Pelco Pan-Tilt-Zoom(PTZ) Support for Video WebEngine

Savoy supports the following methods of controlling Pelco PTZ cameras:

- MX4000 series using KBD4000 emulation
- Cameras via RS485 bus using Pelco P protocol
- CM6700 Switch using ASCII protocol
- CM6800 Switch using ASCII protocol
- CM9740/9760 via CM9760DT Data Translator using ASCII protocol

The Domain Manager listed as 'Savoy PTZ Camera Control' must be loaded on the server interfaced to the equipment with the appropriate COM port and device type selected as below:

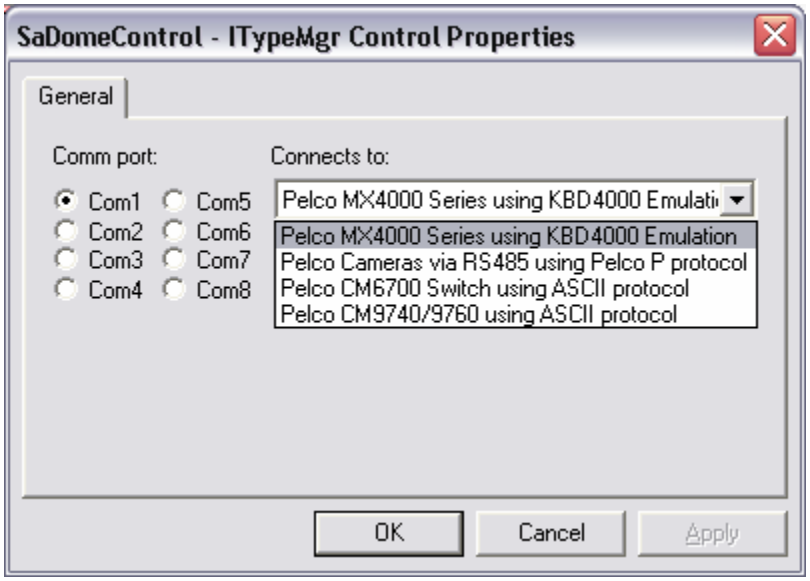


Figure 1 Domain Manager Properties Dialog

Once installed and connected to the appropriate hardware, individual cameras are set up under the Savoy Console application.

To setup a camera for PTZ using the Savoy Console, right click on any video window and select **Cameras…/PTZ Control.** Select the Window name from the pull-down box, and for each camera, create a unique control device specifying the camera and window assignments. For auto-scanning the Preset settings, you can also specify a scan interval.

Figure 2 Camera PTX Control Device Properties

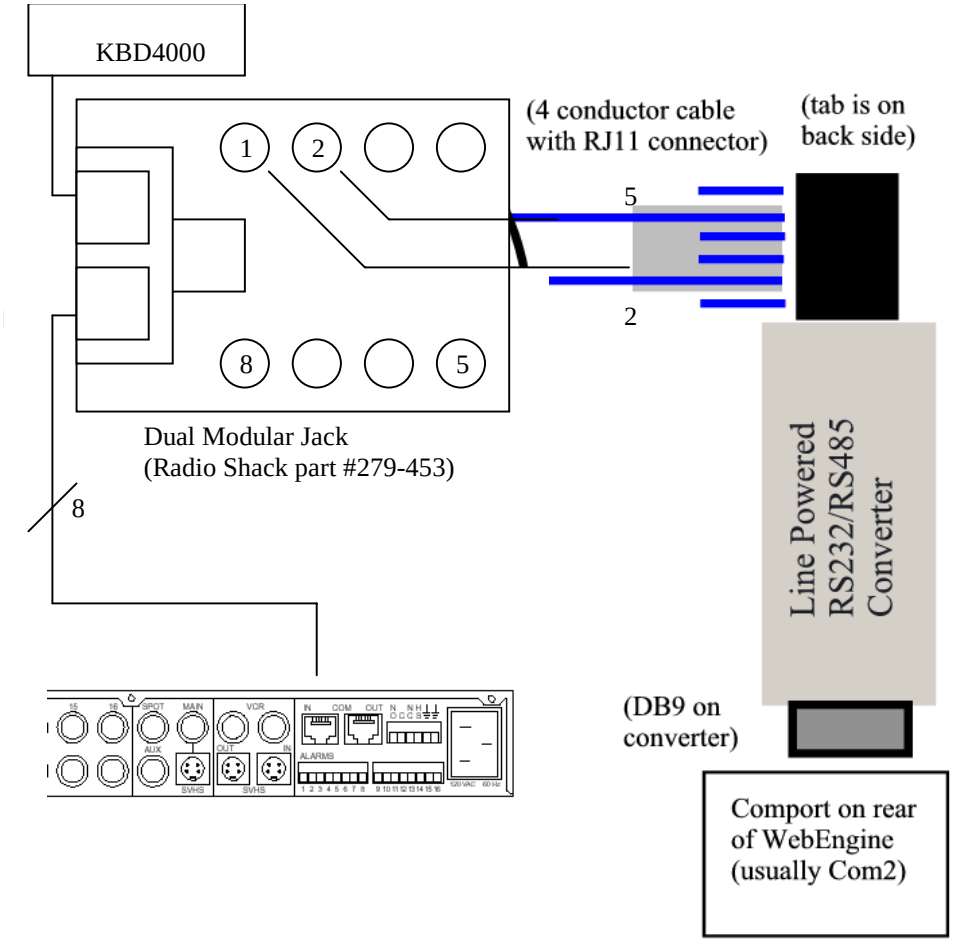
Note: the ***Window*** is the integer (1…16) associated with the video window displayed on the Console; the ***Camera*** (1…9999) is the camera number as selected via Pelco keyboards.

For small systems, the camera number is the address of the camera ***plus one***, set by DIP switches inside the camera, and is limited to 32 cameras. For large systems, where, for example, multiple CM9760s are chained together, the camera number spans across all CM9760s and can be much larger than 32 – the association of camera number to camera address is part of the CM9760 configuration. It is best, therefore, to think of the camera number as the value selected by Pelco keyboards.

MX4000 series using KBD4000 emulation

For connecting to a Pelco MX4000, a special adapter from Savoy as shown below.

NOTE: Open the small rear panel on the KBD4000 keyboard and ensure that DIP Switch 4 is in the ON position (disables poll mode).



Set camera jumpers as suggested by MX4000 manuals.

Figure 3 Interior of Dual RJ-45 Modular Jack

Figure 4 Dual Modular Jack Assembly

Cameras via RS485 bus using Pelco P protocol

Connectors and Cables

To connect the server to the camera system, an RS232-RS484 converter is required (B & B Electronics, Model 485SD9RJ, www.bb-elec.com). This connector plugs into the computer's DB-9 port connector and has a female RJ-11 connector for a cable.

For connecting directly to the cameras, standard RJ11 cables can be used. Connect pins 2 (Tx+) and 5 (Tx-) directly to one or more cameras (Rx+,Rx-) respectively.

Camera Switch Settings

Use Pelco 'P' protocol at 4800 baud. Set camera number to a unique value for each camera. Note that camera numbers begin at one, whereas the switch settings begin at zero. Below shows settings for camera number one:

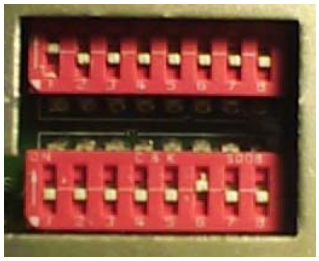


Figure 5 Switch settings for P protocol (SW1, pin 1), address 1(SW2, pins 1-5), 4800 baud (SW2, pins 6-8)

SW1-Protocol Selection								
Coaxitron	off	off	off	off	off	off	off	off
CM9502only	off	off	off	off	off	off	off	on
"P" Version	on	off	off	off	off	off	off	off
"D" Version	off	on	off	off	off	off	off	off
Dip Switch	1	2	3	4	5	6	7	8

Figure 6 Select 'P' Protocol

Coaxitron								
Dip Switch	1	2	3	4	5	6	7	8
No Address	off	off	off	off	off	off	off	off
"P" Version								
Rx Address=Switch Value plus 1								
Dip Switch	1	2	3	4	5			
Rx Address 1	off	off	off	off	off			
Rx Address 32	on	on	on	on	on			
Switch Value	1	2	4	8	16			
Dip Switch						6	7	8
2400 Baud						off	off	off
4800 Baud						on	off	off
9600 Baud						off	on	off
"D" Version								
Rx Address=Switch Value								
Dip Switch	1	2	3	4	5	6	7	8
Rx Address 1	on	off	off	off	off	off	off	off
Rx Address 254	off	on	on	on	on	on	on	on
Switch Value	1	2	4	8	16	32	64	128

Figure 7 Set to Camera number minus one, 4800 baud

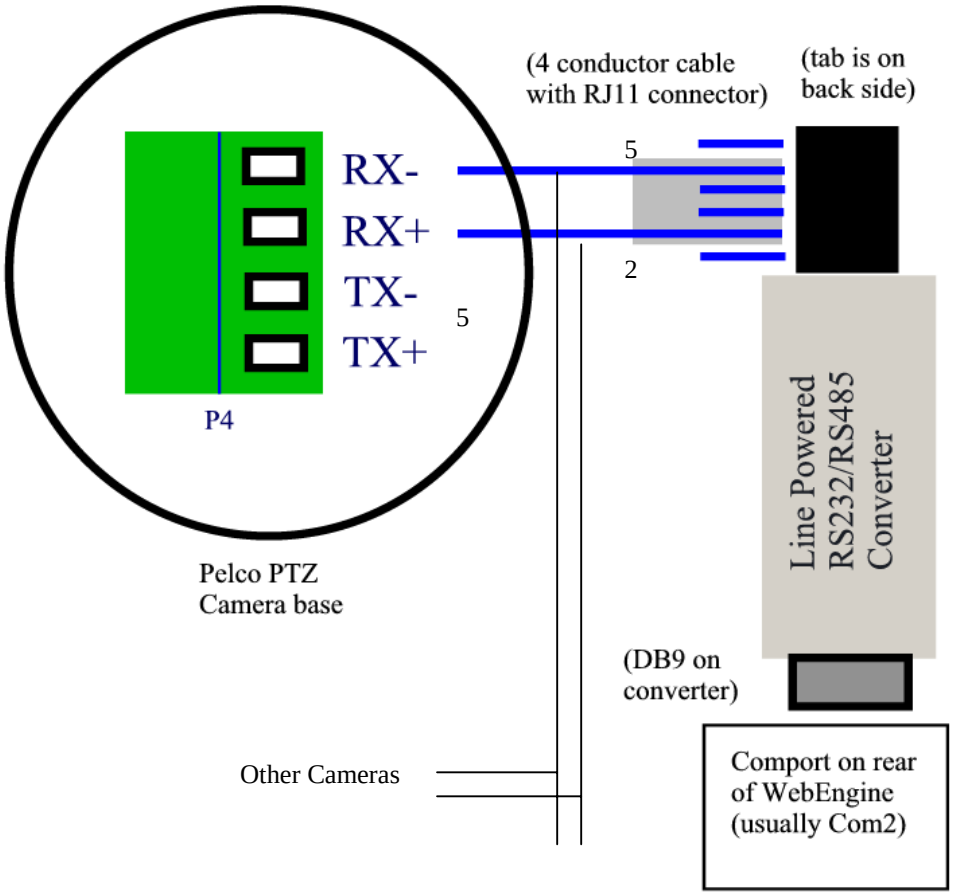
Camera Number (address)

Note that the bits for the switch settings for the camera address (camera number minus one) are transposed left-to-right. Below is a list of camera numbers (1-16) and their bit settings.

Camera Number	Switch
1	00000
2	10000
3	01000
4	11000
5	00100
6	10100
7	01100
8	11100
9	00010
10	10010
11	01010
12	11010
13	00110
14	10110
15	01110
16	11110
17	00001
…	
32	11111

Connectors and Cables

To connect the server to the camera system, an RS232-RS484 converter is required (B & B Electronics, Model 485SD9RJ, www.bb-elec.com). This connector plugs into the computer's DB-9 port connector and has a female RJ-11 connector for a cable.



CM6700 Switch using ASCII protocol

Remove the cover of the CM6700 and ensure that the settings of SW5 are as shown below:

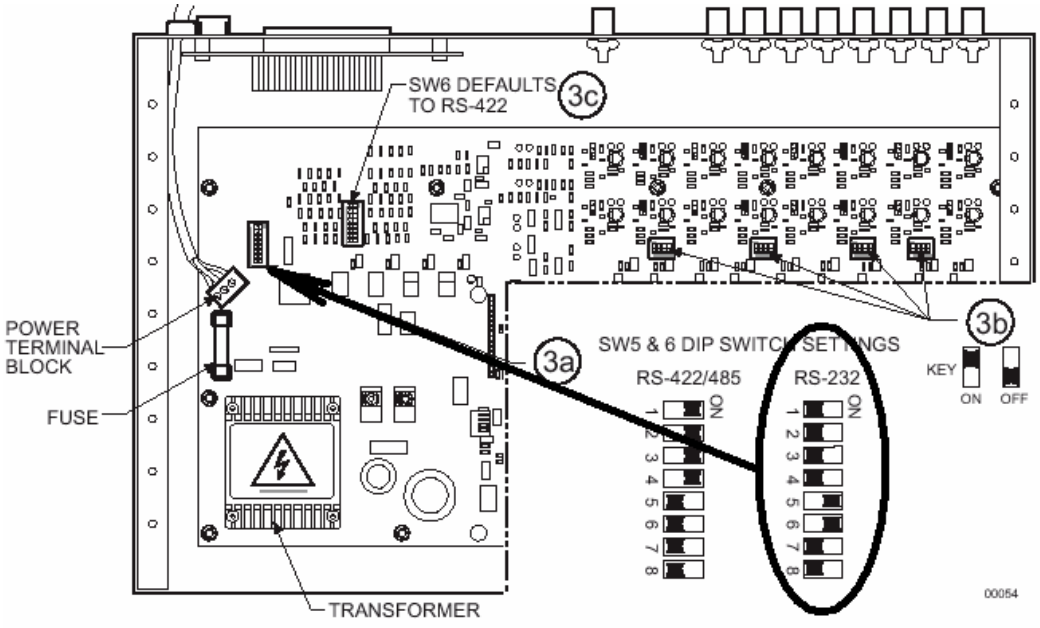


Figure 8 Settings for SW5 (Com2) for RS232 Operation

On the rear of the CM6700. connect the Savoy supplied cable to terminals as shown below:

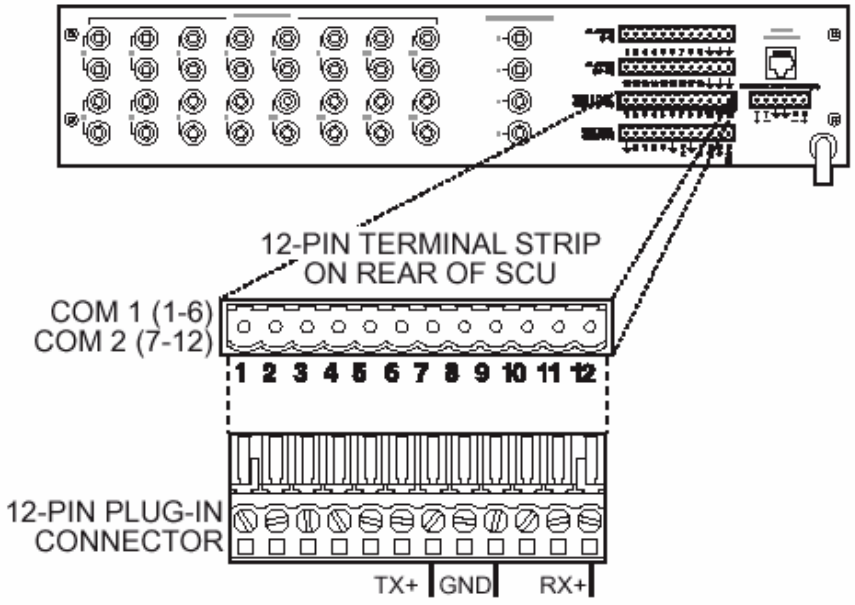
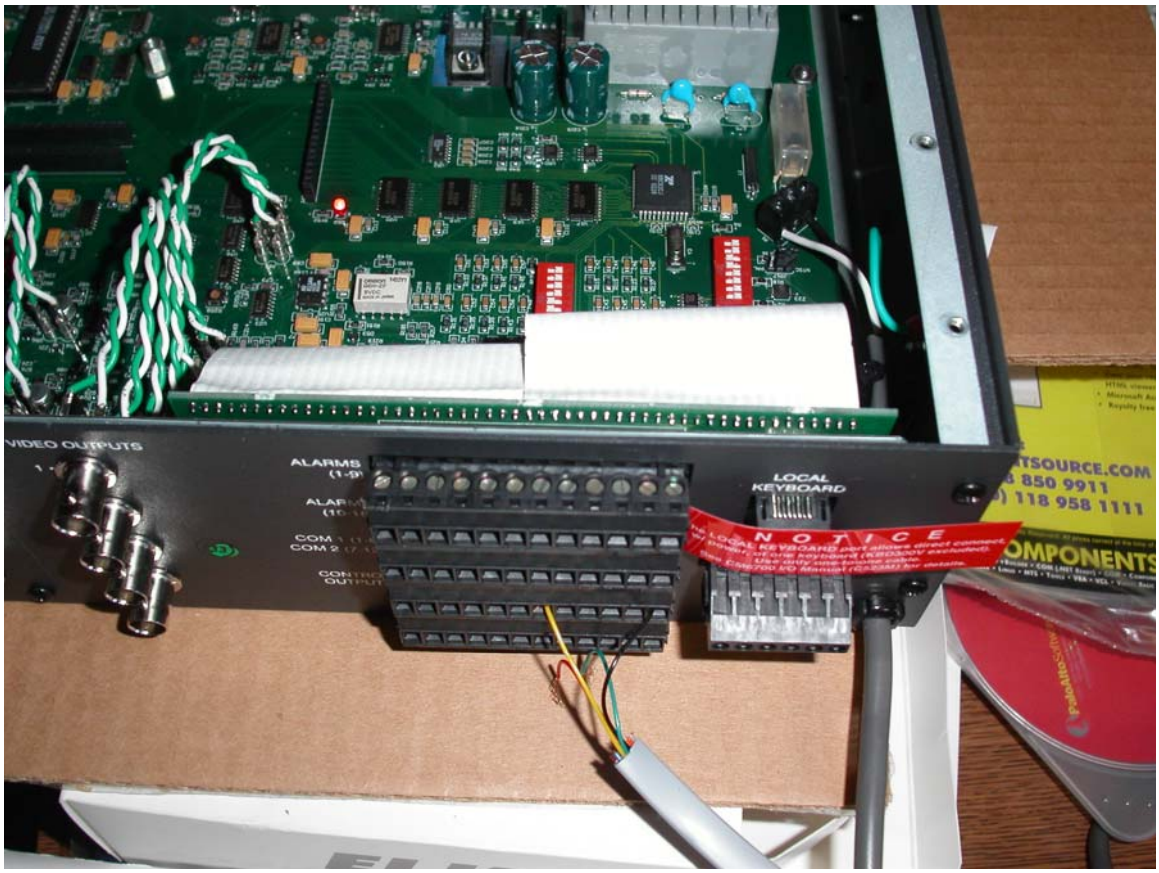
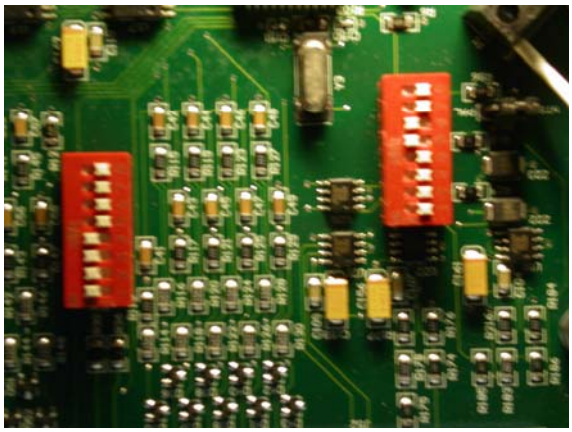


Figure 9 Connection from Computer using Savoy Cable


VIDEO OUTPUTS
ALARMS
LOCAL
KEYBOARD
N O T I C E



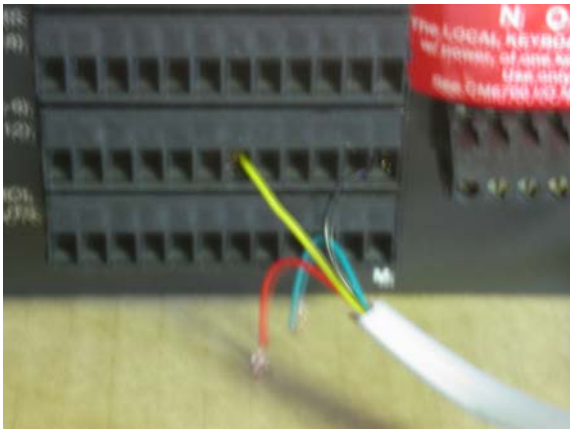
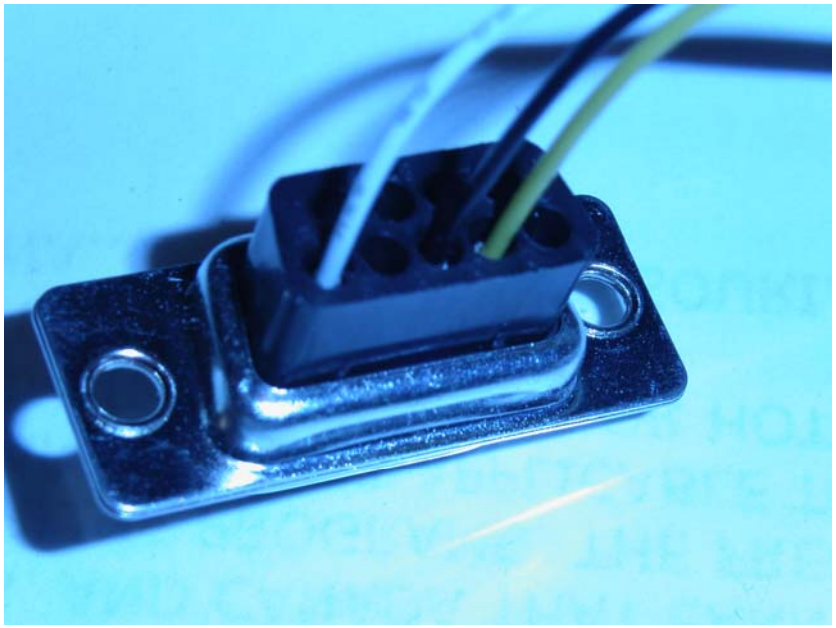


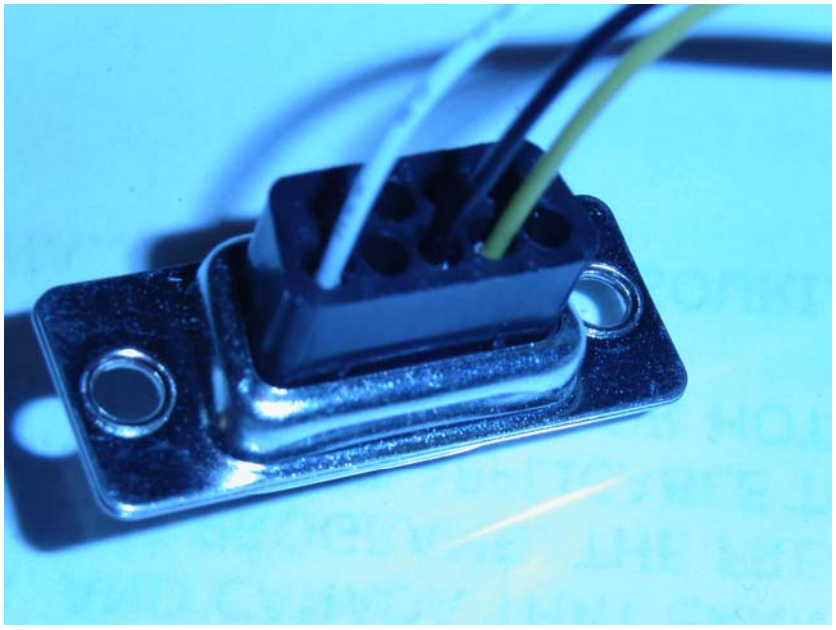
Figure 10 Savoy Connector plugs into Computer COM Port



Actual pin assignments from the RJ-45 to Tx+, Rx+, and Gnd are:

- RJ-45 pin 1:
- RJ-45 pin 2:
- RJ-45 pin 3: Tx+ (to DB9 pin 3, black in above photo)
- RJ-45 pin 4:
- RJ-45 pin 5:
- RJ-45 pin 6: Rx+ (to DB9 pin 2, yellow in above photo)
- RJ-45 pin 7:
- RJ-45 pin 8: Gnd (to DB9 pin 5, white in above photo)

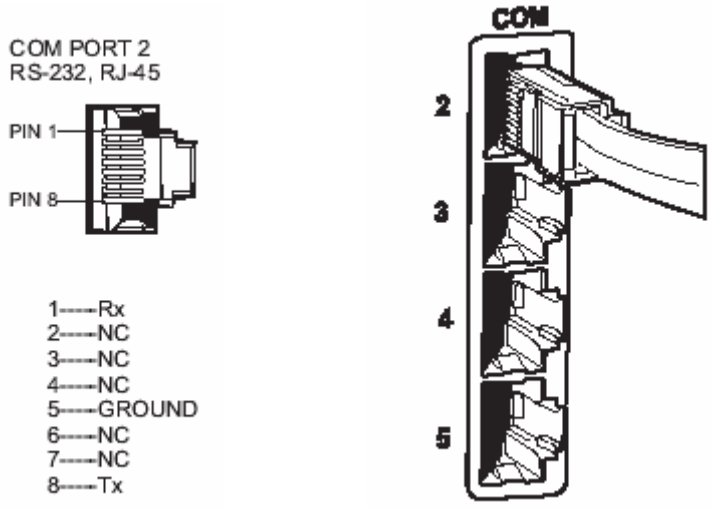
CM6800-32X5 Matrix



Actual pin assignments from the RJ-45 to Tx+, Rx+, and Gnd are:

- RJ-45 pin 1: Tx+ (to DB9 pin 3, dark blue in above photo)
- RJ-45 pin 2:
- RJ-45 pin 3:
- RJ-45 pin 4:
- RJ-45 pin 5:
- RJ-45 pin 6:
- RJ-45 pin 7:
- RJ-45 pin 8: Rx+ (to DB9 pin 2, white in above photo)

Connect RS232 port to 6800 Com2 with a flat straight thru cable



CM9740/9760 via CM9760DT Data Translator using ASCII protocol

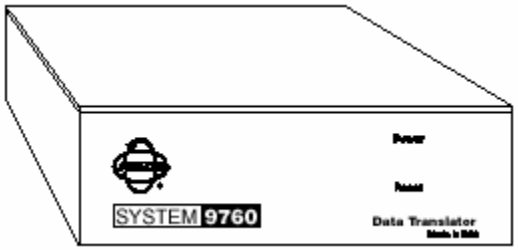


Figure 11 Pelco CM9760-DT Data Translator

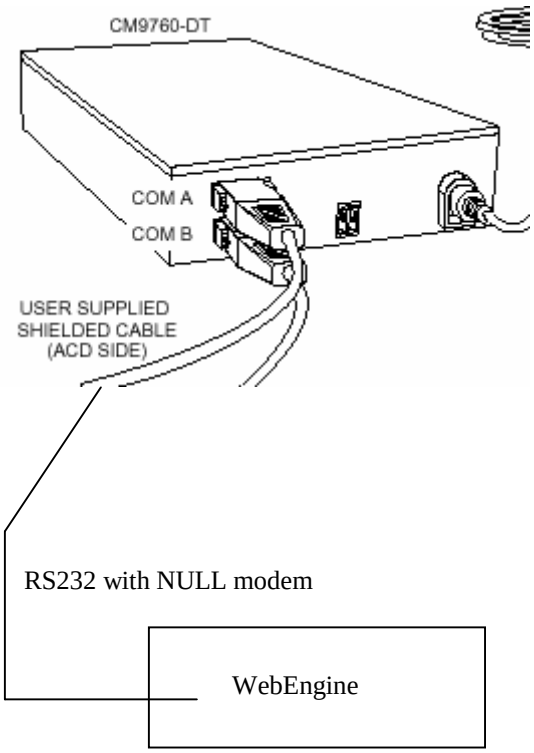


Figure 12 Connect CM9760-DT (COMM A) to Computer Serial Port with NULL Modem

Peered Servers

Large configurations having multiple WebEngines in a single facility can share a common interface for controlling PTZ cameras. For example, consider the following system:

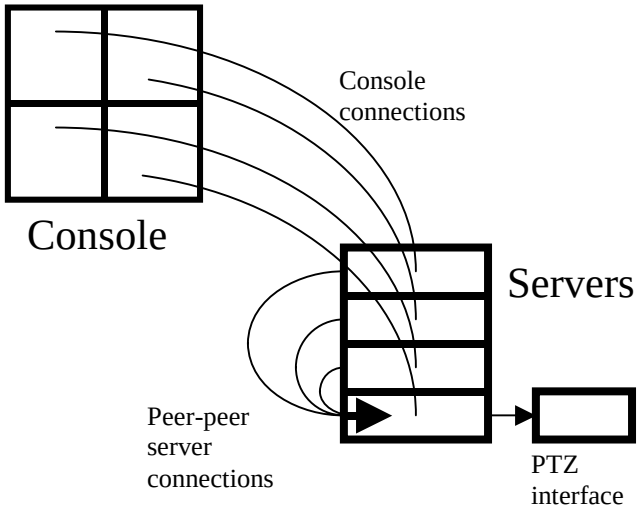


Figure 13 Multiple Peer Connected Servers

In the above diagram, the PTZ interface services all cameras, regardless of which server they are connected to. Yet, PTZ commands issued from the Console are directed to the server as shown. Peer connections among the servers provide a method of automatically routing assertions to the common PTZ interface. To set this up, follow these steps:

1. With peer servers ***disconnected***, create all appropriate PTZ control devices from the Console ***as if*** each server had its own PTZ interface. The name of the control devices should be unique across the entire system.
2. For the server which has the attached PTZ interface, create control devices for this server ***PLUS*** devices for ***all other*** servers having identical names to those previously created for their own server. For these additional devices, enter '0' for the camera number.
3. Now connect the server as peers to bind the devices having common names.

Note: Spelling and case must be correct for controls routed across the servers; if not, servers will create proxy devices and, like two ships in the night, assertions between them will be lost.

Support for Panasonic Cameras

The SaDomeControl domain has been checked in with enhancements to support the following Panasonic equipment:

"Panasonic Cams via RS485 using 'Conventional' cam protocol"

- Direct mode via RS485 connection to all cameras using Panasonic 'Conventional' protocol.
- Comms params are fixed at: 9600,8,N,1;

"Panasonic FS616 Mux using PC/'Conventional' cam protocol"

- Camera control via RS232 connection to FS616 Mux using Panasonic 'Conventional' protocol, via the FS616 Gateway command.
- Support for RS485, multi-drop, has been implemented. The unit address property ["ctlrAddress"] is supported. 0-15 are valid; -1 for RS232. If the connection is 232, "ctlrAddress" must be: not present in CTX file, -1, or match the unit address (minus one) set in the mux configuration. For 485 multi-drop, it must match the target unit address (minus one). The property is not currently exposed in the Savoy Console.
- Comms params are fixed at: 9600,8,N,1;

"Panasonic Cams via RS485 using 'New' cam protocol(CS850, etc.)"

- Direct mode via RS485 connection to all cameras using Panasonic 'New' protocol.
- Comms params are fixed at: 9600,8,N,1;

"Panasonic FS616 Mux using PC/'New' cam protocol(CS850, etc.)"

- Camera control via RS232 connection to FS616 Mux using Panasonic 'New' protocol, via the FS616 Gateway command.
- Support for RS485, multi-drop, has been implemented. The unit address property ["ctlrAddress"] is supported. 0-15 are valid; -1 for RS232. If the connection is 232, "ctlrAddress" must be: not present in CTX file, -1, or match the unit address (minus one) set in the mux configuration. For 485 multi-drop, it must match the target unit address (minus one). The property is not currently exposed in the Savoy Console.
- Comms params are fixed at: 9600,8,N,1;

"Panasonic SX150 Matrix Switcher using PC protocol"

- Camera control via RS232 connection to SX150 Video Switch, using SX150 PC protocol. Not debugged or tested!!!! Coded only.

Notes:

- Relevant documents have been placed in "Savoyard\sw archives\Panasonic Specs\"

- It is believed that the "Panasonic Cams via RS485 using 'New' cam protocol(CS850, etc.)" selection will also work with the MP204 data mux (don't have one). At this time, however, I suspect that there is a conflict when attempting to use a Panasonic controller (e.g. CU360, etc.) and PC control together (inquiries pending).

- The Panasonic 'New' protocol is faster and specifies simplex comms (Tx only); It is clearly supported by the CS850 series cameras. This would include the CS854 and CS864 cameras. There may be unknown others (I asked for a support list and did not get one). This is the preferred camera protocol.

- The Panasonic 'Conventional' protocol is slower, more complex, and specifies responses that the PC should ack (We do not ack, in this domain, but it still works!); This will work with all cameras, so it may turn out to be the preferred domain mode.

- Both protocols, for both the direct camera connect and the mux connect, have been implemented since it is not clear what cameras support the 'New' protocol and whether or not the correct protocol is strictly a function of the camera, mux, or both.

- There is some ambiguous documentation in the CS850 protocol spec that says the 'New' protocol does not work with controllers, other than the MP204 Data Mux,

- however, we have found that it DOES work with other equipment, such as the FS616 Video Mux. We are covered both ways!

- Panasonic recommends using 4 wire/full duplex RS485 connections. I used a B&B model 485BAT3 RS232-485 converter (send control; full/half; with/without bat). Both connection modes worked for me, however the 2 wire/half duplex would return an ER305 error after each response. Panasonic didn't give me an adequete reason. There are two possibilities:
  1)The camera was configured incorrectly (too late to check);
  2)A side-effect induced because we do not ack the camera's responses in this domain.