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Pelco ASCII Protocol Manual

TABLE OF CONTENTS

Document History

1. Initial Release, 8/22/03.

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QUESTIONS

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INTRODUCTION

This protocol manual describes the ASCII protocol used to communicate with Pelco equipment. Some Pelco equipment will use this protocol "natively" (it is programmed into the equipment). Other system components will use a translator interface. The ASCII translator is a piece of hardware that will provide for the translation from the native protocol of the device to the ASCII protocol detailed below.

Not all devices will be able to accommodate all of the features available in this protocol. This protocol is designed to cover the feature sets of a wide variety of equipment. For information on the abilities of a particular piece of equipment, please refer to that equipment's manual.

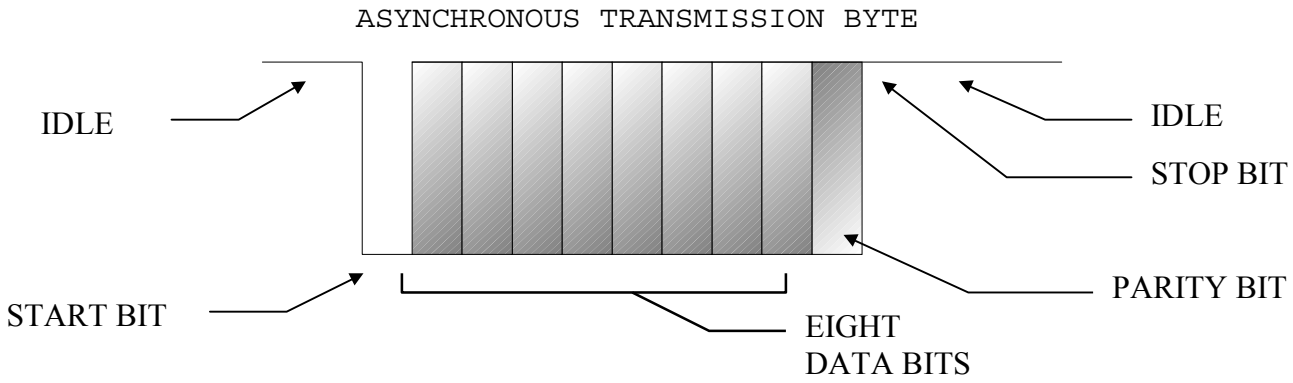
OVERVIEW

The protocol uses the basic ASCII character set to transmit and receive commands that control: pan and tilt mechanisms (both fixed and variable speed), camera functions, auxiliary relays, alarms, multiplexers, and vcrs. These commands are readable but are not English.

The physical layer of this protocol is variable and the user is responsible for making sure that an appropriate standard (RS-232, RS-422, RS-485, etc.) is used. Conversion devices to interface to these standards are readily available.

PHYSICAL LAYER

The ASCII protocol communicates in a standard asynchronous, byte oriented protocol that includes: 1 start bit, 8 data bits, 1 parity bit (or None, dependent on the specific type of Pelco equipment being used), and 1 stop bit. The communications rate varies with the application.



PROTOCOL DESCRIPTION

The commands have a relatively simple format. Each command is identified by an ASCII character. Commands that require a numeric value will transmit the ASCII representation of that value in front of the command identifier. Last of all, each command is followed by a lower case **"a"** [1].

If, for example, we want to tell the equipment to pan left we could send the following string: 27La. This indicates that the currently selected pan and tilt mechanism should pan left at speed 27. Legal values for speeds are in the range 1 to 63 where 1 is the slowest and 63 is the fastest. An exception to this is the "turbo" mode for the Pan axis, **ONLY.** Sending speed 64 activates Turbo mode.

The ASCII translator will send an acknowledgment to commands. The acknowledgment is the letters "AK" followed by a lower case "a".

If the ASCII translator rejects the command, then a negative acknowledgment will be sent back to the host. The negative acknowledgment consists of the letters "NA" followed by the Command being rejected and followed by a lower case "a".

If the command is not recognized, the ASCII translator sends a negative acknowledgment without the Command. That is, it will send "NA" followed immediately by a lower case "a".

[1] Except for the expanded Multiplexer and VCR Control commands which are terminated with a lower case **"m".**

COMMAND SUMMARY

In the command descriptions that follow, the range of legal values differs between commands and is shown preceding the command. The system may narrow the range of legal values. For example, when you control a fixed speed pan and tilt, the optional speed information should be omitted.

PAN AND TILT COMMANDS		CAMERA CONTROL COMMANDS	
Pan Left Stop Pan Left	[1-64]La ~La	Focus Near Stop Focus Near	Na ~Na
Pan Right Stop Pan Right	[1-64]Ra ~Ra	Focus Far Stop Focus Far	Fa ~Fa
Tilt Up Stop Tilt Up	[1-63]Ua ~Ua	Iris Open Stop Iris Open	Oa ~Oa
Tilt Down Stop Tilt Down	[1-63]Da ~Da	Iris Close Stop Iris Close	Ca ~Ca
Stop ALL PTZ Motion	sa	Zoom Telephoto Stop Zoom Telephoto	Ta ~Ta
		Zoom Wide Stop Zoom Wide	Wa ~Wa

ADVANCED COMMANDS			
Record Pattern	[1-99]/a	Set Preset	[1-9999]^a
Execute Pattern	[1-99]pa	Go To Preset Position	[1-9999]\a
End Pattern	[1-99]na	Begin a Tour	[1-99]ta
Start a Sequence	[1-99]qa	End a Tour	[1-99]ra
End a Sequence	[1-99]ea	Auxiliary On	[1-65536]Aa
Sequence Back	ba	Auxiliary Off	[1-65536]Ba - or - [1-65536]~Aa
Sequence Forward	qa	Programming Mode	[1-99]Pa
Sequence Hold	ea	Exit Mode	[1-99]~Pa
Start Macro	[1-9999]Sa	Clear Mode (Default)	ca
Stop Macro	[1-9999]Ha	Query Device	[1-9999]Qa
Trigger Alarm	[1-9999]Ea	Video Loss Detect	[cam #]Va

Clear/Reset Alarm	[1-9999]Ia	Clear Preset	[1-9999]$a
Acknowledge Alarm	[1-9999]Ka	Report Version	va
Send Camera Titles	Ya[string1/… string16]!a	Set Time and Date	ZaMM/DD/YY/HH:MM:SSa
Set Preset with a label	la[string]!a[1-9999]^a	Send Single Camera Title	[1-9999]Ya[string]!a
Decrement or 'step backward' through the list of Active Alarms	da	Increment or 'step forward' through the list of Active Alarms	ia
Override Camera to Monitor Lock	oa	Lock Cam to Monitor Unlock Cam to Mon	Ga ~Ga
Arm Internal Alarm Arm External Alarm Arm Video Alarm Disarm Internal Alarm Disarm External Alarm Disarm Video Alarm	[1-9999]Jia " Jea " Jva " ~Jia " ~Jea " ~Jva	Start Random Scan Start Frame Scan Stop Scan mode	1@a 2@a ~@a
Turn on Zone labels Turn off Zone labels	za ~za	Set Zone start location Set Zone end location	[1 – 8](a [1 – 8])a
Global Auxiliary On Global Auxiliary Off	[1-9999]xa [1-9999]~xa	Set Zone start location and embed a label	la[string]!a[1-8](a
Set Version	7va or 8va		

NOTE: Query is a generalized poll for information. Video loss is a response to a query. Other responses will be added to this portion of the protocol as required by the equipment being operated. Please check with Pelco if you have questions regarding these commands. The Report Software Revision command returns a string to the requesting device in the following format: REVISION X.xx ; where **'X'** depicts the Major revision level and the **'xx'** depicts the Minor revision level, i.e. "REVISION 2.10**".**

MATRIX CONTROL COMMANDS			
Select Monitor	[1-9999]Ma	Select Camera	[1-9999]#a
Next Camera	+a	Previous Camera	-a

MULTIPLEXER COMMANDS			
Digital mode Zoom	ym	Picture in picture	im
Digital mode Pan left	dLm	Quad	um
Digital mode Pan right	dRm	Nano	om
Digital mode Tilt up	dUm	Hex	xm
Digital mode Tilt down	dDm	Select Camera	[1-9999]#m

CM9760-MDA CONTROL COMMANDS			
Cable Compensation	[1-4]ca	Horizontal Characters position	[0-12] wxa
Camera Titles Display toggle	[0,1]fa	Vertical Characters position	[0-42] wya
Time and Date Display toggle	[0,1]ga	Set Date style	1Za[0-3]
Character Brightness	[1-8]ha	Set Hour style	2Za[0-1]
Character Display toggle	[0,1]ja	Query Status	?<command>a
Soft Reset	10359ka	MDA Unit Identifier	[0-15]|a
Comm Port Configuration	Xa/0/[0-4]/[0-2]a		

VCR CONTROL COMMANDS			
Play tape	* [1-65536]>m	Rewind tape	* [1-65536]<<m
Stop tape	sm	Record tape	* [1-65536]rm
Pause tape	* [1-65536]em	Eject tape	<m
Fast Forward tape	* [1-65536]>>m		
* The numeric values preceding some of the above listed commands may not apply to existing revisions of products, but are shown for possible future protocol expansion.			

COMMAND DESCRIPTIONS		
Pan Left Pan Right Stop Pan Left Stop Pan Right	[1-64]La [1-64]Ra ~La ~Ra	Causes the currently selected pan and tilt device to move horizontally to the viewer's left or right at the speed indicated. If the speed is omitted, some devices will operate at a default speed, others will move at the slowest speed possible for the device. The 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 ~Ua ~Da	Causes the currently selected pan and tilt device to move vertically in the direction indicated at the speed indicated. If the speed is omitted, some devices will operate at a default speed, others will move at the slowest speed possible for the device. The speed information has no effect on fixed speed devices.

Zoom Telephoto Zoom Wide Stop Zoom Telephoto Stop Zoom Wide	Ta Wa ~Ta ~Wa	Causes the currently selected camera to either zoom telephoto (narrow the field of view or make objects appear larger) or zoom wide (widen the field of view or make objects appear smaller).

Focus Near Focus Far Stop Focus Near Stop Focus Far	Na Fa ~Na ~Fa	Causes the currently selected camera to change the good focus range nearer to or further from the camera.

Iris Open Iris Close Stop Iris Open Stop Iris Close	Oa Ca ~Oa ~Ca	Causes the currently selected camera to either open (brighten the image) the iris, or close (make the image darker) the iris.
Stop ALL PTZ Motion	sa	Stops all image motion… stops pan, tilt, zoom, focus and iris.

Set Preset Go To Preset Position Clear Preset	[1-9999]^a [1-9999]\a [1-9999]$a	Remember a position (includes pan, tilt, zoom, focus, and iris positioning) and recall that setting. Clear the preset information from the device's non-volatile memory.
Set Preset with a Label: la[string]!a[1-9999]^a		Sets a Preset location with an embedded label, where the **ASCII** string **MUST BE UPPERCASE CHARACTERS.** Where **[string]** is an alphanumeric label limited to 20 characters and **[1-9999]** is the associated Preset number. **NOTE:** All transmitted characters **MUST BE ASCII**
Trigger Alarm Acknowledge Alarm Reset/Clear Alarm	[1-9999]Ea [1-9999]Ka [1-9999]Ia	Generate an alarm through protocol, then acknowledge or Clear an existing alarm. The effects of these commands are system dependent.
Video Loss Detect	[cam #]Va	Reports a video loss condition from the specified camera in response to a Query command from the system master.

Start a Sequence End a Sequence	[1-99]qa [1-99]ea	A sequence is a pre-programmed set of cameras that can be called up in order (automatically or manually). Starting the sequence displays the cameras in the order defined.
Sequence Forward Sequence Backward	qa ba	Display the set of cameras in the order programmed. Display the set of cameras in reverse order as programmed.
Sequence Hold	ea	Places the running sequence in a HOLD state which essentially "freezes" the currently selected camera on the monitor, allowing the user to control the camera or switch. Note that the sequence is still "armed" on the monitor just not "active".
Begin a Tour End a Tour	[1-99]ta [1-99]ra	A tour is a programmed set of camera, monitor, and presets that can be run automatically.
Auxiliary On Auxiliary Off - or -	[1-65536]Aa [1-65536]Ba [1-65536]~Aa	Auxiliaries are relay outputs that can be controlled through the protocol. Please make sure to consult the system manual(s) to find out how the system involved implements relay control.
Start Macro Stop Macro	[1-9999]Sa [1-9999]Ha	Some systems have the ability to execute a programmed behavior. This command starts and stops these preprogrammed behaviors.
Programming Mode EXIT Program Mode Clear Mode	[1-99]Pa [1-99] ~Pa ca	These commands implement a general method of changing a system's mode of operation. Please consult system manuals for how these are implemented in your system.
Query Device	[1-9999]Qa	Generalized poll command. This gives the polled device an opportunity to transmit pending information to the system master or to take control of the bus for a limited time.
Send Group of Camera Titles: Ya[string1/… /string16]!a		Send a series of camera titles (**up to 16**) to a matrix switching system. The first string ***always*** corresponds to Camera #1, then each following string (separated by the **"/"** character) corresponds to the next higher camera number (ending with Camera #16). The user may choose to send fewer than 16 camera titles being certain to terminate with **"] ! a".** Valid characters in the strings are **A-Z, a-z, [a space],** and **0-9** in ASCII representation. Strings are limited to 20 characters.
Set Version	7va or 8va	Sets the configuration of the receiving device to be compatible with either version '7.xx' of the CM-9760 protocol or version '8.xx' CM-9760 protocol
Report Version	va	Asks a device to report its version information.
Set time and date: ZaMM/DD/YY/HH:MM:SSa		This command is a "mode" of operation. Since the time and date string might be confused with other commands, the command string "Za" comes first. This puts the receiving device into a mode that can accept the specialized string. **NOTE:** All transmitted characters **MUST BE ASCII**
Select Monitor	[1-9999]Ma	Selects an available system monitor for display.

Send a Single Camera Title	[1-9999]Ya[string]!a	Send one 20-character string to a specific camera address, in the range of [1-9999]. All restrictions as specified in the 'Send Group Camera Titles' also apply for this command.
Select Camera Next Camera Previous Camera	[1-9999]#a +a -a	Select a camera to be displayed on the current operating monitor. The advance "+" and previous "-" commands allow a user to step to the next numbered camera in the system.
Decrement through list Increment through list	da ia	Used to decrement through the list of Active System Alarms Used to increment through the list of Active System Alarms
Lock Camera to Monitor Unlock Camera to Monitor	Ga ~Ga	Locks a Camera view and control to a specific Monitor Unlocks the Camera resource from the specified Monitor
Override	oa	Overrides the Camera to Monitor Lock state if the user has the correct priority level for issuing such a command
Start Random Scan Start Frame Scan Stop Scan mode	1@a 2@a ~@a	These commands invoke different scan modes and take the device out of scan mode
Set Zone start Set Zone end	[1-8](a [1-8])a	Program the beginning point and the end point of a Zone, identified by the zone number, 1 – 8.
Set Zone start with label	la[string]!a[1-8](a	Sets the Zone start location with an embedded label, where the **ASCII** string **MUST BE UPPERCASE CHARACTERS.** Where **[string]** is an alphanumeric label limited to 20 characters and **[1-8]** is the associated Zone number. **NOTE:** All transmitted characters **MUST BE ASCII**
Turn on Zone labels Turn off Zone labels	za ~za	These commands will enable or disable the Zone label display
Global Auxiliary On Global Auxiliary Off	[1-9999]xa [1-9999]~xa	These commands activate and deactivate global system auxiliaries in the possible range of the system.
Arm Internal Alarm Arm External Alarm Arm Video Alarm Disarm Internal Alarm Disarm External Alarm Disarm Video Alarm	[1-9999]Jia [1-9999]Jea [1-9999]Jva [1-9999]~Jia [1-9999]~Jea [1-9999]~Jva	These commands will arm and disarm the various types of system alarms

MULTIPLEXER COMMANDS

Digital mode Zoom	ym	Performs a '2x'magnification of the currently displayed scene then a '4x' magnification each time the command is issued.
Picture in picture	im	Initiates and exits the PIP mode where one camera scene is displayed as a background and a second camera view is displayed as an insert.
Quad Nano Hex	um om xm	These 3 commands display their respective '4-up', '9-up', and '16-up' multiple camera views.
Camera Select	[1-16]#m	Selects a multiplexer camera input to the current monitor.
Scene Movement in Digital mode using Joystick or Cursor keys	dLm, ~dLm dRm, ~dRm dUm, ~dUm dDm, ~dDm	Directs scene movement when monitor is operating in the Digital Zoom mode.

VCR CONTROL COMMANDS

*Play tape	[1-65536]>m	Plays the currently installed tape
Stop tape	sm	Stops the currently playing tape
*Pause tape	[1-65536]em	Pauses the currently playing tape
*Fast Forward tape	[1-65536]>>m	Initiates Fast forwarding of the current tape
*Rewind tape	[1-65536]<<m	Initiates Rewind of the current tape
Record tape	[1-65536]rm	Initiates the Record function with the current tape
Eject tape	<m	Ejects the currently installed tape

* The numeric ranges preceding some of the above listed commands may not apply to existing revisions of products, but are shown for possible future protocol expansion.

** ***Please Note*** that the commands listed above are functional ***ONLY*** through the use of a CM9760-DT ASCII translator device.

CM9760-MDA CONTROL COMMANDS		
Cable compensation	[1-4]ca	Set the cable compensation value
Camera Titles display toggle	[0,1]fa	Toggle the camera titles Off=0; On=1
Time and Date display toggle	[0,1]ga	Toggle the Time and Date Display Off=0; On=1
Character brightness control	[1-8]ha	Set the character brightness
Character display toggle	[0,1]ja	Toggle all characters Off=0; On=1
Soft Reset command	10359ka	Perform a Soft Reset
Communication Port Configuration	Xa/0/[0-4]/[0-2]a	Set Input Communication Port properties: Baud rate selected by values, 0-4; Parity selected by values, 0-2 *(refer to the CM9760-MDA manual for details)*
Horizontal position of characters	[0-12] wxa	Set the horizontal position of characters
Vertical position of characters	[0-42] wya	Set the vertical position of characters
Set style of the Date display	1Za[0-3]	Set the Date Display Style to one of 4 possible values – refer to the CM9760-DT manual (C542M) for details
Set style of the Time display	2Za[0-1]	Set the Time Display Style to one of 2 possible values – refer to the CM9760-DT manual (C542M) for details
Query Status	?<command>a	The Query Status command is used to preface one of the above commands to return the current value of the function desired (i.e. "?ha" will return… "5ha" which indicates a character brightness setting of '5')
Identify MDA unit	[0-15]|a	Unit Identifier command used to address up to 16 CM9760-MDA devices

EXAMPLES	
COMMAND DESCRIPTION	STRING TO SEND
Switch camera 3 to monitor 1	1Ma3#a
Go to camera 2, preset 3, on monitor 5	5Ma2#a3\a
Pan Right at Speed 47, Tilt down at speed 33	47Ra33Da
Stop Tilt down only	~Da
Run macro 10 on monitor 1	1Ma10Sa
Stop macro 10 on monitor 1	1Ma10Ha
Trigger alarm 945	945Ea
Stop alarm 945	945Ia
Identify Camera 128 as “South Parking”	128Ya<South Parking>!a ; where the label, < South Parking > is in ASCII characters
Program Preset 25 with a label	la<PRST 25>!a25^a ; where the label, <PRST 25> is in ASCII characters
Enter Multiplexer Digital Zoom mode	ym
Move left and then stop in Mux Digital Zoom	dLm… ~dLm
Play a VCR tape, Fast Forward, then Stop	>m… >>m… sm
Set the Date Display style for the CM9760-MDA	1Za3

INDEX