CM6700 Series Matrix

MICROPROCESSOR-BASED SWITCHER/CONTROLLER, 16 X 2/4

U.S. Patent #411,530

Product Features

- 16 Video Inputs; 2 or 4 Video Outputs
- 20-Character Camera Title
- Time (24-hour or AM/PM formats); Date (4 formats)
- Alarm Display Call-up from 18 Direct-Connect Alarm Inputs
- Video Inputs Individually Selectable for Terminating or Looping
- Coaxitron® Compatible
- Individual Monitor Sequential Switching with Preset Call
- Compatible with Pelco's RS-422 D or P Protocol
- Camera Control Selection: Coaxitron® or RS-422; Individually Selectable per Camera
- Control Genex® Multiplexers
- Selectable Data Port – RS-232/RS-422/RS-485
- Password Protected Menu Programming
- User Partitioning to Prevent Unauthorized Viewing
- Keyboards:
  - Switcher Only (KBD100)
  - Switcher Plus Multi-Speed Control, Presets, Patterns, Receiver Aux (KBD200)
  - Switcher Plus 3-axis Joystick for Variable Speed PTZ Control, Presets, Patterns, Receiver Aux (KBD300)
  - Switcher Plus 5-inch (12.7 cm) Active Matrix Monitor Display, 3-axis Joystick for Variable Speed PTZ Control, Presets, Patterns, Receiver Aux (KBD300V)

CM6700-MXB SWITCHER/CONTROLLER

KBD300 KEYBOARD

- Optional CM6700-VMC Two-Monitor Expansion Card
- Includes Spanish-Language Menus

The **CM6700 Matrix** Switcher/Controller is a very affordable, highly versatile, full-featured cross-point matrix switcher. The **CM6700** provides switching and control for 16 video inputs and up to 4 monitor outputs from any one of up to 8 keyboards.

The **CM6700 Matrix** switching unit is designed to be remotely operated from desktop keyboards or external computer systems.

The versatile mounting system allows for installation in a variety of ways: either 19-inch rack (front or rear mount), wall or shelf mount. In this way, the bulk of the video cables can be routed to a convenient area such as a telephone room instead of the operator location.

Straightforward on-screen menus make programming the **CM6700** simple and easy. (The **CM6700** even lets you switch to Spanish-language programming menus.) The user enabled character display shows time and date, operation mode, camera number, and a 20-character title for quick, easy identification of the on-screen video. The display characters are white with black outline for viewing under varying lighting conditions. The display can be located anywhere on the viewing monitor and can be turned on or off.

The **CM6700** supports two system macros, or salvo sequences, to allow quick call-up of up to four cameras to four monitors – simultaneously. Salvo sequences include preset call of suitably equipped (PTZ or dome) receivers.

When an alarm is received, the CM6700 will switch the camera for that alarm to the selected monitors. If a PTZ function is being performed when an alarm is received, an alarm pending message will appear. An alarm will automatically call a preset and pre-position a camera with suitable (PTZ or dome) receivers. Alarms are cleared either by keyboard acknowledgment or timeout after contact deactivation. Two extra alarm inputs allow for alarm-activated salvo sequence call-up. A "Form C" alarm relay output allows for automatic activation of an alarm event recorder or other device. In addition, this relay is manually controllable from the system keyboard.

SYSTEM COMPONENTS

KBD100

SYSTEM KEYBOARDS

KBD100/200/300/300V Series keyboards have been engineered for use with the CM6700 Matrix Switcher. Each keyboard in the series offers a different level of control and functionality in order to provide maximum versatility in every application.

KBD100

Our most economical keyboard, the KBD100 features limited CM6700 Matrix control for operator locations where pan/tilt/zoom (PTZ) functions are not intended or not required. Features include programming capabilities, camera and monitor call-up, operation of sequences and patterns, and three function keys to allow local auxiliary activation.

KBD200

KBD200, KBD300 and KBD300V

Standard Features

These full-feature keyboards offer PTZ control, programming capabilities, camera and monitor call-up, operation of sequences and patterns, and local auxiliary activation. Added function keys allow control of receiver auxiliaries. The functions keys have dual selections to allow remote control of multiplexer functions when a Pelco MX4000 Series multiplexer is used in conjunction with the CM6700 Matrix Switcher.

These keyboards can be configured for Direct Mode operation; see below.

Exclusive Keyboard Features

KBD200

This economical keyboard features “Touchspeed” multi-speed control of variable speed receivers.

KBD300

The KBD200 additionally features an ASCII Mode, included specifically for phone line video applications. KBD200 ASCII Mode allows complete operational control of the CM6700 Matrix Switcher via the ASCII port (programming not supported). When configured for ASCII Mode control, the KBD200 outputs RS-422 ASCII protocol at 9600 baud. This configuration requires the KBDKIT and, in some cases, the PV130 RS-232 to RS-422 converter.

KBD300

This keyboard features a three-axis, vector solving joystick that includes a twisting, return-to-center head for precise, single-hand control of PTZ functions.

KBD300V

KBD300V

The KBD300V offers a complete, stand-alone control and viewing package, featuring a 5-inch (12.7 cm) diagonal active matrix monitor and vector solving joystick.

Direct Mode Receiver Control

The KBD200, KBD300, and KBD300V keyboards can be alternately configured for Direct Mode operation. The KBD200 and KBD300 require a remote keyboard wiring kit (KBDKIT) for direct mode operation.

Direct Mode control is a feature that allows two-wire control of up to 16 daisy-chained receivers directly from the keyboard.

When configured for Direct Mode control, keyboards output Pelco P protocol at 4800 baud.

Direct Mode control features include programming and call-up of presets, full PTZ control of variable speed receivers, and activation of receiver auxiliaries.

TECHNICAL SPECIFICATIONS

SWITCHER

GENERAL

Memory Protection	Replaceable lithium battery provides data protection for ten years
Keyboards	Eight
Receiver/Dome Control	Coaxitron® and RS-422
Alarm Inputs	Eighteen, programmable (includes presets and NO/NC device)
Alarm Relay Outputs	One, DPST
Rating	0.5 amp @ 125 VAC
General Purpose Outputs	Two, open collector; 32 VDC max., 25 mA max.
Data Ports	Two
Receiver	RS-422, D protocol 2400 baud, P protocol 2400-9600 baud
Data (Computer)	RS-232/RS-422/RS-485, 1200-19.2K baud
Keyboard Ports	Two
Local Port	Provides data and 12 VAC power for one keyboard
Remote Port	Data only port for all additional or remote keyboards. Each keyboard connected to this port requires a KBDKIT

ELECTRICAL

Power Source	120V or 230V, 50/60 Hz
Power Consumption	10W

SWITCHER CHARACTERISTICS

Video Inputs	Sixteen inputs, BNC, terminating or looping (jumper selectable) .5 to 2.0 Vp-p composite video
Video Outputs	Two or four outputs, BNC
Switching Type	Cross-point video matrix. RS-170, NTSC, CCIR and PAL compatible
Switching Method	Vertical interval switching
Switching Time	Less than 16 milliseconds (typical)

VIDEO

Bandwidth	17 MHz
Frequency Response	Flat to 8 MHz, ±1dB to 15 MHz
Signal-to-Noise Ratio	-55 dB (peak-to-peak vs. RMS noise)
Cross Talk	-50 dB typical at 3.58 MHz
Differential Gain	2% typical
Differential Phase	0.2° typical
Tilt	0.5% typical
Gain	Unity (±1dB)
DC Output	Zero volts
Video Cable Distances	Minimum cable requirements: • 75 ohms impedance • All-copper center conductor • All-copper braided shield with 95% braid coverage

Cable Type	Maximum Distance
RG-59/U	750 ft (228 m)
RG-6/U	1,000 ft (304 m)
RJ-11/U	1,500 ft (457 m)

CHARACTER GENERATION

Character Type	White with black outline
Camera Identification	One line, twenty characters plus camera number
Date/Time	One line
Programmable	On-screen, menu driven
Character Set	80 ASCII characters

MECHANICAL

Dimensions (switcher only)	3.5" H x 17" W x 10.5"D (8.89 cm x 43.18 cm x 26.67 cm)
Mounting (switcher only)	Factory configured for EIA rack mount (2 RU); rack ears can be removed for wall mount or freestanding applications

KEYBOARD

ELECTRICAL

Input Voltage	
KBD300V only	+12 VDC @ 1 amp
All others	12 VAC or ±12 VDC
Power Consumption	
KBD300V only	8 watts
All others	1 watt
Connector Type	RJ-45, 8-pin modular (female)
Communication Type	RS-485*

*Maximum cable distance for RS-485 communication over 24-gauge wire is 4,000 feet (1,219 m). Pelco recommends using shielded twisted pairs such as Belden 9843, or similar cable that meets or exceeds the basic requirements for EIA RS-485 applications.

KEYBOARD COMMUNICATION

Standard 6700 Mode Operation:	
Protocol	RS-485
Baud Rate	9600
Comm Parameters	8 data bits, odd parity, 1 stop bit
Direct Mode Operation	*(not applicable to KBD100)*
Protocol	RS-422, Pelco P
Baud Rate	4800
Comm Parameters	8 data bits, no partiy, 1 stop bit
ASCII Mode Operation	*(KBD200 only)*
Protocol	RS-422
Baud Rate	9600
Comm Parameters	8 data bits, odd parity, 1 stop bit

GENERAL

Keyboard Keypad	Mechanical
Joystick (KBD300/300V)	3-axis, vector solving, twisting head
Display	
KBD100	7-segment digital display Red LED, 1 cell
KBD200/300/300V	7-segment digital display: Red LED, 2 cells Multiplexer mode indicator: Green LED
KBD300V	LCD Monitor
Display Size	5-inch (12.7 cm) diagonal
Display Method	TFT active matrix system
Input Signal	NTSC/PAL
Input Signal Level	1 Vp-p, 75 ohms
Backlight	CCFT Backlight
Power Supply	+12 VDC, 500 mA
Storage Temperature	-4° to 140°F (-20° to 60°C)
Screen Controls	Brightness, contrast and tint
Tilt Stand	Adds additional 20° viewing angle
Ambient Operating Temperature	
KBD100/200/300	20° to 120°F (-7° to 49°C)
KBD300V	14° to 140°F (-10° to 60°C)
Humidity	10-90% non-condensing
Dimensions	
KBD100	6" W x 7.125" L x 2.25" H (15.24 x 18.1 x 5.72 cm)
KBD200	8.125" W x 7.125" L x 2.25" H (20.64 x 18.1 x 5.72 cm)
KDB300	9.5" W x 7.125" L x 2.25" H (24.13 x 18.1 x 5.72 cm)
KBD300V	14.63" W x 7.125" L x 2.25" H (37.2 x 18.1 x 5.7 cm)

Weight	Unit	Shipping
KBD100	1.9 lb (0.86 kg)	3 lb (135 kg)
KBD200	2.1 lb (0.97 kg)	3 lb (1.35 kg)
KBD300	2.5 lb (1.12 kg)	4 lb (1.81 kg)
KBD300V	4.3 lb (1.95 kg)	7 lb (3.17 kg)

SYSTEM COMPONENTS

MODELS

Matrix Bay

CM6700-MXB2	Switcher/controller. 16 inputs, 2 outputs, NTSC, 120V, 50/60 Hz
CM6700-MXB4	Switcher/controller. 16 inputs, 4 outputs, NTSC, 120V, 50/60 Hz
CM6700-MXB2-X	Switcher/controller. 16 inputs, 2 outputs, PAL, 230V, 50/60 Hz
CM6700-MXB4-X	Switcher/controller. 16 Inputs, 4 outputs, PAL, 230V, 50/60 Hz

Keyboards

KBD100*	Desktop keyboard, switcher only (25-foot cable supplied)
KBD200*	Desktop keyboard, multi-speed PTZ, (25-foot cable supplied) *(Also see C526 spec)*
KBD300*	Desktop keyboard, vari-speed PTZ, (25-foot cable supplied) *(Also see C527 spec)*
KBD300V	Same as KBD300 except has integrated video display. Use with CM6700-MXB2 or CM6700-MXB4 *(Also see C527 spec)*
KBD300V-X	Same as KBD300V except for use with CM6700-MXB2-X or CM6700-MXB4-X *(Also see C527 spec)*

*If distance between switcher and keyboard exceeds 25 feet, use KBDKIT/KBDKIT-X.

Note: In addition, the KBD200 , KBD300, and KBD300V keyboards provide control capabilities for Pelco multiplexers. The function key icons shown are active only when used in conjunction with an appropriate Pelco multiplexer.

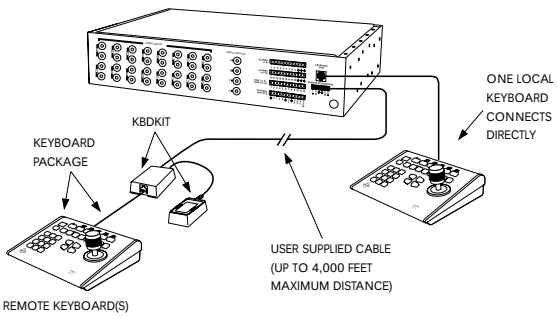
CERTIFICATIONS/RATINGS/PATENTS

- CE compliant (CM6700-MXB2-X, CM6700-MXB4-X, CM6700-VMC2-X, KDB100, KDB200, KDB300, KBD300V-X, and KBDKIT-X)
- UL listed to Standard 2044 (CM6700-MXB2, CM6700-MXB4, KBD100, KBD200, and KBD300)
- cUL listed to Standard CSA 22.2 No. 1-94 (CM6700-MXB2, CM6700-MXB4, KBD100, KBD200, and KBD300)
- FCC, Class A (CM6700-MXB2, CM6700-MXB4, CM6700-VMC2, KBD100, KBD200, KBD300, and KBD300V)
- NEMA 1
- U.S. Patent 411,530 – Model KBD300V

OPTIONS

CM9760-CDU-T	Code distribution unit; 16-channel RS-422 transmit only (2-wire and ground) distributor. Primarily used for "star" configuring up to 16 pan/tilt/zoom receiver data runs
CM6700-VMC2	2-monitor output expansion card (NTSC). Expands a CM6700-MXB2 to a four-monitor system and features easy installation and plug-and-play functionality
CM6700-VMC2-X	2-monitor output expansion card (PAL). Use with CM6700-MXB2-X
KBDKIT	Remote keyboard wiring kit; includes RJ-45 wall block and 120 VAC to 12 VAC transformer. Required when connecting keyboards to Remote Keyboard port
KBDKIT-X	Same as KBDKIT except includes 230 VAC to 12 VAC transformer
PV130	RS-422-to-RS232 interface converter and power supply

SAMPLE CM6700 KEYBOARD WIRING DIAGRAM



Indicates change or addition since last revision.