2.01 GENERAL

A. All equipment and materials used shall be standard components that are regularly manufactured and used in the manufacturer's system.

B. All systems and components shall have been thoroughly tested and proven in actual use.

C. All systems and components shall be provided with the availability of a toll-free (U.S. and Canada), 24-hour technical assistance program (TAP) from the manufacturer. The TAP shall allow for immediate technical assistance for either the dealer/installer or the end user at no charge for as long as the product is installed.

D. All systems and components shall be provided with a one-day turnaround repair express and 24-hour parts replacement. The repair and parts express shall be guaranteed by the manufacturer on warranty and nonwarranty items.

2.02 MICROPROCESSOR-BASED, FULL CROSS-POINT VIDEO MATRIX SWITCHING AND CONTROL SYSTEM

A. The microprocessor-based, cross-point video matrix switching and control system shall consist of an external controller/CPU with integral ASCII control Interface, matrix input/output bay(s), control keyboard(s), optional “hot switch” with back-up CPU, optional VCR/DVR management, optional alarm interface unit(s), optional relay interface unit(s), and optional receiver/driver unit(s) together with all software and graphics accessories necessary to comprise a complete operating video switching and control system.

B. The matrix switching and control system shall include a PC programming/manager software package. The manager software shall be wizard-based, providing simple initial setup of the system as well as guided instructions on adding system devices, system operators, macro programming, and network setup. The system manager shall be capable of uploading and downloading of all system files to a 3.5-inch floppy drive making offsite programming capable. It must also be capable of performing live changes to the system without the need to take the system offline through an RS-232 interface. It must also have the ability to log all system user, fault, and automated system conditions such as alarms to provide an audit trail and reports.

C. The controller/CPU shall meet or exceed the following design and performance specifications:

1. The control processor shall be PC based and feature an internal, Intel Pentium® processor.
2. The controller/CPU shall include a VGA monitor output for display of system status of up to eight video monitors. System status shall include monitor number, currently addressed camera title and number, current alarms, and status associated with the current camera, as well as pan/tilt/lens and auxiliary functions status for the current camera being viewed.
3. The controller/CPU shall be provided with an internal 3.5-inch, 1.44 MB floppy disk drive with which to load/save setup information, previously input via the use of a standard PC, to configure and partition the system. Multiple setup configurations shall be possible by simple download to the controller/CPU via the internal 3.5-inch floppy disk drive.

4. The controller/CPU shall be provided with an internal 32 MB disk-on-chip system drive for storage of system setup parameters, operating system, and setup software.

5. The controller/CPU shall also allow configuration setup programming from an optional, AT-compatible PC keyboard.

6. The controller/CPU shall be provided with a VGA graphics card providing separate VGA and NTSC outputs and support screen resolutions of 1024 x 768 with 256 colors.

7. The controller/CPU shall provide for 16 RS-422 I/O ports and shall be expandable to 120 RS-422 ports via plug-in serial communications cards. Expansion of RS-422 ports shall be accomplished through the use of multiple 8X and/or 32X port expansion modules.

8. The controller/CPU shall provide for 2 RS-232 ports, 1 parallel printer port, 1 VGA output port and 2 PC-AT compatible keyboard ports.

9. The controller/CPU shall provide for all communications to external devices such as matrix switching card cages, system keyboards, alarm interface units, pan/tilt devices, logging printers, etc. via standard computer based format such as RS-422, RS-485, or RS-232. Proprietary code formats shall not be acceptable.

10. The controller/CPU shall provide for up to 96 definable users and passwords, keyboard entered, preventing unauthorized use.

11. The controller/CPU shall feature the capability of preprogrammed commonly occurring events via macro programming. Macros shall be able to be manually initiated, to occur on alarm input, or at a specific time of the day.

12. The controller/CPU shall be capable of up to 5,000 macros with each macro capable of up to 130 steps and up to 60 different step options.

13. The controller/CPU shall be equipped with an on-board ASCII translator allowing for direct communication with external equipment. The ASCII translator shall facilitate direct interface with computer-based access control systems, casino data systems, fire, burglar, and PLC systems for the direct transfer of data to activate alarms; select cameras; and activate preset positions, auxiliaries and macros.

14. The controller/CPU shall be capable of interfacing with an optional back-up controller/CPU via interconnect with an optional standby hot switch. The standby hot switch shall be capable of immediately and automatically switching the back-up controller/CPU into the primary position in the event of the failure of the primary controller/CPU. Upon switch over, the standby hot switch shall provide for audible alarm and LED display of alarm diagnostics as well as no disruption to the system.

15. The controller/CPU shall optionally provide for full VCR/DVR management from the system keyboard(s). Full-function monitoring of system VCRs/DVRs from the system CPU shall ensure operational conditions and continuous recording.

16. The controller/CPU shall operate on either 120 VAC or 230 VAC, 50/60 Hz.

17. The controller/CPU shall have an operating temperature range of 32°F to 120°F (0°C to 49°C) noncondensing.

18. The controller/CPU shall be rack mountable in a standard 19" rack.

19. The controller/CPU shall measure 19" W x 7" H x 19.5" D.

20. The controller/CPU shall weigh a maximum of 29.7 lb.
D. The matrix input/output bay(s) shall meet or exceed the following design and performance specifications:

1. The matrix input/output bay(s) shall provide for all video input/output connections to the matrix switching system.
2. The matrix bay shall be capable of accepting optional redundant power supplies. Optional redundant power supplies must share the load of the matrix bay with the main power supply there by reducing its power demand by 50%.
3. The matrix bay shall have a nonpowered convection venting system that allows air to enter the front of the rack, pass through the matrix bay providing module cooling and even heat dissipation. The air is released out of the back of the rack. There shall be one vent rack per matrix bay in the system. The vent rack shall provide for easy mounting of the matrix bay by providing a sturdy mounting platform.
4. The matrix bay(s) shall be modular in design with each bay providing eight high-density slots for input modules and two high-density slots for an output modules enabling expansion from 32 inputs and 16 outputs to 256 inputs and 32 outputs in a single matrix bay.
5. Multiple matrix bays shall provide interconnection, permitting expansion to 2,048 video inputs and 512 video outputs in a single CPU configuration.
6. Multiple nodes shall be capable of network connection and communication providing for peer-to-peer or peer to subordinate communication. Expansion is accomplished by adding matrix bay card cages, video input cards, video output modules, rear panel BNC cards, and additional networked controller/CPUs.
7. Upon initial power up, the matrix bay shall update all modules in the matrix bay to the latest revision available in the bay.
8. When new modules are inserted into the matrix bay, the monitor module will interrogate each camera module to provide for revision control. The monitor module shall flash update the camera module(s) to the revision the matrix bay has currently in operation.
9. All modules shall have a heartbeat LED indicator that allows for a visual indication that the CPU on the module is running.
10. All modules shall have + and – power LED indicators allowing for a visual indication that the module power circuitry is operational.
11. The camera modules shall have a video loss LED indicator allowing for a visual indication if any of the video inputs on the module are not present.
12. The matrix bay(s) shall be capable of monitoring all video inputs for video loss without the need for any additional hardware or software.
13. The matrix bay(s) shall be capable of servicing without the need to disconnect any external cabling.
14. The matrix bay(s) shall be capable of automatically reporting malfunctions to remote alarm monitoring equipment via an internal alarm output port.
15. The matrix bay(s) shall operate on 120 VAC or 230 VAC, 50/60 Hz.
16. The matrix bay(s) shall consume a maximum of 120 watts fully populated.
17. Matrix bay(s) communications to the system CPU shall be via RS-422, full duplex protocol.
18. The matrix bay(s) shall operate in a temperature range of 32°F to 122°F (0°C to 50°C).
19. The matrix bay(s) shall provide for vertical interval switching of properly phased inputs to all video outputs.
20. The system shall accept video input levels from 0.5 to 2.0 volts peak-to-peak, composite video signal, into 75 ohms.
21. The frequency response shall be flat to 8 MHz.
22. Bandwidth is 15 MHz+.
23. Cross talk shall be –60.9 dB to 3.58 Mhz.
24. Signal-to-noise ratio –70.db RMS.
25. Differential gain shall be <0.5% with differential phase <.5°
26. The matrix bay(s) shall measure 19” W x 10.5” H x 21.7” D and weigh a maximum of 60 lb fully populated.

E. The control keyboard(s) shall meet or exceed the following design and performance specifications:

1. The control keyboard shall provide complete control of all system functions.
2. The keyboard shall interface with the controller/CPU via full duplex RS-422 communications protocol.
3. The system shall allow for up to 96 keyboards to be connected to any one controller/CPU.
4. The keyboard(s) shall be ergonomically designed allowing for a maximum degree of flexibility in controlling camera call-up and pan/tilt/dome operation.
5. The keyboard(s) shall provide for control of camera to monitor selection, camera/PTZ functions, alarm monitoring, and the macro programming/operation.
6. The keyboard(s) shall provide a variable speed, vector-solving joystick for pan/tilt and dome control. All lens functions shall be positioned next to the joystick for one-handed operation of PTZ devices. Zoom lens operations via joystick twist control.
7. The keyboard(s) shall provide two internal relays to directly activate local devices such as video printers and VCRs.
8. The keyboard(s) shall provide for easily accessible Icon programming menus to facilitate on-the-fly programming changes.
9. The keyboard(s) shall provide an audible beeper to alert operators of alarm conditions.
10. Each keyboard shall have a specific, unique, user programmable password assigned to prevent unauthorized use.
11. The keyboard(s) shall feature 24 programmable soft keys that may be individually labeled with installation specific titles to provide logical camera selection based on the camera’s field of view rather than camera numbers.
12. The keyboard(s) programmable soft keys shall be backlit and the LCD display shall be adjustable backlit to provide the greatest amount of flexibility in a variety of lighting conditions.
13. The keyboard(s) shall feature 8 multifunction keys to access programming icons, and five specialty keys for such functions as turbo speed, reversing camera sequences, running macros, preset positions, and camera recall.
14. The keyboard(s) shall operate at 12 VDC from a 120 VAC/230 VAC, 50/60 Hz input voltage power supply that is supplied with the keyboard(s).
15. The keyboard(s) shall consume no more than 6 watts and shall operate and communicate at distances of 4,000 ft on 22 gauge, twisted pair shielded cable. The internal relay rating shall be 1 amp.
16. The keyboard(s) shall have an operating temperature range of 14° to 122°F (-10° to 50°C).
17. The keyboard(s) shall be constructed of polyester resin reinforced with fiberglass, measuring 15” W x 3” H x 8” D and shall weigh a maximum of 6 lb.
F. The alarm interface unit shall meet or exceed the following design and performance specifications:

1. The alarm interface unit shall connect directly to the controller/CPU.
2. The alarm interface unit shall be available in two configurations, providing for the monitoring of up to 128 alarm inputs or up to 256 alarm inputs.
3. The alarm input cards shall be directly accessible from the front of the alarm interface unit.
4. The alarm interface unit shall be rack mountable and shall occupy a maximum space of three vertical rack units.
5. The alarm interface unit shall operate on 120 VAC or 230 VAC input power, 50/60 Hz and shall communicate via RS-232 or RS-422 protocol.

G. The relay interface unit shall meet or exceed the following design and performance specifications:

1. The relay interface unit shall provide for up to 32 relay outputs for the operation of external devices.
2. The relay interface unit shall accept TTL inputs from the controller/CPU and shall provide either NO or NC selectable outputs.
3. The relay interface unit shall operate on 120 VAC or 230 VAC input power.
4. The relay interface unit shall occupy a maximum of 1.75" (one vertical rack space).

H. The code distribution unit (CDU) shall meet or exceed the following design and performance specifications:

1. The CDU-T shall provide 16 independent 3-position screw terminal outputs for star type connection to PTZ devices.
2. The CDU-T shall provide drive for PTZ devices for up to 4,000 feet.
3. The CDU-T shall support up to 128 PTZ devices via daisy-chain connection.
4. The CDU-T shall operate on 100-240 VAC or external source of 10-24 VAC/VDC input for remote field installation.
5. The CDU-T shall utilize 2 RJ-45 connectors for connection to system CPU as well as provide for loop to additional CDU.
6. The CDU-T unit shall occupy a maximum of 1.75" (one vertical rack space).

I. The software and graphics accessories shall meet or exceed the following design and performance specifications:

1. A diagnostics output shall allow for the real-time monitoring of all system functions via a VGA monitor.
2. A graphics user interface (GUI) shall be optionally available for the intuitive graphical display and control of site-specific environments, map display and system components.

J. The microprocessor-based, cross-point video matrix switching and control system shall be provided with a manufacturer’s warranty covering repair or replacement of defective parts for a period of two years from the date of shipment from the factory.

K. The microprocessor-based, cross-point video matrix switching and control system shall be the Pelco CM9770 System or approved equal.