

SECTION 28 13 00
ACCESS CONTROL & ALARM MONITORING SYSTEM (ACAMS)
Construction Specification

PART 1 GENERAL

1.1 SUMMARY

- A. General: Furnish engineering, labor, materials, apparatus, tools, equipment, transportation, temporary construction and special or occasional services as required to make a complete working Access Control and Alarm Monitoring system installation, as described in these specifications.
- B. Section Includes:
 - 1. Access control and alarm monitoring, including access control units, input/output units, card readers, door contacts, rex detectors and door management alarms, and glass break detectors
 - 2. Interface to electric door hardware
 - 3. ACAMS Power supplies
 - 4. Lock Power Supplies
 - 5. Interface to fire life safety system magnetic door release service
 - 6. Interface to elevator control system
 - 7. Interface to central station alarm monitoring.
- C. Products Supplied But Not Installed Under This Section:
 - 1. Elevator card readers
 - a. Provide card reader to elevator contractor to install on car operating panel
 - b. Remove installed reader and make connections to reader from cable in traveler and remount to existing machine tapped mounting holes.
- D. Products Installed But Not Supplied Under This Section:
 - 1. Exit Device (panic bar) Power Supplies
- E. Products Specified But Not Installed Under This Section:
 - 1. Type 1 enclosures at pull box and elevator junction box locations.
- F. Products Furnished and Installed Under Another Section:
 - 1. Data cable to network port(s) to District LAN/WAN
 - 2. 120V power to system
 - 3. Elevator traveler cable for card reader
 - 4. Magnetic door holders
 - 5. Electrified locking hardware.

G. Related Sections:

1. Consult other Divisions; determine the extent and character of related work and properly coordinate work specified herein with that specified elsewhere to produce a complete and operable system.
2. Section 087100 Door Hardware: includes product information for electrified locking hardware and magnetic door holders.
3. Section 280000 Basic Security Requirements: includes general project requirements, submittal formats, warranty, and installation requirements and additional sections for reference.
4. Section 282300 Video Surveillance System: includes product information for video integration with the ACAMS.
5. Section 280513 Security System Cabling: includes product information for wire and cable needed to support the ACAMS.
6. Section 280553 Security System Labeling: includes label types and formats for security devices.
7. Section 280800 Testing/Commissioning: includes the integrating testing/commissioning requirements for the ACAMS.

1.2 SYSTEM DESCRIPTION

A. Overview

B. Refer to Division 1 and Section 280000 for general description

C. Base Building Access Control & Alarm Monitoring System (ACAMS)

1. The ACAMS system will control access control into the building and select interior doors as indicated on the plans. Alarm monitoring, comprised of door contacts, motion detectors, duress button, and glass break detectors, is consolidated to the ACAMS system eliminating the need for a conventional burglar alarm panel.
2. Elevator Access Control:
 - a. Elevator – Hall Call
 - 1) Access is restricted after hours by disabling the hall call buttons on each floor.
 - 2) On schedule the hall buttons, through hardwired integration between the ACAMS and elevator controller, will become inactive and unresponsive to calls.
 - 3) Each hall call button on floors to be access controlled will include an adjacent card reader. Valid card readers will momentarily enable the call button for use and call the elevator to that floor.
 - 4) Car Operating Panel floor select buttons are always unrestricted.

- b. Elevator – Interior Elevator
 - 1) Access is restricted after hours by disabling the Car Operating Panel floor select buttons
 - 2) On schedule the floor select buttons, through hardwired integration between the ACAMS and elevator controller, will become inactive.
 - 3) A single card reader installed in the elevator on the Car Operating Panel momentarily enables specific floor selection buttons and allows travel to floors
 - 4) Hall call buttons are always unrestricted.
 3. Select Interior card readers shall be proximity “Command Card” readers and allow select cardholders to execute preprogrammed commands from the reader numerical keypad. For this scope of work program commands to arm/disarm the door contacts and interior intrusion devices for each space the card reader gains access to with either card plus key command or just key command. Exterior perimeter doors are excluded from card commands
 4. In/Out card readers with door management alarms restrict access to select areas of building and maintain separation between leased space and the building common
 5. Create schedules to automate the opening and closing of the building including unlocking doors, bypassing alarms, and unrestricted elevator access.
 6. Connect the ACAMS system to the Districts existing head end utilizing the LAN/WAN and secondary redundant RS232 communications over modems in the event network failure occurs. The first panel in the hub cluster will connect to the IT switch located in the building. All downstream panels are hardwired on a 20mA loop.
 7. Provide duress buttons at all public service counters or cash exchange locations. Duress buttons will connect auxiliary inputs on the ACAMS panels.
 8. Program conditional commands to output ASCII data to alarm translator/dialer for connection to central station alarm monitoring company. Meet with District to determine unique grouping requirements.
- D. Custom Device Requirements
1. Interconnect magnetic door holders on select card reader doors to prevent after hours propping (refer to plans for locations).
 - a. Interlock magnetic holder power through control relay on Von Duprin PS-873. Relay automatically follows lock power state.
 - b. When door is locked power to magnetic holders is cut.
 - c. When door is unlocked on schedule, during class hours, power is routed to magnetic holders and door can be propped
 - d. Fire alarms will disconnect power from magnetic holders and release door and is not affected by interconnections to ACAMS.

2. Connect all low voltage cables between lock power supplies, transfer hinges, and locks.
3. Interconnect ACAMS system to ADA operators for secure after hour's operation as indicated in drawings.
 - a. Interlock exterior ADA push plates with aux relay on PS-873
 - b. When door is locked exterior push plate is disabled
 - c. When door unlocked, even momentarily, ADA push plate is enabled.
4. Emergency Lockdown Buttons will be installed as prescribed by the construction management team in key locations e.g. classrooms, laboratories, conference/meeting rooms.

E. Tamper Monitoring

1. Provide additional monitor input points for monitoring the following:
 - a. Tamper switches located within each security equipment enclosure and wire way
 - b. Supervision of power supplies and batteries.

1.3 SUBMITTALS

- A. Contractor Qualifications: Submit certification letters for the manufacturer of the ACAMS.
- B. Product Data: Submit product information for components specified herein. Refer to Section 280000 for format and requirements.
- C. Shop Drawings: Submit shop drawings in accordance with Division 1. Refer to Section 280000 for format and requirements.

2.1 MANUFACTURERS

- A. Access Control and Alarm Monitoring System
- B. The ACAMS system is manufactured by Group 4 Technologies AMAG. Pursuant to Section 3400 of the Public Contract Code: AMAG Access Control and Alarm Monitoring System is now in use on the particular public improvement described as San Mateo County Community College District. At each instance in these specifications that "AMAG" is designated by brand name, said manufacturer's system is required and is designated to coordinate with existing systems that are in place at Skyline College, College of San Mateo, Cañada College and the District Administration Building. The Contractor will furnish and install only "AMAG" systems and devices as required, and no substitutions shall be deemed to be "or equal" or allowed.
- C. Card Readers
 1. AMAG Technologies
- D. Power Supplies
 1. Altronix
 2. Or Equal
- E. Alarm Devices

1. GE Security
2. DSI
3. Or Equal

2.2 ACCESS CONTROLLERS

- A. General: 8-door controller capable of expanding to 16 with modular additions, including battery backup, database, user defined reports, and several communication ports. Controller shall serve as a consolidation and control point for all security related field devices including card readers, lock control, elevator control, and intrusion detection devices. Specifically, the core functions of the controller are as follows.
1. Central control for devices attached.
 2. Makes decisions for access without reliance on communications to host or other field panel
 3. Executes scheduled events such as unlocking doors or bypassing alarms.
 4. Responds to monitor activity.
 5. Receives input to control its decision-making.
 6. Reports activity to other devices
 7. Can support multiple reader technologies
 8. Incorporates Flash Memory for remote upgrades or enhancements to firmware
 9. Provides communications in multiple formats to downstream panels or Host Software
- B. District Standard Configuration
1. Enclosure – UL listed Cab 4 Enclosure with internal 12VDC charge card and battery backup and external transformer. Note plug-in transformers will not be used and a hardwired consolidated transformer specified later will be used to power up to 3 controllers
 2. Components
 3. DBU – fitted with Network Interface Module for TCP/IP communications and integral RS232 communications to fall back on dial-up modem communications.
 4. (2) 4DCU
 5. (4) I/O modules.
- C. Capacities:
1. Card Readers: Standard configuration includes 8 cabled to and terminated in main controller enclosure. Controller is expandable to 16 with modular units connected to main database unit.
 2. Monitor Inputs: Standard configuration includes 32 inputs in main controller, expandable to 96 when including modular controllers.
 3. Relay outputs: 16 standard expandable to 32.

4. Card Holders: 20,000
 5. Elevator Control configuration allows for a single card reader connected with 32 floor control.
- D. Mounting: Provide in its own enclosure as a complete UL assembly with power supply.
- E. Power:
1. Source: Power is provided via unshielded twisted pair wiring from an external transformer and internal 12VDC charge card and 7.0 AMP Hour Battery.
 2. Power only the controller components and card readers from control panel power supply.
 3. Power all other devices including additional door furniture, locks, intrusion devices, and auxiliary relays from power supplies designated as such and specified herein.
 4. DBU Battery: A low voltage battery (such as a lithium cell) shall maintain the internally stored database setup when no power is available to the controller
- F. Communications
1. TCP/IP or Dial-up Communications from 1st panel on chain to host.
 2. 20 MA secure bi-directional to downstream panels in chain.
 3. 20 MA to card readers.
- G. Self-protection: The Controller shall have inputs to detect:
1. Power input failures.
 2. Controller tampering.
- H. Manufacturer: AMAG Technologies M2150 and other multiNODE series controllers

2.3 MONITOR INPUT/RELAY OUTPUT BOARDS

- A. General
1. Module that monitors inputs and provides relay outputs.
- B. Capacities:
1. Monitor Inputs: 8 four-state supervision monitor points.
 2. Relay Outputs: 4 Normally Open (NO) or Normally Closed (NC) Form C.
- C. Mounting: Plug in (piggyback) to door control units.
- D. Manufacturer:
1. AMAG Technologies MIN-I/O module

2.4 NETWORK/COMMUNICATION INTERFACE DEVICES

- A. TCP/IP 10/100BASE-TX Connection

- B. Any communications that must be achieved for the first panel other than direct connection to District WAN must be reviewed and approved by the District and the Engineer
- C. Automatic fail over to RS232 dial up communications for alarm routing to host
- D. Manufacturer:
 - 1. AMAG Technologies MIN-NIC-3 Network Interface Module.

2.5 CARD READERS

A. General

- 1. Wire readers back to the Controller directly. Do not daisy chain readers together.
- 2. Presenting a card to the reader shall initiate a single read. Thereafter the card must be removed from the reader's field and re-presented before it is again read by the system.
- 3. Coordinate specific reader types to be used below with district prior to ordering.
- 4. Integral LED to indicate the status of the door and an audible indicator. The LED status shall be as follows:
 - 5. Red steady indicates reader is powered up
 - 6. Red flash after card presentation indicates card has been read but access is denied
 - 7. Green Momentary indicates card is valid and access is granted
 - 8. Green Steady indicates door is unlocked indefinitely on schedule.
 - 9. Provide with an internal tamper switch that will indicate an alarm condition if an unauthorized attempt is made to disassemble the unit.
 - 10. Provide units capable of communicating in 20 MA bi-directional supervised protocol.

B. Exterior Perimeter Mullion Readers

- 1. Read Range: 2.5 inches (typical)
- 2. Operating Voltage: 9-14 VDC.
- 3. Manufacturer: AMAG Technologies S830 Micro Proximity Reader, Black or best color to match mounting surface
- 4. Accessories: AMAG Technologies #67X-GAK card reader gasket.

C. Interior Prox+Pin Command Card Readers

- 1. Read Range: 5 inches (typical)
- 2. Operating Voltage: 9-14 VDC.
- 3. Additional LEDS indicating card command and alarm armed status
- 4. Card Commands programmed from system head end and software based.
- 5. Manufacturer: AMAG Technologies S840-KP-AG Keypad Proximity, Ash Gray or best color to match mounting surface

6. Accessories: AMAG Technologies #67X-GAK card reader gasket.

2.6 REQUEST TO EXIT SENSOR (REX)

A. General

1. Mount REX detector directly to top jamb of doors above recessed contacts.
2. Aim detection pattern directly down in front of door plane to minimize pedestrian circumventing
3. Minimize relay pulse time to 1 second and allow controller to determine bypass time.
4. Wire REX cables directly back to controller.
5. Terminate signal to REX input on controller
6. Power REX detector from auxiliary 12VDC device power supply.

- B. Manufacturer: Detection Systems DS161 (Black) or DS160 (White), with mounting plate, use best color to match mounting surface

2.7 DOOR CONTACTS

A. General

1. Install door contacts flush in top jamb or side jamb of door near top corner
2. Align magnet with door contact
3. Report fire rated assemblies not factory prepped to general contractor to coordinate and acceptable solution
4. Wire contact cables directly back and terminate to controller
5. Closed-loop, 1/2" gap.

- B. Manufacturer: Sentrol 1076D 1" recessed contacts DPDT, mahogany; or approved equal

2.8 GLASS BREAK DETECTOR

- A. Provide digital type glass break sensor utilizing DSP technology.
- B. Sensor shall be capable of being mounted on any surface either vertically or horizontally within 25' of glass surface to be protected
- C. Coordinate location with Architectural reflected ceiling plan and other devices in ceiling
- D. Connect glass break alarm signal to input modules on ACAMS panel.
- E. Power glass break detector from auxiliary 12VDC device power supply.
- F. Manufacturer: GE Security Round Acoustic Glassbreak 5812-RND; white; or approved equal

2.9 TRANSFORMERS

A. General

1. Transformer shall convert 120/240V AC power to 12/24 Volts AC

2. Hardwire transformer to electrical junction box (plug-in transformers are not acceptable)
3. Transformer must be rated to power three ACAMS controllers and not shared with other device power requirements

B. Manufacturer: AMAG XFMR

2.10 POWER SUPPLIES/BATTERY CHARGERS

A. Control Panel Power Supply

1. Integral to AMAG Controller Assembly. Connect to ACME transformer.

B. Lock/Relay Power Supplies

1. 120V hardwired input.
2. 6 AMP continuous 24VDC supply
3. Alarm output for AC fail and low battery; connect to alarm inputs on ACAMS control panel.
4. Integral Isolation relays with 8 access control input triggers and 8 independently controlled and configured outputs
 - a. Dry outputs for triggers to PS-873 power supply at exit device doors
 - b. Wet 24VDC to low current locks
 - c. Wet 24VDC to power control relays in elevator demarcation enclosure.
5. Interconnect all card reader outputs (8) in a one to one relationship to inputs (8) on power supply.
6. Switching lock load through Access Control Panel relays is unacceptable
7. Do not use for devices other than locks and control relays.
8. Manufacturer: Altronix AL600ULXPD16, AL600ULACM

C. Device Power Supplies

1. 120V hardwired input.
2. 4 AMP continuous @ 12VDC.
3. Alarm output for AC fail and low battery; connect to alarm inputs on ACAMS control panel.
4. Do not power locks from power supply
5. Manufacturer: Altronix AL400ULM

2.11 DOOR MANAGEMENT ALARM

- A. Provide door management alarms at all in/out card reader locations
- B. Alarm shall be equipped with integral Rim Cylinder and keyed to the building standard

- C. Connect door alarms directly to door management alarm.
- D. Provide remote reset/shunt recycle function from card reader alarm bypass output to shunt alarm on valid card presentations
- E. Power alarm from 12 VDC auxiliary power supply at SEC.
- F. Manufacturer
 - 1. Designed Security Inc; Door Management Alarm ES4200

2.12 EMERGENCY EXIT ALARM

- A. Alarm shall be equipped with integral Rim Cylinder and keyed to the building standard
- B. Connect door contacts directly to exit alarm.
- C. Power alarm from 12VDC auxiliary power supply at SEC
- D. Manufacturer:
 - 1. Designed Security Inc; Exit Alarm ES4300A

2.13 DURESS BUTTONS/DOOR RELEASE

- A. Provide under-counter pull type duress buttons at each public service or help counters as indicated on the plans
- B. Coordinate final location for installation prior to owner to ensure they are ergonomically appropriate easily accessed with excessive travel
- C. Provide pathway and route consistent with telecom pathways to counters as well. Security and telecom cable me share the same furniture raceways if required.
- D. Manufacturer:
 - 1. Sentrol 3040
 - 2. Inovonics EN4232MR 32 Zone Multi-Condition Receiver
 - 3. Inovonics EN1235SF single-button fixed position hold up transmitter

2.14 TYPE 1 PULL BOXES/JUNCTION BOXES

- A. Provide 24"x24"x6.62" type 1 lockable enclosure at locations shown on plans
- B. Pull Boxes do not require back panel
- C. Elevator junction boxes require back panel and the following components fabricated to panel
 - 1. 24VDC low current double pole double throw form c equipment isolation relays
 - 2. Configure each relay for independent control of either floor select buttons Elevator 1 or hall call buttons Elevator 2 and powered from the lock power supplies located in the SEC
 - 3. Provide terminal strip on panel for landing outputs from relays on one side and interconnecting elevator cables on other side
 - 4. Provide tamper alarm in enclosures and terminate to ACAMS panel.

D. Manufacturer:

1. Hoffman Type 1 Enclosure A-2420ALP; Panel A2420MP; Cylinder Lock Kit A-L12AR

2.15 ACAM Door Local Emergency Lockdown Button

A. Provide and install wall mounted as prescribed by the construction management team for the location and as per ADA requirements.

B. Coordinate final location for installation prior to ensure they are ergonomically appropriate easily accessed with excessive travel

C. Provide pathway and route consistent with electrical pathways.

D. Manufacturer:

1. Safety Technology International Model # SS22A9LDEN

3.1 INSTALLATION

A. Control Equipment Installation

1. Coordinate installation of equipment with other trades to avoid unforeseen conflict.
2. Install supervisory and end of line resistors as required
3. Interconnect all access control panels, lock power supplies and device power supplies with rigid conduit and screw cover raceway (gutter) to protect cables throughout.
4. Hardwire all power supplies with electrical conduit fittings and junction boxes, plug in transformers and exposed cable is unacceptable.
5. Coordinate Network Data Drop with Telecom contractor inside access controller
6. Coordinate IP address with District IT staff
7. Coordinate Voice connection with District IT department.

B. Field Devices

1. Homerun all cable from field devices to control panel, utilizing J-Hangers, sleeves and risers for vertical and horizontal cable runs.
2. Provide wiremold surface mounted raceways to devices when concealment of EMT conduit is not possible
 - a. Exception is long multiple cable pathways routing to pull boxes or homeruns.
3. Install devices as indicated on drawings.
4. Use conduit pathways and fish cable as required to final device locations including using storefront mullion as raceways.

C. Locking and ADA Hardware

1. Coordinate the installation and termination of the security cable with the installation of the electric door hardware and transfer hinge provided under Division 8.

2. Connect and configure access control system integration to ADA operator as indicated in drawings. Reconfigure if required to meet sequence of operation for door. Coordinate with door contractor for equipment terminations.

D. Elevator Integration

1. Meet with elevator contractor to review scope and delineation of scope
2. Provide functioning relays in demarcation enclosure prior to elevator button cutover to ensure elevator will function with card readers at time of turn-up.
3. Furnish card reader to elevator contractor
4. Coordinate the installation and termination of the card reader inside the cab and in the elevator machine room.

3.2 PROGRAMMING

- A. Prior to the completion of construction, schedule a meeting with the Owner and the Engineer to determine the programming criteria and access to District head end. Discuss the following:
1. Door Names
 2. Device Names
 3. Alarm groups
 4. Schedules and time codes
 5. Action/responses from individual input points
 6. Action response from card and keypad commands
 7. Alarms tagged for routing ASCII data to existing alarm dialer.
 8. Document the results of the meeting and perform necessary programming to achieve the Owner's requests.
- B. Program the system such that reliance on a remote host for routine building operations, such as scheduled door commands and conditional events, are minimized to the greatest extent possible and decisions are made at the local building controller.
- C. Program the system in a manner that minimizes the amount of time required for the users to make updates and maintain the system on a daily basis especially updates that impact card holder record updates. Nested programs, such as reader groupings used in access codes shall be used to the greatest extent possible such that single actions are required to update an entire card data population. If there is a question regarding the appropriate approach to programming, given the flexibility of most systems, contact the Engineer prior to any initial programming.
- D. Program and setup all system hardware such that no additional programming other than entering new access cards, time codes, and access adding doors to existing access privilege groups is required. Programming shall include the setup of available features of the software.

END OF SECTION