USC Access Control
Standard Guidelines
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USC Access Control Standard Guidelines Revised 05/04/09
1 PURPOSE

1.1 Document Intent

Due to the complexity of access control systems and the variety of departments within USC affected, this document has been created. The Access Control Standard Guidelines provide guidelines and system intent that would not be covered in a project specification. These guidelines are meant to assist the project managers, consultants, contractors and USC parties with the installation, maintenance and management of access control systems.

This document is not intended to replace project drawings and project specifications. Project drawings and specifications will incorporate the information contained in this document as needed.

The Access Control Standard Guidelines is a living document that will be modified and updated as needed. A revision date is provided so that appropriate reference can be made.
2 GENERAL SYSTEM CRITERIA

2.1 General Overview

2.1.1 Terms Overview – Access Control vs. Security

The term “access control” and the term “security” are not interchangeable related to this document.

“Access control” defines a system that restricts access to a facility based on a set of parameters. Access control systems include card reading devices of varying technologies and evidentiary cameras.

“Security” defines a system that includes active monitoring of a facility and includes active monitoring devices such as glass break devices on windows, horns on exit doors, and monitoring cameras.

This document covers the access control systems and standards at USC.

2.1.2 Types of Access Control Systems

2.1.2.1 Overview

Access control is divided into two categories: external perimeter building access control and interior access and security.

Each building achieves perimeter access control through a Lenel OnGuard system including card readers and cameras. External perimeter access control is maintained via building time schedules.

Interior access control and security is determined by the needs of the individual schools, departments, and staff on a building by building basis.

2.1.2.2 Internal Access Control

Internal access control and security can be achieved in several ways and is driven by the needs of the occupants. Security measures range from monitoring doors being held open to adding cameras to monitor personnel entering and exiting the space. Security measures will add additional cost to the project and will be designed on a case by case basis.

Depending on the size of the project and the security needs, a separate Security Consultant can be engaged aside from the Security Contractor to provide for an engineered solution.
Internal access control and security can be achieved in several ways.
   The Lenel system can be expanded to include interior access devices
An Omnilock system can be designed and utilized
A stand alone burglar alarm can be designed and utilized

2.1.2.2.1 Lenel

Additional equipment can be purchased to extend the Lenel system provided for
the external perimeter access control of each building into the interior of a
building.

A select number of card reader devices and cameras are available with the Lenel
system. This system is installed per university standards for Lenel systems by
an approved university vendor as outlined in these guidelines.

Programming of the system is performed by a university approved vendor.

Credentialing of the system and the assignment of access levels for card holders
is performed by USCard Services.

Maintenance of the system is the responsibility of the department/school. A
university approved vendor is necessary to work on the system. FMS can assist
with system maintenance and warranty issues as needed.

A list of university approved Lenel security contractors can be found in Appendix
B.

2.1.2.2.2 Omnilock

An Omnilock system allows for the ease of installation along with the complexity
of an access control system. An Omnilock device can be installed on a door
instead of traditional keyways and handles, and allows for card restricted access
to the desired areas. Omnilock systems include wireless devices that can be
remotely management and locally maintained. Omnilock devices also have
internally battery back up.

A number of types of devices are available with this system. This system is
installed per the Div 08 university hardware standards and guidelines.

Initial design and setup of the system is performed by a university approved
Omnilock vendor. Programming of the system is performed by the designated
department manager.

Credentialing of the system and the assignment of access levels for card holders
is performed by the designated department manager. With the OM2000, the
User is able to set up desired access rights using the standard USCard provided
to all faculty, staff and students. Access information is recorded in the OmniLock and can be easily downloaded using a compatible handheld PDA/pocket PC. The downloaded information can be managed and mined as desired on the designated department manager’s computer for easy data maintenance.

The OmniLock system is an off line system and is not supported by USCard Services. Maintenance of the system is the responsibility of the department/school. FMS can assist with system maintenance and warranty issues as needed.

2.1.2.2.3 Burglar Alarms

Stand alone burglar alarms may also be used for internal access control and security. These systems are provided by licensed burglar alarm vendors and are outside the scope of this document.

2.1.2.3 External Perimeter Access Control

The philosophy of the external access control system is to provide for the open campus feel during the day and to provide for a secure campus during nights and weekends.

External perimeter access control is achieved through a Lenel system with both campus wide components and local building components. All new access control systems for both existing buildings as well as new buildings will meet the standards outlined in these guidelines.

2.1.2.3.1 Lenel

Equipment and installation as outlined in these guidelines will make up the access control system.

A select number of card reader devices and cameras are available with the Lenel system. This system is installed per university standards for Lenel systems by an approved university vendor as outlined in these guidelines.

Programming of the system is performed by a university approved vendor.

Credentialing of the system and the assignment of access levels for card holders is performed by USCard Services.

Maintenance of the system is the responsibility of the department/school. A university approved vendor is necessary to work on the system. FMS can assist with system maintenance and warranty issues as needed.
A list of university approved Lenel security contractors can be found in Appendix B.

Depending on the installation and scope of the project, design and commissioning is provided by a Security Consultant separate from the Security Contractor. The complexity of the system and the amount of devices will dictate if a Security Consultant should be part of the project team.

2.1.2.3.2 Legacy System – AT&T Blackboard

Some buildings on campus, especially residential buildings, have an AT&T Blackboard system. This system is being phased out and replaced on a project by project basis.

The AT&T Blackboard system is managed and maintained by USCard Services.

2.1.3 Device Locations

2.1.3.1 Overview

Generally, access control devices, such as card readers and cameras, are located on the exterior of buildings or spaces. Card readers are used to limit access into a space. By Fire Code, card readers can not be located on the inside of spaces limiting the ability to exit. Card readers also can not be located in areas that “trap” people and limit egress of a building or space.

Panels and recording devices are located inside the building in a separate Security Room or as part of the Electrical Room. Panels and recording devices must be provided in spaces not accessible by the public and in some cases require card reader secured locations.

Network recording devices are located either within a building in a secure, climate controlled space, or can be located remotely in the main data center.

2.1.3.2 Responsibilities

All devices shall be located by the Security Consultant based on the needs of the building occupants, site visits and drawing reviews. Review and confirmation of the locations is provided by FMS and DPS through review of the access control drawings.

Locations of IP cameras shall be coordinated through ITS as part of the IT scope of the project.

Locations of E-phones shall be coordinated through DPS.
2.2 Project Overview

2.2.1 Project by Scope

The scope of work of each project and the involvement of trades will depend on the size of the project related to access control.

For projects with larger scopes, including new buildings, major renovations that include the external doors of an existing building, and in some cases change of use of a building, a Security Consultant is to be part of the consulting team.

For projects with smaller scopes, including minor door changes to existing buildings, an assessment is provided by DPS and FMS. Consultants and contractors are engaged as necessary.

2.2.2 Drawings and Phases

2.2.2.1 Large Scope Projects

For projects with large scopes of work, as defined above, the drawings for a project follow those of the project consultants. Architectural backgrounds are provided to the Security Consultant and a full scope of drawings and specifications for the project are provided. The Security Consultant will follow the phases of the lead consultant and will have drawings included in the standard schematic design, design documents, and construction documents phases. The Security Consultant will review submittals and perform construction administration duties as well, as per contract.

Once brought on board, the Security Consultant will meet with the Users and the PM to assess the needs of the facility. The initial drawings will be reviewed by the University Access Control team, which includes DPS, CAPS, ITS, USCard Services and FMS, for compliance. The full drawings set will then proceed along with the lead consultant’s and general contractor’s schedules.

The Security Consultant will develop a full permit set of drawings and specifications for bid to the Security Contractor.

Bids to Security Contractors shall follow the standard project’s requirements, including interviews as necessary. Typically the Security Consultant is a sub contractor to the Electrical Contractor.

2.2.2.2 Small Scope Projects
For projects with a smaller scope of work, as defined above, FMS and DPS act as the primary initial point of contact (POC). FMS and DPS work with the User and the PM to assess the needs and determine a scope of work.

In cases where the scope of work dictates a full set of drawings and specifications, FMS and DPS will alert the PM as to the need to hire a Security Consultant.

In all other cases, FMS and DPS will turn the assessment into a bid package and will take the work to bid with the Security Contractor.

2.2.2.3 Commissioning

All access control and security system installations must be commissioned. Commissioning includes the testing of a complete system from the card reader device, for example, to the database. The commissioning process is included in the scope of work by both the Security Consultant and the Security Contractor. A system is accepted as complete only after the commissioning process is complete.

2.2.3 Consultants vs. Contractors

Security Consultants and Security Contractors are both important parts of the design and installation team but provide separate functions. The Security Consultant provides services for the design and commissioning of the access control & security systems while the Security Contractor is responsible for the installation and testing of the system.

2.2.3.1 The Security Consultant

2.2.3.1.1 Overview

The Security Consultant should be engaged early in the design phase of the project. Security drawings and specifications follow the same project design schedule, with drawing sets being issued during the schematic design, design drawings, and construction document phases. Security system design includes coordination with the electrical drawings, as conduits are provided as part of the electrical system. Early coordination allows for accurate costs and budgeting for both the security and electrical systems. Security drawings should also be included with the architectural and electrical sets to be provided to the City for permitting.

As part of the commissioning phase of the project, the Security Consultant will oversee the installation and will assist with the end to end system commissioning including system, programming, and DPS.
2.2.3.1.2 Requirements

Table 1 below provides the minimum qualifications necessary to qualify as a Security Consultant.

<table>
<thead>
<tr>
<th>Certification / Organization</th>
<th>Staff Member – Minimum Amt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified Protection Professional (CPP) Credential</td>
<td>1</td>
</tr>
<tr>
<td>Physical Security Professional (PSP) Credential</td>
<td>1</td>
</tr>
<tr>
<td>Certified Security Consultant (CSC) Credential</td>
<td>1</td>
</tr>
<tr>
<td>NICET Video Security System Designer Certification</td>
<td>1</td>
</tr>
<tr>
<td>International Association of Professional Security Consultants (IAPSC) member</td>
<td>1 (in good standing)</td>
</tr>
</tbody>
</table>

Table 1: Security Consultant Minimum Qualifications

2.2.3.2 The Security Contractor

2.2.3.2.1 Overview

The Security Contractor is hired to install the designed access control and security system. The Security Contractor is responsible for acquiring the necessary hardware and equipment, pulling all wires, and making all final system connections. The Security Contractor is also responsible for communications with CAPS to program the devices of the system and ensure a complete and working system is delivered. All services to be provided by the Security Contractor are part of the security specifications (as provided by the Security Consultant).

Additionally, the Security Contractor is responsible for functional testing of the system once installed and for all adjustments that need to be made after the system has been commissioned.

2.2.3.2.2 Requirements

Security Contractors must be approved by the university. Aside from the USC procedure, Security Contractors must complete an interview process and a hands-on exam administered by USC CAPS (Career and Protective Services).

At minimum, the Security Contractor shall hold the legally required California State Contractor’s licenses necessary to accomplish the installation and USC Access Control Standard Guidelines Revised 05/04/09
activation of the system as well as to submit drawings to the City of Los Angeles. The Security Contractor shall also be a permanent organization approved by Lenel for the purchase and installation of its products.

2.2.3.2.3 Approved List

See Appendix B for approved vendor list.

2.3 System Overview

2.3.1 System Philosophy

The intent of the access control system is to provide for a controllable perimeter of a building that can fit the needs of the building occupants. All exterior doors shall be electronically controlled. This allows for additional flexibility especially during emergency situations.

Some doors are equipped with the ability to enter and exit all the time using card readers. Some doors are equipped with the ability to enter and exit only during certain times. Some doors are for emergency exit only and are equipped with monitoring devices. For devices required per door type, see Section 4.

2.3.2 Electronic Access Control System (EACS)

In generally, the EACS comprises of a wide-area data network, enterprise server, enterprise administrative and monitoring clients, communications client, remote system controllers, and card readers compliant with the campus credentialing system.

The existing EACS system is a Lenel OnGuard, PRO-I enterprise system, providing access control services, with an Optim9000 Credentialing system providing global credential database services to the EACS.

2.3.3 Credentialing System

The credentialing system is designed to provide credentials for faculty, staff, students, support and administrative personnel. The system is managed by USCard Services and operates independent of the access control system.

Modifications to the credentialing system are not part of the scope of work for any projects to date. Card technology requirements impact credentialing.
2.3.4 Video Surveillance System (VSS)

The digital surveillance system is manufactured by Lenel. The system is LAN network-based and uses digital video servers, network recording media, and video management software.

The VSS is integrated with the access control system (Lenel OnGuard PRO-I Edition).

2.4 Requirements Overview

The following requirements shall be enforced and met on all projects. Following is a basic overview of the project document requirements. For additional information relating to the university requirements, see the USC Close Out Standard Guidelines and Division 1 specifications.

2.4.1 Document Requirements

2.4.1.1 Drawings and Specifications

Regardless of the size and scope of the project, drawings and specifications shall be included and followed. For smaller projects, hand sketches and sheet specs are acceptable. For larger projects, full CAD drawings and book specs are required.

2.4.1.2 Submittals

As the specifications indicate, all projects regardless of the size and scope shall include submittals of all devices and wiring included on the project. Submittals shall be provided to the PM and/or general contractor for tracking and approval. No wiring or devices shall be installed prior to written approval of a submittal.

2.4.1.3 Labeling

2.4.1.3.1 Security Terminal Cabinets

All Security Terminal Cabinets (STC) shall have panel schedules and wiring diagrams included within the enclosure.

See Appendix E for additional information.
2.4.1.3.2 Card Reader Devices

All card readers on the outside of a building, regardless of the type of reader, shall be provided with a plaque instructing users how to get help with the device.

See Appendix D for wording and size requirements.

2.4.1.4 As-built Record Drawings

As the specifications indicate, all projects regardless of the size and scope shall include requirements for as-built record drawings at the end of each project. For smaller projects, hand drawn red-lines may be accepted. For large projects, only CAD as-builts will be accepted.

2.4.1.5 Close Out Documents

Close out documents should include all equipment manuals and information provided by the manufacturer. Documentation shall also include electronic versions of the panel schedules and wire diagrams (as indicated in Section 2.4.1.3 Labeling).

2.4.1.5.1 Updated Consultant Documents

As part of the close out document package, the security contractor shall include as-built version of the consultant documents. These updated documents will include, but are not limited to:

- Door Schedules
- Floor Plans
- Door Details
- Camera Details
- Equipment Cabinet Details
- Door Wiring Schematics
- Singe Line Diagrams

Documentation shall include any changes made in the field to the system as shown in the construction drawings and shall include conduit and wire runs for future reference.

Documents shall be provided in both PDF and CAD formats. CAD files shall not be PDF files referenced into a .dwg file. CAD files shall be properly referenced and shall include the color plot table.
2.4.1.5.2 Additional Project Documents

Additionally, documentation shall be provided by the security contractor related to the STC and the wiring of the project. These documents include:
- USC Lenel System Excel Sheet
- STC Cabinet Configuration
- STC Functional Diagram
- STC Panel Wiring Diagram

Documentation shall include all information specifically related to the installed system.

Documents shall be provided in both PDF and CAD formats. CAD files shall not be PDF files referenced into a .dwg file. CAD files shall be properly referenced and shall include the color plot table. The USC Lenel System Excel Sheet shall be provided in electronic form.

See Appendix E for document examples.

2.4.2 Commissioning

All access control and security system installations must be commissioned. Commissioning includes the testing of a complete system from the card reader device, for example, to the database. The commissioning process shall be included in the scope of work of all parties involved with the design and installation of the access control system.

A system is accepted as complete only after the commissioning process is complete.

2.4.3 Training

All projects, regardless of the size, shall include training for both the O&M staff to maintain the equipment and the building occupants to use the system. Training sessions may be attended by other university personnel as well.

The security contractor shall provide a written training plan including outline and time requirement as part of the project requirements. The training plan shall be submitted to the general contractor and/or PM and shall be approved by the university.

Training shall occur prior to final hand off of the system.
3 COORDINATION

3.1 Coordination with USC

3.1.1 FMS

Facilities Management Services (FMS) is the university department responsible for the operations and maintenance of all university buildings.

Related to access control, FMS is responsible for the maintenance of the hardware of the system. FMS determines the standards for installation, including writing of the doors and door frames, types of wires used, and mounting of equipment.

FMS reviews all phases of the access control documentation for compliance with installation standards, doors and hardware coordination, and equipment locations as related to the existing building.

3.1.2 DPS and CAPS

The mission of Career and Protective Services (CAPS) is to support the university’s academic, social and economic goals by recruiting and developing employees of the highest quality, promoting a safe and secure environment, and preserving the university’s reputation and assets. The Department of Public Safety (DPS) is a sub group with the primary goal to provide a safe and secure environment in which the social and academic endeavors of the university community may be fully realized.

Related to access control, DPS is responsible for assessing and approving the locations of all access control devices. DPS determines the feasibility of the location of equipment and advises on the needs related to equipment. DPS is responsible for monitoring and responding to all university access control and security issues.

CAPS is responsible for the maintenance of the main servers and access control data. CAPS determines the standards for all server related hardware and software, including university wide system upgrades.

Both CAPS and DPS review all phases of the access control documentation for compliance with device locations and standard equipment.

3.1.3 ITS

Information Technology Services (ITS) is the university department responsible for the installation and maintenance of all networks.
Related to access control, ITS is responsible for providing network connectivity to the building and access control devices, as well as the maintenance of this connectivity. ITS determines the standards for all networks and network devices.

ITS reviews all phases of the access control documentation for compliance with network and network device standards. ITS makes recommendations if a building network needs to be upgraded as well.

3.1.4 USCard Services

USCard Services (USCard) is the university department whose mission is to facilitate identity for fast, reliable, secure, convenient access to university provided products and services.

Related to access control, USCard is responsible for the creation of the credentialing database including the issuing and assigning of all user rights and privileges, as directed by the customer, as well as all access cards.

USCard reviews certain portions of the access control documentation to understand the systems being designed.

3.2 Coordination with Project Consultants

3.2.1 Architects

The Architect is responsible for providing all architectural backgrounds related to the project to the Security Consultants.

Access control system design includes specific access control equipment but also includes door hardware and locations of equipment.

Coordination between the Security Consultant and the Architect should occur early and often during the project. The Security Consultant will specify hardware that must be included in the door hardware schedule and must been coordinated with the Hardware Consultant and the Door Consultant.

Architectural drawings should account for space required by the access control equipment, including dedicated rooms or shaft space. Locations of equipment may also need to be coordinated to maintain the architectural integrity of the building while meeting the access control needs.

3.2.2 Electrical Engineers

The Electrical Engineer is responsible for providing all electrical drawings related to the project to the Security Consultant.
Access control system design includes conduit and wiring (some low voltage, some line voltage) that must be included on the electrical drawings.

Coordination between the Security Consultant and the Electrical Engineer should occur early in the project and after every drawing issue. The Security Consultant will provide quantities of conduit and wire runs, as well as quantity and locations of equipment that must been included on the electrical drawings.

Electrical drawings should show all conduits, floor and wall penetrations, and power needs of the access control system. Typically access control equipment is also located in the electrical rooms. This additional equipment needs to be taken into account during room layout.

3.3 Coordination with Project Trades

3.3.1 General Contractors

The General Contractor is responsible for coordinating all on site work of the Security Contractor. Access control system installation should be scheduled along with all other trades for a project.

3.3.2 Electrical Contractors

The Electrical Contractor is responsible for the installation of all conduits and power related to the access control system. If these requirements are not coordinated on the electrical drawings, the Electrical Contractor is responsible for the conduits and power requirements shown on the security drawings.

Typically the Security Contractor is a sub-contractor to the Electrical Contractor. In this case, the Electrical Contractor is responsible to provide a full and complete access control system.
4 PRODUCT STANDARDS AND REQUIREMENTS

4.1 UL Requirements

All devices shall meet the City of Los Angeles’ requirements for listing and labeling, including but not limited to UL listing and labeling.

For devices and assemblies with proper UL listing and labeling, stickers shall be accessible and visible to the Inspectors. Paperwork shall also be available during inspections and shall be provided to the university as part of the close out documentation.

For devices and assemblies without proper UL listing and labeling, the project shall coordinate the testing of these devices and/or assemblies prior to inspection. Documentation shall be provided to the university as part of the close out documentation.

4.2 Standard Card Reader Devices

4.2.1 For New Buildings

For a new access control system in any new building on both the UPC and HSC campus, the standard card reader will be a multi-technology, contactless reader. The following models are the only acceptable devices.

For mullion mounting applications: XceedID model XF1100

For typical wall mounting applications: XceedID model XF1500

(See Appendix X for cutsheets.)

4.2.2 For Existing Buildings without Existing Access Control Systems

For a new access control system in any existing building on both the UPC and HSC campus, where an access control system does not currently exist, the standard card reader will be a multi-technology, contactless reader. The following models are the only acceptable devices.

For mullion mounting applications: XceedID model XF1100

For typical wall mounting applications: XceedID model XF1500

(See Appendix X for cutsheets.)
4.2.3 For Existing Buildings with Existing Access Control Systems

4.2.3.1 UPC Campus

For new devices being added to existing buildings on UPC campus, where an access control system exists, the card reader devices will follow the technology of the existing system unless otherwise directed.

Typically, this will be a mag stripe reader.
For typical wall mounting applications: Lenel LNL-2010/2020

(See Appendix X for cutsheet.)

For doors with special ADA accessibility, a standard multi-technology, contactless reader will need to be installed as well with control capability of the ADA access device.

4.2.3.2 HSC Campus

On the HSC campus, the standard multi-technology, contactless reader will be used. The following models are the only acceptable devices:

For mullion mounting applications: XceedID model XF1100

For typical wall mounting applications: XceedID model XF1500

(See Appendix X for cutsheets.)

4.2.4 Exceptions

The above device requirements may be changed on a project needs basis.

4.2.5 Card Reader Device Plaques

All card readers on the outside of a building, regardless of the type of reader, shall be provided with a plaque instructing users how to get help with the device.

See Appendix D for wording and size requirements.
4.3 Standard Request to Exit (REX) Devices

4.3.1 For New Buildings

For a new building, request to exit devices shall be included in the exit device hardware.

See Section 5 – Installation Standards by Opening Type for more detail.

4.3.2 For Existing Buildings

For existing buildings, request to exit devices should be included in the exit device hardware. Additional types of REX devices can be discussed on a project by project basis.

See Section 5 – Installation Standards by Opening Type for more detail.

4.4 Standard Electrified Hardware

4.4.1 For New Buildings

In general, mortise locks and exit devices are acceptable for new buildings. Electrified hinge, transfer pivot, or a continuous hinge with EPT is specified depending on the type of door and door devices.

See Section 5 – Installation Standards by Opening Type for more detail.

4.4.2 For Existing Buildings

For an existing building, devices shall follow standards as much as possible. Openings and requirements can be reviewed on a project by project basis.

See Section 5 – Installation Standards by Opening Type for more detail.

4.4.3 For Additional Information

See the USC standard specification Section 08 71 00 related to doors and door hardware for more detailed information.
4.5 Standard Lenel Equipment

4.5.1 System Controller

Part Number: LNL-2200

One 2200 board can be used for a maximum of 64 readers. USC requires that 25% spare capacity be included for future readers.

Connection of the 2200 board(s) to the USC network is achieved through registering the device MAC addresses and obtaining an IP address. See Section 7 – ITS Requirements and Standards for more information.

4.5.2 Reader Interface Module

Part Number: LNL-1320

One 1320 board shall be provided for every two access doors.

4.5.3 Control modules

Input control modules shall be included for elevator controls, door contacts, rolling doors and door monitoring. Part number LNL-1100.

Output control modules shall be included for door closing signals. All doors shall be controlled so that they can be closed remotely if necessary. Part number LNL-1200.

4.5.4 Security Terminal Cabinets

STCs can be comprised of either a Hoffman enclosure or a Lenel CTX enclosure. STCs must be lockable. The lock/key type shall follow USC standards for these types of enclosures.

STCs shall only be located in electrical rooms, telecom rooms or IDF rooms. Locations shall be coordinated ahead of time. Rooms such as janitor's closets and hidden or concealed rooms are not acceptable locations.

4.6 Standard Video Devices

4.6.1 Cameras
4.6.1.1 Analog Cameras – PTZ (Pan Tilt Zoom) - Interior

The standard for integral dome with pan/tilt/zoom camera inside is the Pelco Spectra mini dome system. The alternative is the Pelco Spectra IV SE series dome systems.

(See Appendix X for cutsheets.)

4.6.1.2 Analog Cameras – PTZ (Pan Tilt Zoom) - Exterior

The standard for integral dome with pan/tilt/zoom camera outside is the Pelco Spectra IV SE series dome systems.

(See Appendix X for cutsheet.)

4.6.1.3 Analog Cameras – Fixed - Interior

The standard for integral dome indoors with fixed position camera is the Pelco IS150 color CCD camera.

(See Appendix X for cutsheets.)

4.6.1.4 Analog Cameras – Fixed - Exterior

The standard for integral dome outdoors with fixed position camera is the Pelco IS110 color CCD camera.

(See Appendix X for cutsheets.)

4.6.1.5 IP Cameras

See Appendix C for the list of IP cameras compatible with Lenel.

4.6.2 NVR/DVR

The Network Video Recorder shall be a Dell Poweredge 2950, or equal by HP/Compaq, with PCI-X, 64-Bit Bus and Two, Dual Core 5150 2.66 Ghz Xeon processors, configured as recommended by the CCTV system manufacturer, but with the minimum attributes meeting the USC specifications.

Storage capacity shall allow for at minimum 31 days.
4.6.3 Video Server

The video server allows for connecting analog video devices. The standard video server is the AXIS 241Q/QA. Stand alone or blade server rack mountable configurations are acceptable. (See Appendix X for cutsheet.)

This device is not yet UL listed. An approval on a project by project basis may be necessary.

4.6.4 UPS

APC Smart-UPS 1500VA USB model SUA1500RMJ2UB or equal.

(See Appendix X for cutsheet.)

4.6.5 Client Workstation

Lenel OnGuard Video Viewer software allows for monitoring, surveillance, and review capabilities and functionality at the client workstations. At minimum, Video Viewer software shall be provided on all projects. Additionally, some projects may include the physical workstation in the specifications, if an existing workstation is not available.

4.6.6 Emergency Phones

Talk A Phone ETP-WM/E

See Appendix G for cutsheet and installation guidelines.

4.7 Standard Wire Requirements

4.7.1 Cable Acceptable for Reader, Door contacts, REX and Power

4.7.1.1 Preferred

The preferred cable acceptable for use with the card readers, door contacts, request to exit devices (REX) and power is the WSECCOMP-2835 composite cable.

This cable includes:
(1) 18 AWG, 4 conductors PVC/PVC unshielded - Grey jacket
(1) 22 AWG, 4 conductors PVC/PVC unshielded - Blue jacket
(1) 22 AWG, 4 conductors PVC/PVC unshielded - White jacket
(1) 22 AWG, 6 conductors PVC/PVC unshielded - Orange jacket

(See Appendix X for cutsheets)
4.7.1.2 Acceptable Substitution

An acceptable substitute cable for use with the card readers, door contacts, request to exit devices (REX) and power is the Belden 658AFS banana peel composite cable.

This cable includes:
(1) 18 AWG, 4 conductor, stranded bare copper shielded – Grey Jacket
(1) 22 AWG, 3 pair, stranded bare copper shielded – Orange Jacket
(1) 22 AWG, 2 conductor, stranded bare copper shielded – White Jacket
(1) 22 AWG, 4 conductor, stranded bare copper shielded – Blue Jacket

(See Appendix X for cutsheets)

4.7.2 Cable Acceptable for Cameras

The preferred cable to be used for cameras include

(1) RG59 plus 18 AWG, 2 conductor plenum rated, non shielded
(1) 24 AWG, 4p, CAT5E plenum rated

(See Appendix X for cutsheet)

4.8 Standard IT Devices

4.8.1 Building Network Requirements

Buildings need to have at minimum 100MB ports.

Existing cabling is CAT5e. New cabling is CAT6a.

4.8.2 Device Network Connections

One Ethernet connection is required at the system controller location.

Each NVR requires an IP connection.

Each Ethernet location requires an individual IP address.
4.9 Power Requirements

4.9.1 Emergency Power

Where available, access control devices shall be provided optional standby power from a generator. If generator power is not available, battery back-up shall be included.

4.9.2 Power for Electric Unlocking

Doors with electric unlocking or latch pull back require one dedicated circuit. Device in-rush current per the manufacturer is 16A.

4.9.3 Power for Mortise Locks

Mortise locks should be provided with 12 volts. For locations of Mortise locks, see Section 5 – Installation Standards by Opening Type.

4.10 Special Dogging For Card Reader Doors

During installation of the access control system on existing building doors, there is a period of time when the door is in flux. The old keyway has been removed from the door, the card reader has been installed but is not yet active, and building occupants need to enter the building. For this reason, special dogging devices shall be included in the specifications as temporary construction provisions. The dogging feature allows the door during construction to be kept unlocked manually during business hours prior to the card reader and access control system being active.

Once the access control system is online and active, the dogging feature is removed from the door.

4.11 Specialty Areas

4.11.1 Elevators

4.11.1.1 Card Access to Enter Elevator with Open Floor Access

4.11.1.2 Card Access to Enter Elevator with Controlled Floor Access

4.11.2 Roll Up Doors

4.11.3 Elephant Doors
4.11.4 Parking Lots
5 INSTALLATION STANDARDS BY OPENING TYPE

5.1 Entrances with Card Readers

5.1.1 General Location

Entrances with Card Readers are designated as the main location for access to a building during off hours and on weekends. Typically, these doors are specified near a parking area or walkway for ease of accessibility. These doors may also be specified close to elevators and ADA accessible entrances.

At least one entrance location is required to have a card reader on the exterior of a building. For the interior, this location would be the main entrance location to a secure space.

5.1.2 Equipment

An Entrance with Card Reader is equipped, at minimum, with a card reader, a request to exit (REX) device, electrified hardware, and a door contact.

5.1.3 Doors and Hardware

5.1.3.1 Exterior - Single Door - With Mortise Lock

For a single exterior door with a card reader and a Mortise lock, specifications shall include the request to exit (REX) device in the Mortise lock and shall fail secure. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Cylindrical locks, electric strikes and door loops are not acceptable.

5.1.3.2 Exterior - Single Door - With Exit Device

For a single exterior door with a card reader and an exit device, specifications shall include the request to exit (REX) device in the exit device and shall include electric latch retraction. The power transfer hinge shall be an electrified continuous hinge with EPT or a transfer pivot.

Electric strikes and door loops are not acceptable.

5.1.3.3 Exterior – Pair of Doors - With Mortise Lock

For a pair of exterior doors with a card reader and a Mortise lock, specifications shall include the request to exit (REX) device in the Mortise lock and shall fail secure. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Cylindrical locks, electric strikes and door loops are not acceptable.
5.1.3.4 Exterior – Pair of Doors -With Exit Device – Rim Devices with Mullion

For a pair of exterior doors with a card reader and rim devices with mullion, specifications shall include the request to exit (REX) device in the exit device. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Electric strikes and door loops are not acceptable.

5.1.3.5 Exterior – Pair of Doors -With Exit Device – Concealed Vertical Rod

For a pair of exterior doors with a card reader and concealed vertical rods, specifications shall include top and bottom latching and the request to exit (REX) device shall be in the exit device. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Less bottom rod, electric strikes, surface vertical rods and door loops are not acceptable.

5.1.3.6 Interior – Single Door - With Mortise Lock

For a single interior door with a card reader and a Mortise lock, specifications shall include the request to exit (REX) device in the Mortise lock. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Electric strikes and door loops are not acceptable.

5.1.3.7 Interior – Single Door - With Exit Device

For a single interior door with a card reader and an exit device, specifications shall include the request to exit (REX) device in the exit device and shall include electric latch retraction or electrified trim. The power transfer hinge shall be an electrified continuous hinge with EPT or a transfer pivot.

Electric strikes and door loops are not acceptable.

5.1.3.8 Interior – Pair of Doors- With Mortise Lock

For a pair of interior doors with a card reader and a Mortise lock, specifications shall include the request to exit (REX) device in the Mortise lock. The power transfer hinge shall be an electrified hinge or a transfer pivot.
Electric strikes and door loops are not acceptable.

5.1.3.9 Interior – Pair of Doors- With Cylindrical Lock

For a pair of interior doors with a card reader and a cylindrical lock, specifications shall include the request to exit (REX) device in the cylindrical lock. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Electric strikes are not acceptable.

5.1.3.10 Interior – Pair of Doors - With Exit Device – Concealed Vertical Rod

For a pair of interior doors with a card reader and concealed vertical rods, specifications shall include the request to exit (REX) device shall be in the exit device. Less bottom rods are acceptable. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Electric strikes and surface vertical rods are not acceptable.

5.1.4 Wire Requirements

5.1.4.1 Type of Wire

Entrances with a Card Reader must be provided with the approved composite cable as per Section 3.2.

5.1.4.2 Conduit

Conduit is not required for inside the door frame as the wire is plenum rated. A junction box shall be provided in the ceiling above the door for wire access. Conduit may be necessary from the junction box back to the location of the Lenel panel based on the type of ceiling in the building.

5.1.4.3 Color Scheme

The following color schedule shall be used:

White – Door Contacts
Blue – Request to Exit (REX)
Orange – Card Readers
Grey – Locks
5.2 Normal Operations Entrances

5.2.1 General Location

Normal Operations Entrances are designated as any door that can be accessed during normal business hours, but is not useable for entrance during off-hours. Normal Operations Entrances are electronically locked during off hours and on weekends for entrance but can always be used as an exit.

Normal Operations Entrances would consist of the group of doors without card readers and those not designated as Exit Only Entrances.

5.2.2 Equipment

A Normal Operations Entrance is equipped, at minimum, with a request to exit (REX) device, a door contact, and electrified hardware.

5.2.3 Doors and Hardware

5.2.3.1 Exterior - Single Door - With Mortise Lock

For a single exterior door with a Mortise lock and without a card reader, specifications shall include the request to exit (REX) device in the Mortise lock and shall fail secure. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Cylindrical locks, electric strikes and door loops are not acceptable.

5.2.3.2 Exterior - Single Door - With Exit Device

For a single exterior door with an exit device and without a card reader, specifications shall include the request to exit (REX) device in the exit device and shall include electric latch retraction. The power transfer hinge shall be an electrified continuous hinge with EPT or a transfer pivot.

Electric strikes and door loops are not acceptable.

5.2.3.3 Exterior – Pair of Doors - With Mortise Lock

For a pair of exterior doors with a Mortise lock and without a card reader, specifications shall include the request to exit (REX) device in the Mortise lock and shall fail secure. The power transfer hinge shall be an electrified hinge or a transfer pivot.
Cylindrical locks, electric strikes and door loops are not acceptable.

5.2.3.4 Exterior – Pair of Doors - With Exit Device – Rim Devices with Mullion

For a pair of exterior doors including rim devices with mullion and without a card reader, specifications shall include the request to exit (REX) device in the exit device. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Electric strikes and door loops are not acceptable.

5.2.3.5 Exterior – Pair of Doors - With Exit Device – Concealed Vertical Rod

For a pair of exterior doors with concealed vertical rods and without a card reader, specifications shall include top and bottom latching and the request to exit (REX) device shall be in the exit device. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Less bottom rod, electric strikes, surface vertical rods and door loops are not acceptable.

5.2.3.6 Interior – Single Door - With Mortise Lock

For a single interior door with a Mortise lock and without a card reader, specifications shall include the request to exit (REX) device in the Mortise lock. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Electric strikes and door loops are not acceptable.

5.2.3.7 Interior – Single Door - With Exit Device

For a single interior door with an exit device and without a card reader, specifications shall include electric latch retraction or electrified trim. The power transfer hinge shall be an electrified continuous hinge with EPT or a transfer pivot.

Electric strikes and door loops are not acceptable.

5.2.3.8 Interior – Pair of Doors - With Mortise Lock

For a pair of interior doors with a Mortise lock and without a card reader, specifications shall include the request to exit (REX) device in the Mortise lock. The power transfer hinge shall be an electrified hinge or a transfer pivot.
Electric strikes and door loops are not acceptable.

5.2.3.9 Interior – Pair of Doors - With Cylindrical Lock

For a pair of interior doors with a cylindrical lock and without a card reader, specifications shall include the request to exit (REX) device in the cylindrical lock. The power transfer hinge shall be an electrified hinge or transfer pivot.

Electric strikes are not acceptable.

5.2.3.10 Interior – Pair of Doors - With Exit Device – Concealed Vertical Rod

For a pair of interior doors with concealed vertical rods and without a card reader, specifications shall include the request to exit (REX) device in the exit device. Less bottom rods are acceptable. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Electric strikes and surface vertical rods are not acceptable.

5.2.4 Wire Requirements

5.2.4.1 Type of Wire

Normal Operations Entrances should be provided with the approved composite cable as per Section 3.2.

5.2.4.2 Conduit

Conduit is not required for inside the door frame as the wire is plenum rated. A junction box shall be provided in the ceiling above the door for wire access. Conduit may be necessary from the junction box back to the location of the Lenel panel based on the type of ceiling in the building.

5.2.4.3 Color Scheme

The following color schedule shall be used:

White – Door Contacts
Blue – Request to Exit (REX)
Orange – Card Readers
Grey – Locks
5.3 Exit Only Entrances

5.3.1 General Location

Exit Only Entrances are designated as any door that can be used only as a means of egress regardless of the time of day. Exit Only Entrances do not have door hardware or key ways to be able to be entered from the outside.

Exit Only Entrances are typically designated only on the outside of a building. Examples of an Exit Only Entrance include exits from stairwells and large auditoriums.

5.3.2 Equipment

A door indicated as an Exit Only Entrance is equipped, at minimum, with door contacts and electrified hardware.

5.3.3 Doors and Hardware

5.3.3.1 Exterior - Single Door - With Mortise Lock

For a single exterior exit only door with a Mortise lock, specifications shall include the request to exit (REX) device in the Mortise lock. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Cylindrical locks and door loops are not acceptable.

5.3.3.2 Exterior - Single Door - With Exit Device

For a single exterior exit only door with an exit device, specifications shall include the request to exit (REX) device in the exit device. The power transfer hinge shall be an electrified continuous hinge with EPT or a transfer pivot.

Door loops are not acceptable.

5.3.3.3 Exterior – Pair of Doors - With Mortise Lock

For a pair of exterior exit only doors with a Mortise lock, specifications shall include the request to exit (REX) device in the Mortise lock. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Cylindrical locks and door loops are not acceptable.
5.3.3.4 Exterior – Pair of Doors - With Exit Device – Rim Devices with Mullion

For a pair of exterior exit only doors including rim devices with mullion, specifications shall include the request to exit (REX) device in the exit device. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Electric strikes and door loops are not acceptable.

5.3.3.5 Exterior – Pair of Doors - With Exit Device – Concealed Vertical Rod

For a pair of exterior exit only doors with concealed vertical rods, specifications shall include top and bottom latching and the request to exit (REX) device shall be in the exit device. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Less bottom rods, surface vertical rods and door loops are not acceptable.

5.3.3.6 Interior – Single Door - With Mortise Lock

For a single interior exit only door with a Mortise lock, specifications shall include the request to exit (REX) device in the Mortise lock. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Door loops are not acceptable.

5.3.3.7 Interior – Single Door - With Exit Device

For a single interior exit only door with an exit device, specifications shall include the request to exit (REX) device in the exit device. The power transfer hinge shall be an electrified continuous hinge with EPT or a transfer pivot.

Door loops are not acceptable.

5.3.3.8 Interior – Pair of Doors - With Mortise Lock

For a pair of interior exit only doors with a Mortise lock, specifications shall include the request to exit (REX) device in the Mortise lock. The power transfer hinge shall be an electrified hinge or a transfer pivot.

Door loops are not acceptable.
5.3.3.9 Interior – Pair of Doors - With Cylindrical Lock

For a pair of interior exit only doors with a cylindrical lock, specifications shall include the request to exit (REX) device in the cylindrical lock. The power transfer hinge shall be an electrified hinge or transfer pivot.

5.3.3.10 Interior – Pair of Doors - With Exit Device – Concealed Vertical Rod

For a pair of interior exit only doors with concealed vertical rods, specifications shall include the request to exit (REX) device in the exit device. Less bottom rods are acceptable. The power transfer hinge shall be an electrified continuous hinge with EPT or transfer pivot.

Surface vertical rods are not acceptable.

5.3.4 Wire Requirements

5.3.4.1 Type of Wire

Exit Only Entrances should be provided with the approved composite cable as per Section 3.2.

Optionally, individual wires for the devices required at the door can be specified but the color scheme must be adhered to.

5.3.4.2 Conduit

Conduit is not required for inside the door frame as the wire is plenum rated. A junction box shall be provided in the ceiling above the door for wire access. Conduit may be necessary from the junction box back to the location of the Lenel panel based on the type of ceiling in the building.

5.3.4.3 Color Scheme

The following color schedule shall be used:

White – Door Contacts
Blue – Request to Exit (REX)
Orange – Card Readers
Grey – Locks
6 INSTALLATION GUIDELINES

6.1 Coordination

Access control wire installation needs to be coordinated with the project schedule.

On any project where door frames are being replaced, regardless if a new building or an existing building, wiring for access control shall be installed into the frame before the frame is mounted and sealed. The Project Manager and General Contractor shall be responsible for coordinating with the security contractor.

6.2 Electrical Connections to Door Hardware

Connections to door hardware shall be made using provided quick connects. Appropriate ends shall be provided by the project for the wire to make these connections.

See Appendix F for installation photos.

6.3 HOLD
7 ITS REQUIREMENTS AND STANDARDS

7.1 Network Device Registration

All network devices must be registered on the USC network. All devices with MAC addresses, including but not limited to, the NVR, cameras, video servers, and Lenel 2200 boards, need to be registered with ITS to receive an IP address.

7.1.1 Registration Procedure

The following registration procedures shall be used for all access control devices requiring IP addresses.

- Contractor shall provide a list of devices and MAC address to the Project Manager.

- Project Manager shall send an email to netadmin@usc.edu indicating each device and MAC address. Included in the email, shall be the contact information designated as:
  Device Owner: FMS fmsacces@usc.edu
  Technical Contact: DPS dpsacctl@usc.edu

- Project Manager shall ensure that a list of devices, MAC addresses, and IP addresses is included in the project close out documents.

7.1.2 Re-registering Devices

Devices that are changed or replaced due to malfunction or upgrading shall be re-registered on the USC network. The Project Manager for the maintenance project shall be responsible for re-registering the devices.

7.2 Device Limitations

Devices with multiple MAC addresses to one IP addresses are considered switches. Switches are not allowed on the USC network. Only devices that have one MAC address to one IP address is acceptable.
8 PROGRAMMING REQUIREMENTS AND STANDARDS

8.1 Programming

The security contractor is responsible for programming to ensure a complete working system and integration between the existing Lenel system and the new components. Programming rights are provided by CAPS/DPS on a project by project basis.

Requests for programming rights should be made in writing to the Project Manager at least 2 days prior to the need. The Project Manager shall make arrangements with CAPS/DPS to have access available.

8.1.1 NVR Setup

- Windows 2003 operating system
- Notify CAPS IT 2 days in advance of activity that would cause port scanning (Axis camera configuration utility) as ITS may shut down the port without notification
- Create OnGuardAdmin user with administrator rights, contact CAPS/DPS for password
- Enable remote desktop and allow OnGuardAdmin user remote access
- Contact CAPS/DPS for ODBC setup
- Make sure to have a strong SQL sa password for the MSDE prior to connecting to the network
- Windows firewall shall be enabled
- Set time synchronization
  - HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\w32time\Parameters
  - "NtpServer"="ntp2.usc.edu,0x1"
- Contact CAPS IT for computer name, and workgroup/domain affiliation
- Run jabstop.exe from CAPS IT
- Install Virus protection from CAPS IT

8.2 Device Naming and Coordination

Each device and door shall have a name consistent with USC naming standards. Once the design is complete, and all equipment has been coordinated, CAPS/DPS will use the construction documents to create names.
8.2.1 USC Responsibility

CAPS/DPS will provide the Access Control Equipment Template in an Excel electronic version. Information that will be completed by CAPS/DPS includes:

- Equipment type: D5030
- Keyword and Nomenclature: Door panel, reader board or reader
- Description: Typically the Lenel name, such as "SoCA 1"
- Building: Building Number
- Equipment Group: "ACCESSCTRL"
- Status: "NOT MAINT"

8.2.2 Security Contractor Responsibility

The contractor is required to complete the remaining fields of the template in Excel including:

- MFR
- MODEL
- SERIAL_NO
- MFR_PART_NO
- ACQUISITION_DATE
- ACQUISITION_VENDOR
- WARRANTY_DATE
- WARRANTY_DESCRIPTION
- WARRANTY_VENDOR
- WARRANTY_PO_NUMBER

The electronic Excel file shall be provided as part of the close out documentation. The Access Control Equipment Template is required to be provided to USC prior to Commissioning.

The Project Manager is responsible for assuring that the completed Excel file is provided to FMS MIS for download into the FAMIS database.

See Appendix A for example of form.

8.3 Time Schedule Set Up

The security contractor will set up a default time schedule as part of the initial system programming. The general schedule will have the doors open from 7am to 7pm. Alternate schedules shall be coordinated between DPS, the security contractor, the building occupants and the Project Manager.
9 Card Access

USCard Services manages and maintains the credentialing system and operates independent of the access control system.

The Project Manager is responsible for communicating with USCard Services to coordinate user access and door schedules prior to the system go-live.

9.1 Time Schedules

Maintenance of the time schedule and changes??

9.2 User Access

All user access requirements, including re-carding if necessary, may be completed by USCard Services. However, it is important to note the access program does not dictate carding requirements nor re-carding. The Project Manager shall coordinate conversations between the building occupants, DPS and USCard Services.
10 Maintenance and Building Operations

10.1 System Monitoring

10.1.1 Doors

Active monitoring of all electrified doors is provided through the Lenel system. During an alarm condition, such as a door being held open, an alert will be sent through the Lenel system to DPS and any Client Workstations.

10.1.2 Cameras

The primary objective of cameras is to provide evidentiary footage if necessary. Some locations have active monitoring via Client Workstations determined by the needs of the building occupants.

10.2 System Problems

10.2.1 Card Readers and Door Issues

When issues occur with card readers and doors related to entry to a building, DPS should be called at x06000. An officer will be sent to assist with entry and a trouble report will be issued with FMS.

Plaques are posted at card reader doors providing the phone number for DPS as well as the device name for reference.

10.2.2 Other issues

XXX
Completing the Lenel System Excel Sheet

As part of the installation of Lenel equipment at USC, the VAR is required to complete the Excel upload document. The file will be provided with the following fields pre-populated:

- Equipment type
- Keyword
- Nomenclature
- Description: this is to be used as the as the Name in Lenel.
- Building
- Equipment group
- Status

The VAR will complete the following fields for each item listed in the spreadsheet as applicable:

- MFR
- MODEL
- SERIAL_NO
- MFR_PART_NO
- ACQUISITION_DATE
- ACQUISITION_VENDOR
- WARRANTY_DATE
- WARRANTY_DESCRIPTION
- WARRANTY_VENDOR
- WARRANTY_PO_NUMBER
- EQUIPMENT

The EQUIPMENT field is used to denote which panels, reader boards and readers are related, and similarly, which NVR, convertor box and cameras. Top level items, such as ISCs and NVRs should be numbered sequentially – 1,2,3, etc. Convertor boxes that belong to NVR 1 would be numbered 1A, 1B, 1C etc. Cameras belonging to convertor box 1A would be numbered 1A1, 1A2, 1A3 etc. All numbers must be unique in the spreadsheet. See example below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Parent</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>New NVR 1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Axis box 1</td>
<td>New NVR1</td>
<td>1A</td>
</tr>
<tr>
<td>Camera 1</td>
<td>Axis box 1</td>
<td>1A1</td>
</tr>
<tr>
<td>Camera2</td>
<td>Axis box 1</td>
<td>1A2</td>
</tr>
<tr>
<td>Axis box 2</td>
<td>New NVR1</td>
<td>1B</td>
</tr>
<tr>
<td>Camera 3</td>
<td>Axis box 2</td>
<td>1B1</td>
</tr>
<tr>
<td>Camera4</td>
<td>Axis box 2</td>
<td>1B2</td>
</tr>
<tr>
<td>EQUIPMENT</td>
<td>EQUIP_TYPE</td>
<td>KEYWORD</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>D5030*</td>
<td>SEC-AC-PNL</td>
<td>CONTROL PANEL, SECURITY ACCESS CARD</td>
</tr>
<tr>
<td>D5030*</td>
<td>SEC-AC-RDR</td>
<td>READER, SECURITY ACCESS CARD</td>
</tr>
<tr>
<td>D5030*</td>
<td>SEC-AC-CTL</td>
<td>CONTROL BOARD, SECURITY ACCESS CARD</td>
</tr>
<tr>
<td>ASSET_NO</td>
<td>PARENT</td>
<td>SITE</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>0020</td>
<td>NOT MAINT</td>
<td>ACCESSCTRL</td>
</tr>
<tr>
<td>2820</td>
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<td>ACCESSCTRL</td>
</tr>
<tr>
<td>0410</td>
<td>NOT MAINT</td>
<td>ACCESSCTRL</td>
</tr>
<tr>
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<td>ACQUISITION_DATE</td>
<td>ACQUISITION_DESCRIPTION</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 of 3 Lenel System Excel Sheet Example
APPENDIX B – APPROVED VENDORS

Four contractors are currently approved for security work at USC:

Convergint Technologies

HCI

Niscayah (formerly Securitas Systems)

SSD
APPENDIX C - LENEL COMPATIBLE IP CAMERAS
OnGuard® Supported IP Cameras

Camera and Video Server additions for OnGuard 2008 Plus release:

Lenel: LC330-DX

**AXIS:** 209MFD, 209MFD MPEG4

Lumenera: LI045C

Mobotix: D12, D22, M12, M22

Panasonic: WV-NS202a PTZ MPEG4, WV-NW964 PTZ

**Sony:** SNC-CS50 H264, SNC-DF50, SNC-DF50 MPEG4, SNC-DF50 H264, SNCDF80, SNC-DF80 MPEG4, SNC-DF80 H264, SNC-RX550 H264, SNC-RZ50 H254

Previously supported Cameras and Video Servers:


ArecontVision: AV-3130

Baxall: ICE-IPCM3H, Baxal IP-C-9313

Bosch XPro and Dinion: VIP X-PRO, VideoJetV8004, VideoJet 8008, NWC-0495-20*

IQInvision (IQ): IQeye302, IQeye701, IQeye501, IQeye702, IQeye510, IQeye511, IQeye703, IQeye602, IQeye705

**JVC:** VN-A1U(A), VN-C11U, VN-C30U

Lumenera: LE075C, LE175C, LE375C

Panasonic: NV-NS202, NV-NS202A, WV-NF284, WV-NP1004, WV-NM100, WV-NP244, WV-NW474, WV-NW484S


**Toshiba:** IK-WB01A, IKWB-2A

*Limited functionally, please verify with Lenel prior to selection
## LENEL DESCRIPTION

<table>
<thead>
<tr>
<th>BLD/DR, NO.</th>
<th>LENEL DESCRIPTION</th>
<th>HARDWARE GROUP</th>
<th>BLD/DR, NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP2</td>
<td>NML_BASEMENT NORTHWEST DOOR</td>
<td>NML-B.1</td>
<td></td>
</tr>
<tr>
<td>SP2</td>
<td>NML_BASEMENT NORTHEAST DOOR</td>
<td>NML-B.2</td>
<td></td>
</tr>
<tr>
<td>SP4</td>
<td>NML_NORTH LOADING DOCK DOOR</td>
<td>NML-N.3</td>
<td></td>
</tr>
<tr>
<td>SP2</td>
<td>NML_14 FLR NORTH ENTR EXIT</td>
<td>NML-A.1</td>
<td></td>
</tr>
<tr>
<td>SP2</td>
<td>NML_SOUTH QUAD MAIN ENTRY DOOR</td>
<td>NML-S.2</td>
<td></td>
</tr>
</tbody>
</table>

## DOOR HARDWARE GROUP

### Heading 20 (HvSet J4)

Key Group

<table>
<thead>
<tr>
<th>Hand</th>
<th>Degree</th>
<th>Act</th>
<th>V/Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH-RA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 PR. DOOR(S) 129 (NML-B.3) LOADING DOCK FROM HALL
60” x 6’10” x 1-3/4” x HMD x X-HMF x NON-RTD

<table>
<thead>
<tr>
<th>Count</th>
<th>Description</th>
<th>Hand</th>
<th>Degree</th>
<th>Act</th>
<th>V/Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>EA VISUAL LITE KIT</td>
<td>VCN</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
<tr>
<td>2</td>
<td>EA CONVEX HINGE</td>
<td>PEM</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
<tr>
<td>1</td>
<td>EA PANIC DEVICES</td>
<td>VCN</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
<tr>
<td>1</td>
<td>EA EL PANIC DEVICES</td>
<td>PEM</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
<tr>
<td>1</td>
<td>EA MC CORE</td>
<td>PEM</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
<tr>
<td>2</td>
<td>EA SURFACE CLOSER</td>
<td>PEM</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
<tr>
<td>1</td>
<td>EA THRESHOLD</td>
<td>PEM</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
<tr>
<td>2</td>
<td>EA POWER SUPPLY</td>
<td>PEM</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
<tr>
<td>2</td>
<td>EA POWER TRANSFER</td>
<td>PEM</td>
<td>001</td>
<td>001</td>
<td>001</td>
</tr>
</tbody>
</table>

Totals Each Assembly to have:

| (1) | 2 | EA VISUAL LITE KIT | VCN | 001 |
| (1) | 2 | EA CONVEX HINGE | PEM | 001 |
| (1) | 1 | EA PANIC DEVICES | VCN | 001 |
| (1) | 1 | EA EL PANIC DEVICES | PEM | 001 |
| (1) | 1 | EA MC CORE | PEM | 001 |
| (2) | 2 | EA SURFACE CLOSER | PEM | 001 |
| (1) | 1 | EA THRESHOLD | PEM | 001 |
| (1) | 2 | EA POWER SUPPLY | PEM | 001 |
| (2) | 2 | EA POWER TRANSFER | PEM | 001 |
GENERAL NOTES:

1. REFER TO SPECIFICATIONS FOR INFORMATION ON EQUIPMENT TO BE PROVIDED.

2. PROVIDE A MINIMUM 1 (ONE) COMPOSITE ACCESS CONTROL CABLE TO EACH DOOR/PORTAL. IF MORE CONDUCTORS ARE REQUIRED TO ACCOMPLISH THE INTENDED FUNCTIONALITY, PROVIDE ADDITIONAL COMPOSITE ACCESS CONTROL CABLES AS NECESSARY.

3. PROVIDE LOCK POWER SUPPLY QUANTITY AS REQUIRED TO POWER ALL LOCKING DEVICES. TOTAL LOAD SHALL NOT EXCEED 75% POWER SUPPLY CAPACITY.

REFERENCE NOTES:

- PROVIDE 2-CONDUCTOR CABLE TO LOCK POWER SUPPLY (LPS) FROM OUTPUT AT EXISTING FIRE ALARM CONTROL PANEL (FACP).

- PROVIDE QUANTITY AS REQUIRED TO CONNECT FIELD DEVICES SHOWN.

- PROVIDE CAT-6 PATCH CABLE TO USC LAN/WAN (NETWORK SWITCH). REFERENCE FLOOR PLAN FOR LOCATION OF NEAREST NETWORK SWITCH.
GENERAL NOTES:

1. ELECTRICAL CONTRACTOR TO COORDINATE WITH THE OWNER THE EXACT LOCATION OF PENETRATIONS FOR THE ROUTING OF CONDUIT AND PLIUM N RATED CABLE.

2. ELECTRICAL CONTRACTOR TO COORDINATE WITH THE OWNER THE LOCATION FOR 120VAC POWER SOURCE AND AVAILABILITY OF CIRCUITS.

3. ELECTRICAL CONTRACTOR TO ALLOW A MINIMUM OF 36" ACCESS CLEARANCE IN FRONT OF CABINETS AND ENCLOSURES.

4. ELECTRICAL CONTRACTOR TO REFER TO ELECTRICAL DRAWING FOR 120VAC POWER SOURCE FOR STC LOCATION.

REFERENCE NOTES:

- ELECTRICAL CONTRACTOR TO PROVIDE 8" x 48" x 48" SECURITY FULL BOX Wireway/Gutter (Refer to SHEET EY-NML-2.01 FOR LOCATION AND CONDUIT DESTINATIONS).

- NISCAHAY TO PROVIDE LOCKABLE 36" x 12" x 30" x 48" D SECURITY TERMINAL CABINET "STC-1.0" TO ENCLOSURE SYSTEM CONTROLLER, DUAL CARD READER INTERFACE MODULES, INPUT CONTROL AND OUTPUT CONTROL MODULES. MOUNTED BY E.C.

- NISCAHAY TO PROVIDE POWER SUPPLY WITH LOCKABLE ENCLOSURE AND BACKUP BATTERY FOR ACCESS CONTROL EQUIPMENT MOUNTED BY E.C.

- NISCAHAY TO PROVIDE LPS WITH LOCKABLE ENCLOSURE AND BACKUP BATTERY. INTERFACE LPS WITH EXISTING FIRE ALARM CONTROL PANEL (FACP) MOUNTED BY E.C.

- ELECTRICAL CONTRACTOR TO PROVIDE 4" SQUARE PULL BOX AND 1/2" CONDUIT.

- PROVIDE (1) 120V/20AMP EMERGENCY POWER CIRCUIT, DEDICATED TO SERVING SECURITY REQUIREMENTS OF THE SECURITY SYSTEM DEVICES MOUNTED ON WALL.

- ELECTRICAL CONTRACTOR TO PROVIDE 3/4" FIRE RATED PLYWOOD BACKBOARD FOR THE MOUNTING OF SECURITY EQUIPMENT TO WALL WITHOUT PLYWOOD.

- ELECTRICAL CONTRACTOR TO PROVIDE 1" CONDUIT TO NEAREST USC LAN/WAN (NETWORK SWITCH) (REFER TO SHEET EY-NML-2.01 FOR LOCATION AND CONDUIT DESTINATION).

- ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT(S) TO FIELD DEVICES LOCATIONS (DOORS, CAMERAS, ETC.) AS REQUIRED (REFER TO SHEET EY-NML-2.01 FOR LOCATION AND CONDUIT DESTINATION).

- ELECTRICAL CONTRACTOR TO PROVIDE 2" CONDUIT UP TO FLOOR ABOVE (REFER TO SHEET EY-NML-2.02 FOR LOCATION AND CONDUIT DESTINATION).
APPENDIX F – DOOR HARDWARE INSTALLATION PHOTOS
Photo F.01 – Proper connection of door hardware using quick connects

Photo F.02 – Improper connection of door hardware
Photo F.03 – Door wiring
EMERGENCY PHONE MOUNTS

ETP-WM/E – Economy Wall Mount Emergency Phone Station

Description
Wall Mount Emergency/Information station provides an integrated security solution. Wall Mounts are used in parking garages, stairwells, universities, medical centers, and more.

Features
- Attention-getting blue light/strobe included and mounted behind polycarbonate window: blue light is continuously lit, strobe is activated when Emergency button is pressed and flashes for duration of call
- Designed to resist extreme weather conditions
- Talk-A-Phone 400 series flush mounting Emergency/Information phone recesses into unit (order separately)
- Save money when faceplate does not need to be recessed or lit
- ADA-compliant
- A variety of lettering, signage and color choices are available

Specifications
- Dimensions: 10.7(272) W x 8.0(203) D x 32.0(813) H in(mm)
- Weight: 41 lbs. (18.6 kg)
- Construction: 12 gauge stainless steel on front and sides, with impact-resistant polycarbonate window
- Lighting: Blue light strobe is 7 watt compact fluorescent, 1.5 million candlepower, 70 flashes per minute
- Lettering: Standard EMERGENCY lettering available as ASSISTANCE, INFORMATION or custom
- Power: Blue light/strobe requires 120VAC, also available in 12VDC/24VAC/24VDC version; Emergency Phone (sold separately) is powered by phone line
- Mounting: Mounts to wall or straps to poll or kiosk
- Compliance: CSA Certified to UL Standard 60950

Communication Options
- Emergency Phone: Model ETP-400 has a standard red EMERGENCY button
- Access Phone: Model ETP-400C has a standard red TO CALL button
- Emergency/Info Phone: Model ETP-400D has a red EMERGENCY button and a black INFO button to allow two different types of locations to be called
- Emergency/Keypad Phone: Model ETP-400K has a red EMERGENCY button as well as a black CALL button which allows access to the built-in keypad
- RF Transmitter: Models VOIP-RF and VOIP-1 when used in conjunction with a phone listed above creates a Radio Frequency Emergency Phone. (Note: other RF equipment is required for a complete proprietary radio frequency network)
- Cellular Interface: Model ETP-CI mounts inside the wall mount to create a stand-alone cellular Emergency Phone station

Options & Accessories
- Fixed CCTV Option: Model ETP-WM/E OP3 includes a Silent Witness fixed b/w camera
- CCTV Housing Option: Model ETP-WM/E OP2 includes a housing for mounting your own fixed CCTV
- 12 or 24VDC version: Model ETP-WM/E 24 is a wall mount with 24VAC/DC or 12VDC lighting
- Pole Mounting Kit: Model ETP-PMKT is a kit for strapping Wall Mount to a pole
ETP-WM/E – Economy Wall Mount Emergency Phone Station

Dimensions

Back View

Bottom View

All dimensions are in inches
Tolerance = ±0.01 in.
The Model ETP-WM/E and ETP-WM/E24 Wall Mount units are designed to house the Talk-A-Phone Blue Light/Strobe and a Talk-A-Phone 400-series ADA compliant hands-free Emergency Phone.

On the ETP-WM/E, the blue light/strobe requires 120VAC, 25W maximum. On the ETP-WM/E24, 18W maximum is required. The strobe connects to auxiliary port number 2 of the Emergency Phone. The Emergency Phone connects via its RJ-11 connector to a standard phone line or PBX extension. The Emergency Phone does not connect to any power source other than the telephone line.

To install the Wall Mount, after site preparation (including telephone line and provision of power for the Blue Light/Strobe) follow these steps.

1) The Wall Mount is held to the wall with 4 #10 screws. Install two #10 screws in order to hold the top section to the wall. Note that the screws should be located so that the Wall Mount will be at the desired height and in the correct position to receive any conduit connections.

2) Electric power and the telephone line can be brought into the unit in one of two ways.
   a) There are two large openings in the back of the unit to allow the unit to be mounted over a flush mounted standard electrical outlet box and/or flush mounted telephone connector box.
   b) There are two conduit openings available on the bottom of the unit for connection of power and/or telephone line. (Note: Power and telephone lines cannot be run in same conduit.)

3) Remove the cap lid from the Wall Mount by removing the four #10 spanner security screws located on the side of the unit. DO NOT remove the Lexan shield from the unit. Mount the unit on the wall using the two keyholes on the top rear of the unit to the two screws mounted to the wall in step 1.

4) Install two additional #10 screws of the appropriate type in the holes in the lower rear of the unit. Tighten all four screws.

5) Install conduit to hole(s) in bottom of unit, if this method is being used (see step 2), and bring power line and/or telephone line to inside of unit.

6) To connect the Blue Light/Strobe, connect the power cord to the power source, and connect the dry contact control line to the orange and black wires (auxiliary output #2) extending from the Emergency Phone. For 120VAC operation, the attached plugs may be used or cut off for hard-wiring. For 24VDC operation, see the wiring diagram below.

7) Connect the RJ-11 plug extending from the Emergency Phone to a phone line connection box.

8) Mount the Emergency Phone into the recessed opening of the Wall Mount using the 6 #10-24 security screws provided.
12VDC-24VDC Strobe Wiring Diagram

To Orange and Black on Emergency Phone

Input Voltage: 10-28VDC
Input Current: Light only: 120mA at 12VDC or 60mA at 24VDC
When Flashing: 1.5A at 12VDC or 750mA at 24VDC
Plenum Rated Data Communications Composite Cable Specification

Connect-Air Wire & Cable PT# WSECCOMP-2835

Description: Four element composite plenum rated cable, 4 conductors 18 AWG unshielded, 4 conductors 22 AWG unshielded, 4 conductors 22 AWG unshielded, and 6 conductors 22 AWG unshielded. Each element individually jacketed and cabled with an overall polyvinylchloride jacket for data Communications and security applications manufactured in the USA and listed (UL) CL3P or CMP c(UL)us 75°C, FT-6.

Element 1: 18 AWG, 4 Conductors PVC/PVC Unshielded Jacketed Component

1. Conductor
   1.1 AWG & Stranding: 18 AWG, Class 7 Strands
   1.2 Material: Annealed Bare Copper

2. Insulation
   2.1 Material: Plenum Rated Polyvinylchloride (SGPVC)
   2.2 Wall Thickness: 0.007”

3. Color Code
   3.1 Code: Black, Red, White, Green

4. Assembly
   4.1 Pair Lay Length: 3.00” LHL, Nominal
   4.2 Pair Binder: N/A
   4.3 Pair Shield: N/A
   4.4 Pair Drain Wire: N/A

5. Jacket
   5.1 Material: Plenum Rated Polyvinylchloride (SGPVC)
   5.2 Wall Thickness: 0.015”
   5.3 Diameter: 0.170”
   5.4 Color: Grey

6. Markings
   6.1 Type: Cable shall be permanently identified via surface inkjet print
   6.2 Legend: E171197 18AWG 4C (UL) CL3P OR CMP C(UL)US 75°C FT-6 “ROHS”

7. Standards
   7.1 UL listed as Type CL3P or CMP c(UL)us 75°C, FT-6
   7.2 All materials used in the manufacture of this component are RoHS compliant
Plenum Rated Data Communications Composite Cable Specification

Connect-Air Wire & Cable PT#WSECCOMP-2835

Element 2: 22 AWG, 4 Conductors PVC/PVC Unshielded Jacketed Component

1. Conductor
   1.1 AWG & Stranding: 22 AWG, Class B 7 Strands
   1.2 Material: Annealed Bare Copper

2. Insulation
   2.1 Material: Plenum Rated Polyvinylchloride (SGPVC)
   2.2 Wall Thickness: 0.007"

3. Color Code
   3.1 Code: Black, Red, Green, White

4. Assembly
   4.1 Pair Lay Length: 3.00" LHL, Nominal
   4.2 Pair Binder: N/A
   4.3 Pair Shield: N/A
   4.4 Pair Drain Wire: N/A

5. Jacket
   5.1 Material: Plenum Rated Polyvinylchloride (SGPVC)
   5.2 Wall Thickness: 0.015"
   5.3 Diameter: 0.133"
   5.4 Color: Blue

6. Markings
   6.1 Type: Cable shall be permanently identified via surface inkjet print
   6.2 Legend: E171197 22AWG 4C (UL) CL3P OR CMP C(UL)US 75° C FT-6 "ROHS"

7. Standards
   7.1 UL listed as Type CL3P or CMP c(UL)us 75°C, FT-6
   7.2 All materials used in the manufacture of this component are RoHS compliant
Plenum Rated Data Communications Composite Cable Specification

Connect-Air Wire & Cable PT#WSECCOMP-2835

Element 3: 22 AWG, 4 Conductors PVC/PVC Unshielded Jacketed Component

1. Conductor
   1.1 AWG & Stranding: 22 AWG, Class B 7 Strands
   1.2 Material: Annealed Bare Copper

2. Insulation
   2.1 Material: Plenum Rated Polyvinylchloride (SGPVC)
   2.2 Wall Thickness: 0.007”

3. Color Code
   3.1 Code: Black, Red, Green, White

4. Assembly
   4.1 Pair Lay Length: 3.00” LHL, Nominal
   4.2 Pair Binder: N/A
   4.3 Pair Shield: N/A
   4.4 Pair Drain Wire: N/A

5. Jacket
   5.1 Material: Plenum Rated Polyvinylchloride (SGPVC)
   5.2 Wall Thickness: 0.015”
   5.3 Diameter: 0.133”
   5.4 Color: White

6. Markings
   6.1 Type: Cable shall be permanently identified via surface inkjet print
   6.2 Legend: E171197 22AWG 4C (UL) CL3P OR CMP C(UL)US 75°C FT-6 “ROHS”

7. Standards
   7.1 UL listed as Type CL3P or CMP c(UL)us 75°C, FT-6
   7.2 All materials used in the manufacture of this component are RoHS compliant
Plenum Rated Data Communications Composite Cable Specification

Connect-Air Wire & Cable PT#WSECCOMP-2835

Element 4: 22 AWG, 6 conductors PVC/PVC shielded Jacketed Component

1. Conductor
   1.1 AWG & Stranding: 22 AWG, Class B 7 Strands
   1.2 Material: Annealed Bare Copper

2. Insulation
   2.1 Material: Plenum Rated Polyvinylcholoride (SGPVC)
   2.2 Wall Thickness: 0.007"

3. Color Code
   3.1 Code: Black, Red, Blue, Brown, Green, White

4. Assembly
   4.1 Cable Lay Length: 3.00" LHL, Nominal
   4.2 Cable Binder: N/A
   4.3 Cable Shield: N/A
   4.4 Cable Drain Wire: N/A

5. Jacket
   5.1 Material: Plenum Rated Polyvinylchloride (SGPVC)
   5.2 Wall Thickness: 0.015"
   5.3 Diameter: 0.160"
   5.4 Color: Orange

6. Markings
   6.1 Type: Cable shall be permanently identified via surface inkjet print
   6.2 Legend: E171197 22AWG 6C (UL) CL3P OR CMP C(UL)US 75°C FT-6 "ROHS"

7. Standards
   7.1 UL listed as Type CL3P or CMP c(UL)us 75°C, FT-6
   7.2 All materials used in the manufacture of this component are RoHS compliant
Plenum Rated Data Communications Composite Cable Specification

Connect-Air Wire & Cable PT#WSECCOMP-2835

Overall Cable:

5. Assembly - Elements 1, 2, 3, & 4
   5.1 Cable Lay Length: 5.50” LHL, Nominal
   5.2 Cable Binder: N/A
   5.3 Cable Shield: N/A
   5.4 Cable Drain Wire: N/A
   5.5 Fillers: N/A

6. Jacket
   6.1 Material: Plenum Rated Polyvinylchloride (SGPVC)
   6.2 Wall Thickness: 0.015"
   6.3 Diameter: 0.399"
   6.4 Color: Natural
   6.5 Weight: 97 lbs./Mft.

7. Markings
   7.1 Type: Cable shall be permanently identified via surface inkjet print
   7.2 Legend: LAKE CABLE E171197 18AWG 4C + 22AWG 4C + 22AWG 4C + 22AWG 6C
               (UL) CL3P OR CMP C(UL)US 75°C FT-6 "ROHS"

8. Standards
   8.1 UL listed as Type CL3P or CMP c(UL)us 75°C, FT-6
   8.2 All materials used in the manufacture of this cable are RoHS compliant

ALL SPECIFIED PARAMETERS ARE NOMINAL AND SUBJECT TO VERIFICATION
Composite Access Control Cable
Banana Peel® Jacketless Cables
Standard—Riser and Plenum

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No</th>
<th>UL NEC/ C(UL) CEC Type</th>
<th>Standard Lengths</th>
<th>Standard Unit Weight</th>
<th>Overall Nom. OD</th>
<th>Component Descriptions</th>
<th>Component Jacket Material &amp; Colors</th>
<th>Component Nom. OD</th>
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<tr>
<td>Riser • PVC Insulation • PVC Jackets • No Overall Jacket</td>
<td>NEC Article 800</td>
<td>558AFS</td>
<td>NEC: CMR CMG FT4</td>
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<td>1000 305.0</td>
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<td>Card Reader: 3TP 22 AWG, OAS 5542FE Type</td>
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Access Control Panel

- Control Panel
- Access Control Banana Peel
- Junction Box
- Lock Power
- Card Reader
- Door Contact
- REX/Spare
Composite Data Communications Cable Specification

Connect-Air Wire & Cable Part #: WSECCOMP-2817

Description: Three element composite plenum rated cable, 2 conductors 18 AWG unshielded, a CAT 5E component, and a RG59 component, with an overall polyvinylchloride jacket for data communications and controls applications manufactured in the USA and (UL) listed CL3P or CMP c(UL)us, 75°C.

Element 1: (Power/Control) 18 AWG, 2 Conductors Unshielded, Insulated with LSPVC

1. Conductor
   1.1 AWG & Strandng: 18 AWG, Class B 7 Strands
   1.2 Material: Annealed Bare Copper

2. Insulation
   2.1 Material: Plenum Rated Polyvinylchloride (LSPVC)
   2.2 Wall Thickness: 0.007”

3. Color Code
   3.1 Code: Red, Black

Element 2: (Data/Communications) Jacketed Plenum Rated CAT 5E Component, Gray

Element 3: (Data/Communications) Jacketed Plenum Rated RG 59 Component, White

Overall Cable:

4. Assembly - Elements 1, 2 & 3
   4.1 Cable Lay Length: Per UL Standard
   4.2 Cable Fillers: N/A
   4.3 Cable Binder: N/A
   4.4 Cable Shield: N/A
   4.5 Cable Drain Wire: N/A

5. Jacket
   5.1 Material: Plenum Rated Polyvinylchloride (LSPVC)
   5.2 Wall Thickness: 0.019”
   5.3 Diameter: 0.378”
   5.4 Color: Lime Green

6. Markings
   6.1 Type: Cable shall be permanently identified via surface inkjet print
   6.2 Legend: AVALANCHE BY LAKE CABLE E171197 18 AWG 2C CONTROL, 24 AWG 4PR CAT5E DATA, 20 AWG RG59U CCTVP (UL) CL3P OR CMP C(UL)US 75°C FT6 FOR ELAN VIA! TOUCH PANELS “ROHS”

7. Standards
   7.1 UL listed as Type CL3P or CMP c(UL)us, 75°C
   7.2 All materials used in the manufacture of this cable are RoHS compliant

ALL SPECIFIED PARAMETERS ARE NOMINAL AND SUBJECT TO VERIFICATION
INTRODUCTION
The ISOX™ series of readers are the most flexible readers in the industry. Finally, one reader handles all applicable ISO standards (14443 and 15693). All ISOX readers contain both 125 kHz proximity and 13.56 MHz contactless smart card capability in one unit.

ISOX readers provide compatibility with HID®, GE/CASI ProxLite®, AWID®, LenelProx, and many 13.56 MHz technologies including ISOX and MIFARE (see chart on back).

Offering 125 kHz and 13.56 MHz technology in one reader, XceedID protects its customers from obsolescence in the transition from proximity technology to contactless smart card technology. Even if customers want to continue using old proximity technology today, ISOX readers offer an economical migration to the latest in contactless smart card technology on their budget or timeline.

PRODUCT APPLICATION
The ISOX mullion reader is perfect for narrow-rail mullion installations and can be used as a sleek and unobtrusive unit, as well as for standard wall mounted reader applications.

DURABILITY/WARRANTY
XceedID readers are manufactured with the highest quality UV-resistant materials. These plastics inhibit discoloration in all types of environmental conditions, including direct sunlight. The readers feature potted electronics and circuitry for protection against inclement weather: XceedID protects its customers with a limited lifetime warranty, providing full confidence in your reader products. See Sales Policy for complete warranty details.
**XceedID ISOX™ model XF1100 Mullion Reader**

**FREQUENCY**
- 125 kHz and 13.56 MHz

**STANDARDS**
- ISO 15693 and ISO 14443

**CERTIFICATIONS**
- FCC Certification
- Canadian FCC Certification
- UL 294 Listed
- R&TTE Directive (15 EU Countries)
- CE Mark

**VOLTAGE RANGE**
- 5-16 VDC

**POWER SUPPLY**
- Linear DC (recommended)

**MAX. CURRENT REQUIREMENT**
- Average 95 mA DC
- Peak 254 mA DC

**CABLE SPECIFICATION**
- Recommended cable is 22AWG (18AWG preferred), minimum 5 conductor shielded (4 plus shield) in retrofit installs. See installation manual for wiring guide and applicable functionality.

**SYSTEM INTERFACE**
- Wiegand (Standard)

**CABLING DISTANCE**
- Wiegand Output: 500 ft. (152m)

**OPERATING TEMPERATURE**
- -31 to 151°F (-35 to 67°C)

**PHYSICAL DIMENSIONS (HWD)**
- 5.85" x 1.72" x 1.14"
- 14.9 cm x 4.3 cm x 2.9 cm

**WEIGHT**
- 0.6 lbs.

**MATERIAL**
- PBT Polymer

**COLOR OPTIONS**
- Black (standard)
- Charcoal (optional)
- Light Gray (optional)

**MAXIMUM READ RANGE**
- 125 kHz:
  - up to 5" (12.7 cm)
  - ISO 15693: up to 4.5" (11.43 cm)
- 13.56 MHz:
  - ISO 14443 MIFARE® Standard: up to 2" (5.08 cm)
  - ISO 14443 MIFARE DESFire®: up to 1.5" (3.81 cm)

* Maximum read range depends on credential type/form factor and installation conditions

---

**Available RF Technologies**

<table>
<thead>
<tr>
<th>Default reader features</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>(any combination of these features can be disabled upon request)</td>
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</tbody>
</table>

**13.56 MHz Smart Card Applications**

1. Secure MIFARE®  
2. Secure ISOX™  
3. Secure ISOX Lite™  
5. DESFire® Application

**13.56 MHz Smart Card CSN**

6. CSN HID® iClass®, CSN Inside® Picotag®  
   Card Serial Number (CSN) means NO ability to read data application areas

**125 kHz Technologies**

7. HID® Prox  
8. GE/CASI® Prox  
9. AWID® Prox, LenelProx

**Other reader features**

(these features can be enabled upon request but require other features to be disabled)

**13.56 MHz Smart Card CSN**

10. CSN 14443-A (Cascade 1) MIFARE® 1K, 4K  
    only possible if features 1 and 3 are disabled

11. CSN 14443-A (Cascade 2) DESFire®  
    only possible if feature 5 is disabled

12. CSN 15693 (TI, ST, my-d)  
    only possible if feature 2 is disabled

---

Note: Compatibility chart is applicable to readers with firmware revision X02_21 and above. For firmware versions X02_20 and below, please see www.xceedid.com for complete details.

XceedID Corporation  
Phone: (303) 273-9930  
Fax: (303) 273-9937  
www.xceedid.com


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**INTRODUCTION**

Offered by the original pioneer of Multi-technology card readers, the next generation XF1500 Wall Mount reader is arguably the most advanced and flexible, Multi-technology reader in the industry.

Compatible with most industry standard 125 KHz proximity and a variety of 13.56 MHz contactless smart cards (see compatibility chart on reverse).

As more companies converge IT and physical security, the XF1500 protects security managers from technological obsolescence by working with existing card infrastructure while offering seamless migration to future smart card technologies.

The XF1560 is a single frequency (13.56MHz only) contactless smart card reader ideal for new installations or other contactless smart card environments. The XF1500P-K is a single frequency (125 KHz) proximity reader ideal for adding onto existing proximity systems.

**PRODUCT APPLICATION**

Designed for universal mounting, the XceedID XF1500 & XF1560 mount on a single gang U.S. electrical box as well as European and Asian electrical boxes. The attractive low profile styling of the reader, combined with high performance, makes it the preferred choice for corporate environments. The Wall Mount reader footprint is slightly larger than common single gang or light switch sized proximity readers, creating the opportunity to upgrade without having to re-paint wall surfaces.

The XF1500 & XF1560 support high security contactless smart card technologies that provide multiple applications including access control ID numbers and biometrics. The XF1500 & XF1560 provide best-in-class smart card security by combining security measures such as mutual authentication and message authentication coding.

**DURABILITY**

The XF1500 & XF1560 are manufactured using the highest quality UV-resistant materials. These plastics inhibit discoloration in all types of environmental conditions, including direct sunlight. The XF1500 & XF1560 readers feature potted electronics and circuitry for protection against inclement weather.
XceedID ISOX™ model XF1500 Wall Mount Reader

**FREQUENCY**
- 125 kHz and 13.56 MHz - XF1500
- 125KHz - XF1500P-K
- 13.56MHz - XF1560

**STANDARDS**
- ISO 15693 and ISO 14443
- FCC Certification
- Canadian FCC Certification
- UL 294 Listing Pending
- CE Mark

**VOLTAGE RANGE**
- 5-16 VDC

**POWER SUPPLY**
- Linear DC (recommended)

**MAX. CURRENT REQUIREMENT**
- Average 110 mA DC
- Peak 160 mA DC

**CABLE SPECIFICATION**
- Recommended cable is 22AWG (18AWG preferred), minimum 5 conductor shielded (4 plus shield) in retrofit installs. See installation manual for wiring guide and applicable functionality.

**SYSTEM INTERFACE**
- Wiegand (Standard)

**CABLING DISTANCE**
- Wiegand Output: 500 ft. (152m)

**OPERATING TEMPERATURE**
- -31 to 151°F (-35 to 67°C)

**PHYSICAL DIMENSIONS (HWD)**
- 5.1" x 3.25" x 0.76"
- 130 mm x 83 mm x 20 mm

**WEIGHT**
- 0.6 lbs.

**MATERIAL**
- PBT Polymer

**COLOR OPTIONS**
- Black (standard)

**RANGE**
- 125 kHz:
  - up to 4.5" (11.4 cm)
- 13.56 MHz:
  - ISO 15693: up to 3.0" (7.6 cm)
  - ISO 14443 MIFARE® Standard: up to 2" (5.1 cm)
  - ISO 14443 MIFARE DESFire®: up to 1.5" (3.8 cm)
- Maximum read range depends on credential type/form factor and installation conditions

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**Available RF Technologies**

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<th>Default reader features</th>
<th>XF1500 Multi-tech</th>
<th>XF1560P Smart only</th>
<th>XF1500P-K Prox only</th>
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**13.56 MHz Smart Card Applications**

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<td>2. Secure ISOX™</td>
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<td>3. Secure ISOX Lite™</td>
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<td>5. DESFire® Application</td>
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**13.56 MHz Smart Card CSN®**

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**125 kHz Technologies**

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<td>8. GE®/CASI® Prox</td>
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<td>9. AWID® Prox, LenelProx</td>
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**Other reader features**

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**13.56 MHz Smart Card CSN®**

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<td>12. CSN® 15693 (TI, ST)</td>
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Specifications above apply only to the XF1500 Multi-technology reader. Contact XceedID for specifications for other models.

*Card Serial Number (CSN) means NO ability to read data application areas.

X - Reader model supports this technology

**XF1500 PART NUMBERS**

- MULTI-TECHNOLOGY READER (Prox and Smart): XF1500
- 13.56MHz SMART ONLY: XF1560P
- 125 KHz PROX ONLY: XF1500P-K

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XceedID Corporation
Phone: (303) 273-9930
Fax: (303) 273-9937
www.xceedid.com

Specifications subject to change without notice. Revised 11/2007.

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Lenel Magnetic Card Access Readers

Overview

Lenel Systems International’s Magnetic Card Access Readers are durable, dependable, convenient and competitively priced. The Magnetic Card Access Readers are available in both 12 VDC and optional 5 VDC models. The LNL-2010W is a magnetic swipe only reader, and the LNL-2020W includes a twelve-position keypad (available with an indestructible keypad). The readers have a fully weatherized metal casing shell, which provides strength and durability. The readers are first treated with an anti-corrosion film and then coated with a tough, abrasion resistant, beige or black textured finish that complements any interior or exterior decor. The readers accept low and high coercivity magnetic stripe cards. Track 2 magnetic readers are standard, but optional Track 1 or Track 3 readers are available.

The reader communicates with the Intelligent System Controller (ISC) through one of two reader interface modules. The single (LNL-1300) or dual (LNL-1320) reader interface module interprets the Wiegand communication (Data 1/Data 0 or Clock and Data) from the reader and sends the signal back to the ISC via RS-485 communication. The reader can be located up to 500 feet away from the reader interface module.

Features and Functionality

- 12 VDC power supply (optional 5 VDC available)
- Bi-directional Card Swipe
- One million card pass read head
- Choice of three attractive weatherproof finishes—black and beige (antique brass optional)
- Two single-color LEDs for reader status
- Track 2 Default (Optional Track 1 and 3)
- Audible indicator beeper contacts
- Strike controlled by reader interface module
- DIP switch selectable data outputs
- Maximum 500 feet distance from reader interface module
- RJ-45 jack for quick installation
- Optional tamper switch
- 12-position keypad (LNL-2020W only)
- UL 294 listed and CE approved
- (Optional) indestructible keypad, LNL-2020W-NDK

Lenel Systems International, Inc.
**Options**

**Reader Options**
- LNL-2010W: Magnetic Reader, 12 VDC, track 2 weatherized, without keypad
- LNL-2020W: Magnetic Reader, 12 VDC, track 2 weatherized, with keypad
- LNL-WP10: Wall plate cover for Single Gang electric box
- LNL-RCC: Reader connector cable, replacement (lot of 5)
- LNL-SS: Security screw (lot of 10)
- LNL-SSK: Security screw key for A-SS (lot of 5)
- LNL-AB: Antique brass finish

**Power Supplies and Enclosures**
- LNL-AL400ULX: Lenel UL Listed 4 A, 110 VAC Power Supply - 12 VDC or 24 VDC 4 A output (switch selectable), 120 VAC input, continuous supply current with enclosure (12 x 16 x 4.5 in.), lock and open frame transformer, tamper switch, UPS capable (Battery Optional) (UL Approved)
- LNL-AL600ULX-4CB6: Lenel UL Listed Power Supply - 12 VDC or 24 VDC 6 A output (switch selectable), 120 VAC (1.6 amps) input, continuous supply current with enclosure (18 x 24 x 4.5 in.), lock and open frame transformer, tamper switch, UPS capable (Battery Optional), UL Approved
- ABT-12: Battery Kit - 12 VDC, 12 AH battery (PS-12120)

**Specifications**

- *The reader is for use in low voltage, power limited, class 2 circuit only.*

**Primary Power (DC):**
- DC input:
  - 12 V Model: 12 VDC (10.2 to 13.8 VDC)
  - 5 V Model: 5.8 VDC (4.9 to 6.4 VDC)

**Environmental:**
- Temperature: Operating: 0° to +70° C (32° to 158° F)
  - Storage: -55° to +85° C (-67° to 185° F)
- Humidity: 0 to 95% RHNC

**Mechanical:**
- Dimension: 1.95 x 5.50 x 1.30 in. (50 x 140 x 33 mm)
- Weight: 10 oz. (290 g) nominal

**Approvals:**
- UL 294 and UL 1076 Listed

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Lenel Systems International, Inc.

Lenel Systems International, Inc.
1212 Pittsford-Victor Road Pitts NY 14534 USA

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Spectra® IV SE Series Dome Systems
PREMIER INTEGRATED DOME SYSTEM

Product Features

- 3 Autofocus, High Resolution Integrated Camera/Optics Packages; Multiple Back Box Models
- Day/Night, 540 TVL, 128X Wide Dynamic Range (WDR), Motion Detection, and Electronic Image Stabilization (SD43S Series)
- Day/Night, 540 TVL, 80X Wide Dynamic Range, and Motion Detection (SD4CBW Series)
- Window Blanking
- Camera Title Overlay, 20 User-Definable Characters
- Horizontal and Zone Blanking
- On-Screen Compass and Tilt Display
- Password Protection
- Freeze Frame During Presets
- Built-in Surge and Limited Lightning Protection
- Integrated Passive Unshielded Twisted Pair (UTP) Circuit
- Internal Scheduling Clock
- Ability to Add IP Network Capability by Purchasing Optional TXB-IP Module

Modularity

Spectra® IV SE was designed with ease of installation and ease of maintenance in mind. Each dome system consists of three components: a back box, a dome drive, and a lower dome. These three system components are interchangeable with other Spectra IV SE dome systems, making retrofitting and application adjustments simple. Also, dome drives and lower domes can be removed and replaced reducing maintenance time.

Back Box

Spectra IV SE back box options include the following models: environmental in-ceiling (ideal for outdoor soffits), indoor in-ceiling, indoor surface mount, standard and environmental pendant, heavy-duty, pressurized, and stainless steel. Each back box model features built-in back box memory to store camera and location-specific dome settings, including labels, presets, patterns, and zones. A passive UTP circuit is located on the door assembly for convenient video transmission through twisted pair wire. For added flexibility, Pelco fiber modules can also be attached to the door assembly for transmission over single-mode or multimode fiber.

Dome Drive

The Spectra IV SE dome drive’s unique integrated optics package incorporates many advanced features that allow the system to produce high quality video in the most difficult environments. All cameras in Spectra IV SE dome drives feature LowLight™ technology allowing the cameras to compensate for scenes where minimal light is present. The 35X day/night camera features built-in motion detection and advanced 128X wide dynamic range that enables the system to compensate for scenes where dramatic contrasts in lighting are present. Electronic image stabilization digitally reduces blurring of the camera image due to vibration caused by external sources such as wind and traffic. The 23X day/night camera features built-in motion detection and 80X wide dynamic range. The 22X color camera features an EXview HAD™ imagers for increased sensitivity.

Lower Dome

Special consideration was taken when designing the Spectra IV SE lower dome bubble to ensure that an optimal optical relationship between the lens and bubble was achieved, providing crystal clear video at long focal lengths.

Dome Systems

Spectra IV SE dome systems feature many software enhancements that increase performance and make programming and operation easy. An internal scheduling clock allows for the scheduling of presets and patterns. Window blanking enables a user to program up to eight, four-sided, user-defined privacy areas. Password protection prevents unauthorized users from changing the system settings. Programmable on-screen compass and tilt display provides positioning information when needed. Intuitive multilingual on-screen programming can be displayed in English, Spanish, Portuguese, Italian, French, German, Russian, Polish, Turkish, and Czech.

Spectra IV SE’s variable speed capabilities range from a smooth, fast pan motion of 400 degrees per second to a smooth “creep” speed of 0.1 degree per second. The system is capable of continuous 360 degrees rotation and has an “auto flip” feature that allows the dome to rotate 180 degrees and reposition itself for uninterrupted viewing of any subject that passes directly beneath the dome.

In addition, with the optional Pelco TXB-IP module, you can add IP network capability at any time to a Spectra IV dome system without losing analog viewing and control. By snapping the TXP-IP module into the back box, you can stream network video to a Web browser, Endura®, Integral Digital Sentry®, or third-party software recording solution allowing integration into virtually any IP-based system.
## TECHNICAL SPECIFICATIONS

### CAMERA/OPTICS

<table>
<thead>
<tr>
<th></th>
<th>Day/Night (35X)</th>
<th>Day/Night (23X)</th>
<th>Color (22X)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signal Format</strong></td>
<td>NTSC (DD4CBW35) PAL (DD4CBW35-X)</td>
<td>NTSC (DD4CBW23) PAL (DD4CBW23-X)</td>
<td>NTSC (DD4C22) PAL (DD4C22-X)</td>
</tr>
<tr>
<td><strong>Scanning System</strong></td>
<td>2.1 Interface</td>
<td>2.1 Interface</td>
<td>2.1 Interface</td>
</tr>
<tr>
<td><strong>Image Sensor</strong></td>
<td>1/4-inch EXview HAD™</td>
<td>1/4-inch progressive scan CCD</td>
<td>1/4-inch EXview HAD CCD</td>
</tr>
<tr>
<td><strong>Effective Pixels</strong></td>
<td>768 (H) X 494 (V)</td>
<td>768 (H) X 494 (V)</td>
<td>768 (H) X 494 (V)</td>
</tr>
<tr>
<td></td>
<td>752 (H) X 582 (V)</td>
<td>752 (H) X 582 (V)</td>
<td>752 (H) X 582 (V)</td>
</tr>
<tr>
<td><strong>Horizontal Resolution</strong></td>
<td>&gt;540 TV Lines</td>
<td>540 TV Lines</td>
<td>&gt;470 TV Lines</td>
</tr>
<tr>
<td></td>
<td>&gt;540 TV Lines</td>
<td>&gt;540 TV Lines</td>
<td>&gt;460 TV Lines</td>
</tr>
<tr>
<td><strong>Lens</strong></td>
<td>1/1.4 (focal length, 3.4–119 mm)</td>
<td>1/1.6 (focal length, 3.6–82.8 mm)</td>
<td>1/1.6 (focal length 4–88 mm)</td>
</tr>
<tr>
<td><strong>Zoom</strong></td>
<td>35X optical, 12X digital</td>
<td>23X optical, 12X digital</td>
<td>22X optical, 12X digital</td>
</tr>
<tr>
<td><strong>Zoom Speed (optical range)</strong></td>
<td>3.2/4.6/6.6 seconds</td>
<td>2.9/4.2/5.8 seconds</td>
<td>2.4/3.9/6.3 seconds</td>
</tr>
<tr>
<td><strong>Horizontal Angle of view</strong></td>
<td>55.8° at 3.4 mm wide zoom;</td>
<td>54° at 3.6 mm wide zoom;</td>
<td>47° at 4.0 mm wide zoom;</td>
</tr>
<tr>
<td></td>
<td>1.7° at 119 mm telephoto zoom Automatic with manual override</td>
<td>2.5° at 82.8 mm telephoto zoom Automatic with manual override</td>
<td>2.2° at 88 mm telephoto zoom Automatic with manual override</td>
</tr>
<tr>
<td><strong>Maximum Sensitivity at 35 IRE</strong></td>
<td>NTSC/EIA: 0.55 lux at 1/60 sec (color)</td>
<td>NTSC/EIA: 0.025 lux at 1/2 sec (color)</td>
<td>NTSC/EIA: 0.02 lux at 1/2 sec shutter</td>
</tr>
<tr>
<td></td>
<td>PAL/CCIR: 0.0018 lux at 1/2 sec (B-W)</td>
<td>PAL/CCIR: 0.005 lux at 1/50 sec (B-W)</td>
<td>PAL/CCIR: 0.02 lux at 1/1.5 sec shutter</td>
</tr>
<tr>
<td></td>
<td>0.068 lux at 1/6 sec</td>
<td>0.1 lux at 1/60 sec</td>
<td>0.025 lux at 1/50 sec (color)</td>
</tr>
<tr>
<td></td>
<td>0.00018 lux at 1/15 sec (B-W)</td>
<td>0.004 lux at 1/15 sec (B-W)</td>
<td>0.025 lux at 1/1.5 sec (color)</td>
</tr>
<tr>
<td><strong>Sync System</strong></td>
<td>Internal/AC line lock, phase adjustable using remote control, V-Sync</td>
<td>Internal/AC line lock, phase adjustable using remote control, V-Sync</td>
<td>Internal/AC line lock, phase adjustable using remote control, V-Sync</td>
</tr>
<tr>
<td><strong>White Balance</strong></td>
<td>Automatic with manual override</td>
<td>Automatic with manual override</td>
<td>Automatic with manual override</td>
</tr>
<tr>
<td><strong>Shutter Speed</strong></td>
<td>NTSC: 1/2 – 1/30,000</td>
<td>NTSC: 1/2 – 1/30,000</td>
<td>NTSC: 1/2 – 1/30,000</td>
</tr>
<tr>
<td></td>
<td>PAL: 1/1.5 – 1/30,000</td>
<td>PAL: 1/1.5 – 1/30,000</td>
<td>PAL: 1/1.5 – 1/30,000</td>
</tr>
<tr>
<td><strong>Iris Control</strong></td>
<td>Automatic Iris Control with manual override</td>
<td>Automatic Iris Control with manual override</td>
<td>Automatic Iris Control with manual override</td>
</tr>
<tr>
<td><strong>Gain Control</strong></td>
<td>Automatic/OFF</td>
<td>Automatic/OFF</td>
<td>Automatic/OFF</td>
</tr>
<tr>
<td><strong>Video Output</strong></td>
<td>1 Vp-p, 75 ohms</td>
<td>1 Vp-p, 75 ohms</td>
<td>1 Vp-p, 75 ohms</td>
</tr>
<tr>
<td><strong>Video Signal to Noise</strong></td>
<td>&gt;50 dBC</td>
<td>&gt;50 dBC</td>
<td>&gt;50 dB</td>
</tr>
<tr>
<td><strong>Wide Dynamic Range</strong></td>
<td>128X</td>
<td>80X</td>
<td>—</td>
</tr>
<tr>
<td><strong>Electronic Image Stabilization</strong></td>
<td>Integrated</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Image Enhancement</strong></td>
<td>Integrated</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
TECHNICAL SPECIFICATIONS

DOMES DRIVE FEATURES

- 256 Presets
- ±0.1° Preset Accuracy
- Electronic Image Stabilization (35X model)
- Image Enhancement (35X model)
- Multilingual Menus (English, Spanish, Portuguese, Italian, French, German, Russian, Polish, Turkish, and Czech)
- RJ-45 Data Port for Software Update and Setup
- On-Screen Compass, Tilt, and Zoom Display
- 400°/sec Pan Preset Speed and 200°/sec Tilt Preset Speed
- Rotating Discreet Liner with Sealed Fixed Bubble
- Window Blanking: Up to 8, Four-Sided, User-Defined Shapes
- 8 Zones (programmable in size) Can Be Labeled with up to 20 Characters Each or Set to Output Blank Video
- 7 Alarm Inputs
- 1 Auxiliary (Form C) Relay Output and 1 Open Collector Auxiliary Output (can be alternately programmed to operate upon alarm)
- Programmable Locations of Labels and On-Screen Displays
- Action on Alarm: Alarms Can Be Individually Programmed for 3 Priority Levels, to Initiate a Stored Pattern, or to Go to an Associated Preset When Received

WINDOW BLANKING

Window blanking allows a user to program up to eight, four-sided, user-defined areas that cannot be viewed by the operator of the dome system. A blanked area will move with pan and tilt functions and automatically adjust in size as the lens zooms telephoto and wide.

BEFORE

AFTER

WIDE DYNAMIC RANGE

The Wide Dynamic Range (WDR) setting balances the brightest and darkest sections of a scene to produce a picture that provides more detail.

BEFORE

AFTER
**TECHNICAL SPECIFICATIONS**

**BACK BOX FEATURES**

**Surface Mount (Indoor)**
- Built-in Memory Stores Camera/Dome Settings
- Available in Black or White Finish
- Quick Disconnect to Dome Drive
- Injection-Molded Plastic
- Integrated Passive UTP

**In-Ceiling (Indoor)**
- Built-in Memory Stores Camera/Dome Settings
- Single Back Box for Suspended or Hard Ceiling Applications
- Requires 5.25-Inch Space Above Ceiling and 3.25 Inches Below
- Minimum Ceiling Thickness 0.5-Inch; Maximum 1.75 Inches
- Quick Disconnect to Dome Drive
- Aluminum Construction
- Suitable for Use in Environmental Air Handling Spaces
- Integrated Passive UTP

**Environmental In-Ceiling**
- Built-in Memory Stores Camera/Dome Settings
- Single Back Box for Hard Ceiling Applications
- Requires 4.4-Inch Space Above Ceiling and 4.3 Inches Below
- Includes Heater and Fan
- Minimum Ceiling Thickness 0.5-Inch; Maximum 1.75 Inches
- Quick Disconnect to Dome Drive
- Aluminum Construction
- Integrated Passive UTP

**Standard and Environmental Pendant**
- Standard and Environmental Models
- Built-in Memory Stores Camera/Dome Settings
- Standard Pendant Available in Black or Gray Finish; Environmental Pendant Gray Finish Only
- Quick Disconnect to Dome Drive
- Aluminum Construction
- Environmental Model Includes Sun Shield, Fan, and Heater
- Integrated Passive UTP

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**NOTE:** VALUES IN PARENTHESES ARE CENTIMETERS; ALL OTHERS ARE INCHES.
## TECHNICAL SPECIFICATIONS

### MECHANICAL (Dome Drive Only)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pan Movement</td>
<td>360° continuous pan rotation</td>
</tr>
<tr>
<td>Vertical Tilt</td>
<td>Unobstructed +2° to -92°</td>
</tr>
<tr>
<td>Manual Pan/Tilt Speeds</td>
<td></td>
</tr>
<tr>
<td>Pan</td>
<td>0.1° to 80°/sec manual operation, 150°/sec Turbo</td>
</tr>
<tr>
<td>Tilt</td>
<td>0.1° to 40°/sec manual operation</td>
</tr>
<tr>
<td>Preset Speeds</td>
<td></td>
</tr>
<tr>
<td>Pan</td>
<td>400°/sec</td>
</tr>
<tr>
<td>Tilt</td>
<td>200°/sec</td>
</tr>
</tbody>
</table>

For variable-speed operation an appropriate controller is required (with nonvariable speed control, Spectra IV SE pan/tilt speed is 20°/sec).

### ELECTRICAL

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>18 to 32 VAC, 24 VAC nominal</td>
</tr>
<tr>
<td></td>
<td>22 to 27 VDC, 24 VDC nominal</td>
</tr>
<tr>
<td>Input Power</td>
<td></td>
</tr>
<tr>
<td>24 VAC</td>
<td>23 VA nominal (without heater); 73 VA nominal (with heater)</td>
</tr>
<tr>
<td>24 VDC</td>
<td>0.7 A nominal (without heater); 3 A nominal (with heater)</td>
</tr>
<tr>
<td>Fuse</td>
<td>1.25 A</td>
</tr>
<tr>
<td>Auxiliary Outputs</td>
<td>2</td>
</tr>
<tr>
<td>Alarm Inputs</td>
<td>7</td>
</tr>
</tbody>
</table>

### CERTIFICATIONS/RATINGS/PATENTS

- CE, Class B
- FCC, Class B
- UL/cUL Listed
- C-Tick
- S Mark for Argentina
- GOST
- U.S. Patents 5,931,432; 6,793,415 B2; 6,802,656 B2; 6,821,222 B2; 7,161,615 B2

Meets the following standards:

- NEMA Type 4X, IP66 when installed properly
  (BB4-F-E, BB4-P8, BB4-PG, and BB4-PG-E)
- NEMA Type 1, IP40 (BB4-SMW, BB4-SMB and BB4-F)

### GENERAL

#### Back Box

<table>
<thead>
<tr>
<th>Surface Mount</th>
<th>Plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Ceiling</td>
<td>Aluminium</td>
</tr>
<tr>
<td>Pendant</td>
<td>Aluminium</td>
</tr>
<tr>
<td>Dome Drive</td>
<td>Aluminium, thermo plastic</td>
</tr>
<tr>
<td>Bubble</td>
<td>Acrylic</td>
</tr>
</tbody>
</table>

#### Light Attenuation

- Smoked: f/0.5 light loss
- Clear: Zero light loss
- Chrome: 1/2.0 light loss
- Gold: 1/2.0 light loss

#### Cable Entry (Back Box)

- In-Ceiling and Surface Mount
- 0.75-inch conduit fitting
- Through 1.5-inch NPT pendant mount

#### Weight (approximate)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Shipping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Box</td>
<td></td>
</tr>
<tr>
<td>Surface Mount</td>
<td>0.7 lb (0.32 kg) 2 lb (0.90 kg)</td>
</tr>
<tr>
<td>In-Ceiling</td>
<td>1.5 lb (0.68 kg) 2 lb (0.90 kg)</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
</tr>
<tr>
<td>In-Ceiling</td>
<td>2.1 lb (0.95 kg) 3 lb (1.36 kg)</td>
</tr>
<tr>
<td>Standard Pendant</td>
<td>2.4 lb (1.09 kg) 4 lb (1.81 kg)</td>
</tr>
<tr>
<td>Environmental Pendant</td>
<td>3.5 lb (1.59 kg) 5 lb (2.27 kg)</td>
</tr>
<tr>
<td>Dome Drive</td>
<td>3.3 lb (1.48 kg) 5 lb (2.27 kg)</td>
</tr>
<tr>
<td>Lower Dome</td>
<td></td>
</tr>
<tr>
<td>Surface Mount</td>
<td>0.4 lb (0.18 kg) 1 lb (0.45 kg)</td>
</tr>
<tr>
<td>In-Ceiling</td>
<td>0.2 lb (0.09 kg) 1 lb (0.45 kg)</td>
</tr>
<tr>
<td>Pendant and Environmental</td>
<td></td>
</tr>
<tr>
<td>In-Ceiling</td>
<td>0.6 lb (0.27 kg) 2 lb (0.90 kg)</td>
</tr>
</tbody>
</table>

#### Environment

- Indoor
- Surface Mount
- In-Ceiling
- Standard and Environmental
- Indoor
- Outdoor

#### Operating Temperature

| Surface Mount and Indoor In-Ceiling | 32° to 122°F (0° to 50°C) |
| Standard Pendant and Environmental | (Assumes no wind chill factor) |
| Maximum                               | 113°F (45°C) absolute maximum; 95°F (35°C) sustained maximum |
| Minimum                               | 25°F (-4°C) sustained minimum |

#### Effective Projected Area (EPA)

- 20.5 square inches (without mount)
- 47 square inches (with IWM Series mount)
OPTIONAL ACCESSORIES

DD5-FM  Fixed camera mount adapter. Interchangeable with all Spectra IV dome drives.

IPS-RMK  Remote monitor kit. Stand-alone kit consisting of a 5.6-inch TFT-LCD monitor, Palm™ OS compatible handheld, cables and carrying case. Allows viewing of camera video, local PTZ control, system setup, and system software upgrades at any installed dome.

IPS-CABLE  Remote monitor cable and software kit consisting of the Spectra IV remote monitor interface cable and necessary software for use with a PC (Windows® 95, 98, Me, 2000), Palm™ OS compatible handheld or iPaq™ Series Pocket PC. Refer to www.pelco.com for a list of compatible devices.

IPS-RDPE-2*  Remote data port. 24 VAC, wall/pole mount video/data breakout box. Allows ground-level control/programming and Spectra IV OS software upgrades when used with the IPS-RMK or IPS-CABLE.

TXB Series*  Translator boards for AD™ Manchester, Hersis, Bosch® (Philips, Burle), Sensormatic®, Vicon™, TASS, and NTCIP protocols.

TXB-IP Series*  Communication module that allows you to control and monitor Spectra IV dome systems over an IP network (in-ceiling and pendant models only).

FS85011A*  Fiber transmitter sends one unidirectional composite video channel and one bidirectional data channel over one multimode or single-mode fiber optical cable.

*If TXB or FS85011A boards are installed, remote upload of system software will not be possible.
## RELATED PRODUCTS

### RECOMMENDED MOUNTS

<table>
<thead>
<tr>
<th>Surface Mount Domes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASMB</td>
<td>Pendant adapter for surface mount dome, black</td>
</tr>
<tr>
<td>SD53SM-P</td>
<td>2' x 2' drop ceiling panel for BB4-SMW and BB4T-SMW series back boxes; replaces 2' x 2' ceiling tile; aluminum construction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In-Ceiling Domes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD5-P</td>
<td>2' x 2' drop ceiling panel, aluminum construction; replaces 2' x 2' ceiling tile</td>
</tr>
<tr>
<td>SCA1</td>
<td>Support rails for BB4-F; for use in ceiling tile applications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pendant Domes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB5-PCA-BK†</td>
<td>Pendant conduit adapter, black</td>
</tr>
<tr>
<td>BB5-PCA-GY†</td>
<td>Pendant conduit adapter, gray</td>
</tr>
<tr>
<td>IWM Series</td>
<td>Wall mount, with or without integral 24 VAC, 100 VA transformer; black or gray finish; can be adapted for corner, parapet or pole applications</td>
</tr>
<tr>
<td>MRCA</td>
<td>Ceiling mount, black</td>
</tr>
<tr>
<td>MRWA</td>
<td>Wall mount, black</td>
</tr>
<tr>
<td>PP4348</td>
<td>Parapet roof mount</td>
</tr>
<tr>
<td>PP350/PP351</td>
<td>Parapet wall/roof mount</td>
</tr>
<tr>
<td>SWM Series</td>
<td>Compact wall mount, black or gray finish; can be adapted for corner or pole applications</td>
</tr>
</tbody>
</table>

† Not suitable for use with heavy-duty, pressurized, or stainless steel Spectra domes.

### RECOMMENDED POWER SUPPLIES

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS Series</td>
<td>Indoor, 24 VAC power supply</td>
</tr>
<tr>
<td>MCS*E Series</td>
<td>Indoor, 24 VAC power supply</td>
</tr>
<tr>
<td>WCS Series</td>
<td>Outdoor, 24 VAC power supply</td>
</tr>
</tbody>
</table>

Refer to individual power supply specifications for more information.
## SYSTEM AND COMPONENT MODELS

### SYSTEM MODEL NUMBERS

<table>
<thead>
<tr>
<th>Type</th>
<th>Back Box Color</th>
<th>Lower Dome</th>
<th>35X Day/Night*</th>
<th>23X Day/Night*</th>
<th>22X Color*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Mount</td>
<td>White</td>
<td>Smoked</td>
<td>SD435-SMW-0</td>
<td>SD43BW-SMW-0</td>
<td>SD4CC2-SMW-0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear</td>
<td>SD435-SMW-1</td>
<td>SD43BW-SMW-1</td>
<td>SD4CC2-SMW-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrome</td>
<td>SD435-SMW-2</td>
<td>SD43BW-SMW-2</td>
<td>SD4CC2-SMW-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gold</td>
<td>SD435-SMW-3</td>
<td>SD43BW-SMW-3</td>
<td>SD4CC2-SMW-3</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>Smoked</td>
<td>SD435-SMB-0</td>
<td>SD43BW-SMB-0</td>
<td>SD4CC2-SMB-0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear</td>
<td>SD435-SMB-1</td>
<td>SD43BW-SMB-1</td>
<td>SD4CC2-SMB-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrome</td>
<td>SD435-SMB-2</td>
<td>SD43BW-SMB-2</td>
<td>SD4CC2-SMB-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gold</td>
<td>SD435-SMB-3</td>
<td>SD43BW-SMB-3</td>
<td>SD4CC2-SMB-3</td>
</tr>
<tr>
<td>In-Ceiling, Indoor</td>
<td>Black</td>
<td>Smoked</td>
<td>SD435-F0</td>
<td>SD43BW-F0</td>
<td>SD4CC2-F0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear</td>
<td>SD435-F1</td>
<td>SD43BW-F1</td>
<td>SD4CC2-F1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrome</td>
<td>SD435-F2</td>
<td>SD43BW-F2</td>
<td>SD4CC2-F2</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>Smoked</td>
<td>SD435-F0-E</td>
<td>SD43BW-F0-E</td>
<td>SD4CC2-F0-E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear</td>
<td>SD435-F1-E</td>
<td>SD43BW-F1-E</td>
<td>SD4CC2-F1-E</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>Smoked</td>
<td>SD435-PB-0</td>
<td>SD43BW-PB-0</td>
<td>SD4CC2-PB-0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear</td>
<td>SD435-PB-1</td>
<td>SD43BW-PB-1</td>
<td>SD4CC2-PB-1</td>
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<tr>
<td></td>
<td>Black</td>
<td>Smoked</td>
<td>SD435-PG-0</td>
<td>SD43BW-PG-0</td>
<td>SD4CC2-PG-0</td>
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<td></td>
<td>Clear</td>
<td>SD435-PG-1</td>
<td>SD43BW-PG-1</td>
<td>SD4CC2-PG-1</td>
</tr>
<tr>
<td></td>
<td>Lt. Gray</td>
<td>Smoked</td>
<td>SD435-PG-E0</td>
<td>SD43BW-PG-E0</td>
<td>SD4CC2-PG-E0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear</td>
<td>SD435-PG-E1</td>
<td>SD43BW-PG-E1</td>
<td>SD4CC2-PG-E1</td>
</tr>
<tr>
<td>In-Ceiling, Environmental†</td>
<td>Black</td>
<td>Smoked</td>
<td>SD435-F-E0</td>
<td>SD43BW-F-E0</td>
<td>SD4CC2-F-E0</td>
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<td>SD435-F-E1</td>
<td>SD43BW-F-E1</td>
<td>SD4CC2-F-E1</td>
</tr>
<tr>
<td>Pendant, Standard</td>
<td>Black</td>
<td>Smoked</td>
<td>SD435-PB-0</td>
<td>SD43BW-PB-0</td>
<td>SD4CC2-PB-0</td>
</tr>
<tr>
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<td>Clear</td>
<td>SD435-PB-1</td>
<td>SD43BW-PB-1</td>
<td>SD4CC2-PB-1</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>Smoked</td>
<td>SD435-PG-0</td>
<td>SD43BW-PG-0</td>
<td>SD4CC2-PG-0</td>
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<tr>
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<td></td>
<td>Clear</td>
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<td>SD43BW-PG-1</td>
<td>SD4CC2-PG-1</td>
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<tr>
<td></td>
<td>Lt. Gray</td>
<td>Smoked</td>
<td>SD435-PG-E0</td>
<td>SD43BW-PG-E0</td>
<td>SD4CC2-PG-E0</td>
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<tr>
<td></td>
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<td>SD43BW-PG-E1</td>
<td>SD4CC2-PG-E1</td>
</tr>
<tr>
<td>Pendant, Environmental†</td>
<td>Lt. Gray</td>
<td>Smoked</td>
<td>SD435-PG-E0</td>
<td>SD43BW-PG-E0</td>
<td>SD4CC2-PG-E0</td>
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</tbody>
</table>

### COMPONENT MODEL NUMBERS

<table>
<thead>
<tr>
<th>Back Box</th>
<th>Dome Drive*</th>
<th>Lower Dome†</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB4-SMB</td>
<td>DD4C22</td>
<td>LD5SSMB-0</td>
</tr>
<tr>
<td>BB4-SMW</td>
<td>DD4CBW23</td>
<td>LD5SSMB-1</td>
</tr>
<tr>
<td>BB4-F</td>
<td>DD4CBW35</td>
<td>LD5SSMB-2</td>
</tr>
<tr>
<td>BB4-F-E</td>
<td>DD5-FM</td>
<td>LD5SSMB-3</td>
</tr>
<tr>
<td>BB4-PB</td>
<td>Color (NTSC) camera (22X)</td>
<td>Smoked, surface, black</td>
</tr>
<tr>
<td>BB4-PG</td>
<td>Day/Night (NTSC) camera (22X)</td>
<td>Clear, surface, black</td>
</tr>
<tr>
<td>BB4-PG-E</td>
<td>Day/Night (NTSC) camera (35X)</td>
<td>Chrome, surface, black</td>
</tr>
<tr>
<td></td>
<td>Removable, fixed mount bracket only (camera and lens not included)</td>
<td>Gold, surface, black</td>
</tr>
<tr>
<td></td>
<td>Interchangeable with all Spectra IV dome drives.</td>
<td>Smoked, surface, white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear, surface, white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrome, surface, white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gold, surface, white</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoked, in-ceiling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear, in-ceiling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrome, in-ceiling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gold, in-ceiling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoked, pendant, black</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clear, pendant, black</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrome, pendant, black</td>
</tr>
</tbody>
</table>

**Notes:**

- To order a fixed mount dome system refer to the component models above and select one each of the following: back box (BB4-F), dome drive (DD5-FM), plus choice of lower dome (LD5F-0, LD5F-1, LD5F-2 or LD5F-3).
- For environmental applications, you must order an environmental back box (BB4-F-E) or (BB4-PG-E).
- DD5-FM is ideal for use with Pelco's C10DN-6, C10DN-6X, C10CH-6, C10CH-6X, CCC1390H-6, and CCC1390H-6X cameras with selected Pelco lenses.

---

*For PAL and CCIR models add “-X” suffix to part number. (Example: SD435-SMW-0-X)

†Environmental dome systems include a heater, fan, and the environmental pendant also includes a sun shield.

§Use the pendant lower domes with the environmental in-ceiling and environmental pendant back boxes.

§Not recommended for outdoor use due to possible light reflections.

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Spectra® Mini Dome System

INDOOR, MINIATURE, SURFACE MOUNT/IN-CEILING

Product Features

- Familiar Spectra® Camera Menu Structure
- Single Model for Surface Mount and In-Ceiling Applications
- Autofocus, High Resolution Integrated Color Camera/Optics Package
- 80X Zoom (10X Optical, 8X Digital)
- Zone Blanking
- 64 Presets
- 0.5° Preset Accuracy
- 140°/second Pan Speed
- Rotating Discreet Liner
- 1 Pattern
- 1 Dynamic Window Blanking Area
- Proportional Pan and Tilt
- Programmable Zoom Speeds
- Multilingual Support
- Integral, Autosensing, Multiprotocol Receiver
- Auto Flip Dome Rotation
- Integrated UTP Circuit
- Quick Connect Cable for Power, Video (Coaxial or UTP), and Data
- Available with Smoked or Clear Dome

The Spectra® Mini incorporates many well-known features from Pelco’s full-size Spectra dome system into a cost effective, small form factor. The easy-to-install dome system can be mounted to the surface of ceilings or recessed into hard ceilings and suspended tile ceilings. A high resolution camera transmits video over coaxial cable or unshielded twisted pair (UTP) wires. When paired with active UTP receivers, Spectra Mini is capable of transmitting high quality video across distances of up to 4,000 ft (1,219 m). Pan/tilt operation can be performed with Pelco’s controllers that transmit Pelco D, Pelco P, or Coaxitron® protocols. For non-Pelco controllers, a translator board can be installed. On-screen programming allows easy setup of the miniature dome’s many features.

Variable speed capabilities of the Spectra Mini range from a fast pan motion of 140 degrees per second to a smooth “creep” speed of 0.4 degrees per second. The system is capable of continuous 360 degrees rotation and has an auto flip feature. This feature allows the dome to rotate 180 degrees and reposition itself for uninterrupted viewing of any subject that passes directly beneath the dome’s location.

Optional diagnostic/installation tools include a remote monitor kit (IPS-RMK) and a remote monitor cable (IPS-CABLE), both of which require an adapter cable (IPS-MINIADPT). The IPS-MINIADPT cable is supplied with the IPS-RMK. These accessories allow the installer to view video, control PTZ, and perform system setup and software upgrades at the installation site. The IPS-RMK is a stand-alone kit consisting of a 5.6-inch TFT-LCD monitor, Palm™ OS-compatible handheld device and interface cable, carrying case, and the remote monitor cable.
Product Features

- 64 Presets: 53 User Definable and 11 Predefined
- ±0.5° Preset Accuracy
- Multilingual Menus (English, Spanish, Portuguese, Italian, French, and German)
- Alternate Language Files (includes Russian, Polish, Turkish, and Czechoslovakian) Available as Optional Software Upload
- Data Port for Software Update and Setup
- On-Screen Compass, Tilt, and Zoom Display
- Password Protection
- 140°/sec Pan Preset Speed and 80°/sec Tilt Preset Speed
- Rotating Discreet Liner
- 4 Zones (programmable in size) Can Be Labeled with up to 20 Characters Each or Set to Output Blank Video
- Programmable Locations of Labels and On-Screen Displays
- 1 on-screen, user-defined programmable pattern. Includes pan, tilt, zoom, and preset functions
- 1 Programmable Window Blanking Area
- Proportional Pan and Tilt: Continually decreases pan and tilt speeds in proportion to depth of zoom
- Variable Scan Speed: Scan speed can be 3, 6, or 12°/sec
- Pan Motion Allows 0.4-140°/sec Pan Speed
- Programmable Limit Stops for Auto/Random/Frame Scan Modes
- Autosensing Protocol (Coaxitron, RS-422 Pelco P and Pelco D); Accepts Competitive Control Protocols with Optional TXB Translator Boards
- Digital Position, Zoom Control, and Feedback Through Pelco D Protocol
- Built-in Menu System for Setup of Programmable Functions
- Auto Flip Rotates Dome 180° at Bottom of Tilt Travel
- Programmable Zoom Speeds

GENERAL

Construction
- Top Cap: Anodized cast aluminum
- Dome Drive: ABS plastic
- Trim Ring and Surface Mount Ring: ABS plastic
- Bubble: Acrylic
- Finish: White or black
- Light Attenuation: f/0.5 light loss, Zero light loss
- Cable Entry: RJ45-10 pigtail connector for video (UTP), power, and data (supplied)
- BNC connector for video (coaxial)
- Environment: Indoor
- Operating Temperature: 32° to 122°F (0° to 50°C)
- Unit Weight: 1.75 lb (0.79 kg)
- Shipping Weight: 4 lb (1.81 kg)

MECHANICAL

Pan Movement
- 360° continuous pan rotation
- Proportional Pan and Tilt: Continually decreases pan and tilt speeds in proportion to depth of zoom
- Variable Scan Speed: Scan speed can be 3, 6, or 12°/sec
- Pan Motion Allows 0.4-140°/sec Pan Speed
- Programmable Limit Stops for Auto/Random/Frame Scan Modes
- Autosensing Protocol (Coaxitron, RS-422 Pelco P and Pelco D); Accepts Competitive Control Protocols with Optional TXB Translator Boards
- Digital Position, Zoom Control, and Feedback Through Pelco D Protocol
- Built-in Menu System for Setup of Programmable Functions
- Auto Flip Rotates Dome 180° at Bottom of Tilt Travel
- Programmable Zoom Speeds

ELECTRICAL

Input Voltage: 18-30 VAC, 24 VAC nominal
Input Power: 21 VA nominal
Fuse: 1.6 A

WITH TXB TRANSLATOR BOARD

5.05
(12.83)
5.05
(12.83)
5.13
(13.03)
5.27
(13.39)
0.425
(10.80)
0.619
(15.72)

WITHOUT TXB TRANSLATOR BOARD

5.05
(12.83)
5.05
(12.83)
5.13
(13.03)
5.27
(13.39)
0.425
(10.80)
0.619
(15.72)

Note: Values in parentheses are centimeters; all others are inches.
### TECHNICAL SPECIFICATIONS

#### CAMERA
- **Signal Format**: NTSC/PAL
- **Scanning System**: 2:1 interlace
- **Image Sensor**: 1/4-inch interline CCD
- **Effective Pixels**
  - NTSC: 768 (H) x 494 (V)
  - PAL: 752 (H) x 582 (V)
- **Horizontal Resolution**
  - NTSC: >470 TV lines
  - PAL: >460 TV lines
- **Minimum Illumination**: 3.0 lux
- **Sync System**: AC line lock, phase adjustable using remote control, V-Sync
- **White Balance**: Automatic with manual override
- **Shutter Speed**: Automatic (electronic iris)/manual 1/60 ~ 1/30,000
- **Gain Control**: Automatic with manual override
- **Video Output**
  - Composite: 1.0 to 1.2 Vp-p, 75 ohms, adjustable
  - UTP: 1.0 to 1.2 Vp-p, 100 ohms, adjustable
- **Video Signal-to-Noise Ratio**: >50 dB

#### OPTIONAL MOUNTS
- **SPM4-W**: Pendant mount, white
- **SPM4-B**: Pendant mount, black
- **SWM4-W**: Pendant-wall mount, white
- **SWM4-B**: Pendant-wall mount, black

#### LENS
- **Lens**: f/1.8 (f= 4.2~42 mm optical) 10X optical zoom, 8X digital zoom
- **Zoom Speed (optical range)**: 1.5/2.5/4.3 seconds
- **Horizontal Angle of View**: 46.4° wide zoom; 5.0° telephoto zoom
- **Focus**: Automatic with manual override
- **Iris Control**: Automatic with manual override

#### CERTIFICATIONS
- CE, Class B
- FCC, Class B
- UL/cUL Listed
At the time of this printing, all other certifications are pending. Please consult the factory, our website www.pelco.com, or the most recent B.O.S.S.® update for the current status of certifications.

#### SPECTRA MINI DOME SHOWN WITH OPTIONAL SPM4-W PENDANT MOUNT

<table>
<thead>
<tr>
<th>SPM4-W/SPM4-B</th>
<th>SWM4-W/SWM4-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting Method</td>
<td>Install adapter plate on wall or junction box using appropriate hardware; attach wall mount to adapter plate; attach Spectra Mini dome with hardware supplied with mount</td>
</tr>
<tr>
<td>Construction</td>
<td>ABS plastic, aluminum</td>
</tr>
<tr>
<td>Finish</td>
<td>White, Black</td>
</tr>
<tr>
<td>Unit Weight</td>
<td>0.30 lb (0.14 kg), 0.72 lb (0.33 kg)</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td>2 lb (0.91 kg)</td>
</tr>
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## MODELS AND RELATED PRODUCTS

### MODELS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD4-B0</td>
<td>Indoor dome system, black, smoked bubble, NTSC</td>
</tr>
<tr>
<td>SD4-B1</td>
<td>Indoor dome system, black, clear bubble, NTSC</td>
</tr>
<tr>
<td>SD4-B0-X</td>
<td>Indoor dome system, black, smoked bubble, PAL</td>
</tr>
<tr>
<td>SD4-B1-X</td>
<td>Indoor dome system, black, clear bubble, PAL</td>
</tr>
<tr>
<td>SD4-W0</td>
<td>Indoor dome system, white, smoked bubble, NTSC</td>
</tr>
<tr>
<td>SD4-W1</td>
<td>Indoor dome system, white, clear bubble, NTSC</td>
</tr>
<tr>
<td>SD4-W0-X</td>
<td>Indoor dome system, white, smoked bubble, PAL</td>
</tr>
<tr>
<td>SD4-W1-X</td>
<td>Indoor dome system, white, clear bubble, PAL</td>
</tr>
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</table>

### OPTIONAL ACCESSORIES

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPS-RMK</td>
<td>Remote monitor kit. Stand-alone kit consisting of a 5.6-inch TFT-LCD monitor, Palm OS-compatible handheld, cables and carrying case. Allows viewing of camera video, local PTZ control, system setup, and system software upgrades at any installed dome. Includes IPS-MINIADPT adapter cable.</td>
</tr>
<tr>
<td>IPS-CABLE</td>
<td>Remote monitor cable and software kit consisting of the Spectra remote monitor interface cable and necessary software for use with a PC (Windows® 95, 98, Me, 2000), Palm OS-compatible handheld or iPaq™ Series Pocket PC. Refer to <a href="http://www.pelco.com">www.pelco.com</a> for a list of compatible devices.</td>
</tr>
<tr>
<td>IPS-MINIADPT</td>
<td>Adapter cable required to use IPS-RMK and IPS-CABLE. Supplied with IPS-RMK.</td>
</tr>
<tr>
<td>TXB Series</td>
<td>Translator boards for AD Manchester, Hernis, Bosch® (Philips, Burle), Sensormatic®, TASS, and Vicon™ protocols.</td>
</tr>
</tbody>
</table>

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Camclosure® IS Series Rugged Mini Dome

IS150 SERIES IN-CEILING, WDR, DAY/NIGHT, HIGH RESOLUTION

Product Features

- Fully-Integrated Enclosure with Camera and Lens
- Rugged, High-Impact, Vandal-Resistant, Puncture-Proof Domes; Tamper-Resistant Hardware
- 4 Camera Options:
  - Day/Night Wide Dynamic Range (WDR): Pixel-Based Imager for Accurate Color Representation, Progressive Scan
  - Day/Night High Resolution: 540 TVL
  - Wide Dynamic Range (WDR): Pixel-Based Imager for Accurate Color Representation, Progressive Scan
  - High Resolution Color: 540 TVL
- Varifocal Lens Options: 3.0~9.5 mm, 9.0~22.0 mm
- Includes Both Composite and Unshielded Twisted Pair (UTP) Outputs
- Easy to Install; Camera Module Easy to Adjust and Remove
- Meets NEMA Type 4X and IP66 Standards
- All Cameras Feature Digital Signal Processing
- 12 VDC or 24 VAC Operation, Autosensing
- Available with Smoked or Clear Bubble
- Includes Service Connector for Video Output

Camera Modules

The IS150 Series Camclosure® Integrated Camera System offers a large selection of camera and lens options. Available camera modules include:

- **Day/night wide dynamic range (WDR) and wide dynamic range:** Pelco’s WDR uses a pixel-based imager that adjusts for lighting by pixel. Traditional CCD cameras adjust the entire image for lighting conditions that appear in a small portion of the image or lighting conditions that are not extreme. Different lighting problems occur at night; car headlights and parking lot lights are good examples of problematic video images. Use Pelco’s Day/Night WDR where you need the camera to adjust from extreme lighting to low light conditions.

- **Day/night high resolution (540 TVL)** color camera with auto iris, varifocal lens: Application examples include environments that require monochrome images at night and color images during the day.

- **High resolution (540 TVL)** color camera with auto iris, varifocal lens: Application examples include all general-purpose environments.

Enclosure Module

The IS150 Series Camclosure Integrated Camera System combines a camera and lens package into a small, high-security enclosure for medium-security installations subject to vandalism. The in-ceiling dome is designed for suspended ceiling or recessed ceiling/wall installations. An adapter plate is supplied with the dome to mount the unit to a 4S electrical box or to provide additional support for suspended ceiling installations.

The lower dome of the IS150 Series is available with either a clear or a smoked bubble. Models with a clear bubble include a liner for discreet viewing. Domes may be purchased without the camera module for pre-installation or for camera bicycling.
TECHNICAL SPECIFICATIONS

GENERAL
Construction: Aluminum with steel camera mounting bracket and polycarbonate dome
Finish: White polyester powder coat trim ring with charcoal gray back box
Light Attenuation:
- Smoked: f/1.5 light loss
- Clear: Zero light loss
Unit Weight: 1.70 lb (0.77 kg)
Shipping Weight: 3.0 lb (1.36 kg)

ELECTRICAL
Input Voltage*: 12 VDC or 24 VAC (+10%), autosensing
Synchronization: Internal or AC line lock
Power Consumption:
- Camera: <3 W (DW/CW models)
- <4 W (DN/CH models)
- Heaters: 10 W when active; thermostatically controlled

MECHANICAL
Pan/Tilt Adjustment: Manual
Pan: 360°
Tilt: 80° (20° to 100° range)
Rotation: 360°

VIDEO
Signal System: NTSC or PAL
Video Output:
- Composite: 1 Vp-p, 75 ohms
- UTP: 1 Vp-p, 100 ohms
Video Connectors:
- Composite BNC and 1 UTP
Service Connector: 3-conductor, 2.5 mm connector for video output to optional IS-SC cable

ENVIRONMENTAL
Environment: Low temperature, indoor/outdoor
Operating Temperature:
- -50° to 122°F (-46° to 50°C);
- de-ices to 25°F (-4°C)
Thermostat Operation: Heater is thermostatically controlled to activate ON at 50°F (10°C) and OFF at 80°F (27°C)

CERTIFICATIONS/RATINGS/PATENTS
- CE, Class B
- FCC, Class B
- UL/cUL Listed
- C-Tick
- GOST
- Meets NEMA Type 4X and IP66 safety standards
- Meets NEC requirements for use in environmental air handling spaces
- IEC 60068-2-27 Shock Certified
- IEC 60068-2-30 Humidity Certified
- IEC 60068-2-6 Vibration Certified
- ISTA Shipping Standard
- U.S. Patents D476,025; 6,715,939 B2; 6,805,498 B2

NOTE: VALUES IN PARENTHESES ARE CENTIMETERS; ALL OTHERS ARE INCHES.

*24 VAC power is recommended when installing any Camclosure Integrated Camera System under fluorescent lighting conditions.
### TECHNICAL SPECIFICATIONS

#### CAMERA SPECIFICATIONS

<table>
<thead>
<tr>
<th>Visión del Día</th>
<th>Visión de Noche</th>
<th>Visión de Noche</th>
<th>Visión de Noche</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focal Length</td>
<td>1/3-inch pixel-based imager</td>
<td>1/3-inch pixel-based imager</td>
<td>1/3-inch pixel-based imager</td>
</tr>
<tr>
<td>Imagen</td>
<td>640 x 480</td>
<td>720 x 576</td>
<td>720 x 576</td>
</tr>
<tr>
<td>Distancia de foco</td>
<td>3.0~9.5 mm</td>
<td>3.0~9.5 mm</td>
<td>3.0~9.5 mm</td>
</tr>
<tr>
<td>Peso</td>
<td>1.0~1.7</td>
<td>1.0~1.7</td>
<td>1.0~1.7</td>
</tr>
<tr>
<td>Ancho de campo</td>
<td>100.4°</td>
<td>100.4°</td>
<td>100.4°</td>
</tr>
<tr>
<td>Diagonal</td>
<td>131.6°</td>
<td>131.6°</td>
<td>131.6°</td>
</tr>
<tr>
<td>Vertical</td>
<td>72.8°</td>
<td>72.8°</td>
<td>72.8°</td>
</tr>
</tbody>
</table>

#### LENS SPECIFICATIONS

<table>
<thead>
<tr>
<th>Serie</th>
<th>Varifocal con Auto Iris</th>
<th>Varifocal con Auto Iris</th>
<th>Varifocal con Auto Iris</th>
<th>Varifocal con Auto Iris</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitud Focal</td>
<td>3.0~9.5 mm</td>
<td>9.0~22.0 mm</td>
<td>3.0~9.5 mm</td>
<td>9.0~22.0 mm</td>
</tr>
<tr>
<td>Formato</td>
<td>1/3-inch</td>
<td>1/3-inch</td>
<td>1/3-inch</td>
<td>1/3-inch</td>
</tr>
<tr>
<td>Número de F</td>
<td>1.0~1.7</td>
<td>1.5~3.0</td>
<td>1.0~1.7</td>
<td>1.5~3.0</td>
</tr>
<tr>
<td>Movimiento de Iris</td>
<td>Auto</td>
<td>Auto</td>
<td>Auto</td>
<td>Auto</td>
</tr>
<tr>
<td>Óptica</td>
<td>Auto</td>
<td>Auto</td>
<td>Auto</td>
<td>Auto</td>
</tr>
<tr>
<td>Ángulo de visión</td>
<td>100.4° a 31.6°</td>
<td>32.4° a 13.6°</td>
<td>95.0° a 30.2°</td>
<td>30.6° a 13.0°</td>
</tr>
<tr>
<td>Diagonal</td>
<td>131.6° a 39.6°</td>
<td>41.4° a 17.2°</td>
<td>123.6° a 37.6°</td>
<td>39.2° a 16.4°</td>
</tr>
<tr>
<td>Vertical</td>
<td>72.8° a 23.8°</td>
<td>23.8° a 10.2°</td>
<td>69.0° a 22.6°</td>
<td>22.6° a 9.8°</td>
</tr>
</tbody>
</table>

*Focal length specifications presume a 10% horizontal and 4% vertical monitor overscan.*
MODEL NUMBERS

Dome Only
IS150-ENC IS150 Series in-ceiling mount enclosure (no camera/lens)
IS150-LD IS150 Series smoked bubble
IS151-LD IS150 Series clear bubble with liner

When ordering an IS150 Series in-ceiling mount dome with no camera or lens, please order 1 enclosure and 1 bubble.

System Numbers

Use this table to create a model number to specify your IS150 Series Camclosure. Note the additional information in the table below for NTSC/PAL options.

For example, IS151-DNV9X is the model number for a PAL version color day/night high resolution camera with a clear bubble and a 3.0~9.5 mm varifocal lens.

For information, contact your Pelco sales representative.

<table>
<thead>
<tr>
<th>Bubble (a)</th>
<th>Camera (b)</th>
<th>Lens (c)</th>
<th>PAL (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Smoked</td>
<td>DW Color Day/Night Wide Dynamic Range</td>
<td>V9 Varifocal, 3.0~9.5 mm, Auto Iris</td>
<td>DN and CH cameras only: X PAL</td>
</tr>
<tr>
<td>1 Clear with Black Liner</td>
<td>DN Color Day/Night High Resolution</td>
<td>V22 Varifocal, 9.0~22.0 mm, Auto Iris</td>
<td>Do not use for NTSC</td>
</tr>
<tr>
<td></td>
<td>CW Color Wide Dynamic Range</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CH Color High Resolution</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RECOMMENDED POWER SUPPLIES

TF2000 Power supply for one 24 VAC camera, 20 VA
MCS Series Multiple 24 VAC camera power supply, indoor
MCS*E Series Multiple 24 VAC camera power supply, indoor
WCS Series Single/multiple 24 VAC camera power supply, outdoor

OPTIONAL ACCESSORIES

ICS150-P 2 x 2 ft (61 x 61 cm) metal ceiling panel for IS150 Series in-ceiling dome
IS-SC 4-foot service/monitor cable; compatible with any standard monitor BNC connector
Camclosure® IS Series Rugged Mini Dome
IS110 SERIES SURFACE MOUNT, WDR, DAY/NIGHT, HIGH RESOLUTION

Product Features

- Fully-Integrated Enclosure with Camera and Lens
- Rugged, High-Impact, Vandal-Resistant, Puncture-Proof Domes; Tamper-Resistant Hardware
- 4 Camera Options:
  - Day/Night Wide Dynamic Range (WDR): Pixel-Based Imager for Accurate Color Representation, Progressive Scan
  - Day/Night High Resolution: 540 TVL
  - Wide Dynamic Range (WDR): Pixel-Based Imager for Accurate Color Representation, Progressive Scan
  - High Resolution Color: 540 TVL
- Varifocal Lens Options: 3.0~9.5 mm, 9.0~22.0 mm
- Includes Both Composite and Unshielded Twisted Pair (UTP) Outputs
- 12 VDC or 24 VAC Operation, Autosensing
- Available with Smoked or Clear Bubble
- Service Connector for Video Output

Camera Modules

The IS110 Series Camclosure® Integrated Camera System offers a large selection of camera and lens options. Available camera modules include:

- Day/night wide dynamic range (WDR) and wide dynamic range: Pelco’s WDR uses a pixel-based imager that adjusts for lighting by pixel. Traditional CCD cameras adjust the entire image for lighting conditions that appear in a small portion of the image or lighting conditions that are not extreme. Different lighting problems occur at night; car headlights and parking lot lights are good examples of problematic video images. Use Pelco’s Day/Night WDR where you need the camera to adjust from extreme lighting to low light conditions.

- Day/night high resolution (540 TVL) color camera with auto iris, varifocal lens: Application examples include environments that require monochrome images at night and color images during the day.

- High resolution (540 TVL) color camera with auto iris, varifocal lens: Application examples include all general-purpose environments.

Enclosure Module

The IS110 Series Camclosure Integrated Camera System combines an environmental cover, back box, camera, lens, and lower dome into a small, high-security system that is quick and easy to install. The system is perfect for a variety of indoor and outdoor applications and its versatile design allows for multiple mounting options.

The IS110 Series can be installed directly into a ceiling or wall, or to a 1.5-inch (3.81 mm) NPT fitting with the optional pendant mount adapter (ICS110-PG). The unit can also mount directly to a 4S electrical box using the optional adapter plate (ICS110-AP) or a standard plaster ring.

The system’s back box has three conduit openings: two in the base, and a threaded 0.75-inch (1.91 cm) opening in the side. The environmental cover can be used to hide and protect the side conduit opening if it is not used.
TECHNICAL SPECIFICATIONS

GENERAL
Construction: Aluminum with steel camera mounting bracket and polycarbonate dome
Finish: Light gray polyester powder coat
Light Attenuation:
- Smoked: f/1.5 light loss
- Clear: Zero light loss
Unit Weight: 2.20 lb (1.00 kg)
Shipping Weight: 4.0 lb (1.81 kg)

ELECTRICAL
Input Voltage*: 12 VDC or 24 VAC (±10%), autosensing
Synchronization:
- Internal or AC line lock
Power Consumption:
- Camera: <3 W (DW/CW models)< 4 W (DN/CH models)
- Heaters: 10 W when active; thermostatically controlled

MECHANICAL
Cable Entry: One 0.75-inch (1.91 cm) NPT threaded opening on side; two 0.75-inch (1.91 cm) openings on base
Pan/Tilt Adjustment:
- Pan: 360°
- Tilt: 80° (20° to 100° range)
- Rotation: 360°

VIDEO
Signal System: NTSC or PAL
Video Output:
- Composite: 1 Vp-p, 75 ohms
- UTP: 1 Vp-p, 100 ohms
Video Connectors: 1 composite BNC and 1 UTP
Service Connector: 3-conductor, 2.5 mm connector for video output to optional IS-SC cable

ENVIRONMENTAL
Environment: Low temperature, indoor/outdoor
Operating Temperature: -50° to 122°F (-46° to 50°C); de-ices to 25°F (-4°C)
Thermostat Operation: Heater is thermostatically controlled to activate ON at 50°F (10°C) and OFF at 80°F (27°C)

CERTIFICATIONS/RATINGS/PATENTS
- CE, Class B
- FCC, Class B
- UL/cUL Listed
- C-Tick
- GOST
- Meets NEMA Type 4X and IP66 standards
- IEC 60068-2-27 Shock Certified
- IEC 60068-2-30 Humidity Certified
- IEC 60068-2-6 Vibration Certified
- ISTA Shipping Standard
- U.S. Patents D476,025; 6,715,939 B2; 6,805,498 B2

NOTE: VALUES IN PARENTHESES ARE CENTIMETERS; ALL OTHERS ARE INCHES.

*24 VAC power is recommended when installing any Camclosure Integrated Camera System under fluorescent lighting conditions.
## Technical Specifications

### Camera Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>DW Series</th>
<th>CN Series</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imaging Device</strong></td>
<td>1/3-inch pixel based imager</td>
<td>1/3-inch pixel based imager</td>
</tr>
<tr>
<td><strong>Picture Elements</strong></td>
<td>720 (H) x 540 (V)</td>
<td>720 (H) x 540 (V)</td>
</tr>
<tr>
<td><strong>Dynamic Range</strong></td>
<td>120 dB typical</td>
<td>120 dB typical</td>
</tr>
<tr>
<td><strong>Scanning System</strong></td>
<td>2:1 interface/progressive (DIP switch)</td>
<td>2:1 interface/progressive (DIP switch)</td>
</tr>
<tr>
<td><strong>Horizontal Resolution</strong></td>
<td>NTSC: 504 TV lines</td>
<td>NTSC: 504 TV lines</td>
</tr>
<tr>
<td><strong>Signal-to-Noise Ratio</strong></td>
<td>&gt;53 dB</td>
<td>&gt;53 dB</td>
</tr>
<tr>
<td><strong>Minimum Illumination</strong></td>
<td>Color (day): 0.8 lux</td>
<td>Color (day): 0.8 lux</td>
</tr>
<tr>
<td><strong>Day/Night Operation</strong></td>
<td>Infrared (IR) cut filter</td>
<td>Infrared (IR) cut filter</td>
</tr>
<tr>
<td><strong>Gain Control</strong></td>
<td>Auto (36 dB maximum)</td>
<td>Auto (36 dB maximum)</td>
</tr>
<tr>
<td><strong>Exposure</strong></td>
<td>Auto (1/15–1/22,000)</td>
<td>Auto (1/15–1/22,000)</td>
</tr>
<tr>
<td><strong>White Balance</strong></td>
<td>Auto or manual (DIP switch), 2800°K–7500°K</td>
<td>Auto or manual (DIP switch), 2500°K–9500°K</td>
</tr>
<tr>
<td><strong>Backlight Compensation</strong></td>
<td>Auto</td>
<td>Auto</td>
</tr>
</tbody>
</table>

### Lens Specifications

<table>
<thead>
<tr>
<th>Series</th>
<th>Varifocal with Auto Iris</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focal Length</strong></td>
<td>DW/CW Series</td>
</tr>
<tr>
<td>3.0–9.5 mm</td>
<td>9.0–22.0 mm</td>
</tr>
<tr>
<td><strong>Format Size</strong></td>
<td>1/3-inch</td>
</tr>
<tr>
<td><strong>F-Number (f)</strong></td>
<td>1.0–1.7</td>
</tr>
<tr>
<td><strong>Operation</strong></td>
<td>Auto</td>
</tr>
<tr>
<td><strong>Iris</strong></td>
<td>Auto</td>
</tr>
<tr>
<td><strong>Angle of View</strong></td>
<td>Horizontal 100.4° to 31.6°</td>
</tr>
<tr>
<td></td>
<td>Diagonal 131.5° to 39.6°</td>
</tr>
<tr>
<td></td>
<td>Vertical 72.8° to 23.8°</td>
</tr>
</tbody>
</table>

*Focal length specifications presume a 10% horizontal and 4% vertical monitor overscan.*
MODEL NUMBERS

Dome Only

IS110-ENC IS110 Series surface mount enclosure (no camera/lens)
IS110-LD IS110 Series smoked bubble
IS111-LD IS110 Series clear bubble with liner

When ordering an IS110 Series surface mount dome with no camera or lens, please order 1 enclosure and 1 bubble.

System Numbers

Use this table to create a model number to specify your IS110 Series Camclosure. Note the additional information in the table below for NTSC/PAL options.

For example, IS111-DNV9X is the model number for a PAL version color day/night high resolution camera with a clear bubble and a 3.0~9.5 mm varifocal lens.

For information, contact your Pelco sales representative.

<table>
<thead>
<tr>
<th>Bubble (a)</th>
<th>Camera (b)</th>
<th>Lens (c)</th>
<th>PAL (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>DW</td>
<td>V9</td>
<td>DN and CH cameras only:</td>
</tr>
<tr>
<td>1</td>
<td>Wide Dynamic Range</td>
<td>Varifocal, 3.0~9.5 mm, Auto Iris</td>
<td>PAL</td>
</tr>
<tr>
<td>Clear with black liner</td>
<td>DN Color Day/Night</td>
<td>V22 Varifocal, 9.0~22.0 mm, Auto Iris</td>
<td>Do not use for NTSC</td>
</tr>
<tr>
<td></td>
<td>High Resolution</td>
<td>CH Color High Resolution</td>
<td></td>
</tr>
</tbody>
</table>

RECOMMENDED POWER SUPPLIES

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF2000</td>
<td>Power supply for one 24 VAC camera, 20 VA</td>
</tr>
<tr>
<td>MCS Series</td>
<td>Multiple 24 VAC camera power supply, indoor</td>
</tr>
<tr>
<td>MCS*E Series</td>
<td>Multiple 24 VAC camera power supply, indoor</td>
</tr>
<tr>
<td>WCS Series</td>
<td>Single/multiple 24 VAC camera power supply, outdoor</td>
</tr>
</tbody>
</table>

OPTIONAL ACCESSORIES

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICS110-AP</td>
<td>Adapter plate for a 4-square electrical box</td>
</tr>
<tr>
<td>ICS110-PG</td>
<td>Pendant mount adapter</td>
</tr>
<tr>
<td>ICS110-BV</td>
<td>Breather vent to prevent condensation from forming inside the unit</td>
</tr>
<tr>
<td>SMW Series</td>
<td>Compact wall mount with cable feedthrough. Requires ICS110-PG adapter.</td>
</tr>
<tr>
<td>IS-SC</td>
<td>4-foot service/monitor cable; compatible with any standard monitor BNC connector</td>
</tr>
</tbody>
</table>
# APC Smart-UPS 1500VA USB & Serial RM 2U 100V Black

**Part Number:**
SUA1500RMJ2UB

## Output

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Power Capacity</td>
<td>980 Watts / 1500 VA</td>
</tr>
<tr>
<td>Max Configurable Power</td>
<td>980 Watts / 1500 VA</td>
</tr>
<tr>
<td>Nominal Output Voltage</td>
<td>100V</td>
</tr>
<tr>
<td>Output Voltage Distortion</td>
<td>Less than 5% at full load</td>
</tr>
<tr>
<td>Output Frequency (sync to mains)</td>
<td>50/60 Hz +/- 3 Hz user adjustable +/- 0.1</td>
</tr>
<tr>
<td>Crest Factor</td>
<td>up to 5 : 1</td>
</tr>
<tr>
<td>Waveform Type</td>
<td>Sine wave</td>
</tr>
<tr>
<td>Output Connections</td>
<td>(6) NEMA 5-15R</td>
</tr>
</tbody>
</table>

## Input

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Input Voltage</td>
<td>100V</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>50/60 Hz +/- 5 Hz (auto sensing)</td>
</tr>
<tr>
<td>Input Connections</td>
<td>NEMA 5-15P</td>
</tr>
<tr>
<td>Cord Length</td>
<td>2.44 meters</td>
</tr>
</tbody>
</table>

## Batteries & Runtime

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Type</td>
<td>Maintenance-free sealed Lead-Acid battery with suspended electrolyte : leakproof</td>
</tr>
<tr>
<td>Typical recharge time</td>
<td>3 hour(s)</td>
</tr>
<tr>
<td>Replacement Battery</td>
<td>RBC24J</td>
</tr>
<tr>
<td>RBC™ Quantity</td>
<td>4</td>
</tr>
</tbody>
</table>
### Typical Backup Time

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>at Half Load</td>
<td>26.5 minutes (490 Watts)</td>
</tr>
<tr>
<td>at Full Load</td>
<td>7.4 minutes (980 Watts)</td>
</tr>
</tbody>
</table>

### Communications & Management

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface Port(s)</td>
<td>DB-9 RS-232, SmartSlot, USB</td>
</tr>
<tr>
<td>Available SmartSlot™ Interface Quantity</td>
<td>1</td>
</tr>
<tr>
<td>Audible Alarm</td>
<td>--</td>
</tr>
<tr>
<td>Emergency Power Off (EPO)</td>
<td>Optional</td>
</tr>
</tbody>
</table>

### Surge Protection and Filtering

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surge energy rating</td>
<td>320 Joules</td>
</tr>
<tr>
<td>Filtering</td>
<td>Full time multi-pole noise filtering: 0.3% IEEE surge let-through: zero clamping response time: meets UL 1449</td>
</tr>
</tbody>
</table>

### Physical

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Height</td>
<td>87.00 mm</td>
</tr>
<tr>
<td>Maximum Width</td>
<td>483.00 mm</td>
</tr>
<tr>
<td>Maximum Depth</td>
<td>464.00 mm</td>
</tr>
<tr>
<td>Rack Height</td>
<td>2U</td>
</tr>
<tr>
<td>Net Weight</td>
<td>25.00 KG</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td>28.60 KG</td>
</tr>
<tr>
<td>Shipping Height</td>
<td>249.00 mm</td>
</tr>
<tr>
<td>Shipping Width</td>
<td>597.00 mm</td>
</tr>
<tr>
<td>Shipping Depth</td>
<td>610.00 mm</td>
</tr>
<tr>
<td>Color</td>
<td>Black</td>
</tr>
<tr>
<td>Units per Pallet</td>
<td>16.00</td>
</tr>
</tbody>
</table>

### Environmental

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Environment</td>
<td>0 - 40 °C</td>
</tr>
<tr>
<td>Operating Relative Humidity</td>
<td>0%</td>
</tr>
</tbody>
</table>
Operating Elevation 0-3000 meters
Storage Temperature -15 - 45 °C
Storage Relative Humidity 0%
Storage Elevation 0-15000 meters
Audible noise at 1 meter from 45.00 dBA surface of unit
Online Thermal Dissipation 225.00 BTU/hr

Conformance
Regulatory Approvals UL 1778, VCCI
Standard Warranty 2 years repair or replace
ROHS/WEEE Compliance RoHS 7b Exemption

**The time to recharge to 90% of full battery capacity following a discharge to shutdown using a load rated for 1/2 the full load rating of the UPS.

Copyright © American Power Conversion Corp., all rights reserved
AXIS 241Q/241S Video Servers
Bringing network video benefits to analog surveillance systems.

AXIS 241Q/241S Video Servers enable analog cameras to be integrated into an IP-based video surveillance system, providing users with the benefits of professional network video technology.

AXIS 241Q/241S Video Servers convert analog video signals into high quality, de-interlaced, digital video streams that are sent over an IP network. AXIS 241Q features four analog channels and AXIS 241S features one channel. Both models are available as standalone units or blade versions for rack solutions.

MPEG-4 and Motion JPEG streams can be sent simultaneously from each channel and at full frame rate. This allows users to have different viewing and recording settings that are optimized for image quality and efficient bandwidth/storage use.

AXIS 241Q/241S Video Servers provide powerful event management functions. Events can be triggered for example by video motion detection and external input devices, and responses can include image upload, alarm notifications and activation of external devices such as lights, doors or alarms.

The video servers’ serial ports enable pan/tilt/zoom control of PTZ cameras and PTZ dome cameras over the network.

AXIS 241Q/241S Video Servers offer comprehensive security features such as multiple user access levels, IP address filtering, HTTPS encryption and IEEE 802.1X.
## Technical specifications – AXIS 241Q/241S Video Servers

<table>
<thead>
<tr>
<th>Video encoder</th>
<th></th>
</tr>
</thead>
</table>
| **Models** | AXIS 241Q*: Four video channels  
AXIS 241S*: One video channel  
*Also available as blade versions for Axis Video Rack Solution |
| **Video compression** | MPEG-4 Part 2 (ISO/IEC 14496-2)  
Motion JPEG |
| **Resolution** | 160x120 to 704x576 |
| **Frame rate** |  |
| MPEG-4 | AXIS 241Q: Up to 20/17 (NTSC/PAL) fps at CIF  
AXIS 241S: Up to 30/25 (NTSC/PAL) fps at 2CIF, 21/17 fps at 4CIF |
| Motion JPEG | AXIS 241Q: Up to 30/25 (NTSC/PAL) fps at CIF  
AXIS 241S: Up to 30/25 (NTSC/PAL) fps at 4CIF |
| **Video streaming** | Simultaneous MPEG-4 and Motion JPEG  
Controllable frame rate and bandwidth  
VBR/CBR MPEG-4 |
| **Image settings** | Compression, color, rotation, aspect ratio correction, mirroring  
Text and image overlay  
Privacy mask  
De-interlace filter |
| **Pan/Tilt/Zoom** | Wide range of analog PTZ cameras supported (drivers available for download at www.axis.com)  
20 presets/camera  
Guard tour  
PTZ control queue  
Supports Windows compatible joysticks |
| **Network** |  |
| **Security** | Password protection, IP address filtering, HTTPS encryption, IEEE 802.1X network access control, digest authentication, user access log |
| **Supported protocols** | IPv4/6, HTTP, HTTPS, QoS Layer 3 DiffServ, FTP, SMTP, Bonjour, UPnP, SMBv1/v2/c/v3(MB-2), DNS, DynDNS, NTP, RTSP, RTP, TCP, UDP, IGMP, RTCP, ICMP, DHCP, ARP, SOCKS |
| **System integration** |  |
| **Application** | Open API for software integration, including VAPIX® from Axis Communications available at www.axis.com |
| **Programming Interface** |  |
| **Intelligent video** | Video motion detection, active tampering alarm |
| **Alarm triggers** | Intelligent video, external inputs, video loss |
| **Alarm events** | File upload via FTP, HTTP and email  
Notification via email, HTTP and TCP  
External output activation |
| **Video buffer** | 9 MB pre- and post-alarm per channel |
| **General** |  |
| **Casing** | Metal casing  
Standalone, stackable or with brackets for wall or cage mount |
| **Processors and memory** | AXIS 241Q: ARTPEC-2, 64 MB RAM, 8 MB Flash  
AXIS 241S: ARTPEC-2, 32 MB RAM, 8 MB Flash |
| **Power** | 7 – 20 V DC, max 8 W |
| **Connectors** | Analog composite video NTSC/PAL auto-sensing:  
AXIS 241Q: 4 BNC inputs  
AXIS 241S: 1 BNC input and 1 BNC output: loopthrough or 1/C video input  
RJ-45 10BaseT/100BaseTX  
Terminal block:  
I/O terminal block for four configurable inputs/outputs  
RS-485/ RS-422  
D-sub for RS-232 port |
| **Operating conditions** | 5 – 50 °C (41 – 122 °F)  
Humidity 20 – 80% RH (non-condensing) |
| **Approvals** | EN 55022 Class B, EN 61000-3-2, EN 61000-3-3, EN 55024, FCC Part 15 Subpart B Class B, ICES-003 Class B, VCCI Class B, C-tick AS/NZS CISPR 22, EN 60950  
Power supply: EN 60950-1, UL, cUL |
| **Weight** | 540 g (1.2 lbs) |
| **Included accessories** | Power supply, mounting and connector kits, Installation Guide, CD with installation and management tools, software and User’s Manual, 1 Windows decoder user license |

### Dimensions

<table>
<thead>
<tr>
<th>241Q</th>
<th>241S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video input x4</td>
<td>Video input</td>
</tr>
<tr>
<td>Video output</td>
<td>Video output</td>
</tr>
<tr>
<td>Power supply connector</td>
<td>Network connector</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>136 mm (5.4&quot;)</td>
<td>42 mm (1.7&quot;)</td>
</tr>
<tr>
<td>155 mm (6.1&quot;)</td>
<td>140 mm (5.5&quot;)</td>
</tr>
</tbody>
</table>

### Optional accessories

#### AXIS Rack Solution

AXIS 295

Video Surveillance Joystick

For information on AXIS Camera Station and video management software from Axis’ Application Development Partners, see www.axis.com/products/video/software/