

**SECTION 28 00 13: ACCESS CONTROL ALARM MONITORING SYSTEM**

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**I. GENERAL**

## 1.1 SUMMARY

- A. This Section includes security access control devices and control panels; labor for installation of a complete and fully functional system, programming, licenses, and wiring.

## 1.2 GOVERNING CODES, STANDARDS AND REFERENCES

- A. American National Standards Institute (ANSI):
1. J-STD-607 (Current Edition): Commercial Building Grounding and Bonding Requirements for Telecommunications
- B. Code of Federal Regulations (CFR)
1. 14 CFR 107.207 (Current Edition): Access Control System
  2. 47 CFR 15 (Current Edition): Radio Frequency Devices
- C. International Standards Organization
1. ISO 7816 (Current Edition): Parts 1 - 4
  2. ISO 14443A (Current Edition): Certifications Directory
- D. National Electrical Manufacturers Association (NEMA)
1. NEMA ICS 4 83 (Current Edition): Terminal Blocks for Industrial Control Equipment and Systems
- E. National Fire Protection Association (NFPA)
1. NFPA 101 (Current Edition): Code for Life Safety from Fire in Buildings and Structures
  2. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- F. Security Industry Association (SIA)
1. SIA AC-01-1996.10 (Current Version): Access Control Standard Protocol for the 26-bit Wiegand TM Reader Interface
- G. Underwriters Laboratories Inc. (UL)
1. Certifications Directory
  2. UL 294 (Current Edition): Access Control System Units
  3. UL 2043 (Current Edition): Fire Test for Heat and Visible Smoke Release for Discrete Products and their Accessories Installed in Air-Handling Spaces.

## 1.3 SYSTEMS DESCRIPTION

- A. Description: Access control at the locations specified on the Contract Documents.
1. Provide access control system (ACS) to locations in the terminal. Provide portal access control equipment including card readers, door position switches, locks and latch-sets, power transfer hinges horn/strobes,

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interface terminal boxes (ITBs), standalone access controllers, and associated conduit, boxes, cabling, and power supplies.

**1.4 QUALITY CONTROL AND ASSURANCE**

- A. As specified in Section 01 45 16.13 – Contractor Quality Control.
- B. Equipment shall be UL-listed, or approved by the AHJ if UL listing is not available.
- C. Contractor shall have performed a minimum of three similar installations.
- D. Manufacturers of access control devices shall have been engaged in manufacturing of these devices for a minimum of five years.
- E. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet when tested in accordance with NFPA 262.
- F. Perform Work in accordance with NEC. In addition, perform work in accordance with Port's standards, if and when they are more stringent than the NEC.

**1.5 FIELD MEASUREMENTS**

- A. Verify field measurements prior to fabrication.

**1.6 PROJECT COORDINATION**

- A. Verification: Coordinate with the Engineer for correct locations, sizes, communication circuits, and power loading requirements for functional and operational support of the access control system.
- B. Coordinate the access control system devices and cabling with the following:
- C. Fire alarm addressable relay modules installed in the Equipment Room to release access control doors during fire alarm condition.

**1.7 SYSTEM INTERFACE REQUIREMENTS**

- A. Access controller shall provide a signal that is compatible with the existing ACS headend.
- B. Card reader with pinpad shall read existing proximity cards in order to ensure system operation.
  - 1. Coordinate with the STIA Aviation Maintenance Department to confirm proximity card type.

**1.8 PERFORMANCE REQUIREMENTS**

- A. Equipment and devices shall be able to operate in areas of high EMI/RFI emissions. Specifically, equipment shall be unaffected and fully functional in the airport environment, which includes radio and radar emissions from ground radios, and airport and aircraft equipment, especially from aircraft operating on ramp areas.

**II. PRODUCTS****2.1 GENERAL**

- A. Furnish and install products described in this Section, except where otherwise noted. Coordinate with the Engineer for schedule and delivery of products installed under this Section.

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- B. Provide non-specialty fasteners required to install products in this Section (i.e., fasteners not normally included by the manufacturer for installation of a specific product).
- C. Coordinate with the Engineer regarding final part lists of portals and portal hardware for compatibility of security access portal controls prior to delivery to the Port. Refer to Division 8 OPENINGS.

**2.2 STANDALONE ACCESS CONTROLLER**

- A. Manufacturer:
  - 1. Johnson Controls CK721A. This shall include the following items:
  - 2. Enclosure and Power Supply: JCI Cat No. 300-DIN-LG
  - 3. CK721-A network controller: JCI Cat No. CK721-A
  - 4. I/O module: JCI Cat No S300-DIN-I8O4
  - 5. Mux: MHUBX8: RS485 Hub with Cover
- B. No substitutions.

**2.3 POWER SUPPLIES**

NOTE: Engineer shall coordinate Power supply requirements with AVM ET Shop and modify list below as required.

- A. Manufacturer:
  - 1. Altronix: Power Supply shall include the following items.
    - a. Power Supply and Enclosure: MAXIMAL77FE
    - b. Power Distribution Module: PD8ULCB
    - c. Voltage Regulator: PDS8CBK1
  - 2. No substitutions.

**2.4 INTERFACE TERMINATION BOX (ITB) WITH TERMINAL STRIP**

- A. Manufacturer:
  - 1. Interior: Johnson Controls Part number 11044936
  - 2. Exterior: Johnson Controls enclosure shall be NEMA 4X
  - 3. No Equal
- B. Provide a new ITB with a terminal strip at each designated portal location to allow connectivity and power from the standalone controller to the door devices as shown on the Contract Drawings.
- C. ITB terminal strips shall be designed to operate with the standalone controller and the required portal devices.
- D. ITB features:
  - 1. UL-rated NEMA 1 (for indoor installation) or UL-rated NEMA 4X (for outdoor installation) style metal cabinet designed for surface mounting
  - 2. Dimension: 12"x16"x6"

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- E. Lockable cover with tamper switch and 270 lock core.
- 2.5 COMBINATION CONTACTLESS CARD READER/NUMERIC KEYPAD/BIOMETRIC (FINGERPRINT) READER
- A. Manufacturer/Model:
    - 1. Safran Morpho Sigma
    - 2. Safran Morpho Sigma Extreme series
    - 3. No Equal.
  - B. Reader locations: Readers shall be located as shown on the Contract Drawings.
  - C. Card reader with pinpad shall be able to read existing STIA proximity technology cards. The readers shall be dual identification input technology capable (proximity and personal identification number PIN) and suitable for access control, alarm management, and/or relay control.
  - D. The readers shall be capable of independent operation (keypad only, card only) or in a multifunction mode where two valid IDs (PIN and proximity card) are required. The readers shall recognize multiple encoding schemes. Reader shall be weatherproof. The reader shall be powered by 10 to 28.5 VDC, supplied by the controller or reader interface, and also compatible with PoE+ switches.
  - E. Communications protocol shall be compatible between the standalone access controller or reader interface and its associated reader.
  - F. Reader mounting method: Readers shall be suitable for surface or flush mounting as required. Exposed fasteners shall be tamper resistant. Readers shall be mounted on back boxes.
  - G. The proximity reader shall have a read range of 5 to 8 inches. The reader shall be able to be mounted with its sides against metal door or window frames. The reader can have a short or long read range and be capable of either uni-directional or bi-directional operation.
  - H. Reader display and indicators: Reader shall have a visual indicator display. When a valid proximity card is presented to the reader, the normally red LED shall flash green and a beeper shall sound.
  - I. Color: [Coordinate color with POS]
  - J. Reader response: Reader shall respond to passage requests by generating a signal to the standalone access controller or reader interface.
  - K. Response time shall be 100 milliseconds or less from the time the reader finishes reading the card information and entry authorization is completed until a visual indicator is illuminated.
  - L. Operating temperature shall be minus 22 degrees F to plus 150 degrees.
  - M. The proximity card shall be read when presented in any orientation or at any angle to the surface.
  - N. Locate card readers as shown on the Contract Drawings.
- 2.6 COMBINATION CARD READER AND PIN PAD
- A. Acceptable Manufacturers:

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1. HID
  2. Honeywell
  3. Or Approved Equal
- B. Specifications:
1. Keypad: four rows by three columns
  2. Maximum dimensions: 3.3"x4.8"x1.1"
  3. Power: 5-16VDC
  4. IP65 rating (provide gaskets as necessary)
  5. Operating temperature: -31° to 150°F
  6. Operating humidity: 5% to 95% relative humidity, non-condensing
  7. Transmit frequency: 13.56MHz
  8. EAL5+ certified secure element hardware, tamper proof
  9. Compatible with Security Industry Association Open Supervised Device Protocol standard.
- C. Unit shall be capable of authenticating for card read only, PIN only, or both.
- 2.7 AUDIO/VISUAL (A/V) SIGNAL DEVICE
- A. Acceptable manufacturers:
1. System Sensor
  2. Edwards Signaling
  3. Federal signaling
  4. Or Approved Equal
- B. Furnish an A/V indicator at each access-controlled portal where specified in Contract Documents.
1. Devices shall activate upon door alarm condition, creating an audible and visible indication as described in the Contract Documents.
  2. Devices shall be capable of being silenced remotely via the ACS.
  3. Upon acknowledgement of the alarm by the ACS operator, the device shall reset.
  4. Devices shall be individually controllable for strobe and audio. The horn will activate and then shut off, while the strobe will remain on.
- C. A/V indicator shall be a low-profile strobe and shall be supplied with all mounting hardware. It shall not be marked "FIRE".
1. A/V indicators located outdoors or in environmentally uncontrolled areas shall be rated NEMA 4X device for weather resistance.
  2. A/V indicator bodies shall be white and unmarked.
  3. Strobe lens: emergency door A/V indicator strobe lens shall be clear.
  4. Strobe shall not require tools for strobe tube replacement.

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5. Strobe mechanism output: emergency door A/V indicator strobe output shall be at least 15 candela.
6. Contractor shall determine correct type of mount for strobe location.
7. A/V indicator sounder/horn outputs shall be at least 90 dBA at a distance of one meter.

**2.8 BALANCED MAGNETIC SWITCH/DOOR POSITION SWITCH**

- A. Acceptable manufacturers:
  1. Sentrol
  2. Securitron
  3. Honeywell
  4. Or Approved Equal
- B. System interface: BMS/DPS shall interface and be compatible with standalone access controller or reader interface.
- C. The BMS/DPS shall detect a ½ inch or less of separating relative movement between the magnet and the switch housing.
  1. Upon detecting such movement, it shall transmit an alarm signal to the standalone access controller or door controller.
- D. BMS/DPS subassemblies: the BMS/DPS shall consist of a switch assembly and an actuating magnetic assembly.
  1. The magnet assembly shall house the actuating magnet.
  2. The switch mechanism shall comprise three independent form-c triple-biased reed contacts wired in single pull double throw (SPDT) configuration.
  3. Switch shall have a supervised loop.
  4. Switches shall be rated for a minimum lifetime of 10,000,000 operations.
- E. Housing: the housings of switches and magnets shall be made of nonferrous metal and shall be weatherproof.
  1. Housing (except concealed) shall have three feet of stainless steel armored cable to protect leads.
- F. Spacers: spacers shall be of nonferrous material.
- G. Mounting hardware: exposed fasteners shall be tamper resistant.
- H. Contractor shall fabricate mounts, adapter, etc., to fit existing conditions.

**2.9 ELECTRIC LATCH SET**

- A. Provide electric latch set in accordance with this Section, Division 8 - OPENINGS, and other Contract Documents.
- B. Electric latch set shall have a request-to-exit switch that releases the lock mechanism when initiating an opening on the secured side of the portal.
- C. Electric latch set shall be configured to fail secure.

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- 2.10 ELECTRICAL POWER TRANSFER HINGE
  - A. Refer to Division 08 - OPENINGS.
- 2.11 PANIC BAR
  - A. Refer to Division 8 - OPENINGS.
- 2.12 INTERCOM STATION
  - A. Intercoms shall be IP based and compatible with the existing Port digital intercom system, which is a Zenitel/Alphacom XE-series audio server.
    - 1. ZENITEL TMIS-1
    - 2. ZENITEL TCIS-2
    - 3. No Equal
  - B. Description:
    - 1. Unit shall be used at access controlled doors.
    - 2. Faceplate: 0.12" PMMA, color printed on back side
    - 3. Size: 7.1" x 4.7" x 3.3"
- 2.13 REQUEST TO EXIT SWITCH (REX)
  - A. Function: REX shall be used for signaling access control system standalone access controller or reader interface to open door lock and bypass alarm function.
  - B. Request to exit switches shall be incorporated into electrified latches. .
  - C. Use of pushbutton REXs and passive infrared REX devices shall be approved by POS ET.
- 2.14 DOOR HARDWARE
  - A. Door hardware required for access control on designated security portals as detailed in Division 8 - OPENINGS specifications and on the Contract Documents.
- 2.15 INFRASTRUCTURE
  - A. Conduit, junction boxes, wiring, and cabling for security access portal control equipment in accordance with this Section, Section 26 05 33 – Raceways and Boxes and other Contract Documents.
- 2.16 CABLE
  - A. See Section 26 05 23 - Control/Signal Transmission Media.
  - B. See Section 27 15 00 - Communications Horizontal Cabling.
  - C. Contractor is responsible for final cable configuration, but representative cables are indicated on drawings.
  - D. Provide cable quantities in accordance with the Contract Documents or as directed by the Port of Seattle.

**III. EXECUTION**

- 3.1 INSPECTION
  - A. Inspect all work areas and inform Port of any discrepancies in the plans.

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**3.2 INSTALLATION**

- A. Provide security whenever an active access-controlled portal is in any way brought off line. Security personnel must be approved by the Port and must be present for the full duration of the portal downtime.
- B. Fabricate mounts, adapters and any other required equipment as necessary to fit existing conditions.
- C. Exposed fasteners shall be tamper resistant and shall match device finish.
- D. Provide a detailed schedule identifying portal (door) number, physical location, standalone access controller location, and installation schedule for replacement of new portal control installations for approval by the Port.
- E. ITB
  - 1. Install ITB on the secure side of the portal, above the level of the ceiling, or as indicated on the drawings. In plenum areas, install ITB in a plenum-rated enclosure.
- F. Power supplies
  - 1. For new access portals: Provide new power supplies.
    - a. Power supplies connected to emergency exits will have failsafe interface to immediately unlock door upon signal from fire system.
    - b. New doors will be individually fused and the power supply will be configured with 25% spare capacity.
    - c. The number of power supplies will be as required for complete system operation.
  - 2. Label Contractor-furnished equipment and cables as specified in Section 26 05 53 - Electrical Identification. Include label callouts and documentation on final as- built drawings.
- G. Install new readers for new access-controlled portals as shown on the Contract Drawings.
  - 1. Provide new data and power cable for new doors as shown on the Contract Drawings.
  - 2. Provide card readers 42" from floor to center and on latch side of door unless shown or noted otherwise on the Contract Drawings.
  - 3. Install access control field devices according to manufacturer's and Engineer's instructions at portals shown on the Contract Drawings.
  - 4. Securely attach each access control field devices plumb and true on the surface they are to be mounted on. Tamper screws matching other device screws shall be used on card readers. Furnish screws and other items necessary for card reader installation unless included as part of the manufacturer's package.
- H. Card Readers
  - 1. Card reader mounting method:

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- a. Mount card reader with its sides against metal door or window frames.
  - b. Mount the terminals flush with finished surface.
  - c. Exposed fasteners shall be tamper resistant.
  - d. Mount card readers on new back boxes.
- I. Audio/visual (A/V) signal device
- 1. A/V mounting method:
    - a. A/V devices shall be flush mounted.
    - b. A/V devices shall be mounted on new back boxes.
- J. Door position switch (DPS)
- 1. The installed DPS device shall consist of two units mounted adjacent to each other in door and frame:
  - 2. Mount switch unit, containing the magnetic switch, on the door frame.
  - 3. Mount magnet unit, containing the permanent magnet, on the door.
  - 4. Mount the DPS to sense movement of the door (or of either door leaf in double door configuration).
  - 5. Coordinate DPS installation with installation of card reader.
- K. Electric latch
- 1. Install the electric latch set according to manufacturer's instructions.
  - 2. Latch set configurations will be tested by the Port or a Port-designated contractor for correct actuation with the RX and card reader equipment and failsafe operation.
- L. Panic bar
- 1. For new doors: Install a non-latching release device that allows one-motion egress and meets the requirements of NFPA 101 for exit devices at emergency doors. Additional requirements in Division 8 - OPENINGS.

**3.3 FIELD QUALITY CONTROL**

- A. Coordinate tests and inspections with the Port. The Port Representative will witness all field tests. Perform tests as specified in Section 27 05 00 - Common Work Results for Communications and Section 27 15 00 - Communications Horizontal Cabling.
- B. Cabling
- 1. Coordinate with Port ICT regarding Port cable backbone cross-connectivity completion, which is a prerequisite to complete circuit testing.
  - 2. Test new ACS extension cabling as specified in Section 26 05 23 - Control/Signal Transmission Media and Section 27 15 00 \_ Communications Horizontal Cabling. Tests will be repeated from the opposite end of the Owner ACS when data transmission is two-way.
  - 3. Test for signal continuity:

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- a. From each access control portal device to the interface terminal block above each access portal
  - b. From the standalone controller cable termination to the interface terminal block above each access portal
- C. Access control equipment
1. Perform device-level functional testing on equipment, devices, and components to verify proper installation prior to acceptance of the installation by the Engineer.
  2. Verify that power circuits meet the equipment requirements and each ACS field device can be powered up in the field.
  3. Configure the remote standalone controller and network switch, and conduct performance verification (operational) testing on the completed data circuits.
  4. DPSs will be tested by opening the door and ensuring that an alarm has been annunciated at the central processor alarm annunciation display.
- D. Document field test results. Correct any detected deficiencies. Retest and document results. Submit results in writing to Engineer.
- E. Make changes to or replace equipment that does not meet tests conducted by the Owner or an Owner-designated contractor.

**3.4 COMMISSIONING**

- A. Commissioning shall be performed in accordance with the requirements identified in Section 01 91 00 - Commissioning.
- B. Refer to Section 26 05 23 Control/Signal Transmission Media and Section 27 15 00 - Communications Horizontal Cabling for cable testing and this Section for functional device testing requirements. Any deficiencies in the Contractor's installation or work shall be immediately corrected at no further cost to the Port.
- C. The Contractor shall not hand over the installation to the Engineer for commissioning until inspection and testing requirements are completed in accordance with this section, Divisions 27 and 28 Standards, and the following general requirements:
1. ACS components have been installed, and have been inspected and approved by the Contractor.
  2. A visual inspection of the ACS components has been conducted to ensure that defective equipment items have not been installed and that there are no loose connections.
  3. System wiring has been tested and verified by the Contractor as correctly connected as indicated on the Contractor's approved shop drawings.
  4. System grounding and transient protection systems have been verified as properly installed and connected as indicated on the Contractor's approved shop drawings.
  5. Power supplies to be connected to ACS equipment have been verified as the correct voltage, phasing, and frequency.

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6. Satisfaction of the above requirements shall not relieve the Contractor of responsibility for incorrect installations or collateral damage as a result of Contractor work/equipment.

End of Section