

SECTION 28 13 00

ACCESS CONTROL AND ALARM MONITORING SYSTEM

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 (ACAMS) installation, as described in these specifications.
- B. Section Includes:
 - 1. Access Control, including access control units, input/output units, and card readers
 - 2. Door contacts and request to exit motion detectors
 - 3. Interface to electric door hardware and gate operators
 - 4. Interfaces and connections between security subsystems to allow communication with one another
 - 5. ACAMS Power supplies
 - 6. Entry Telephone Units
- C. Products Supplied But Not Installed Under This Section:
 - 1. None
- D. Products Installed But Not Supplied Under This Section:
 - 1. New electric feed-through power transfer hinges.
- E. Products Specified But Not Installed Under This Section:
 - 1. None
- F. Products Furnished and Installed Under Another Section:
 - 1. Life safety system relay
 - 2. Local area network ports
 - 3. Door Hardware
 - 4. Local area network ports
 - 5. Telecommunication cabling connectivity between PBX connected intercom locations and the IDF (telecom room)
- 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 28 00 00 Basic Security Requirements: includes general project requirements, submittal formats, warranty, and installation requirements.
 - 3. Section 28 23 00 Video Surveillance System: includes product information for video integration with the ACAMS.
 - 4. Section 28 05 13 Security System Cabling: includes product information for wire and cable needed to support the ACAMS.

5. Section 28 05 53 Security System Labeling: includes label types and formats for security devices.
6. Section 28 08 00 Security System Commissioning: includes the integrating testing/commissioning requirements for the ACAMS.

1.2 SYSTEM DESCRIPTION

A. Overview

1. The access control system is a distributed network of control panels connected to and programmed from an existing off-site central server and client workstations.
2. Electronic card access controls visitors, delivery personnel, members, and employee entrances to the facility.
3. Provide CCTV interface software for network video recording system. Provide interface to the Video Surveillance system network video recorders such that alarm activation (forced door alarm, held open alarm, etc) trigger alarm event recording.
4. Provide access control panels. Locate in Vender rooms located through the project. Panels support card readers with locking control outputs and multiple general-purpose input/output modules for automation.
5. Provide proximity card readers:
 - a. Main entrances to the building
 - b. Separation between departments
 - c. Med rooms
 - d. Staff Lounges and Lockers rooms
 - e. Data rooms
 - f. Vendor and Electrical rooms
 - g. Stairwell doors
 - h. Pharmacy
6. Provide door contacts and request-to-exit motion detectors for card reader controlled doors.
7. Provide double pole double throw contacts on doors controlled by card readers with associated alarm monitoring keypads. Wire one contact to the ACAMS system.
8. Provide door contacts for floor perimeter doors.
9. Provide 12VDC 3AMP ACAMS power supply.
10. Provide 24VDC 10AMP lock power supply.
11. Provide battery backup of system components and power supplies.

B. Entry Phone Unit

1. The Entry Phone unit shall consist of an outdoor-rated, vandal resistant and ADA-compliant hands-free speakerphone communications device with a stainless steel faceplate and metal buttons located as indicated on the drawings.
2. Utilize the Owner's PBX system for dial-up connection.
3. Entry Phone units at the loading dock as shown on project drawings.
4. Monitor activation of Entry telephone using an interface relay and a monitor input point to the access control system.

5. Unit will have one red anodized aluminum tactile button labeled "TO CALL", and one 0.375" diameter red light emitting diode (LED) labeled "LIGHT ON INDICATES CALL RECEIVED". The unit shall be programmable from a remote location and have a two number dialing capability per button, reverting to the second number if the first is busy or does not respond. The unit shall be totally hands-free on both sides after connection is initiated at site or by attendant.
 6. The unit shall be phone line powered, requiring no outside power source or battery back-up. DIP switch programming, push to talk devices, and devices requiring external power are not acceptable.
 7. Activation of the entry telephone sends a signal to the video surveillance system to initiate camera call up and recording.
 8. The Entry Phone unit shall be Talk-A-Phone model ETP-400DC
- C. Tamper Monitoring
1. Provide additional monitor input points for monitoring the following:
 - a. Tamper switches located within each security equipment enclosure and wireway (use unsupervised inputs for this purpose).
 - b. Supervision of power supplies and batteries (use unsupervised inputs for this purpose).
 - c. Tamper switches located within each door junction box.

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.
- C. Shop Drawings:
 1. Device placement on floor plans
 2. Point-to-Point Diagrams: Include wiring, points of connection and interconnecting devices between the following:
 - 1) Central Controller
 - 2) Printers
 - 3) Card Reader Controllers
 - 4) Card Readers
 - 5) Door and lock position monitoring contacts
 - 6) Alarm point monitoring modules
 - 7) Electric door locks & hardware
 - 8) Miscellaneous control relays
 - 9) Fire Alarm interface wiring
 - 10) Devices connected to the system
 - 11) Conductors (identify conductors on the point-to-point diagrams with the same tag as the installed conductor)
 - b. Schedules: Provide schedules for access control units that show each point ID with a description of the connected devices.
 - c. Block Diagram/Riser Diagram: Show the access control system components, conduit, wire types, and sizes between them, including cabling interties between termination hardware.
 - d. User interface graphics with icons and control buttons displayed.
3. Custom mounting details
 - a. Coordinate custom mounting of elevator card readers in elevator cabs.

1.4 EXTRA MATERIALS

- A. Provide 10% spare parts of total installed the following: (Round up to the next complete device)
 - 1. Fuses (Place five (5) of each type of fuse inside each SEC and power supply housing).
 - 2. Relays

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Access Control and Alarm Monitoring System
 - 1. LENEL, to match existing SGH standard.
- B. Card Readers
 - 1. HID
 - 2. Exceed ID

2.2 ACCESS CONTROLLERS

- A. General: RS-485, RS422, or 20mA based 8-door controller with battery backup, database, user defined reports, and several communication ports. Multiple communication channels to which a variety of devices can connect. Support at least one hardware module daughterboard for additional memory and/or for future feature enhancements. Functions provided include:
 - 1. Central control for devices attached
 - 2. Makes decisions for access
 - 3. Responds to monitor activity
 - 4. Receives input to control its decision making
 - 5. Reports activity to other devices
- B. Capacities:
 - 1. Addressable Devices: Proximity sensors, up to 16
 - 2. Monitor Inputs: Station switch, tamper, power fail, and alarm
 - 3. Relay outputs: Building Mode and Alarm
 - 4. I/O module: Connect with monitor input/output module via RS-485, RS-422, or 20mA
- C. Mounting: Provide in its own enclosure as a complete UL assembly.
- D. Power:
 - 1. Source: Power provided via unshielded twisted pair wiring from a Power Supply unit.
 - 2. Battery: Maintain the internally stored database setup when power not available to the controller with a low voltage battery (such as a lithium cell).
- E. Wiring:
 - 1. Cable limitations
 - a. Do not exceed 4,000 feet for RS-485, RS-422, or 20mA data channel.

- b. Every RS-485 device requires 16 VDC minimum for power.
 - c. Limit data power cable length by the cable losses, the length of the cable, and the devices to which it is connected.
- F. Communications
 - 1. RS-485 devices: through the system's shielded twisted pair wiring.
 - 2. Host or printer: TCP/IP via 10Base-T/100Base-TX/RS-485 Terminal Server interface.
 - 3. Terminal: ASCII through Terminal Port
- G. Self-protection: Provide inputs to detect:
 - 1. Power input failures
 - 2. Controller tampering
- H. Manufacturer:
 - 1. LENEL: #LNL-1000
 - 2. Software House: iSTAR GC

2.3 READER BOARD

- A. General
 - 1. Controls communications for a minimum of four readers and associated door contact, REX device and lock output.
 - 2. Incorporated flash memory for downloadable firmware
 - 3. Mounting: Mount DCU in the access controller enclosure as a complete UL assembly.
- B. Manufacturer:
 - 1. LENEL: #LNL-1320
 - 2. Software House: #iSTAR ACM

2.4 MONITOR INPUT/RELAY OUTPUT BOARDS

- A. General
 - 1. Monitor Input: Module that monitors inputs that occur over network and sends them via RS-485 protocol to the Controller.
 - 2. Relay Output: Executes relay commands received from the Controller via RS-485 protocol.
- B. Capacities:
 - 1. Monitor Inputs: Minimum 8 four-state monitor points.
 - 2. Relay Outputs: Minimum 8 Normally opened (NO) or Normally Closed (NC) via strap position.
- C. Manufacturer:
 - 1. Input Module:
 - a. LENEL: #LNL-1100
 - b. Software House: #I/8
 - 2. Output Module:
 - a. LENEL: #LNL-1200

- b. AMAG: #M2000 I/O, input/output module
- c. Software House: #R/8

2.5 NETWORK/COMMUNICATION INTERFACE DEVICES

- A. TCP/IP 10/100BASE-TX Connection
 - 1. Sensormatic single device terminal server with a 10/100BASE-TX connection and an RS-232/RS-485 output.
- B. RS-232 Direct Connection
 - 1. Short distance (max. two miles point-to-point on 22-AWG twisted pair at 9600 baud.)
 - 2. Manufacturer: Black Box short haul modems, ME800A
- C. RS-232 to RS-485
 - 1. Capable of transmitting data up to 4,000 ft at 64 kbps.
 - 2. Manufacturer: Access control system standard or Black Box RS-232 to RS422/485, IC107A
- D. RS-232 to Fiber
 - 1. Manufacturer: Access control system standard or Black Box Async Fiber Driver, MD940A
- E. RS-485 to Fiber
 - 1. Manufacturer: Access control system standard or Black Box Async Fiber Driver, MD940A
- F. KVM over Category 5 cabling
 - 1. Manufacturer: CCC Group FreeDesk transmitter and receiver

2.6 PROXIMITY CARD READERS

- A. General
 - 1. Wire readers back to the SEC directly using S-485 Multiplexers. Do not daisy chain readers together.
 - 2. Provide a single unit with properly sized mounting holes that allow it to be attached directly to a single gang electrical box, unless otherwise noted.
 - 3. Presenting a card to the reader initiates 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.
 - 4. Provide a multi-color LED to indicate the status of the door and an audible indicator. Provide separate terminal control points for the green, red, and amber LED, and the audible indicator.
 - 5. Provide with an internal tamper switch that will indicate an alarm condition if an unauthorized attempt is made to disassemble the unit.
 - 6. Provide units sealed to a NEMA rating of 4X, and internal electronics will have conformal coating to provide a high degree of environmental protection.
 - 7. Provide units capable of communicating in a Wiegand protocol interface, and compatible with standard access control systems.

8. Exterior Locations: Provide fully weatherized units with an operating temperature of -22 to 150 degrees Fahrenheit (-30 to 65 degrees Celsius), and an operating humidity of 5-95% non-condensing.
 9. Provide reader personality modules as required.
- B. Standard Range Readers
1. Read Range: 4 inches (minimum)
 2. Operating Voltage: 10-28.5 VDC.
 3. Manufacturer:
 - a. Indala
- C. Bio-metric Card Readers
1. Read Range: 4 inches (minimum)
 2. Manufacturer:
 - a. Bioscrypt V-Prox

2.7 ACCESS CARDS

- A. Cards
1. Provide 1,000 proximity cards.
 2. Format: Wiegand 35-Bit
 3. Manufacturer:
 - a. HID ProxCard II, corporate 1000 program.
 - b. XceedID, ISOX 9400
- B. PVC Skins
1. Provide 1000 PVC skins for printing.
 2. Manufacturer: Fargo #81759-B, 14 mil adhesive backed

2.8 DOOR POSITION CONTACTS

- A. Interior Doors
1. Mounting: Recessed
 2. Contacts: Single Pole, Single Throw
 3. Gap Distance: 0.5" maximum
 4. Manufacturer:
 - a. Sentrol 1078 closed-loop
 - b. Ademco
 - c. Or Equal
- B. Gates and Grilles –Wide Gap Contacts
1. High-Security
 2. Contacts: Single Pole, Single Throw
 3. Gap Distance: 0.4" maximum
 4. Manufacture:
 - a. Sentrol 2505 closed-loop
 - b. Ademco

c. Or Equal

2.9 REQUEST-TO-EXIT MOTION SENSORS

- A. Power: 12 VDC, 26 mA
- B. Relay Output: 2 form "C" contacts
- C. Adjustable relay latch time
- D. Programmable retrigger or non-retrigger mode
- E. Programmable Fail Safe or Fail Secure Modes
- F. Radio Frequency Interference (RFI) Immunity in the range from 26 to 1000 Mhertz at 50 v/m
- G. Manufacturers: Wall or Door Frame Mounted:
 - 1. Detection Systems #DS160i with trim plate
 - 2. Kantec, #T-REX
 - 3. Or Equal

2.10 LOCAL DOOR ALARM MANAGEMENT UNIT

- A. Panel operating voltage selectable 12 or 24 VDC at 150 mA.
- B. Keyswitch operation using rim cylinder supplied under Division 8 for local shunt, override and reset.
- C. 80 Db horn
- D. Input points for door switch, alarm shunt, remote alarm reset/override and voltage sense shunt.
- E. Outputs for door propped alarm, intrusion alarm, door status, tamper switch, and key switch override.
- F. Timers for access period, warning period and auto reset
- G. Tamper switch to detect the removal of the unit from the electrical box.
- H. Provide custom 3-gang electrical back box.
- I. Manufacturer:
 - 1. Designed Security Inc #ES4300 Exit Alarm.
 - 2. Or Equal

2.11 POWER SUPPLIES/BATTERY CHARGERS

- A. Access Control & Alarm Monitoring System
 - 1. Provide a 120 VAC input to 24 & 12 VDC output, continuous current, fully supervised power supplies for power to door locks, motion detectors, indicator lamps, etc.
 - 2. Provide separate power supplies for lock power. Other devices such as REX's and alarm horns may be combined on common power supplies.
 - a. Fail Safe an/or Fail Secure power outputs, individually selectable.
 - b. LEDs indicate outputs triggered

- c. Firm alarm disconnect individually selectable per output
- d. Manufacturer: Altronix #AL600ULACMCB UL listed power supply / battery charger for lock power.
- e. Manufacturer: Securitron #BPS-12-6 with 8-output expander card #CCB-8 for other devices.

2.12 NETWORK SWITCH

- A. Network Switch: (24) 10/100BASE-T ports, Cisco 2924 or equal

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Access Controllers
 - 1. Place power supply and associated hardware in same location.
 - 2. Install supervisory and end of line resistors as required.
- B. Proximity Readers
 - 1. Cable Requirements: Minimum five conductor, 22 AWG, stranded cable with overall shield. A six-conductor cable is required when controlling the red and green LED individually. A seven-conductor cable is required when both the red and green LED's are controlled by the Host. A 22AWG twisted pair shielded, stranded cable is required for use of the tamper switch.
 - 2. Wire the card reader 's multi-color LED to indicate the following status of the door.
 - a. Red status indicates the door is secure (locked).
 - b. Green status indicates the door is unsecured (unlocked).
 - c. Yellow status indicates the card reader is not functioning (off-line/trouble), is processing a read request, or has denied access.
 - 3. The card reader to produce an audible beep tone to indicate to the user:
 - a. The card was read and/or access was denied.
 - b. Door is being held open and needs to be closed.
- C. Door Hardware
 - 1. Route power to electrically controlled locks on life-safety doors through fire alarm interface relays to allow the door to be unlocked in the event of a fire alarm.
 - 2. Setup and conduct a door hardware coordination meeting.
 - 3. Coordinate the installation and termination of the security cable with the installation of the electric door hardware and transfer hinge.
 - 4. Provide cable and terminate wires to delayed egress devices for monitoring activation of delayed egress by the ACAMS system.
- D. Door Position Contacts
 - 1. General
 - a. Install on protected (secured) side of door.
 - b. Install 6" from leading edge at top of door.
- E. Request-To Exit Motion Detectors
 - 1. Mount motion detector on the secured (protected side) of door.

2. Install motion detector so that detection pattern is not obstructed by Exit Signs, light fixtures and other objects that would interfere with proper operation.
3. Adjust relay hold time and pattern to properly detect valid exit and allow shunting of door contact.
4. Adjust detection sensitivity to pulse.
5. Mask detector lens to provide a confined detection area limited to the door handle or pushbar.
6. Run wire inside structural tube steel frame into back of conduit for cage locations.

3.2 PROGRAMMING

- A. Prior to the completion of construction, schedule a meeting with the Owner and the Engineer to determine the programming criteria. Discuss the following:
 1. Access card levels and door groupings
 2. Alarm priority levels
 3. Schedules and time codes
 4. Holidays and holiday types (priorities)
 5. Action/responses from individual input points
 6. Standard and custom (expanded) reports
 7. Defining alarm messages and standard response messages applicable to site
 8. Routing of alarm points to selected pagers
 9. Routing of alarm points to operator's workstations, printers, and history files
 10. Coordinate implementation of graphics with Owner. Develop sample graphic complete with icons and text. Alarms to appear on building floor plans depicting the nature and location of alarms. Review and revise graphic layout as required by Owner.
 11. System data base backup to CD-ROM
 12. Emergency Phone Numbers
 13. Backup Phone Numbers
 14. CCTV camera call-up & recording requirements on activation of intercom
 15. CCTV camera call-up & recording requirements on activation of emergency phone
- B. Document the results of the meeting and perform necessary programming to achieve the Owner's requests.
- C. System Operation, Alarm and Reporting Function: Program door control panel tamper switches to immediately reported as a separate "tamper" point to the system resulting in an alarm condition displayed in both text and graphic form on the applicable workstation(s) and an alarm message transmitted to the appropriate pager(s).
- D. Receive CAD drawing files of floor plans and perform the following relative to system graphics:
 1. Delete non-applicable drawing layers and details to arrive at simple floor plans of the building as built.
 2. Convert drawings to a graphic file format compatible with the Owner's access control and alarm monitoring system.

3. Load drawing files into the system.
 4. Apply new and predefined icons and other points on each graphic to indicate point and control status.
 5. Link graphic images to reader, monitor and control points.
- E. Program routing of monitor and control points. Route activations and restore messages to one or more of the following locations as directed by the Owner's Representative:
1. One or more system workstations;
 2. One or more system printers;
 3. One or more alphanumeric pagers;
 4. History files in addition to the above;
 5. History files only.
- F. 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.
- G. 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
- H. Complete other programming as required for system operation.
- I. Program and setup the system such that no additional programming other than entering new access cards is required. Include setup of available features of the software.
- J. Use the point names provided on the system point schedule.
- K. Perform 2 full system back-ups at completion of initial programming and deliver one copy to owner with letter of Transmittal explaining information included in back-up and brief description of recovery procedures. Label the second CD-ROM and store onsite. Perform back-ups on a regular bases through the remainder of the project.
- L. Customize menus with the assistance of the factory to "gray-out" features not used on project (such as elevator control).
- M. Perform field software changes after the initial programming session to "fine tune" operating parameters and sequence of operations based on revised operating requirements.
- N. Program the Emergency/Entry Telephone Unit as required based on the results of the meeting.

3.3 TESTING

- A. Commission ACAMS in accordance with Section 28 08 00.

END OF SECTION