Overview

The purpose of this document is to specify the Architectural/Engineering and Bid criteria for the design, supply, installation, and commissioning of a BluSKY Access Control System. If you are looking to save this information, right click and print or save as a pdf.

Architecture and Engineering Specifications

Access Control Hardware

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Product Support

The first lines of support for BluBØX products are the third-party installing/servicing dealer and the online BluBØX Knowledge Base. Please check the Knowledge Base and/or contact the dealer with any questions or support requests, prior to contacting BluBØX.

Specifications

This document specifies the architectural/engineering and bid criteria for a Physical Access Control System (PACS) with a cloud-based Hosted Security Management System (HSMS) software that controls and monitors networked intelligent system controllers, card readers and personal identification devices, portal control devices, input/output interface hardware and power supplies.

Notes to Specifier

1. Where several alternative parameters or specifications exist, or where the Specifier has the option of inserting text, such choices are presented in **red bold text**.

2. Explanatory notes and comments are presented in **red hidden text**. To display the hidden text, see the Instructions at the end of this document.

3. Delete any item or paragraph that is not applicable to this project, renumber the paragraphs. Insert additional provisions as required for this project.

4. **Delete the hidden text specifier instructions prior to releasing or publishing this document.**

Document Disclaimer and Restrictions

Information in this document was current as of the time of publication, and subject to change without notice, Inc. For the most up-to-date information, visit www.BluBØX.com.
Section 28 14 00
ACCESS CONTROL HARDWARE

PART 1 GENERAL

1. 1.01. SUMMARY
1. Section Includes
   1. This section specifies ACCESS CONTROL HARDWARE components that communicate with and control devices for access control and intrusion detection, including relay interface control. Components in this section are controlled and monitored by a Hosted Security Management System (HSMS) as part of Physical Access Control System (PACS).

2. Products Furnished [or] Supplied But Not Installed Under This Section
   [SPECIFIER NOTE: Briefly list products that are only furnished/supplied by this section, but whose installation is specified in other sections. For example, these may be new products “installed by owner”. Delete if not used.]

3. Products Installed But Not Furnished [or] Supplied Under This Section
   [SPECIFIER NOTE: Briefly list products that are only installed by this section, but furnished/installled under other sections. For example, these may be new products “furnished by owner”.]

4. Related Requirements
   1. Section 28 14 00 Access Control.
      [SPECIFIER NOTE: This is a required BluBØX A&E specifications document for related access control hardware requirements.]

      [SPECIFIER NOTE: This is a required BluBØX A&E specifications document for related access control hardware requirements. Delete only if it is not relevant to the Project.]

5. Related Sections
   [SPECIFIER NOTE: Delete any item or paragraph not applicable in the section and renumber the paragraphs.]
   1. Section 07 00 00 – Thermal and Moisture Protection (Division 07)
      1. Section 07 84 00 – Firestopping.
         [SPECIFIER NOTE: This applies Common when cable is run through penetrations in fire-resistance-rated walls and flooring.]

   2. Section 14 00 00 – Conveying Equipment (Division 14)
      1. Section 14 21 00 – Electric Traction Elevators. Requirements for elevators.
      2. Section 14 24 00 – Hydraulic Elevators. Requirements for elevators.
      3. Section 26 00 00 – Electrical (Division 26)
[SPECIFIER NOTE: Common Work Results for Electrical, for interface and coordination with building electrical systems and distribution]

1. Section 26 05 11 – Requirements for Electrical Installations.
2. Section 26 05 21 – Low Voltage Electrical Power Conductors and Cables (600 Volts and Below).
3. Section 26 05 33 – Raceways and Boxes for Electrical Systems.
4. Section 26 05 41 – Underground Electrical Construction.
5. Section 26 08 00 – Commissioning of Electrical Systems.
6. Section 26 20 00 – Low Voltage Electrical Transmission.
7. Section 26 27 00 – Low Voltage Distribution Equipment.

4. Section 27 00 00 – Communications (Division 27)
   1. Section 27 05 00 – Common Work Results for Communications.
   2. Section 27 05 33 – Pathways for Communications.
   3. Section 27 08 00 – Commissioning of Communications.
   4. Section 27 10 00 – Structured Cabling.
   5. Section 27 15 00 – Communications Horizontal Cabling.
   6. Section 27 20 00 – Data Communications.
   7. Section 27 24 00 – Peripheral Data Communications Equipment.

5. Section 28 00 00 – Electronic Safety and Security (Division 28)
   1. Section 28 05 00 – Common Work Results for Electronic Safety and Security.
   [SPECIFIER NOTE: For general requirements that are common to more than one section in Division 28.]
   2. Section 28 05 13 – Conductors and Cables for Electronic Safety and Security.
   [SPECIFIER NOTE: For cabling between system computers, panels and remote devices]
   4. Section 28 05 28 – Pathways for Electronic Safety and Security, for conduit and raceway requirements.
   5. Section 28 08 00 – Commissioning of Electronic Safety and Security.
   [SPECIFIER NOTE: For requirements for commissioning, systems readiness checklists, and training.]

2. 1.02. REFERENCES

1. Abbreviations And Acronyms
   1. ADA: Americans with Disabilities Act.
   2. AES: Advanced Encryption Standard.
   3. IEEE: Institute of Electrical & Electronics Engineers.
   5. APB: Anti Passback.
   6. BDM – Battery Disconnect Module.
8. **EOL**: End of Line (resistance).
9. **FAI**: Fire Alarm Interface.
10. **F2F**: Frequency/Double Frequency.
11. **HSMS**: Hosted Security Management System (SaaS PACS Application).
12. **IP**: Internet Protocol.
14. **ITU**: International Telecommunication Union.
15. **LAN**: Local Area Network.
16. **LED**: Light Emitting Diode.
17. **LCD**: Liquid Crystal Display.
18. **NOC**: Network Operations Center.
19. **PACS**: Physical Access Control System.
20. **PIN**: Personal Identification Number.
21. **PoE**: Power over Ethernet.
22. **REX**: Request to Exit.
24. **SPI**: Serial Peripheral Interface.
25. **SSH**: Secure Shell.
26. **SSL**: Secure Socket Layer.
29. **WAN**: Wide Area Network.

2. **Definitions**

1. **Access Control**: A function or a system that restricts access to authorized persons only.
2. **Anti-Passback**: An access control security measure to prevent or discourage a cardholder from allowing another individual to use the cardholder’s card to gain entry to an access-controlled area immediately after the cardholder gains entry, without the cardholder first exiting the area. Enabling Hard and Soft Anti-Passback requires that each door providing entry into the restricted area have two readers, one outside the area (referred to as an Entry Reader) and one inside the area (an Exit Reader).
3. **Authentication**: A process that establishes the origin of information, or determines an entity’s identity.
4. **Authenticator**: A memory, possession, or quality of a person that can serve as proof of identity, when presented to a verifier of the appropriate kind. For example, passwords, cryptographic keys, and fingerprints are authenticators.
5. **Authorization**: A process that associates permission to access a resource or asset with a person and the person’s identifier(s) for the purpose of granting or denying access.
6. **Auto-Relock**: Door control feature that automatically relocks the door after access has been granted and the door has opened and closed, regardless of the time allowed for the door to momentarily remain unlocked to allow entry.
7. **Central Station**: A central alarm monitoring station service providing its subscribers with around
the clock real-time alarm monitoring and response services by trained operators and alarm investigators.

8. **Controller**: A purpose-built microcomputer that receives from the HSMS the door and cardholder data including access privileges and device configurations; communicates with reader and keypad access control devices and performs real-time access decisions; executes processes and procedures based upon user-selectable/user-defined triggers; and performs I/O operations with monitoring inputs and control relay outputs.

9. **CPU**: Central processing unit, the electronic circuitry within a computer that executes the computer’s firmware and the software running on the computer, processing data the computer receives from connected devices and systems.

10. **Credential**: Data assigned to a person or non-person entity (such as security system equipment) and used to identify that person or entity. For a person, the data may be printed on an access/ID card, such as a photograph, name, and other printed data, or stored electronically in the computer chip on a smart card, an RFID chip, or in the memory of a biometric reader. For electronic equipment, the data is securely stored in a digital certificate file, which contains equipment identification information as well as the allowed purposes for which the certificate may be used.

11. **Identifier**: A credential card, keypad personal identification number or code, biometric characteristic, or other unique identification entered as data into the entry-control database for the purpose of identifying an individual.

12. **Peripheral Interface Device**: An electronic device that provides an interface between a computer or system controller and peripheral equipment, such as a card reader.

13. **Power Controller**: Smart internet-capable device that is used to remotely monitor LifeSafety Power equipment.

14. **Power Distribution Module**: A programmable electronic device for the distribution of a continuous voltage to a security system electronic component, and to respond to a fire condition via its fire alarm interface for the control of facility egress locks into a fail secure or fail safe mode.

15. **Power Module**: Smart networked device that is able to communicate power status to, and be controlled by, a Power Controller.

16. **PACS**: Physical Access Control System.

17. **ROM**: Read-only memory. ROM data are maintained through losses of power.

18. **RS-232**: ANSI/TIA standard for asynchronous serial data communications between terminal devices. This standard defines a 25-pin connector and certain signal characteristics for interfacing computer equipment.


20. **Serial Peripheral Interface**: Full-duplex synchronous serial communication interface specification used for short distance communication, primarily in embedded systems.

21. **TCP/IP**: Transport control protocol/Internet protocol, the primary communications protocol of the Internet, also used as a communications protocol on private networks.

22. **UPS**: Uninterruptible power supply.

23. **Wiegand**: Patented magnetic principle that uses specially treated wires embedded in the credential card.

24. **Windows**: Microsoft® Windows®, a computer operating system by Microsoft Corporation.

25. **Workstation**: A network-connected personal computer intended to be used by a specific person or people for the performance of specific tasks, such as an alarm and video monitoring workstation; a tablet computer used for a similar function.

3. **Reference Standards**

https://knowledge.blub0x.com/Architecture_and_Engineering_Specifications/PACS_Hardware

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1. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.

2. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.

3. The publications listed below (including amendments, addenda, revisions, supplement, and errata) form a part of this specification to the extent referenced. The publications are referenced in specifications text by their basic designation only.

4. American National Standards Institute/International Code Council:

5. American National Standards Institute/Telecommunications Industry Association:
   1. ANSI/TIA-232-F Interface Between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange
   2. ANSI/TIA-568 set of commercial building telecommunications wiring standards:
      1. ANSI/TIA-568.0-D Generic Telecommunications Cabling for Customer Premises
      2. ANSI/TIA-568-C.0 Generic Telecommunications Cabling for Customer Premises
      3. ANSI/TIA-568-C.1 Commercial Building Telecommunications Cabling Standard
      4. ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standard
      5. ANSI/TIA-568-C.3 Optical Fiber Cabling Components
   3. ANSI/TIA-569-D Telecommunications Pathways and Spaces
   4. ANSI/TIA-606-B Administration Standard for Telecommunications Infrastructure
   5. ANSI/TIA-607-C Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
   6. ANSI/TIA-422-B Electrical Characteristics of Balanced Voltage Digital Interface Circuits

6. Canadian Standards Association (CSA)
   2. C22.2 107.1 – General Use Power Supplies.


8. European Union:
   1. Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS).

   2. FCC Part 68 – Connection of Terminal Equipment to the Telephone Network.

    1. FIPS 197 – Advanced Encryption Standard (AES).
    2. FIPS-201-1 – Personal Identity Verification (PIV) of Federal Employees and Contractors.
   1. GAO-03-8-02 – Security Responsibilities for Federally Owned and Leased Facilities.

12. Institute of Electronic and Electrical Engineers (IEEE)
   1. 802.3 Ethernet standards.

13. Institute of Electrical and Electronics Engineers (IEEE):
   1. 802.3 – Ethernet Standards.

   1. 11801 – Generic Cabling Standard.

15. Institute of Electrical and Electronics Engineers (IEEE):
   1. IEEE 802.3 Ethernet Standards.


   1. ISO/IEC 7810 Identification cards – Physical characteristics.

18. ITU Telecommunications Sector (ITU-T)
   1. X.509 – A framework for public key infrastructure (PKI) and privilege management infrastructure (PMI).


20. National Institute of Standards and Technology (NIST):
   1. FIPS PUB 140-2 – Security requirements for cryptographic modules protecting sensitive information.

21. Underwriters Laboratories (UL)
   1. UL294 – The Standard of Safety for Access Control System Units.
   2. UL603 – Power Supplies for Use with Burglar-Alarm Systems.
   4. UL1076 – Proprietary Burglar Alarm Units and Systems.
   5. UL1481 – Power Supplies for Fire-Protective Signaling Systems.
   6. UL2044 – Commercial Closed-Circuit Television Equipment.
   7. UL2572 – Mass Notification Systems.

22. Underwriters Laboratories of Canada (ULC)

23. U.S. Department of Justice:
   1. ADA Standards for Accessible Design 2010.
4.  1.03. SUBMITTALS
   1. Refer to 28 10 00 PHYSICAL ACCESS CONTROL SYSTEM, Part 1.
   2. Provide certificates of compliance with Section 1.8, Quality Assurance.

5.  1.04. MAINTENANCE MATERIAL SUBMITTALS
   1. Spare Parts
      1. At the conclusion of the work, submit a complete list of the manufacturer's recommended spare parts and components required to satisfactorily maintain and service the systems, as well as unit pricing for those parts and components.
      2. Extra Stock Materials
         1. Furnish extra materials described below as [Part of the Base Bid][Bid Alternate] before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Provide not less than one of each item listed below. Deliver extra materials to Owner marked on the outside of each original manufacturer's packaging with “SPARE EQUIPMENT FOR PHYSICAL ACCESS CONTROL SYSTEM”.
            1. Fuses: One for every 10; each type and rating.
            2. Card Readers: One spare for each type installed.
            3. Cameras: One spare for each type installed.

7.  1.05. QUALITY ASSURANCE
   1. Provide, install, and operate PACS as shown. Provide certification as required.
   2. Install and test PACS to ensure all components are fully compatible as a system and can be integrated with all associated security subsystems and HSMS.
   3. Qualifications
      1. Manufacturers
         1. Manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.
      2. Product
         1. Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.
      3. Contractors / Installers
         1. Contractor and sub-contractors shall be licensed to perform security installations in the state the work is to be performed.
         2. Contractor and sub-contractors shall have a minimum of five years' experience installing and servicing systems of similar scope and complexity.
         3. Provide four (4) current references from clients with systems of similar scope and complexity which became operational in the past three (3) years.
            1. At least three (3) of the references shall be utilizing the same system components, in a similar configuration as the proposed system.
            2. The references must include a current point of contact, company or agency name, address, telephone number, complete system description, date of completion, and approximate cost of the project. The owner reserves the option to visit the reference...
sites, with the site owner's permission and representative, to verify the quality of installation and the references' level of satisfaction with the system.

4. Utilize only factory-trained technicians to install, program, and service PACS equipment and services.
   1. Utilize factory-trained technicians to install, terminate and service controller/field panels and reader modules.
   2. Provide copies of system manufacturer certification for all technicians.
   3. Technicians shall have a minimum of five continuous years of technical experience in electronic security systems.

5. A local service facility is required.
   1. Facility shall be located within 60 miles of the project site.
   2. Facility shall maintain sufficient spare parts inventory to support the service requirements associated with this contract.
   3. Facility shall include appropriate diagnostic equipment to perform diagnostic procedures.
   4. Owner's Representative reserves the option of surveying the company's facility to verify the service inventory and presence of a local service organization.

6. Provide evidence that installing service company is an authorized dealer in good standing for HSMS manufacturer, and that it meets the manufacturer's technical certification requirements.

4. Service Qualifications
   [SPECIFIER NOTE: In the following paragraph use 4 hours for metropolitan areas and 8 hours for rural areas.]
   1. There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within [four] [OR] [eight] hours of receipt of notification that service is needed. Submit name and address of service organizations.

4. Certifications
   1. FIPS 201 Compliance Certificates
      [SPECIFIER NOTE: Delete and add components to the list as required by the project. Check http://www.fips201.com/ website for list of the approved products.]
      1. Provide Certificates for all software components and device types utilizing credential verification. Provide certificates for:
         1. Intelligent Controller.
         2. Peripheral Interface Device.
         3. [list devices and software]

8. 1.06. DELIVERY, STORAGE, AND HANDLING
   1. Deliver materials in manufacturer's labeled packages. Store and handle in accordance with manufacturer's requirements.
   2. Storage And Handling Requirements
      1. All equipment shall be stored in an environment compliant with the equipment manufacturers' recommendations.

9. 1.07. SITE CONDITIONS
   1. Ambient Conditions
2. Existing Conditions

[SPECIFIER NOTE: Identify site specific existing conditions. Such as the condition of existing work subject to rework or modification.]

10. **WARRANTY**

1. Manufacturer Warranty
   1. Provide manufacturer warranty that software and hardware products are free from defects in materials and/or workmanship for a period of one year from the date of installation.
   2. Provide periodic software and firmware updates during the warranty period.
   3. Provide a manufacturer limited "no questions asked" warranty for hardware products to be free of defects in material and workmanship, as follows:
      1. Two years – Controller; I/O Expansion Boards; Reader Interface Modules.

2. Special Warranty
   1. Refer to 28 10 00 PHYSICAL ACCESS CONTROL SYSTEM, Part 1, 1.09.B. Special Warranty.

**PART 2 PRODUCTS**

1. **OWNER-FURNISHED PRODUCTS**
   [SPECIFIER NOTE: Use this article to describe owner-furnished products to enable the Contractor to install them correctly, or to ensure compatibility or proper system operation. Delete if not applicable.]
   1. New Products
      1. <list new products furnished by owner>.
   2. Existing Products
      1. <list existing products/systems furnished by owner>.

2. **ACCESS CONTROLLER ASSEMBLY**
   1. Manufacturers
      2. Substitution Limitations: No substitutions permitted.
   3. Product Options

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**Controller Power Supply included. No Lock Power Supply.**

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- 120-2400
- 120-2300
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- EP1501
- EP1502
- EP2500
- EP4502
- MR51e
- MR50
- MR52

- 751-1200
- 752-2000
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1. **2.03 Access Control Panel – Door Network Controller**
1. Manufacturers
   2. Substitution Limitations: No substitutions permitted.

3. Product Options
   1. 120-1200 EP2500 Controller for new installations.
   2. 120-1400 EP4502 Controller for new installations.
   3. 125-2000 M5-IC Controller for Casi Micro5 retrofit installations(replaces Casi PX, PXN, PXN CPU controller).

2. Description
   1. The intelligent controller shall:
      1. Constitute an Ethernet ready, fault-tolerant host communication capable for the efficient management of a large network of access panels in any system design. The intelligent controller shall use an RS-232, 2-wire RS-485 or Ethernet link to connect to a Windows or Linux host.
      2. Once configured, the intelligent controller shall function independently of the host, and shall be capable of controlling access, managing alarms, interfacing with an array of hardware devices, all while providing the decision-making oversight that each system configuration requires.
      3. Independently execute elaborate user-selected/user-defined processes and procedures without host intervention.
      4. Provide centralized biometric template management
      5. Support a wide range of reader technologies, including Wiegand, magnetic stripe and biometric 2-wire RS-485 connectivity and capable of supporting up to 64 doors in paired and or alternate reader configurations with peripheral interface devices.

3. Performance / Design Criteria
   1. Technical Specifications
      1. Primary Power:
         1. Twelve to twenty-four volts of direct current (12-24VDC) +/- 10 percent, three hundred milliamperes (300mA) maximum.
         2. Twelve to twenty-four volts of direct current (12-24VDC) +/- 10 percent, three hundred milliamperes (500mA) maximum (EP4502 controller only).
      2. Communication Ports:
         1. Host Port 0: 10/100 Ethernet.
         2. Host Port 1: RS-232, 2-wire RS485 or Ethernet adapter (120-1200 controller only).
      3. Inputs: Two dedicated: tamper and power monitor
      4. Temperature: zero to seventy degrees Centigrade (0 to 70° C) operational, minus fifty-five to eighty-five degrees Centigrade (-55 to 85° C) storage.
      5. Humidity: ten to ninety-five percent (10 to 95 percent) relative humidity, non-condensing (RHNC)
      6. Standards:
         1. UL294 Recognized, CE Compliant, ROHS.
3. BACNet Compliant, PSIA, SNMP, OSDP and OSDP SC (EP4502 controller only)

7. Connectivity:
   1. Primary Port: 10/100 Ethernet.
   2. IP Server, IP Client, DHCP Client.
   3. HTTP, TLS, X.509.

2. Capacities
   1. Access Control:
      1. Cardholder capacity:
         1. EP2500: 600,000.
         2. EP4502: 2,000,000.
         3. M5-IC: 600,000.
      2. 50,000 Transaction buffer.
      3. If/Then Macro capability.

   2. Card Formats:
      1. Eight active card formats per intelligent controller.
      2. Entire card number reported on invalid read.
      3. 19 digit (64-bit) User ID and 15 digit PIN numbers maximum.
      4. PIV-II, CAC, TWIC card compatible.
      5. Up to 200 bits with large encoded ID feature (EP4502 controller only)
      6. 32 Access Levels per cardholder.
      7. Activation/Deactivation Dates.

   3. Card Reader Functions
      1. Multiple card format support by reader.
      2. Paired reader support.
      3. Alternate reader support.
      4. Elevator support.
      5. Turnstile support.
      6. Biometric device support.
      7. Open Supervised Device Protocol (OSDP) compliant (120-1200 controller only).
      8. Occupancy count.
     10. Anti-passback support
         1. Area-based, reader-based, or time based.
         2. Nested area, hard, soft, or timed forgiveness.
     11. Supports host-based approval rules.
     12. Keypad support with programmable user commands, card input.
4. Database Functions
   1. Configurable card database.
   2. Large Encoded Card ID (freeform fields up to 245 bits) (125-2000 controller only).
   3. Supports up to nineteen (19) digital card numbers.
   4. Supports pin codes up to fifteen (15) digits.
   5. Programmable card activation and deactivation times and dates.
   6. Card issue code, ADA and VIP flags (up to 32 bits); PIV (75 bits); Smart Card (200 bits).
   7. Up to 128 access levels per user.
   8. Ability to track people and objects.

5. Intrusion Alarm Functions
   1. Supports entry delays and exit delays.
   2. Area monitoring.
   4. Provides control and alarm processing from the keypad.

6. Time based scheduling: (125-2000 controller only)
   1. Supports more than 255 time zones with up to 12 intervals.
   2. Holiday schedules configured with start date and duration intervals.
   3. Holidays may span consecutive days.
   4. Supports daylight savings time.
   5. Time zone overrides – Onetime events & Honor Day of Week.
   6. Temporary ACR override.

7. Inputs (EP4502 only)
   1. 8 general purpose: programmable circuit type
   2. Two dedicated: tamper and power monitor

8. Alarm Management: (EP4502 controller only)
   1. Normally open/Normally closed, Unsupervised, Supervised
   2. Standard or custom end-of-line resistances

9. Reader Ports: (EP4502 controller only)
   1. 2 Reader Ports.

10. Wireless Reader Support: (125-2000 controller only):
    1. Ingersol Rand – Schalge AD300 & AD400.
    2. SALTO SALLIS.
    3. ASSA ABLOY – Aperio 1 to 8 lock support.

2. 2.04 ACCESS CONTROL PANEL – SINGLE DOOR NETWORK CONTROLLER
   1. Manufacturers

   2. Product Options
1. 120-1000  EP1501

2. Description
   1. The intelligent controller shall provide decision making, event reporting, and database storage for hardware platform. Two reader interfaces shall provide control for one door and capable of supporting up to an additional 16 doors in paired and or alternate reader configurations with peripheral interface devices.
   2. The controller shall communicate with the host via on-board 10BaseT/100BaseTX Ethernet port.
   3. One physical barrier shall be controlled. Each reader port shall accommodate a read head that utilizes Wiegand, magnetic stripe, or one or two wire LED controls, and buzzer control. One reader port will also accommodate two-wire RS-485 electrical signaling standards.

3. Performance / Design Criteria
   1. Technical Specifications
      1. Power Input:
         1. Power over Ethernet (PoE) power input 12.95 watts, compliant to IEEE 802.3af.
         2. Twelve volts of direct current (12VDC) plus/minus 10 percent 900 mA maximum power supply, 200 mA minimum power.
      2. Power Output: 12 Volts DC at 650mA including reader and AUX output.
      3. Reader Interface: power via PoE, 12VDC plus/minus 10 percent regulated or local power supply (12VDC). PTC limited to 150mA maximum.
      4. Inputs: Two general purpose programmable circuit type and dedicated tamper.
      5. Outputs: Two relays – Form-C, 2 Amp, 30 volts direct current.
      6. Readers Ports 2: One transistor-transistor logic (TTL) reader port and one TTL or 2-wire RS-485 reader port.
      8. LED: TTL, two wire or one wire bi-color support.
      10. Temperature: 0 to 77 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
      11. Humidity: ten to ninety-five percent (10 – 95 percent) relative humidity, non-condensing (RHNC).
      13. Connectivity: Primary Port: 10/100 Ethernet.
   2. Door Control: One physical barrier can be controlled using single or paired readers.
      1. Two-reader ports:12VDC regulated power, 150mA maximum.
         1. Port 1: clock/data, data-1/data-0, or 2-wire RS-485 (2 devices).
      2. Two (2) programmable inputs, Two (2) relays, diagnostic LEDs.
   3. Access Control:
      1. 240,000 Cardholder capacity, 50,000 Transaction buffer, 32 Access Levels per cardholder, 19 digit (64-bit) user ID and 15 digit PIN numbers maximum, Activation and Deactivation dates, If/Then Macro capability.
   4. Card Formats:
      1. Eight active card formats per intelligent controller.
2. 19 digit (64-bit) User ID and 15 digit PIN numbers maximum.
3. PIV-II, CAC, TWIC card compatible.

5. Card Reader Functions:
   1. Multiple card format support by reader.
   2. Paired reader support.
   3. Alternate reader support.
   4. Elevator support.
   5. Turnstile support.
   6. Biometric device support.
   7. Open Supervised Device Protocol (OSDP) compliant.
   8. Occupancy count.
   10. Anti-passback support.
   11. Area-based, reader-based, or time based.
       1. Nested area, hard, soft, or timed forgiveness.
       2. Anti-passback support, both reader and time based.
   12. Supports host-based approval rules.
   13. Keypad support with programmable user commands, card input.
   14. Shunt relay support.
   15. Strike follower relay support.

6. Database Functions:
   1. Configurable card database.
   2. Supports up to nineteen (19) digital card numbers.
   3. Supports pin codes up to fifteen (15) digits.
   4. Programmable card activation and deactivation times and dates.
   5. Card issue code, ADA and VIP flags (up to 32 bits); PIV (75 bits); Smart Card (200 bits).
   6. Up to 128 access levels per user.
   7. Ability to track people and objects.

7. Intrusion Alarm Functions:
   1. Supports entry delays and exit delays.
   2. Area monitoring
   3. Standard alarm masking
   4. Provides control and alarm processing from the keypad

3. **ACCESS CONTROL PANEL – TWO DOOR NETWORK CONTROLLER**
   1. Manufacturers
      1. BluBØX, Inc., 9 Bartlett Street, Suite 334, Andover, MA 01811. Phone: (844) 425-8209, 
         www.BluBOX.com
      2. Substitution Limitations: No substitutions permitted.
3. Product Options
   1. 120-1100 EP1502

2. Description
   1. The intelligent controller shall provide decision making, event reporting, and database storage for
      hardware platform. Two reader interfaces shall provide control for two doors and capable of supporting
      up to an additional 62 doors in paired and or alternate reader configurations with peripheral interface
      devices.
   2. The controller shall communicate with the host via on-board 10BaseT/100BaseTX Ethernet port or use
      an RS-232 link.
   3. Two physical barriers shall be controlled. Each reader port shall accommodate a readhead that utilizes
      Wiegand, magnetic stripe, or 2-wire RS-485 electrical signaling standards, one or two wire LED
      controls, and buzzer control.

3. Performance / Design Criteria
   1. Primary Power: twelve to twenty four volts of direct current
      1. (12-24VDC) +/- 10 percent, 500mA maximum.
   2. Communications Ports:
      1. Host Port 0: 10/100 Ethernet.
   3. Inputs:
      1. Eight general purpose – programmable circuit type.
      2. Two dedicated: tamper and power monitor.
   4. Outputs: Four relays – Form-C, 5 Amp, 30 volts direct current.
   5. Readers Ports: Two reader ports.
      1. Unregulated pass-through (150 mA maximum) or regulated 12Vdc.
      2. Signaling Clock and Data, Wiegand or 2-wire RS-485.
   7. LED: Two-wire or one-wire bicolor support.
   8. Buzzer: One-wire LED mode.
   9. Temperature: zero to seventy degrees Centigrade (0-70° C) operational, -55 to 85 degrees Centigrade
      (-55 – 85° C) storage.
   10. Humidity: ten to ninety-five percent (10 – 95 percent) relative humidity, non-condensing (RHNC).
   11. Standards:
      1. UL294 Recognized, CE Compliant, ROHS.
   13. Door Control:
      1. Two-reader ports: Clock and Data, Wiegand, or RS-485.
      2. Eight programmable inputs, four relays, diagnostic LEDs.
   14. Access Control:
1. 240,000 Cardholder capacity, 50,000 Transaction buffer, 32 Access Levels per cardholder, 19 digit (64-bit) user ID and 15 digit PIN numbers maximum, Activation and Deactivation dates, If/Then Macro capability

15. Card Formats:
   1. Eight active card formats per intelligent controller.
   2. 19 digit (64-bit) User ID and 15 digit PIN numbers maximum.
   3. PIV-II, CAC, TWIC card compatible.

16. Card Reader Functions:
   1. Multiple card format support by reader.
   2. Paired reader support.
   3. Alternate reader support.
   4. Elevator support.
   5. Turnstile support.
   6. Biometric device support.
   7. Open Supervised Device Protocol (OSDP) compliant.
   8. Occupancy count.
   10. Anti-passback support.
   11. Area-based, reader-based, or time based.
   12. Nested area, hard, soft, or timed forgiveness.
   14. Keypad support with programmable user commands, card input.
   15. Shunt relay support.
   16. Strike follower relay support.

17. Database Functions:
   1. Configurable card database.
   2. Supports up to nineteen (19) digital card numbers.
   3. Supports pin codes up to fifteen (15) digits.
   4. Programmable card activation and deactivation times and dates.
   5. Card issue code, ADA and VIP flags (up to 32 bits); PIV (75 bits); Smart Card (200 bits).
   6. Up to 128 access levels per user.
   7. Ability to track people and objects.

18. Intrusion Alarm Functions:
   1. Supports entry delays and exit delays.
   2. Area monitoring.
   4. Provides control and alarm processing from the keypad.

4. Manufacturers

2. Substitution Limitations: No substitutions permitted.

3. Product Options
   1. 120-2300 MR50

5. Description
   1. The peripheral interface device shall provide a solution for interfacing to a TTL/Wiegand, or 2-wire RS-485 type reader and door hardware. It shall also provide a tri-state LED control and buzzer control, two relay outputs and two programmable inputs.

6. Performance / Design Criteria
   1. Primary Power: 12-24 Volts DC +/- 10 percent, 150mA maximum; 12Vdc at 110mA nominal; 24Vdc at 60mA nominal.
   2. Communication: 2-wire RS-485, 4,000 feet using Belden 9841 cable.
   3. Inputs:
      1. Two general purpose – programmable circuit type.
      2. One dedicated: tamper.
   4. Outputs:
      1. Two relays:
         1. Form-C, 5 Amp, 28 volts direct current.
         2. Form-C 1 Amp, 28 volts direct current.
      5. Readers Port: One reader port
         1. Power input voltage pass through.
         2. Signaling clock/data, data-1/data-0, or 2-wire RS-485 (2 devices).
   6. LED: Two-wire or one-wire bicolor support.
   7. Buzzer: One-wire LED mode.
   8. Temperature: -40 to 75 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
   9. Humidity: 10 to 95 percent RHNC.
   10. Standards:
        1. UL294 Recognized, CE Compliant, ROHS Connectivity: 10/100 Ethernet, RS-232, Dial-up.
   12. Door Control:
        1. Clock/data, data-1/data-0, or 2-wire RS-485.
        2. Two programmable inputs.
        3. Two relay outputs.
   13. Card Formats:
        1. Eight active card formats per intelligent controller.
        2. 19 digit (64-bit) User ID and 15 digit PIN numbers maximum.
        3. PIV-II, CAC, TWIC card compatible.
   14. Card Reader Functions:
1. Multiple card format support by reader.
2. Biometric device support.
3. Keypad support with programmable user commands, card input.

15. Database Functions:
   1. Supports up to nineteen (19) digital card numbers.
   2. Supports pin codes up to fifteen (15) digits.

16. Intrusion Alarm Functions:
   1. Supports entry delays and exit delays.

17. Offline mode operation
   1. Door mode
      1. Unlocked, locked, facility code only
   2. Relay Mode
      1. Programmable for offline conditions

4. **ACCESS CONTROL SUB PANEL – SINGLE CARD READER NETWORK PANEL**
   1. Manufacturers
      2. Substitution Limitations: No substitutions permitted.
      3. Product Options
         1. 120-2400 MR51e
   2. Description
      1. The peripheral interface device shall be a network connected, single door, PoE capable interface panel that provides an integration solution when a network connection to the door is required.
      2. The reader ports shall be capable of supporting TTL/Wiegand/RS-485 type readers.
   3. Performance / Design Criteria
      1. Power Input: PoE at 12.95 watts, compliant to IEEE 802.3AF or a 12Vdc+/- 10 percent @ 900 mA power supply.
      2. Power Output: 12 Volts DC at 700mA including reader and AUX output.
      3. Communication: Ethernet, 10BaseT/100BaseTX, AES 128 bit encrypted.
      4. Inputs: Four programmable inputs with optional end-of-line resistor.
      5. Outputs: Two programmable relays – Form-C, 5 Amp, 28 Vdc.
   6. Reader Interface:
      1. Reader Interface: power via PoE, 12Vdc plus/minus 10 percent or local power supply. PTC limit is 150mA maximum.
      2. Signaling: 2 Ports: one is TTL and one is TTL or 2-wire RS-485.
      3. LED: Two-wire or one-wire bicolor support.
      4. Buzzer: One wire mode.
   7. Temperature: 0 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
   8. Humidity: 10 to 95 percent RHNC.
9. Standards: UL 294 recognized, CE compliant, RoHS.RoHS.

10. Card Formats:
    1. Eight active card formats per intelligent controller.
    2. 19 digit (64-bit) User ID and 15 digit PIN numbers maximum.
    3. PIV-II, CAC, TWIC card compatible.

11. Card Reader Functions:
    1. Multiple card format support by reader.
    2. Paired reader support.
    3. Alternate reader support.
    4. Elevator support.
    5. Turnstile support.
    6. Biometric device support.
    7. OSPD protocol support.
    8. Keypad support with programmable user commands, card input.

12. Database Functions:
    1. Supports up to nineteen (19) digital card numbers.
    2. Supports pin codes up to fifteen (15) digits.

13. Intrusion Alarm Functions:
    1. Supports entry delays and exit delays.
    2. Provides control and alarm processing from the keypad.

14. Offline mode operation:
    1. Door mode:
        1. Unlocked, locked, facility code only.
    2. Relay Mode:
        1. Programmable for offline conditions.

5. **ACCESS CONTROL SUB PANEL – DUAL CARD READER RS-485**

1. Manufacturers

2. Substitution Limitations: No substitutions permitted.

3. Product Options
   1. 120-2500 MR52

2. Description
   1. The intelligent controller sub-panel shall:
   2. Interface to TTL/Wiegand/RS-485 type readers and door hardware.
   3. Accept data from a reader with clock/data, Wiegand or RS-485 signaling.
   4. Provide a tri-stated LED control and buzzer control.
   5. Provide six Form-C relay outputs and eight supervised inputs for monitoring.

3. Performance / Design Criteria
1. Primary Power:
   1. 12-24VDC plus/minus 10 percent, 550mA maximum, plus reader current.
   2. 12VDC at 450mA nominal, plus reader current.
   3. 24VDC at 270mA nominal, plus reader current.
2. Communication:
   1. 2-wire RS-485 up to 4,000 feet using Belden 9841.
   2. Reader Interface: two reader ports, data card/keypad, clock/data, data-1/data-0, or 2-wire RS-485.
   3. LED: one-wire bi-color LED support or two-wire.
3. Keypad: 8-bit Mercury, 8-bit Dorado, or 4-bit HID.
4. Reader Power:
   1. Pass-through or 12Vdc regulated power, 125mA each reader.
5. Inputs:
   1. Eight general purpose programmable type and two dedicated for tamper and power monitor.
6. Outputs:
   1. Six relays – Form-C, 5 Amps at 28Vdc.
7. Temperature:
   1. 0 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
8. Humidity:
   1. 10-95 percent RHNC.
9. Standards: UL 294 recognized, CE compliant, RoHS.
10. Card Formats:
    1. Eight active card formats per intelligent controller.
    2. 19-digit (64-bit) User ID and 15-digit PIN numbers maximum.
    3. PIV-II, CAC, TWIC card compatible.
11. Card Reader Functions:
    1. Multiple card format support by reader.
    2. Paired reader support.
    3. Alternate reader support.
    4. Turnstile support.
    5. Biometric device support.
    6. Shunt relay support.
    7. Keypad support with programmable user commands, card input.
    8. Strike follower relay support.
12. Database Functions:
1. Supports up to nineteen (19) digital card numbers.

13. Intrusion Alarm Functions:
   1. Supports entry delays and exit delays.
   2. Provides control and alarm processing from the keypad.

14. Offline mode operation:
   1. Door mode:
      1. Unlocked, locked, facility code only.
   2. Relay Mode:
      1. Programmable for offline conditions.

6. **ACCESS CONTROL SUB PANEL – 16 GENERAL PURPOSE INPUT PANEL**
   1. A. Manufacturers
      2. Substitution Limitations: No substitutions permitted.
      3. Product Options
         1. 120-2100 MR16in
   2. Description
      1. The peripheral interface device shall be used to monitor sixteen (16) inputs.
   3. Performance / Design Criteria
      1. Primary Power:
         1. 12-24Vdc plus/minus 10 percent, 350mA maximum.
         2. 12Vdc at 300mA nominal.
         3. 24Vdc at 220mA nominal.
      2. Communication: 2-wire RS-485, 4,000 feet using Belden 9841.
      3. Inputs: sixteen (16) general purpose programmable type and two dedicated for tamper and power monitor.
      4. Outputs: two (2) relays – Form-C, 5 Amp, 28Vdc.
      5. Temperature: 0 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
      6. Humidity: 10 to 95 percent RHNC.
      7. Standards: UL 294 recognized, CE compliant, RoHS.RoHS.
      8. Offline mode operation:
         1. Relay Mode:
            1. Programmable for offline conditions.

7. **ACCESS CONTROL SUB PANEL – 16 OUTPUT PROGRAMMABLE PANEL**
   1. A. Manufacturers
      2. Substitution Limitations: No substitutions permitted.
      3. Product Options
2. Description
The peripheral interface device shall be used to provide sixteen (16) dry contact outputs to auxiliary equipment such as locks or to activate alarms.

3. Performance / Design Criteria
1. Primary Power:
   1. 12-24Vdc plus/minus 10 percent, 350mA maximum.
   2. 12Vdc at 300mA nominal.
   3. 24Vdc at 220mA nominal.
2. Communication: 2-wire RS-485, 4,000 feet using Belden 9841(MR-16out and M5-16DO only).
3. Inputs: two (2) dedicated for tamper and power monitor.
4. Outputs: sixteen (16) relays – Form-C, 5 Amp at 28Vdc(MR-16 only), (16) Transistor switches, .04A @ 24VDC (max) (M5-16DO only), (16) relays – Form-C, 2 Amp at 40 Vdc (M5-16DOR only).
5. Temperature: 0 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
6. Humidity: 10 to 95 percent RHNC.
7. Standards: UL 294 recognized, CE compliant, RoHS.RoHS.
8. Offline mode operation
   1. Relay Mode:
   2. Programmable for offline conditions.

8. ACCESS CONTROL SUB PANEL – READER BOARD TTL/WIEGAND/F2F FOR MICRO 5

Manufacturers

1. Product Options
   1. 125-1600 M5-2RP.
2. Substitution Limitations: No substitutions permitted.
4. Description
The peripheral interface device shall provide a solution for interfacing to TTL/Wiegand/F2F and Supervised F2F type readers and door hardware. The intelligent controller shall accept data from a reader with clock/data, Wiegand or F2F signaling; provide a tri-stated LED control and buzzer control. It shall also provide four Form-C relay outputs and six supervised inputs for monitoring. The controller shall communicate RS-485/ provided by backplane of a legacy Micro 5 enclosure and be physically compatible with the Micro 5 system architecture.

5. Performance / Design Criteria
1. Primary Power:
   1. 12-24VDC plus/minus 10 percent, 550mA maximum, plus reader current.
   2. 12VDC at 450mA nominal, plus reader current.
   3. 24VDC at 270mA nominal, plus reader current.
2. Communication: RS-485/ provided by backplane.
   1. Reader Interface: two reader ports, data card/keypad, clock/data, data-1/data-0, or 2-wire
RS-485.
1. LED: one-wire bi-color LED support or two-wire.
2. Buzzer: one-wire LED mode.
3. Keypad: 8-bit Mercury, 8-bit Dorado, or 4-bit HID.
4. Reader Power:
   1. Pass through or 12Vdc regulated power, 125mA each reader.
5. Inputs: four general purpose inputs: 2 per reader port.
6. Outputs: 6 outputs, Form C, 2A@30 Vac/dc.
7. Temperature: 0 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
8. Humidity: 5-95 percent RHNC.
9. Standards: UL 294 recognized, CE compliant, RoHS.
10. Card Formats:
    1. Eight active card formats per intelligent controller.
    2. 19 digit (64-bit) User ID and 15 digit PIN numbers maximum.
    3. PIV-II, CAC, TWIC card compatible.
11. Card Reader Functions:
    1. Multiple card format support by reader.
    2. Paired reader support.
    3. Alternate reader support.
    4. Turnstile support.
    5. Biometric device support.
    6. Keypad support with programmable user commands, card input.
    7. Shunt relay support.
    8. Strike follower relay support.
12. Database Functions:
    1. Supports up to nineteen (19) digital card numbers.
13. Intrusion Alarm Functions:
    1. Supports entry delays and exit delays.
    2. Provides control and alarm processing from the keypad.
14. Offline mode operation:
    1. Door mode
       1. Unlocked, locked, facility code only.
    2. Relay Mode
       1. Programmable for offline conditions.
9. **ACCESS CONTROL SUB PANEL – 8 READER F2F BOARD FOR MICRO 5**
1. Manufacturers
2. Substitution Limitations: No substitutions permitted.

3. Product Options
   1. 125-1800 M5-8RP.

2. Description
   The peripheral interface device shall provide a solution for interfacing up to 8 Casi F2F or Supervised F2F readers. It shall also provide eight transistor switched outputs and four supervised inputs for monitoring. The controller shall communicate via RS-485/provided by backplane.

3. Performance / Design Criteria
   1. Primary Power:
      1. 12-24VDC plus/minus 10 percent, 550mA maximum, plus reader current.
      2. 12VDC at 450mA nominal, plus reader current.
      3. 24VDC at 270mA nominal, plus reader current.
   2. Communication: RS-485/provided by backplane.
      1. Reader Interface: eight reader ports F2F and Supervised F2F.
   3. Keypad: 8-bit Mercury, 8-bit Dorado, or 4-bit HID.
   4. Reader Power:
      1. Pass through or 12Vdc or 5Vdc regulated power, 300mA each reader, PTC fused.
   5. Outputs: 8 relay – Transistor switches, .01Amps at 12Vdc.
   6. Temperature: 0 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
   7. Humidity: 10-95 percent RHNC.
   8. Standards: UL 294 recognized, CE compliant, RoHS.RoHS.
   9. Card Reader Functions:
      1. Multiple card format support by reader.
      2. Paired reader support.
      3. Alternate reader support.
      4. Turnstile support.
      5. Biometric device support.
      6. Keypad support with programmable user commands, card input.
      7. Shunt relay support.
      8. Strike follower relay support.
   10. Offline mode operation:
       1. Door mode:
          1. Unlocked, locked, facility code only.
       2. Relay Mode:
          1. Programmable for offline conditions.

4. 2.12. ACCESS CONTROL SUB PANEL – READER BOARD TTL/WIEGAND/RS485 FOR MICRO 5
   1. Manufacturers
2. Substitution Limitations: No substitutions permitted.

3. Product Options
   1. 125-1700 M5-2SRP.

2. Description
   The peripheral interface device shall provide a solution for interfacing to Casi Supervised, TTL/ Wiegand/RS-485 type readers and door hardware. The intelligent controller shall accept data from a reader with clock/data, Wiegand or RS-485 signaling, provide a tri-stated LED control and buzzer control. It shall also provide six Form-C relay outputs and four supervised inputs for monitoring. The controller shall communicate via RS-485/provided by backplane.

3. Performance / Design Criteria
   1. Primary Power:
      1. 12-24VDC plus/minus 10 percent, 550mA maximum, plus reader current.
      2. 12VDC at 450mA nominal, plus reader current.
      3. 24VDC at 270mA nominal, plus reader current.
   2. Communication: RS-485/provided by backplane:
      1. Reader Interface: two reader ports, data card/keypad, clock/data, data-1/data-0, or 2-wire RS-485, F2F and osdp.
         1. LED: one-wire bi-color LED support or two-wire.
         2. Buzzer: one-wire LED mode.
      3. Keypad: 8-bit Mercury, 8-bit Dorado, or 4-bit HID.
   4. Reader Power:
      1. Pass through or 12Vdc or 5Vdc regulated power, 300mA each reader, PTC fused.
   5. Inputs: four general purpose programmable type and two dedicated for tamper and power monitor.
   7. Temperature: 0 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
   8. Humidity: 10-95 percent RHNC.
   9. Standards: UL 294 recognized, CE compliant, RoHS.RoHS.
   10. Card Formats:
       1. Eight active card formats per intelligent controller.
       2. 19 digit (64-bit) User ID and 15 digit PIN numbers maximum.
       3. PIV-II, CAC, TWIC card compatible.
   11. Card Reader Functions:
       1. Multiple card format support by reader.
       2. Paired reader support.
       3. Alternate reader support.
       4. Turnstile support.
       5. Biometric device support.
       6. Keypad support with programmable user commands, card input.
       7. Shunt relay support.
8. Strike follower relay support.

12. Database Functions:
   1. Supports up to nineteen (19) digital card numbers

13. Intrusion Alarm Functions:
   1. Supports entry delays and exit delays.
   2. Provides control and alarm processing from the keypad.

14. Offline mode operation:
   1. Door mode:
      1. Unlocked, locked, facility code only.
   2. Relay Mode:
      1. Programmable for offline conditions.

10. **ACCESS CONTROL SUB PANEL – 20 DIGITAL INPUT FOR MICRO 5**

1. Manufacturers
   2. Substitution Limitations: No substitutions permitted.
   3. Product Options
      1. 125-1500 M5-20IN

2. Description
   The peripheral interface device shall be used to monitor a maximum of twenty (20) digital inputs and be physically compatible with the Micro 5 system architecture. Each point being supervised for the following states, open, closed, short and line open.

3. Performance / Design Criteria
   1. Primary Power:
      1. 12-24Vdc plus/minus 10 percent, 350mA maximum.
      2. 12Vdc at 300mA nominal.
      3. 24Vdc at 220mA nominal.
   3. Inputs: twenty (20) general purpose programmable type and two dedicated for tamper and power monitor.
   4. Outputs: two (2) relays – Form-C, 5 Amp, 28Vdc.
   5. Temperature: 0 to 70 degrees Centigrade operational, -55 to 85 degrees Centigrade storage.
   6. Humidity: 10 to 95 percent RHNC.
   7. Standards: UL 294 recognized, CE compliant, RoHS.RoHS.
   8. Offline mode operation:
      1. Relay Mode:
         1. Programmable for offline conditions.

11. **RS-485 MULTIPLEXER**

1. Manufacturers
2. Description
   1. The RS-485 Multiplexer shall expand a single RS-485 or RS-232 data line into multiple data lines or to extend an RS-485 communication but beyond 4000 ft. wiring distances.

3. Performance / Design Criteria
   1. Technical Specifications
      1. Power Input: 12Vdc plus/minus 15 percent, 250mA.
      2. Interfaces:
         5. Port 6,8: RS-485, Transmit/Receive, or Receive Only (8 port model only).
   3. Wire requirement:
      1. Power: 1 twisted pair, 18 AWG.
      2. RS-485: 24AWG, 4,000 feet, (1,200 meters) maximum, twisted pair(s) with shield.
      3. RS-232: 24AWG, 50 feet (15 meters) maximum.
   4. Environmental:
      1. Temperature:
         1. 0 to 70 °C, operating.
         2. -55 to +85 °C, storage.
      2. Humidity: 0 to 95 percent RHNC.
      3. Dimensions: 5 inches (127mm) L x 6 inches, (152mm) W x 1 inch (25mm) H.
      4. Weight: 4 ounces (180 g) nominal.
   4. Accessories
      1. Provide enclosure of sufficient size to support RS-485 Multiplexer and wiring.

12. DESTINATION DISPATCH ELEVATOR (DDE) PACS – PROCESSOR KIT

   1. Manufacturers
      2. Substitution Limitations: No substitutions permitted.
      3. Product Options:
         1. DDE4DP-E4M1 (770-2000) - 4 Car Dual Processor Kit
         2. DDE8DP-E4M1 (770-2005) - 8 Car Dual Processor Kit
         3. DDE12DP-E4M1 (770-2010) - 12 Car Dual Processor Kit
4. DDE16DP-E4M1 (770-2015) - 16 Car Dual Processor Kit
5. DDE24DP-E4M1 (770-2020) - 24 Car Dual Processor Kit
6. DDE25DP-E4M1 (770-2025) - 25 or More Car Dual Processor Kit

2. Description
   1. Processor kit including destination Dispatch Elevator software and dual industrial processors, in a locking enclosure power supply with remote power monitoring and management.

3. Performance/Design Criteria
   1. Technical Specifications
      1. Distributed Output Module:
         1. Four, controlled fused at 3A each
         2. Eight, auxiliary Class II P limited at 2.5A each
      2. Input Power:
         1. Input 120/230VAC 50/60Hz | 200 Watts
         2. Overload and short circuit protection
         3. Overload temperature protection
         4. Polarized AC power supply disconnect
      3. Output Power:
         1. 150W Total Output Power | 12VDC/12A or 24VDC/6A.
         2. FPO Board Outputs: Continuous (DC1), Resettable (DC2).
         3. 120mV Output Voltage Ripple | System Efficiency: 88 percent | System BTU Rating: 66 BTU/Hr.
      4. Battery Charging:
         1. Independent built-in 1A (FPO150) Charger for sealed lead-acid or gel type batteries.
         2. Microprocessor dual rate charging of 12 or 24V battery sets.
         3. Automatic switchover to standby battery when AC fails.
         4. Zero voltage drop when switched over to battery backup.
      5. Power and Enclosure Regulatory Compliance:
         1. UL294, UL603, UL864, UL1076, UL1481, UL2044, UL2572, ULC S318, ULC S319, ULC S527.
         2. CSA C22.2 #107.1, FCC Part 15, CSFM Approved.
      6. DDE Processor Regulatory Compliance:
         1. EMC: CE/FCC Class A, CCC, BSMI.
         2. Safety: UL, CCC, BSMI, CB.
      7. Size and Weight:
         1. Height: 24 inches.
         2. Width: 20 inches.
         3. Depth: 4.5 inches.
      8. Destination Dispatch Elevator Processor:
1. Dual Processor CPU is specific to each Kit:
   1. 770-2000 - CPU
   2. 770-2005 - CPU
   3. 770-2010 - CPU
   4. 770-2015 - CPU
   5. 770-2020 - CPU
   6. 770-2025 - CPU

13. **POWER MANAGEMENT SYSTEM HARDWARE**

   A. Manufacturers
      1. LifeSafety Power, Inc., 750 Tower Road, Unit B, Mundelein, IL 60060, Phone: (888) 577-2898
         www.lifesafetypower.com
      2. Substitution Limitations: No substitutions permitted.
      3. Product Options
         a. Power supplies, power modules and power controller modules may be supplied integral to access
            control hardware enclosures as per 2.2 Access Controller Assembly, separately as individual
            modules, or as assemblies in their own enclosure

**Power Distribution/Power Controller Modules**

<table>
<thead>
<tr>
<th>Option</th>
<th>Item</th>
<th>Description</th>
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<tbody>
<tr>
<td>670-1720</td>
<td>D8</td>
<td>8 Output, Power Distribution Module Fused</td>
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<tr>
<td>670-1730</td>
<td>D8P</td>
<td>8 Output, Power Distribution Module Class 2 Power Limited</td>
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<tr>
<td>670-1800</td>
<td>C4</td>
<td>4 Lock Controller Module Fused</td>
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<tr>
<td>670-1810</td>
<td>C4P</td>
<td>4 Lock Controller Module Class 2 Power Limited</td>
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<td>C8</td>
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</tr>
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<td>670-1830</td>
<td>C8P</td>
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<td>M8</td>
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<tr>
<td>670-2840</td>
<td>M8P</td>
<td>8 Input, 8 Output Smart Power Controller Module Class 2 Power Limited</td>
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**Power Supply Assemblies with Enclosures**

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<thead>
<tr>
<th>Option</th>
<th>Kit</th>
<th># Lock Outputs</th>
<th># Aux Outputs</th>
<th>Voltage DC</th>
<th>Power Distribution</th>
<th>Power Management</th>
<th>Fire Alarm Interface</th>
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<tbody>
<tr>
<td>670-1310</td>
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<td>Option</td>
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<td>FPO75-B100C8PD8PE2M4</td>
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<tr>
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<td>670-1475</td>
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**Network Interface Modules**

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<tr>
<th>Option</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>670-2000</td>
<td>NL2</td>
<td>Two Port Network Communication Interface for Remote Power Monitoring, Reporting and Control</td>
</tr>
<tr>
<td>670-2100</td>
<td>NL4</td>
<td>Four Port Network Communication Interface for Remote Power Monitoring, Reporting and Control</td>
</tr>
</tbody>
</table>

**PART 3 EXECUTION**

1. **3.01. EXAMINATION**
   
   A. Verification Of Conditions
      
      1. The Contractor shall visit the site and verify that site conditions are in agreement with the design package. The Contractor shall report all changes to the site or conditions which will affect performance of the system to the Owner. The Contractor shall not take any corrective action without written permission from the Owner.
      
      2. General
         
         a. Verify that substrate conditions, which have either been previously installed under other sections, or that existing site conditions, are acceptable for product installation in accordance with manufacturer’s instructions.
         
         b. Verify that building doors, frames, walls, wire runs, related items, and conditions are ready to receive work of this Section.
      
      3. Cable & Wiring
         
         a. Examine pathway elements intended for cables. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.
         
         b. Examine roughing-in for LAN and control cable conduit systems to PCs, Controllers, card...
readers, and other cable-connected devices to verify actual locations of conduit and back boxes before device installation.

4. LAN/WAN
   a. Verify LAN connections for Ethernet capable PACS controllers and devices provide access to the internet and the HSMS host.

5. Power Connections
   a. Verify power circuits which are existing or have been previously installed under other sections are acceptable for product installation in accordance with manufacturer’s instructions.

B. Preinstalling Testing
1. Perform the following field tests and inspections and prepare test reports:
   a. LAN Cable Procedures: Inspect for physical damage and test each conductor signal path for continuity and shorts. Use Class 2, bidirectional, Category 5 tester. Test for faulty connectors, splices, and terminations. Test according to TIA/EIA-568-1, "Commercial Building Telecommunications Cabling Standards – Part 1 General Requirements." Link performance for UTP cables must comply with minimum criteria in TIA/EIA-568-B.
   b. Test each circuit and component of each system. Tests shall include, but are not limited to, measurements of power supply output under maximum load, signal loop resistance, and leakage to ground where applicable. System components with battery backup shall be operated on battery power for a period of not less than 10 percent of the calculated battery operating time. Provide special equipment and software if testing requires special or dedicated equipment.
   c. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance from each end of all pairs installed. Remove temporary connections when tests have been satisfactorily completed.

2. 3.02. PREPARATION
   A. Refer to 28 10 00 PHYSICAL ACCESS CONTROL SYSTEM, Part 3, PREPARATION.
   B. Determine Owner’s priority of importance to alternate high priority devices and normal priority devices on different multi-tap power supplies or POE switches to reduce failure points where a large number of devices are unavailable to a critical area.
   C. Coordinate arrangement, mounting, and support of electronic safety and security equipment:
      1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated,
      2. To provide for ease of disconnecting the equipment with minimum interference to other installations, To allow right of way for piping and conduit installed at required slope, so connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
   D. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
   E. Coordinate location of access panels and doors for electronic safety and security items that are behind finished surfaces or otherwise concealed.
   F. Prior to Installation
      1. All equipment shall be tested and configured in accordance with instructions provided by the manufacturer.

3. 3.03 INSTALLATION
   A. General
1. Before permanent installation of the system, the system and interconnected components and cables shall be staged on-site to verify that all are in good working order.

2. Install all system components and appurtenances in accordance with the manufacturer’s specifications, referenced practices, guidelines and applicable codes.

3. Comply with manufacturer’s written data, including product technical bulletins, product catalog installation instructions and product carton installation instructions.

4. Furnish all necessary interconnections, services, and adjustments required for a complete and operable system as specified.

5. Control signal, communications, and data transmission line grounding shall be installed as necessary to preclude ground loops, noise and surges from adversely affecting system operation.

6. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., sensors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

7. Use weatherproof equipment or covers where installed in areas exposed to weather.

B. Wiring

1. General
   a. All wiring is to be installed in dedicated conduit throughout. Cable shall not be pulled into conduits or placed in raceways, compartments, outlet boxes, junction boxes or similar fittings with other building wiring.
   b. All low voltage wiring outside the control console, cabinets, boxes and similar enclosures, shall be plenum rated where required by code.
   c. All wiring conductors connected to terminal strips shall be individually numbered and each cable or wiring group being extended from a panel or cabinet to a building mounted device shall be identified with the name and number of the particular device as identified and shown on building drawings.
   d. All exposed wiring inside and outside the control console, cabinets, boxes and similar enclosures, shall be dressed down neatly and secured with wiring cleats or wire ties.
   e. All exposed metallic flexible conduit and armored cable shall be dressed down neatly and secured with low profile, metal fasteners.

2. Fire Wall Penetrations
   a. The Contractor shall avoid penetration of fire rated walls and floors wherever possible. Contractor shall also seal all floor, ceiling and wall penetrations in fire or smoke barriers and in the wiring closet.

3. Wall Penetrations
   a. Where penetrations are necessary, they shall be sleeved with metallic conduit and resealed with an Underwriter Laboratories (UL) approved sealant.
   b. Provide three sided pre-finished metal hood and seal to wall where conduit penetrates exterior wall.
   c. Install new conduit on portable pipe supports – (low profile type), as manufactured by Portable Pipe Hangers or Advanced Support Products. Provide roof protection pads under each support. Coordinate location and routing with design engineer prior to rough-in or installation of system.

C. Containers
[SPECIFIER NOTE: Modify or delete the following paragraphs to fit the Project.]

1. All cabinets, boxes, and similar enclosures containing security system components and/or cabling, which may easily be accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building shall not be considered to be accessible.

2. All junction boxes and small device enclosures below ceiling level, and easily accessible to employees or the public, shall be covered with a suitable cover plate and secured with tamper proof screws.

D. Controllers

1. End-of-Line resistors shall be installed at the field device location and not at the controller panel location.


3. Use the HSMS web interface to:
   a. Add new controller to site locations.
   b. Update the Controller firmware to the version specified by the provider of the Hosted Security Management System (HSMS).
   c. Perform System Diagnostics to confirm successful network connectivity and initial configuration.

   [SPECIFIER NOTE: Delete the following Paragraph (Controllers – Retrofit) if no retrofit work is required.]

E. Controllers – Retrofit

1. Document installation and operational details for existing system.

2. Coordinate with guards / alarm monitoring personnel and central monitoring service regarding system outage schedule.
   a. Schedule retrofit work to minimize impact on owner operations.

   [SPECIFIER NOTE: Delete one or both below Subparagraphs if not required.]
   b. Provide security personnel to manually process owner personnel access to portals when secure access through a portal is required while work is being performed.
   c. Provide security personnel to protect portals that are unsecured after integrator work hours.

3. Disconnect power and battery backup from existing controllers.

4. Remove existing controllers and associated expansion cards and deliver to owner.
   1. Leave existing enclosures, backplanes, and power supplies in-place.

5. Follow manufacturer’s installation instructions to install retrofit controller boards in existing enclosures and reconnect existing cables.
   1. End-of-Line resistors shall be installed at the field device location and not at the controller panel location.


7. Use the HSMS web interface to:
   a. Add new controller to site locations.
   b. Update the Controller firmware to the version specified by the provider of the Hosted Security Management System (HSMS).
   c. Perform System Diagnostics to confirm successful network connectivity and initial configuration.
   d. Configure controller to return prior operation to existing portals.
F. Badging Workstations
   1. Coordinate with Owner’s representative for exact location of badging workstation, mounting height and location of camera and photo backdrop.
   2. Run print test for the printer confirming communications between PC and printer, and for proper calibration for thickness of card being used.

G. Elevator Controls
   [SPECIFIER NOTE: Use the Elevator Controls subparagraphs for hardwired-panel driven elevator controls. For network-controlled elevator controls, delete this section and reference in 28 10 00 – Systems Integration.]
   1. Install Elevator Card Readers at locations indicated in drawings.
   2. Connect two PACS door control relays to elevator control panel.
      1. Cable provided by other.
      2. Elevator Installer shall make connection to elevator control panel.
   3. Program HSMS to energize associated relay when proper credential is presented to Elevator Card Reader. Energized relay will enable elevator call button.

4. 3.04. REPAIR/RESTORATION
   [SPECIFIER NOTE: Describe how existing work is to be repaired, restored and cleaned.]

0. 3.05. RE-INSTALLATION
   [SPECIFIER NOTE: Describe the building-in, installation or re-installation of existing elements.]

0. 3.06. SITE QUALITY CONTROL
   A. Site Tests and Inspections
      1. Coordinate with Site Tests and Inspections defined in 28 10 00 PHYSICAL ACCESS CONTROL SYSTEM, Part 3, SITE QUALITY CONTROL.
   B. Non-Conforming Work
      1. Contractor must note any variants at the site and notify owner’s representative within three business days of anything that might affect the delivery date of the system or any trades associated with the functioning of the system.
         [SPECIFIER NOTE: Retain paragraphs below to require a factory-authorized service representative to perform, or assist Contractor. Delete in its entirety to require only an inspection before field testing.]
   C. Manufacturer Services
      1. Engage a member of the manufacturer’s engineering support team to inspect[], test, and adjust field-assembled components and equipment installation, including connections[, and to assist in field testing, final testing]. Report results in writing.
      2. Engage a member of the manufacturer’s engineering support team for training.

1. 3.07. ADJUSTING
   A. Perform field software changes after the initial programming session to “fine tune” operating parameters and sequence of operations based on any revisions to the Owner’s operating requirements.
   B. Security Hardening Procedures
      1. Installer/Factory User Accounts
         a. Remove all (default, installer, or temporary) user accounts and passwords used during installation that are not part of the End-user’s final operational requirements.
      2. User accounts that match factory defaults user accounts shall have new passwords assigned that are substantially different from factory default passwords.
3.08. CLEANING
   A. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment

3.09. CLOSEOUT ACTIVITIES
   A. Demonstration
      1. Refer to 28 10 00 PHYSICAL ACCESS CONTROL SYSTEM, Part 3, CLOSEOUT ACTIVITIES.
      2. Demonstrate operation of PACS secured doors.
      3. Demonstrate operation of PACS secured/controlled elevators.
      4. Demonstrate the Power Management capabilities.
   B. Training
      1. Refer to 28 10 00 PHYSICAL ACCESS CONTROL SYSTEM, Part 3, CLOSEOUT ACTIVITIES.
   C. License Assignment
      1. Software, hardware, firmware, operational or administrative licenses necessary for to operate or administer the devices shall be registered to the Owner.
      2. Deliver to the Owner’s Representative proof of license registration from the product manufacturer.

4. 3.10. PROTECTION
   A. Maintain strict security during the installation of equipment and software. Rooms housing accessible equipment and workstations that have been powered up shall be locked and secured during periods when a qualified operator in the employ of Contractor is not present.
   B. Protect installed work of other trades when working in the same location.
   C. Protect all completed work prior to acceptance by owner.
      [SPECIFIER NOTE: Owner may, at Owner's discretion, relieve the contractor from this burden. For example, if the site already has onsite officer guarding service.]

0. 3.11. MAINTENANCE
   A. Software and Firmware updates are to be delivered as part of the Warranty and Service Agreements.

END OF SECTION

Specifier Notes

#