



SECTION 13700

SECURITY ACCESS AND SURVEILLANCE

ARCHITECTURAL & ENGINEERING SPECIFICATIONS



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PART 1

1.0 GENERAL

The intent of this document is to specify the minimum criteria for the design, supply, installation, and commissioning of an integrated Access Control and Alarm Monitoring System (ACS).

1.01 SUMMARY

- A. System and Components including Products Supplied and Installed:
1. Access Control System PC (host computer)
 2. Operating system and applicable software
 3. Design and input of system database
 4. Microprocessor-based Intelligent Main Logic Board (PTMLB)
 5. Microprocessor-based Intelligent Interface Modules:
 - a. Door Controller Module (PTDCM)
 - b. Quad Relay Module (PTQRM)
 - c. Zone Input Module (PTZIM)
 - d. Card Enrollment Kit (PTCEK)
 - e. Vista Gateway Module (PTVGM)
 6. Alarm input devices including, but not limited to, door position switches
 7. Standard and Enrollment Readers
 8. Cards
 9. Communication devices including, but not limited to, Modems
 10. Power Supplies
 - a. Distributed-Intelligent (PTDPSU)
 - b. Uninterruptible (UPS)
 11. System Wiring
- B. Products Supplied But Not Installed:
1. N/A
- C. Products Installed But Not Supplied:
1. Division 16 - Electrical
 - a. Section 16050 - Basic Electrical Materials and Methods
 - b. Section 16100 - Wiring Methods
 - c. Section 16200 - Electrical Power
 - d. Section 16300 - Transmission and Distribution
 - e. Section 16400 - Low-Voltage Distribution

f. Section 16700 - Communications

D. Related Sections:

1. Section 13800 - Building Automation and Control
2. Section 13850 - Detection and Alarm
3. Section 14280 - Elevator Equipment and Controls
4. Section 15700 - Heating, Ventilation and Air Conditioning Equipment
5. Section 16500 - Lighting

E. Allowances: TBD

F. Unit Prices: TBD

G. Alternates: TBD

1.02 REFERENCES

The specifications and standards listed below form a part of this specification to the extent specified:

A. Federal Communications Commission (FCC):

1. FCC Part 15 - Radio Frequency Devices
2. FCC Part 68 - Connection of Terminal Equipment to the Telephone Network

B. Underwriters Laboratories (UL):

1. UL294 - Access Control System Units

C. National Fire Protection Association (NFPA):

1. NFPA70 – National Electrical Code

D. Miscellaneous

1. FTT-10 - Echelon Free-Topology Transceiver Specification

1.03 DEFINITIONS

- A. Access Point – A collection of card readers, alarm input zones, and output relays committed to the control and monitoring of the door hardware, at a single point of

entry or exit. An access point can be a door, gate, turnstile, or any point of controlled access in a facility.

- B. Access Control System (ACS) PC/Host Computer – A PC that is 1) executing the ACS application software, 2) where the ACS database resides, and 3) provides the user interface to the ACS for programming and operational control.
- C. On-line/Off-line – The Access Control System is on-line when the Access Control System application software is connected to and communicating with the PTMLB and off-line when the Access Control System application software is disconnected from and not communicating with the PTMLB.
- D. Account – A partition of the Access Control System database that allows the operator to manage more than one Access Control System location. Accounts help the operator manage multiple PTMLB's by treating each PTMLB as an independent unit. Each PTMLB is assigned a unique account number. The operator must login to a specific account, which refers to a single PTMLB controlling access points at the protected premises.
- E. Zone – The circuitry, wiring and sensor or sensors required for monitoring a desired condition. Commonly referred to as an Input or Alarm Input.

1.04 SYSTEM DESCRIPTION

- A. The Access Control System (ACS) shall consist of software and hardware components that provide monitoring and control of access points to a protected premises. The ACS shall be capable of protecting multiple premises and operating with or without the ACS PC connected to the hardware components. The ACS shall be capable of monitoring alarm inputs and controlling relay outputs and of being integrated with a compatible Fire/Burg Alarm Control panel. Modular hardware architecture shall allow maximum versatility for tailoring secure and dependable access and alarm monitoring solutions for small and medium facilities. The ACS shall include the following capabilities:
 - 1. The ACS shall be designed to be fully scalable, offering capabilities and capacities to support a wide variety of applications. The ACS shall support up to 32 access points.
 - 2. A fully distributed architecture shall be utilized. The ACS architecture shall place key access decisions, event/action processing, and alarm monitoring functions within the intelligent PTMLB and hardware interface modules, thereby maintaining high levels of site security and allowing offline operation.
 - 3. ACS Operating Modes - The following modes shall be provided:
 - a. Off Line - Once configured the ACS shall be capable of full operation in an off-line mode, where the application software is not communicating with the PTMLB.
 - b. On Line - ACS resources shall be controlled and events monitored in real-time by an on-line mode, where the application software is

communicating with the PTMLB. This mode shall also be used for enrollment and system configuration changes.

4. Echelon LonWorks shall provide the communication means and multiple connectivity options between the PTMLB and hardware interface modules.
5. The ACS shall fully utilize the graphical user interface and native 32-bit multi-tasking, multi-threaded capabilities of Microsoft® Windows®. The graphical user interface shall follow the Microsoft® Graphical User Interface guidelines and employ other Windows® components such as Help utilities, task bars, drag-and-drop features, and the mouse “right-click,” for an intuitive system interface.
6. The ACS shall provide an interface to a fire/burg alarm system, allowing integrated access control and security features, such as, single card swipes to arm/disarm alarm partitions and monitoring of the ACS by a central station.
7. The ACS shall be designed to specifically address ease of installation, robustness, and reliability.
8. Successively larger ACS capacities shall be accomplished by means of strategically adding hardware interface modules to achieve capacity and performance without disturbing the overall unity of the system.
9. Upgrades to the hardware and software shall occur seamlessly without the loss of database, configurations, or historical report data.
10. The ACS shall be, at a minimum, UL 294 listed.

1.05 SUBMITTALS

A. Schematics shall be provided showing:

1. Riser diagrams for communications cables and device cables.
2. Termination drawings for interface modules.
3. List of connected devices at the respective modules.
4. Interconnection diagrams for connection to third-party products or systems.

B. Product data provided shall include:

1. Technical data sheets shall be submitted for each system component, including computer equipment, system printers, communications devices, application software description, PTMLB, interface and power supply modules, readers, cards, and all supplemental and field devices.
 2. A complete set of user's guides, installation, and operation manuals shall be provided in either hardcopy or electronic form.
- C. "As-Built" data provided shall include:
1. All specified data shall be submitted in final "as-built" form: specifically, riser diagrams, interconnection diagrams, and termination diagrams.

1.06 QUALITY ASSURANCE

- A. The manufacturer shall be certified as being compliant with ISO9001.

1.07 DELIVERY, STORAGE, AND HANDLING

1.08 PROJECT CONDITIONS

1.09 SEQUENCING

1.10 SCHEDULING

1.11 WARRANTY

- A. General - The warranty period shall begin on the date of first beneficial use and shall be for a one-year period. It shall include work performed during and after regular hours.
- B. Personnel - Warranty service shall be performed by technicians trained by the manufacturer.
- C. Scope - The ACS supplier shall maintain a stock of replacement parts sufficient to provide responsive same-day or next-day service with a minimum of system "down" time.

1.12 MAINTENANCE

- A. Preventive Maintenance Agreement During Warranty - As a separate price item, the Contractor shall provide preventive maintenance during the warranty period. Maintenance shall include, but not be limited to:
1. Labor and materials, at no additional cost, to provide tests, lubrication, and adjustment to system devices, including printers, locking and door hardware, and all supplemental and field hardware.

2. Labor and materials, at no additional cost, to provide tests for noise suppression, ground faults, battery test, and UPS test.
 3. Regular inspections to ensure that a correct procedure is established and being followed for database backup and archiving.
- B. Preventive Maintenance Agreement - As a separate price item and at the owner's request, the contractor shall provide a complete Maintenance Agreement for a period of three years after the conclusion of the warranty period. The Maintenance Agreement shall include, but not be limited to:
1. Labor and materials, at no additional cost, to repair any ACS devices, including computers and related equipment, communication devices, printers, PTMLB, interface modules, power supplies, batteries, UPS, locking and door hardware and all supplemental and field hardware.
 2. Labor and materials, at no additional cost, to provide tests, lubrication, and adjustment to system devices, including printers, locking and door hardware and all supplemental and field hardware.
 3. Labor and materials, at no additional cost, to provide tests for noise suppression, ground faults, battery test, and UPS test.
 4. Regular inspections to ensure that a correct procedure is established and being followed for database backup and archiving.

1.13 TRAINING

- A. Operator training shall be conducted for a minimum session length of four hours at the customer's site, on at least two separate occasions.
- B. Training shall be performed by factory-trained personnel.
- C. Sessions shall include but not be limited to:
 1. Pre-installation - database collection, design, and entry.
 2. Post installation - system operation including manual commands, database backup, system diagnostics, and report generation.

PART 2

2.0 PRODUCTS

2.01 SYSTEM PERFORMANCE

- A. ACS PC (Host Computer) - The ACS PC shall be installed at the location as indicated by the owner. The ACS PC shall be directly connected, via RS-232 or short haul modems, connected by auto-dial modems, or connected through a LAN to a PTMLB, as indicated on the drawings.
1. The ACS PC shall be, at a minimum:
 - a. 90 MHz Pentium I
 - b. 16 MB Ram
 - c. 20 MB of available Hard Drive space
 - d. SVGA, 800 x 600, 256 Colors, Monitor
 - e. 1.44 MB Floppy and CD-ROM
 - e. Keyboard and Mouse
 - f. One (1) available serial port (for PTMLB connection)
 2. The ACS PC Operating System shall be Windows 95, 98 or NT 4.0.
 3. A UPS shall be provided. It shall be sized to support the PC, Monitor, and attached peripherals, including modems, printers and speakers in the event of a building power supply failure of up to 10 minutes.
- B. Optional Computer Hardware - The ACS PC shall be capable of supporting additional optional hardware for:
1. Advanced Features:
 - a. One (1) available serial port (for Twain digital camera)
 - b. Twain compliant scanner
 - c. Integral Technologies® Flashpoint Light™ video capture card (or equivalent) for on-screen video
 - d. Two (2) Hayes® compatible 28.8K (or faster) modems
- C. ACS Application Software - The 32-bit application software shall be compatible with Windows 95, 98 and NT 4.0, provide easy-to-use “wizards” for system configuration, and provide pre-packaged, predefined graphical templates (access levels and time schedules) for quick system set-up. The application software shall allow the operator to manage a single facility by communicating with a single PTMLB and its associated hardware interface equipment through the use of an Account. The application software shall allow the operator to manage multiple facilities by communicating with up to 32 accounts, where each account contains a single PTMLB. The application software shall also enable configuration and maintenance procedures to be performed on the PTMLB and its associated interface modules. The application software shall support “real-time” event

monitoring and a means of extracting historical data from the PTMLB, allowing event reports to be produced. The application software shall also support automated enrollment of PTMLB and interface modules.

1. Operators - Operators shall be required to log on by entering a personal name and password assigned by the ACS administrator. The privileges assigned to each operator shall allow variable capability and govern operator access to specific menu items. The ACS shall support 21 independent system operators.
2. Database Management - The ACS shall use a 32-bit, ODBC-compliant, Borland Paradox 7.0 database. Other 32-bit, ODBC-compliant databases or parts of databases shall be imported using an ASCII comma delimited file that provides for security, data integrity checks, and corruption detection.
3. Cardholder Management – Each ACS account shall support up to 1958 cardholders. A comprehensive Cardholder Record shall provide detailed information regarding an employee’s access control, work, personal, and vehicle-related data. The ACS shall allow the operator to customize 8 user-defined data fields. The ACS shall support migration of cardholder data from one account into another, allowing multiple sites with identical cardholder databases.
4. Complete Report Builder - A complete library of Database Reports shall be included with the system. A Custom Report Builder shall allow the user to modify the reports or create new reports to suit specific applications and then print or export in text, Paradox, dBase or Excel formats.
5. Alarm Reporting and Control - The ACS shall monitor, report, and record alarms of various types and classes, including system alarms, general alarms, access alarms, intrusion alarms, and trouble alarms. The ACS shall support 66 alarm inputs.
 - a. The ACS event display shall include a dedicated text-based event window. The event display shall list system conditions in the order received from the PTMLB.
6. Dynamic Graphical Display - The ACS shall provide a graphical representation, or icon, of the hardware modules and their status.
 - a. The icons shall reflect the current condition of the device or object represented and shall change state when viewing the resource status display by selecting the refresh button.
 - b. Selection of a particular icon shall present a menu with appropriate contents to allow the operator to control the device.

7. History Logging and Reporting – All ACS events shall be logged to the history log. A complete library of History Log Reports shall be included with the system. A Custom Report Builder shall allow the user to modify the reports or create new reports to suit specific applications.
 8. Maintenance and Diagnostics - Diagnostic reports of system setups and status shall be supported for display and for printing.
 9. Database Backup, Restore and History Archive - The ACS shall support full system backup and restore, incremental backup and restore, and data archiving capability.
 10. Help – An extensive easy-to-use, context-sensitive, hyper-linked Help Utility shall be provided.
- D. Communication Methods – ACS communications shall support directly connected, dial-up and network connections between ACS PC and PTMLB.
1. Directly Connected Communication via RS232 Serial Port – The ACS PC serial port shall be used to directly connect, via RS-232 or short haul modems, to an PTMLB for support of a local site.
 2. Dial-Up Communications to a Remote Site – An auto-dial modem may be connected to the serial port on the ACS PC for support of remote sites.
 3. Network Communications – Ethernet addressable devices may be connected to the ACS PC and PTMLB allowing them to communicate through an existing Local Area Network (LAN).
- E. ACS Hardware (PTMLB, Interface and Power Supply Modules) - The ACS hardware shall maintain a high level of site security and allow offline operation by using distributed processing and a centralized database. The ACS hardware shall use a modular design and free-topology connections allowing for ease of installation and expansion. The PTMLB shall be the main controller and hold the database, event log, programming and configuration options, and status information for the ACS. The interface modules shall function as peripherals to the PTMLB. Each interface module shall support the input and output functions of the ACS. The interface modules shall consist of Door Control Modules (PTDCM), Quad Relay Modules (PTQRM), Zone Input Modules (PTZIM), System Console (6139 Keypad, PTKPAD), Card Enrollment Kits (PTCEK), Power Supply Modules (PTDPSU), and Vista Gateway Modules (PTVGM). All configurable options for each module shall be accomplished via software, firmware and non-volatile memory, eliminating the need for PCB jumpers and DIP switches. All modules except the power supply shall perform self-tests and advanced diagnostics and report hardware problems back to the ACS application software.

1. PTMLB Hardware - The PTMLB shall be an intelligent, distributed processing, single board controller. The PTMLB shall use a 32-bit microprocessor and shall be constructed with a noise immune architecture. The PTMLB shall provide one RS-232 serial port for communications to the ACS PC, an Echelon FTT-10 network connection for communications with interface modules and a local keypad/display for trouble annunciation.
 - a. The PTMLB shall support a minimum of 32 access points, in either one or two reader configurations.
 - b. The PTMLB shall support up to 60 application modules including 32 Door Control Modules, 8 Zone Input Modules, 8 Relay Control Modules, and 12 Computer Port Modules.
 - c. Power Requirements shall not exceed 10.5-14.0 VDC @ 250 mA.
 - d. The card database, event log, and system configuration information shall be stored in the PTMLB's non-volatile FLASH memory. It shall be possible to adjust the size and configuration of the memory for the card database and the event log depending on the system requirements.
 - e. The PTMLB shall contain a Real Time Clock and shall use the clock to time events, validate access time schedules, and provide the time-stamp for events in the event log. The clock will accommodate leap year, daylight savings time adjustments and year 2000 compliance. It shall include a replaceable battery with a typical life of five years.
 - f. Each module (except the PTCEK and PTVGM) shall provide monitoring of the AC Power Loss and Low Battery outputs of the related PTDPSU.
 - g. The PTMLB shall provide two supervised user configurable Alarm Input Zones and one Form C supervised output relay, complete with LED annunciation.
 - h. The PTMLB shall support an optional Contact-ID Digital Communicator (PTVGM) allowing 685 based central station monitoring of access point conditions. It shall be possible to choose the PTMLB's account number to be identical to a security system in order to allow combined ACS and security system customer billing.
2. PTMLB Communication to Application Modules - Communication with Application Modules shall be via Echelon LonWorks.

- a. The connection shall adhere to the Echelon Free-Topology Transceiver specification (FTT-10) which uses a transformer-coupled interface for electrical isolation and common mode noise rejection. A polarity insensitive, unshielded, twisted pair cable shall be used.
 - b. It shall operate at a speed of 78 KBPS, at distances up to 2,700 meters (8860 feet) using a doubly terminated bus. Distances of up to 500 meters (1640 feet) shall be achieved in a free-topology architecture, which includes star, bus and loop wiring.
3. PTMLB Access Control Features -
- a. Access Point – Up to 32 access points shall be supported, each having a unique number and a 1-40 character name.
 - b. Card and PIN Modes - It shall be possible to configure an Access Point for Card only, PIN only, Card or PIN, Card + PIN or PIN + Card modes. The modes shall be changed automatically by Time Schedule or Event /Action.
 - c. Duress Mode - Shall be activated by the cardholder entering a pre-selected digit sequence at a keypad during a forced entry.
 - d. PIN Retry Lockout – The system shall monitor the number of incorrect PIN entries, and after the pre-set number of attempts shall place the Access Point into exit only mode for a programmed number of seconds (1-255).
 - e. Entry/Exit Control - Access Areas shall be used to create separate protected areas. The PTMLB shall use these areas to control entry and exit of cardholders from an access area. If a cardholder is known to be in an access area, and that cardholder presents a card at any reader located in a different area, an Entry/Exit violation shall occur. Each PTMLB shall support at least 127 Access Areas. Hard and soft violations shall be supported.
 - f. Timed Anti-Passback - Timed Anti-Passback shall prevent a card from being used consecutively at the same Access Point within a specified time. The Anti-Passback Timer shall be capable of settings from 1 to 60 minutes and shall be decremented once per minute. Hard and soft violations shall be supported.
 - g. Access Groups - Each PTMLB shall have a minimum of 128 Access Groups that define access privileges. Access Groups shall be a combination of Access Points and Time Schedules shared by a group of cardholders. Up to five Access Groups may be assigned to a single card.

- h. Multiple Cards - It shall be possible to assign multiple cards to a cardholder. Each card shall be configured with a unique card code, a user selectable PIN code, up to five Access Groups, an expiration date which automatically disables the card on a specific date and a Usage Number that decrements for each Access Grant.
 - 1) Each card may be Enabled, Disabled, Traced, or provided with Executive Privilege and be forgiven pass-back status to re-synchronize the pass-back logic.
 - 2) In addition to normal Access Point control, each cardholder may also be assigned an Action, which is initiated when the card is Granted Access at any Access Point. Each cardholder may also be assigned a second Action, which is initiated when the card is Denied Access.
- i. Scheduling - The PTMLB shall have a capacity of 64 weekly time schedules. Time schedules shall be used to program the Access Privileges and Event/Action Programs.
 - 1) A Time Schedule shall be constructed of Day Templates. Each Day Template shall have 8 start/stop time periods, and may span midnight. There shall be at least 22 Day Templates available.
 - 2) The Start Date and an End Date shall define the period during which the Time Schedule shall be operative.
 - 3) The PTMLB shall have a minimum capacity of 32 holidays.
- j. Actions -
 - 1) Scheduled Actions - A Time Schedule shall be associated with two actions. The first, Start Action, shall be initiated when the schedule becomes Active, and the second, Stop Action, shall be initiated when the schedule becomes Inactive. A "Resume Scheduled Control" command shall allow operators to return a resource to Scheduled Control. This command shall be executed automatically for scheduled resources at system re-start or power-up.
 - 2) Event/Action Control - An Event/Action program shall match events being logged into the PTMLB buffer with events entered into the Event/Action table. The Event/Action Scanner shall constantly review the Event Buffer for new events and if the new event in the buffer

matches the event in the table and the associated Weekly Time Schedule is Active, then the action shall be performed. The PTMLB shall contain a minimum of 32 Event/Action programs.

- k. Precedence and Persistence - The PTMLB shall include a mandatory feature, which gives precedence to action functions. This feature is necessary to prevent an action generated by one part of the system overriding an action of a higher priority.
 - 1) Precedence shall be assigned to System Functions such that as that function is performed at a resource, then the precedence value is left with that resource. Only a function of an equal or higher Precedence would then be able to control the resource.
 - 2) After a resource has been controlled by a function with a specific Precedence then it must be specified if this Precedence is to persist (remain at the resource). A Persistence level shall be sent with the function command. The Persistence shall determine if the resource “takes” the new Precedence, “leaves” the existing Precedence or “clears” the Precedence.
- l. Threat Levels – Threat Levels shall qualify a global condition or “state of emergency”. A minimum of six Threat Levels shall be provided and used by Access Groups and Actions.
- m. Event Log - The event log shall contain a history of events. Each entry in the Event Log shall be time and date stamped with a time resolution of one second and automatically sent to the system. In the event that communication is interrupted, the events shall be stored in the Event Log. The events in the log are prioritized such that events of the highest priority are sent first when communication is resumed.
- n. Deny Override mode - In this mode, the PTMLB shall perform all of its normal access control checks but will allow access to any cardholder. Card events reported while in this mode shall display the actual results of the card event, e.g. Access Denied – even though access was Granted. In addition, a Deny Override indication shall be provided.
- o. Modem Support – The PTMLB may be installed at remote sites and shall communicate with the ACS application software using dial-up modems. A timer shall monitor the connection and if no communication occurs within a pre-determined time period then the connection shall be terminated.

- 1) Call Initiation - The PTMLB shall initiate a call based on any combination of: Time of Day, Day of Week, Time since last connection, Capacity of Buffer, Minimum time between calls and Event Priority.
 - 2) Security – If the ACS application software initiates the call then the PTMLB will receive the call, immediately disconnect and initiate a call to the ACS application software. On connection a 14-digit hexadecimal password will be negotiated.
- F. Door Control Module (PTDCM) - The PTDCM shall provide all inputs and outputs required to manage up to two single-reader Access Points and shall simultaneously accept card data from two card readers. The PTDCM shall provide two supervised Alarm Zone Inputs for Door Position Switches, two supervised Zone Inputs for Request to Exit devices and two Form C, supervised Output Relays which can be used to operate electromagnetic door locks or electric strikes. The PTDCM shall also provide two open-collector Trigger Outputs, which can be used to operate sounders or LED's for local annunciation of alarms.
1. The PTDCM shall be installed in an enclosure with the PTMLB or installed in a remote location and be connected to the PTMLB using the Echelon network.
 2. Power requirements shall not exceed 10.5-14.0 VDC @ 170 mA.
 3. Configuration settings shall be downloaded from the PTMLB. There shall be no configuration switches or jumpers.
 4. Card Reader Technology - The PTDCM shall provide support for up to two card readers, connected to the PTDCM using either Data 1/Data 0 or Clock & Data communication format. Each reader connected to the PTDCM may be a different reader technology. The technologies that shall be supported are Wiegand or Wiegand output devices, Proximity, Magnetic Stripe, Keypads and Reader/Keypad combinations.
 5. Request-to-Exit (RTE) Zone Input – If the RTE switch is a passive infrared detector, it shall be specifically designed for Request-to-Exit applications. The RTE switch shall be configured to be either Normally Open, Normally Closed, EOLR Normally Open or EOLR Normally Closed. When the RTE switch is activated, and the Access Point is in Protected Mode or Exit Only Mode, the Door Lock Control Relay shall be energized, unlatching (unlocking) the door's locking device.
 6. Door Lock Control Relay - The PTDCM shall provide two Form C Supervised Relays, rated at 5A resistive load @ 28Volts AC/DC. Each relay shall include LED annunciation of the state of the relay.

- a. Door-Latch Unlock Time (Momentary Unlatch Time) – The momentary time, in seconds, during which the door control relay is energized, unlatching (unlocking) the door. The time shall be adjustable between 1 and 65,535 seconds (18.2 hours).
 - b. Relay voltage supervision shall be provided by monitoring a terminal on the PTDCM, and reporting if the power supply for the door-locking device fails.
7. Door Status Monitor (DSM) - The DSM input shall be configured to be either a Normally-Open or Normally Closed device, or shall be supervised as a three-state device by a single end-of-line-resistor (EOLR).
8. Door Open Time – The maximum time that a door is allowed to remain open during an access grant through the Access Point. If this time is violated, the PTDCM shall generate a Door Open Time alarm. The door open time shall be adjustable between 1 and 65,535 seconds (18.2 hours).
9. Alarm Modes - The PTDCM shall report any of the following conditions:
 - a. Door Open - The door was opened without authority.
 - b. Door Open Time - The door was held open beyond the Door Status Monitor Zone Time Open.
 - c. Non-Entry - The door was not opened after an Access Grant.
10. Trigger Outputs - There shall be a Trigger Output associated with the Alarm Mode that will be activated by a Door Forced or a Door Propped Open event. The trigger shall be used to interface to an audible/visible alarm device or as an input to a monitored alarm system. Each Trigger Output shall be rated at 15mA @ 15VDC.
11. Relatch (Anti-Tailgating) - The Access Point shall be programmable as to whether or not the associated door should re-lock or not, and when this should happen. Relatch shall be selectable to occur upon door opening or door closure.
12. Operational Modes - The PTDCM shall be capable of operating in the following modes:
 - a. Protected - This shall be the normal state for an Access Point. In this mode, the system shall control all entry and exit through the Access Point. The door is unlatched (unlocked) only momentarily, in order to allow entry or egress.

- b. Exit Only - This mode shall deny all entry requests but shall allow authorized card reader exit requests or requests to exit. At an Access Point having Entry and Exit readers, Entry readers associated with this Access Point shall be disabled.
 - c. Bypassed - This mode shall permanently unlatch (unlock) the door. Entries and exits can occur freely. The RTE zone shall be disabled. The DSM zone shall be bypassed.
 - d. Locked - This mode shall keep the door latched (locked) against all access requests. All entries and exits shall be blocked. The RTE zone associated with this Access Point shall be disabled. No access grant requests shall be accepted from operators or as a result of Event/Actions or Scripts. To make access possible, the Access Point must be returned to Protected mode before access requests from any source can be serviced.
13. Pre-Alarm Condition – The PTDCM shall be capable of providing a Pre-Alarm signal, which activates before the Access Point goes into a Door Open Time alarm. The Pre-Alarm time is adjustable from between 1 and 65,535 seconds (18.2 hours). The PTDCM shall also initiate a Pre-Alarm cycle if the Access Point changes mode from Bypassed to Protected, Exit Only or Locked mode while the door is still open. If the PTDCM senses the door is closed, then the Access Point shall go directly to the new mode without Pre-Alarm.
- a. The Access Point Pre-Alarm shall be associated with a PTDCM Trigger (open collector output) that shall be used to interface to an audible/visible alarm device. During the Pre-Alarm time, the output can be controlled for:
 - 1) Controlled – The state of the output will track the pre-alarm condition status.
 - 2) One-Shot (Pulse) - The output can be turned on from 1 to 65,535 seconds (18.2 hours), or until the door closes.
 - 3) Repeating - The output can be turned on from 1 to 65,535 seconds (18.2 hours), and be turned off from 1 to 65,535 seconds (18.2 hours). This cycle can be continually repeated from 1 to 255 times, or repeated forever (or until the door closes).
14. Reduced Capability Mode (RCM) - In the event the PTDCM loses communication with the PTMLB, it shall automatically enter Reduced Capability Mode. The PTDCM while in RCM shall, as predefined by the operator, validate the encoded card data using a bit-wise analysis and grant or deny access.

- a. Automatic RCM - In this mode, the following basic Access Point controls shall continue to function:
 - 1) Requests to exit - Will be processed.
 - 2) Pre-Alarm - Will activate the associated trigger output.
 - 3) Door Forced Open – Will activate the associated trigger output.
 - 4) Door Propped Open – Will activate the associated trigger output.
 - b. Special Function Cards - Eight special-function cards or groups of cards which may be assigned to perform:
 - 1) An access grant.
 - 2) Latch the door and place in Protected mode. If the door is open when this occurs, then Pre-Alarm shall take place.
 - 3) Unlatch the door and place in Bypass mode.
- G. Zone Input Module (PTZIM) - The Zone Input Module shall provide eight supervised alarm inputs that shall be used for general-purpose alarm monitoring.
- 1. The PTZIM shall be installed in an enclosure with the PTMLB or installed in a remote location and be connected to the PTMLB using the Echelon network.
 - 2. Power requirements shall not exceed 10.5-14.0 VDC @ 100 mA.
 - 3. Supervision - The zone inputs shall:
 - a. Be unsupervised 2-state, supervised 3-state, using a single 2K ohm End of Line Resistor (EOLR) or supervised 4-state using two 2K ohm EILR (End In Line Resistors).
 - b. Include software “de-bounce” to provide noise rejection.
 - 4. All configuration information shall be downloaded from the PTMLB. There shall be no configuration switches or jumpers.
- H. Quad Relay Module - The Quad Relay Module (PTQRM) shall provide four Form C supervised output relays. It shall also provide four open collector general purpose Trigger Outputs that may be used to drive external relays, LEDs or piezoelectric sounders.

1. The PTQRM shall be installed in an enclosure with the PTMLB or installed in a remote location and be connected to the PTMLB using the Echelon network.
 2. Power requirements shall not exceed 10.5-14.0 VDC @ 190 mA.
 3. All configuration information shall be downloaded from the PTMLB. There shall be no configuration switches or jumpers.
 4. Output Relays - The PTQRM shall provide four Form C Supervised Relays, rated at 5A resistive load @ 28Volts AC/DC. Each relay shall include LED annunciation of the state of the relay.
 - a. Relay Voltage Supervision - Relay voltage supervision shall be provided by monitoring a terminal of the relay, and reporting if the power supply for the monitored device fails.
 - b. Configuration - The configuration of each relay shall be stored at the PTQRM such that the PTMLB need only send an activation command to that relay.
 5. Trigger Outputs - The PTQRM shall provide four Open-Collector Trigger Outputs rated at 15mA, 15VDC.
 6. Each Output Relay and Trigger may be energized or de-energized continuously, pulsed or repeatedly pulsed.
- I. Distributed Power Supply Unit (PTDPSU) - The Power Supply Module shall be a distributed, intelligent, microprocessor-based module with self-diagnostic capabilities. Each PTDPSU shall provide both a 13.7VDC @ 450mA linear power supply and a 14.0VDC @ 1.35A switching power supply.
1. The PTDPSU shall be connected to the AC line voltage by an 18VAC @ 50VA plug-in Class 2 power transformer.
 2. The PTDPSU shall include the capability to monitor the state of the AC input voltage once every two seconds and a quick battery test shall be performed for one second once every minute. An extended battery test shall be performed for eight minutes every 22 hours.
 3. The PTDPSU shall include battery charge capability for battery back up using a 12VDC, 7.0 Amp-Hour battery.
 4. The PTDPSU shall provide supervision outputs for AC input voltage and low battery condition.
- J. Card Enrollment Kit (PTCEK) - The PTCEK shall provide an Echelon network to universal reader port interface for use as a command station or enrollment reader.

1. The PTCEK shall be installed in a desktop unit allowing convenient placement of the attached device or card enrollment/command station.
 2. The PTCEK shall be powered by a 15VDC @ 600mA plug-in Class 2 power transformer.
- K. Vista Gateway Module (PTVGM) - A PTVGM shall provide an interface between the PTMLB and an Ademco Vista 128FB panel allowing integration of access control and Fire/Burg features.
1. The PTVGM shall allow either system to:
 - a) Arm or disarm the other.
 - b) Be capable of initiating actions within the other.
 - c) Be capable of controlling each other's outputs.
 2. Up to 16 ACS access points and up to 8 spare ACS input zones shall be mapped into the zones of a fire/burg panel.
 3. ACS cardholders shall be mapped to Fire/Burg cardholders allowing:
 - a) Fire/Burg user codes to request access or egress.
 - b) RF Fire/Burg transmitters to be used as cards.
 - c) Card swipes to control arming and disarming of Fire/Burg partitions.

4. Card and keypad generated access and egress requests shall be:

- a) Denied to Fire/Burg partitions that are armed in Away mode, restricting cardholders from entering protected areas and reducing false alarms Fire/Burg user codes to request access or egress.
 - b) Granted to Fire/Burg partitions that are armed in Stay mode, allowing cardholders to enter protected areas without disrupting other perimeter protection.
- K. System Console (6139 Keypad, PTKPAD) - The 6139 Keypad shall be provided as a minimal user interface. The 6139 Keypad shall be a full-alpha console with a 2-line by 16 character backlit LCD display, 16-character keypad and piezoelectric sounder. The 6139 Keypad shall be used to display system status.
- L. Enclosures – Enclosures shall be complete with locking door. The enclosures shall be manufactured using a minimum of 18-gauge metal. Provisions shall be made for the attachment of grounding shields on all enclosures.

2.02 ELECTRICAL POWER REQUIREMENTS

- A. ACS PC Power - The ACS PC shall operate using standard 120-volt AC, 50/60-Hz power. The connection to the main building power supply shall be performed in accordance with the general terms and conditions of this contract. An Uninterruptible Power Supply (UPS) shall be provided. It shall be sized to support the PC, Monitor, and attached peripherals, including modems, printers and speakers in the event of a building power supply failure of up to 10 minutes.
- B. ACS Hardware Power - The ACS hardware shall operate using standard, unswitched 120-volt AC, 50/60-Hz power. The connection to the main building power supply shall be performed in accordance with the general terms and conditions of this contract. This shall include provision of and connection to an UPS when specified.
- 1. An in-line or plug-in Class 2 transformer rated at 18VAC @ 50VA shall provide power.
 - 2. The power supply shall include a 12VDC, 7.0 Amp-Hour battery, securely fastened within the enclosure to prevent the accidental removal of the battery.

(1) 2.03 ENVIRONMENTAL CONDITIONS

- A. Environmental Conditions - The ACS shall be designed to meet the following environmental conditions:
1. Storage Temperature - The ACS shall be designed for a storage temperature of -10° C to 70°C.
 2. Operating Temperature - The ACS shall be designed for an operating temperature of 0° C to 50°C (32° F to 120°F).
 3. Humidity - The system shall be designed for normal operation in a 0-80% non-condensing relative humidity environment.
 4. Electromagnetic Interference - The system shall meet or exceed the requirements of FCC Part 15, Class B devices, FCC Part 68 and IEC EMC directive.

2.04. ASSOCIATED EQUIPMENT

- A. The following equipment shall be provided as part of the system:
1. Card Readers - Card Readers and/or keypads shall be provided at the specified locations. These shall be installed at the height shown on the drawings. The cabling to the readers shall be shielded and grounded as per the manufacturer's instructions. Care should be taken to avoid errant contact between the shield and doorframe. Any one or combination of the following components shall be provided:
 - a. Wiegand – HID (Sensor Engineering) Wiegand card readers or reader-keypad combos of style and finish selected from the manufacturer's product list as shown on the installation documents shall be provided.
 - b. Proximity – Motorola Indala or HID (Sensor Engineering) Proximity card readers or reader-keypad combos of style and finish selected from the manufacturer's product list as shown on the installation documents shall be provided.
 - c. Magnetic Stripe – Dorado or Mercury Magnetic Stripe card readers or reader-keypad combos of style and finish selected from the manufacturer's product list as shown on the installation documents shall be provided. They shall be available in both swipe and insert designs in various styles and finishes as selected from the manufacturer's standard product list. The readers shall read standard American Banking Association (ABA) magnetic stripe cards.
 - d. Bar Code - Time Keeping Systems Bar Code card readers of style and finish selected from the manufacturer's product list as shown

on the installation documents shall be provided. The readers shall provide a 26-bit Wiegand or ABA type output.

- e. Stand-Alone Keypad - Keypads shall be manufactured by Essex Piezoelectric and suitable for indoor or outdoor use. They shall provide a Wiegand output and use standard Wiegand reader cable.
2. Access Cards - Access Control Cards, selected from the manufacturer's standard product offering, shall be provided. Any one or combination of the following components shall be provided.
- a. Wiegand - The Wiegand cards shall be either standard 26-bit cards or unique 34-bit cards.
 - 1) The Standard 26-bit cards shall include an 8-bit facility code, and 16-bit card number.
 - 2) The 34-bit cards shall be unique to Ademco. The 34-bit card number shall include a 20-bit card number, an 8-bit facility code and a 4-bit RCM code, which shall be used for Reduced Capability Mode. The card data shall also include a beginning and an ending parity bit to ensure a proper card read.
 - b. Proximity - The proximity cards shall be either standard 26-bit cards or unique 34-bit cards. They shall be manufactured by HID or Motorola Indala.
 - 1) The Standard 26-bit cards shall include an 8-bit facility code, and 16-bit card number.
 - 2) The 34-bit cards shall be unique to Ademco. The 34-bit card number shall include a 20-bit card number, an 8-bit facility code and a 4-bit RCM code, which shall be used for Reduced Capability Mode. The card data shall also include a beginning and an ending parity bit to ensure a proper card read.
 - c. Magnetic Stripe - The magnetic stripe cards shall be encoded on either Track 1 or 2 to suit the specified readers. The magnetic stripe cards shall be standard American Banking Association (ABA) cards.
 - d. Bar Code - The bar code cards shall be factory encoded in "3 of 9" bar card format. Support of bar code formats "interleaved 2 of 5" and "Codabar" shall not be required.
 - e. Card options shall include items selected from the following list:

- 1) Standard card
- 2) Card suitable for direct-to-card photo ID
- 3) Card with adhesive backing and high-gloss PVC for direct-print photo ID

PART 3

3.0 EXECUTION

3.01 EXAMINATION

- A. Submission of a proposal confirms that the Contract Documents and site conditions are accepted without qualifications unless exceptions are specifically noted.
- B. The site shall be visited on a regular basis to appraise ongoing progress of other trades and contracts, make allowances for all ongoing work, and coordinate the requirements of this contract in a timely manner.

3.02 PREPARATION

3.03 INSTALLATION

- A. The Access Control and Alarm Monitoring System shall be installed in accordance with the manufacturer's installation instructions.

3.04 TESTING AND CERTIFICATION

- A. The Access Control and Alarm Monitoring System shall be tested in accordance with the following:
 - 1. The Contractor shall conduct a complete inspection and test of all installed access control and security monitoring equipment. This includes testing and verifying connection to equipment of other Divisions, such as Life Safety and Elevators.
 - 2. The Contractor shall provide staff to test all devices and all operational features of the system for witness by the Owner's representative and the Authority Having Jurisdiction (AHJ). The Contractor shall provide two-way radio communications to assist in the testing. The owner's representative prior to acceptance must witness all testing.
 - 3. The testing and certification shall take place as follows:
 - a. System shall be tested in conjunction with the manufacturer's representative.
 - b. All deficiencies noted in the above test shall be corrected.
 - c. Test results shall be submitted to the consultant or owner's representative.
 - d. System test witnessed by owner's representative and correction of any deficiencies noted.

- e. The owner's representative shall accept the system.
 - f. System test shall be witnessed by the AHJ. Any deficiencies noted shall be corrected.
4. A letter of certification shall be provided to indicate that the tests have been performed and all devices are operational.

END OF SECTION



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