2.01 GENERAL

A. All equipment and materials used shall be standard components, regularly manufactured, regularly utilized 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 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.

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

2.02 MICROPROCESSOR-BASED, CROSS-POINT VIDEO MATRIX SWITCHING SYSTEM

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

B. 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 \textsuperscript{®} processor.

2. The controller/CPU shall include an output for the display of system diagnostics. The output shall display diagnostic and graphical information to a VGA monitor. System status/diagnostics of up to eight video monitors shall be displayed. System status/diagnostics 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. All diagnostic displays shall be in clear, well defined graphic format with text. Interpretation of diagnostic status through the use of signaling LED shall not be accepted.
3. The controller/CPU shall be provided with an internal 3.5 inch, 1.44 MB floppy disk drive with which to load setup information, previously input via the use of a standard PC, to configure and partition the system. This is to allow programming of the system to be accomplished off site and is to minimize disruption to the operation of the overall CCTV system. In addition, the system shall be capable of being programmed on-site through the use of a direct PC input to the systems central processing unit. Multiple set-up configurations shall be possible by simple download to the controller/CPU via the internal 3.5 inch floppy disk drive or live via direct PC interface.

4. The controller/CPU shall be provided with an internal flash memory for storage of system parameters, operating system, and set-up software. Multiple program configurations shall be able to be loaded directly on the flash memory for direct reconfiguration of the system based on operational requirements.

5. The controller/CPU shall also allow configuration set-up programming from a PS2 compatible PC, keyboard which shall be included with the system.

6. The controller/CPU shall be equipped with a VGA graphics card capable of supporting VGA screen resolutions of 1024 X 768 with 256 colors. The controller/CPU shall provide for 16 RS-422 I/O ports. This is to ensure system compliance for expansion of input devices from external interfaces such as access control system, fire/burglar alarm systems, programmable logic controllers (PLC) and operator keyboards.

7. The controller/CPU shall provide for 2 RS-232 ports, 1 parallel printer port, 1 VGA output port and 1 PS2 compatible keyboard ports.

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

9. The controller/CPU shall provide for up to 200 individual, user defined passwords, preventing unauthorized use. Each operators password shall enable or deny access to camera viewing and control and shall allow priority level operation for overriding lower priority operators.

10. The controller/CPU shall feature the capability of pre-programmed commonly occurring events via Macro programming. Macros shall be able to be manually initiated or may be programmed to occur on alarm input, or at a specific time of the day.

11. The controller/CPU shall be capable of up to 2000 macros with each macro capable of up to 130 steps and up to 52 different step options.

12. The controller/CPU shall be capable of interfacing with an optional ASCII translator allowing for direct communication with external equipment. The optional ASCII translator shall facilitate direct interface with computer based access control systems, fire, burglar and PLC systems for the direct transfer of data to activate alarms, select cameras, activate pre-set positions, auxiliaries and macros.
13. 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.

14. The hot switch shall be capable of switching control to a standby CPU under the following user selectable fault conditions: catastrophic failure of primary CPU; communication ceases from the primary CPU; memory fault in primary CPU; fault on COM1/COM2 of primary CPU; fault on any user selectable communication ports in primary CPU when user of MGR programming software/PC logs off. In addition, alarms may be generated as a result of the hot switch status. Alarms are user selectable to occur under the following conditions: Failure of primary CPU; if errors occur with the controlling of primary CPU; if errors occur in controlling secondary CPU; if manual change-over is initiated; if user of MGR programming software/PC logs off; communication port errors. All hot switch change-over will activate an audible alarm and relay output.

15. The controller/CPU shall optionally provide for full VCR management or control capabilities from the system keyboard unit(s). Full function control and monitoring of system VCR’s from the system keyboard(s) shall ensure operational conditions and continuous recording.

16. The controller/CPU shall be capable of accepting VCR commands from the matrix switching keyboard and outputting these commands to a VCR control device for connection to individual VCRs thus facilitating control over the following VCR functions: Play, Record, Fast Forward, Rewind, Pause, Stop and Eject. A minimum of three (3) makes/models of VCRs shall be supported by the system to eliminate reliance on a single manufacturers VCR.

17. The controller/CPU shall be capable of accepting multiplexer commands from the matrix switching keyboard and outputting these commands directly to video multiplexers thus facilitating control over the following multiplexer functions: Full Screen, Picture-in-Picture, Quad (2X2), Nano (3X3), Hex (4X4), Live or Recorded images/displays. A minimum of three (3) makes/models of multiplexers shall be supported by the system thus eliminating reliance on a single manufacturers multiplexer.

18. VCR and Multiplexer control from the matrix switching system keyboard shall be intuitive in operation with the use of simple icon displays for the facilitation of the above stated functions.

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

20. The controller/CPU shall have an operating temperature range of 14° to 122° Fahrenheit (-10° to 50° Centigrade).

21. The controller/CPU shall be rack mountable in a standard 19” rack.

22. The controller/CPU shall measure 19” W x 5.25” H x 14.25” D.

23. The controller/CPU shall weigh a maximum of 13.6 lbs.

24. The controller/CPU shall be capable of interfacing to an optional Network Interface Unit. The network interface unit shall provide facilities for satellite networking of up to 24 remote system/CPUs to a main monitoring location/CPU.

25. Networking multiple CPUs shall provide the capability of switching video from remote systems to local operators monitors.
26. Remotely selected networked cameras shall be switched automatically to the first available video tie line for routing back to the requested operators monitor display. Selection and deselecting individual video paths for camera viewing shall not be acceptable.

C. 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(s) shall be modular in design with each bay providing sixteen high density slots for input and one (1) high density slot for an output module enabling expansion from 16 inputs and 4 outputs to 256 inputs and 16 outputs in a single matrix bay.
3. Two matrix bays shall be capable of connecting to the systems CPU to provide a total of 256 video inputs and 32 video outputs in a single CPU configuration.
4. The matrix bay(s) shall be capable of monitoring all video inputs for video loss without the need for any additional hardware or software.
5. The matrix bay(s) shall be capable of servicing without the need to disconnect any external cabling.
6. Video input and/or output modules shall be capable of being inserted into the video matrix bay without having to power down the matrix bay allowing expansion and/or troubleshooting to occur without the loss of viewing capabilities on all cameras connected to the matrix bay.
7. The matrix bay(s) shall be capable of being provided with an optional back-up power supply ensuring continuous operation in the event of a primary power supply failure.
8. The matrix bay(s) shall be capable of automatically reporting malfunctions to remote alarm monitoring equipment via an internal alarm output port.
9. The matrix bay(s) shall operate on 120VAC or 230VAC, 50/60 HZ.
10. The matrix bay(s) shall consume a maximum of 50 watts.
11. Matrix bay(s) communications to the system CPU shall be via RS-422, Full Duplex protocol.
12. The matrix bay(s) shall operate in a temperature range of 14° to 122° Fahrenheit (-10° to 50° Centigrade).
13. The matrix bay(s) shall provide for vertical interval switching of properly phased inputs to all video outputs.
14. The system shall accept video input levels from 0.5 to 2.0 volts peak to peak, composite video signal, into 75 ohms.
15. The frequency response shall be +/- 1 dB at 7 Mhz; +/- 3 dB at 10 Mhz.
17. Hum noise shall be -60 dB ref 1 volt peak to peak.
18. Differential gain shall be < 0.3% with differential phase < 1° and tilt vertical holding < 1%.
19. The matrix bay(s) shall measure 19” W x 10.5” H x 20” D and weigh a maximum of 52.9 lbs.
D. 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 8 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. In addition, zoom control shall be provided on the keyboard joystick with the use of high quality potentiometers.
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 user shall have a specific, unique, user programmable password assigned to prevent unauthorized use.
11. The keyboard(s) shall feature 24 programmable soft keys which 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. These programmable keys may also be labeled with location titles of remote networked matrix systems to further simplify networked switching and control operation.
12. The keyboard(s) programmable soft keys shall be back-lit and the LCD display shall be adjustably back-lit to provide the greatest amount of flexibility in a variety of lighting conditions.
13. The keyboard(s) shall feature 8 multi-function 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/system programming shall provide for alternate camera view selection. Up to ten (10) alternate cameras may be assigned to each camera in the system allowing fast and simple tracking of subjects moving throughout the surveillance coverage area(s).
15. The keyboard(s) shall operate at 12VDC from a 120VAC/230VAC, 50/60 HZ input voltage power supply which is supplied with the keyboard(s).
16. 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.
17. The keyboard(s) shall have an operating temperature range of 14° to 122° Fahrenheit (-10° to 50° Centigrade).
18. 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 lbs.
E. 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 provide for the monitoring of up to 64 contact closure alarm inputs.
3. The alarm interface unit shall be rack mountable and shall occupy a maximum space of 1.75" (one vertical rack space).
4. The alarm interface unit shall operate on 120VAC or 230VAC input power, 50/60 Hz and shall communicate via RS-232 or RS-422 protocol.

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

1. The relay interface unit shall provide for up to 64 single-pole, single-throw (spst) 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 120VAC or 230VAC input power.
4. The relay interface unit shall occupy a maximum of 1.75" (one vertical rack space).

G. The receiver/driver unit(s) shall meet or exceed the following design and performance specifications:

1. The receiver/driver unit(s) shall interface directly with the controller/CPU via RS-232 or RS-422 communication protocol.
2. The receiver/driver unit(s) shall be either indoor or indoor/outdoor version and shall provide for a minimum of 80 preset positions per receiver/driver.
3. The receiver/driver unit(s) shall be provided with LED indicators for power and data transmission and a seven segment display for diagnostic purposes.
4. The receiver/driver unit(s) shall be NEMA 4 rated.
5. The input voltage shall be switch selectable 24VAC, 120VAC or 230VAC.
6. The pan/tilt voltage shall be switch selectable 24VAC, 120VAC or 230VAC.
7. The camera voltage shall be switch selectable 24VAC, 120VAC or 230VAC.
8. The lens output voltage shall be 6 to 10VDC; 25 mA @ 10VDC and 100 mA @ 9VDC.
9. The receiver/driver unit(s) shall consume a maximum of 80 vA.
10. The control input shall be RS-422 compatible @ 1200, 2400, 4800 or baud.
11. Receiver/driver address and baud rate shall be DIP switch selectable.
12. The receiver/driver unit(s) shall provide for one NO alarm input standard and eight additional NO alarm inputs optionally.
13. The receiver/driver unit(s) shall provide for one relay alarm output standard and eight additional relay alarm outputs optionally.
14. The receiver/driver unit(s) shall feature both random scan and frame scan modes of automatic pan/tilt movement.

H. 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.
I. 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.

J. The microprocessor based, cross point video matrix switching and control system shall be the Pelco CM9740 System or approved equal.