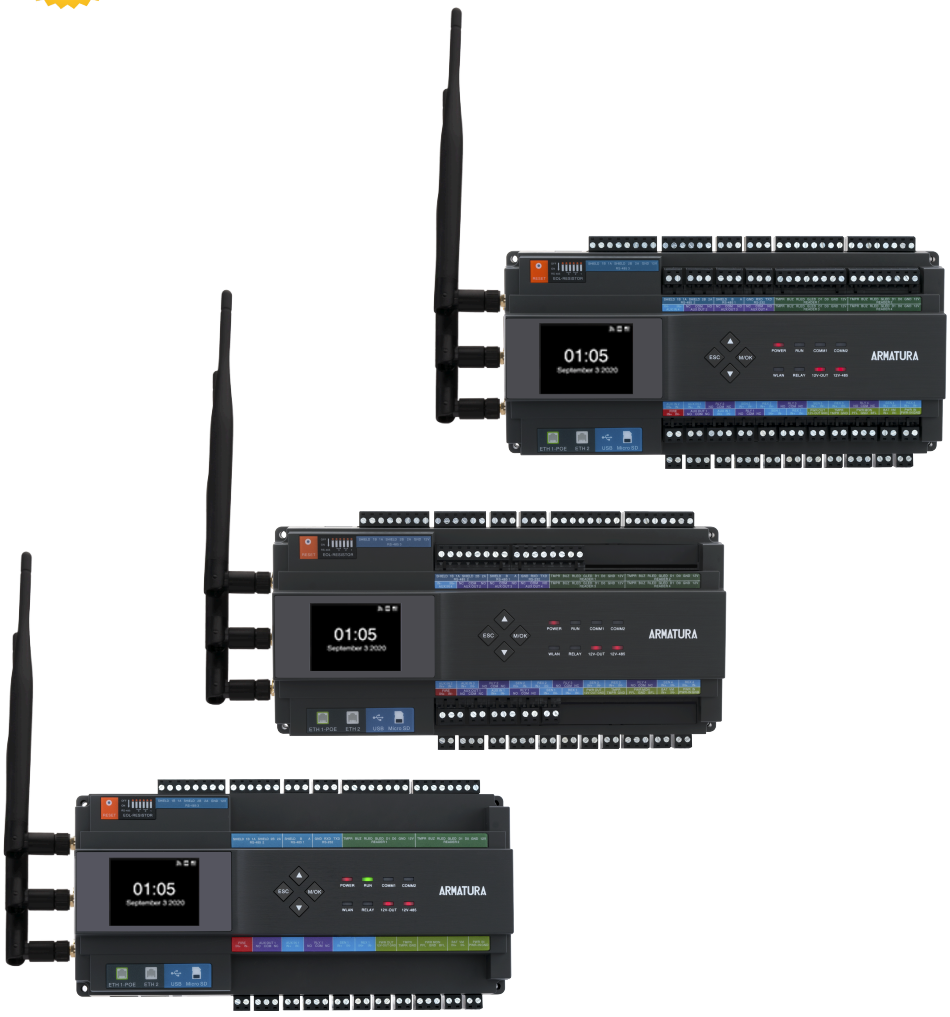
AHDU Series IP-Based Biometric Door Unit Controller



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Section 1

1. Purpose

The purpose of this architectural and engineering system specifications (A&E) document is intended to provide a comprehensive guide for the design, implementation, and installation of the AHDU Series, IP-based biometric door unit.

2. Goals and Objectives

The AHDU Series, IP-based biometric door unit A&E specifications document aims to achieve the following goals and objectives:

- Provide a highly secure and reliable IP-based core controller with advanced authentication and advanced 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 specifications for the design, supply, installation, and commissioning of the AHDU Series.

3. Key Features and Requirements

The AHDU Series shall have the following key features and requirements:

- The AHDU Series includes three different models: AHDU-1160, AHDU-1260, and AHDU-1460, with robust and customizable elevator control mode.

- Supports advanced access control functions including multi-frequency RFID card, multi-biometric authentication, mobile credential, anti-passback, multi-level authentication and cross panel linkage (global linkage).

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- Authentication capacity supports a maximum of 400,000 (1:N) or 800,000 (1:1) RFID card or mobile credential capacity with 400,000 (1:N) (Bluetooth). Supports 50,000 (1:N) and 100,000 (1:1) fingerprint capacity ; supports 5,000 (1:N) and 100,000 (1:1) face capacity. Supports 3,000 (1:N) & 5,000 (1:1) palm capacity. The transaction buffer supports 300,000 events.

- The AHDU Series, IP-based biometric door unit can be powered using Power-over-Ethernet (PoE) with 802.3at/af standards or 12DVC to 24VDC from a power sourcing equipment (PSE) according to the PoE 802.3at/ af standards.

- Enables integration with Armatura Explorer series readers, third-party biometric readers, as well as third-party Wiegand and OSDP readers. Armatura One provides RESTful based API for seamless third-party software integration.

- It should have unlimited threat levels which are used to instantly adjust users access right during lockdown and lockout.

- Support port failover (TCP/IP) and redundancy. The AHDU controller series features dual Ethernet ports with automatic failover capability. It supports separate network configurations for each port and includes 100Base-TX Ethernet data transfer. Additionally, the controller's three RS-485 ports offer redundancy functionality, activating a secondary port if issues occur with the primary connection to prevent disconnection.

- 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.

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- Supports up to 384 inputs (when using AHEB-1616 I/O expansion board) through OSDP V2.2 connection between boards. 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.

- Adopt MQTT based communication protocol and enables the controller to communicate with more edge devices, including Door Unit, reader and sensor under the same network environment.

- Use the sserverless 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 or global linkage can operate normally.

- Adopt the onboard webserver design, The controller can be configured via the Armatura Connect mobile app or web browser using a TCP/IP connection. Additionally, basic diagnostics are possible using the controller's built-in monitor and keypad.

- Includes 4-state supervised inputs to prevent open or short circuit attacks effectively. It can detect circuit abnormalities as slight as 5% Ohms and filter out potential attacks for enhanced security.

- REX inputs and dedicated fire alarm inputs are independently controlled by isolated microchips to ensure their continued operation under extreme conditions, even if the motherboard malfunctions.

- The system shall comply with GDPR privacy standards, ensuring that the system meets all relevant privacy and data protection requirements.

- Adopt advanced encryption standard, AES 256-bit algorithm for communication with Explorer series readers and I/O expansion boards by

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TCP/IP. Adopt AES 128-bit encryption to the readers and I/O expansion boards by OSDP V2.2 over RS-485.

- Adopt AES128/TLS 1.2 (with AES256) secures communication between Armatura One server and edge devices. The Armatura One server communicates with web clients via HTTPS/TLS1.2 (AES256) or higher and enhanced by a Certified EAL6+ standard crypto chip for AHSC-1000 controller security. It supports IP/MAC address filtering and VLAN isolation for heightened cybersecurity.

4. Design and Implementation Constraints

The AHDU Series IP-based biometric door unit should comply with the following design and implementation constraints.

- Ongoing maintenance and support shall constraints necessitate regular software updates and firmware patches to address security vulnerabilities and ensure system reliability.
- The design shall be scalable and flexible to accommodate varying user and system requirements.
- The implementation shall be done by trained installers who have been certified by the manufacturer.
- The AHDU Series shall be designed to operate in a wide range of environmental conditions, including temperature, humidity, and vibration.

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5. Existing Standards and Regulations

The AHDU Series should comply with the following standards and regulations.

- FCC Standards
- CE Standards
- UL Standards
- UL294 Standards

6. Submittals

The following submittals shall be provided.

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

7. Qualifications

The manufacturer of the AHDU Series shall have the following qualifications.

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

8. Warranty

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

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Section 2

1. Key Features and Requirements

1.1 The AHDU Series shall have the following key features and requirements:

i. Ultimate Authentication Performance Supports up to 400,000 (1:N) RFID card or 800,000 (1:1) RFID card capacity. The maximum RFID card number length is up to 512bits. Support mobile credential capacity up to 400,000 (1:N) (Bluetooth); 400,000(1:N) (NFC @ Armatura ID / HID employee badge in Apple Wallet); 400,000 (1:N) (Dynamic QR Code). Fingerprint capacity is at a maximum of 100,000 (1:1) & 50,000 (1:N). Face capacity supports up to 5,000 (1:N) & 100,000 (1:1). Palm capacity supports up to 3,000 (1:N) & 5,000 (1:1). The maximum transaction buffer is 300,000 events.

ii. Highly scalable and supports up to 384 inputs (when using AHEB-0216 I/O expansion board) through OSDP V2.2 connection between boards. Acts as an edge device under the AHSC-1000 security core, which supports cascading to manage up to 128 doors under a single controller.

iii. Innovative MQTT Based Communication Protocol. MQTT is a lightweight messaging protocol designed for IoT devices that allows the controller to communicate with more edge devices (Door Unit, Reader, and sensor) under the same network environment.

iv. AHDU-1160, AHDU-1260 and AHDU-1460 primary power supply uses the Power over Ethernet (PoE) 802.3at/af standard, supporting 12VDC to 24 VDC ± 20%, with a maximum current of 550 mA. The reader current is not included.

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v. AHDU-1160, AHDU-1260 and AHDU-1460 primary host communication over Ethernet is 100Base-TX speed and utilizes the 256bit AES symmetric encryption for Controller to Server and Inter-Controller communications.

vi. AHDU-1160, AHDU-1260 and AHDU-1460 secondary host communication uses Bluetooth 5.2, and it is optional.

vii. AHDU-1160, AHDU-1260 and AHDU-1460 third host communication utilizes Wi-Fi at IEEE 802.11ac for 5GHz standard, or 2.4GHz or 5GHz IEEE 802.11n standard. It adopts 256bit AES symmetric encryption for Controller to Server and Inter-Controller communications.

viii. AHDU-1160, AHDU-1260 and AHDU-1460 Ethernet network connection Port 1 and Port 2 are at 100Base-TX speed. They are configurable for port failover.

ix. RS-485 connectivity dedicated for AHDU-1160, AHDU-1260 and AHDU-1460 communication, enabling Port 1, Port 2 and Port 3 via Armatura RS-485 or OSDP V2.2. It is configurable for Port Redundancy dedicated on Port 2 and Port 3.

x. Ports of the AHDU-1160 consists of 2*TCP/IP, 3*RS-485, 2*Wiegand and 1*RS232.

xi. Ports of the AHDU-1260 consists of 2*TCP/IP, 3*RS-485, 4*Wiegand and 1*RS232.

xii. Ports of the AHDU-1460 consists of 2*TCP/IP, 3*RS-485, 4*Wiegand and 1*RS232.

xiii. AHDU-1160, AHDU-1260 and AHDU-1460 consists of inputs with 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

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10k. Dedicated panel tamper I/O input and the dedicated microchip control fire alarm I/O input and REX input for catastrophic situation.

xiv. AHDU-1160 outputs have 1 Relay, 1* Form-C with dry contacts.

xv. AHDU-1260 outputs have 2 Relay, 2* Form-C with dry contacts.

xvi. AHDU-1460 outputs have 4 Relay, 4*Form-C with dry contacts.

xvii. Normally open contact rating for AHDU-1160, AHDU-1260 and AHDU-1460 is at 5A @ 30VDC resistive.

xviii. Normally closed contact rating for AHDU-1160, AHDU-1260 and AHDU-1460 is at 5A @ 30VDC resistive.

xix. AHDU-1160, AHDU-1260 and AHDU-1460 on-board monitor has a 2.4-inch TFT monitor with a resolution of 321*240, for the quick view status of board, connected doors and for configuration information display.

xx. AHDU-1160, AHDU-1260 and AHDU-1460 on-board firmware supports dual firmware, access control mode (standard) and elevator control mode (optional and it requires extra license for activation).

xxi. AHDU-1160, AHDU-1260 and AHDU-1460 on-board webserver consists of a 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.

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xxii. Support access level of 100,000.

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

xxiv. AHDU-1160 support a maximum of 2 readers. AHDU-1260 supports a maximum of 4 readers and AHDU-1460 supports a maximum of 8 readers.

xxv. AHDU-1160, AHDU-1260 and AHDU-1460 support the maximum input of 384 using Armatura AHEB-1602 or AHEB-1616 controller.

xxvi. AHDU-1160, AHDU-1260 and AHDU-1460 support the maximum output of 385 using Armatura AHEB-1611 controller.

xxvii. Under access control mode, AHDU-1160, AHDU-1260 and AHDU-1460 support a maximum of 792 pieces of I/O Board, with 24 pieces of I/O Board directly connect via Armatura RS-485 connection. AHDU-1160, AHDU-1260 and AHDU-1460 also supports a maximum of 768 pieces of I/O Board (access control mode), through AHDU-1460 module over TCP/IP connections.

xxviii. Under elevator control mode, AHDU-1160 support 8 pieces of AHEB-1616 I/O Board directly connect via Armatura RS-485 for a maximum of 128 floors management. AHDU-1260 support 16 pieces of AHEB-0808 I/O Board directly connect via Armatura RS-485 for a maximum of 128 floors management. AHDU-1460 support 24 pieces of AHEB-1602 I/O Board directly connect via Armatura RS-485 for a maximum of 48 floors management.

xxix. RFID or Biometric reader interface input voltage requirements for AHDU-1160, AHDU-1260 and AHDU-1460 shall be 12 to 24 VDC ± 10% regulated, with a maximum current draw of 550 mA on each reader.

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xxx. RFID or Biometric reader interface maximum input current requirements for AHDU-1160, AHDU-1260 and AHDU-1460 shall be 12 to 24 VDC ± 10% regulated, with a maximum current draw of 550 mA on each reader.

xxxi. Tailored RFID or Biometric reader interface for AHDU-1160, AHDU-1260 and AHDU-1460 shall employ the RS-485 protocol with AES-128 encryption and OSDP secure channel.

xxxii. RFID or Biometric reader interface of AHDU-1160, AHDU-1260 and AHDU-1460 for OSDP Mode over a range of 9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit. For third party reader, it support OSDP V2.2 or above.

xxxiii. RFID or Biometric reader interface of AHDU-1160, AHDU-1260 and AHDU-1460 for Wiegand support up to 128 bits (read) ; support 26 / 34 / 37 bit (write) and other customized card formats.

xxxiv. RFID or Biometric reader interface of AHDU-1160, AHDU-1260 and AHDU-1460 for tamper input (Wiegand) TTL compatible, high > 3V, low < 0.5 V, 5 mA source or sink maximum.

xxxv. RFID or Biometric reader interface of AHDU-1160, AHDU-1260 and AHDU-1460 for LED output (Wiegand) TTL compatible, high > 3V, low < 0.5 V, 5 mA source or sink maximum.

xxxvi. AHDU-1160, AHDU-1260 and AHDU-1460 data inputs support RS-485, OSDP and Wiegand standards. The maximum RS-485 or OSDP cable length is 3937ft. (1200m) and the maximum Wiegand cable length is 328ft. (100m).

xxxvii. AHDU-1160, AHDU-1260 and AHDU-1460 I/O Expansion Board interface employs RS-485 protocol with AES-128 encryption and OSDP V2 secure channel.

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xxxviii. AHDU-1160, AHDU-1260 and AHDU-1460 I/O Expansion Board interface OSDP Mode over a range of 9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit.

xxxix. AHDU-1160, AHDU-1260 and AHDU-1460 I/O Expansion Board interface support data inputs consists of OSDP standards with a maximum cable length of 3937ft. (1200m).

xl. Elevator control interface of AHDU-1160, AHDU-1260 and AHDU-1460 employs RS-485 uses TLS 1.2, AES-128 encryption and OSDP V2.2 secure channel.

xli. Elevator control interface of AHDU-1160, AHDU-1260 and AHDU-1460 in OSDP Mode over a range of 9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit.

xlii. Elevator control interface of AHDU-1160, AHDU-1260 and AHDU-1460 support I/O Expansion Board of AHEB-1616 with dual function firmware for access control mode & elevator control mode for a maximum of 128 floors management.

xliii. Elevator control interface of AHDU-1160, AHDU-1260 and AHDU-1460 support I/O Expansion Board of AHEB-0808 with dual function firmware for access control mode & elevator control mode for a maximum of 128 floors management.

xliv. Elevator control interface of AHDU-1160, AHDU-1260 and AHDU-1460 support I/O Expansion Board of AHEB-1602 with dual function firmware for access control mode & elevator control mode for a maximum of 48 floors management.

xlv. Elevator control interface of AHDU-1160, AHDU-1260 and AHDU-1460 provide advanced elevator control functions with AHEB-1616 with dual

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function firmware for access control mode & elevator control mode. The advanced elevator control functions encompass automatic floor selection and floor selection history logging.

xlvi. Elevator control interface of AHDU-1160, AHDU-1260 and AHDU-1460 provide general elevator control function with AHEB-0808, AHEB-1602 and AHEB-1616 with dual function firmware for access control mode & elevator control mode.

xlvii. Elevator control interface of AHDU-1160, AHDU-1260 and AHDU-1460 support OSDP standards data input with the maximum cable length of 3937ft. (1200m).

xlviii. AHDU-1160, AHDU-1260 and AHDU-1460 power and relays cable shall require one twisted pair, 18 to 16 AWG.

xlix. AHDU-1160, AHDU-1260 and AHDU-1460 Ethernet cable shall require CAT-5 and a minimum length of 330 ft. (100m).

l. AHDU-1160, AHDU-1260 and AHDU-1460 Ethernet Failover Port shall require CAT-5 and a minimum length of 330 ft. (100m).

li. AHDU-1160, AHDU-1260 and AHDU-1460 employs RS-485 reader port over a range of 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, and the maximum cable length is 3937ft. (1200m).

lii. AHDU-1160, AHDU-1260 and AHDU-1460 employs RS-485 I/O Device Port over a range of 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, and the maximum cable length is 3937ft. (1200m).

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liii. AHDU-1160, AHDU-1260 and AHDU-1460 employs RS-485 Failover Port over a range of 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, and the maximum cable length is 3937ft. (1200m).

liv. AHDU-1160, AHDU-1260 and AHDU-1460 employs Wiegand Port shall require 20 AWG shielded Wiegand wire with 328ft. (100m).

lv. AHDU-1160, AHDU-1260 and AHDU-1460 have a dimension of 4.8” in width, 10.2” in length and 2.5” in height, which is equivalent to 122mm in width, 260mm in length and 62.5mm in height.

lvi. AHDU-1160 weighs 1.67lb which is equivalent to 756g.

lvii. AHDU-1260 weighs 2lb which is equivalent to 893g.

lviii. AHDU-1460 weighs 2.1lb which is equivalent to 947g.

lix. AHDU-1160, AHDU-1260 and AHDU-1460 are compatible with DIN rail mounting. Support DIN35 rail, compatible with UTA89 Din Rail Adapter for screwing on switchgear (Sold Separately) and wall mount.

lx. Housing material of AHDU-1160, AHDU-1260 and AHDU-1460 use ABS-PC and reach UL-94 V2 rating.

lxi. AHDU-1160, AHDU-1260 and AHDU-1460 operating and storage temperature ranges from -22°F to 158°F, which is equivalent to -30°C to 70°C.

lxii. AHDU-1160, AHDU-1260 and AHDU-1460 operating humidity ranges from 0% to 95% relative humidity in non-condensing environments.

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lxiii. AHDU-1160, AHDU-1260 and AHDU-1460 reached CE, FCC, UL. RoHS and UL294 certifications.

lxiv. AHDU-1160, AHDU-1260 and AHDU-1460 is compatible with Armatura One Security System.

lxv. AHDU-1160, AHDU-1260 and AHDU-1460 in TCP/IP Mode utilizes Ethernet with 100Base-TX speed.

lxvi. AHDU-1160, AHDU-1260 and AHDU-1460 in TCP/IP Protocol uses NTP, SNMP V2 /V3, 802.1X, VLAN, SSH, MQTT, IPv4, IPv6, DNS, DDNS.

lxvii. AHDU-1160, AHDU-1260 and AHDU-1460 in TCP/IP encryption complies with TLS1.2, AES-256 end to end secure communication channel.

lxviii. AHDU-1160, AHDU-1260 and AHDU-1460 in TCP/IP communication uses Spada Protocol over MQTT.

2. Maintenance and Support

AHDU Series, IP-based biometric door unit 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 AHDU Series, IP-based biometric door unit.

- User manual

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

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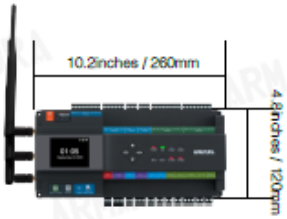
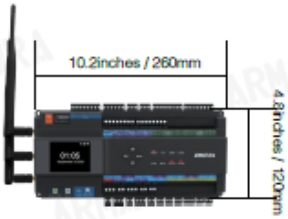
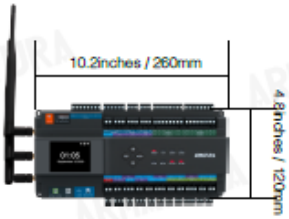
4. Technical Specifications



AHDU-1160



AHDU-1260



AHDU-1460

General Information			
	AHDU-1160	AHDU-1260	AHDU-1460
Primary Power	PoE 802.3at/af / 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	BLE 5.2 (Optional)		
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 3*RS-485 2*Wiegand 1*RS232	2*TCP/IP 3*RS-485 4*Wiegand 1*RS232	2*TCP/IP 3*RS-485 4*Wiegand 1*RS232
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 Firmware	Dual Firmware Support, Access Control Mode (Standard) & Elevator Control Mode (Optional, Require Extra License for Activation)		

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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		
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@Armatura ID / HID employee badge in Apple Wallet) 400,000 (1:N) (Dynamic QR Code)		
Fingerprint Capacity	50,000 (1:N) / 100,000 (1:1)		
Face Capacity	5,000 (1:N) / 100,000 (1:1)		
Palm Capacity	3,000 (1:N) / 5,000 (1:1)		
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 1 (Wiegand) with on-board IO	3 (OSDP over RS-485) or 2 (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	384 (using Armatura AHEB-1602 / AHEB-1616)		
Maximum Outputs	385 (using Armatura AHEB-1616)		
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		

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RFID / Biometrics Reader Interface			
	AHDU-1160	AHDU-1260	AHDU-1460
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			
	AHDU-1160	AHDU-1260	AHDU-1460
RS-485 Protocol	AES-128, OSDP V2 Secure Channel		
OSDP Mode	9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit.		
Data Inputs	OSDP standards supported. Maximum cable length: 3937ft. (1200m)		

Elevator Control Interface			
	AHDU-1160	AHDU-1260	AHDU-1460
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)		

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Cable Requirement			
	AHDU-1160	AHDU-1260	AHDU-1460
Power & Relays	One twisted pair, 18 to 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)		

Mechanical			
	AHDU-1160	AHDU-1260	AHDU-1460
Dimensions	4.8" W X 10.2" L X 2.5" H (122 X 260 X 62.5mm)		
Weight	1.67lb (756g)	2lb(893g)	2.1lb(947g)
DIN Rail 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			
	AHDU-1160	AHDU-1260	AHDU-1460
Operating Temperature	-22°F ~ 158°F (-30°C~70°C), Operating & Storage		
Operating Humidity	0-95% RHNC		
Certification(s)*	CE, FCC, UL, RoHS, UL294		
Security Rating	ABS-PC UL-94 V2		

Software Interface			
	AHDU-1160	AHDU-1260	AHDU-1460
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	Complies with TLS1.2, AES-256 end to end secure communication channel		
TCP/IP Communication	Spada Protocol over MQTT		
Supported Software	Armatura One Security System		

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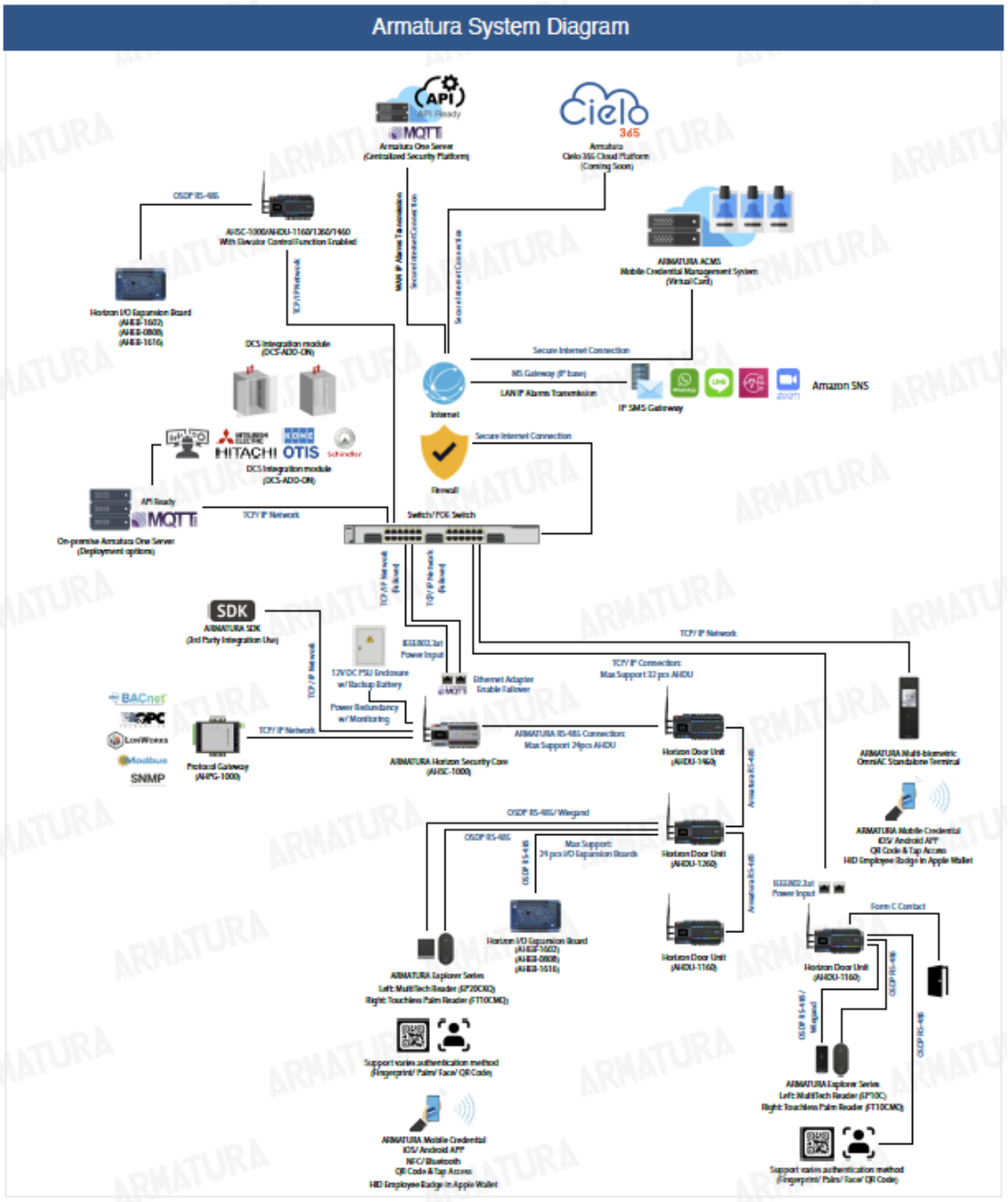
5. Armatura System Diagram



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6. Installation and Configuration

The AHDU Series, IP-based biometric door unit shall be installed and configured in accordance with the following requirements.

- The installation shall be conducted 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 AHDU Series, IP-based biometric door unit 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 AHDU Series, IP-based biometric door unit 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 communicate with mobile devices running iOS or Android operating systems for mobile credential verification.
- The controller shall support integration with LDAP and Active Directory for user authentication and management.

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- 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 enrolment 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.

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- 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 AHDU Series, IP-based biometric door unit:

- 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.

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