SECTION 28 15 00 - INTRUSION DETECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. Division 28 Contractor shall furnish and install a complete Security Intrusion Detection System as shown on the Drawings and as specified herein. Provide all accessories and equipment as necessary for a complete system. The contractor is required to provide and coordinate any required licenses and services as part of the contract. **The intrusion detection system shall match the current DSC PowerSystem Neo system.**

B. The systems shall notify, by means of cellular communications network with connection to the Owner's approved central office.

C. The system shall utilize keypads to arm and disarm the zones. The keypads shall be located as indicated on the Drawing, and shall be programmed to arm/disarm the zone with which it is associated.

D. The Digital Alarm Communicator System (DACS) specified herein shall include a Digital Alarm Communicator Transmitter (DACT), test timer, battery charging/voltage supervision circuitry, powered two-wire smoke detector circuit, diagnostics displays, lightning/EMI protection circuits, and the associated optional modules and components for a complete DACS system.

E. The DACT firmware shall support programmable "software" features as detailed in section 2.2 System Features/Capability Summary. The following describes the general functional requirements of the DACS system:
   1. The DACS shall support the connection and reporting of intrusion and commercial fire detection devices.
   2. The DACS shall provide identification, annunciation, and communication of alarmed detectors by point.
   3. The DACS shall be "modularly" expandable using hard-wired modules and wireless receivers or connected to a command center.
   4. The DACS shall have electrically-supervised detection loops and power supplies (mains and battery(s)).This supervision shall be programmable for the purposes of reporting this information to the DACR. The battery supervision must include missing-battery supervision. The mains supervision reporting must be able to be suppressed until another signal is sent to the Digital Alarm Communicator Receiver (DACR) (tag along reporting).
   5. The DACS shall be capable of sending (manually or automatically) test and status reports to remote DACRs. Automatic tests shall be capable of being sent daily, weekly or once each 28 days. Automatic test times shall be capable of being set as an offset of up to 24 hours from the current time. Automatic test reports shall be capable of being deferred by one test interval if any other report is transmitted in the current interval.
   6. The DACS shall be programmable locally or remotely. Programming shall be accomplished via a command center or a computer with a remote programmer and diagnostic software package. The Contractor shall provide a fully licensed copy of this

software to the Owner at no additional cost to the Owner. The Contractor shall install and configure the software to be fully functional to the Owner on a PC as assigned by the Owner. An on-site user must be able to initiate remote programming while on-line with the servicing location. The remote programming device must provide a compare feature and allow for downloading either the stored program or the (un)modified program copied from the panel. The number of system programmers shall be severely restricted via the use of program locking features and passwords. Passcode protection in excess of sixteen million combinations is required. The panel must allow the local programming option to be disabled and must provide a method to program a panel, while no one is home, when the panel shares a line with an answering machine

8. The DACS shall annunciate alarm, trouble, service reminders, and other relevant system status messages in English text at the command center. Point description text is to be sixteen custom characters per point.
9. The motion sensors specified shall be a PIR detector designed for commercial indoor applications. The unit shall consist of a self-locking two-piece enclosure with a built in two-way bubble level. The detector shall sense a field of coverage that encompasses the associated windowed wall. The detector shall incorporate:
    a. Sensor data fusion technology to ensure that the detector sends alarm condition based only on precise information
    b. Tri-focus optics technology to eliminate coverage gaps
    c. Multi-Point Anti-mask with Integrated Spray Detection protects the detector against masking attempts.

1.02 QUALITY ASSURANCE

A. The system shall be the standard product of one manufacturer, and the manufacturer shall have been in business manufacturing similar products for at least five years.
    1. All equipment, systems, and materials furnished and installed shall be new and installed in accordance with the applicable standards of:
        a. National codes: NEC, NFPA, UBC
        b. Approvals and listings: UL
        c. Security Industry Association (SIA)
        d. Local Authorities Having Jurisdiction

1.03 SUBMITTALS

A. For Review:
    1. Product data sheets of all components
    2. Wiring Diagrams
    3. Full Size Lay-out Drawings

B. To be included in Record and Information Manuals:
    1. One copy of each approved submittal
    2. Test results
    3. Certificate of System Completion
    4. Certificate of Material Receipt

1.04 MANUFACTURERS

A. Intrusion Detection Products
    1. DSC PowerSystem Neo

PART 2 PRODUCTS

2.01 SYSTEM FEATURE/CAPABILITY SUMMARY

A. Security Industry Association (SIA) False Alarm Reduction Compliance: By factory default settings, the DACS shall be compliant with SIA's Control Panel Standard for False Alarm Reduction (ANSI/SIA CP-01- 2000, © 1994-2000 SIA).

B. Number of Loops/Sensors: 40 separately-identifiable points. Eight are on-board loops and up to 40 are offboard addressable points connected to five point expansion modules (max) and/or two RF Receivers (max).

C. Programming Point Functionality: Each point in the system shall provide for the following matrix of selectable type of response in the system.

Type	Response	Options
24-hour, Fire	No Alarm Response	No Point Options
24-hour, Fire Alarm with Verification	Reports	Trouble on Open
24-hour, Voice Active	Alarm Report Delay	Trouble on Short
24-hour, Tamper	Swinger Bypass	Trouble on Open or Short
24-hour, Emergency	Smart Swinger Bypass	Cross Point
24-hour, Visible Panic	Alarm Output	Part Arming
24-hour, Invisible Panic	Log Event	Pulse Count/Time
24-hour, Burglary		Sensor Monitor Trouble
24-hour, Independent Point Control		
Controlled, Keyswitch		
Controlled, Entry/Exit Delay 1		
Controlled, Entry/Exit Delay 2		
Controlled, Follower		
Controlled, Instant		
Controlled, Instant (Part On Mode)		

D. Configurable Independent Areas: The DACS shall provide a maximum of four areas that may be configured independently of the other three areas.

E. RF Compatibility: The DACS shall be compatible with RF/wireless detection devices, smoke detectors, command centers and keyfobs.

F. Number of Command Centers: A maximum of eight command centers, each capable of displaying custom English text on liquid crystal or vacuum fluorescent (VF) displays and sounding different patterns of audible alarm for different events, shall be required. LED Command Centers may also be used to display point status and arm/disarm status, and carry out user command functions.

G. Number of User Passcodes: Up to 32 different passcodes shall be required. Passcodes shall be 3 to 7 digits in length. Passcodes shall be assigned one of four different authority levels to carry out functions such as changing passcodes from the command center, activating one-time passcodes and changing watch tone responses. These passcodes shall also be required

for performing various system functions such as arming/disarming the system, transmitting a duress code, and silencing sounders.

H. Communication Formats: **TL880LECAT communicator compatible for Alarm.com.**

I. Testing, Diagnostic, and Programming Facilities: Automatic test reports and remote system access for diagnostics, and programming shall also be supported via a remote central station computer utilizing the dedicated software.

J. Reports: Reports to DACRs at commercial central stations as a result of system supervision shall include alarm, trouble, missing modules, restoral, system status, AC failure and low battery. The DACS shall also transmit test reports once every hour, 24 hours, 7 days, or 28 days. CPU failure shall be annunciated locally.

K. "Phone Routing": The DACS shall have the capability of communicating with up to 2 different DACRs (destinations). Each destination can support up to two phone numbers. Each phone number can be up to 32 digits long. The DACS reports shall be classified into 24 sub-categories or "report groups." Each DACR shall be designated as a primary or duplicate destination for each report group. The transmission of events allows the reporting of different types of information to different remote DACRs. The report groups shall be as follows:

- 24-hour, Fire
- 24-hour, Fire Alarm w/ Verification
- 24-hour, Independent Point Control
- 24-hour, Tamper
- 24-hour, Emergency
- 24-hour, Visible Panic
- 24-hour, Invisible Panic
- 24-hour, Burglary
- 24-hour, Voice Active
- Controlled, Keyswitch
- Controlled, Entry/Exit Delay 1
- Controlled, Entry/Exit Delay 2
- Controlled, Follower
- Controlled, Instant
- Controlled, Instant (Part On Mode)
- System Status Reports
- Walk Test Start/End Reports
- ABC Key/Duress Reports
- Test Reports
- Open/Close Reports
- Alarm Reports
- Restoral Reports
- Bypass/Force Bypass Reports
- Point trouble/Point Trouble Restoral Reports

L. Number of Programmable Outputs: The DACS shall provide a minimum of four on-board programmable outputs, which may be expanded to 20 by connecting up to two output modules to the DACS. Each output module shall provide eight fully programmable Form "C" outputs for a total of sixteen outputs (eight per output module). The following functions can be executed:

- Arming
- Arming Beeps (kysw & RF arming)
- Auto Arm Pre-Arming Alert
- Follow Command Center Sounder
- User Tamper
- Duress
- Bell Time
- Strobe
- Panel Off-Hook
- Ring Detect
- Voice Request
- Ready to Arm

- Entry/Exit Delay
- Bell Test on Close
- Phone Line Fail
- Ack Received
- AC Fail
- Low/Missing Battery
- Siren Supervision Fail
- Sensor Trouble Monitor
- Silent Alarm
- Alarm/Fire Alarm
- Fire Verification
- System Trouble
- RF Keyfob Functions
- ABC Key Functions
- Unsuccessful Dialing Attempts
- Comm Fail Event
- Watch
- Exit Error
- AC 60 Hz
- Ground Start
- Follow Point Index
- Follow Passcode
- Sked Only
- Change Outputs

The Contractor shall provide a minimum of one output for each of the exterior door contact indicated, plus four (4) spare contacts.

M. Output Mode: The DACS shall provide outputs with the following mode functions:

- Steady
- Latch
- Toggle
- One Shot
- One Shot with Re-Trigger
- One Shot with Reset Pulse

Output modes shall also perform reverse logic functions (output activate/deactivate states are reversed).

N. Alarm Output Selections: Two different types of alarm output selections shall be supported by the DACS: Steady and Temporal Code 3.

O. Miscellaneous Features: The DACS shall provide programmable Swinger count (1, 2, 3 or 4), separate programmable swinger counts for alarm output and alarm reporting, smart swinger option and momentary and maintained keyswitch on/off operation. See below for keyswitch arming states:

- Maintained, All On, Off from Any
- Maintained, All On, No Off
- Maintained, No On, Off from Any
- Maintained, Part On, Off from Any
- Maintained, Part On, No Off
- Maintained, No On, Off from Part On/Part 2 On On/Part 2 On
- Momentary, All On, Off from Any
- Momentary, All On, No Off
- Momentary, No On, Off from Any
- Momentary, Part On, Off from Any
- Momentary, Part On, No Off
- Momentary, No On, Off from Part

P. DACS Power Ratings: The DACS shall provide 600 mA of auxiliary power and 1.85 A of alarm power, both rated at 12 VDC. Additional auxiliary power shall be provided by adding battery/charger modules up to a maximum of 2 amps. The Contractor shall verify exact power requirements for the project and provide all necessary power devices required to provide 100% of the power required by the initial installation, as well as spare capacity of 20%.

Q. DACS Fault Detection: The DACS shall provide a programmable point scan time at either 300 ms or 20 ms.

R. User-Programmable Features: The DACS shall provide a "user-friendly" interface for operating the system to the operational criteria of the application. A service passcode with the appropriate authority level can be assigned to the servicing agent allowing him limited access to system functions. User programmable/activated functions assigned by authority level include:

1. Arming the System: The required authority level can perform the following arming functions:

• All/Part/Part 2 On with Delay
• All/Part/Part 2 On with Delay, no Exit Tone
• All/Part/Part 2 On with no Delay

2. Disarming the System: The required authority level may disarm the system and perform one-time system disarm.
3. Disable Open/Close Reports: The sending of opening/closing reports may be restricted by authority level.
4. Force Arm/Bypass Points: The required authority level may force arm or bypass faulted points.
5. Arm/Disarm All Areas by Command Function: The required authority level may arm and disarm all areas using a command function.
6. System Operation Command Functions: The required authority level may perform the following system operations via command functions:

• View Alarm Memory
• System Test
• View System Trouble
• Remote Program
• Walk Test
• Reset Sensors
• View Point Trouble
• Set Time and Date
• Change Skeds
• Renew One-Time Passcodes
• Change/Add Other Passcodes
• Delete Passcodes
• Set Watch Tone
• Set Watch Points
• Set Part 2 Points
• Toggle Auto Call Forwarding On/Off
• Auto Call Forwarding Enable
• Auto Call Forwarding Disable
• Adjust Command Center keystroke volume/display ltg
• Toggle Watch Feature On/Off

7. Move to Area Command Function: The required authority level may perform the Move to Area command function.
8. Extend Close Command Function: The required authority level may perform the Extend Close (Automatic Arming) function.
9. View Log Function: The required authority level may view the system log.

S. Auto Call Forwarding: The DACS shall provide an automatic call forwarding feature that dials the entered digits to activate the telephone company's call forwarding service when the system is armed All On. The enabling/disabling of this feature may be restricted by authority level.

T. 254 Event Log: The DACS shall provide a history log capable of holding up to 254 events, including alarm events, arming the system, and disarming the system.

U. Programmable Skeds: The DACS shall provide up to 8 programmable scheduled events (skeds) that occur at a specific time of day and day of week. These events can be used to automatically arm/disarm the system or control output functions.

V. Sequential Entry Delay: The DACS shall commence the Entry Delay sequence when the location with an Entry/Exit Delay point type is faulted and continues with the faulting of consecutive locations (lowest to highest) assigned to Follower point types. The sequence of

point types must be consecutive and without any gaps. For example, Location sequence 2, 3, 4, and 5 with Location 2 as an Entry/Exit point type and Locations 3 to 5 as Follower point types is OK. A location sequence of 2, 3, 5 with Location 4 as a Fire point type is not a valid sequence.

2.02 SYSTEM INTERFACE REQUIREMENTS

A. Grounding: The Contractor shall properly earth ground the DACS.

B. Primary power: The Contractor shall provide a dedicated 120 VAC power circuit to the DACS system. This circuit shall be connected to the emergency power system. The 120 VAC is stepped down to 18 VAC to power the DACS panel using a class two, plug-in transformer. This power circuit shall be properly rated to continuously power all points and functions indefinitely in full alarm condition.

C. Primary power supervision: When the primary power source fails, the system can be configured to report an "AC Fail" message to a commercial central station. The creation of this message is suppressed if the AC Failure is less than 60 seconds. The message can be programmed to "tag-along" with another message transmitted to the central station. The system will always display a loss of primary power on the command center and may be configured to provide additional audible warning.

D. Secondary power (standby battery): The Contractor shall provide adequate battery power as defined by the relevant application criteria, (UL 985 and 865 for alarm installations or NFPA 72 chapters for fire applications). Appropriate battery chargers shall be provided consistent with the battery backup capacity. The battery capacity shall be a minimum of 4 hours at full capacity, unless other jurisdictional requirements exceed this minimum. The Contractor shall verify the duration required of the battery capacity and provide the required capacity at no additional cost to the Owner.

E. Secondary power supervision: When the secondary power source experiences an 85% depletion of its standby capacity, the system can be configured to report a "Low Battery" message to a commercial central station. The system will always display a low battery condition on the command center and may be configured to provide additional audible warning.

F. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guideline shall be followed for wiring installation: Wiring shall be appropriately color-coded with permanent wire markers, and shall be compliant with all ratings required by all applicable codes and the local authority having jurisdiction.

G. EMI/Lightning Protection: The DACS system shall be protected from EMI and lightning surges.

H. Auxiliary function control interfaces: Auxiliary functions such as activating bells, strobes, or lights shall be accomplished using the optional relay modules. These auxiliary interfaces shall be electrically isolated to avoid inter-system interference or damages.

I. Non-Volatile Backup: Functional criteria programmed into system memory shall be backed up to internal non-volatile RAM. Additionally, the number of system programmers shall be severely restricted via the use of program locking features and passwords.

2.03 SYSTEM SENSOR REQUIREMENTS

A. Door Contacts
1. Where still accessible door contacts shall be recessed round ¾" plug type door contacts by DSC, DMP, Bosch or Honeywell.

B. Wired Motion Sensors
1. The motion sensors shall be listed and approved by UL, ULC, CE, FCC, IC, and EN50131-2-4 grade 2.
2. The motion sensor shall operate on 9 VDC-15 VDC, with a maximum current draw of 25 mA.
3. The motion sensor shall be capable of operating in temperatures ranging from -20ºF to +130ºF.
4. The motion sensors shall utilize both infrared and microwave technologies, as well as light level sensors.
5. The motion sensors shall utilize active white light suppression to combine infrared disturbance with visible light spectrum to minimize false triggers caused by transient sources such as passing automobile headlights.
6. The motion sensors shall utilize adjustable optics with 86 zone tri-focus optic configuration.
7. The microwave sensors shall have adjustable sensitivity and supervised control.
8. The sensor shall provide automatic temperature compensation.
9. **The approved manufacturer and series shall be Bosch Professional Series, with equals by DSC and Ademco. The Contractor shall verify the appropriate coverage range and provide the required unit.**
   a. Basis for design 360° coverage: Bosch DSM9360
   b. Standard wall-mount: Bosch ISC-PPR1-W16

C. **Wired Glass Break Sensor**
1. Wired Glass Break sensors shall be Bosch DS1102I (square) or DS1101I (round)
   a. Test using AFT-100 glass break simulator

PART 3 EXECUTION

3.01 INSTALLATION

A. Division 28 Contractor shall install security system as shown on the Drawings in accordance with Manufacturer's written instructions.

B. Contractor to install associated low-voltage wiring. All wiring shall be installed in conduit.

3.02 TESTING

A. Division 28 Contractor shall provide a complete functional test of all components in accordance with Manufacturer's recommendations.

B. Operate system for a minimum of seven consecutive days with no problems before claiming Contract Completion.

C. Refer to Section 26 08 40, "Electrical Tests, Adjustments, Inspection."

3.03 SPARE PARTS

A. Division 28 Contractor shall furnish one spare device for each type used.

B. Obtain a signed copy of the Certificate of Material Receipt from Section 28 00 99, "Requirements for Contract Completion."

3.04 EQUIPMENT DEMONSTRATION

A. After all system tests have been completed, schedule an instruction period with the Owner. Instruction to be provided by Manufacturer's authorized field technician. Provide four separate sessions of four hours. Record sessions on thumb drive and furnish two copies to owner.

B. Instruction shall include:
1. Location of all components of the system and explanation of their function
2. Demonstration of equipment
3. Maintenance and repair procedures
4. Programming procedures
5. Review of documents in Record and Information Manuals

C. Division 28 Contractor shall have all participants sign the Certificate of System Completion in Section 26 00 99, "Requirements for Contract Completion."

3.05 WARRANTY OF WORK

A. All components, parts, and assemblies supplied by the Manufacturer and installed by the Contractor shall be warranted against defects in material and workmanship for a period of at least 36 months (parts and labor), commencing upon date of acceptance by Owner. A qualified factory-trained service representative shall provide warranty service.

END OF SECTION