CCTV Command Protocol

Appendix F

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Introduction

MOMENTUM comes with a complete command set of Burle switcher commands. However, there are several other switcher manufacturers and these are not included in the command set.

To help you in programming MOMENTUM to accommodate your CCTV system, this appendix includes commands and syntax considerations for supported switchers.

ASCII Codes for CCTV

ASCII protocol uses the ASCII character set to transmit and receive commands between the MOMENTUM workstation/server and a CCTV switcher. The commands are readable but are not English. They control the pan and tilt mechanisms (fixed and variable speed), camera functions, auxiliary relays, and alarms.

If you are using the CCTV Control Window, you can substitute an absolute camera, monitor, or preset value into your ASCII command with one of these MOMENTUM variables:

$auto variable for the monitor specified in the CCTV Control Monitor field. MOMENTUM takes this wildcard and substitutes the value you specify in the CCTV Control Monitor field.

$mon variable for the primary monitor recognized by MOMENTUM.

$mon2 variable for the secondary monitor recognized by MOMENTUM.

$cam variable for the camera specified in the CCTV Control Monitor field. MOMENTUM takes this wildcard and substitutes the value you specify in the CCTV Control Camera field.

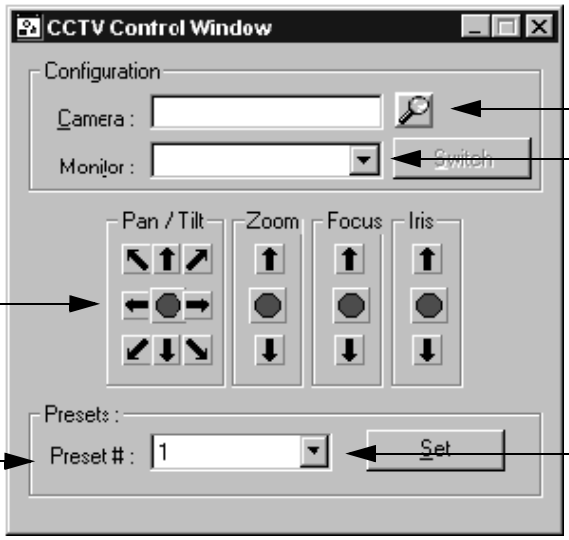
$preset variable for preset. MOMENTUM takes this wildcard and substitutes the value you specify in the CCTV Control Preset # field.

Each of these variables takes the currently selected value from the CCTV Monitor Window and inserts it into the code.

Notice that each of the symbols and buttons shown in this window correspond to a CCTV command shown in the CCTV List.

For example, the PANLEFT command corresponds to the left arrow of the Pan/Tilt controls.

Similarly, the Preset combo box corresponds to the PRESET command in the CCTV list.



field designated by $cam

field designated by $auto

field designated by $preset

Burle Commands

The default settings for the MOMENTUM CCTV commands is Burle. No changes need be made to these settings.

Table F-2 shows the most used MOMENTUM commands for Burle switchers:

Action	Command
CCTVSWITCH	MON+CAM $auto $cam
FOCUSFAR	R/C $cam 10 0
FOCUSNEAR	R/C $cam 10 0
NORTHEAST	NORTHEAST R/C $cam 7 0
NORTHWEST	R/C $cam 5 0 R/C $cam 7 0
SOUTHEAST	R/C $cam 4 0 R/C $cam 6 0
SOUTHWEST	R/C $cam 5 0 R/C $cam 6 0
PANLEFT	R/C $cam 5 0
PANRIGHT	R/C $cam 4 0
PRESET	R/C $cam 2 $preset
TILTDOWN	R/C $cam 6 0
TILTUP	R/C $cam 7 0
ZOOMIN	R/C $cam 3 0
ZOOMOUT	R/C $cam 3 8

Table F-1: Common MOMENTUM Commands for Burle CCTV Switcher s

Pelco ASCII Commands

The Pelco ASCII protocol communicates in a standard asynchronous, byte-oriented protocol that includes: 1 start bit, 8 data bits, 1 parity bit (odd parity), and 1 stop bit (8O1). The communication rate is 9600 baud.

Note: Both firmware versions 2.7 and 3.0 are supported.

The ASCII translator acknowledges accepted commands with 'AK' in Version 2.7 or 'AKa' in Version 3.0. The translator rejects commands by sending 'NA' in Version 2.7 or 'NAa' in Version 3.0. Pelco includes a lowercase "a" at the end each command. If the command requires a numeric value, enter the number first.

Table F-2 shows the most used MOMENTUM commands for Pelco switchers:

Action	Command
CCTVSWITCH	$autoMa $cam#a
FOCUSFAR	Fa
FOCUSNEAR	Na
IRISCLOSE	Ca
IRISOPEN	Oa
NORTHEAST NORTHWEST SOUTHEAST SOUTHWEST	not supported by Pelco switchers
PANLEFT	La
PANRIGHT	Ra
PRESET	$preset\a
STOP	sa
TILTDOWN	Da
TILTUP	Ua
ZOOMIN	Ta
ZOOMOUT	Wa

Table F-2: Common MOMENTUM Commands for Pelco CCTV Switcher s

Note: Currently the commands in Table F-2 are the only commands supported by MOMENTUM for this switcher.

Table F-3 shows the general commands for Pelco switchers:

Action	Command	Result
Select monitor	[1-9999]Ma	Calls a monitor to use for camera operation.
Select camera Next camera Previous camera	[1-9999]#a +a –a	Selects a camera to display on the current operating monitor. The NEXT key (+) and PREV key (-) commands switch to the next numbered camera in the system.
Start a sequence forward	[1-99]qa	Starts the selected sequence going forward (incrementing camera numbers) by pressing and holding the NEXT key for two seconds.
Start a sequence backward	[1-99]ba	Starts the selected sequence going backward (decrementing camera numbers) by pressing and holding the PREV key for two seconds.
Hold a sequence	ea	Places the running sequence on hold, freezing the currently selected camera on the monitor. It lets you control the camera or switch. The sequence is still “armed” on the monitor, but inactive.
Pan left Pan right Stop pan left Stop pan right	[1-64]La [1-64]Ra sa sa	Moves the currently selected pan and tilt device left or right at the speed indicated. If you omit the speed, some devices move at their default speed and others move at their slowest possible speed. Speed information has no effect on fixed speed devices.
Tilt up Tilt down Stop tilt up Stop tilt down	[1-63]Ua [1-63]Da sa sa	Moves the currently selected pan and tilt device up or down at the speed indicated. If you omit the speed, some devices move at their default speed and others move at their slowest possible speed. Speed information has no effect on fixed speed devices.
Zoom telephoto Zoom wide Stop zoom telephoto Stop zoom wide	Ta Wa sa sa	Makes the currently selected camera zoom in (close up view) or zoom out (wide view).
Focus near Focus far Stop focus near Stop focus far	Na Fa sa sa	Changes the good focus range nearer or farther on the currently selected camera.

Table F-3: Pelco CCTV Switcher Commands

Action	Command	Result
Iris open Iris close Stop iris open Stop iris close	Oa Ca sa sa	Opens (brighter image) or closes (darker image) the iris on the currently selected camera.
Stop all PTZ motion	sa	Stops all image motion (stops pan, tilt, zoom, focus, and iris). Does not stop a pattern.
Record pattern Execute pattern End pattern	[1-99]/a [1-99]pa [1-99]na	On receivers that do patterns, these commands let you record your motions and operations (for a limited time) and then have the system repeat them.
Go to preset position	[1-99]\a	Recalls a stored preset position.
Set preset with a label	1a[string]!a [1-9999]sequencea	Sets a preset location with an embedded label, where the ASCII string must be UPPERCASE characters. The [string] is an alphanumeric label up to 20 characters long and [1-9999] is the associated preset number. **NOTE:** All transmitted characters must be ASCII.
Auxiliary on Auxiliary off	[1-9999]Aa [1-9999]Ba	Auxiliaries are relay outputs that can be controlled through the protocol. 1-8 operate auxiliaries at the camera (receiver) and 9-11 operate F1-F3 auxiliaries at the CM6700.
Start macro	[1-99]Sa	Starts the pre-programmed system group camera sequence (the CM6700 supports only two macros: 1 and 2).
Trigger alarm	[1-9999]Ea	Triggers an alarm. For example, 945Ea triggers alarm 945.
Acknowledge (stop) alarm	[1-9999]Ia	Acknowledges an existing alarm. For example, 945Ia stops alarm 945.

Table F-3: Pelco CCTV Switcher Commands

Action	Command	Result
Send camera title	Ya[string1/…/string16]!a	Sends a series of camera titles (up to 16) to a matrix switching system. The first string always corresponds to camera #1, then each subsequent string (separated by a slash) corresponds to the next higher camera number (ending with camera #16). You can choose to send fewer than 16 camera titles; be sure to end with]!a. Valid characters in the string are A-Z, a-z, space, and 0-9 in ASCII representation. Strings are limited to 20 characters.
Version	va	Returns the device's version number.
Set date and time	ZaMM/DD/YY/HH:MM:SSa	This mode of operation command sets the date and time. Since the date and time string might be confused with other commands, Za comes first. This puts the receiving device into a mode that can accept the specialized string. **NOTE:** All transmitted characters must be ASCII.

Table F-3: Pelco CCTV Switcher Commands

Table F-4 provides examples of ASCII commands and the effects they have on cameras.

Procedure	Example	Result
Switch camera # 16 to currently selected monitor 3.	3Ma 16#a	Select a pan and tilt device labeled "CAMERA # 16" and switch it to monitor #3.
Manipulate the pan and tilt device.	1Ma3#a 5Ma2#a3\a 47Ra33Da sa	Switch camera 3 to monitor 1. Go to camera 2, preset 3, on monitor 5. Pan right at speed 47, tilt down at speed 33. Stop tilt down only.
Switch a camera.	1Ma3#a	Switch camera 3 to monitor 1.
Call a preset.	5Ma2#a3\a	Go to camera 2, preset 3, on monitor 5.
Pan and tilt.	47Ra33Da	Pan right at speed 47, tilt down at speed 33.

Table F-4: Pelco ASCII Examples

Vicon ASCII Commands

The Vicon ASCII protocol communicates in a standard asynchronous, byte-oriented protocol that includes: 8 data bits, no parity bit (none), 1 stop bit (8N1). The communication rate is 9600 baud and the flow control is 'hardware.'

Table F-5 lists the most common CCTV commands you should insert in MOMENTUM for Vicon switchers:

Action	Command
CCTVSWITCH	A$auto B$cam
FOCUSFAR	Q
FOCUSNEAR	P
IRISCLOSE	R
IRISOPEN	S
NORTHEAST NORTHWEST SOUTHEAST SOUTHWEST	not supported by Vicon switchers
PANLEFT	I
PANRIGHT	J
PRESET	G$preset
STOP	,
TILTDOWN	L
TILTUP	M
ZOOMIN	O
ZOOMOUT	N

Table F-5: Common MOMENTUM Vicon CCTV Commands

Notice that in Vicon ASCII protocol there are no spaces between command elements.

Note: ***Currently the commands in Table F-5 are the only commands supported by MOMENTUM for this switcher.***

Table F-6 shows the general commands for Vicon switchers:

Action	Command	where #	Example
Select monitor	A###	3-digit monitor number	A004 assigns monitor 4 to the host computer.
Select camera Next camera Previous camera	B####	4-digit camera number	B0001 routes video from camera 1 to the selected monitor output.
Pan left	I		I causes the pan-and-tilt unit to pan to the left.
Pan right	J		J causes the pan-and-tilt unit to pan to the right.
Autopan	K		K engages autopan at slow speed. Subsequent K commands increase the speed.
Tilt down	L		L causes the pan-and-tilt unit to tilt the camera down.
Tilt up	M		M causes the pan-and-tilt unit to tilt the camera up.
Zoom out	N		N causes the motorized lens to zoom out for a wider angle view.
Zoom in	O		O causes the motorized lens to zoom in for a close-up view.
Focus Near	P		P causes the lens to focus near.
Focus Far	Q		Q causes the lens to focus far.
Iris Close	R		R causes the lens to close the iris.
Iris Open	S		S causes the lens to open the iris.
Auto Iris	T		T toggles the autoiris feature.
Changing Lens Speed	[		[causes the lens speed to toggle from fast to slow or slow to fast.
Auxiliary Operations	U – Z		W engages latching of auxiliary 3 or disengages it (if it is currently engaged). Auxiliary relays control latching or momentary functions at the switcher site.

Table F-6: Vicon CCTV Switcher Commands

Ultrak CATS ASCII Commands

The common commands available for this switcher type are:

Action	Command
CCTVSWITCH	C $auto $cam
FOCUSFAR	TBD
FOCUSNEAR	TBD
IRISCLOSE	TBD
IRISOPEN	TBD
NORTHEAST NORTHWEST SOUTHEAST SOUTHWEST	not currently supported by Ultrak switchers
PANLEFT	TBD
PANRIGHT	TBD
PRESET	P $preset $cam
STOP	TBD
TILTDOWN	TBD
TILTUP	TBD
ZOOMIN	TBD
ZOOMOUT	TBD

Table F-7: Common MOMENTUM Ultrak CCTV Commands

Currently only two Ultrak commands are supported by MOMENTUM.

Table F-8 shows the general commands for Ultrak switchers:

Function	Function Code	Monitor (Aux)	Camera
PROGRAM	P	Mon. Number	Cam Number
CALL	C	Mon. Number	Cam Number
SEQUENCE	S	Mon. N umber	0
ALARM ENABLE/DISABLE	a	0	Cam Number
CLEAR SINGLE ALARM	c	Mon. N umber	0

Table F-8: Ultrak General CCTV Commands

Function	Function Code	Monitor (Aux)	Camera
CLEAR ALL ALARMS	A	Mon. N umber	0
AUXILIARY CONTROL	V'	Aux. Control Bits	0
CLEAR SEQUENCE	N	Mon. N umber	0

Table F-8: Ultrak General CCTV Commands (Continued)

Additional Ultrak CCTV commands are:

Function	Funct. Code	Arg. 1	Arg. 2	Arg. 3	Arg. 4
HELP	?	0	0	0	0
COORD DISPLAY OFF	C	0	0	0	0
DISPLAY ON	D	0	0	0	0
DISPLAY CHARACTER	E	Row	Character	Count	Column
LIST VECTORSCANS	F	0	0	0	0
LIST VECTORSCAN CONTENTS	G	0	VScan No	0	0
FUNCTION KEY H	0	Funct No	0	0	
FINDHOME POSITION	I	0	0	0	0
CHARACTER, PROG	J	0	Character	0	0
PROGRAM VECTORSCAN	K	0	0	0	0
LIST PRESHOTS	L	0	0	0	0
RUN VECTORSCAN ONCE, MENU	M	0	0	0	0
CONTINUOUS VECTORSCAN, MENU	N	0	0	0	0
RUN VECTORSCAN ONCE	O	0	VScan No	0	0
GO TO PRESHOT	P	0	Preshot No	Tran Time	0
PROGRAM PRESHOT, MENU	Q	0	0	0	0
DISPLAY OFF	R	0	0	0	0
CONTINUOUS VECTORSCAN	S	0	VScan No	0	0
GO TO PRESHOT, MENU	T	0	0	0	0
PROGRAM SECTOR	U, V	0	0	0	0
LIST SECTORS	W	0	0	0	0
RETURN TO MANUAL	X	0	0	0	0
18" SCAN CONTACT OUT ON/OFF	Y	0	0	0	0

Table F-9: Ultak Additional Command s

Function	Funct. Code	Arg. 1	Arg. 2	Arg. 3	Arg. 4
COORD DISPLAY ON	Z	0	0	0	0
QUICK PROGRAM PRESHOT	[	0	Preshot No	0	0
ENABLE ONE STANDARD ALARM	(60h)	0	Alarm No	0	0
ENABLE ALL STANDARD ALARMS	(61h)	0	0	0	0
DISABLE ONE STANDARD ALARM	(62h)	0	Alarm No	0	0
DISABLE ALL STANDARD ALARMS	(63h)	0	0	0	0
ACKNOWLEDGE OLDEST STANDARD ALARM	(64h)	0	0	0	0
ACKNOWLEDGE ALL STANDARD ALARMS	(65h)	0	0	0	0

Table F-9: Ultak Additional Commands (Continued)

Tracking CCTV Service

One of the most useful tools included with MOMENTUM is CCTVService. This utility enables you to view how a command is sent from MOMENTUM down to the switcher. Using this utility, you can tell whether the command syntax you entered in the CCTV Commands section really sends the correct command to the switcher.

To run CCTVService through DOS:

1. Stop the MOMENTUM CCTV Service through the **Services** option in Control Panel.
2. At the Windows desktop, select **Start > Programs > Command Prompt**. The Command Prompt screen appears.
3. Go to the *Momentum\bin* directory using the DOS *cd* command in this manner:

   ```
   cd \Momentum\bin
   ```
4. Type in this command:

   ```
   cctvservice -c
   ```

   then press **Enter**.

   The CCTVService program begins.
5. Return to MOMENTUM and use the CCTV Control Window to initiate an action.
6. Press **Shift** + **Tab** to switch back to Command Prompt window and see what MOMENTUM sent to the switcher. If it accords with the command syntax specified here, you are sending the correct command.
7. Continue to test your configuration as needed.
8. When you're finished, exit the Command Prompt screen by typing:

   ```
   exit
   ```

   The Command Prompt screen disappears.
9. Restart MOMENTUM CCTV Service.

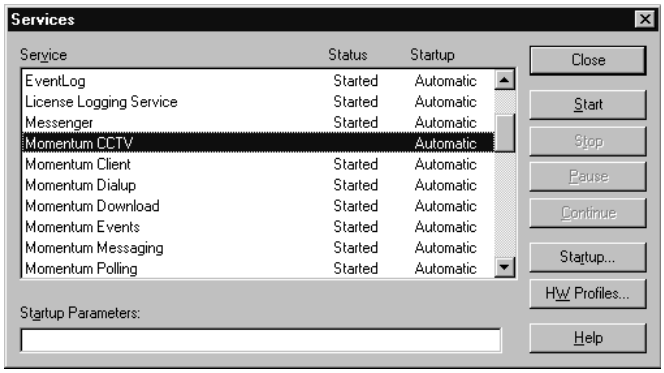
Communication Verification

Here are some steps to verify that you have communications to your CCTV switcher before you try to configure it in MOMENTUM. In order to test the connection, you must first connect a special cable (available from your switcher vendor) from the PC's COM Port to the CCTV Switcher. If you don't have the required equipment, contact your CCTV switcher vendor.

Burle Switcher Verification

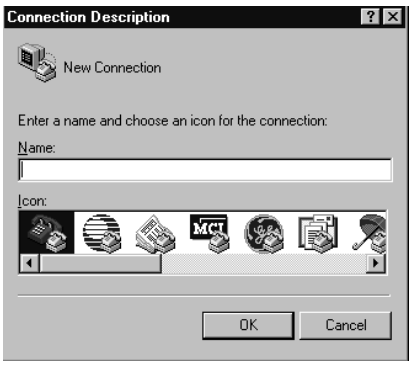
To verify your Burle switcher:

1. Stop the Momentum CCTV Service as shown below.



2. Start HyperTerminal from the Windows desktop by selecting **Start > Programs > Accessories > Hyperterminal**.

   The Connection Description window appears like this:

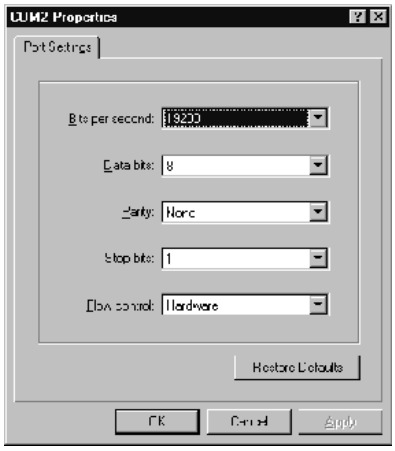


3. In the name field, enter the name for this new connection, then click **OK**.

The Connect To window appears like the example below.

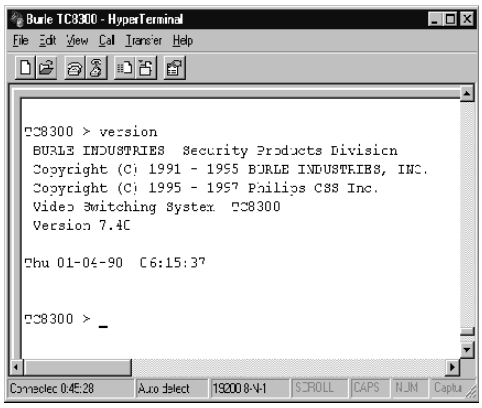
4. In the Connect field, select the COM port to which the CCTV Switcher is physically connected and click **OK**. In the preceding example, the port is COM2.

   The port's Properties screen appears like the one below.

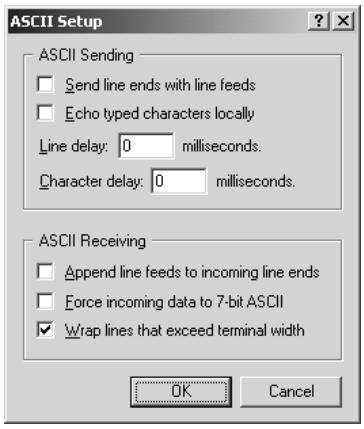


5. Set all settings as required by your Burle CCTV switcher, then click **OK**.

   You are now at the HyperTerminal window like the following Burle example.



6. Select **File > Properties** from the task bar. The Properties dialog box appears.
   a. Click on the Settings tab. The Setting property sheet appears.
   b. At the Emulation combo box, select **auto detect**.
   c. Click the **ASCII Setup...** button. The ASCII Setup dialog box appears.



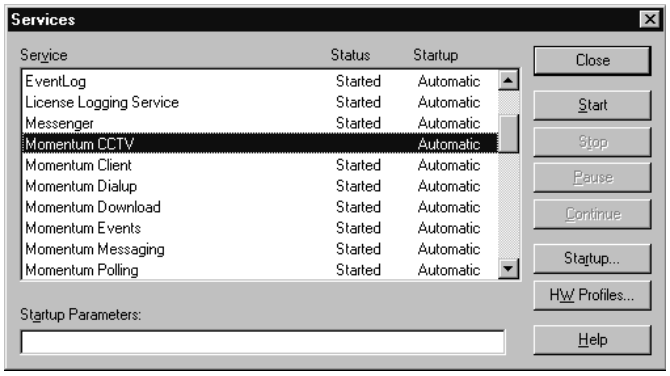
   d. Under 'ASCII Sending,' check the 'Echo typed characters locally' box.
   e. Under 'ASCII Receiving,' check both the 'Append line feeds to incoming line ends' and the 'wrap lines that exceed terminal width' boxes.
7. Click **OK**. You are returned to the Properties Settings property sheet.
8. Enter Burle ASCII commands here to send to the switcher for configuration.

   When you see information like the window above, it means you have communication from your computer Hyperterminal to the switcher.

Vicon Switcher Verification

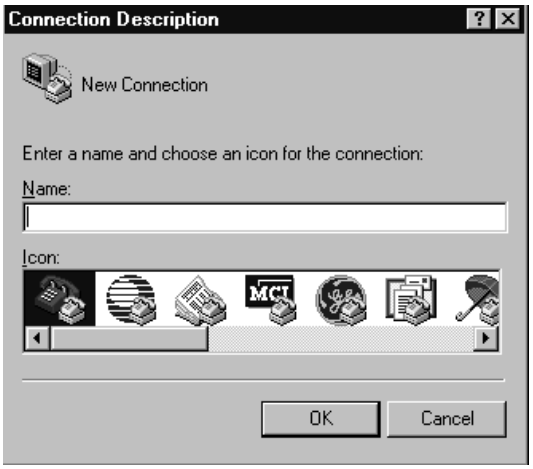
To verify your Vicon switcher:

1. Stop the Momentum CCTV Service as shown below.



2. Start HyperTerminal from the Windows desktop by selecting **Start > Programs > Accessories > Communications > Hyperterminal**.

   The Connection Description window appears like this:

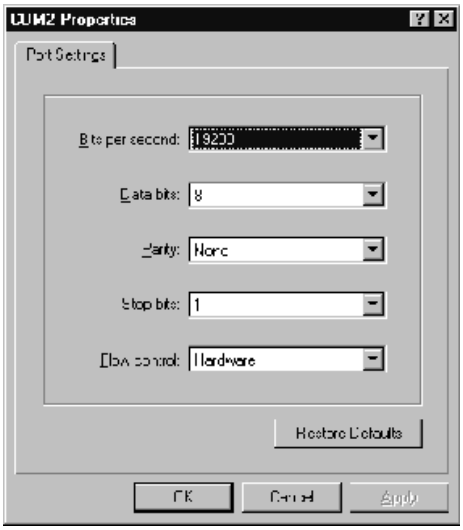


3. In the name field, enter the name for this new connection, then click **OK**.

The Connect To window appears like the example below.

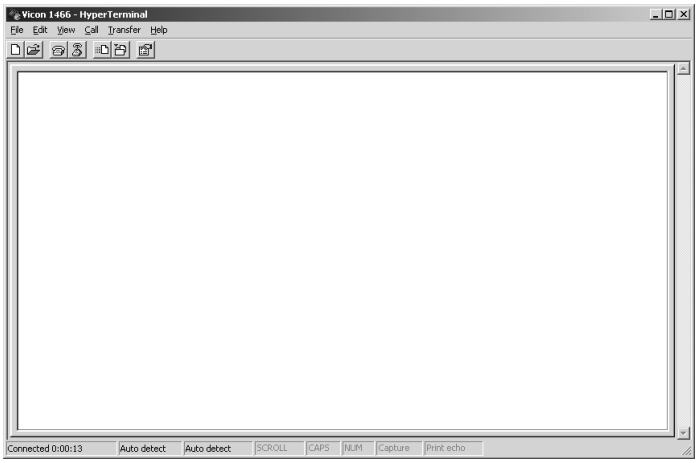
4. In the Connect field, select the COM port to which the CCTV Switcher is physically connected and click **OK**. In the preceding example, the port is COM2.

   The port's Properties screen appears like the one below.

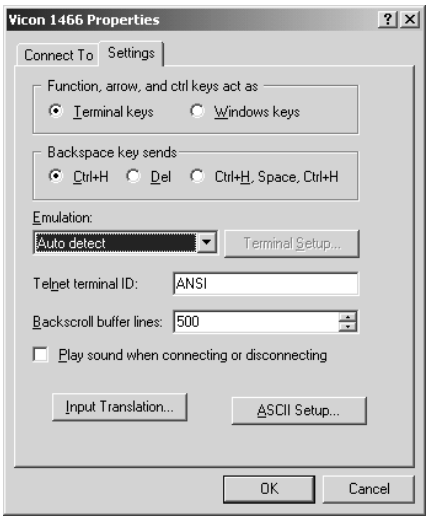


5. Set all settings as required by your Vicon CCTV switcher (as shown in the preceding example), then click **OK**.

You are now at the HyperTerminal window.

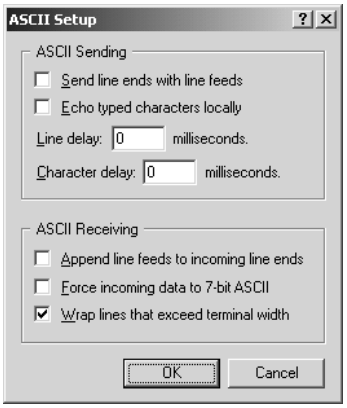


6. Select **File > Properties** from the task bar. The Properties dialog box appears.
   a. Click on the Settings tab. The Setting property sheet appears.



   b. At the Emulation combo box, select **auto detect**.
   c. Click the **ASCII Setup...** button.

The ASCII Setup dialog box appears.



d. Under 'ASCII Sending,' check the 'Echo typed characters locally' box.
e. Under 'ASCII Receiving,' check both the 'Append line feeds to incoming line ends' and the 'wrap lines that exceed terminal width' boxes.
f. Click **OK**. You are returned to the Properties Settings property sheet.

7. Click **OK**.
8. From the task bar, select **File > Save**.
9. Set your keyboard's Caps Lock to on.
10. Click in the HyperTerminal display screen and press the **Ctrl** and **A** keys simultaneously.
11. Press **Enter**. The cursor should not appear as a square. You are now ready to enter valid CCTV commands to the Vicon switcher.
12. All commands must be preceded by Ctrl + A since this is the required header.
13. Verify connectivity via HyperTerminal by using valid CCTV commands.