

Technical Service Note

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Re: Architect and Engineering Specification
Product: DS7400Xi Control/Communicator
Date: January 5, 1998



1.0 Part One: General

1.1 Work Included

Provide all labor, materials, equipment, and services to perform all operations required for the complete installation and related work as shown in all contract documents.

1.2 Qualifications

- A. The alarm contractor shall provide all equipment and accessories for a complete electrically supervised security alarm system as described herein and shown in the drawings.
- B. Model numbers and designations, which appear herein, indicate design, quality, and type of material as well as operating characteristics.
- C. The security alarm system products shall be built modular in construction for ease of expansion and service. Functions shall be on replaceable panels or modules to accommodate functional changes when required. All critical wiring and connectors shall be supervised so as to give a trouble signal if removed or disconnected.

1.3 Security Alarm System Make

The control/communicator, control stations, and programmers shall be manufactured by Detection Systems, Inc.

1.4 Submittals

Submittals are required for the entire system, including the branch wiring diagram.

1.5 System Description

- A. The actuation of any alarm initiating device shall cause the following to happen:
 - 1. [All audible security alarm annunciators shall sound. These annunciators shall be [bells] [horns] [sirens].] [Alarms shall be silent; there shall be no audible devices.]
 - 2. Centrally located visual annunciation shall take place at a control station showing the particular [partition] [point] in alarm.
 - 3. A telephone line shall be provided for communication to the alarm company central station.
 - 4. All automatic locking devices located at each perimeter door, and all hatches or other access routes leading outside of the protected area shall automatically activate. The locking devices shall not be released except by the system operator at a master control panel, or automatically in the event of a fire alarm.

5. Each elevator shall automatically descend to the ground level in the event of any fire alarm. The elevators shall not return to normal operation until all alarms have been acknowledged by the system operator.

B. A code (personal identification number) shall be provided through the control station to manually silence all audible alarm signals.

C. The control/communicator shall contain initiating [and bypass] circuits as required, and shall be connected to all necessary equipment to individually and collectively power and effect the operating of the overall security alarm system. All initiating circuits shall be supervised.. The control station shall visually annunciate alarm and trouble conditions.

E. Remote access through the control station shall allow control of all options and functions of the control/communicator.

F. The control station shall provide [fire] [emergency] [panic] keys that shall manually alarm the security alarm system.

G. Activation of any installed control station shall allow designated personnel an installer adjustable pre-set entry/exit delay time interval to enter or exit a secured area before alarming the system.

H. The control/communicator shall be connected to a primary source of 120 volts, [50 Hz] [60 Hz], through a U.L. Listed 18.0 VAC transformer rated at 50 VA. The control/communicator, in turn, shall then provide up to 2.5 A of power at 12.0 VDC nominal for the security alarm system's supervisory and detection functions.

I. Sufficient standby power shall be furnished for no less than four hours of overall system operation at full auxiliary power standby load of 1.5 A and 2.5 A total in alarm.

J. The control/communicator shall be installed in accordance with [NFPA 72, The National Fire Code] and in accordance with [U.L. Standard UL985, Household Fire Alarm] [U.L. Standard UL864, Commercial Fire Alarm] [U.L. Standard UL1023, Household Burglary Alarm] [U.L. Standard UL609, Local Burglary Alarm Grade A] [U.L. Standard UL365, Police Station Connection Grade A] [U.L. Standard UL1610, Central Station Burglary Alarm Grades B and C] [U.L. Standard UL681, Installation and Classification of Mercantile and Bank Burglar Alarm Systems] [U.L. Standard UL1641, Installation and Classification of Residential Burglar Alarm Systems].

K. The alarm contractor shall provide all power supplies, peripheral devices, and equipment required for a complete and operational security alarm system.

2.0 Part Two: Products

2.1 Control/Communicator

A. The control/communicator shall be surface mounted, [shall contain all necessary system power] and all circuitry shall be housed in a locked 20 Gauge cold-rolled steel enclosure [[with a cover to enclosure] [and an enclosure to wall] actuated tamper switch installed].

[B. The control/communicator shall supply standby power to operate the audible security alarm system's annunciators in the event of an alarm.]

[C. The control/communicator standby power shall be provided by [one] [two] rechargeable sealed lead-acid battery[s].]

- D. The control/communicator shall be capable of recharging the standby battery[s] within 24 hours on a fully loaded system after the re-application of AC power.
- E. Auxiliary power shall be 12.0 VDC nominal at up to 1.5 A continuous to power auxiliary devices and shall not be battery dependent.
- F. The temperature compensated battery charge shall be for up to 34.4 AH of batteries.
- G. Circuitry shall be protected by MOVs or the equivalent, backed-up by spark gaps, and shall have automatically resettable thermal breakers.
- H. Each installed [control station] [keyswitch] shall allow system [arming] [disarming] [bypassing] and shall display the status of the security alarm system.
- I. The control/communicator shall have the following outputs:
1. The alarm output shall be controlled by a 12.0 VDC, form A, 1.0 A contact connected to auxiliary power. It shall be able to be programmed for a steady or pulsed output.
 2. The programmable output #1 shall be a solid state current sink rated at 1 A max. It shall be able to be used for alarm, arming state, or access control, and shall be generally programmable.
 3. The programmable output #2 shall be a solid state voltage source rated at 500 mA max. It shall be able to be used for alarm, arming state, or access control, and shall be generally programmable.
- J. The control/communicator shall have 8 (expandable to 128) supervised normally-open or normally-closed burglar input points.
- K. The control/communicator shall have up to 128 supervised fire input points. The input[s] shall be a Class B, latching circuit. At least 8 of these input points shall accept [four] or [two] wire smoke detectors.
- L. Smoke alarm verification shall be available by automatically resetting the smoke detectors once an alarm should occur. The system shall alarm immediately should a second alarm occur within the verification window.
- M. The control/communicator shall be capable of being divided in up to eight partitions. This shall allow the system to act as up to eight different and independent systems. Each partition shall have an individually programmable automatic arming time. This automatic arming time shall be extendable on a per day basis using a PIN number followed by a special command.
- N. The control/communicator shall be capable of having a common area when more than one partition exists in the system. The common area shall be partition one, and it shall be able to be common to all other partitions (allowing for use of a common entry way to other partitions). The common area shall arm only when all the partitions it is common to are armed. It will disarm when any of the partitions it is common to are disarmed, only if the user has access to the common area.
- O. Up to 15 control stations shall be able to be connected to the control/communicator. These control stations shall be able to operate the security alarm system and fully program the control/communicator.

P. Any or all of the control stations shall be capable of being a master control station. It shall be capable of accessing all partitions. It shall display the arm/disarm status of all the partitions and can be used to individually control each partition. It shall be able to be assigned to any or all of the partitions.

Q. The control/communicator shall contain a history buffer that shall retain the last 400 events by time and day. The most recent 64 events shall be stored in a non-volatile memory and will be kept even in the event of total power loss. It shall be able to be read back through any control station.

R. The control/communicator shall have non-volatile EEPROM memory that is unaffected by a power failure.

[S. The control/communicator shall be remotely accessible with remote programming software, using an IBM compatible PC and a Hayes brand modem. This accessibility shall allow control of all system [options] [status] [programming].

[T. The control/communicator shall automatically download history to the remote programmer at a pre-set time and day.]

U. The control/communicator shall be capable of answering a call from a remote programmer, hanging up and calling the remote programmer back, preventing access to the control/communicator by foreign remote programmers.

V. The control/communicator shall be capable of reporting to up to two 20 digit phone numbers with full single, double, and back-up reporting. It shall communicate in 3/1, 3/1 extended, 3/1 with parity, 3/1E with parity, 4/1, 4/2, BFSK, SIA 110 Baud, SIA 300 Baud, Pager and Contact ID formats.

W. The control/communicator shall be capable of sending all alarm, restoral, trouble, opening, closing, cancel, and test reports to a digital receiver.

X. The control/communicator shall dial out on tone or pulse, and loop start or ground start phone lines. Tone dial shall revert to pulse dial when required [and is programmable].

Y. Up to 90 personal identification numbers with seven authority levels shall operate the security alarm system and shall be capable of reporting to a digital receiver uniquely by number.

Z. The operating temperature range of the control/communicator shall be +32° to +120°F (0° to +49°C).

AA. When using the expansion points, a BusLoc® code shall be available which will help prevent system takeover by programming an invisible identification code into each multiplex point.

BB. MAKE: Detection Systems, Inc. DS7400Xi.

2.2 Control Station

A. The control station shall contain a keypad, sounder, and status indicator lights (armed, status, and power) [with a [digital] [alpha] read-out display].

B. The control station shall have a back-lit keypad [backlight dimmer] [volume control] [text for alpha numeric displays shall be freely programmable for all points and partitions].

C. A control station shall support all of the control/communicator functions.

D. Any or all of the control stations shall be capable of being a master control station. It shall be capable of accessing all partitions. It shall display the arm/disarm status of all the partitions and can be used to individually control each partition. It shall be able to be assigned to any or all of the partitions.

E. The control station shall be connected to the control/communicator with #22 AWG, unshielded, 4-wire cable and have a maximum of 1000 feet between the control/communicator and the control station.

F. The control station shall be capable of complete system programming by inputting an installer changeable personal identification number.

G. The control station shall allow the following four levels of arming:

1. The entire system shall be armed with exit points programmed for delays.
2. The entire system shall be armed with entry and exit points programmed for delays.
3. The perimeter points shall be armed without delays and the interior points shall not be armed.
4. The perimeter points shall be armed and programmed for entry and exit delays and the interior points shall not arm.

H. Arming and disarming the security alarm system shall be done by entering a [user] [installer] personal identification number.

I. Arming the alarm security system shall initiate a programmable 0-99 second exit delay on points programmed for delays. The red 'armed' light shall flash, then go on steady after the exit delay has been completed.

J. Entering a protected area through a delay point, when the system is armed, shall initiate a 0-99 second entry delay, and the pre-alert tone shall sound. Disarming the system before the entry delay expires shall silence the pre-alert tone.

K. Entering a protected area through a delay point, when the system is armed, and an alarm had occurred while the system was armed, the red 'armed' light shall flash during the entry delay. Entering a personal identification number shall disarm the system and shall stop the light from flashing.

L. There shall be a mode to custom arm the system. This mode shall be able to be programmed to arm any combination of point functions.

M. Bypassing points or force arming the security alarm system shall be done at the control station when the green 'status' light is off, indicating one or more points are not ready to arm.

N. The following tests shall be able to be performed by inputting a key command at the control station while in the disarm mode:

1. A burglar point test shall begin scrolling the point numbers of those burglar points that are untested (unviolated). While a point is being tested (violated) it will appear on the control station display and the sounder will turn on. When that point is done being tested, the sounder will turn off and the display will return to showing those points remaining to be tested.

2. A fire point test shall begin scrolling the point numbers of those fire points that are untested (unviolated). While a point is being tested (violated) it will appear on the control station display and the sounder will turn on. When that point is done being tested, the sounder will turn off and the display will return to showing those points remaining to be tested.
 2. The local battery/sounder test shall operate the control station sounders alarm outputs for two seconds while load testing the battery.
 3. The battery test shall check the battery voltage while the full system or alarm load is applied.
 4. The communicator test shall initiate the control/communicator to send a pre-programmed report to a digital receiver.
- [O. A duress signal shall be sent to a digital receiver when disarming the security alarm system using a duress code. The system will appear to disarm normally with no indication that a duress signal has been sent.]
- P. The control station shall provide fire, emergency, and panic keys that shall manually and immediately alarm the system. They shall be recessed into the keypad cover to prevent accidental activation.
- Q. The control station shall be capable of surface mounting. It shall be capable of being mounted to single or four gang switch or outlet boxes.
- R. The control station shall include six function buttons to facilitate common system commands. These buttons shall be labeled ON to arm the system, OFF to disarm the system, PERIMETER ONLY, to arm only the perimeter, NO ENTRY to disable the entry delay period, BYPASS, to disable a point, and SYSTEM RESET to reset system trouble conditions and latched smoke detectors.
- S. MAKE: Detection Systems, Inc. DS7447.
- T. A keypad with eight zone LED's shall also be available. This keypad will not include the alpha numeric displays and will include four additional system status LED's plus an LED to annunciate the status of each of the first eight points.
- U. MAKE: Detection Systems, Inc. DS7445.

2.3 Remote Programmer

- A. The remote programmer shall operate with an IBM compatible computer that is equipped with a Hayes brand modem and running Windows® 3.1, Windows95® or higher.
- B. The remote programmer shall support color or monochrome monitors, and shall allow selection of menu items, data, and help using a mouse or other pointing device.
- C. The remote programmer shall remotely access the control/communicator and allow access and notification to all system options, status, and programming.
- D. Unattended uploading, downloading, arming, disarming, bypassing, and testing shall be capable with the remote programmer.

- E. An account shall be created for each control/communicator that is connected by the remote programmer and shall be capable of being logged and located by phone numbers, names, addresses, account numbers, and sort keys.
- F. There shall be up to 15 authority levels which can restrict remote programmer users access to certain information and options.
- G. The remote programmer shall allow up to 100 default files to be created which serve as templates for formatting common characteristics of similar accounts.
- H. User formatted reports containing any data base items or history event can be printed or exported to other programs.
- I. The remote programmer shall be capable of locking out all or partial control station programming.
- J. A unique, one of one trillion combination security code can be downloaded to the control/communicator, limiting access to a particular remote programmer.
- K. MAKE: Detection Systems, Inc. WDSRP

2.4 Accessories

- A. The DS7412: RS323 Serial Interface Module. This module allows the panel to send event information, in an ASCII format, directly to a serial printer or computer. The module also allows the direct connection of a computer to the panel for programming via the WDSRP programming software. One DS7412 module shall be allowed per system.
- B. The DS7420i: Dual Phone Line/Bell Supervision Module. This module shall allow the control/communicator to be used in NFPA 72 installations. It shall connect to the options bus of the control/communicator. It shall provide two supervised 12.0 VDC signaling outputs, one Class A (Style D) input zone, dual phone line transmission and supervision, and an Auxiliary output supervision jumper. One DS7420i module shall be allowed per system.
- C. The DS7420iAT: Dual Phone Line/Bell Supervision Module. This module shall allow the control/communicator to be used in NFPA 72 installations. It shall connect to the options bus of the control/communicator. It shall provide two supervised 12.0 VDC signaling outputs, dual phone line transmission and supervision, and an Auxiliary output supervision jumper. One DS7420iAT module shall be allowed per system.
- D. The DS7430: Multiplex Expansion Module. This module shall allow the control/communicator to expand to 128 points. It shall connect to the expansion port of the control/communicator. It shall provide a bus power output for the connection of separately powered multiplex devices. One DS7430 module shall be allowed per system.
- E. The DS7432: Eight Input Remote Module. This module shall provide a means of addressing up to eight input loops of conventional contacts to the multiplex bus of the control/communicator. This module requires the use of the DS7430. Up to fifteen DS7432 modules shall be allowed per system.
- F. The DS7433: Eight Input Module. This module shall expand the control/communicator to 16 hard-wired points. These points will support any combination of Burg/Fire points (2-wire smoke detectors). This module can not be used with the DS7430. One DS7433 module shall be allowed per system.

- G. The DS7450: Flush Mount Single Multiplex Contact Point. This module shall monitor a single flush mount magnetic contact and is intended as a replacement for conventional dry contacts. The module connects to the DS7430 Multiplex Expansion Module.
- H. The DS7452: Surface Mount Single Multiplex Contact Point. This module shall monitor a single surface mount magnetic contact and is intended as a replacement for conventional dry contacts. The module connects to the DS7430 Multiplex Expansion Module.
- I. The DS7457: Single Zone Multiplex Input Module. This module shall monitor a single set of conventional normally open or normally closed dry contacts. The module connects to the DS7430 Multiplex Expansion Module.
- J. The DS7460: Dual Point Module. This module shall monitor conventional normally open or normally closed contacts and will report their status to the control/communicator as multiplex addresses. The module will occupy two multiplex points on the system and can monitor up to two separate loops. The module connects to the DS7430 Multiplex Expansion Module.
- K. The DS7465: Single Input/Output Module. This module shall monitor a conventional normally open or normally closed dry contacts and will report their status to the control communicator as a multiplex address. This module shall also provide a single normally open or normally closed dry contact as a programmed output. The module shall occupy two multiplex zones and no more than 20 modules are allowed per system. This module connects to the DS7430 Multiplex Expansion Module.
- L. The DS7480: Bell Supervision Module. This module shall provide a supervised (polarity reversing) output relay to activate the bell. The module shall also provide a Form "C" bell fault output to be connected to the control panel.
- M. The DS7481: Single Phone Line Monitor Module. This module shall monitor a single phone line for fault conditions. When a fault is detected it shall automatically close its normally open relay contacts to provide a means of signaling the fault. One DS7481 module shall be allowed per system.
- N. The DS7488: Octal Relay Module. This module shall provide eight form "C" relay outputs for addition to the control/communicator. It shall connect to the options bus of the control/communicator. The outputs shall be fully programmable and shall be activated by several system events. Each output shall operate individually of the other seven outputs for complete flexibility. Two DS7488 modules shall be allowed per system.
- O. The DS7489: Solid State Output Module. This module shall provide eight open collector transistor outputs for addition to the control/communicator. It shall connect to the options bus of the control/communicator. The outputs shall be fully programmable and shall be activated by several system events. Each output shall operate individually of the other seven outputs for complete flexibility. The outputs provide a current sink (the output shorts to common) when activated. Two DS7489 modules shall be allowed per system.
- P. The MX280: Photoelectric Smoke Detector. This module detects smoke and automatically determines the detectors sensitivity using the Detection Systems "Chamber Check" feature. Up to 120 modules may be connected to the multiplex bus. This module connects to the DS7430 Multiplex Expansion Module.
- Q. The MX280TH: Photoelectric Smoke Detector. This module detects smoke and automatically determines the detectors sensitivity using the Detection Systems "Chamber Check" feature. The module also incorporates a 135° heat sensor for high temperature alarms. Up to 120 modules

may be connected to the multiplex bus. This module connects to the DS7430 Multiplex Expansion Module.

R. The MX280THL: Photoelectric Smoke Detector. This module detects smoke and automatically determines the detectors sensitivity using the Detection Systems “Chamber Check” feature. The module also incorporates a 135° heat sensor for high temperature alarms and a 45° cold sensor to warn of possible freezing temperatures. Up to 60 modules may be connected to the multiplex bus. This module connects to the DS7430 Multiplex Expansion Module.

S. The MX540: Passive Infrared (PIR) Intrusion Detector. This module provides a detection range of 40 by 50 feet (12 by 15 meters). This module connects to the DS7430 Multiplex Expansion Module.

T. The MX835: TriTech Microwave/PIR Intrusion Detector. This module provides a coverage range of 35 by 35 feet (10.7 by 10.7 meters) and features Detection Systems “Pet Avoidance” technology. This module connects to the DS7430 Multiplex Expansion Module and requires an external voltage of 9-15 vdc at a maximum of 35 mA.

U. The MX775: Passive Infrared (PIR) Intrusion Detector. This module provides a detection range of 50 by 50 feet (15 by 15 meters). This module connects to the DS7430 Multiplex Expansion Module.

V. The MX794: Passive Infrared (PIR) Intrusion Detector. This module provides a selectable detection range of 80 by 50 feet (24 by 15 meters) or 200 by 10 feet (61 by 3.1 meters). This module connects to the DS7430 Multiplex Expansion Module.

W. The MX934: Passive Infrared (PIR) Intrusion Detector. This module provides a detection range of 35 by 35 feet (10.7 by 10.7 meters). This module connects to the DS7430 Multiplex Expansion Module.

X. The MX938: Passive Infrared (PIR) Intrusion Detector. This ceiling mount module provides a detection range of 50 feet (18.3 meters) in diameter. This module connects to the DS7430 Multiplex Expansion Module.

Y. The MX950: TriTech Microwave/PIR Intrusion Detector. This module provides a coverage range of 50 by 50 feet (15 by 15 meters) and features Detection Systems motion monitor and anti-mask technology. This module connects to the DS7430 Multiplex Expansion Module and requires an external voltage of 9-15 vdc at a maximum of 35 mA.

Z. The ARDISSM Communications Module. This module provides a means of communicating alarm and supervision signals via the ARDIS radio network. This module connects to the options bus.

3.0 Part Three: Execution

3.1 Installation

A. Installation shall be accomplished in a professional manner by qualified personnel regularly engaged in and experienced in this type of work.

B. Install all wiring in accordance with manufacturer’s [and U.L.] recommendations.

C. All wiring shall be stranded copper and installed in [accordance with NEC open wiring requirements] [rigid steel conduit] [EMT conduit] [cable tray] a separate and segregated system.

- D. Provide [#22 AWG] [#18 AWG] four conductor cable as recommended by the equipment supplier. Minimum #14 AWG for audible devices.
- E. Provide a dedicated 120 volt circuit in separate conduit as a source of primary power for the master control/communicator.
- F. Supply, install, and wire [recommended transformers] [DC power sources] [recommended transformers and DC power sources] to the master control/communicator. [For use with the control/communicator, the transformer shall be dedicated, and shall be Detection Systems, Inc. model TR-18C.] The transformer shall not be shared with anything else.
- G. Perform walk tests and set-up procedures for each detector as specified by the manufacturer to ensure that all boundaries of coverage are sufficient to detect intruders in each secured area.
- H. The alarm contractor shall provide complete wiring diagrams to the electrical contractor as part of the shop drawing submittal, and shall supervise the installation in order to ensure a complete operating and trouble-free system.
- I. Provide (____) sets of keys for all panels, stations, and devices.

3.2 Testing

- A. The alarm contractor shall submit a written test report that the system has been 100 percent tested and approved. The final test shall be witnessed by the owner [engineer] [electrical contractor] and performed by the alarm contractor. The final test report must be received and acknowledged by the owner prior to request for final payment.
- B. Provide instruction to the owner's satisfaction with regard to proper use and operation of the system.

3.3 Warranty

The entire system shall be warranted against failure and installation defects for a period of (_____) from the date of the acknowledged owner acceptance of the final test.

