



# CM9770 Series Matrix

## MICROPROCESSOR-BASED SWITCHER/CONTROLLER, 2,048 INPUTS, 512 OUTPUTS

### Product Features

- Microprocessor-Based, Full Cross-Point Video Matrix
- High-Density Architecture Supports up to 256 Cameras and 32 Monitors in Each Bay
- Control up to 2,048 Cameras and 512 Monitors in a Single Node
- Virtually Unlimited Expansion Using Networked Nodes (up to 24 Nodes)
- Sixteen RS-422 COM Ports (Expandable to 120) and Two RS-232 Full-Duplex Ports Available on the CPU
- System Diagnostic LEDs Displayed on Front Panel
- Flash Technology Eases System Maintenance and Upgrades
- Logical Camera Selection and Priority Level Operation
- Multiplexer and VCR Control Via Keyboard
- Built-in Video Loss Detection
- Userfriendly Windows®-Based System Management Software (Windows 98, NT® 4.0, 2000, XP)
- Factory Tested PrePackaged Systems
- ASCII Data Input to Interface Access Control and Other External Computer-Based Systems
- Powerful Macro Programming
- Remote Viewing and Control over TCP/IP Networks Using PelcoNet™
- Interface to DX9000 Series Digital Video Recorder (DVR)



The **9770 System** is a full-featured video matrix switching control system that allows users to view and control up to 2,048 cameras and 512 monitors on a single node. Expanded monitor capacity in the matrix bay allows implementation of larger systems with a smaller footprint (less hardware) than other matrix systems.

The base configuration for the **9770 System** is made up of a central processing unit (CC1), matrix switching bay(s) (MXBs) with video input/output modules, and keyboard controllers (KBDs). Optional components can be added to enhance system capabilities.

Preconfigured, prepackaged systems make installation fast and simple. The **9770 System** features a new, user-friendly Windows-based management system, which allows for easy system programming and maintenance.

Powerful macro operation allows activation of commonly occurring events, either manually or automatically, based on time of day, day of week, day of year, and alarms. Macros may call system-wide sequences (tours); activate preset positions and auxiliaries on properly equipped cameras; automate VCR control; and activate external relays to turn lights on, lock doors, and control other auxiliary functions (additional equipment may be required).

The **9770 System** also includes built-in video loss detection and system diagnostic features, indicated by LEDs on the front panel of the matrix bay. Flash technology incorporated into the system design allows for easier system maintenance and upgrades.

Optional DVR/VCR management allows DVRs and VCRs to be controlled directly from the system keyboards. Suitable DVRs and VCRs can be monitored for operational conditions ensuring continuous recording. Integration with the DX9000 Series digital video recorder allows the **9770 System** to monitor and respond to the recorder's video motion detection capabilities.

### Optional Accessories

- "Hot Switch" and Backup CPU Ensure Uninterrupted Operation
- Redundant Power Supplies for Switching Bays
- Coaxitron® Translator Allows PTZ Communication Over Standard Coaxial Cable
- Responds to 5,000 Alarms
- Network Interface Unit Allows Multiple Systems to Share Video and Control
- Graphical User Interface (VMX200, VMX300) for Simplified Control from External PC
- DVR Management

*All CM9770 Series systems require installation by a Pelco Certified Dealer/Installer. This specification sheet may be used for purpose of information only and does not constitute approval or certification of receiving party. Proof of certification must be provided prior to shipment of CM9770 Systems contained herein.*



**DataFAX**  
**SPEC:** 21555  
**MANUAL:** Not Available through DataFAX

C1555 / REVISED 4-04



International Organization  
 for Standardization;  
 Registered ISO 9001



# SYSTEM COMPONENTS/TECHNICAL SPECIFICATIONS



## CENTRAL PROCESSING UNIT (CC1)

The central processing unit communicates with external devices and accepts commands from external computers, keyboards, graphical user interfaces (GUIs), access control systems, casino data systems, programmable logic controllers (PLCs), and lighting and intercom systems. An internal graphics accelerator card is included for displaying system diagnostics and for programming. RS-422 COM ports are provided for communication with external devices such as matrix switching bays, pan/tilt or dome receivers, and keyboards.

### ELECTRICAL

Input Voltage	120V, 60 Hz or 230V, 50 Hz, autoranging
Power Consumption	57 watts
Diagnostic Monitor	
Output	One VGA, one RCA (composite video, NTSC, or PAL), one S-Video
I/O Ports	Sixteen RS-422 (expandable to 32); total system capability is 120 ports.* Two RS-232 ports One parallel printer port One VGA output port Two TV Out ports Two PC-AT compatible keyboard ports

### GENERAL

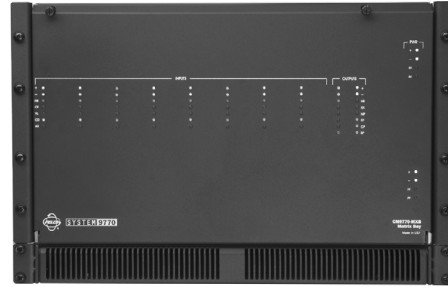
Operating Temperature	32° to 120°F (0° to 49°C)
Dimensions	7.0" H x 19.0" W x 19.5" D (17.78 x 48.26 x 49.53 cm)
Mounting	Fits 19-inch EIA-standard rack (4 RUs)
Unit Weight	29.7 lb (13.5 kg)
Shipping Weight	43 lb (19.5 kg)

### CERTIFICATIONS

- CE, Class B
- UL Listed
- UL Listed to Canadian safety standards
- FCC, Class B

\* The CM9700-CC1 is equipped with 16 RS-422 COM ports; total capacity can be expanded to 32 ports by adding two CM9700-SER serial communication cards (8 ports each).

Total system capability can be expanded to 120 RS-422 COM ports by adding three CM9700/9770-SER-32 port expansion units (32 ports each) to the CC1.



## MATRIX SWITCHING BAY

Each bay includes a power supply and mounting baffle and will support modules for up to 256 camera inputs and 32 monitor outputs. Multiple bays can be used to expand a single CPU system to a maximum of 2,048 camera inputs and 512 monitor outputs. An optional backup power supply module (MPS) can be installed in each bay to provide redundancy.

### ELECTRICAL

Input Voltage	100-240V, 50/60 Hz, autoranging
Power Consumption	60 watts maximum (fully populated)
Communication	Full duplex RS-422 using an RJ-45 connector

### VIDEO

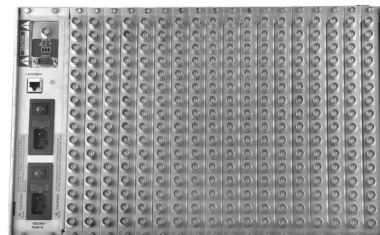
Inputs	Card slots support up to 256 inputs per bay
Outputs	Two output card slots for supporting 32 outputs per bay
Video Input Level	0.5 to 2 Vp-p, RS-170 composite video
Impedance	75 ohms terminating (looping versions available)
Crosstalk-Adjacent Channel	-61 dB at 3.58 MHz
V-Synch	External connector available on rear panel
Overall Frequency Response	Flat to 8 MHz
Differential Gain	0.51%
Differential Phase	0.38 degrees
Luminance Nonlinearity	.20%
Signal to Noise Ratio	-71 dBrms

### GENERAL

Operating Temperature	32° to 122°F (0° to 50°C), non-condensing
Dimensions	
Matrix Bay	10.5" H x 19.0" W x 21.7" D (26.67 x 48.26 x 55.10 cm)
Mounting Baffle	1.75" H x 19.00" W x 24.00" D (4.45 x 48.26 x 60.96 cm)
Mounting	Fits 19-inch EIA-standard rack (matrix bay: 6 RUs; mounting baffle: 1RU)
Unit Weight	33 lb (14.99 kg)
	52 lb (23.59 kg), fully populated
Shipping Weight	44 lb (19.96 kg)
	62 lb (28.12 kg), fully populated

### CERTIFICATIONS

- CE, Class A
- UL Listed
- UL Listed to Canadian safety standards
- FCC, Class A



CM9770-MXB REAR PANEL

# SYSTEM COMPONENTS AND ACCESSORIES

## MODELS

### CONTROLLER

CM9700-CC1	CPU controller. Operates on 120V, 60 Hz or 230V, 50 Hz. (4 RUs)
CM9700-SER	Serial communication card (RS-422 SERCOM) provides eight communications ports to interface peripheral equipment (4 maximum per CPU.)
CM9700-CC1-VID	CPU VGA card; includes outputs for composite, S-Video, and VGA display of system diagnostics and programming.
CM9700-SER-32/ CM9760-SER-32	Port expansion unit; 32 serial communication (SERCOM) ports per unit. Up to three units can be added to a CC1. (Check with Pelco Systems Applications Department before adding to an existing CM9700-CC1). Includes interconnecting cables and adapters for DB9 and RJ45 connectors. Data interface can be RS-232 or RS-422. (4 RUs)

### MATRIX BAY

CM9770-MXB	Video matrix bay equipped with CM9770-MPS power supply. 100-240V, 50/60 Hz, autoranging (6 RUs).
CM9770-MPS	Matrix bay power supply (spare). 120V, 60 Hz or 230V, 50 Hz.
CM9770-DFC	Downframe card and cable assembly; connects multiple matrix bays for expansion purposes.
CM9770-VCC	Video camera card capable of accepting up to 32 camera inputs. Also requires a rear panel card (CM9770-DFC, CM9770-RPC).
CM9770-RPC	Rear panel video card; provides 32 BNC connectors used to connect camera inputs to matrix bay.
CM9770-VMC	Video monitor card providing 16 monitor outputs; requires CM9770-RPM.
CM9770-RPM	Rear panel monitor card; provides 16 BNCs to connect monitor outputs to matrix bay; also interfaces video output signals from video output card.

## OPTIONAL COMPONENTS

The following components are compatible with the 9770 System:

### KEYBOARDS

#### CM9760 Keyboard Controller

The CM9760 keyboard controller allows the user to control the system. Desktop (KBD) and rack-mount (KBR) models are available. The keyboard includes a variable speed, vector-solving joystick with zoom control knob for pan/tilt/zoom (PTZ) and dome control. From the keyboard, the user can control GPI-activated devices, receivers, camera/monitor switching, and multiplexer screen functions, and create single/dual patterns, zones, zone labels, presets and preset recalls. The user can also arm and disarm alarms as well as implement stand-alone, direct mode operation. Twenty-four programmable soft keys can be individually labeled with installation-specific titles allowing logical camera selection based on the camera's field of view rather than camera numbers.

CM9760-KBD	Full-function desktop variable-speed keyboard. 120V, 60 Hz.
CM9760-KBD-X	Same as CM9760-KBD except 230V, 50 Hz.
CM9760-KBR	Full-function 19-inch EIA rack mount keyboard (4 RUs). 120V, 60 Hz.
CM9760-KBR-X	Same as CM9760-KBR except 230V, 50 Hz.

#### KBD200A Keyboard Controller

The KBD200A provides control of camera/monitor switching; reset, pattern, and sequence operation; local and receiver auxiliary operation; and multiplexer screen functions. The KBD200A also provides push-button control of PTZ functions. (A KBDKIT is required for power.)

KBD200A	Desktop keyboard with full switching capabilities, plus push-button control of PTZ functions. 12V or $\pm 12$ VDC. (Requires KBDKIT for power.)
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#### KBD300A Keyboard Controller

The KBD300A provides control of camera/monitor switching; preset, pattern, and sequence operation; local and receiver auxiliary operation; and multiplexer screen functions. The KBD300A also provides joystick control of PTZ functions. (A KBDKIT is required for power.)

KBD300A	Desktop keyboard with full switching capabilities, plus joystick control of PTZ functions. 12V or $\pm 12$ VDC. (Requires KBDKIT for power.)
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### NETWORK INTERFACE UNIT

The CM9700-NW1 Network Interface Unit allows multiple systems to share video and control.

CM9700-NW1	Network interface unit; network CPU and software necessary for joining two or more independent systems together. (4 RUs)
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# SYSTEM COMPONENTS AND ACCESSORIES

## MISCELLANEOUS

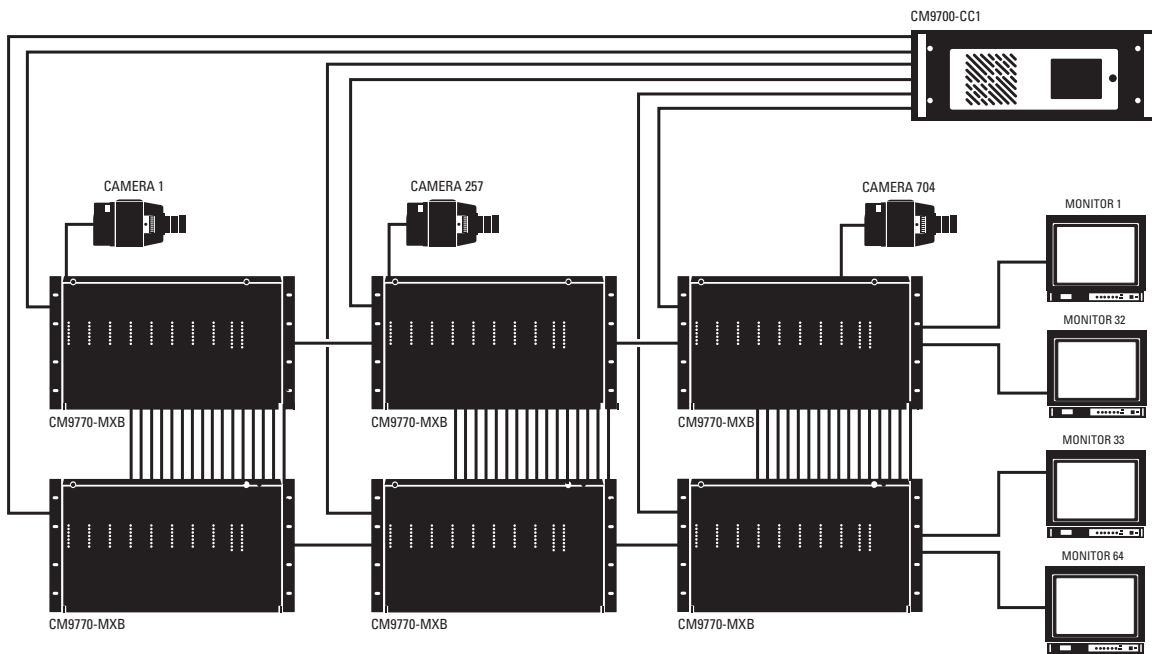
CM9760-ALM	Alarm interface unit; connects directly to each system; each unit can monitor up to 64 alarms and up to four units can be connected in a series from one SERCOM port. (1 RU)
CM9760-CDU-T	Code distribution unit; 16-channel RS-422 transmit only (two data wires and ground) distributor. Primarily used for wiring up to 16 pan/tilt/zoom receivers in a "star" configuration. (1 RU)
CM9760-CXTA	Coaxitron® translator; generates Coaxitron signals for Pelco Coaxitron receivers; each translator supports up to 16 receivers. (1 RU)
CM9760-DMR	Data merger and port expander unit; this unit allows multiple CM9700-CC1 units to control multiple pan/tilt/zoom cameras and allows multiple keyboards to communicate through one CC1 port. (1 RU)
CM9760-DMR-X VMX200 and VMX300 Series	Same as CM9760-DMR except 230V, 50 Hz.
CM9760-HS	Video management systems; graphical map/icon-based user interface for mouse-driven operator control from external PC.
CM9760-MDA	Hot switch interface unit; changeover unit that monitors the status of a primary CC1 in a 9770 system. (three components, 1 RU each)
CM9760-MDA	Master distribution amplifier; inserts master time and date from the CM9700-CC1 and a programmable title of up to 24 characters on one to sixteen video signals. (3 RUs)
CM9760-MDA-X	Same as CM9760-MDA except 230V, 50 Hz.

CM9760-REL	Relay interface unit; connects directly to each system and provides dry contact switching for direct or automatic control of peripheral equipment; each unit provides up to 64 SPST contact outputs. (1 RU)
CM9760-SAT	Sixteen-input satellite video matrix switcher; allows the user to distribute switching capability around a facility, reducing the number of coaxial cable runs to the 9760 and allowing local monitoring at the satellite switch locations. (2 RUs)
CM6800E-48X8	Forty-eight-input satellite video matrix switcher; same functionality as CM9760-SAT except supports up to 48 inputs, or up to 96 inputs in a 96x16 configuration. (3 RUs)
Genex Multiplexers	Genex® Series MX4009 (9-channel) and MX4016 (16-channel) multiplexers. (1 RU)
CM9760-VCRC	CM9760-VCRC Series VCR Controller; VCR control unit capable of controlling 64 VCRs. (1 RU)

## COMPATIBLE RECEIVERS

Spectra® Series	Spectra dome multiple protocol receiver.
ERD97P21-U	Pelco P protocol receiver.
LRD41C21-1/-2/-3	Legacy®, fixed speed receiver with presets.
LRD41C22-1/-2/-3	Same as LRD41C21 Series except variable speed receiver.
Esprit®	Integrated pan/tilt positioning receiver.
Coaxitron	Coaxitron translator allows Coaxitron control of PTZ cameras.

RU = Rack Unit. One RU is equivalent to 1.75 inches (4.45 cm) of vertical space. Identifies number of rack units required to mount component in a 19-inch EIA Standard rack mount.



**Pelco Worldwide Headquarters:**  
3500 Pelco Way, Clovis, California 93612-5699 USA  
**USA & Canada** Tel: (800) 289-9100 • FAX (800) 289-9150 • DataFAX (800) 289-9108  
**International** Tel: (559) 292-1981 • FAX (559) 348-1120 • DataFAX (559) 292-0435  
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