System 9765

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Description

System 9765 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.

System 9765 has the following basic components:

- CM9700-CC1—This is the system CPU; connect matrix bays, keyboards, PTZ camera control lines, and peripheral devices to the CC1.
- CM9765-MXB—This is the video matrix (switching) bay with video input/output modules; connect cameras, monitors, VCRs, and other video input and output devices to the MXB.
- CM9760-KBD—This is the system keyboard, providing operator control of System 9765.
- CM9700-MGR installed on an external PC—This is the system management software providing an easy method of system setup and configuration.

In addition to the basic components, you can also use peripheral CM9760 equipment in a System 9765, such as KBD300A keyboards (an alternate keyboard for operator control), MDA units, ALM units, REL units, Genex® multiplexers, and Pelco VCRs.

MODELS

Controller and CPU Components

CM9700-CC1	CPU controller; 120 VAC, 60 Hz or 230 VAC, 50 Hz.
CM9700-SER	Serial communication card (RS-422 SERCOM); provides 8 communications ports to interface peripheral equipment (4 maximum per CPU).
CM9700-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 RJ-45 connectors. Data interface can be RS-232 or RS-422.

NOTES ON USING THE SYSTEM CPU:

- You can use CM9760-CC1/CM9760-NW1 CPUs with System 9765 if the CPU has been updated with software version level 9.01.XXX (note that at this software level the first three digits—9.01 in this case—must be at the same version level in the CPU (CC1 and NW1) and in the MGR software; the remaining three digits, such as .001 in version level 9.01.001, can vary).

- Note, however, that software version level 9.01 requires a minimum of 16 MB of RAM in the CPU. If necessary, you can upgrade the RAM in a CM9760-CC1 using the software upgrade kit appropriate for your CPU. Contact Pelco Technical Support at 1-800-289-9100 or 1-559-292-1981 for additional information.

Matrix Bay

CM9765-MXB	Video matrix bay equipped with one CM9700-MPS power supply; 100-240 VAC, 50/60 Hz, autoranging.
CM9700-MPS	Matrix bay power supply (spare); 120 VAC, 60 Hz or 230 VAC, 50Hz.
CM9765-DFC	Downframe card and cable assembly; connects multiple matrix bays for expansion purposes.
CM9765-DFL	Downframe card and cable assembly with BNC connectors for looping video.
CM9765-VCC	Video camera card capable of accepting up to 32 camera inputs; also requires a rear panel card (CM9765-DFC, CM9765-DFL, or CM9765-RPC).
CM9765-RPC	Rear panel video card; provides 32 BNC connectors used to connect camera inputs to matrix bay.
CM9765-VMC	Video monitor card providing 16 monitor outputs; requires CM9765-RPM.
CM9765-RPM	Rear panel monitor card; provides 16 BNCs to connect monitor outputs to matrix bay; also interfaces video output signals from video output card.
CM9700-VPP	Video patch panel; provides 32 BNC connections for looping video out of system.
CM9700-VPP-RK	Optional rack mount designed to hold up to 16 CM9700-VPP patch panels.

Network Interface Unit

CM9700-NW1	Network interface unit; network CPU and software necessary for joining two or more independent systems together.

Keyboards

The following keyboards are compatible with System 9765:

Table A.

Series	Power Cord	Keyboard Model Number
CM9760-KBD: Full-function desktop variable-speed keyboard. 100-240 VAC, 50/60 Hz.	US	CM9760-KBD-US
	UK	CM9760-KBD-UK
	AU	CM9760-KBD-AU
	EU	CM9760-KBD-EU
CM9760-KBR: Full-function 19-inch EIA rack mount keyboard (4 RUs). 100-240 VAC, 50/60 Hz.	US	CM9760-KBR-US
	UK	CM9760-KBR-UK
	EU	CM9760-KBR-EU
	AU	CM9760-KBR-AU

NOTE: CM9760-KBD software version 8.03 or higher is required.

KBD200A   Desktop keyboard with full switching capabilities, plus push-button control of PTZ functions; 12 VAC or ±12 VDC. (Requires KBDKIT for power.)

KBD300A   Desktop keyboard with full switching capabilities, plus joystick control of PTZ functions; 12 VAC or ±12 VDC. (Requires KBDKIT for power.)

Optional Components

CM9760-ALM   Alarm interface unit; connects directly to each system; each unit can monitor up to 64 alarms; up to four units can be connected in a series from one SERCOM port.

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.

CM9760-CXTA   Coaxitron® translator; generates Coaxitron signals for Pelco Coaxitron receivers; each translator supports up to 16 receivers.

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.

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

VMX200 and VMX300 Series   Video management systems; graphical map/icon-based user interface for mouse-driven operator control from external PC.

CM9760-HS   Hot switch interface unit; changeover unit that monitors the status of a primary CC1 in a 9765 system.

CM9760-MDA   Master distribution amplifier; inserts master time and date from the CM9700-CC1 and a programmable title of up to 24 characters on 1 to 16 video signals.

CM9760-MDA-X   Same as CM9760-MDA except 230 VAC, 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.

Genex Multiplexers   Genex Series MX4009 (9-channel) and MX4016 (16-channel) multiplexers.

CM9760-VCRC   CM9760-VCRC Series VCR Controller; VCR control unit capable of controlling 64 VCRs.

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.

Installation

UNPACKING

1. Unpack and inspect all equipment, and verify delivery according to the packing slip.

   Before shipping, Pelco connects, tests, and programs each system according to the individual sales order. Contact Pelco immediately if there is any discrepancy in the equipment that you receive.

CM9700-CC1

The following items are supplied with the CM9700-CC1:

- 1 CM9700-CC1 unit, with front rack ears installed
- 1 120 VAC, 60 Hz power cord (USA standard)
- 1 230 VAC, 50 Hz power cord (European standard)
- 1 Keyboard, PS/2
- 1 PS/2-to-AT keyboard adapter
- 1 RCA-to-BNC adapter
- CM9700 Resource CD (includes the CM9700-MGR software)
- BNC extraction tool
- 4 Rack mount screws, 10-32 x .750-inch, Phillips, pan head with washers

CM9765-MXB

The following items are supplied with the CM9765-MXB:

- 1 CM9765-MXB matrix bay, with front rack ears installed
- 1 CM9765-MXB mounting baffle, with front and rear rack ears installed
- 1 120 VAC, 60 Hz power cord (USA standard)
- 1 230 VAC, 50 Hz power cord (European standard)
- 1 RJ-45 reversed data cable
- 1 Sheet of camera number labels (these can be affixed to the BNC cards to correspond to camera input numbers)
- 16 Screws and washers for mounting the bay

NOTE: The appropriate number of CM9765-VCC cards (camera cards), CM9765-VMC cards (monitor cards), and associated rear panels are added to your system according to your system order.

2. Keep all manuals and cabling with their associated equipment.

3. Locate the following documents:

- System 9765 Port Assignments Sheet. This document contains specific information about your system. All System 9765s are preprogrammed based on your system order.
- System 9765 manual binder.

MOUNTING

Install System 9765 in an EIA-standard 19-inch (48.26 cm) racks.

CM9765-MXB

1. Install the CM9765-MXB mounting baffle first (refer to Figure 1).

   The mounting baffle uses 1 rack unit (RU), and it has front and rear mounting ears, which are attached to the front and rear mounting racks. The rear mounting brackets are adjustable to allow for different depths of cabinets.

NOTE: Be sure to use all eight screws provided with the mounting baffle. The mounting baffle must be installed securely to support the weight of the matrix bay.

   The mounting baffle provides the following functions:

   • The mounting baffle helps to direct the heat from a lower matrix bay (or other equipment) toward the rear of the mounting baffle, instead of allowing the heat to flow up into the matrix bay.

   • The mounting baffle supports the weight of the matrix bay.

   • The matrix bay is easier to install when it is sitting on top of the mounting baffle.
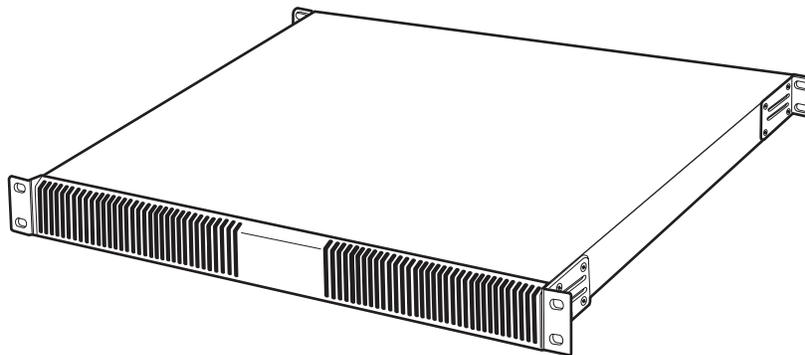
Figure 1. CM9765-MXB Mounting Baffle

2. Install the CM9765-MXB matrix bay on top of the mounting baffle. Refer to Figure 2.

   In a single-bay installation, always leave 1 RU of space above the matrix bay for airflow.

   In a multiple-bay installation you do not need to leave additional RUs open between units. However, you must always leave 1 RU of space above the upper bay.

NOTE: Figure 2 illustrates the recommended mounting method. For an alternate, open-rack mounting method, refer to the *Mounting the CM9765-MXB in an Open Rack* section in the *Appendix.*
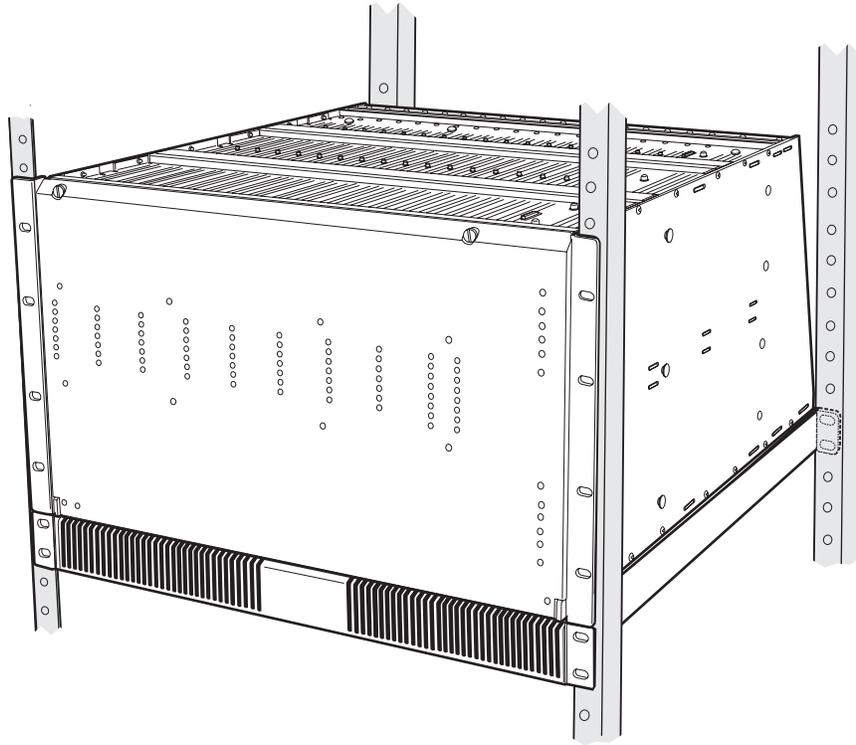
Figure 2. Mounting the CM9765-MXB on Top of the Mounting Baffle

(Optional) Install additional CM9765-MXB mounting trays and matrix bays to the side of and below the first unit, as necessary.

⚠ **WARNING:** Always install equipment starting from the bottom of the rack frame or cabinet. Installing equipment from the top down will make a rack or cabinet top heavy and could cause the equipment to tip over.

NOTE: Each CM9765-MXB has a unique label for identifying the bay location in the installation. This ID information is important in ensuring correct video and data connections.

3. Use the RJ-45 data cables supplied with each CM9765-MXB to connect the MXBs to the CC1. Refer to the *Data Connections* section and the *Port Assignments* insert (supplied with the System 9765 documentation) for directions on which port to use for each MXB connection.

CM9700-CC1

The CC1 must be located near the CM9765-MXB matrix bays. The maximum distance between the CC1 and the matrix bays should be no more than 4,000 feet (1,219 m).

The CC1 occupies 4 RUs or 7 inches (17.18 cm) of vertical space in a universal mount. Allow 1 RU of space above the CC1 for air circulation.

To mount the CM9700-CC1 into a standard 19-inch EIA rack follow these instructions and refer to Figure 3:

1. Insert the CM9700-CC1 into the rack.

2. Tighten the CM9700-CC1 to the rack using the four supplied Phillips screws with washers..

RACK

CM9700-CC1

(4) SCREWS,
10-32 X 0.750-INCH
PHILLIPS, PAN HEAD
WITH WASHERS
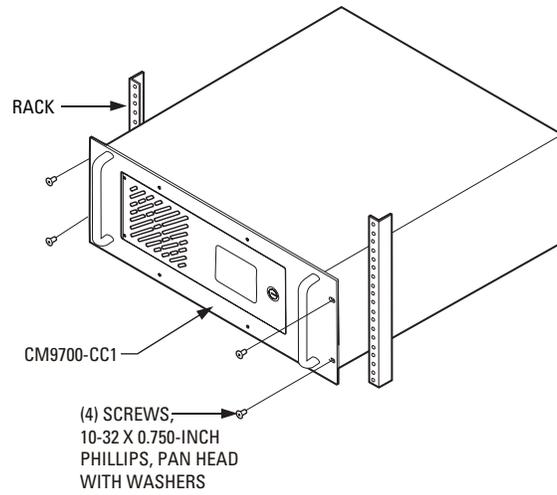
Figure 3. Mounting the CM9700-CC1

VIDEO INPUT/OUTPUT CONNECTIONS

The following steps provide an overview of how to connect video input and output sources. More complete procedures are provided in the subsequent sections.

NOTE: If your System 9765 is configured by Pelco, the appropriate number of video input cards and monitor output cards and BNC rear panels are installed at the factory, and steps 1 and 2 are not necessary. If this is the case, skip to Step 3.

1. Install the CM9765-VCC and CM9765-VMC cards in the matrix bay. Refer to the *Installing Video Input Cards (CM9765-VCC)* section and the *Installing Monitor Output Cards (CM9765-VMC)* section in the following pages.

2. Slide the CM9765-RPC and CM9765-RPM BNC rear panels into the appropriate slots from the back of the matrix bay. Refer to the *Insert or Replace a Rear Panel Video BNC Card (CM9765-RPC)* section and the *Insert or Replace a Rear Panel Monitor BNC Card (CM9765-RPM)* section in the following pages.

3. Before you connect any video input or output to the matrix bay, you may want to power up the unit to ensure that the system is operating properly. Refer to the *Performing a Basic LED Check* section.

4. Connect video inputs and monitor outputs to the rear panel BNC connectors on the CM9765-MXB matrix bay unit(s).

Installation Tips

- Be sure each connection is secure. For best results, use crimp-on BNCs only. Do not use screw-on BNCs; these typically do not provide adequate ground and signal connections.
- Label each video input; this can save a considerable amount of troubleshooting time in the future.
- Video output from the CM9765-VMC cards is not terminated. Terminate the video signal at the output device (monitor or VCR). If you are looping to other devices, unterminate all but the last device.

NOTE: The end point of any video cable run must be terminated in 75 ohms.

Opening the CM9765-MXB Front Cover

To install or remove a video input card, monitor output card, or power supply, you must first open the CM9765-MXB front cover.

1. Loosen the two screws at the top of the CM9765-MXB frame.

2. Pull the front cover towards you. The hinges at the bottom keep the cover attached to the frame.

3. When you are finished working with the interior components, close the cover and tighten the screws at the top of the frame.

NOTE: Although the CM9765-MXB will function properly with the front cover open, the front cover must remain closed during system operation to meet safety standards.

INSTALLING VIDEO INPUT CARDS (CM9765-VCC)

The first video input card is inserted into slot 1; the next card is inserted into slot 2 (refer to Figure 4). To add a video card, slide the card into the first available slot. The CM9765-MXB can contain a maximum of eight video input cards.

HOT SWAPPING: You can "hot swap" a video input card—remove a card and/or insert a new card—while the system is powered and running. When you hot swap a card, the CM9765-MXB automatically verifies system software levels on all cards and then updates software on the new cards if necessary. This process can be as fast as 30 seconds, or can take up to 5 minutes, depending on the number of differing software files; however, the matrix bay continues to function throughout this process. The process is complete when the LEDs marked "HB" on the front panel blink at a one-second rate.

How to Turn On the Pelco V-Sync Signal

The Pelco V-Sync signal, which is sent up the coax cable, provides a synchronization pulse for cameras that can use the Pelco V-Sync signal. This signal eliminates the vertical roll that occurs when multiple cameras are connected to the same switching device. To turn on the Pelco V-Sync signal, move the jumper labeled "VSYNCH" on the CM9765-VCC video input card to the ON position. Refer to the CM9765-VCC Card illustration in the Appendix to see where this jumper is located.

The Pelco V-Sync feature is either "all on" or "all off" (default) for every camera connected to the specific CM9765-VCC card. You cannot turn the feature on or off for individual cameras.

For the Pelco V-Sync feature to work properly, all matrix bays in the system must be connected to the same power circuit (because they must be in the same phase).

DOWNFRAMING NOTE: If you are downframing the video signal to additional bays, you need to turn on the Pelco V-Sync on the final matrix bay only.

Insert or Replace a Video Card

1. Open the front of the matrix bay, insert the video card into the card guides, and slide the card partially into the bay.

2. Hold the latches parallel to the floor until you reach the edge of the bay's frame.

3. Adjust the latches to fit them properly onto the top and bottom edges of the bay's frame.

4. Push the latching levers into the closed position; this seats the video card firmly into place.

Remove a Video Card

1. Unlatch (pull) the levers at the top and bottom portion of the video card.

2. Pull the video card towards you (towards the front of the matrix bay) until it is out of the frame.

NOTE: Do not insert a video input card into slots 9 or 10; Slot 10 is reserved for monitor output cards as shown in the *Monitor Output Cards (CM9765-VMC)* section and Slot 9 is not used.
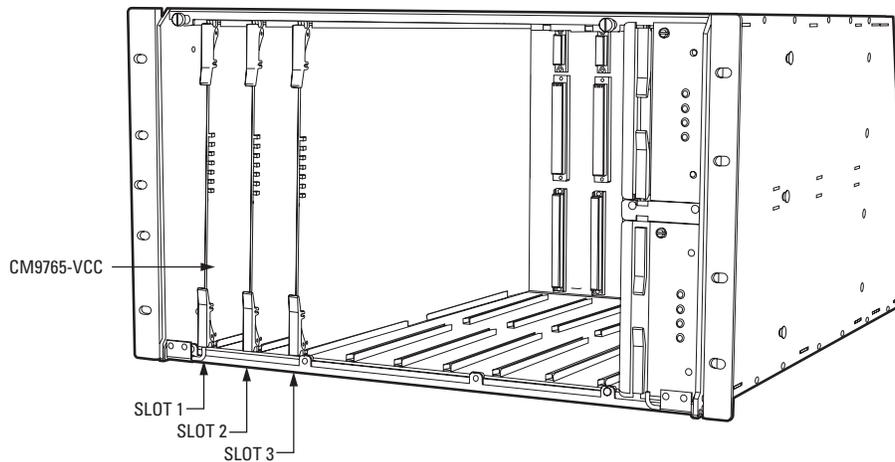
Figure 4. Video Input Card (CM9765-VCC) Locations: Slots 1-8

INSTALLING MONITOR OUTPUT CARDS (CM9765-VMC)

The monitor output card located in slot 10 is the primary card, and it handles video for monitors 1-16. Refer to Figure 5. Note that the CM9765-MXB will not function without a CM9765-VMC card inserted into slot 10.

> **ⓘ** **HOT SWAPPING:** You can "hot swap" a monitor output card—remove a card and/or insert a new card— while the system is powered and running. When you hot swap a card, the CM9765-MXB automatically verifies system software levels on all video input cards in the matrix bay and then updates the software on any cards that do not match the VMC card in the primary VMC slot (slot 10). This process can be as fast as 30 seconds, or can take up to 5 minutes, depending on the number of differing software files; however, the matrix bay continues to function throughout this process. The process is complete when the LEDs marked "HB" on the front panel blink at a one-second rate.

Insert or Replace a Monitor Card

> **⚠** **CAUTION:** When you insert a VMC card into the VMC slot—slot 10—the CM9765-MXB synchronizes software levels on all cards in the matrix bay, based on the software contained on this card. If the new card inserted into the VMC slot contains software at a lower level than the other cards in the matrix bay, you could lose some system settings and functionality.

1. Open the front of the matrix bay, insert the monitor card into the card guides, and slide the card partially into the bay.

2. Hold the latches parallel to the floor until you reach the edge of the bay's frame.

3. Adjust the latches to fit them properly onto the top and bottom edges of the bay's frame.

4. Push the latching levers into the closed position; this seats the monitor card firmly into place.

Remove a Monitor Card

1. Unlatch (pull) the levers at the top and bottom portion of the monitor card.

2. Pull the monitor card towards you (towards the front of the matrix bay) until it is out of the frame.

CM9765-VMC — MONITOR CARD SLOT 10

Figure 5. Monitor Output Card (CM9765-VMC) Location

PERFORMING A BASIC LED CHECK

You should perform a basic LED check before you connect any video input or output to the matrix bay. The LED check allows you to ensure that the system is operating properly.

1. Turn on the power switch on the rear of the matrix bay. The front cover can either be open or closed during the LED check.
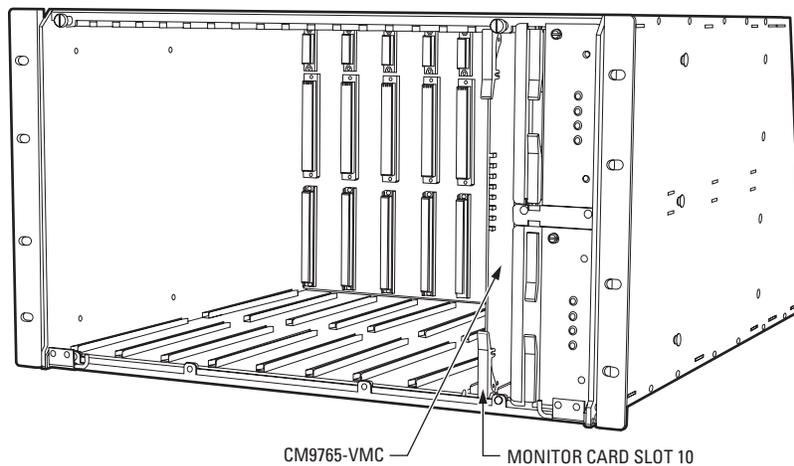
2. Various LEDs will blink during the initialization process as the software verifies communication and version level information. Once the initialization process is complete, continue to step 3.

NOTE: The initialization process should take approximately 30 seconds, unless the CM9765-VMC monitor card is updating software on the CM9765-VCC video cards. The software update process takes several minutes.

3. Ensure that the appropriate LEDs are illuminated, as described in Table B.

4. Ensure that the red CF LED on each video input card is off. If this LED is illuminated on any input card, reseat the card. If the problem continues, replace with a known good video input card. If this LED is illuminated on all of the video input cards, there may be a problem with the primary monitor output card (in slot 10). Reseat the primary monitor card. If the problem continues, replace with a known good monitor card.

5. Ensure that the red FF and PF LEDs on the power supply are off.

6. If the LEDs are properly illuminated, turn off the power switch on the rear of the matrix bay, and then install all video inputs and outputs.

Table B. LEDs Illuminated During a Basic Check

Front Panel Label	Color	Diagnostic Check
Power Supply		
+	Green	On.
-	Green	On.
Monitor Output Card (CM9765-VMC)		
+	Green	On.
-	Green	On.
HB	Amber	Blinks at a one-second rate.
RX	Amber	Blinks during normal system operation as switching commands are sent and polled.
MP	Amber	Blinks during normal system operation.
NOTE: The amber FP, CP, and BP LEDs will blink on start-up, but should not remain illuminated.		
Video Input Card (CM9765-VCC)		
+	Green	On.
-	Green	On.
HB	Amber	Blinks at a one-second rate.
VL	Red	This is the video loss LED, and it should be illuminated because there are no video signals coming into the rear panel yet. During normal operation this LED should be off.
NOTE: The amber CD LED may blink on start-up, but should not remain illuminated.		

Refer to Table I and Table J in the *Appendix* for additional information on the LEDs and troubleshooting information.

INSTALLING REAR PANEL BNC CARDS

The following rear panel cards can be used with the CM9765-MXB matrix bay:

- CM9765-RPC—the BNC card for video connections
- CM9765-RPM—the BNC card for monitor connections
- CM9765-DFC—this is a downframe card and cable assembly used to connect multiple matrix bays; refer to the *Downframing* section in the *Appendix* for more information
- CM9765-DFL—this downframe card and cable assembly is the same as the CM9765-DFC, except that it also has BNC connectors for looping inputs; refer to the *Downframing* section in the *Appendix* for more information

Insert or Replace a Rear Panel Video BNC Card (CM9765-RPC)

1. Slide the video BNC card into the card guides at the rear of the bay. From the rear of the bay, the slot at the far right provides the connection point for the video input card inserted in the front of the bay into slot 1. Refer to Figure 6.

NOTE: You will note that the video BNC card consists of two cards connected into one unit. Each video BNC card (CM9765-RPC) provides 32 video input connections and connects to one video input card (CM9765-VCC).

2. Push the BNC card into place firmly.

3. Tighten the screws at the top and bottom of the BNC card.

Remove a Rear Panel Video BNC Card (CM9765-RPC)

1. Loosen the screws at the top and bottom of the BNC card. Refer to Figure 7.

2. Pull the BNC card towards you until it is out of the frame.
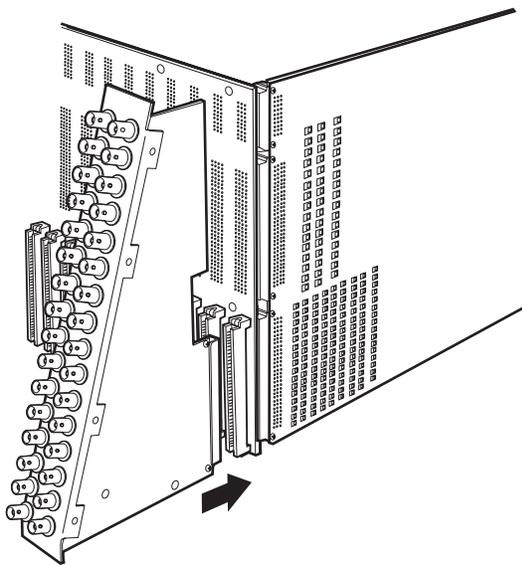
Figure 6. Insert a Rear Panel Video BNC Card (CM9765-RPC)

TWO RPC CARDS ARE CONNECTED INTO ONE UNIT - LOOSEN SCREWS AT TOP AND BOTTOM TO REMOVE RPC UNIT
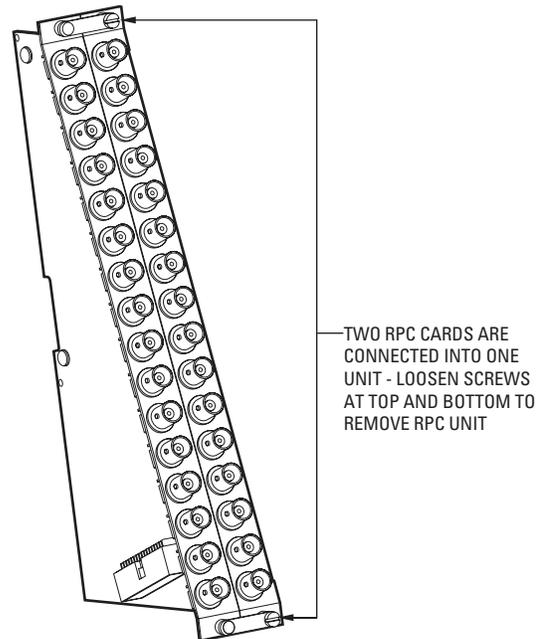
Figure 7. Remove a Rear Panel Video BNC Card (CM9765-RPC)

Change the Termination Jumpers on a Rear Panel Video BNC Card

In a single-bay, non-looping configuration (up to 256 cameras and 16 monitors), the jumpers must be set in the terminated position. Refer to the Installing Additional Matrix Bays—Sideframing and Downframing section in the Appendix for details on termination jumper settings in multiple-bay configurations.

When looping video out to another device (such as a DVR, VCR, or switcher), set the termination jumpers on the CM9765-RPC cards to the unterminated position.

The termination jumpers are set in the appropriate position when your system is configured at the factory by Pelco. However, if you expand or change your system, or purchase a replacement CM9765-RPC card, you may need to change the termination yourself.

Since the CM9765-RPC consists of two cards assembled together, you must access the termination jumpers on each card in a different way. Access the termination jumpers on the right-side card as shown in Figure 8. Access the termination jumpers on the left-side card as shown in Figure 9.

Figure 13 and Figure 14 illustrate sample sideframing configurations. Figure 15 illustrates a sample downframing configuration.

Refer to the *Installing Additional Matrix Bays—Sideframing and Downframing* section in the *Appendix* for detailed instructions on sideframing and downframing.
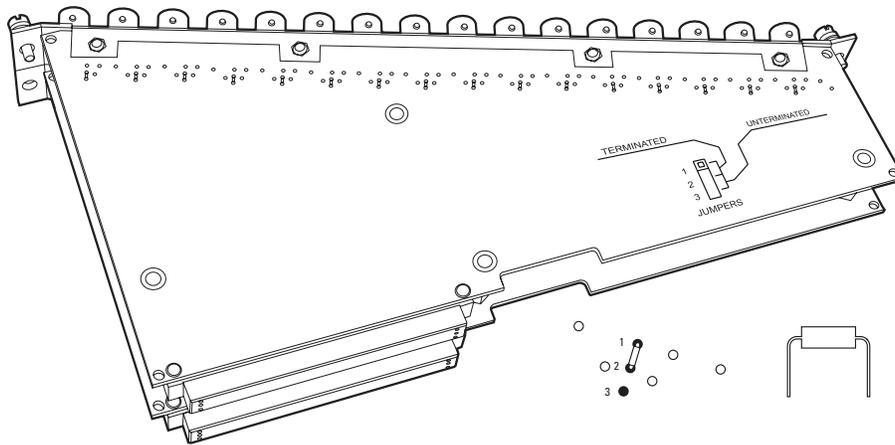
Figure 8. CM9765-RPC Termination Jumpers—Right Card
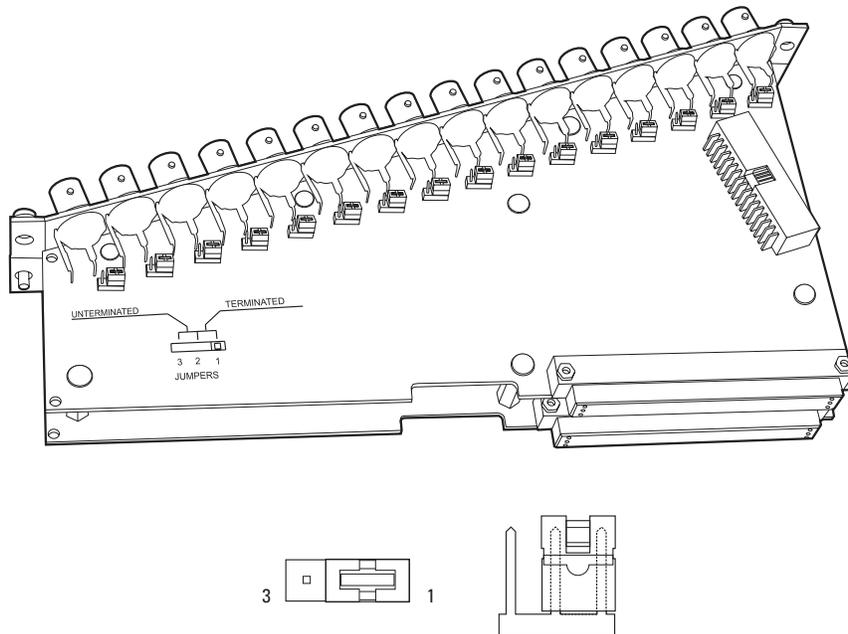
Figure 9. CM9765-RPC Termination Jumpers—Left Card

Looping Video

When looping video out to another device (such as a DVR, VCR, or switcher), the connection instructions depend on the size of your system, as follows:

- In a system containing 16 monitors or fewer (the video is not downframed), use the CM9700-VPP panels to loop the video out. Connect the DFC cables that are provided with the VPP panel to the connectors on the bottom of the matrix bay RPC cards, as shown in Figure 10.

  When looping video, set the termination jumpers on the CM9765-RPC cards to the unterminated position. Refer to the *Change the Termination Jumpers on a Rear Panel Video BNC Card* section. Terminate the video signal at the final device.

  Instructions on installing the CM9700-VPP panels into an EIA-standard rack are provided in the *Appendix.*

- If your system contains more than 16 monitors (in a downframed configuration), you must use the CM9765-DFL card in the final bay. Use the DFC cable that is provided with the DFC card to connect the downframe connector on the bottom of the DFL card with the DFC card in the previous bay. This configuration is illustrated in Figure 31, in the *Installing Additional Matrix Bays—Sideframing and Downframing* section of the *Appendix.*
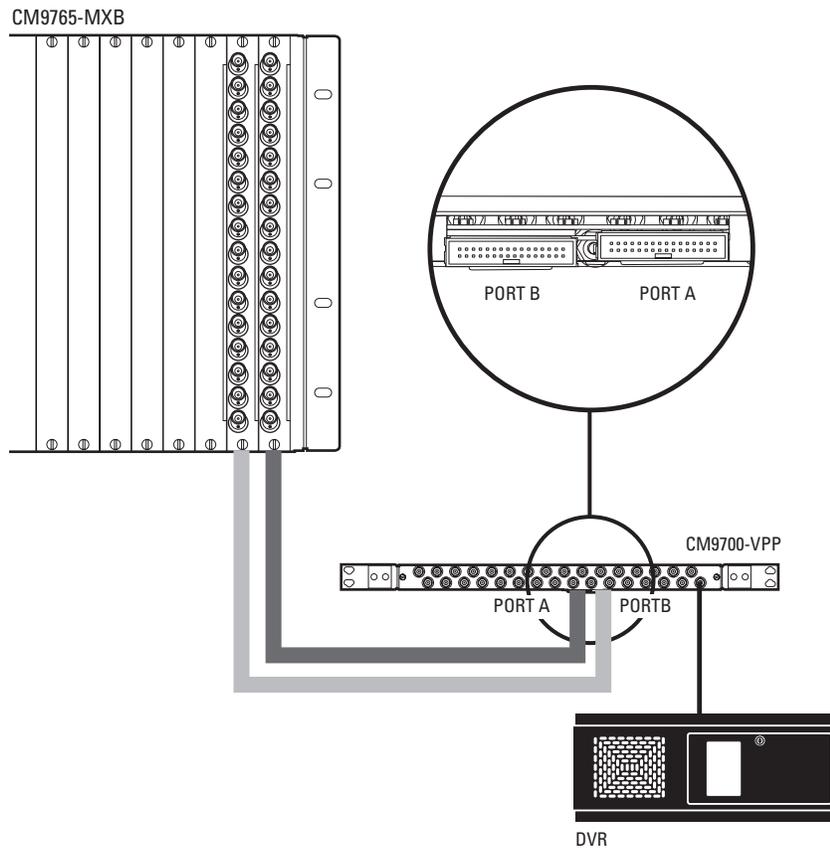
Figure 10. Looping Video Out from the CM9765-MXB

Insert or Replace a Rear Panel Monitor BNC Card (CM9765-RPM)

1. Slide the monitor BNC card into the card guides at the rear of the bay. From the rear of the bay, the slot at the far left provides the connection point for the primary monitor output card inserted in the front of the bay into slot 10.

NOTE: Each monitor BNC card (CM9765-RPM) provides 16 monitor output connections and connects to one monitor output card (CM9765-VMC). The CM9765-MXB can hold one monitor output card, for a total of 16 monitor outputs.

2. Push the BNC card into place firmly.

3. Tighten the screws at the top and bottom of the BNC card.
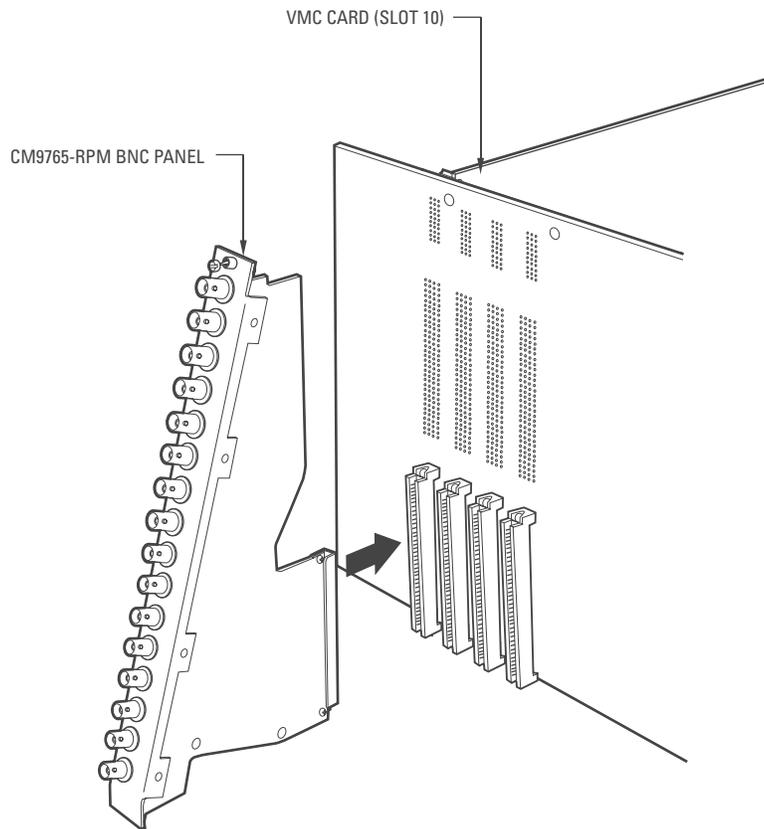
Figure 11. CM9765-MXB Matrix Bay: 16 Monitor Output Connections for Each VMC Card

VIDEO INPUT/OUTPUT CAPACITY

Single Bay

A single CM9765-MXB can support up to 256 camera inputs (in increments of 32) and 16 monitor outputs. Refer to Figure 12.
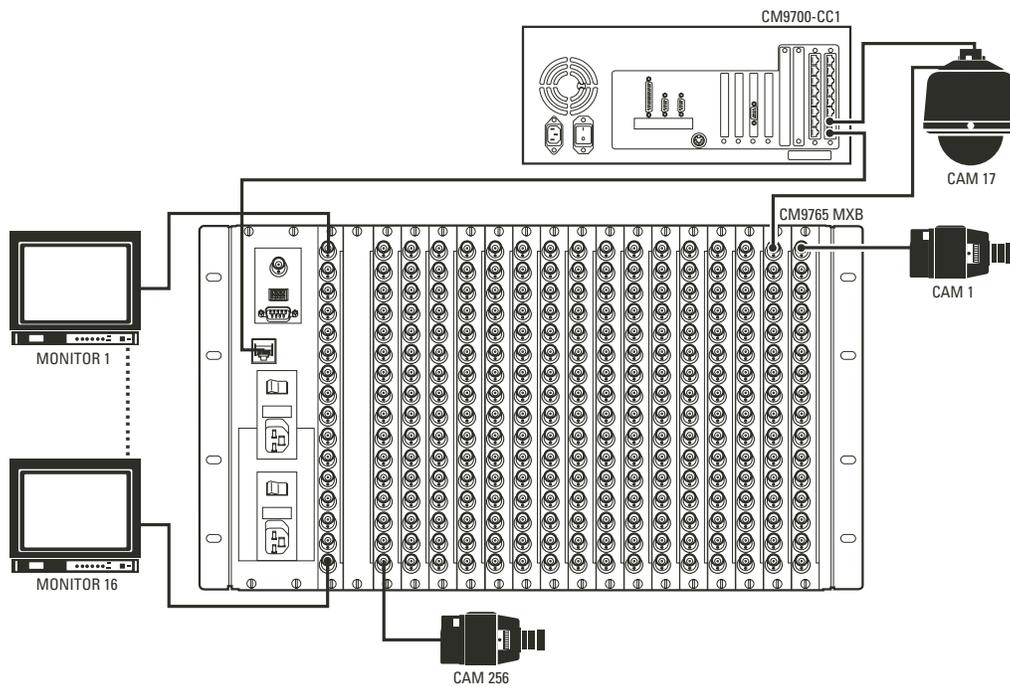
Figure 12. Sample CM9765 System with 256 Cameras and 16 Monitors

Multiple Bays, Single Node

In a single-node system with one CM9700-CC1 (not networked), you can connect multiple CM9765-MXBs using "sideframing" and "downframing" for a maximum capacity of 2,048 camera inputs and 128 monitor outputs.

NOTE: When using CM9760-MDA units, you can increase the monitor output capacity to a maximum of 512. Refer to the *Downframing* section in the *Appendix* for more information on using CM9760-MDA units.

- Sideframing—To expand the matrix video inputs beyond 256, you can use multiple bays, with video from the monitor outputs on each bay sideframed (with cable connections) to the bay to which the monitors are connected.

  System 9765 provides the following sideframing options:
  - Sideframe Option A (refer to Figure 13):
    Sideframe from each bay to the bay to which the monitors are connected—the sideframe cables are connected to the video inputs on the bay with the monitors, starting with slot one, and continuing to the higher slots as necessary. Any camera input slots not used to receive output from sideframed bays can be used for additional camera inputs.
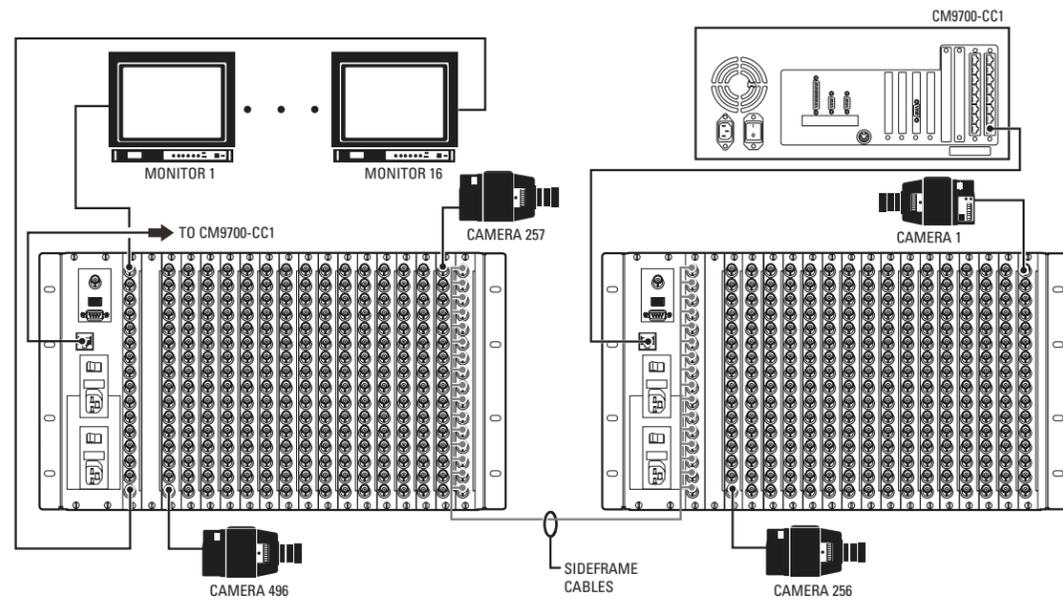
Figure 13. Sample System Using Sideframing from Bay to Bay

- Sideframe Option B:
  Sideframe from each bay directly to an output bay. This method requires an extra bay, but maintains the total capacity of camera inputs in each of the other bays in the system.

  Figure 14, on the next page, illustrates a sample sideframing system with all the sideframe cables connected to an output bay.

Refer to the *Installing Additional Matrix Bays—Sideframing and Downframing* section in the *Appendix* for detailed sideframing instructions.
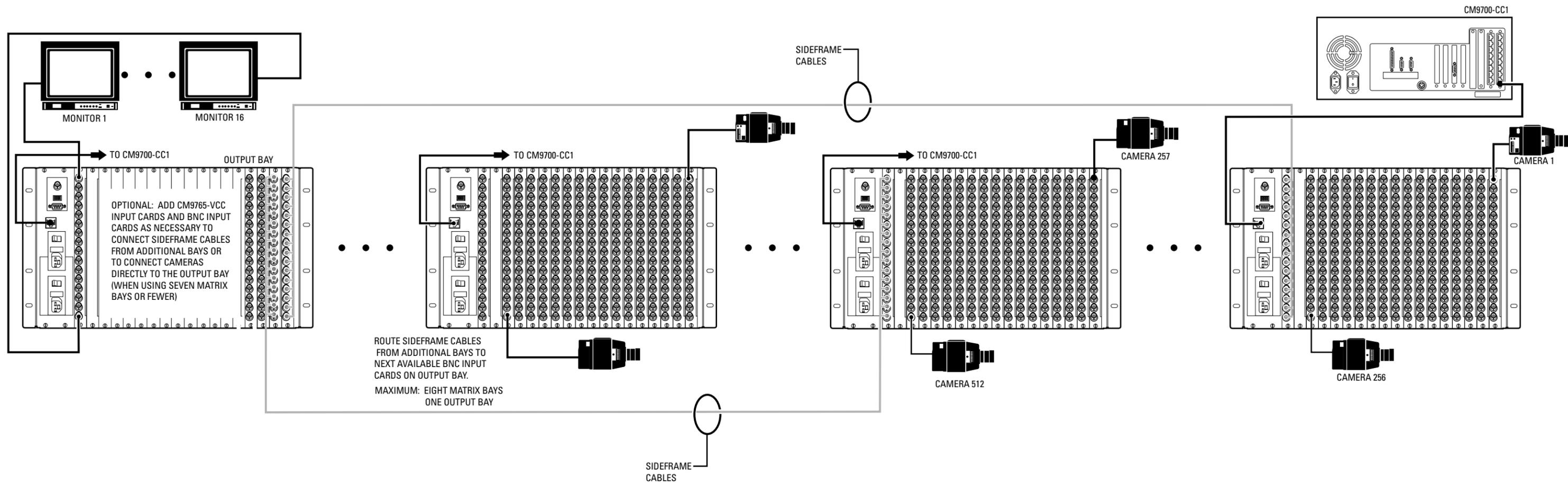
Figure 14. Sample Sideframing System Using an Output Bay

CM9700-CC1

SIDEFRAME CABLES

SIDEFRAME CABLES

MONITOR 1

MONITOR 16

TO CM9700-CC1

OUTPUT BAY

OPTIONAL: ADD CM9765-VCC INPUT CARDS AND BNC INPUT CARDS AS NECESSARY TO CONNECT SIDEFRAME CABLES FROM ADDITIONAL BAYS OR TO CONNECT CAMERAS DIRECTLY TO THE OUTPUT BAY (WHEN USING SEVEN MATRIX BAYS OR FEWER)

TO CM9700-CC1

TO CM9700-CC1

CAMERA 257

CAMERA 1

ROUTE SIDEFRAME CABLES FROM ADDITIONAL BAYS TO NEXT AVAILABLE BNC INPUT CARDS ON OUTPUT BAY.

MAXIMUM: EIGHT MATRIX BAYS ONE OUTPUT BAY

CAMERA 512

CAMERA 256

- Downframing—To expand the matrix video outputs beyond 16, you can loop the video from the first CM9765-MXB to subsequent CM9765-MXB units for an additional 16 monitor outputs on each matrix bay. Refer to Figure 15.

  You can connect a maximum of eight bays in a downframing configuration for a total MXB capacity of 128 monitors; in addition, you can increase monitor capacity further by using MDA units, for a total single-node system capacity of 256 monitors.

  Refer to the *Installing Additional Matrix Bays—Sideframing and Downframing* section in the *Appendix* for detailed downframing instructions.
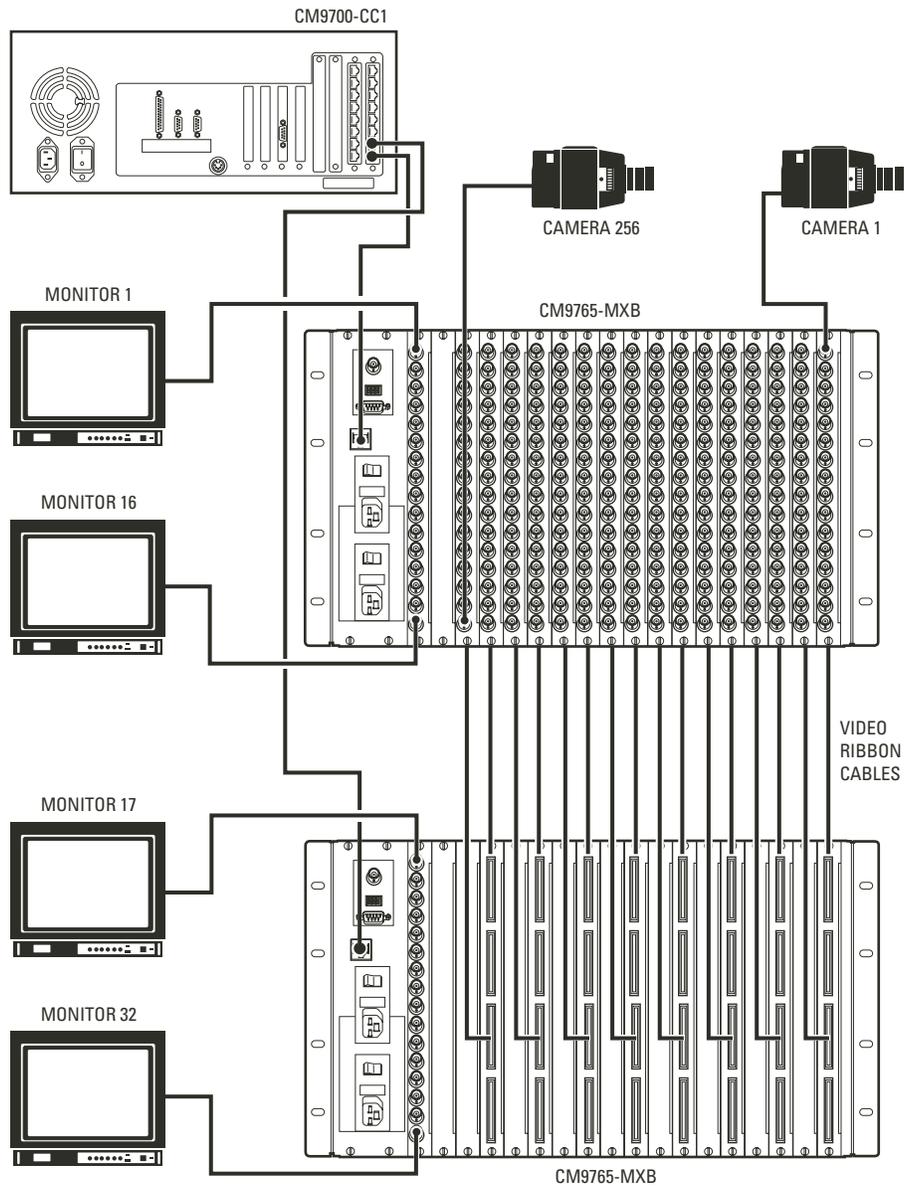
Figure 15. Sample Single-Node System with Downframing

Networked System

A networked system with multiple nodes uses an NIU (network interface unit) to combine up to 24 CM9700-CC1 systems into a network—each CC1 system is called a "node." Multiple CM9765-MXB units can be connected to each CC1 through sideframing and downframing. An NIU is a CM9700-CC1 loaded with networking software, sold as a CM9700-NW1. Refer to Figure 16.
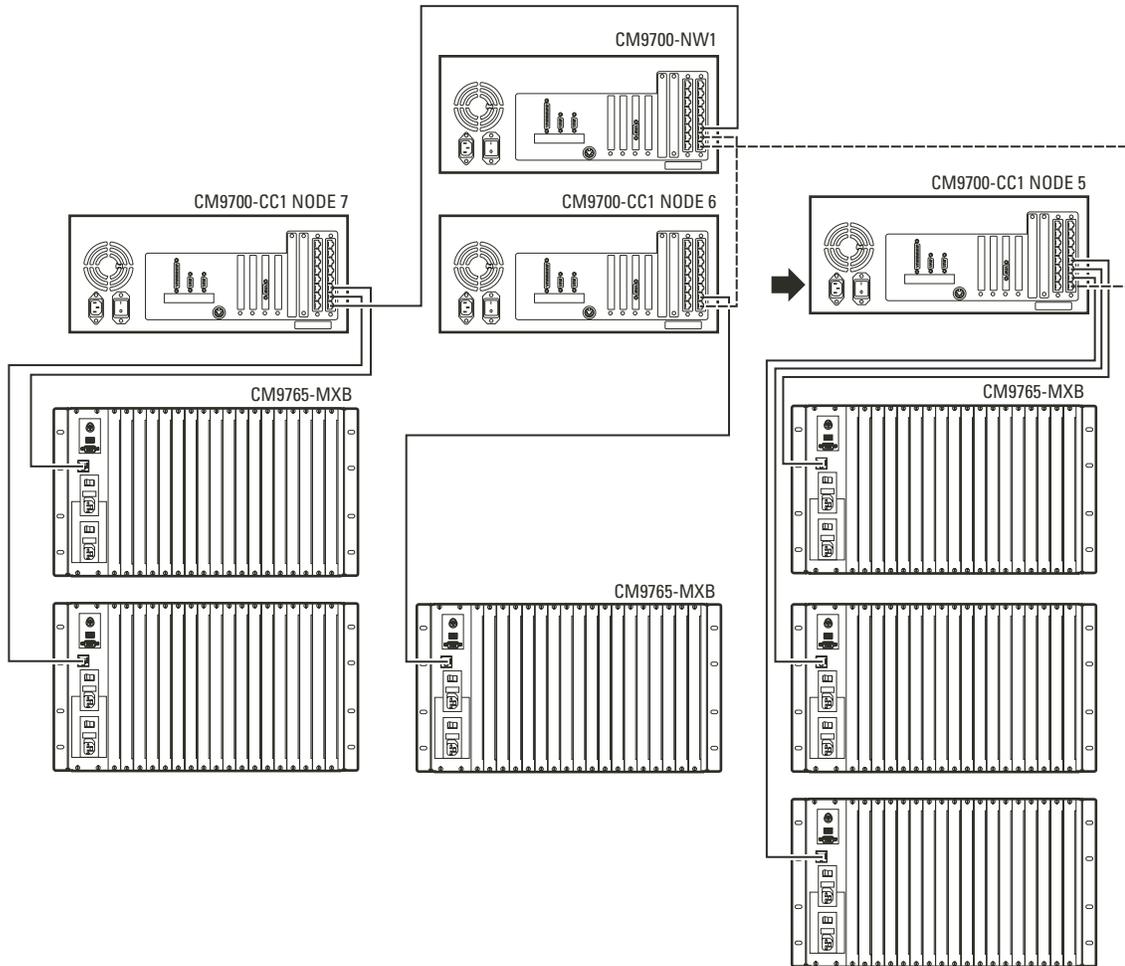
Figure 16. Sample Networked System

THE POWER SUPPLY MODULE (CM9700-MPS)

You can add a backup power supply module (CM9700-MPS) to a System 9765 matrix bay to provide redundancy to the bay's power supply.

NOTE: You can "hot swap" a backup power supply module—remove and/or insert a backup power supply—while the system is powered and running.

INSTALL A BACKUP POWER SUPPLY

1. Open the matrix bay front cover.

2. Remove the blank-off plate from the empty power input slot.

3. Slide the power input module partially into the bay, on the guide rail.

4. Hold the latches parallel to the floor until you reach the edge of the bay's frame.

5. Adjust the latches to fit them properly onto the top and bottom edges of the bay's frame.

6. Push the latching levers into the closed position; this seats the power input module firmly into place.

7. Replace the matrix bay front cover.

REMOVE A BACKUP POWER SUPPLY

1. Open the matrix bay front cover.

2. Loosen the screw at the top of the power supply module.

3. Unlatch (pull) the levers at the top and bottom portion of the power supply module.

4. Pull the power supply module towards you (towards the front of the matrix bay) until it is out of the frame.
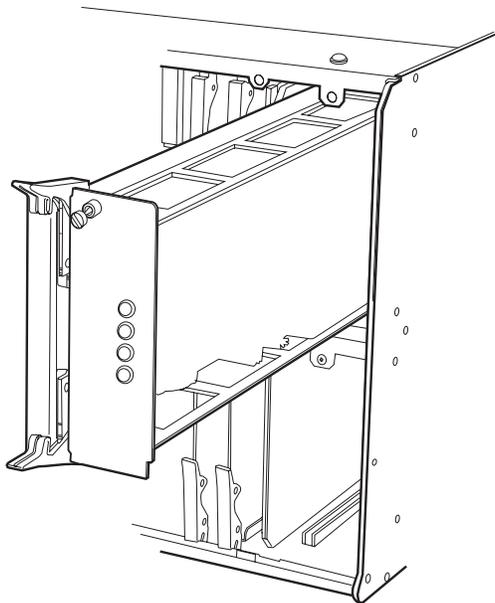
Figure 17. How to Install or Remove a Power Supply

HOW TO REPLACE THE FUSE IN A POWER SUPPLY MODULE

The matrix bay is shipped from the factory configured for the correct input power. The power input panel, on the rear panel of the matrix bay, provides two separate power input receptacles, one for each power supply.

NOTE: The power input panel is not serviceable and should be removed or installed only by Pelco.

Each power input receptacle is equipped with a fuse assembly. In addition, each fuse assembly also provides a spare fuse. Refer to Figure 18.

⚠ **WARNING:** Always replace blown fuses with fuses of the same rating. Failure to do so could result in serious damage to the unit.

1. Remove the power cord from the power input receptacle.

2. Using a small screwdriver, pry the fuse holder out of the socket. The complete fuse assembly comes out of the unit.

3. Replace the fuse using a 1.6 ASB fuse. If using the spare, be sure to replace the spare with one of the same rating.

4. Plug the power cord into the power input receptacle.
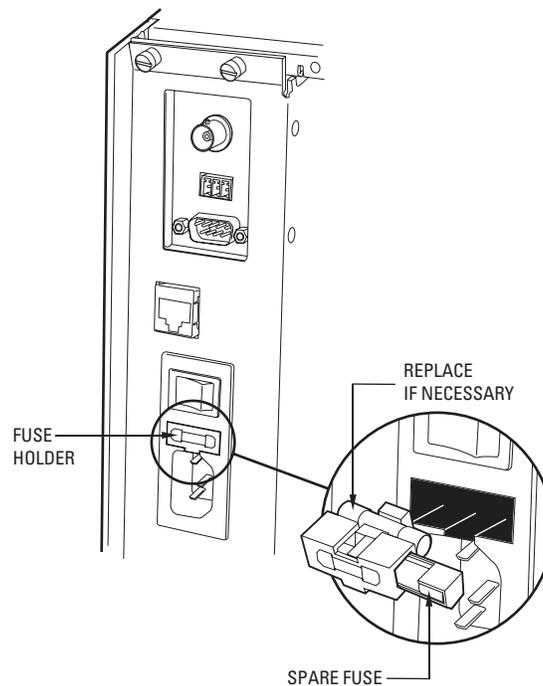
Figure 18. How to Replace a Power Supply Fuse

HOW TO TURN OFF THE AUDIBLE POWER SUPPLY ALARM

The power supply module contains an audible alarm, which operates in conjunction with the fault LEDs located on the power supply front panel. To turn off this alarm, complete the following steps:

1. Turn off the matrix bay power.

2. Remove the power supply module from the matrix bay frame.

3. Move the speaker switch to the OFF position (refer to Figure 19).

4. Insert the power supply module back into the matrix bay frame.

5. Turn on the power.
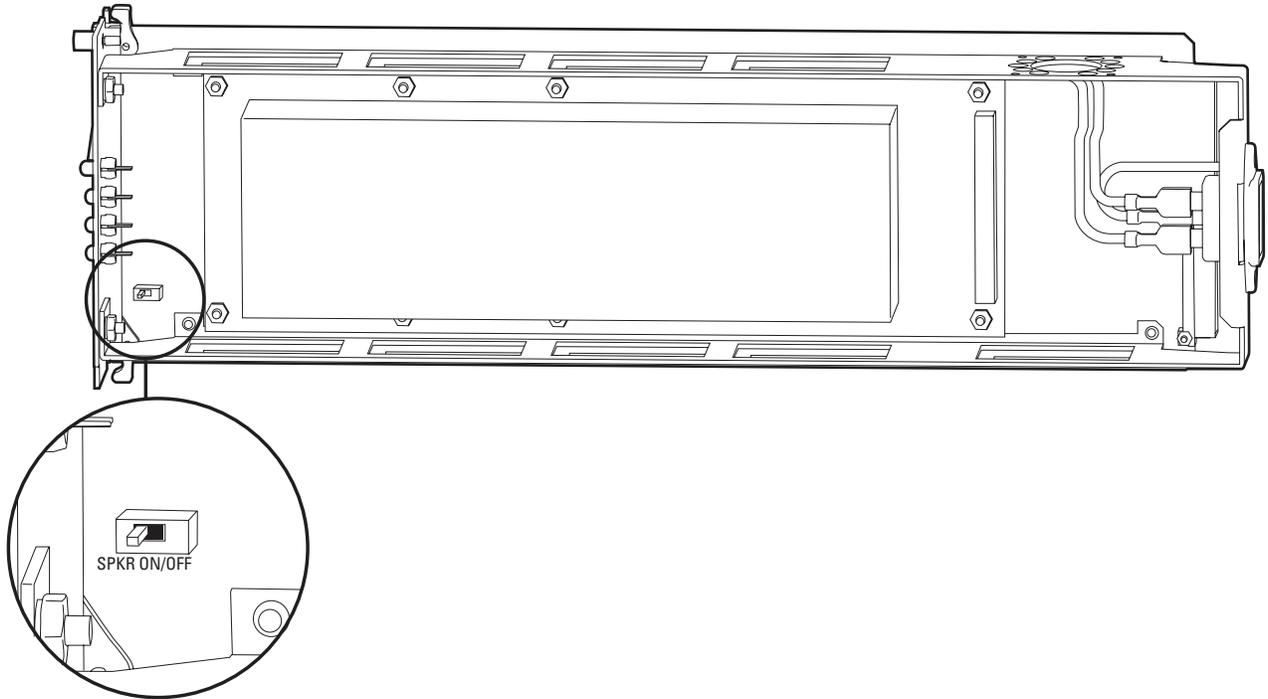
Figure 19. Power Supply Alarm Speaker Switch

SYSTEM DEVICE CONNECTIONS

1. Turn off power to all system devices and disconnect all power line cords while connecting system devices.

2. Complete the following steps to connect one or more CM9760-KBD system keyboards.

NOTE: CM9760-KBD software version 8.03 or higher is required.

    a. Connect the keyboard to the CM9505-UPS using the straight cable supplied with the keyboard.

    b. Connect the CM9505-UPS to one of the RS-422 COM ports on the CC1 using the 6-foot (1.8 m) reversed data cable supplied with the keyboard. Refer to the *RS-422 COM Port ("Sercom") Connections* section and your *Port Assignments* insert for directions on which port to use for each keyboard.

    c. Refer to the CM9760-KBD Keyboard Installation/Operation manual for additional instructions on keyboard setup and operation.
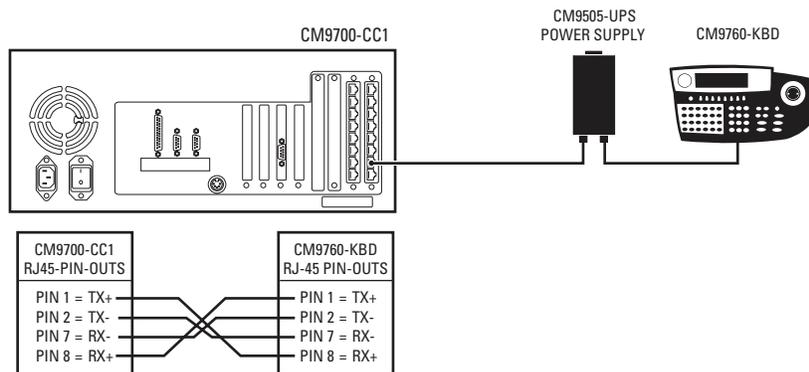
Figure 20. Connect the CM9760-KBD to the CM9700-CC1

3. Connect a VGA monitor to the CM9700-CC1, as shown in Figure 21. This monitor displays the CC1 system diagnostic screen, as shown in Figure 25.

4. Connect the PS/2 keyboard to the PS/2-to-AT keyboard adaptor, and then connect the adaptor to the CM9700-CC1, as shown in Figure 21.

5. Complete the following steps to connect a PC to the CM9700-CC1 (refer to Figure 21 and Figure 22):

    a. Using a null modem cable (user-supplied), plug one end into the DB9 COM 1 port on the PC.

    b. Plug the other end of the cable into the DB9 COM 1 port on the CC1, as shown in Figure 21. This port is configured at the factory for use with the CM9700-MGR and RS-232 communication.
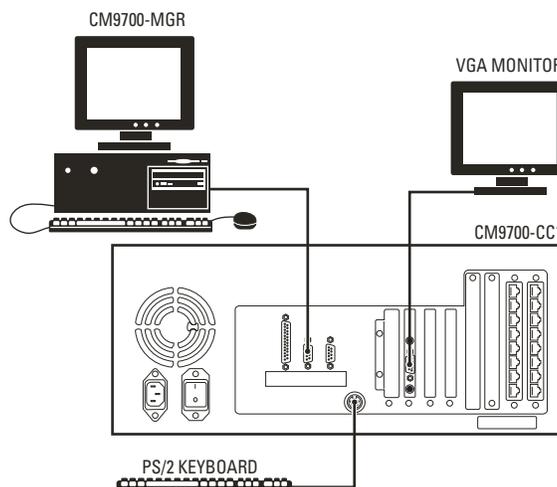
Figure 21. CM9700-CC1 Device Connections

CM9700-MGR
PC COM PORT

RS-232 CABLE

CM9700-CC1
COM 1/COM 2

PIN 3 (TX)   PIN 2 (RX)

PIN 2 (RX)   PIN 3 (TX)

PIN 5 (GND)   PIN 5 (GND)

DB9 FEMALE   DB9 FEMALE
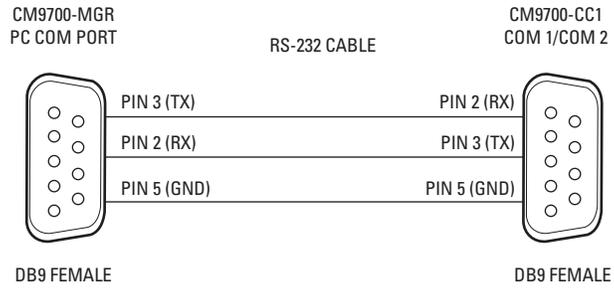
Figure 22. CM9700-MGR PC Pin-Out Detail

6. Install any additional system peripheral devices. Refer to the manuals for the individual devices for instructions. Refer to the *Data Connections* section and your *Port Assignments* table for directions on which port to use for each device.

7. Connect all power line cords to the equipment. Do not turn on the power until the installation is complete. Refer to the *System Start-Up* section.

RS-422 COM PORT ("SERCOM") CONNECTIONS

All peripheral equipment in a System 9765 connect through the RS-422 COM ports on the CM9700-CC1 rear panel. (These ports are also known as "sercom" ports, short for "serial communication" ports.) If you exceed the number of CM9700-CC1 rear panel ports available, you can add ports with the CM9700/9760-SER port expander unit.

NOTES:

- When connecting peripheral equipment to the serial communication ports, shielded cabling is required to comply with CE emissions guidelines.

- Generally, Pelco will preconfigure your 9765 system, and then provide you with a Port Assignment Table. This document identifies which port should be used for each device. Set up your system with the port assignments specified in your Port Assignment Table. The information provided in this section should be used when expanding or servicing your system.

The 9700 System Manager software configures your system with the appropriate hierarchy of connections, so the easiest way to determine where to connect each device is to use the 9700 System Manager to set up your system. The resulting list of devices in the tree view portion of the CM9700-MGR Main window identifies the appropriate port number for each device in your system. Sample device list views are provided in the following tables, to illustrate sample connections for each type of configuration.

Note that a specific hierarchy of connections is required when connecting equipment to the RS-422 COM ports. Connect MXB units into the first available sequential ports, starting with port 5. Do not skip a port number when making MXB connections. Note, however, that the hierarchy varies, depending on whether your system is networked and whether you use the hot switch package to connect a backup CC1 unit. The hierarchy rules are provided in Tables B-E.

Once your MXB units and any NIU (network interface unit) or hot switch devices are connected (refer to Figure 23 and Figure 24), you can then connect peripheral devices (such as keyboards) into any remaining ports. Peripheral devices do not have to be connected in any sequential order, and you can leave ports empty between peripheral devices.

NOTE: In the following tables, "hot switch" refers to using the CM9760-HS hot switch package to connect a backup CC1, which provides operational redundancy in a system. If the controlling CC1 unit were to fail, control would be passed to the backup CC1, and a system error would be generated (through an LED and an audible tone). Refer to the System 9760 CM9760-HS Hot Switch Installation/Operation manual for information on using a hot switch package. Note that the procedure for using a hot switch with a CM9700-CC1 is the same as for a CM9760-CC1, except that the programming within CM9700-MGR is much easier. You just need to add the CM9760-HS as a device.

Table C. Data Connections—Single Node Systems Without a Hot Switch

MXB connection(s)	CC1 port 5 and next available sequential ports, as necessary.	
Other peripherals	Any available port(s)—these connections do not have to be in sequential ports.	

Table D. Data Connections—Networked System Without a Hot Switch

MXB connection(s)	CC1 port 6 and next available sequential ports, as necessary.	
NIU connection	CC1 port 5—note that this connection is made through port 5 on each CC1 in the network.	
Other peripherals	Any available port(s)—these connections do not have to be in sequential ports.	

Table E. Data Connections—Single Node, Hot-Switched System

MXB connection(s)	CC1 port 6 and next consecutive ports, as necessary—connected through the hot switch.	
Hot Switch connection	CC1 port 5.	
Other peripherals	Any available port(s)— connected through the hot switch. These connections do not have to be in sequential ports.	

Table F. Data Connections—Networked, Hot-Switched System

MXB connection(s)	CC1 port 7 and next consecutive ports, as necessary—connected through the hot switch.	
NIU connection	CC1 port 6—connected through the hot switch.	
Hot Switch connection	CC1 port 5.	
Other peripherals	Any available port(s)— connected through the hot switch. These connections do not have to be in sequential ports.	

NOTE: If you expand the number of matrix bay units in your system, you may need to change your port connections to connect each matrix bay to the lowest sequential port possible. Refer to the *How to Expand Your System* section in the *Appendix* for more information.

CM9700-CC1

REVERSED CABLE

CM9765-MXB

PIN 1
PIN 8

CM9765-MXB RJ-45 PIN-OUTS	REVERSED DATA CABLE	CM9700-CC1 RJ-45 PIN-OUTS
PIN 1 = TX+		PIN 1 = TX+
PIN 2 = TX-		PIN 2 = TX-
PIN 7 = RX-		PIN 7 = RX-
PIN 8 = RX+		PIN 8 = RX+
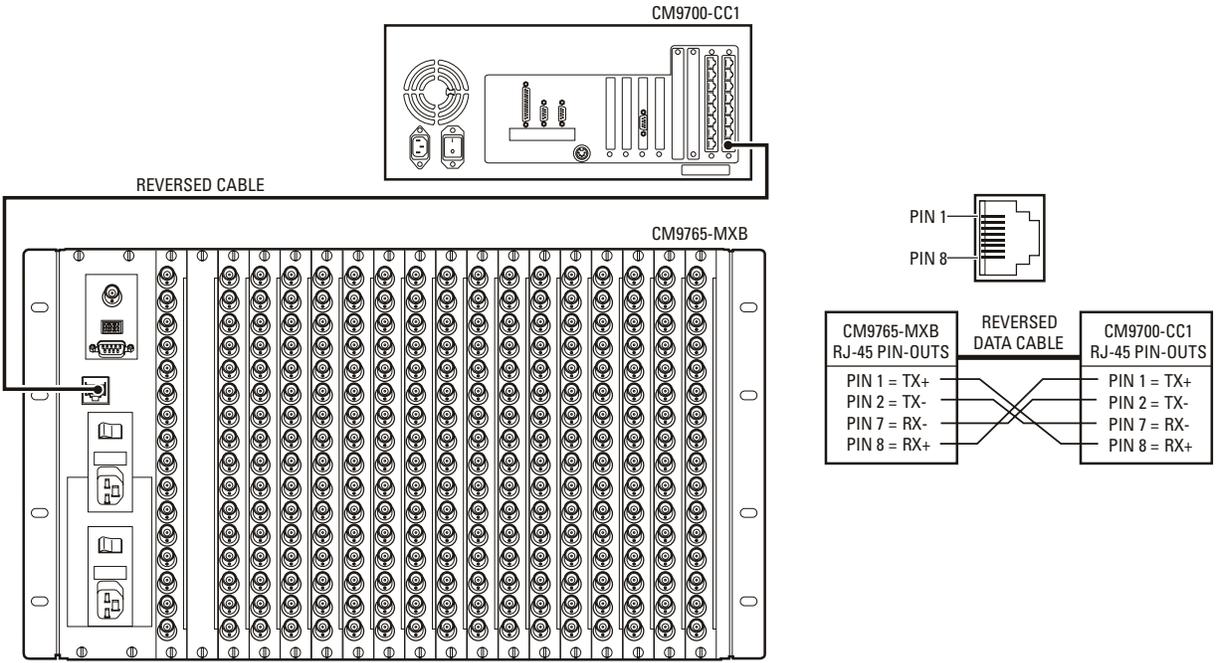
Figure 23. Sample CM9765-MXB to CM9700-CC1 Connection

CM9700-NW1

CM9700-CC1 NODE 7

CM9700-CC1 NODE 6

CM9700-CC1 NODE 5

TO NODE 7

CM9765-MXB

TO NODE 6

TO NODE 5

CM9765-MXB

CM9765-MXB
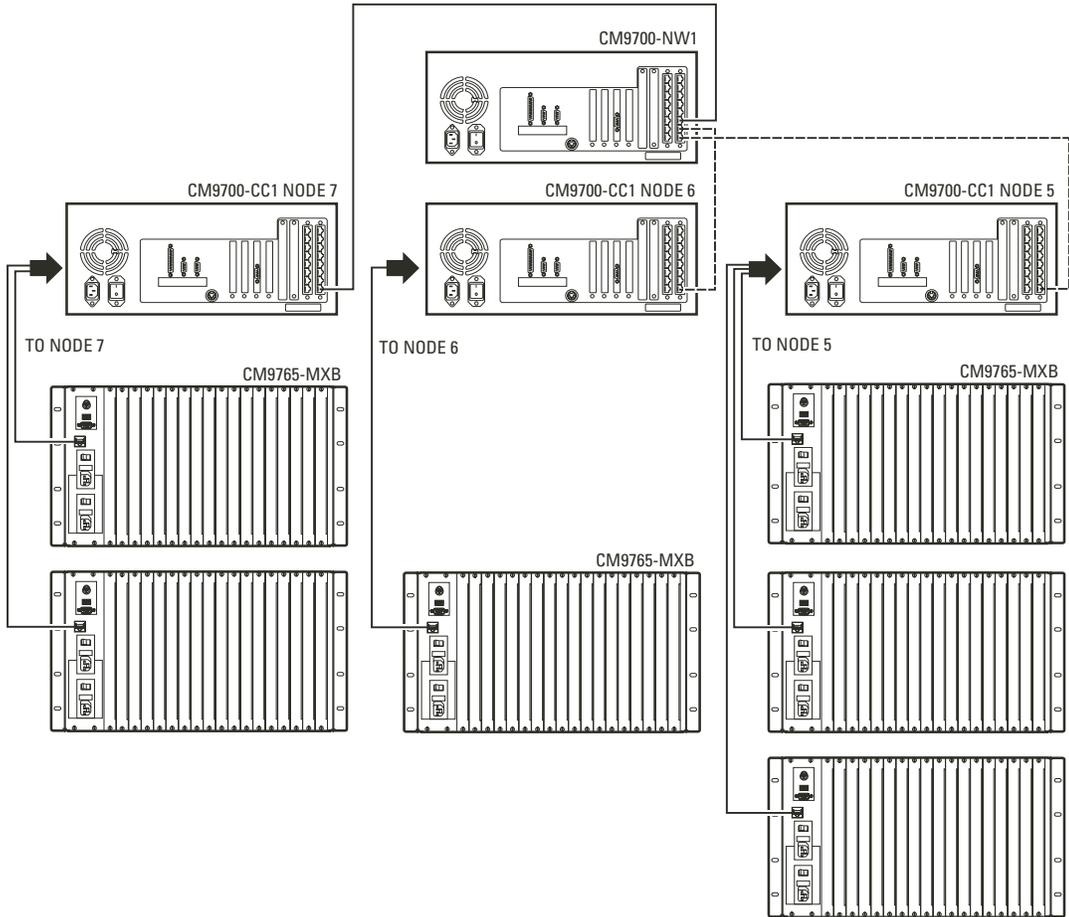
CM9765-MXB

Figure 24. Sample CM9765-MXB and CM9700-CC1 Connections in a Networked System

System Start-Up

To start up your system you must complete the following tasks:

1. Install the CM9700-MGR on a PC connected to the CC1.

   Refer to *System Device Connections* in the *Installation* section for instructions on connecting a PC to the CC1. Refer to the CM9700-MGR Software Guide for instructions on installing the CM9700-MGR software.

2. Complete the following steps on the CM9700-MGR PC (instructions are provided in the CM9700-MGR Software Guide):

   a. Copy the CM9700 system design file (the *.psm file) to the PC.

   b. Start the CM9700-MGR software.

   c. Open the system design file, and then customize the system as necessary. This step is optional because the *.psm file is defined at the factory based on your system order.

      OR

      If your system order did not include the factory configuration process, your first step is to set up your system. Refer to *How to Configure a New System* in the CM9700-MGR Software Guide for instructions.

3. Initialize the CC1. Refer to following section for instructions.

4. If you make any changes to the *.psm file, you must transfer the updated system settings to the CC1. Refer to *Transferring System Settings to the CC1* in the CM9700-MGR Software Guide for instructions.

INITIALIZE THE CC1

1. Apply power to all peripheral equipment connected to the CC1.

2. Apply power to the CC1.

   Initialization begins when the CC1 is turned on and the DOS boot process executes.

   When the boot process calls the executable in the autoexec.bat file, the CC1 diagnostic screen appears on the VGA monitor. The initialization process is complete when the message "Setup Complete" appears at the bottom of the screen.
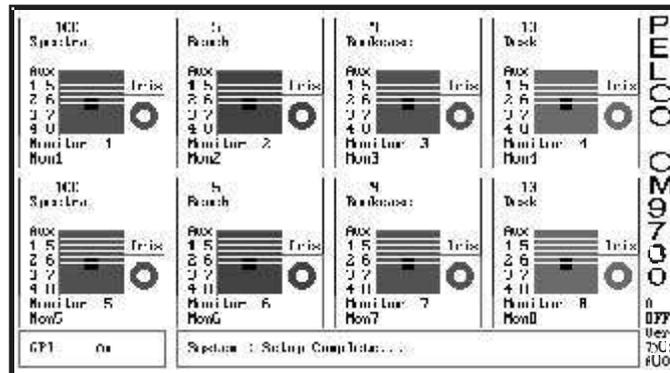
Figure 25. CC1 Initialization

VERIFY SYSTEM OPERATION

1. Power up all the remaining equipment.

2. After the CM9700-CC1 loads the configuration files, "SYSTEM 97XX" appears on the CM9760-KBD LCD.

3. Enter the default operator password on the CM9760-KBD keypad. "ENTER MONITOR #" appears on the LCD.

NOTE: The default password for operator 1 is 0101; operator 2 is 0202; operator 3 is 0303; and so on. These numbers are defined in the Operator PIN field in CM9700-MGR.

4. Enter 1, and then press the MON key. (Note: if you are not viewing monitor 1, substitute the appropriate monitor number.)

5. Enter a camera number, and then press the CAM key.

6. Press the FWD key to step through cameras and verify switching.

INITIALIZE KEYBOARDS

Specify a monitor for each keyboard after your first power-up or any time power is cycled to the keyboard or the CM9700-CC1.

Always allow five seconds to elapse before specifying a monitor.

1. Enter a number corresponding to the monitor output that is feeding the monitor you are viewing.

2. Press the MON key. The keyboard LED displays the number you entered. This also confirms successful communication between the keyboard and the CM9700-CC1. If the keyboard LED does not display the monitor number, repeat steps 1 and 2.

DISPLAY THE CM9765-MXB SOFTWARE VERSION LEVEL

To display the software version level on a system monitor, complete the following steps:

1. Remove the monitor card from the CM9765-MXB.

2. Set DIP switch 5 off and DIP switch 6 on.

3. Insert the monitor card into the CM9765-MXB. A blue raster screen with software version alphanumerics appears on the monitor.

MONITOR COLOR ADJUSTMENT

Once you have connected all devices and powered the system, you can use the System 9765 color bars as a reference tool for adjusting the color on each monitor.

1. Remove the monitor card from the CM9765-MXB.

2. Set DIP switch 5 on and DIP switch 6 on.

3. Insert the monitor card into the CM9765-MXB. Broadcast quality color bars appear on the monitor.

Figure 26. System 9765 Color Bars

Programming Your System

When you open CM9700-MGR, the Getting Started dialog box appears..

Figure 27. Getting Started Dialog Box

The CM9700-MGR provides the following configuration options:

- **Setup Wizard:** This option opens the Setup Wizard (a series of dialog boxes), which provides assistance in setting up a new system.
- **New System:** This option opens the CM9700-MGR main window with a blank system. Use this option when you want to create a new system configuration from scratch.
- **Open:** This option allows you to open a CM9700-MGR system design file (a .psm file).
- **Import Configuration Files:** This option allows you to import configuration files. You can use this option to import the following types of files:
    - Configuration files that have been copied from the CM9700-CC1 (note, however, that copying configuration files from the CC1 is not recommended; the *.psm file generated from the CM9700-MGR provides more complete descriptions of system settings)
    - CM9760-MGR configuration files (also known as "flat files") created for a System 9760 or System 9740.

NOTE: When Pelco customizes your system at the factory, system settings are saved in the *.psm file, which is provided to you on the CD labeled "CD-CM9700CONFIG" (provided in your system binder). The accompanying sets of configuration files have been transferred to the CM9700-CC1 at the factory. Any system changes should start by opening the *.psm file. (With previous CM9760-CC1 and CM9700-CC1 systems, configuration files were used for system changes. With the current system, however, configuration files are handled only as an output from the *.psm file.)

Detailed instructions for using the 9700 System Manager are provided in the CM9700-MGR Software Guide which is included in the System 9765 binder.

GETTING HELP USING CM9700-MGR

Instructions for how to use CM9700-MGR are provided throughout the software.

The CM9700-MGR provides wizards to help users complete tasks, such as adding a device or a group. Each wizard screen contains instructions and explanatory text.
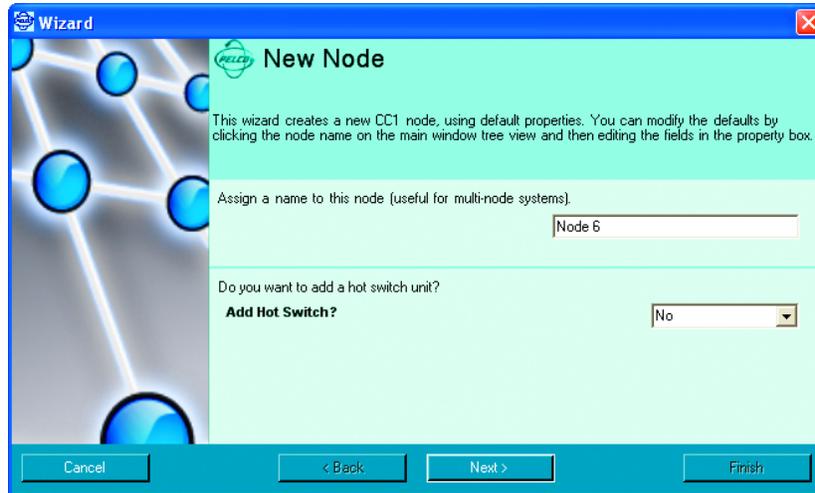
Figure 28. Sample Wizard Page

When you are working within the grid view or tree view on the CM9700-MGR main window, help is provided as "real-time" help. When you click on a row within the grid, the fields in that row are displayed in the properties area of the window.

Figure 29. CM9700-MGR Main Window - Properties Section

The box below the properties fields provides a description of the selected field.

Figure 30. CM9700-MGR Main Window - Help Section

Refer to the CM9700-MGR Software Guide (provided in the System 9765 binder) for detailed instructions.

Operation

A brief description of System 9765 operation is provided here.

Power-up the system.	Refer to the *System Start-Up* section.
Switch monitor.	Enter the monitor number. Press the MON key.
Select camera.	Enter the camera number. Press the CAM key.
Control PTZ receivers.	Use the appropriate PTZ control keys or joystick (depending on the keyboard used).
Call a preset.	Program the preset through the keyboard. Enter the preset number. Press the PRESET key or Prst/Lock key (depending on the keyboard used).
System does not function.	Refer to the *Troubleshooting* section.

OPERATING YOUR SYSTEM 9765

System 9765 can be operated with a CM9760-KBD or KBD300A keyboard. Operation instructions are provided below, but you should become familiar with the detailed instructions provided in the appropriate keyboard manual.

Switch Monitors

If you select a restricted monitor, the monitor does not switch; the keyboard LED displays the previously selected monitor number.

1. Enter the monitor number.

2. Press the MON key. The keyboard LED displays the selected monitor number.

Select Cameras

If you select a restricted camera view, the camera view does not appear on that monitor. The previously selected, unrestricted camera view remains on the monitor.

1. Enter the camera number.

2. Press the CAM key.

OR

Press the PREV or NEXT key to scroll through the available cameras.

Control Receivers

Select a suitable camera and operate a PTZ function.

Pan/Tilt/Zoom

Move the joystick until the camera reaches the desired position. To increase the speed of movement, move the joystick farther from center or press the T key to pan at turbo speed. Twist the joystick clockwise to zoom in, counterclockwise to zoom out. Or use the IN/OUT key to zoom in or out.

Lens Control: Focus, Iris

Use the NEAR/FAR key to focus near or far. Use the OPEN/CLS key to open or close the iris.

Call a Preset

1. Enter the preset number.

2. Press the Prst/Lock key, or select the PRST icon.

Appendix

SYSTEM ARCHITECTURE

System 9765 is similar to Pelco's System 9760 but uses different matrix bay hardware and provides more features. Users familiar with System 9760 should note the following differences:

- Each System 9765 video input card (CM9765-VCC) receives input from 32 video connections (from the CM9765-RPC BNC input card, which contains 32 BNC connectors). A fully loaded CM9765-MXB matrix bay supports 256 video inputs with just eight video input cards. Refer to Figure 6 in the *Installation* section.

- The CM9765-MXB provides a slot for one monitor output card (CM9765-VMC), providing a capacity of 16 monitors in a single bay. Refer to Figure 11 in the *Installation* section.

- When you "hot swap" video input cards (CM9765-VCC) or monitor output cards (CM9765-VMC), the CM9765-MXB automatically verifies system software levels on all cards, and then updates software on the new cards if necessary.

- The CM9700-MGR software provides the easiest way to configure your system. As you add devices or components to your system, it is recommended that you first add them into the CM9700-MGR software. Then the software will reassign ports according to the appropriate system hierarchy, and will easily renumber/rename system devices. Refer to the *CM9700-MGR Software Guide* for information.

NOTE: Actual maximum capacity depends on usage of the RS-422 COM ports on the CM9700-CC1. With the addition of CM9700-SER serial communication cards and CM9700-SER-32 port expansion units, the number of RS-422 COM ports could be expanded to a maximum of 120 ports. In addition, you would need to use COM ports to connect keyboards (and any other optional peripheral devices). Therefore, the actual maximum number of cameras and monitors is restricted by the number of COM ports remaining available for the matrix bays, after the number of COM ports needed for keyboards and other peripheral devices has been determined. If your system requirements exceed 120 ports, multiple 9765 systems can be networked together to reach your required capacity.

HOW TO EXPAND YOUR SYSTEM

System 9765 provides a number of ways to expand your system to handle additional capacity. For example:

- If you have a matrix bay that is not fully loaded, you can install additional video input cards (CM9765-VCC), up to a total of eight cards. Refer to *Installing Video Input Cards (CM9765-VCC)* in the *Installation* section.

- You can install additional matrix bay units in a single-node system, using either a sideframe configuration or a downframe configuration.

- You can add a backup power supply module (CM9700-MPS) to a System 9765 matrix bay to provide redundancy to the bay's power supply.

- You can use CM9760-MDA unit(s) to increase monitor output capacity to a maximum of 256. Refer to the CM9760-MDA Installation/Operation manual and note that the procedure for using an MDA unit with a CM9700-CC1 is the same as for a CM9760-CC1.

- You can expand the number of communication ports available on the CC1 in either or both of the following ways:
  - If your original CC1 configuration allows, you can install additional CM9700-SER serial communication cards (the CC1 can contain a maximum of four cards).
  - You can add additional, external communication ports with the CM9700-SER-32 Port Expander. Refer to the CM9700-SER-32 Port Expander Installation/Operation manual and note that the procedure for using a port expander with a CM9700-CC1 is the same as for a CM9760-CC1.

Instructions for expanding your System 9765 are provided in the following pages.

NOTE: You can also expand a single-node system to a networked system by adding a CM9700-NW1 unit. Refer to the *Networking* section in this *Appendix* for instructions.

INSTALLING ADDITIONAL MATRIX BAYS—SIDEFRAMING AND DOWNFRAMING

When either more cameras and/or more monitors are needed than can be accommodated by one matrix bay (256 x 16), you can install additional matrix bays in either of the following configurations:

* Sideframing—This option increases the number of available video inputs.
* Downframing—This option increases the number of monitors available for output.

Sideframing

To expand the matrix video inputs beyond 256, you can use multiple bays, with video from the monitor outputs on each bay sideframed (with cable connections) to the bay to which the monitors are connected.

NOTE: Sideframing requires that the matrix bays be located in nearby bays since the expansion occurs in a horizontal manner.

In a sideframe configuration, the termination jumpers on the RPC cards must be set as follows:

* The input bay(s) termination jumpers must be in the unterminated position; these are the bays to which the cameras (or other input devices) are connected.
* The output bay termination jumpers must be in the terminated position; these are the bays to which the monitors (or other output devices) are connected.

Refer to *Change the Termination Jumpers on a Rear Panel Video BNC Card* in the *Installation* section for instructions.

System 9765 provides the following sideframing options:

* Sideframe Option A (refer to Figure 13 in the Installation section):

   Sideframe from each bay to the bay to which the monitors are connected—the sideframe cables are connected to the video inputs on the bay with the monitors, starting with slot one, and continuing to the higher slots as necessary. Any camera input slots not used to receive output from sideframed bays can be used for additional camera inputs.

Note that the bay-to-bay input-to-output wiring must correspond to specific slot positions, as illustrated in Figure 13 and Figure 14 in the *Installation* section.

* Sideframe Option B (refer to Figure 14 in the Installation section):

   Sideframe from each bay directly to an output bay. This method requires an extra bay, but maintains the total capacity of camera inputs in each of the other bays in the system.

Downframing

To expand the matrix video outputs beyond 16, you can downframe the video from the first CM9765-MXB to subsequent CM9765-MXB units for an additional 16 monitor outputs on each matrix bay. Refer to Figure 31.

You can connect a maximum of eight bays in a downframing configuration for a total MXB capacity of 128 monitors; in addition, you can increase monitor capacity further by using MDA units, for a total single-node system capacity of 256 monitors.

When downframing video, the termination jumpers on the RPC cards in the first bay must be set in the unterminated position. Refer to *Change the Termination Jumpers on a Rear Panel Video BNC Card* in the *Installation* section for instructions.

When looping video out to another device (such as a DVR, VCR, or switcher), use the CM9765-DFL card in the final bay. You must set the termination jumpers on the CM9765-DFL card to the unterminated position. Refer to the *Change the Termination Jumpers on a Rear Panel Video BNC Card* section. Terminate the video signal at the final device.

Refer to the *Downframing* section on the following page for instructions on setting the termination jumpers in the downframed bays.
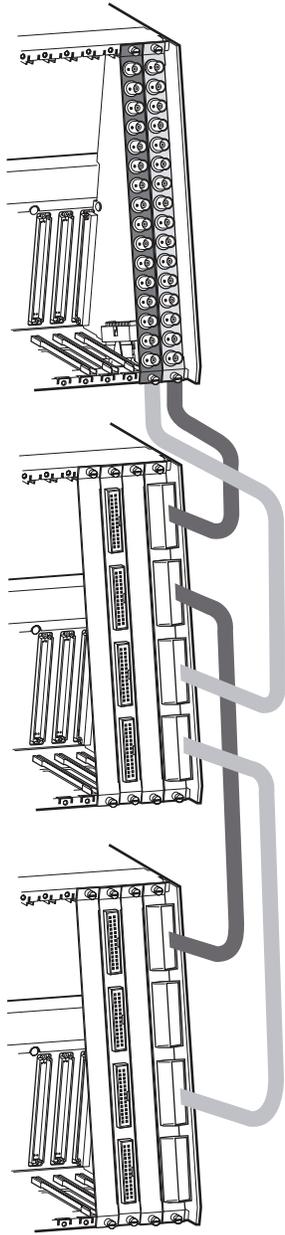
Figure 31. Downframing with DFC Cards
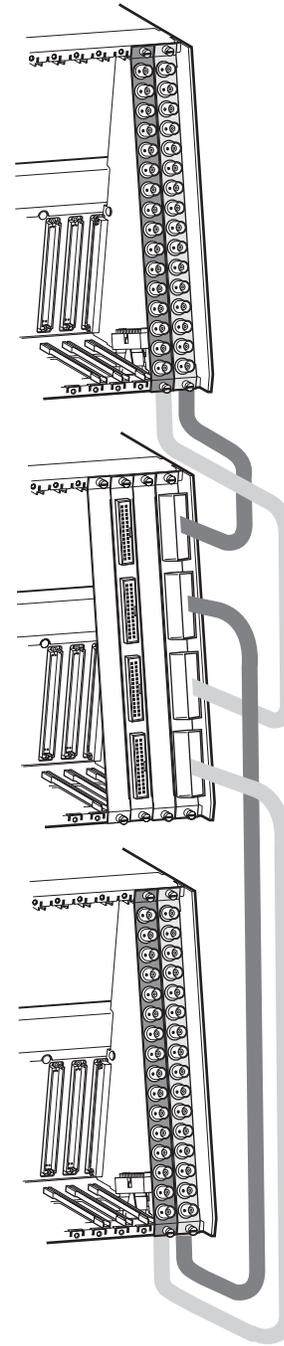
Figure 32. Looping Video Out in a Downframed Configuration

A downframe cable is used to connect the bottom connector of the RPC card to a downframe card.
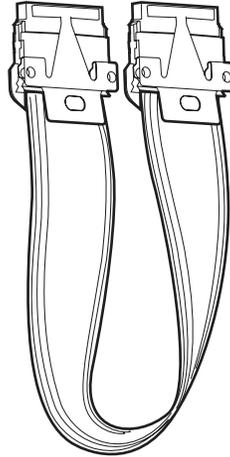
Figure 33. DFC Cable

Downframe Cards

The following downframe cards are available for System 9765:

• CM9765-DFC—This is the "no looping" downframe card.

• CM9765-DFL—This is the "looping" downframe card.

If you are downframing to only one bay, the downframed bay can be populated with either DFL or DFC cards.

If you are downframing to more than one bay, each bay between the first and the last must be populated with DFC cards, and the termination jumpers must be set in the unterminated position. The last bay can be populated with either DFL or DFC cards. You must terminate the video signal at the final point in the downframe configuration, which could be either of the following:

• If you are not looping video out from the final bay, terminate the video at the DFL or DFC cards in the final bay.

• If you are using the DFL card in the final bay, and are looping video to another device, terminate the video signal at the final device.

INPUT FROM BAY ABOVE
(LOWER-NUMBERED SLOT)

OUTPUT TO BAY BELOW
(LOWER-NUMBERED SLOT)

INPUT FROM BAY ABOVE
(HIGHER-NUMBERED SLOT)

OUTPUT TO BAY BELOW
(HIGHER-NUMBERED SLOT)

IN-A

OUT-A

IN-B

OUT-B

UNTERMINATED
TERMINATED
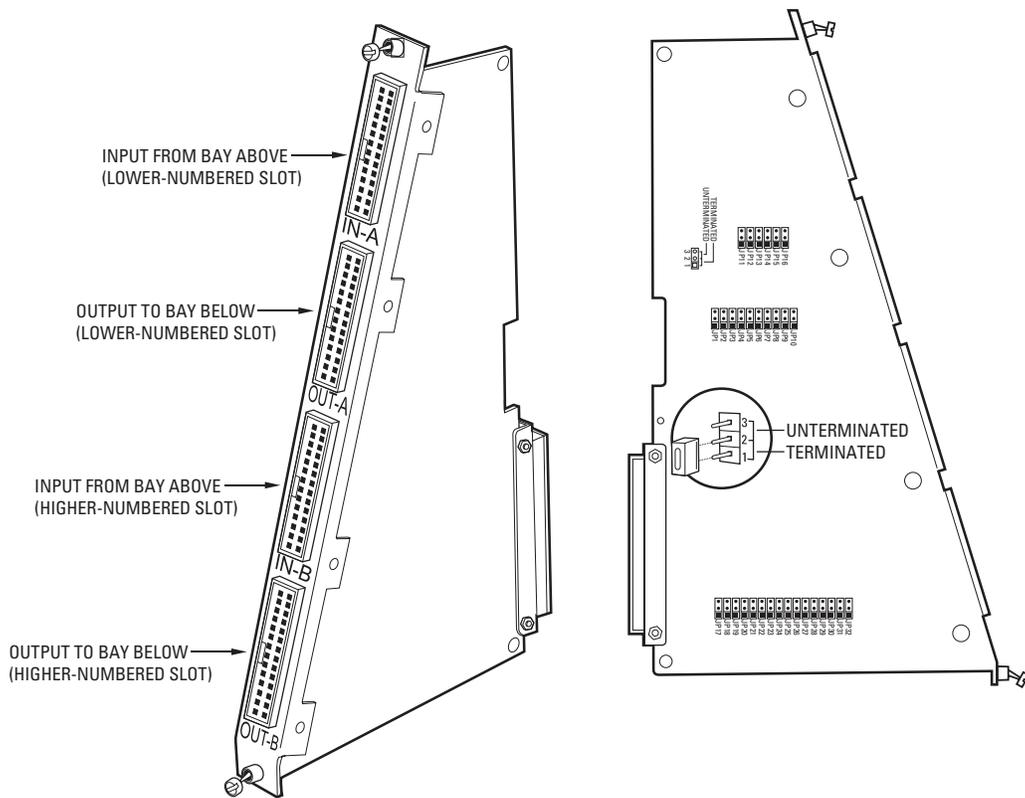
Figure 34. DFC Card
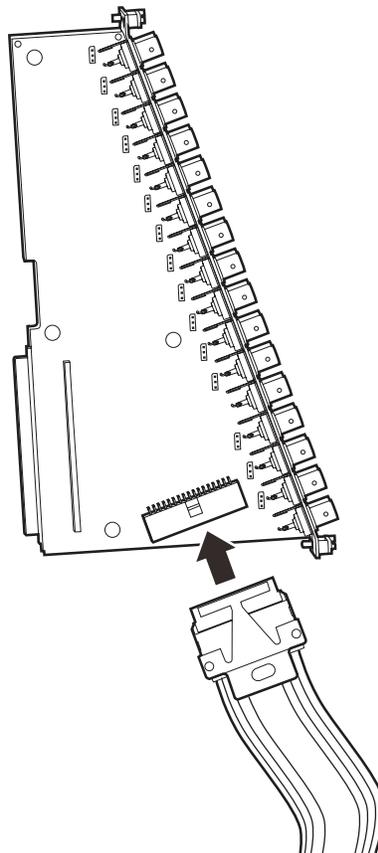
Figure 35. CM9765-DFL Card

HOW TO INSTALL OR REPLACE A CM9700-SER CARD IN THE CC1

If you have ordered a replacement or additional CM9700-SER serial communication card, complete the following steps to configure the jumpers on the CC1 board for the slot position the new SER card will occupy.

NOTE: When connecting peripheral equipment to the serial communication ports, shielded cabling is required to comply with CE emissions guidelines.

1. Turn off the CC1 power switch.

⚠ **WARNING:** Failure to turn off the CC1 power switch could result in serious damage to the equipment.

2. Remove the top cover of the CC1. Refer to Figure 36.

    a. Remove the 10 screws that hold the top cover in place.

    b. Tilt the top cover up at a slight angle, as indicated by the dotted line in the drawing, and then pull the cover backwards to remove the cover from the front edge of the CC1 chassis.
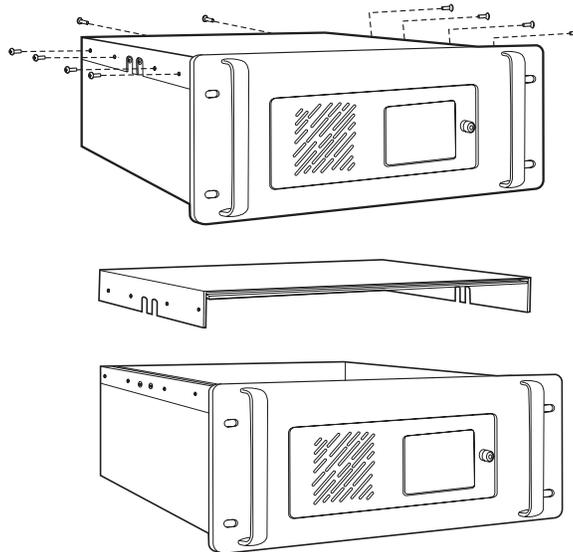
Figure 36. Removing the CC1 Top Cover

3. Set the W1 interrupt (IRQ) and W2 address select jumpers on the SER card. Refer to Figure 37.

Note that the jumper settings vary, depending on the ISA slot in which the SER card is to be installed. Refer to the following tables for a list of SER card jumper assignments.

Table G. SER Card Jumper Assignments for a CM9700-CC1 System Control

ISA Slot Number	W1 IRQ Setting	W2 Address Setting
1	IRQ 10	Pins 1 to 2 and 3 to 4
2	IRQ 11	Pins 1 to 2 only
3	IRQ 12	Pins 3 to 4 only
4	IRQ 5	No jumpers

Table H. SER Card Jumper Assignments for a CM9700-NW1 Network Interface Unit

ISA Slot Number	W1 IRQ Setting	W2 Address Setting
1	IRQ 10	Pins 1 to 2 and 3 to 4
2	IRQ 11	Pins 1 to 2 only
3	IRQ 12	Pins 3 to 4 only

NOTE: For a CM9700-NW1, the default configuration is one SER card. A maximum of three SER cards can be installed in a CM9700-NW1.

W1 IRQ SELECT

PIN 2 ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ PIN 22
PIN 1 ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒ PIN 21

IRQ 3 IRQ 4 IRQ 5 IRQ 6 IRQ 7 IRQ 9 IRQ 10 IRQ 11 IRQ 12 IRQ 14 IRQ 15

W2 ADDRESS SELECT

PIN 2 ☒ ☒ PIN 4
PIN 1 ☒ ☒ PIN 3
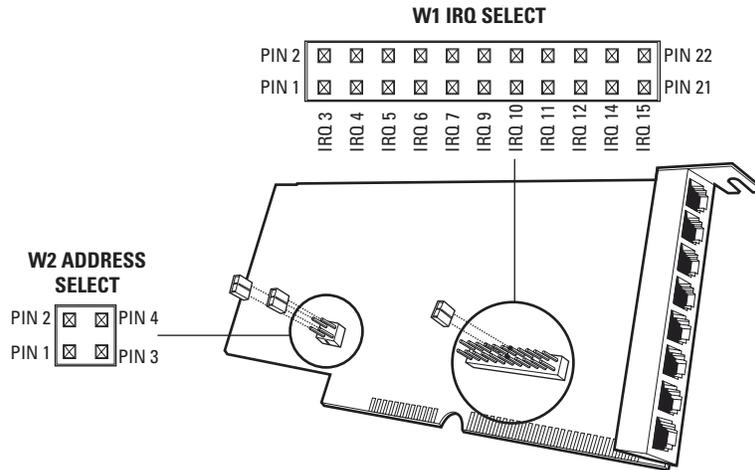
Figure 37. SER Card Jumper Assignments

4. Insert the new SER card into an available ISA slot. The default CM9700-CC1 configuration provides SER cards in ISA slots 1 and 2, so you will most likely insert the new card into slot 3 or 4. Refer to Figure 38.

5. Replace the top cover of the CC1.

6. Power up the CC1.

CM9700-SER CARD ACCESS SLOTS (SLOT COVERS REMOVED)

SLOT COVERS

ISA SLOTS (DEFAULT CM9700-SER CARDS SUPPLIED IN ISA SLOTS 1 AND 2)

CM9700-CC1 CHASSIS, FRONT
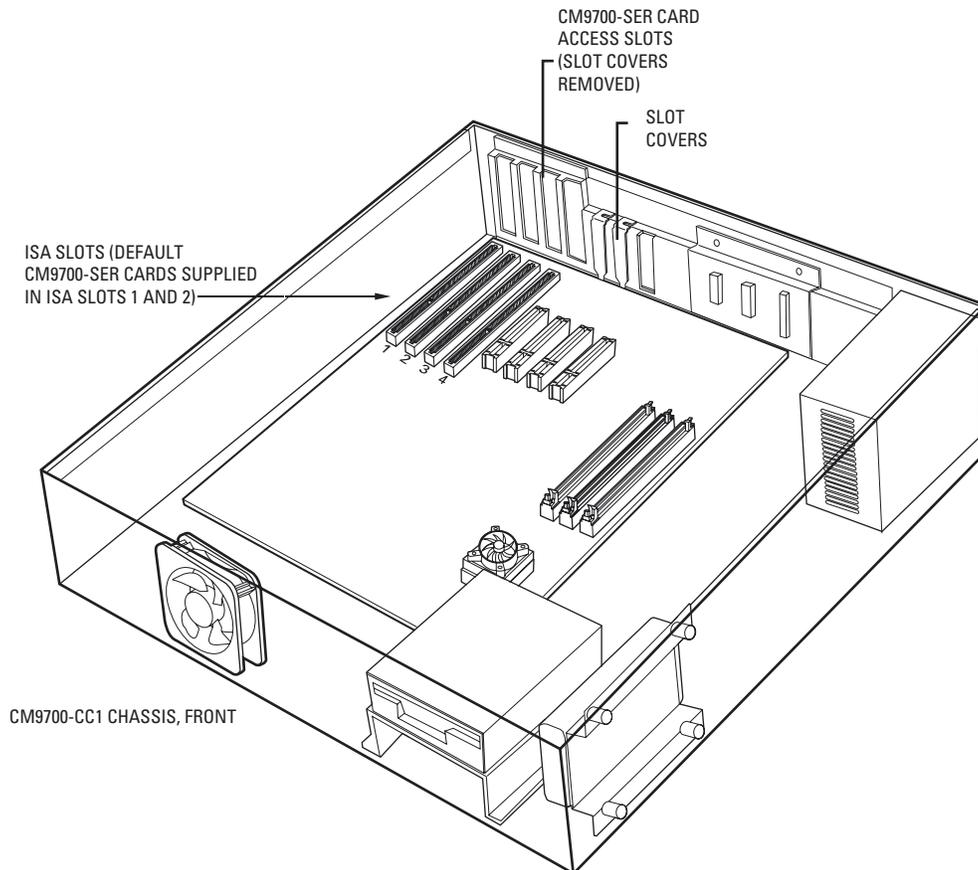
Figure 38. How to Install a CM9700-SER Card

VIDEO INPUT CARD (CM9765-VCC) DETAIL
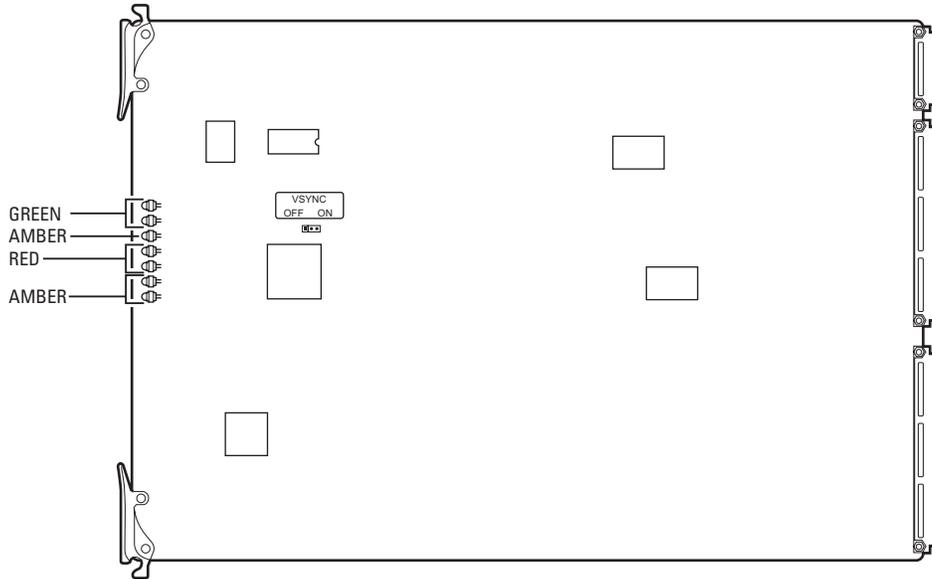
Figure 39. CM9765-VCC Card

Table I. Video Input Card (CM9765-VCC) LEDs

Front Panel Label	Color	When LED Is On
+	Green	The +5 VDC power source is functioning properly.
-	Green	The -5 VDC power source is functioning properly.
HB	Amber	The CPU is active; this "heartbeat" LED blinks at a different rate, according to the current activity: 0.25 Second: Programming The VCC card blinks at a quarter-second rate while it receives updated programming from the VMC card. 0.5 Second: Boot ROM The VCC card blinks at a half-second rate while executing boot ROM code. 1.0 Second: Normal Operation The VCC card blinks at a one-second rate during normal operation.
CF	Red	This LED illuminates if communication from the CM9765-VMC monitor card failed or if the CM9765-VMC card is inserted in the wrong slot.
VL	Red	Video Loss: This LED illuminates when there is a video signal missing from the input of the rear panel.
CD	Amber	Configuration: This LED illuminates on startup if the FPGA is not programmed. Once the FPGA is programmed from the application code or the test code, it will turn OFF.
AX	Amber	This LED toggles on every valid switch command. It also flashes when the CF LED is illuminated to indicate that communication with the primary CM9765-VMC card failed.

MONITOR OUTPUT CARD (CM9765-VMC) DETAIL
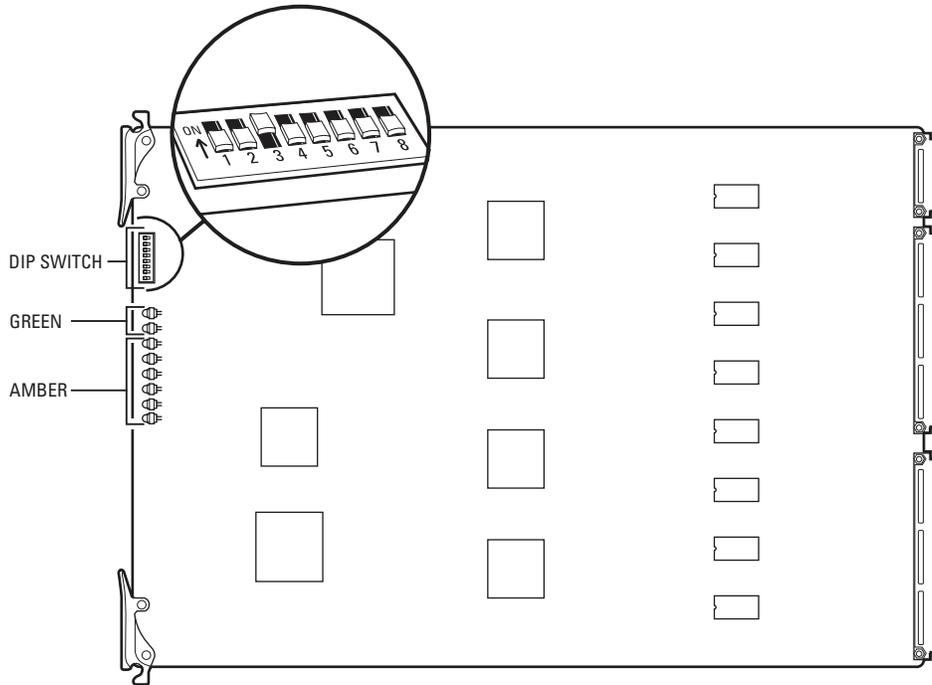
Figure 40. CM9765-VMC Card

Table J. Monitor Output Card (CM9765-VMC) LEDs

Front Panel Label	Color	When LED is on or blinking
+	Green	The +5 VDC power source is functioning properly.
-	Green	The -5 VDC power source is functioning properly.
HB	Amber	The CPU is active; this "heartbeat" LED blinks at a different rate, according to the current activity: <u>VMC—0.25 Second: Downloading</u> The VMC card blinks at a quarter-second rate while updated software is downloading from a PC connected to the RS-232 COM port on the rear panel. <u>0.5 Second: Boot ROM</u> The VMC card blinks at a half-second rate when in normal boot ROM mode. <u>1.0 Second: Normal Operation</u> The VMC card blinks at a one-second rate during normal operation.
RX	Amber	Blinks when communication is active between the MXB and either the CC1 or a PC (through the RS-232 COM port; for system software upgrade).
MP	Amber	Blinks when communication is active between the VMC card and VCC cards. This communication occurs during normal system operation, as switching commands are sent and polled.
FP	Amber	Blinks once to indicate that the characters have been enabled for monitor display. This is the third initialization step.
CP	Amber	Blinks once to indicate that the CPU support chip has been configured. This is the second initialization step.
BP	Amber	Turns on during the boot sequence (the first initialization step), and turns off when initialization is complete.

The monitor output card DIP switch selects various options. These switches are set in the proper position at the factory, but they can be changed, if necessary.

Table K. Monitor Output Card DIP Switch

Switch 1		Color System
ON		PAL
OFF		NTSC*
Switch 3	**Switch 2**	**Port 1 RS-422 Baud Rate**
OFF	OFF	2400
ON	OFF	9600*
OFF	ON	4800
ON	ON	9600
Switch 4		**Data Protection**
ON		Main flash programmable
OFF		Main flash protected*
Switch 5	**Switch 6**	**Test Mode**
OFF	OFF	Not used*
ON	OFF	Diagnostic mode
OFF	ON	Display software version levels
ON	ON	Display color bars
		NOTE: You can also display color bars with a keyboard command (refer to *Monitor Color Adjustment* in the *System Start-Up* section).
Switch 7		**Video Loss**
ON		Report
OFF		Ignore*
Switch 8		**VMC Force Program All Hardware**
ON		Force
OFF		Upload if necessary*
		The CM9765-VMC card verifies the version levels on all software and hardware image binary files on the CM9765-VCC cards. If the file version levels are not the same as the files on the CM9765-VMC, the CM9765-VMC updates all the files on the CM9765-VCC cards.
		If you change this setting to Force, the CM9765-VMC updates all the files on the CM9765-VCC cards without checking file version levels.

*Factory settings

NETWORKING

Networking of systems is required when the following conditions apply:

- Two or more individual systems need to share video and control features. The CM9700-NW1 network interface unit (NIU) allows you to link any combination of the following systems into a network:
  - One or more System 9740 or 9760 systems (note that the CM9740-CC1/CM9760-CC1 must be upgraded to software version level 9.01)
  - One or more System 9765 or 9780 systems
- More than 2,048 cameras are required.
- More than 256 monitors are needed for the system (without full cross-point).

NOTE: When using CM9760-MDA units, you can increase the monitor output capacity of a non-networked system to a maximum of 512.

- Alarms and cameras connected to remotely-located systems need to be accessed.

The CM9700-NW1 network interface unit allows you to combine your systems into a network. Up to 24 nodes can be connected to a CM9700-NW1.

The NIU offers the following features:

- Each system maintains local operations (local camera switching, control, etc.) if the NIU goes off-line.
- A system can be remotely located as far as the transmission type and path allows (typically hard-wired with 24 AWG twisted pair up to a maximum of 4,000 feet/1,219 m).
- Information on each node connected to the network (for example, cameras and monitors attached) is automatically downloaded to the NIU.
- Operators can be allocated/restricted access to most features/equipment throughout the network.
- Alarm signals can be transferred between nodes.

Refer to the *System 9760/9765 Networking Guide* for detailed instructions on networking your system. Note that the information in the networking guide is applicable to both the System 9760 and System 9765, except for the instructions in the *Network Setup* section, which apply to the old CM9760-MGR software. For instructions on programming a system controlled by a CM9700-NW1, refer to the CM9700-MGR Software Guide (provided in the System 9765 binder).
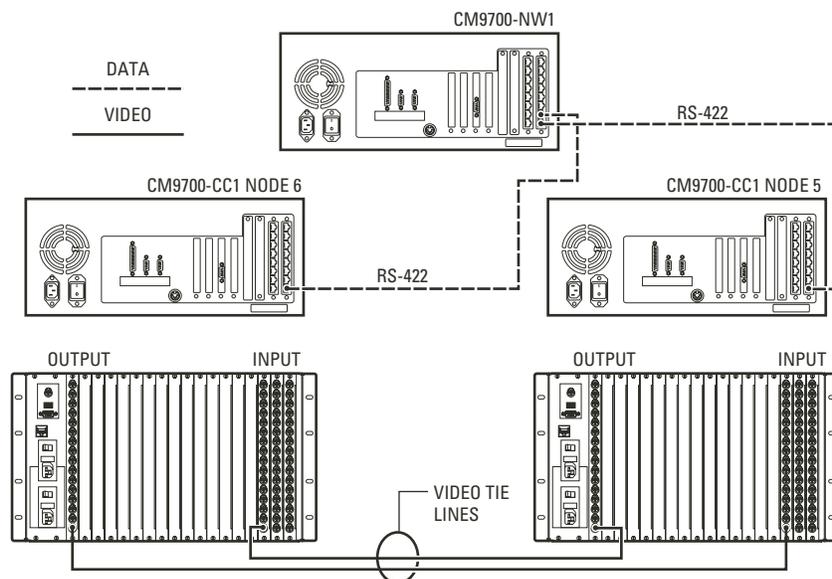
Figure 41. Sample Networked System

CONNECTING SATELLITE DEVICES

You can connect a CM6800E-48X8 matrix switcher or a CM9760-SAT device to System 9765.

Refer to the CM9760-SAT Installation/Operation manual or to the CM6800E-48X8 Installation/Operation manual for instructions. The procedure for using a satellite device with a CM9700-CC1 is the same as for a CM9760-CC1, except that the programming within CM9700-MGR is more user-friendly. You just need to add the satellite device using the Add Device wizard. The wizard leads you through the process, which includes selecting tie lines and unique logical numbers.
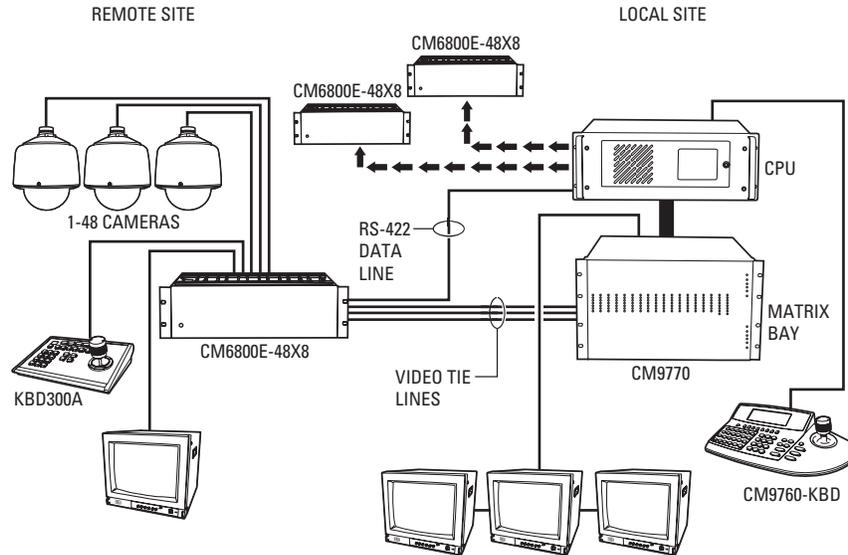
Figure 42. Sample Satellite System

PROGRAMMING SATELLITE DEVICES

To add a satellite device to a System 9765, you simply need to add the satellite device in the CM9700-MGR. The Add Device wizard helps you configure all the settings that are needed to set up the device for satellite operation.

Detailed instructions for adding a satellite device in the CM9700-MGR are provided in the CM9700-MGR Software Guide.

Note that you cannot program camera titles for satellite cameras through the 9700 System Manager. You can program these camera titles directly from the satellite device. When a System 9765 monitor displays a satellite camera, the title received from the satellite device is displayed.

Figure 43. Add a Satellite Device

HOW TO INSTALL VIDEO PATCH PANELS (CM9700-VPP)

There are two ways you can mount a CM9700-VPP video patch panel into a rack.

1. Single panels onto a rack

2. Up to 16 panels using the CM9700-VPP-RK

The following illustration shows how to mount a single panel onto a rack. The panel is mounted horizontally.
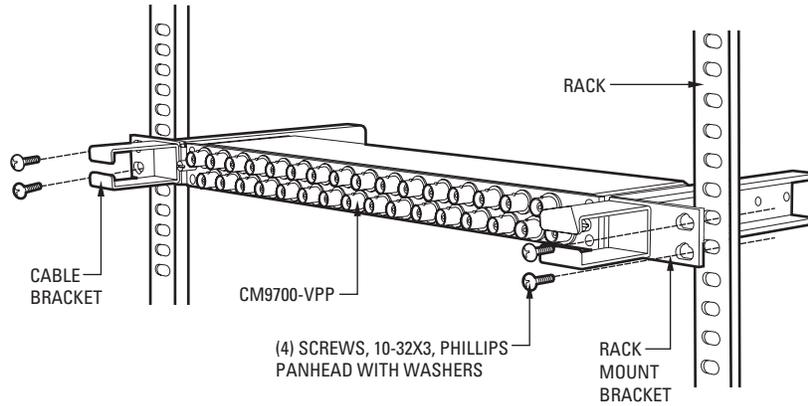
Figure 44. CM9700-VPP Horizontal Mount

The following illustration shows how to mount up to 16 panels using the CM9700-VPP-RK. The panels are mounted vertically in the CM9700-VPP-RK. This rack saves 1 RU of space and provides better cable management.
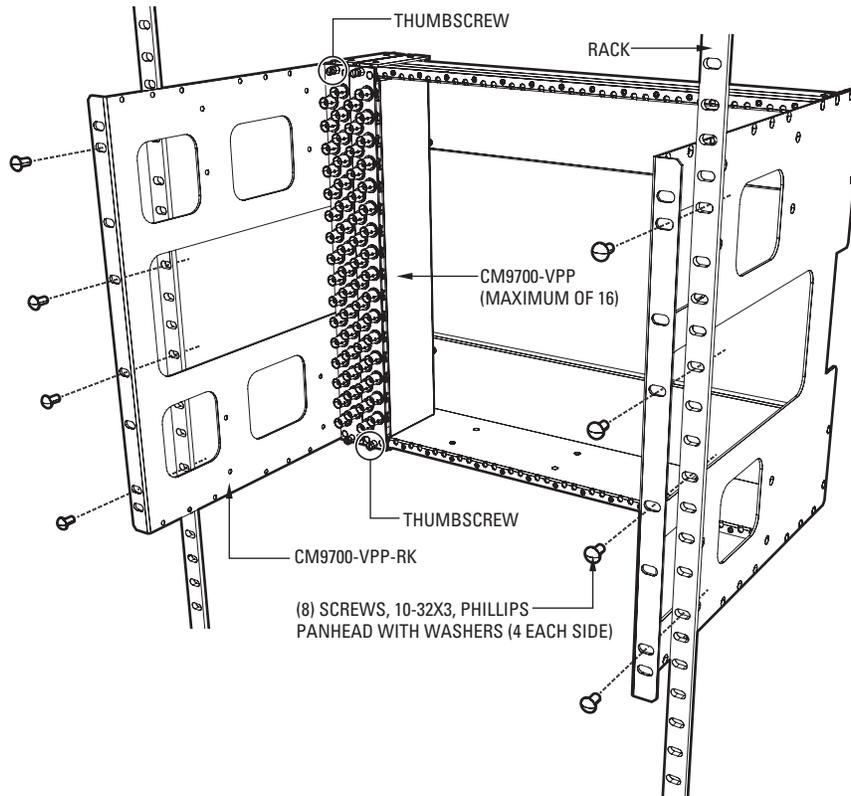
Figure 45. CM9700-VPP Vertical Mount

MOUNTING THE CM9765-MXB IN AN OPEN RACK
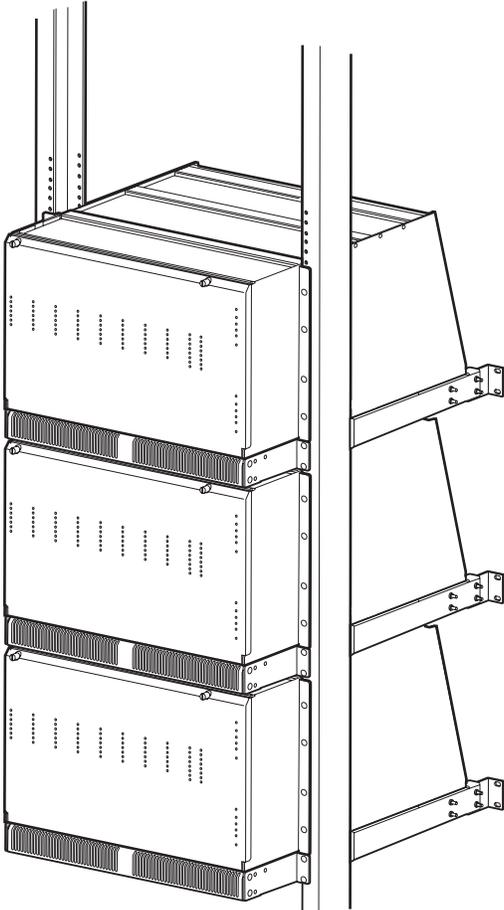
Figure 46. Mounting the CM9765-MXB in an Open Rack

DOS ENVIRONMENT AND COMMAND REFERENCE

DOS stands for Disk Operating System. Every time you turn on the CM9700-CC1 or every time you reboot (Alt +Ctrl +Del), the computer loads DOS from the CC1 disk into the memory (RAM). Once loaded DOS lets you run other programs, in particular, the CM9700.EXE program.

On factory-configured systems the autoexec.bat file is configured for one of the following scenarios:

• The boot process ends at the following system prompt (c:\9700>).

• The boot process loads and executes the CM9700.EXE program.

THE BOOT PROCESS

The following process occurs when the CC1 is turned on or is rebooted:

1. If turned OFF and then turned ON, the CC1 goes through a power-on self-test (POST). Here the computer essentially examines its electronic components.

2. The computer looks at drive A for a DOS system disk. If one is not there, the CC1 will load DOS from its hard drive.

3. This process looks for two "hidden" system files: IO.SYS and MSDOS.SYS. If these files are not present, DOS displays the "Non-System disk or disk error" message. (The CC1 also displays this error during the boot process if there is a floppy disk in the A drive that has no system files).

4. If the "hidden" files are present, IO.SYS loads first and executes. An initialization program called SYSINIT contained within IO.SYS reads in the MSDOS.SYS file; SYSINIT next locates the CONFIG.SYS file and executes its files for it to configure itself in memory. Then, SYSINIT locates and invokes COMMAND.COM. If SYSINIT cannot find COMMAND.COM, DOS displays the "Bad or missing Command Interpreter" error message.

NOTE: Since COMMAND.COM is not a hidden file, it is possible that it could accidentally be moved, corrupted or erased. If this occurs, you may need to start DOS from a floppy disk and COPY COMMAND.COM into the CC1s root directory.

5. If SYSINIT finds and loads COMMAND.COM, it, in turn, searches your root directory for the AUTOEXEC.BAT file. If it exits, COMMAND.COM will cause the AUTOEXEC.BAT file to execute. If AUTOEXEC.BAT does not exist, the DATE and TIME commands are invoked by COMMAND.COM. After entering date and time information, the basic system prompt (C:>) appears. This completes the startup or boot process.

You cannot separate the boot process from CC1 initialization. The DOS boot process must succeed before the CM9700.EXE program can run. The result of the DOS initialization process is that you either have a system prompt on a DOS screen or, as part of the boot process, the CM9700.EXE program has been invoked. In the latter case, the System window of the diagnostic screen displays "Setup Complete…" if everything initialized OK; otherwise, an applicable error message appears.

AUTOEXEC.BAT AND THE BOOT PROCESS

The AUTOEXEC.BAT file is the last file called during the boot process. For CC1s configured as part of a system node at the factory, the end result of this process is the appearance of the CM9700 diagnostic screen on the attached VGA monitor.

The factory-configured boot process occurs because of the instructions added to the AUTOEXEC.BAT file. The AUTOEXEC.BAT file is a batch file, which contains a series of instructions that are executed serially when the file is called.

Invoking the CM9700 Executable

The following commands are the last two in the AUTOEXEC.BAT file:

CD9700   This command directs DOS to the 9700 directory where the 9700 executable resides.

CM9700 Node1   This command starts the executable (CM9700) and directs the program to load into memory all configuration files having the collective prefix name of "Node1" (also located in the same directory).

The program continues to configure the system environment and goes on line. If everything is functioning properly, the "Setup Complete" message appears on the CM9700 diagnostic System Window on the attached VGA monitor.

If you change the name (the prefix) of your current flat files or copy a new set of configuration files (with a different name) to the 9700 directory, then you must change the AUTOEXEC.BAT file to correspond.

File Names and DOS

File names in DOS are limited to eight characters. If you issue a command to change the name of the configuration files in the 9700 directory to a name exceeding eight characters, the name is truncated to eight characters. The Windows-based CM9700-MGR program does not allow you to use more than eight alphanumeric characters when creating a name for your set of configuration files.

DOS Commands

DOS commands are divided into two groups. Because of the large number of DOS commands available, only the most commonly used commands are loaded into memory (RAM). The remaining commands reside in the DOS directory. The commands loaded into memory are called internal commands and the commands in the DOS directory are called external commands. When DOS reads a command, it looks first in RAM, then it looks in the DOS directory, and then it looks in the directory from which the command was issued. If you invoke an executable type file that isn't in any one of those places, you must navigate to the directory in which the executable file is located.

The Path Statement

As an alternative to navigating to the directory in which an executable file is located, you can put a PATH command statement into the AUTOEXEC.BAT file. The PATH statement directs DOS to look in each of the directory paths listed there for any executable [.EXE, .COM or .BAT file] it is instructed to carry out. The syntax of the PATH statement is as follows:

PATH = { [drive:]path; [drive:]path; [drive:]path…..] }

Example: PATH=c:\;c:\dos;c:\windows
(Note that spacing is included in the syntax statement to make it easier to see the elements that make up the path statement. In actual use, no spaces exist, as demonstrated in the example.)

Semicolons (;) separate drive-path statements. There are no spaces. The complete drive path must be given for each directory you wish to include in the search. The search is for files with .EXE and .COM extensions only. If the executable you call, in turn, issues a call for a non-executable file (that is, one without an .exe or .com extensions), then the PATH statement does not apply. Instructions for using the executable must tell you either where to place needed non-executable files or the executable itself must provide the means whereby the file can be found. DOS will not look for these files.

Note that you cannot insert the directory path for the CM9700 executable file into the PATH statement. The CM9700 executable uses a non-executable file that always resides in the C:\9700 directory. If you invoked the CM9700 executable from any directory location other than the C:\9700 directory, the executable would not finish successfully because CM9700.EXE expects to find the file residing in the same directory that it does. You can manually invoke the command (CM9700 test) while in the C:\9700 directory, but in most cases, you need to reboot the CPU, and as a result, DOS boots to the root directory. That is why the CD command to switch to the 9700 directory is included in the AUTOEXEC.BAT file. If you used the PATH command statement alone, the CM9700.EXE would be found, but the other non-executable file needed would not be found and system initialization would fail.

Navigating the DOS Directory Tree

When you exit to DOS on the CC1, you are normally at the C:\9700> screen prompt. While in the directory, you may manipulate any file there or you may navigate to any subdirectory contained in that directory.

To navigate to a subdirectory of the 9700 directory, use the following syntax:

C:\9700> CD [subdirectory name] [ENTER]

For example, if a 9700 subdirectory had the name BKUPTST, your entry would read as follows:

C:\9700> CD BKUPTST [ENTER]

This takes you to the C:\9700\BKUPTST> screen prompt in the BKUPTST directory:

Once in the C:\9700\BKUPTST> prompt, files within the directory can be manipulated. The key entries used to backtrack up the directory tree depend on where you want to go. From the BKUPTST directory, you either can go back to the root directory with one single key entry or you can go in steps, one directory at a time. To proceed directly to the root directory, enter the following:

C:\9700\BKUPTST> CD\ [ENTER]

The " \ " symbol, when used alone represents the root directory; otherwise, it indicates separation of various levels of the directory tree, collectively known as the directory path. The result of the above entry takes you directly to the root directory and the "C:\>" screen prompt:

To backtrack up the directory tree one directory at a time, enter the following at the system prompt:

C:\9700\BKUPTST> CD.. [ENTER]

That entry takes you to the C:\9700> prompt.

If you entered the same command again (CD..) at the c:\9700> prompt and pressed the ENTER key, you would finally end up again at the root directory as previously done. To proceed directly from the directory you are in to another directory, no matter where in the directory tree you are, enter the total directory path of the location you wish to go to at the system prompt.

For example, to get to the C:\9700\BKUPTST directory from the root directory, type C:\> CD [directory path], and then press the ENTER key. You will be at the C:\9700\BKUPTST> screen prompt.

Manipulating Files in the DOS Environment

The safest way to manipulate files is to do so from within the directory in which those files are located. This is because of the following reasons:

- If you enter a DIR command at the directory prompt, then the names of the file(s) you wish to manipulate are right there on the screen. This reduces the risk of making simple mistakes, such as entering an incorrect file name as part of an erase command, for example.

- When using commands directed at file manipulation, the format of the command requires that the command name be listed first, followed by the file name to be acted upon. If you issue a command for a file that is in another directory, then you must enter the complete directory path where that file is found in addition to the name of the file at which the command is directed.

The command formats (such as COPY, MOVE, RENAME, DELETE) for the most commonly used commands are provided with examples in the Command Reference Table at the end of this section.

Using the Wild Card Character

The most commonly used wild card character recognized by DOS is the asterisk (*). The asterisk can be used as a placeholder to group files that are going to be acted upon by the same DOS command. The asterisk helps you specify character positions that are of the "don't care" type in file names. When DOS encounters the asterisk, DOS ignores the characters in the position containing the wildcard as well as all the characters that follow it.

The CM9700-CC1 configuration files provide a good example of how the wildcard can be used.

Example 1

To copy configuration files from the A floppy drive to the 9700 directory on the CC1 disk complete the following steps:

1. Change to the A: directory

2. At the A prompt type your command using the following syntax:

   A:> copy [configuration file name].* [destination].

   For example, if the filename prefix for the configuration files was "Node1", type **copy Node1.* C:\9700**

3. Press the Enter key.

Example 2

To move configuration files from the 9700 directory to another directory [previously created] for archiving purposes, complete the following steps:

1. Change to the 9700 directory.

2. Type your command using the following syntax:

   C:\9700>copy [source] [destination]

   For example, if the destination directory was "archive," type **copy Node1.* C:\archive**
   Since you are already in the 9700 directory, the source portion of the command consists only of the file name(s) to be moved. The destination contains the path to the directory where the files are to be moved to.)

3. Press the Enter key.

DOS REFERENCE

The following table provides a list of the most common DOS commands that you are most likely to use when operating the CC1. In addition, you can use the command HELP to access the MS-DOS command reference on the CC1.

NOTE: In DOS, the backslash symbol (" \ ") used alone, refers to the root directory. The [..] symbol refers to the parent directory.

Table L. DOS Command Reference Directory

COMMAND	EXAMPLE(S)	SWITCHES	COMMENTS
CD	C:\>**CD**		Displays the name of the current directory or changes the current directory if specified and if the directory specified exists.
	C:\>**CD 9700**		Changes to the 9700 directory.
CLS	C:\>CLS		The Clear Screen command clears a full screen to just the command prompt and the cursor.
COPY	C:\>COPY [source] [destination] C:\>COPY A:\TEST.* C:\9700 C:\>COPY A:*.* C:\9700 C:\>COPY A:\TEST.MON C:\9700		Copies one or more files to the location you specify. **Source** specifies the location and name of a file or set of files. Source can consist of a driver letter and colon, a directory name, a filename, or a combination files you wish to copy. **Destination** specifies the name and location of a file or set of files to which you want to copy. Destination can consist of a drive letter and colon, a directory name, a filename, or a combination. When more than one file is copied, MS-DOS displays each filename as the file is copied.
DEL	C:\>DEL C:\9700\TEST.MON C:\>DEL A:TEST.MON C:\9700>DEL TEST.*		Deletes the file or files you specify. You must include the location (if other than you current location) and name of the file or set of files you wish to delete.
	C:\9700>DEL TEST.* /P	/P	Prompts you for confirmation before deleting each file.
DIR	C:\>**DIR**		Displays a list of files and subdirectories that are in the directory you specify. When you use the DIR command without switches, it displays the disk's volume label and serial number, one directory or filename per line including the filename extension, size, date and time file was last modified; total number of files listed, cumulative size and free space left on the disk.
	C:\>DIR/**W**	/W	Displays the listing in wide format, with as many a five filenames or directory names on each line.
	C:\>DIR/**P** C:\>DIR/**W/P**	/P	Displays one screen of the listing (in whatever format) at a time. It is useful to use these switches when looking at the contents of the DOS directory. This switch will look for all instances of the filename in all directories.
	C:\ >DIR { filename} **/S** [syntax] example: C:\ >**DIR *.mon /S**	/S	In the example the **location** of all file names having the .mon extension will be found and displayed.
EDIT	C:\>**EDIT AUTOEXEC.BAT**		Starts the MS-DOS editor, a test editor you can use to create and edit ASCII text files. The example text shown would load the autoexec.bat file for editing.

COMMAND	EXAMPLE(S)	SWITCHES	COMMENTS
FASTHELP	C:\>**FASTHELP**		Lists and briefly describes every command provided with MS-DOS. This list is much less detailed than the list you get using the "HELP" command.
	C:\>FASTHELP **DIR**		Specifies the name of the command that you wish FASTHELP to give information about. In this example, DIR.
FORMAT	C:\>FORMAT A:		Formats a disk for use with MS-DOS.
	C:\>FORMAT A:/S	/S	Transfers system files to the formatted disk. You can boot from the floppy of a disk formatted using this switch.
HELP	C:\>**HELP**		Starts the MS-DOS command reference located on the CC1's hard disk.
	C:\>HELP **DIR**		Specifies the command whose help topic you want to display. In this example, DIR.
MD	C:\>**MD** 9700		Creates a directory. The example creates a 9700 directory.
MORE	C:\>DIR C:\DOS **| MORE**		Displays one screen of information at a time. Can also be used with the TYPE command when viewing a long text file. The symbol is called a redirection operator. On the keyboard, it is located above the backslash \ symbol.
PATH			Indicates which directories DOS should search for executable files. By default, DOS searchers just the current directory.
RENAME or REN	C:\>**RENAME** C:\9700\TEST.* TESTALL.* C:\>**REN** C:\9700\TEST.* TESTALL.*		Changes the name of the file or files you specify. Specify the name and location of the file or files to be changed. The last part of the command specifies the new name. You cannot specify a new drive or path.
TYPE1	C:\>**TYPE** C:\9700\TEST.MON		Displays the contents of the text file you specify. You must specify a directory path if the location of the file is in a directory other than the one you are in.
	C:\>**TYPE** C:\9700\TEST.ALM MORE		MORE	Here the MORE redirection operator is used to enable us to view the alarm file (usually quite long), one page at a time.
UNDELETE	C:\>**UNDELETE** C:\9700\TEST.BAT		Restores files that were previously deleted using the DEL command.
	C:\>UNDELETE C:\9700\ **/LIST**	/LIST	Lists the deleted files that are available to be recovered, but does not recover any files.
	C:\>UNDELETE C:\9700\ **/ALL**	/ALL	Recovers deleted files without prompting for confirmation on each file.
RMDIR or RD	C:\>**RMDIR** NETWORK C:\>**RD** NETWORK		Deletes or removes a directory. Before the directory can be deleted, it must contain no files or other subdirectories. The directory must be completely empty except for the " . " and " . . " symbols.
VER	C:\>**VER**		Displays the current version of DOS on your machine.
TREE	C:\>**TREE**		Displays the directory structure of all the directories on your hard drive if it is issued while in the root directory; otherwise, it will display only the subdirectories of the directory you are currently in.

Troubleshooting

Problems with the CC1

Problems with the CC1 as part of a 9765 system may occur in the following areas:

- The CC1 itself
- Setup files (also known as configuration files)
- Peripheral devices connected to the CC1
- DOS operating system

A log is recommended for keeping track of changes made to the system. The log should document the change made, why it was made, the date it was made, and the person responsible for the change. This log will help in troubleshooting any errors that may occur. It also makes it easier to identify errors that might have been caused by the change from other types of errors.

Table M. CC1 Hardware Errors

Symptom	Possible Cause	Corrective Action
Green power LED not lit.	No AC power to the unit.	Check power cord connection.
	Fuse has blown.	Replace fuse.
No VGA display.	Video cable not seated.	
	Power cord not plugged in.	
	Bad VGA card.	

Table N. CC1 System Errors

Symptom	Possible Cause	Corrective Action
Port x ERR Coms Framing	Mismatched baud rate settings.	Correct the baud rate setting in the CM9700-MGR to match the settings in the device connected to the specified port.
Port x ERR Coms Fatal	Failure of Comms line after power up and initialization.	Check and correct hardware fault.
Port x ERR Coms Parity	Mismatched parity settings.	Correct the parity setting in the CM9700-MGR to match the settings in the device connected to the specified port.
Port x ERR Coms Max Retry	If the communications line is faulty (wired incorrectly or not seated properly), the diagnostic screen displays this error message during initial power-up. If the communication line goes bad after power-up and initialization, then a Port x ERR Coms Fatal error appears, followed by a Port x ERR Max Retry message.	Check and correct the hardware fault.
	Temporary communications fault.	Fault will automatically be corrected when communications resume.
	Noise on the data line.	Check data cables.

The VCC Card CF LED Is Illuminated and the AUX LED Is Blinking

Problem: The LED labeled "CF" on the CM9765-VCC Video Input card is illuminated, and the LED labeled "AX" is flashing one short blink (quarter-second rate) and one long blink (one-second rate).

Solution: This indicates that communication with the primary CM9765-VMC card has failed. Make sure that a CM9765-VMC card is inserted into slot 10 and is working properly.

Monitor Display Problems

Problem: Text characters (such as in camera titles) do not display properly.

Solution: The CM9765-VMC monitor output card in the matrix bay may not be set for the correct video format (NTSC or PAL). Check switch 1 on the DIP switch and verify that the switch is in the correct position, as identified in Table O. Refer to Figure 40 for an illustration of the DIP switch.

Table O. Monitor Output Card DIP Switch 1

Switch 1	Video Format
ON	PAL
OFF	NTSC

Problem: The CM9765-MXB color bars display in black and white, instead of the appropriate colors.

Solution: The CM9765-VMC monitor output card in the matrix bay may not be set for the correct video format (NTSC or PAL). Check switch 1 on the DIP switch and verify that the switch is in the correct position, as identified in Table O. Refer to Figure 40 for an illustration of the DIP switch.

LED Indicators on the Power Supply Module

Problem: If two power supply modules are installed in the matrix bay, the following LED indicators on a power supply will signify that the power supply is not working.

Front Panel Label	Color	LED State
+	Green	On
-	Green	Off
FF	Red	Flashing
PF	Red	On

Solution: First verify that the inactive power supply is seated properly in the matrix bay frame, and is turned on. If it is, the power supply may have blown a fuse. Refer to *How to Replace the Fuse in a Power Supply Module* in the *Installation* section for instructions.

Specifications

CM9700-CC1

ELECTRICAL

Input Voltage	120 VAC, 60 Hz or 230 VAC, 50 Hz, autoranging
Power Consumption	57 watts
Processor	Pentium® class CPU
Clock Speed	733 MHz
Memory	64 MB RAM
Disk Drive	3.5-inch, 1.44 MB
Flash Disk Storage	32 MB solid-state flash memory
Diagnostic Monitor Output	1, VGA
I/O Ports	Sixteen RS-422 ports (expandable to 32); total system capacity is 120 ports Two RS-232 ports (COM 1 and COM 2) One parallel printer port One VGA output port Two PC-AT compatible keyboard ports (1 front, 1 rear)

GENERAL

Operating Temperature	32° to 120°F (0° to 49°C)
Dimensions	7.0 (H) x 19.0 (W) x 19.5 (D) inches (17.78 x 48.26 x 49.53 cm)
Mounting	Fits 19-inch EIA-standard rack (3 RUs)
Unit Weight	29.7 lb (13.5 kg)

CM9765-MXB

ELECTRICAL

Input Voltage	100-240 VAC, 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	One output card slot for supporting 16 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 8MHz
Differential Gain	0.51%
Differential Phase	0.38 degrees
Luminance Nonlinearity	0.20%
Signal to Noise Ratio	-71dBrms

GENERAL

Operating Temperature	32° to 122°F (0° to 50°C), noncondensing
Dimensions	
Matrix Bay	10.5 (H) x 19.0 (W) x 21.7 (D) inches (26.67 x 48.26 x 55.10 cm)
Mounting Baffle	1.75 (H) x 19.00 (W) x 24.00 (D) inches (4.45 x 48.26 x 60.96 cm)
CM9700-VPP	1.07 (H) x 19.00 (W) x 6.00 (D) inches (2.72 x 48.26 x 15.24 cm)
CM9700-VPP-RK	13.96 (H) x 19.00 (W) x 14.12 (D) inches (35.46 x 48.26 x 35.86 cm)
Mounting	Fits 19-inch EIA-standard rack (6 RUs)
Unit Weight	33 lb (14.99 kg) 52 lb (23.59 kg), fully populated

(Design and product specifications subject to change without notice.)

Regulatory Notices

CM9780-MXB

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes and Modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission's rules.

In order to maintain compliance with FCC regulations shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and television reception.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CM9700-CC1

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RADIO AND TELEVISION INTERFERENCE

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may also find helpful the following booklet, prepared by the FCC: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402.

Changes and Modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commission's rules.

In order to maintain compliance with FCC regulations shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and television reception.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

PRODUCT WARRANTY AND RETURN INFORMATION

WARRANTY

Pelco will repair or replace, without charge, any merchandise proved defective in material or workmanship **for a period of one year** after the date of shipment.

Exceptions to this warranty are as noted below:

- Five years on FR/FT/FS Series fiber optic products and TW3000 Series unshielded twisted pair transmission products.
- Three years on Spectra® IV products.
- Three years on Genex® Series products (multiplexers, server, and keyboard).
- Three years on Camclosure® and fixed camera models, except the CC3701H-2, CC3701H-2X, CC3751H-2, CC3651H-2X, MC3651H-2, and MC3651H-2X camera models, which have a five-year warranty.
- Three years on PMCL200/300/400 Series LCD monitors.
- Two years on standard motorized or fixed focal length lenses.
- Two years on Legacy®, CM6700/CM6800/CM9700 Series matrix, and DF5/DF8 Series fixed dome products.
- Two years on Spectra III™, Esprit®, ExSite™, and PS20 scanners, including when used in continuous motion applications.
- Two years on Esprit and WW5700 Series window wiper (excluding wiper blades).
- Two years (except lamp and color wheel) on Digital Light Processing (DLP®) displays. The lamp and color wheel will be covered for a period of 90 days. The air filter is not covered under warranty.
- Eighteen months on DX Series digital video recorders, NVR300 Series network video recorders, and Endura™ Series distributed network-based video products.
- One year (except video heads) on video cassette recorders (VCRs). Video heads will be covered for a period of six months.
- Six months on all pan and tilts, scanners or preset lenses used in continuous motion applications (that is, preset scan, tour and auto scan modes).

Pelco will warrant all replacement parts and repairs for 90 days from the date of Pelco shipment. All goods requiring warranty repair shall be sent freight prepaid to Pelco, Clovis, California. Repairs made necessary by reason of misuse, alteration, normal wear, or accident are not covered under this warranty.

Pelco assumes no risk and shall be subject to no liability for damages or loss resulting from the specific use or application made of the Products. Pelco's liability for any claim, whether based on breach of contract, negligence, infringement of any rights of any party or product liability, relating to the Products shall not exceed the price paid by the Dealer to Pelco for such Products. In no event will Pelco be liable for any special, incidental or consequential damages (including loss of use, loss of profit and claims of third parties) however caused, whether by the negligence of Pelco or otherwise.

The above warranty provides the Dealer with specific legal rights. The Dealer may also have additional rights, which are subject to variation from state to state.

If a warranty repair is required, the Dealer must contact Pelco at (800) 289-9100 or (559) 292-1981 to obtain a Repair Authorization number (RA), and provide the following information:

1. Model and serial number
2. Date of shipment, P.O. number, Sales Order number, or Pelco invoice number
3. Details of the defect or problem

If there is a dispute regarding the warranty of a product which does not fall under the warranty conditions stated above, please include a written explanation with the product when returned.

Method of return shipment shall be the same or equal to the method by which the item was received by Pelco.

RETURNS

In order to expedite parts returned to the factory for repair or credit, please call the factory at (800) 289-9100 or (559) 292-1981 to obtain an authorization number (CA number if returned for credit, and RA number if returned for repair).

All merchandise returned for credit may be subject to a 20% restocking and refurbishing charge.

Goods returned for repair or credit should be clearly identified with the assigned CA or RA number and freight should be prepaid. Ship to the appropriate address below.

If you are located within the continental U.S., Alaska, Hawaii or Puerto Rico, send goods to:

> Service Department
> Pelco
> 3500 Pelco Way
> Clovis, CA 93612-5699

If you are located outside the continental U.S., Alaska, Hawaii or Puerto Rico and are instructed to return goods to the USA, you may do one of the following:

If the goods are to be sent by a COURIER SERVICE, send the goods to:

> Pelco
> 3500 Pelco Way
> Clovis, CA 93612-5699 USA

If the goods are to be sent by a FREIGHT FORWARDER, send the goods to:

> Pelco c/o Expeditors
> 473 Eccles Avenue
> South San Francisco, CA 94080 USA
> Phone: 650-737-1700
> Fax: 650-737-0933

⊠Green The materials used in the manufacture of this document and its components are compliant to the requirements of Directive 2002/95/EC.

This equipment contains electrical or electronic components that must be recycled properly to comply with Directive 2002/96/EC of the European Union regarding the disposal of waste electrical and electronic equipment (WEEE). Contact your local dealer for procedures for recycling this equipment.

REVISION HISTORY

Manual #	Date	Comments
C1593M	9/09	Original version.