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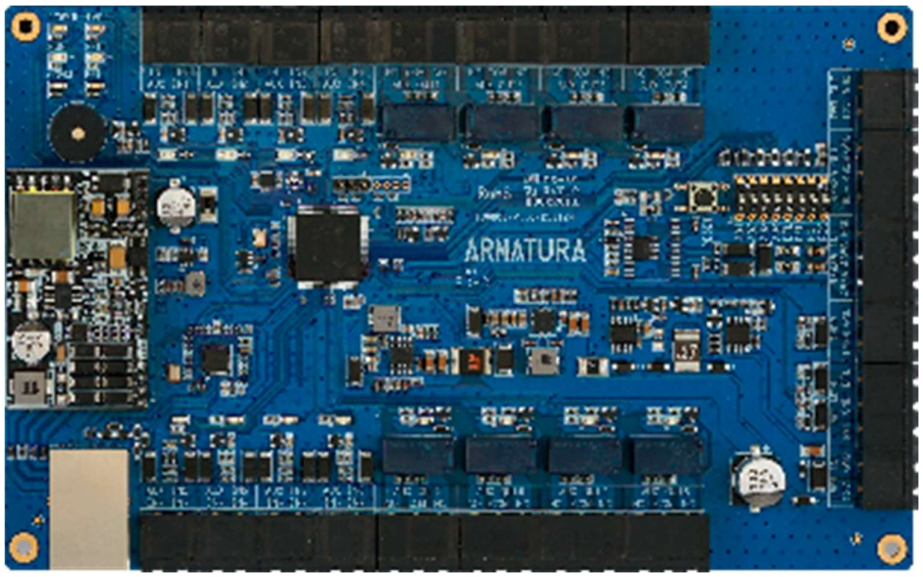
AHEB Series IO Expansion Board

POE

ENCRYPTION AES 256 ENCRYPTION

OSDP



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Section 1

1. Purpose

This architectural and engineering specifications document (A&E) outlines the minimum requirements for the design, supply, installation, and commissioning of the AHEB Series IO Expansion Board.

2. Goals and Objectives

This A&E specifications of AHEB Series IO expansion board aims to achieve the following goals and objectives:

- Provide a highly secure and reliable IO Expansion Board capabilities.
- Ensure scalability and flexibility to accommodate system requirements. Supports up to 384 inputs and 385 outputs under a single AHDU controller and ultimately supports up to 12,801 inputs or outputs under a combination of AHSC-1000 and AHDU series controllers.
- Meet or exceed relevant industry standards and regulations.
- Provide a clear and detailed specification for the design, supply, installation, and commissioning of the AHEB Series IO Expansion Board.

3. Key Features and Requirements

The AHEB Series IO expansion board shall have the following key features and requirements:

- The AHEB Series should communicate with AHSC1000 or AHDU series controller through OSDP v2.2 over RS485 and secured with AES 128/ TLS 1.2 (with AES256) encryption.
- The AHEB Series can be monitored & updated by the AHSC-1000 and AHDU controller series onboard web server through encrypted RS485 communication.
- Supports communication with the Armatura One security system and Cielo365 (coming soon) through the AHSC-1000 and AHDU controller series.

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- High scalability and supports up to 384 inputs and 385 outputs under a single AHDU controller and ultimately supports up to 12,801 inputs or outputs under a combination of AHSC-1000 and AHDU series controllers. All communication is secured by AES128 encryption.
- Offers supervised inputs. The AHEB IO expansion board is equipped with four state supervised inputs, which gradually avoids short circuit attacks. The AHEB expansion board can detect abnormal changes as low as 5% Ohms in the circuits and filter out all possible attacks. Isolated microchips independently manage REX inputs and dedicated fire alarm inputs to ensure these can normally work under extreme situations.
- Supports third-party integration. The AHEB IO expansion board provides various relay inputs and outputs. It is ideal for most kinds of security sensors. The Armatura One system offers a RESTful based API for the third-party software integration.
- Supports 9 to 24VDC inputs, which makes it the perfect choice for universal deployment, eliminating the need for extra power adaptors.
- Programmable Input States with Time Zone Management Supervised and programmable Inputs states (In-Active, Active, Short, Open) and input time can be configured through the Armatura One security platform and Cielo365 (coming soon).

4. Design and Implementation Constraints

- Certified OSDP V2.2, FCC, CE, RoHS and UL294 standards.
- The AHEB Series IO expansion board should be designed to operate in a wide range of environmental conditions, including temperature and humidity. The operating and storage temperature ranges from -30°C to 70°C, which is equal to -22°F to 158°F. Also, the operating humidity for the AHEB Series IO expansion board ranges from 0% to 95% (relative humidity non-condensing).

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- The AHEB Series IO expansion board should be designed to be easily integrated with the AHSC1000 or AHDU series Access Control System and other third-party systems.
- 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 implementation shall comply with relevant standards and regulations including Certified OSDP V2.2, FCC, CE, RoHS and UL294.
- The implementation shall ensure high-level cybersecurity should be designed to comply with industry standards.

5. Existing Standards and Regulations

The AHEB Series IO expansion board should comply with the following standards and regulations.

- Certified OSDP V2.2
- FCC Standards
- CE Standards
- RoHS Standards
- UL294 Standards

6. Submittals

The following submittals shall be provided.

- Product datasheets
- Installation guide
- Operation manuals
- Test reports

7. Qualifications

The manufacturer of the AHEB Series IO expansion board shall have the following qualifications.

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

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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

Key Features and Requirements

The AHEB Series IO expansion board shall have the following key features and requirements:

Cyber Security

The AHEB Series IO expansion board can communicate with AHSC1000 or AHDU series controller through OSDP V2.2 over RS-485. The communications between the AHEB I/O expansion board is secured with AES128/ TLS 1.2 (with AES256) encryption. Communications between the Armatura One server and web client are protected by HTTPS / TLS1.2 (AES256) or above. Enhanced encryption levels are provided by an additional crypto chip (Certified EAL6+ standard), providing dedicated storage and cryptographic functionality for all Armatura controllers.

Supervised Inputs

The AHEB Series IO expansion board is equipped with 4 state supervised inputs, which gradually avoids short circuit attacks. The AHEB Series can detect abnormal changes as low as 5% Ohms in the circuits and filter out all possible attacks. Also, the isolated microchips independently manage REX inputs and dedicated fire alarm inputs to ensure these can normally work under extreme situations.

Scalable

Supports up to 384 inputs and 385 outputs under a single AHDU controller and ultimately supports up to 12,801 inputs or outputs under a combination of AHSC-1000 and AHDU series controllers. All communication is secured by AES128 encryption.

3rd Party Integration

Supports various relay inputs and outputs. Suitable for most kinds of security sensors. Armatura One system provides a RESTful based API for 3rd Party Software Integration.

Innovative System Management Hierarchy

The AHEB Series IO expansion board can be monitored & updated by the AHSC-1000 and AHDU controller series onboard webserver through encrypted RS-485 communication. Supports communication with the Armatura One security system and Cielo365 (coming soon) through the AHSC-1000 and AHDU controller series. Besides, the universal voltage supports 9 to 24VDC inputs, which makes it the perfect choice for universal deployment, eliminating the need for extra power adaptors.

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Programmable Input States with Time Zone Management
Supervised and programmable Inputs states (In-Active, Active, Short, Open) and input time can be configured through the Armatura One security platform and Cielo365 (coming soon).

Maintenance and Support

The AHEB Series IO expansion boards 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.

Documentation

The supplier shall provide the following documentation for the AHEB Series IO expansion board.

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

Specifications

AHEB Series IO expansion board general information:

- There are three models of AHEB Series IO expansion board, including AHEB-0808, AHEB-1602 and AHEB-0216.
- AHEB-0808, AHEB-1602 and AHEB-0216 primary power requires 12 to 24 VDC ± 20%, with a maximum current draw of 550 mA.
- RS-485 connectivity of the AHEB-0808, AHEB-1602 and AHEB-0216 requires: Output should be RS-485 standard / OSDP V2.2 (Dedicated for AHSC-1000/ AHDU series controller communication). Input should be RS-485 Input standard / OSDP V2.2 (Dedicated for AHEB series IO expansion board communication).

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- AHEB-0808 has the following number of Ports:
  - 1 RS-485
  - 8 supervised inputs (AUX IN)
  - 8 relay outputs (AUX OUT)
  - 1 power Input (PWR IN)
  - 1 power output (PWR OUT)
  - 1 power detection (AC Fail)
  - 1 backup battery detection (BAT Fail)
  - 1 tamper input (TMPR)

- AHEB-1602 has the following number of Ports:
  - 1 RS-485
  - 16 supervised inputs (AUX IN)
  - 2 relay outputs (AUX OUT)
  - 1 power Input (PWR IN)
  - 1 power output (PWR OUT)
  - 1 power detection (AC Fail)
  - 1 backup battery detection (BAT Fail)
  - 1 tamper input (TMPR)

- AHEB-0216 has the following number of Ports:
  - 1 RS-485
  - 2 supervised inputs (AUX IN)
  - 16 relay outputs (AUX OUT)
  - 1 power Input (PWR IN)
  - 1 power output (PWR OUT)
  - 1 power detection (AC Fail)
  - 1 backup battery detection (BAT Fail)
  - 1 tamper input (TMPR)

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- AHEB-0808, AHEB-1602 and AHEB-0216 Inputs should have 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.
- AHEB-0808 has the following Outputs: 8 relays and 8 Form-C with dry contacts.
- AHEB-1602 has the following Outputs: 2 relays and 2 Form-C with dry contacts.
- AHEB-0216 has the following Outputs: 16 relays and 16 Form-C with dry contacts.
- When AHEB-0808, AHEB-1602 and AHEB-0216 use the RS-485 protocol and its interface with the AHSC-1000 and AHDU series controller requires a power supply of 12 to 24 VDC ± 20%, with a maximum current draw of 550 mA.
- When AHEB-0808, AHEB-1602 and AHEB-0216 use the OSDP mode and its interface with the AHSC-1000 and AHDU series controller requires 9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit and a cable with maximum 2,000 ft. (609.6m) in length.
- When AHEB-0808, AHEB-1602 and AHEB-0216 use Data inputs and its interface with the AHSC-1000 and AHDU series controller supports OSDP with a cable length maximum allowed is 500ft. (152m).
- The cable requirement of AHEB-0808, AHEB-1602, and AHEB-0216 for power and relays should be 12 to 24 VDC ± 20%, with a maximum current draw of 550 mA. It is also important to use appropriate cables for optimal performance.
- The cable requirement for AHEB-0808, AHEB-1602, and AHEB-0216 for RS-485 port should be 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 the maximum cable length allowed is 3937ft (1200m).
- The dimensions of AHEB-0808, AHEB-1602 and AHEB-0216 is 116mm (4.6”) in length, 193mm (7.6”) in width and 17.5mm (0.7”) in height.
- AHEB-0808, AHEB-1602 and AHEB-0216 weigh 165.3g or equivalent to 5.8oz.
- AHEB-0808, AHEB-1602 and AHEB-0216 supports wall mount.

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- The operating and storage temperature for AHEB-0808, AHEB-1602 and AHEB-0216 ranges from -30°C to 70°C, which is equal to -22°F to 158°F.
- The operating humidity for AHEB-0808, AHEB-1602 and AHEB-0216 ranges from 0% to 95% (relative humidity non-condensing).
- AHEB-0808, AHEB-1602 and AHEB-0216 security rating includes data storage encrypted with certified EAL6+ Crypto chipset.
- AHEB-0808, AHEB-1602 and AHEB-0216 reach the CE, FCC, RoHS and UL294 standards.
- AHEB-0808, AHEB-1602 and AHEB-0216 is compatible with the Armatura One Security System and Cielo365 (coming soon).

Installation and Configuration

The AHEB Series IO expansion board 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 IO expansion board 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 IO expansion board shall be tested and commissioned to ensure proper operation and compliance with the specified requirements.

Warranty and Support

The AHEB Series IO expansion board 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.

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Training and Documentation

The manufacturer shall provide the following training and documentation for the AHEB Series IO expansion board.

- User manuals and technical documentation for installation, configuration, and operation of the IO expansion board.
- 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 the specific certifications applicable to your location.

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