

**Part 1            General**

**1.1                CARE, OPERATION AND START-UP**

- .1            Provide instructions in accordance with Section 26 05 00.

**1.2                PRODUCT DATA**

- .1            Submit product data in accordance with Section 26 05 00.

**1.3                OPERATION AND MAINTENANCE DATA**

- .1            Provide data for incorporation into maintenance manual.
- .2            Include description of system operation.
- .3            Include parts list using component identification numbers standard to electronics industry.

**1.4                ACCEPTABLE MATERIALS**

- .1            Where materials are specified by the trade name within this Section, they are to establish an acceptable standard of quality. Alternates shall only be accepted upon approval prior to tender closing.

**Part 2            Products**

**2.1                GENERAL - DESCRIPTION**

- .1            The access control system shall be a modular access control system controlled at one P.C. under one software program. Configuration to be on-line system programming without hardware changes. System programming (software) shall be menu driven and include on-line help.
- .2            Alarm point monitoring:
  - .1            System to support both manual and automatic responses to alarms to allow for multiple outputs (i.e. door control, remote devices, etc.)
- .3            Operator level assignable by assigned password for basic monitoring up to full control including programming (define area's and day of access).

**2.2                ACCESS CONTROL**

- .1            Control Panel:
  - .1            Microprocessor based modular construction distributed intelligence architecture for independent operation.
  - .2            Database information storage and logic execution shall be at the control panel.
  - .3            System programming and control logic shall be stored in read only memory (ROM) at the control panel.

- .4 Control panel RAM and ROM to be field upgradeable.
- .5 Configuration:
  - .1 Input points:
    - .1 Two (2) fully customizable.
    - .2 Expansion to 256 input points via expansion modules.
  - .2 Output Points:
    - .1 Two (2) relay outputs (5A & 1A).
    - .2 Expansion to 28 output points expansion modules.
  - .3 Battery Backup:
    - .1 Min two (2) hour system operation.
  - .4 Proximity type reader support.
  - .5 12-button keypad support.
  - .6 Firmware:
    - .1 Card/keycode capacity: 8000 with expansion to 64,000.
    - .2 Real Time transaction transmission.
  - .7 EEMAC 1 enclosure with hinged cover key lock and tamper switch, internal power supply.
  - .8 Acceptable manufacturer or approved equal:
    - .1 DSC #PC4020
    - .2 Kantech
    - .3 Honeywell
- .2 Proximity reader:
  - .1 Reader head: proximity type not dependant on presented card orientation.
  - .2 Read range: 8".
  - .3 Rating: 24 VDC.
  - .4 Operating temperatures: -22 to 150°F (-30 to 65°C).
  - .5 Visual confirmation: LED indicator.
  - .6 Enclosure: polycarbonate, weatherproof.
  - .7 Acceptable manufacturer or approved equal:
    - .1 ioProx #P225W26
    - .2 Kantech
    - .3 Honeywell
- .3 Proximity Cards:
  - .1 For use with readers specified above.
  - .2 Quantity: as required by Client.

- .4 Power Supply:
  - .1 The power supply to the overall system is to be capable of supplying two hours of complete system operation.
- .5 Electric Strikes:
  - .1 24 volt strikes supplied by door hardware supplier.
- .6 Door Release Button:
  - .1 Mounted at desk to owners' specification.
  - .2 Rocker, momentary action, single pole, single throw.
  - .3 Acceptable manufacturer or approved equal:
    - .1 RCI #909SM0W
    - .2 Kantech
    - .3 Honeywell

### **2.3 SYSTEM SOFTWARE**

- .1 The system software is to be Honeywell, Delta Controls or approved equal to provide door access control.

### **2.4 ALTERNATE MANUFACTURERS**

- .1 The system as designed is based on a system supplied by a specific manufacturer. The Contractor shall include, in his request for approved equals, a written description of all areas of the proposed system which deviate from the specified system; the system must be compatible with the existing system software. Approval shall be by the Client. No alternate system will be allowed without their approval.
- .2 Layout shown on drawing E-2 in diagramical form only; electrical contractor to ensure system is complete end to end with all necessary hardware, modules, software and licenses required for a complete and fully functional system.

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Install security devices including, but not limited to, proximity card readers, door monitor contacts, control units, power supplies, central computers, pushbuttons, conduit, wiring, etc.
- .2 Locate security devices as indicated and make interconnections in accordance with manufacturer's requirements.
- .3 Program software to function in accordance with the Owner's requirements.
- .4 The final programming and/or identification shall use room numbers which will be provided to the Contractor. The room numbers used on the contract drawings shall not be used unless advised otherwise.

**3.2 TESTING**

- .1 The complete system shall be tested and verified to confirm that it is operating in conformance with the manufacturer's requirements and the intentions of this specification.
- .2 Provide a certificate from the manufacturer verifying that each component is functioning properly and that the system is functioning as intended.

**3.3 TRAINING**

- .1 Provide sufficient training to ensure that operating personnel are capable of proper operation of the system.

**END OF SECTION**

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**Part 1      General**

**1.1      REFERENCE**

- .1      Read and be governed by Section 26 05 00.

**1.2      RELATED WORK**

- .1      Comply with relevant Sections of this and other Divisions of this Specification.
- .2      Refer to mechanical drawings for the exact location of all fans, starters and other required devices and sequence of operation description and ensure compliance.
- .3      Division 26 will transmit a signal to ECMS (BAS) controller, when system goes into alarm.

**1.3      DESCRIPTION OF SYSTEM**

- .1      New devices to be added to base building system as per drawings. New devices must be compatible with this Notifier system.
- .2      The operation of any alarm initiating device will:
  - .1      Cause all signals to sound continuously throughout the building at the evacuation rate (temporal pattern) without automatic interruption, unless manually silenced by the responding fire department.
  - .2      A one-minute inhibit feature is to be programmed into the fire alarm system to prevent alarm silencing before one minutes has elapsed. Silencing the audible signals will activate a "signal silenced" lamp. A subsequent alarm from any circuit will cause the audible signals to sound again.
  - .3      Transmit signal to the security, ECMS systems and central monitoring station.
  - .4      Activate visual signal devices.
  - .5      Cause zone of alarm and the actual device to be indicated on the control panel.
  - .6      Automatically shut down all recirculating air handling equipment, not associated with smoke control system.
  - .7      Release any fire doors and smoke control doors if normally held open, to close automatically.
  - .8      Actuation of supervisory devices to:
    - .1      Cause electronic latch to lock-in supervisory state at central control unit.
    - .2      Indicate respective supervisory zone at central control unit and at remote annunciators.
    - .3      Cause audible signal at central control unit to sound.
    - .4      Activate common supervisory sequence.
  - .9      Resetting alarm and/or supervisory device to return system indications/functions back to normal.

- .10 Trouble on system to:
  - .1 Indicate circuit in trouble at central control unit.
  - .2 Activate “system trouble” indication, buzzer and common trouble sequence. Acknowledging trouble condition to silence audible indication; whereas visual indication to remain until trouble is cleared and system is back to normal.
- .11 Trouble on system: suppressed during course of alarm.
- .12 Trouble condition on any circuit in system not to initiate alarm conditions.

#### **1.4 SUBMITTALS**

- .1 Submit shop drawings for the following:
  - .1 All new devices.
  - .2 Passive graphic display.
- .2 Submit with the shop drawings:
  - .1 Updated description of the operational sequences of the system, in such a manner as to show a complete understanding of both Mechanical and Electrical requirements and provisions.
  - .2 Complete set of drawings, indicating location of all devices, control and annunciator panels, all interconnections to mechanical equipment, all conduit routing and sizes, all wire sizes, types, number and a riser for each control panel indicating all of the above.
  - .3 Pictorial drawings of control equipment indicating the location of the components and parts and their respective catalogue number and electrical characteristics.
  - .4 Internal schematic diagrams of control equipment.
  - .5 Interconnecting diagrams and cable manual.
  - .6 System descriptions of the actual installation.
  - .7 Maintenance instructions.
  - .8 Recommended spare parts list.
- .3 Provide name, address and telephone number of the manufacturer's service representative to be contacted during the warranty period.
- .4 In addition, “As-Built” riser and wiring diagrams reflecting all T-Taps, each programmed device characteristic including detector type, base type, serial number, sensitivity setting and wire configurations will be provided to the Engineer-Architect, based on the information gathered during the verification process described above.

#### **1.5 REPROGRAMMING**

- .1 Allow for all reprogramming of software, during the duration of the contract.

## **1.6 MAINTENANCE**

- .1 Allow for 1 (one) year's parts and labour maintenance commencing from the date of substantial completion, with 2 (two) inspections by manufacturer during the year. Inspections to be performed to ULC S536 standards. Submit inspection report to Engineer-Architect and Owner.

## **1.7 ACCEPTABLE MATERIALS**

- .1 Where materials are specified by the trade name within this Section, they are to establish an acceptable standard of quality. Alternates shall only be accepted upon approval prior to tender closing.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 All equipment to be CSA approved, ULC listed and manufactured to the following standards:  
Power supply: CAN4-S524.  
Audible signal devices: ULC-S525.  
Control unit: ULC-S527.  
Manual fire alarm stations: ULC-S528.  
Smoke detectors: ULC-S529.  
Thermal detectors: ULC-S530.  
Smoke alarms: ULC-S531.  
Digital dialer & GSM wireless annunciator: CAN/ULC-S561.
- .2 All equipment used for the fire alarm system to be designed and supplied by a single manufacturer, to ensure uniformity of standards, compatibility in operation, parts availability, trained technical support and competent maintenance.
- .3 It must be possible to expand and modify the system with minimum software and hardware changes, in such a way, that system components are not affected.
- .4 The system to be capable of detecting the electrical location of each intelligent device. It will be possible to display the intelligent device map on the laptop PC.
- .5 If a device map cannot be generated by the Control Panel, the contractor must include a minimum of (3) days to verify location of all wire runs and conduit.

### **2.2 PASSIVE GRAPHIC DISPLAY**

- .1 Acrylic graphic display passive type as follows:  
  
Passive graphic display(s) on white photo bond paper in metal frame (s) with polycarbonate or plexiglass glazing. In compliance with NFPA-72 6-2.3, the graphic(s) "shall be designed and fabricated" and installed in a manner "to render them damage and tamper resistant". The display(s) shall be securely attached to the wall adjacent to the fire alarm main panel. The labelling on the graphic must closely correspond to the displays on

the fire alarm annunciator or the labels for each fire panel alarm indication. All wording shall be in English. The floor plan drawing is to indicate:

- .1 Building's outline showing all exterior doors.
- .2 Building's corridors, stairways and elevators.
- .3 Location of, and divisions between, the fire alarm zones.
- .4 Location of the main fire alarm panel.
- .5 The location of the main sprinkler system valve and the supervised valve for each sprinkler zone (Use of a legend and symbols is recommended).
- .6 Duct smoke detector locations and/or ventilation equipment rooms, where relevant. (use of a legend and symbols is recommended)
- .7 Kitchen fire suppression system, where relevant.
- .8 An accurate "you are here" indicator each graphic display must be oriented to match the direction of the location at which it is to be posted. - i.e. oriented to the direction in which the person viewing the display is facing.

## 2.3 DEVICES

- .1 Manual Pull Stations (existing):
  - .1 Manual pull stations to utilize a pull-down lever, be semi-flush or surface type, bilingual, single-stage, intelligent addressable analog type, and finished in red enamel. Pull stations to be molded polycarbonate material construction. Metal pull stations are not acceptable.
- .2 Heat Detectors:
  - .1 Heat Detectors to be intelligent analog addressable type, rate compensated and shall include the following:
    - .1 Detectors to be rated at 135 degrees. Detectors to be constructed to compensate for the thermal inertia inherent in conventional type detectors due to the thermal mass, and alarm at the set point of 135 degrees Fahrenheit.
    - .2 The detectors furnished shall have a listed spacing for coverage up to 900 square feet for use in environments as covered by ULC.
- .3 Smoke detectors:
  - .1 Addressable smoke detector: ionization type, air duct type with sampling tubes with protective housing.
    - .1 Twistlock plug-in type with fixed base.
  - .2 Wire-in base assembly with integral red alarm LED, and terminals for remote relay alarm LED.
  - .3 Electronics to communicate detector's status to addressable module.
  - .4 Detector address to be set on detector base in field.
  - .5 Complete with two (2) auxiliary contacts.

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- .4 Detector Bases:
- .1 Universal Fire Detector Bases to be low profile twist lock type with screw clamp terminals and self-wiping contacts. Bases to be installed on an industry standard, 4" square or octagonal electrical outlet box and to be supplied with the following features as required for performance to this specification:
    - .1 Where selective localized control of electrical devices is required for system operation, furnish and install detector base with software programmed addressable relay integral to the base. Operation of the addressable control circuit to be independent of the number of detectors and relays on the circuit or the number in an alarm state.
    - .2 Furnish a concealed security lock, preventing unauthorized removal, installed in the base in those areas requiring tamper resistant installation as indicated on the drawings.
    - .3 The detector bases to be compatible with, and allow the installation of, detectors operating on the flame, ionization, photoelectric or rate compensated heat principles of detection in intelligent and conventional formats.
- .5 Addressable Interface Module (existing):
- .1 Dual-Zone addressable interface module, to be provided to connect nonaddressable contact devices such as waterflow switches, low pressure switches, sprinkler valve tamper switches and pre-action systems to an addressable signaling circuit.
- .6 Line Isolator Modules (existing):
- .1 Install line isolator modules, whenever the analog signal line connected to an analog signaling module, is required to isolate a section affected by a short circuit. When the isolator operates, the balance of input devices located on wiring sections not in the same fire separation shall not be affected by the short and shall continue to function normally.
  - .2 The system shall indicate a short circuit trouble on the loop.
  - .3 Module to mount on an electrical box and have terminals for all wiring connections. When assembled, neither the wiring nor any controls to be exposed.
- .7 Combination Audible/Visual Signal Devices:
- .1 Horns: Horns to be selectable for high or low dBA output (4 adjustable volume settings) and temporal horn synchronization.
  - .2 Strobes to provide field selectable 15/75, 30/75, 75 or 110 cd synchronized flash outputs. The strobe to have lens markings oriented for universal mounting (24 Vdc).
  - .3 uLC Listed for both wall and ceiling mount.
  - .4 Strobe and horn synchronization shall be provided by a single pair of wires.

- .8 End-of-Line Devices:
  - .1 Provide high impact plastic red end-of-line plates with screw terminations as required for all conventional circuits.

## **2.4 ACCEPTABLE MATERIALS**

- .1 Siemens
- .2 Edwards
- .3 Simplex
- .4 Notifier

## **Part 3 Execution**

### **3.1 INSTALLATION**

- .1 Install systems in accordance with CAN/ULC-S524.
- .2 All conduits and wiring to be new:
  - .1 Wiring to be in accordance with the Canadian Electrical Code.
  - .2 All wiring to be installed in conduit and in accordance with recommendations of manufacturer. All wiring/conduit to be concealed in construction.
  - .3 Connect smoke detectors and manual stations between red and black conductors at each outlet. Cut red and black conductors at each outlet and connect to terminal screws provided, red to red and black to black.
  - .4 Align alarm devices and signals, where grouped together, one above the other.
  - .5 Terminate wiring for alarm devices and signals on floor in a suitable terminal cabinet for that particular floor.
  - .6 Entire installation to be done under supervision of manufacturer. Upon completion of installation, check entire system to approval and correct any malfunction immediately.
  - .7 Splices are not permitted.
  - .8 Label conductors at panel and each junction point, with plastic wire markers indicating, signal or control circuit number.
- .3 Locate and install detectors and connect to alarm circuit wiring. Do not mount detectors within a 900mm radius of air outlets. Maintain at least 600mm radius clear space on ceiling, below and around detectors. For detectors located at held open doors, mount detector within 900mm of door on either side.
- .4 Connect alarm circuits to main control panel.
- .5 Locate and install signal and/or visual signal devices and connect to signalling circuits. Locate and install strobes and connect to signalling circuits to flash.

- .6 Install end-of-line devices in an outlet box (in electrical rooms) at a height not exceeding 1800mm above finished floor.
- .7 Program device address to reflect Owner's room names and numbers. Confirm the room names and numbers to be used with the Owner, prior to programming.
- .8 All fire alarm junction boxes to contain terminal strips as required.
- .9 Verification to be provided for all new devices and to conform to CAN/ULC-S537.

### 3.2 FIELD QUALITY CONTROL

- .1 Perform tests in accordance with this Specification and CAN/ULC-S537.
- .2 Fire alarm system:
  - .1 Test each device and alarm circuit to ensure manual stations and smoke detectors, transmit alarm to control panel and actuate general alarm and ancillary devices.
  - .2 Simulate grounds and breaks on alarm and signalling circuits to ensure proper operation of trouble signals.
- .3 Provide final PROM program return for system incorporating program changes made during construction.
- .4 Functional testing of audible devices is to be performed to ensure the sound pressure level is not less than 10 dBA above the ambient noise level without being less than 65 dBA.

### 3.3 INSPECTION

- .1 Upon completion of work, the fire alarm system must be verified by a contractor/company OTHER than the installing contractor/company. An inspection of all equipment, including those components necessary for the direct operation of the system such as manual stations, detectors and controls is to be performed. The inspection to comprise an examination of such equipment for the following:
  - .1 That the type of equipment installed is that designated by this specification.
  - .2 That the wiring type, installation and connections to all equipment components show that the installer undertook to have observed all applicable codes and standards.
  - .3 That equipment supplied by the manufacturer was installed in accordance with the manufacturer's recommendation and that all devices have been operated or tested to verify their operation. .4 That the supervisory wiring of those items of equipment connected to a supervised circuit is operating and that the governmental regulations, if any, concerning the supervisory wiring, have been met to the satisfaction of inspection officials.
- .2 The manufacturer to supply to the electrical contractor reasonable amounts of technical assistance with respect to any changes necessary to conform to Paragraphs .1, .2 and .4 above. During the period of inspection by manufacturer, the electrical contractor to make available to the manufacturer, electricians as designated by the manufacturer.

- .3 To assist the electrical contractor in preparing his bid, the manufacturer to indicate the number of hours necessary to complete this inspection prior to closing of tenders.
- .4 On completion of the inspection and when all of the above conditions have been complied with, the manufacturer to issue to the Engineer-Architect:
  - .1 A copy of the Inspecting Technician's report showing location of each device and certifying the test results of each device.
  - .2 A certificate of verification confirming that the inspection has been completed in accordance with CAN/ULC-S537 and showing the conditions upon which such inspection and certification have been rendered.
  - .3 The representative of the manufacturer shall provide evidence of technical training on the type of electronic equipment specified herein and shall have at least five (5) years experience with early warning fire detection and control systems.
  - .4 Final test and acceptance of the system shall be witnessed by representatives of three parties: the Owner, the Contractor, the Manufacturer.
  - .5 Service technicians and replacement components for the system specified shall be available within 24 hours from an authorized service representative of the manufacturer who is able to provide evidence of the technical training and authorization by the manufacturer.
  - .5 All costs involved in this inspection, both from the manufacturer and the electrical contractor work, to be included in the tender price.

### **3.4 WARRANTY**

- .1 Provide a written guarantee, signed and issued in the name of the Owner, stating that the fire alarm system is guaranteed against defects in material, workmanship and performance for a period of two (2) years from the date of the Final Certificate of Completion. CAN/ULC-S537.

**END OF SECTION**