



PRODUCT SPECIFICATION

CM9740™ Series Matrix

MICROPROCESSOR-BASED SWITCHER/CONTROLLER, 256 X 32



Product Features

- Full Cross-point Video Matrix; Controls Up to 256 Cameras to 32 Monitors
- Logical Camera Selection
- Priority Level Operation
- Built-in Video Loss Detection
- Built-in System Diagnostics
- Factory Tested Pre-Packaged Systems
- Windows® Based System Management Software
- Step-Command Macro Programming
- High Speed Flash Memory for Fast System Start-up
- Pre-configured Matrix Bays Simplify System Design

The **System 9740™** full featured video matrix switching control system is for use in medium sized CCTV installations. The system is designed to allow operators the ability to view and control a maximum of 256 cameras to 32 video monitors. A single matrix bay can be configured for up to 256 non-looping video inputs and 16 monitors (standard models) or 128 looping video inputs and 16 monitors ('S' models). A dual bay system can be configured for up to 256 non-looping inputs and 32 monitors (standard models) or 256 looping video inputs and 32 monitors ('L' models).

Pre-configured, pre-packaged systems make installation fast and simple. Each system is provided with Windows® based software for overall system programming.

Powerful macro operation allows manual or automatic activation of events that commonly occur, based on time of day, day of week, day of year and alarms. Macros may call system wide sequences (tours), activate pre-positions and auxiliaries on equipped cameras, automate VCR control, and activate external relays to turn on lights, lock doors, etc.

The **System 9740** matrix also includes built-in video loss detection and system diagnostic features. Video loss detection monitors incoming video signals to alert operators of a camera failure. Diagnostic monitor outputs (VGA) are included to assist in set-up, programming and troubleshooting.

Network compatibility allows 9740 matrix systems in remote locations to communicate with a centralized, master System 9760 video matrix switching/control system.

While the **System 9740** matrix uses some components and accessories of the System 9760, it is not possible to expand the 9740 beyond 256 inputs or 32 outputs, or convert it into a 9760.



Optional system accessories provide enhanced capabilities:

- ◆ **Fail-Safe Redundancy** – Optional standby “hot switch” and backup CPU ensure uninterrupted operation. Under normal conditions, both CPUs operate as if each is online. If a primary CPU fails, the “hot switch” places the backup CPU into the primary position and operation is uninterrupted.
- ◆ **Redundant Power Supply** – All System 9740 matrix switching bays are available with optional redundant power supplies. This feature protects against a large number of cameras and/or monitors from being affected by a power supply failure.
- ◆ **Coaxitron® Compatible Interface** – An optional Coaxitron translator allows communication between the System 9740 and Coaxitron receivers for pan/tilt and dome control.
- ◆ **Optional Data Translator** – Allows external equipment such as access control, fire alarm, home automation, burglar alarm, and slot management systems, etc., to communicate with the System 9740 matrix.
- ◆ **VCR and Multiplexer Control** – System is compatible with several makes and models of VCRs and Multiplexers.
- ◆ **Powerful Alarm Processing** – The System 9740 allows alarm information to be transmitted to the system's CPU through an optional alarm interface unit. The interface accepts contact closures from external sensors or from suitably programmed access control, fire, burglar or PLC systems. Multiple alarm response settings may be programmed for system automation.



MODELS



Central Processing Unit (CPU)

The System 9740 uses an external CPU (CM9740-CC1) to control the system's features and for communicating with external devices such as pan & tilt/dome receivers, keyboards, matrix switching bays, alarm interface units, and relay interface units. The system's CPU will accept

commands from suitably programmed external computers, graphical user interfaces (GUIs), access control systems, slot data systems, lighting and intercom systems.

An on-board diagnostic card is included for the display of system diagnostics. Sixteen RS-422 COM ports are provided. COM ports communicate between the CPU and the system's matrix switching bay(s) or pan & tilt/dome receivers, and are also used as inputs from external devices such as system keyboards (CM9760-KBD or CM9760-KBR), external computers, access control systems, etc. Each matrix switching bay, keyboard or external computer requires one RS-422 port. A maximum of sixteen pan & tilt receivers may be directly connected to each RS-422 port. With external code distribution, up to 32 receivers may be connected to each RS-422 port. There are also two RS-232 ports available for inputs from external devices/computers.

ELECTRICAL/MECHANICAL

Input Voltage	120/230 VAC, 50/60 Hz
Disk Drive	1.44 MB
Hard Drive	16 MB disk-on-chip
I/O Ports	16 RS-422; 2 RS-232
Keyboard Ports	2 PS/2 compatible
Monitor Output	VGA (monitor not supplied)

GENERAL

Operating Temperature	14° to 122°F (-10° to 50°C)
Mounting	Fits 19-inch EIA standard rack (3 RUs)
Dimensions	5.25" H x 19.00" W x 14.25" D (13.34 x 48.26 x 36.20 cm)
Weight	13.6 lb (6.17 kg)

CERTIFICATIONS

- ◆ CE, Class B
- ◆ UL, cUL pending
- ◆ FCC, Class B



Matrix Switching Bay

The Matrix Switching Bay (CM9740-MXB) is a card cage with 16 available card slots for video input modules (CM9760-VCC) and one video output module (CM9740-VMC). Each bay is equipped with a power supply and can accommodate up to 256 inputs and 16 outputs or 128 looping video inputs and 16 monitor outputs. Pre-configured matrix bays are available.

VIDEO

Video Input Level	.5 to 2 Vp-p RS-170 composite video
Impedance	75W terminating (Looping versions available; use CM9740-MXBL model)
Crosstalk	-55 dB to 4.43 MHz

ELECTRICAL

Input Voltage	120/230 VAC, 50/60 Hz
Power	90W max. (fully populated)
Communication	RS-422
COMM Connections	RJ-45

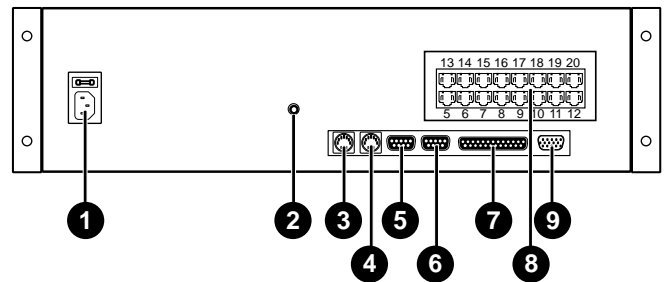
GENERAL

Operating Temperature	14° to 122°F (-10° to 50°C)
Mounting	Fits 19-inch EIA standard rack (6 RUs)
Dimensions	10.50" H x 19.00" W x 20.00" D (26.67 x 48.26 x 50.80 cm)
Weight	52.9 lb (fully populated)

CERTIFICATIONS

- ◆ CE, Class A (CM9740-MXB-X)
- ◆ FCC, Class A (CM9740-MXB, CM9740-MXBL)

CM9740-CC1 (Rear View)



- 1 POWER INPUT**
Auto-ranging 120 VAC, 60 Hz or 230 VAC, 50 Hz
- 2 RESET SWITCH**
- 3 PS/2-COMPATIBLE KEYBOARD PORT**
Connects PS/2-compatible keyboard for use with CM9740-CC1

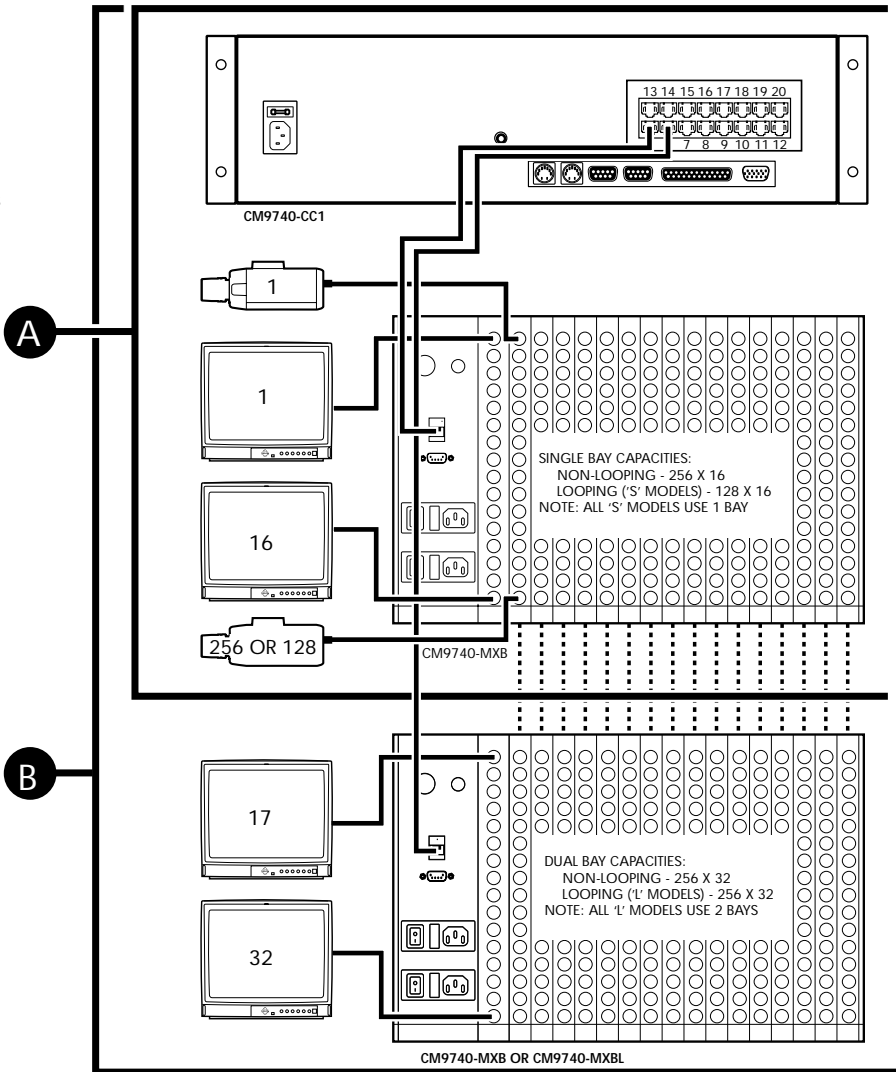
- 4 PS/2 MOUSE PORT**
- 5 COM1 PORT (RS-232)**
Connects external PC; used for updating operating system with CM9760-MGR software program
- 6 COM2 DATA TRANSLATOR PORT (RS-232)**
Connects CM9760-DT ASCII Translator

- 7 PRINTER PORT**
25-pin, D-type connector for printer interface
- 8 COMMUNICATION PORTS (RS-422)**
Connects the following components or accessories, as designated. Ports labeled "Open" are for use with any compatible System 9760 accessory (such as CM9760-VCRC, etc.) not previously defined.

- 5 - Matrix Bay (CM9740-MXB)
- 6 - Open (or additional Matrix Bay)
- 7 - Keyboard port (CM9760-KBD/-KBR)
- 8 - Open
- 9 - Open
- 10 - Open
- 11 - Open
- 12 - Open
- 13 - Cameras 1-32 (PTZ 1-32)
- 14 - Cameras 33-64 (PTZ 33-64)
- 15 - Cameras 65-96 (PTZ 65-96)
- 16 - Cameras 97-128 (PTZ 97-128)
- 17 - Cameras 129-160 (PTZ 129-160)
- 18 - Cameras 161-192 (PTZ 161-192)
- 19 - Cameras 193-224 (PTZ 193-224)
- 20 - Cameras 225-256 (PTZ 225-256)

- 9 VGA PORT**
Connects a VGA/SVGA monitor; displays system diagnostic screen.

SYSTEM APPLICATIONS



- A System 9740 - 256 inputs x 16 outputs, Non-looping**
Maximum configuration shown; requires (1) CM9740-CC1, (1) CM9740-MXB, (16) CM9760-VCC, (16) CM9760-RPC, (1) CM9740-VMC16 and (1) CM9760-RPM.

128 inputs x 16 outputs, Looping ('S' Models)
Requires (1) CM9740-CC1, (1) CM9740-MXB, (8) CM9760-VCC, (8) CM9760-RPL, (1) CM9740-VMC16 and (1) CM9760-RPM.

- B System 9740 - 256 inputs x 32 outputs, Non-looping**
Maximum configuration shown; requires (1) CM9740-CC1, (2) CM9740-MXB, (32) CM9760-VCC, (16) CM9760-RPC, (16) CM9760-DFC, (2) CM9740-VMC16 and (2) CM9760-RPM.

256 inputs x 16 outputs, Looping ('L' Models)
Requires (1) CM9740-CC1, (1) CM9740-MXB, (16) CM9760-VCC, (16) CM9760-RPC, (1) CM9740-VMC16, (1) CM9760-RPM, (1) CM9740-MXBL and (16) CM9760-DFL.

256 inputs x 32 outputs, Looping ('L' Models)
Requires (1) CM9740-CC1, (2) CM9740-MXB, (32) CM9760-VCC, (16) CM9760-RPC, (16) CM9760-DFL, (2) CM9740-VMC16 and (2) CM9760-RPM.

SYSTEM COMPONENTS/SPECIFICATIONS



Keyboard Controller

The keyboard (CM9760-KBD) provides the main user interface to the System 9740. It is ergonomically designed to provide system users with the maximum degree of flexibility in controlling camera call-up and pan & tilt/dome operation. Twenty-four programmable soft keys may be individually labeled with installation specific titles. This allows logical camera selection based on the camera's field of view rather than camera numbers. (For example, a key labeled "Reactor Room" may be programmed to call up a reactor room camera(s) to a selected monitor(s).) There is no need for the operator to remember individual camera numbers associated with viewing areas.

The CM9760-KBD includes a variable speed joystick with zoom control knob for pan/tilt/zoom and dome control. All additional lens control functions are positioned next to the joystick for one-handed operation. Two internal relays are provided to activate local devices such as video printers and VCRs. LCD display keys give system operators fingertip control of powerful programming and operational features. These keys access multiple menus of logically displayed icons for simplistic operation. All programmable soft keys illuminate when relays and auxiliaries are activated. The keyboard utilizes an adjustable back-lit LCD screen to provide the greatest amount of flexibility in a variety of lighting conditions. Also, an adjustable audible beeper is provided to alert operators of all alarm conditions. An optional full-function rack mount version keyboard is also available (CM9760-KBR).

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 invoke stand-alone, direct mode operation.

FUNCTIONAL

Joystick	Vector-solving, variable speed with zoom lens control knob
Display	LCD, backlit icon and alphanumeric
Lens Controls	Rocker switches; (In/Out), (Near/Far) and (Open/Close)
Camera/Monitor Keys	24 programmable "soft keys"; numeric keys (0-9); plus (Cam) and (Mon)
Programming Keys	8 multi-function keys to access programming icons
Specialty Keys	
(T)	"Turbo" activates high speed mode of Intercept® and Spectra® domes
(Bkwd/Fwd)	Initiates backward or forward camera sequencing of next/last camera
(Run/Mac)	Initiates sequencing/calls pre-programmed macros
(Rcl/Alt)	Recalls previously selected cameras in group/calls next camera in group
(Prst/Lock)	Calls pre-position scene/locks currently displayed camera to monitor

ELECTRICAL

Input Voltage	12 VDC from 120 VAC, 60 Hz or 230 VAC, 50 Hz wall transformer (supplied)
Power Consumption	10 watts
Communication	RS-422, full duplex
Operating Distance	4,000 feet (1,219 m) on 24 AWG wire
Internal Relay Rating	1 amp

GENERAL

Operating Temperature	14° to 122°F (-10° to 50°C)
Dimensions (Desk top)	3.30" H x 15.53" W x 7.80" D (8.38 x 39.45 x 19.81 cm)
Weight	4.59 lb (2.08 kg)

CERTIFICATIONS

- ◆ CE, Class A (CM9760-KBD)
- ◆ CE, Class B (CM9760-KBR)
- ◆ FCC, Class A (CM9760-KBD)
- ◆ FCC, Class B (CM9760-KBR)

SYSTEM COMPONENTS/SPECIFICATIONS

A single-number ordering system is used to specify the basic system components for the CM9740. This numbering system includes the controller and all matrix bay components needed for the capacity specified by the model number. (Example: CM9740-96X16 has 96 non-looping inputs and 16 outputs.) Model numbers for the keyboard and other system accessories need to be listed separately on your order. Refer to the latest price list for a complete list of the Matrix System model numbers.

BASIC SYSTEM COMPONENTS

Controller

CM9740-CC1 CPU controller. Operates on 120 VAC, 60 Hz or 230 VAC, 50 Hz. (3 RUs)

Matrix Bay Components

CM9740-MXB Video matrix bay equipped with CM9760-MPS power supply. 120 VAC, 60 Hz. (6 RUs)

CM9740-MXB-X Same as CM9740-MXB except 230 VAC, 50 Hz.

CM9740-MXBL Video matrix bay for use with downframe looping cards (CM9760-DFL). No power required. (6 RUs)

CM9760-MPS Matrix bay power supply (spare). 120 VAC, 60 Hz.

CM9760-MPS-X Matrix bay power supply (spare). 230 VAC, 50 Hz.

CM9760-VCC Video input (camera) card capable of accepting up to 16 camera inputs. Also requires CM9760-RPC.

CM9760-RPC Rear panel (BNC) card provides 16 BNC connectors used to connect camera inputs to matrix bay.

CM9760-DFC Downframe card and cable assembly; connects multiple matrix bays for expansion purposes.

CM9760-DFL Same as CM9760-DFC except has looping inputs.

CM9760-RPL Double wide rear panel card for single bay looping. Maximum number of inputs per bay reduced to 128.

CM9740-VMC4 Video output (monitor) card providing 4 monitor outputs. Requires CM9760-RPM.

CM9740-VMC8 Video output (monitor) card providing 8 monitor outputs. Requires CM9760-RPM.

CM9740-VMC12 Video output (monitor) card providing 12 monitor outputs. Requires CM9760-RPM.

CM9740-VMC16 Video output (monitor) card; provides 16 monitor outputs. Requires CM9760-RPM.

CM9740-VMM Video output module; expands CM9740-VMC4, CM9740-VMC8 or CM9740-VMC12 by 4 outputs.

CM9760-RPM Rear panel (BNC) card; provides 16 BNCs used to connect monitor outputs to matrix bay; also interfaces video output signals from video output card.

Keyboards

CM9760-KBD Full-function desktop variable-speed keyboard. 120 VAC, 60 Hz.

CM9760-KBD-X Same as CM9760-KBD except 230 VAC, 50 Hz.

CM9760-KBR Full-function 19-inch EIA rack mount keyboard (4 RUs). 120 VAC, 60 Hz.

CM9760-KBR-X Same as CM9760-KBR except 230 VAC, 50 Hz.

SYSTEM ACCESSORIES

Alarm Interface

CM9760-ALM Alarm interface unit; provides alarm monitoring capabilities for up to 64 alarm inputs. 100-240 VAC, 50/60 Hz, auto-ranging. (1 RU)

Relay Interface

CM9760-REL Relay interface unit. Provides 64 relays for operating peripheral equipment. 100-240 VAC, 50/60 Hz, auto-ranging. (1 RU)

Switchover Card Cage

CM9760-CCS Switchover card cage for "redundant" CPU units. 120 VAC, 60 Hz. (3 RUs)

CM9760-CCS-X Same as CM9760-CCS except 230 VAC, 50 Hz.

CM9760-CCS-CRD Switchover port cards for CM9760-CCS.

CM9760-CCS-PNL Switchover wiring harness kit (1 per CM9760-CCS required).

VCR Controllers

CM9760P-IRC Infrared VCR controller card cage; controls VCR functions using infrared. (128 VCRs/cage max.) (3 RUs)

CM9760P-IRC-JVC VCR control card for controlling up to 32 JVC brand VCRs.

CM9760P-IRC-MIT VCR control card for controlling up to 32 Mitsubishi brand VCRs.

CM9760P-IRC-PAN VCR control card for controlling up to 32 Panasonic brand VCRs.

CM9760P-IRC-SHP VCR control card for controlling up to 32 Sharp brand VCRs.

CM9760-IRC-TX VCR control cable (1 per VCR required).

CM9760-VCRC VCR controller; controls Sanyo and Sony model VCRs that support resistive ladder remote control and Sony "S-Link" remote control. (64 VCRs per controller.) (1 RU) (See C1491 spec)

CM9760-VCRC-P VCR controller; controls Pelco TLR2096 VCR. (64 VCRs per controller.) (1 RU) (See C1491 spec)

CM9760-VCRC-PTX VCR control cable; 50-foot cable. Use with CM9760-VCRC-P.

CM9760-VCRC-TX VCR control cable; 20-foot control cable (1/8-inch jack to bare leads) for connecting VCR to controller.

CM9760-VCRC-C20 Same as CM9760-VCRC-TX except 20-foot (6.1 m) length

CM9760-VCRC-C50 Same as CM9760-VCRC-TX except 50-foot (15.2 m) length

Master Distribution Amplifier

CM9760-MDA Master distribution amplifier card cage. 16 channels of 1 input by 4 outputs with time, date and title insertion. 120 VAC, 60 Hz. (3 RUs)

CM9760-MDA-X Same as CM9760-MDA except 230 VAC, 50 Hz



MODELS

Miscellaneous

CM9760-CDU-T	Code distribution unit; 16-channel RS-422 transmit only (2-wire and ground) distributor. Primarily used for "star" configuring up to 16 pan/tilt/zoom receiver data runs. (1 RU)
CM9760-CDU-TR	Same as CM9760-CDU-T except transmit and receive version (4-wire and ground) for bi-directional receivers. (1 RU)
CM9760-RDU	Passive two-wire receiver distribution panel (1 input x 16 outputs). RJ-45 input and screw terminal output. Primarily used for "star" configuring up to 16 pan/tilt/zoom receiver data runs. (1 RU) (Can also be used with Pelco CM6700 matrix switcher and Genex® multiplexer.)
CM9760-DT	ASCII translator; translates programmed ASCII messages sent from an access control device or device capable of sending valid ASCII messages. RS-232 output for interface to COM2 data translator port. 120 VAC, 60 Hz. Desktop model; 1.75" H x 5.50" W x 8.8" D.
CM9760-DT-X	Same as CM9760-DT except 230 VAC, 50 Hz.
CM9760-DT4	Same as CM9760-DT except has RS-422 output to interface with any available RS-422 communications port on CC1. 120 VAC, 60 Hz.
CM9760-DT4-X	Same as CM9760-DT4 except 230 VAC, 50 Hz.
CM9760P-PEX	Port expander card cage; each cage can be fitted with up to five port expander cards. (3 RUs)
CM9760P-PEX-CRD	Port expander card; each card expands one COM port into eight RS-422 ports.
CM9760-CXT	Coaxitron® Translator. Controls up to 16 Pelco Coaxitron receivers. Data input RS-422, full duplex. (1 RU)

COMPATIBLE RECEIVERS

Spectra® Series	Spectra Integrated Dome System with multi-protocol receiver (See C1487 and C1498 specs)
Esprit™ Series	Esprit Integrated Positioning System with multi-protocol receiver (See C306 and C307 specs)
ERD97P21-U	CM9760 receiver, for use with 24/120/230 VAC pan and tilt devices; supports up to 80 pre-positions; has one relay output (See C571 spec)
LRD41C21-1/-2/-3	Legacy® fixed speed receiver with up to 64 presets. Available in 120/24/230 VAC. Use with Legacy LWM41 wall mount (See C557 spec)
LRD41C22-1/-2/-3	Same as LRD41C21 Series except variable speed receiver (See C557 spec)

COMPATIBLE MOUNTS

CE9-BK, CE9-GY	Desktop console in black or two-tone gray, 9 RUs. Will accommodate one CM9740-CC1 (3 RUs) and one CM9740-MXB (5 RUs) (See C906 spec)
CE16-BK, CE16-GY	Same as CE9-BK/CE9-GY except 16 RUs
BP1-BK, BP1-GY	Blank panel, black or gray, 1RU
BP2-BK, BP2-GY	Blank panel, black or gray, 2RU

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.

■ Indicates change or addition since last revision.