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SERIAL COMMAND SET

The complete serial command set for the QuadView *Plus* is presented in this chapter.

GENERAL

All QuadView *Plus* functions are accessible by means of serial commands. Typically the device is controlled by a 3rd party machine or by means of an optional software control program, called the Virtual Control Panel (VCP). The VCP program allows a user to control the QuadView *Plus* directly from a PC running the Windows Operating system. See “Control Software For Windows” on page 15" for more information on VCP.

SERIAL COMMAND SET USAGE

The serial command set can be used to control the QuadView *Plus*. The command set is made up of ASCII characters and is not case sensitive.

The uppercase letters in the command name can be used to abbreviate the command on the prompt line. For example, **BRIghtness**, you can use **BRI**, and for **CONTrast**, you can use **CONT**. A space is required between a command and its argument. To execute serial commands, each command line must be followed by a carriage return.

Commands consist of a command name followed by an argument. For example, to set the brightness level of input 1 to 123, type in **BRI 1 123**. The serial command set can also be used to find out the current state for a particular parameter. For example, to find out the brightness level of input 1, type **BRI 1**. The QuadView *Plus* will return the current value (i.e. Brightness = 123).

SERIAL COMMAND SET LIST

The following tables list all of the commands for controlling the QuadView *Plus*.

INPUT COMMANDS

These commands allow you to make adjustments for your inputs and then save these settings into the unit's internal memory.

Command	Arguments	Description
INput	<input # | ALL> [AUTO | LOCK | DEBUG]	Sets the input mode for the specified input. *Auto* engages the autosync circuitry. *Lock* turns the autosync circuitry off. *Debug* provides information on input status and reports changes to measured parameters. Factory default: AUTO
INput**DE**Lete	<1…50>	Deletes the specified saved input from the *Input List*.
INput**F**ormat	<input #>	*InputFormat* checks the video format of the current video input selection. The command is only valid when *Input Type* is set to either Composite, Component, or S-Video. The response to the command will be NTSC or PAL.
INput**I**nteractive	<input#>	Enters input interactive mode to visually adjust timing parameters of the specified input. A white box frame and cross hair appear over the full screen input. Starting with the upper-left corner of the image, use these keyboard controls to position the image within the white frame: **i** = move up **m** = move down **j** = move left **l** = move right With the upper-left corner properly adjusted, address the lower-right corner next by using these keyboard controls: **I** = move up **M** = move down **J** = move left **L** = move right With the image properly adjusted, quit the utility: **q** = quit After you have adjusted the input to your satisfaction, use the *Input Name* command to name your input source, and the *Input Save* command to store the setting to the *Input List*.
INput**LIST**	[<1…50>] [<1…50>] [<ACTIVE>]	Displays the entire *Input List* of saved input timings. If arguments are supplied, displays only the portion of the list requested. The *Active* argument displays all saved list entries.
INput**LOAD**	<input #> <1…50>	Loads the indicated entry from the *Input List* to the specified input channel. The entry is loaded only if it matches the measured parameters of the signal—sync format and polarity, interlace state, vertical total, and horizontal frequency.
INput**N**ame	<input #> <name>	Assigns a name to the specified input. The argument can be up to 17 alphanumeric characters with no spaces (underscore is acceptable). Factory default: Auto_1
INput**S**ave	<input#> <1…50>	Saves the specified input to the selected entry in the *Input List*. These settings are recalled whenever the signal is reapplied to the QuadView *Plus*.
INput**T**iming	<input #> <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>	Sets the timing of the selected input. **Note:** The vertical total cannot be changed from the measured value; that is, the total of <vfp> + <vs> + <vbp> + <vact> must remain constant. See Table 4 for acceptable ranges.

Command	Arguments	Description
INput**TYPE**	<input#> <COMPOSITE | SVIDEO | COMPONENT | RGB>	The command selects between the four possible inputs types for each channel. One input type per channel can be used at a time. Factory default: RGB
Load**I**nput**L**ist	<1...50> <name> <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact> <hfreq> <sync> <hpol> <vpol> <il>	The *LoadInputList* command lets you define input timing strings without requiring the input signal to be present. For example, if one QuadView system had an Input List which must be copied to a second unit, the LoadInputList command could be used to enter in the list entries one by one. The first argument, <1…50>, indicates the Input List entry number to which to store the timing string. The second argument, <name>, gives a customized name to the signal. The next eight arguments, <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>, define the signal's timing. The next five, <hfreq> <sync> <hpol> <vpol> <il>, define the horizontal frequency, sync format and polarity, and interlace status. All 15 arguments must be supplied for the command to be successful.
Video**A**spect**R**atio	<input#> <NORMal | WideScreen1 | WideScreen2 | WideScreen3 | WideScreen4 >	Selects the video input source aspect ratio. Use this command when using a wide screen display with letterboxed video. Normal = 1.33:1 WideScreen1 = 1.66:1 WideScreen2 = 1.78:1 WideScreen3 = 1.85:1 WideScreen4 = 2.35:1 Factory default: NORMAL

HOST COMMANDS

The Host commands control the output of the QuadView *Plus*. They define the output or "host" timing and sync format, and save, load, and delete timings to the Host List.

Command	Arguments	Description
Clear**H**ost**L**ist	(none)	Clears the *Host List* of all user-defined hosts.
HOST	(none)	A query command which returns information on the selected host timing.
Host**DEL**ete	<1..10>	Deletes the specified user-defined host.

Command	Arguments	Description
Host**I**nteractive	(none)	Enters the host interactive mode. This is an adjustment mode for changing the Host Timing values to better suit your display device. Once in the interactive mode, a white box and cross hair appear on the output display. Starting with the upper-left corner of the box, use these keyboard controls: **i** = move up **m** = move down **j** = move left **l** = move right With the upper-left corner properly adjusted, address the lower-right corner next by using these keyboard controls: **I** = move up **M** = move down **J** = move left **L** = move right With the image properly adjusted, quit the utility: **q** = quit After you have adjusted the input to your satisfaction, use the *Host Name* command to name your input source, and the *Host Save* command to store the *Host List*.
Host**LIST**	[<1…64>] [<1…64>]	Displays the entries in the Host List (Table 5). Without arguments, the command returns the entire list. With one argument, it returns information on the specified Host List entry. With both arguments, it returns the portion of the Host List specified by the arguments. The first 10 entries are user-defined. That is, these slots are reserved for host timing strings the user defines with the *HostTiming* and/or *HostInteractive* commands, and saves with the *HostSave* <1…10> command. Entries 11 through 54 include both progressive (non-interlaced) and interlaced hosts with a standard 4:3 or 5:4 aspect ratio. They are listed in order of decreasing resolution and frequency. Entries 55 through 63 are 16:9 wide screen hosts. Entry 64 is a 1600x1200 pixel host. Factory default: Host #11
Host**LOAD**	<1…64>	Loads the indicated host settings from the *Host List.*
Host**N**ame	<name>	Assigns a name to the current host. The argument can be up to 17 alphanumeric characters with no spaces (underscore is acceptable). Factory default: Auto_1
HostSave	<1…10>	Saves the current host settings into the *Host List.* The argument specifies which *Host List* position is used.
Host**T**iming	<input #> <hfp> <hs> <hbp> <hact> <vfp> <vs> <vbp> <vact>	Sets the timing for the current host. Factory default: Host #11, 1280x1024, 75 Hz See Table 5 for a description of Host List.

WINDOW POSITIONING/VISIBILITY

This section contains commands for controlling the display configuration, zoom and pan operations, and freezing inputs.

Command	Arguments	Description
Double**B**uffer	<input#> <ON | OFF>	The double buffering feature eliminates pointer crossover. This is a visual artifact which can be visible in imagery containing horizontal motion—for example, a camera panning from left to right—or scene changes. It appears as a brief, horizontal break in the picture. Your eye may not discern it, but what you are seeing is a portion of one frame of video and a portion of another. With DoubleBuffer ON, pointer crossover is eliminated. The trade off is that horizontal motion may appear a little jerkier. DoubleBuffer is applicable to both RGB and video inputs. When setting DoubleBuffer for input 1, first select the specific input type with the INputType command. DoubleBuffer should be used only with a progressive output. It is valid with video inputs and RGB inputs with progressive scan. Factory default: ON
Free**Z**e	<input# | ALL> <ON | OFF>	Turns freeze status of selected input on or off. If *Freeze* is on, it delays action of *Brightness*, *Contrast*, and *Gamma* commands until *Freeze* is turned off. The freeze status is maintained through switches between display configurations, as it is the input that is frozen, not the output. Any change to the host timing resets the freeze status to off. Factory default: OFF
Full**S**creen	<input# | BLACK>	The FullScreen command sets the selected input to a full screen display. With the black argument, the screen is set to black. FullScreen is an alternative display configuration command to QuadView.
Motion**F**ilter	<input #> <ON | OFF>	This command sets the motion filter level for the specified input. When Off, you get the greatest vertical resolution but a possible side effect of motion artifiacts such as "feathered edges" on moving objects. When motion filter is On, motion artifacts are removed, but at the expense of some vertical resolution. Motion filter only applies to video inputs and has no effect on RGB inputs. Factory default: OFF
OVERSCAN	<input #> <ON | OFF>	*Overscan* performs an automatic 2% enlargement on video inputs only. It has no effect on WSR values, and it applies to all video inputs for the specified channel. *Overscan* is useful in trimming out excess blanking in video signals or head switching for VTR sources. Unlike WSR, when *Overscan* is turned on, the enlargement is automatic and constant even when switching between the various video input types. Factory default: OFF
PAN	<input #>	Activates the pan utility for the selected input. Only a zoomed input can be panned. The controls for the utility are as follows: **i** = pan up **m** = pan down **j** = pan left **l** = pan right **q** = quit

Command	Arguments	Description
POSition	<input #> [<direction> <repetition>]	Activates the position utility, allowing you to move the specified input window around the output display. The controls for the utility are as follows: **i** = move up **m** = move down **j** = move left **l** = move right **q** = quit The *direction* and *repetition* arguments allow you to repeat a movement in one direction without repeatedly pressing the key. For example, to move window 1 to the left 20 times, you can type: > POS 1 j 20 The actual pixel or line increments that a window moves is determined by the *Setrate* command. In the above example, the window will move 400 pixels to the left (20 times the default rate of 20 pixels). *Position* affects the WDR value for the input.
PRIority	<input # | ALL> <1..4>	Priority numbers run from one through four. Priority one is the highest priority level, meaning a window with priority one appears "in front of" all other windows. If a windows' priority is increased, the window previously at that priority level moves down one and, if necessary, lower priority windows also move down. In other words, no two inputs can have the same priority level. The *All* argument allows you to change the priority level for all inputs at once.
RSR	<input#>	Resets the source rectangle (WSR) to default value, that is equal to the HACT and VACT measurements of the specified input signal. RSR "unzooms" a zoomed image. RSR also resets brightness, contrast, gamma, hue, saturation, and sharpness values to defaults.
Quad**V**iew	(none)	The QuadView command switches the output display to a quadrant configuration, using the quadrant/input arrangement specified in the QuadViewMap command. There are no arguments for this command. QuadView is an alternative display configuration command to FullScreen and DualView.
Quad**V**iew**MAP**	(none)	This command sets up the input/quadrant mapping assignment used in the output display. All four quadrant assignments are required, and no input can be repeated more than once. The arguments are in quadrant order of top left to bottom right (TL, TR, BL, BR), and refer to the inputs. For example, if the command "QVM 4 3 2 1" is issued, input #4 appears in the TL quadrant, input #3 in the TR, input #2 in the BL, and input #1 in the BR. The QuadViewMap assignment is saved in NVRAM.
SETRATE	<x-rate> <y-rate>	This command determines the number of pixels (x-rate) or lines (y-rate) a window will move with the *Position* command. Factory default: x= 20, y= 20
SIZE	<input #>	Activates the size utility, allowing you to resize the specified input window. The controls for the utility are as follows: **s** = smaller **l** = larger **q** = quit *Size* affects the WDR value for the input.

Command	Arguments	Description
WDR	<input #> <x> <y> <width> <height>	This command sets both the position and size of an input's destination rectangle. The <x> and <y> arguments represent the monitor coordinates of the rectangle's top left corner, but hardware limitations may cause the actual placement to differ slightly from that specified. (When you read WDR for any window, the numbers given accurately reflect the state of the hardware.) The <width> and <height> arguments represent the pixel width and line height of the destination rectangle. The rectangle can be positioned and sized so that part of it is positioned off the screen. WDR is limited to the output resolution of the QuadView *Plus* (full screen display). Example—with an output host resolution of 1024 x 768, set window 4 to be full screen: >WDR 4 0 0 1024 768 Example—place a 100 pixel by 100 line video window at column 300, line 400 on the monitor for input window 2: >WDR 2 300 400 100 100
WINdow	<input# | ALL> <ON| OFF>	The *Window* command is used to turn off one or all windows. If *Window* is Off and the input to that channel is removed and reapplied within two seconds then the status remains off. If *Window* is On and a signal is removed for more than two seconds and then reapplied, the window status reverts to on. This allows for the use of a switcher and maintaining the desired on/off status. It also means that when a previously unused channel is used, the window automatically turns on allowing the new input to be displayed. The WIN ALL command is used to turn all windows on or off simultaneously. Factory default: ALL ON

Command	Arguments	Description
WSR	<input#> <x> <y> <width> <height>	Sets the source rectangle for the selected input. The source rectangle is the portion of the original input that is displayed on screen. By default, WSR is set to show the entire image. That is, the default value for RGB inputs is equal to the HACT and VACT measurements of the specified input signal. For video, WSR defaults to 720x480 for NTSC and 720x574 for PAL. The source rectangle is used to zoom in or out on an image. The <x> and <y> coordinates represent coordinate screen starting point from which to draw the supplied values of <width> and <height>. Example—To zoom in on the upper left quadrant of an 800x600 input, the WSR values are: wsr <input#> 0 0 400 300 To display only the bottom right quadrant, the WSR values are: wsr <input#> 400 300 400 300 The full, default source rectangle for this 800x600 input is: wsr <input#> 0 0 800 600 WSR resets to defaults whenever the signal is acquired or reacquired. That is, if you remove or replace the input signal, or if you change the input type selection on a single channel with the INputTYPE command, then WSR resets to the default values for the newly acquired signal.
Zoo**M**	<input#>	Activates the zoom utility. *Zoom* affects the WSR value for the input. The zoom utility controls are: **i** = zoom in **o** = zoom out **q** = quit The maximum zoom is limited in all cases to no more than two times the original image. Not all inputs generate a 2x zoom ratio, however. The amount of available zoom range is dependent on the pixel rate of the input signal. *Zoom* resets to an unzoomed state whenever the signal is acquired or reacquired. That is, if you remove or replace the input signal, or if you change the input type selection on a single channel with the *InputType* command, then *Zoom* resets to the default values for the new signal.

IMAGE CONTROLS

After you have made your adjustments with the *Input Commands*, you can then adjust the image controls for each input.

Command	Arguments	Description
BRIght	<input# | ALL> <-500…500>	Sets *brightness* value of the selected input. The ALL argument sets brightness for all four inputs. Factory default: 0
CONTrast	<input# | ALL> <0…199>	Sets *contrast* value of the selected input. The ALL argument sets contrast for all four inputs. Factory default: 100
GAMma	<0.5…2.0>	Sets a gamma value for the QuadView *Plus*. For RGB inputs, the value is automatically saved with *InputSave* command. Factory default: 1.0

Command	Arguments	Description
HUE	<input#> <-180…180>	Sets *hue* value of the selected input. Hue is only valid for video inputs. Factory default: 0
SATuration	<input#> <0…199>	Sets *saturation* value of the selected input. Saturation is only valid for video inputs. Factory default: 100
SHARPness	<input#> <0 | 1 | 2 | 3>	Sets *sharpness* value of the selected input. Factory default: 2

SERIAL PORT FUNCTIONS

These commands control the baud and echo settings.

Command	Arguments	Description
BAUDrate	<1200 | 2400 | 9600 | 19200 | 38400 | 57600 | 115200>	Sets the serial port *baud* rate. The value is automatically saved in NVRAM. Factory default: 9600
ECHO	<ON | OFF>	Turns the serial *echo* On/Off. The value is saved in the NVRAM. The *echo* is only on commands typed and sent to the unit. **Note:** *Echo* setting has no effect on responses issued by the QuadView *Plus*; responses are always visible, regardless of the *echo* status. Factory default: ON

MISCELLANEOUS

These commands control a variety of general QuadView *Plus* functions.

Command	Arguments	Description
AUTOSAVE	<ON | OFF>	The *AutoSave* feature automatically stores the system configuration approximately every ten seconds. The process stores configuration information such as *HostList*, *InputList*, *Host* settings, and display parameters. *AutoSave* allows you to turn the NVRAM automatic update mode on or off. Factory default: ON
DEMO	(none)	*Demo* runs the built-in demo sequence. Type “q” to quit demo.
Front**P**anel	<ON | OFF>	Enables and disables the front panel. Factory default: ON
Help	[<command>]	*Help*, without an argument will display the entire serial command set. *Help*, with a command as an argument will display detailed information about that command.
ID	(none)	Displays the product identification, product name, firmware version number, date, and serial number.

Command	Arguments	Description
PRESET	<1...6>	Stores your current display configuration to the designated preset memory. This configuration includes window size, position, and order, image parameters, input timing parameters, and output timing parameters. You can reload these presets using the *Recall* command.
RECALL	<1...6> [<all>]	Recalls a previously saved preset configuration. Without the ALL argument, the QuadView Plus recalls only the position, size, and priority level for each input window. With the ALL argument, the QuadView Plus recalls all of the parameters stored in the EEPROM (i.e. input type selection, image controls, etc.). This option will take more time since more parameters are being recalled.
Restore**F**actory**D**efaults	(none)	Restores all user settings to their factory default values.
SAVECONFIGuration	(none)	Forces an update and explicit save of the system's NVRAM. This stores configuration information such as *HostList*, *InputList*, *Host* settings and display parameters.
STATus	(none)	Returns the *Status* of the QuadView *Plus* and its current settings.
Test**P**attern	<OFF | MovingBars | GrayScale | ColorBars>	This command turns the designated *TestPattern* (moving bars, grayscale, or color bars) on. Use the Off argument to turn the *TestPattern* off. Factory default: OFF
Update**F**irm**W**are	(none)	This command updates the firmware for the QuadView *Plus*. If the baud rate is other than 115,200, the user will be prompted to change the baud rate of the terminal emulator and the QuadView *Plus* to 115,200. When this is complete, the *Updatefirmware* command must be re-issued and confirmed. The user is prompted to download the file. On the screen, progress dots appear during the download. See *Appendix B* for more information on the update procedure.
VERSION	(none)	*Version* returns firmware, hardware, and bootcode revision information.

TABLE 1. Definitions and Ranges for Input Timing Parameters

Parameter	Definition	Range
HFP	Horizontal front porch	0 to 640 pixels
HS	Horizontal sync	16 to 640 pixels
HBP	Horizontal back porch	0 to 640 pixels
HACT	Horizontal active	16 to 1600 pixels
VFP	Vertical front porch	0 to 512 lines
VS	Vertical sync	2 to 32 lines
VBP	Vertical back porch	0 to 512 lines
VACT	Vertical active	12 to 1200 lines
HFREQ	Horizontal frequency in Hz	15 to 90 kHz
SYNC	Sync format	3, 4, or 5 wires
HPOL	Horizontal sync polarity	1 or 0
VPOL	Vertical sync polarity	1 or 0
IL	Interlaced/Noninterlaced	1 or 0

TABLE 2. Host List

#	NAME	HFP	HS	HBP	HACT	VFP	VS	VBP	VACT	HFREQ	SYNC	HPOL	VPOL	IL
1 . . 10	(user defined hosts)													
11	VESA_1280x1024_75	16	144	248	1280	1	3	38	1024	799805	1	1	0	
12	VESA_1280x1024_60	48	112	248	1280	1	3	38	1024	639835	1	1	0	
13	1280x1024___59.94	48	112	248	1280	1	3	38	1024	638975	1	1	0	
14	1280x1024_____50	52	116	250	1280	1	3	38	1024	532995	1	1	0	
15	VESA_1280x960__60	96	112	312	1280	1	3	36	960	600025	1	1	0	
16	1280x960____59.94	96	112	312	1280	1	3	36	960	599415	1	1	0	
17	1280x960_____50	96	112	312	1280	1	3	36	960	500005	1	1	0	
18	EIA_1260x946___30	44	136	164	1260	8	8	61	473	306925	1	1	1	
19	EIA_1164x874___30	36	112	140	1164	6	6	59	437	283425	1	1	1	
20	SUN_1152x900___66	30	128	194	1152	2	4	31	900	617975	1	1	0	
21	APPLE_1152x870_75	32	128	144	1152	3	3	39	870	686815	1	1	0	
22	VESA_1152x864__75	64	128	256	1152	1	3	32	864	675035	1	1	0	
23	EIA_1080x809___30	26	96	118	1080	6	6	54	404	262445	1	1	1	
24	1024x768_____100	24	136	160	1024	3	6	29	768	806065	1	1	0	
25	VESA_1024x768__85	48	96	208	1024	1	3	36	768	686815	1	1	0	
26	VESA_1024x768__75	16	96	176	1024	1	3	28	768	600245	1	1	0	
27	VESA_1024x768__70	24	136	144	1024	3	6	29	768	564785	0	0	0	
28	VESA_1024x768__60	24	136	160	1024	3	6	29	768	483655	0	0	0	
29	1024x768____59.94	24	134	158	1024	3	6	29	768	483115	0	0	0	
30	1024x768_____50	24	136	160	1024	3	6	29	768	403035	0	0	0	
31	VESA_1024x768__43	8	176	56	1024	0	8	41	384	356015	1	1	1	
32	EIA_900x674____30	20	64	80	900	5	5	45	337	218705	1	1	1	

33	APPLE_832x624__74	32	64	224	832	2	3	38	624	497165	1	1	0
34	EIA_832x624____30	16	56	64	832	5	5	41	312	202535	1	1	1
35	800x600_____100	32	96	128	800	1	2	22	600	625005	1	1	0
36	VESA_800x600___85	32	64	152	800	1	3	27	600	536735	1	1	0
37	VESA_800x600___75	16	80	160	800	1	3	21	600	468755	1	1	0
38	VESA_800x600___72	56	120	64	800	37	6	23	600	480795	1	1	0
39	VESA_800x600___60	40	128	88	800	1	4	23	600	378805	1	1	0
40	800x600_____59.94	40	128	88	800	1	4	23	600	376425	1	1	0
41	VESA_800x600___56	24	72	128	800	1	2	22	600	351565	1	1	0
42	800x600_____50	32	96	128	800	1	2	22	600	312505	1	1	0
43	PAL_768x576____25	22	70	84	768	5	5	39	288	156255	0	0	1
44	640x480_____100	16	96	48	640	10	2	33	480	525015	0	0	0
45	VESA_640x480___85	56	56	80	640	1	3	25	480	432695	0	0	0
46	VESA_640x480___75	16	64	120	640	1	3	16	480	375005	0	0	0
47	VESA_640x480___72	24	40	128	640	9	3	28	480	378605	0	0	0
48	VESA_640x480___60	16	96	48	640	10	2	33	480	314735	0	0	0
49	640x480_____59.94	16	96	48	640	10	2	33	480	314735	0	0	0
50	640x480_____50	16	96	48	640	10	2	33	480	262505	0	0	0
51	NTSC_640x480___30	44	112	104	1280	6	6	29	242	157345	0	0	1
52	VESA_720x400___85	36	72	108	720	1	3	42	400	379275	0	1	0
53	VESA_640x400___85	32	64	96	640	1	3	41	400	378605	0	1	0
54	VESA_640x350___85	32	64	96	640	32	3	60	350	378605	1	0	0
55	1280x768_____56	48	112	248	1280	1	3	30	768	451165	0	0	0
56	1280x720_____100	110	40	220	1280	5	5	20	720	750015	0	0	0
57	1280x720_____60	108	40	214	1280	5	5	20	720	450005	0	0	0
58	1280x720____59.94	112	40	224	1280	5	5	20	720	449555	0	0	0
59	1280x720_____50	110	40	220	1280	5	5	20	720	375005	0	0	0
60	852x480_____60	20	66	52	852	6	6	33	480	314915	0	0	0
61	852x480_____59.94	20	66	52	852	6	6	33	480	314685	0	0	0
62	1360x1024__75.1	32	136	272	1360	3	3	35	1024	80000 5	1	1	0
63	1360x768__60	92	40	276	1360	3	6	18	768	47700 5	1	1	0
64	1600x1200_____60	55	164	259	1365	1	3	46	1200	75001 5	1	1	0

SERIAL CONTROL OF MULTIPLE UNITS

The Multi-Product Serial Driver (MPSD) is a protocol for controlling more than one RGB Spectrum product through a single console. The maximum number of MPSD supported products in a single chain is ten. An extra non-MPSD supported device can be connected to the last MPSD device in the chain, making the total controllable devices equal to eleven.

The Auxiliary serial communications port is used to implement daisy-chaining of multiple systems. The Auxiliary port of an upstream device is connected to the primary port of a downstream device (see Figure 1). When a device is not

selected, it passes all commands to its downstream port, and passes all responses from its Auxiliary port back to the console.

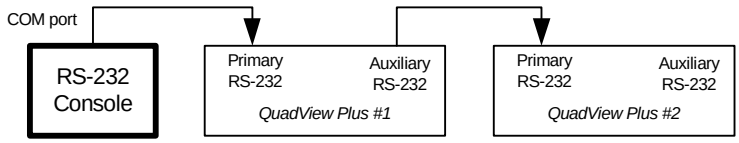

FIGURE 1. **Serial Control of Two QuadView Units**

MPSD COMMANDS

All MPSD commands are preceded with ":" and are buffered by each device that receives them. The devices must be placed in MPSD mode with the **:assign** command before any other MPSD commands can be issued.

If the console receives no response from the devices, or a wrong command is issued, entering **:assign** usually brings the system back into communication.

:assign - identifies all connected devices and enters into MPSD mode

```
:assign
```

This command identifies all connected devices and places them in MPSD mode. Each device has a unique ID number from 0 to 9. Device 0 is automatically selected to communicate with the terminal console. The ID number or device name is shown with the prompt sign so users can recognize which device they are working with. Since all MPSD commands are buffered, Device 0 is responsible for echoing MPSD commands to the console.

:unassign - cancels MPSD mode for all connected devices

```
:unassign
```

This command removes all connected devices from MPSD mode. Device 0 then communicates with the console as a stand-alone device.

:select - selects a particular device to communicate with

```
:select <device number|device name>
```

Selects a particular device to communicate with the console. Other devices which do not match the device number or device name are deselected. If a non-valid number or name is entered, the console cannot receive any responses to commands or queries because none of the devices is selected. Entering the

:select command with a valid argument re-establishes communication with the console.

If a non-MPSD device is connected to the end of the chain and a non-valid device number or name is entered, the non-MPSD device is selected. However, if the intent is to control a non-MPSD device in a chain of devices, use the **:auxdevice** command.

:auxdevice - select a non-MPSD device

```
:auxdevice
```

To send serial commands to a non-MPSD device installed at the end of the MPSD chain, use the **:auxdevice** command. If no such device is connected, the console will not receive any response. When the non-MPSD device is selected, an error message in response to the initial MPSD command may be shown on the console because the non-MPSD device cannot recognize it.

To re-establish communication with the MPSD devices, use either the **:assign** or **:select** command.

:addname - assign a name to a particular device

```
:addname <device number> [<device name>]
```

This command allows you to assign a name to an MPSD device. The name is permanently stored in the QuadView *Plus*'s memory. The device can be connected to different positions on the chain and the device's name remains attached to it.

If the **[device name]** argument is not entered, the name of the selected device is deleted.

Example—assign the name "Screen2" to the second Quad-View Plus in the MPSD chain:

```
Device 0> :addname 1 Screen2
```

:report - check the identity of one or all MPSD device(s) in the chain

```
:report <device number | device name>
```

Reports the identification of one or all MPSD device(s) in the chain.

If the command is entered without argument, all MPSD devices respond by sending a single line of device information to the console. If a device number or device name follows the command, that particular device responds to the console with its identifying information.

MPSD EXAMPLE: BAUD RATE CHANGE

In this example of changing the baud rate by MPSD control, the first step is to place all of the five connected devices in MPSD mode. Next, the baud rate is changed from 9600 (default) to 115200 for each of the five MPSD devices. Then, the baud rate of the terminal console is changed to 115200. Keep in mind that Device 0 is automatically selected to communicate with the terminal console when in MPSD mode. Device 0 is responsible for echoing and relaying MPSD commands. When out of MPSD mode, Device 0 is communicating with the terminal console as a stand-alone unit.

STEP ONE

> :assign	identify all connected devices and enter them into MPSD mode

STEP TWO

Device 0> :select 4	select Device 4 to receive commands
Device 4> baudrate 115200	set baud rate of Device 4 to 115200
> :select 3	select Device 3 to receive command
Device 3> baudrate 115200	set baud rate of Device 3 to 115200
> :select 2	select Device 2 to receive command
Device 2> baudrate 115200	set baud rate of Device 2 to 115200
> :select 1	select device 1 to receive command
Device 1> baudrate 115200	set baud rate of Device 1 to 115200
> :select 0	select Device 0 to receive command
Device 0> baudrate 115200	set baud rate of Device 0 to 115200

STEP THREE

The baud rate on the console can now be changed to 115200, and then:

> :unassign	disengage MPSD mode and clear out serial buffer
> :assign	re-establish MPSD communication mode
Device 0>	

The baud rate is changed starting from the last device in the chain because after the baud rate is set, there will be no communication between that device and the console. Even though there is no prompt sign returned to the console, we still can enter MPSD commands. Selecting the next upstream device in the chain, which is still at the old baud rate, re-establishes communication.

After changing the baud rate for the console, the **`:unassign`** command is issued to clear out the serial buffer before re-establishing communication once again with Device 0.

CONTROL SOFTWARE FOR WINDOWS

RGB Spectrum offers an optional software control program which runs under Microsoft Windows 95/98/2000/ME/XP/NT. The QuadView *Plus* Virtual Control Panel (VCP) is a graphical user interface for RS-232 serial control.

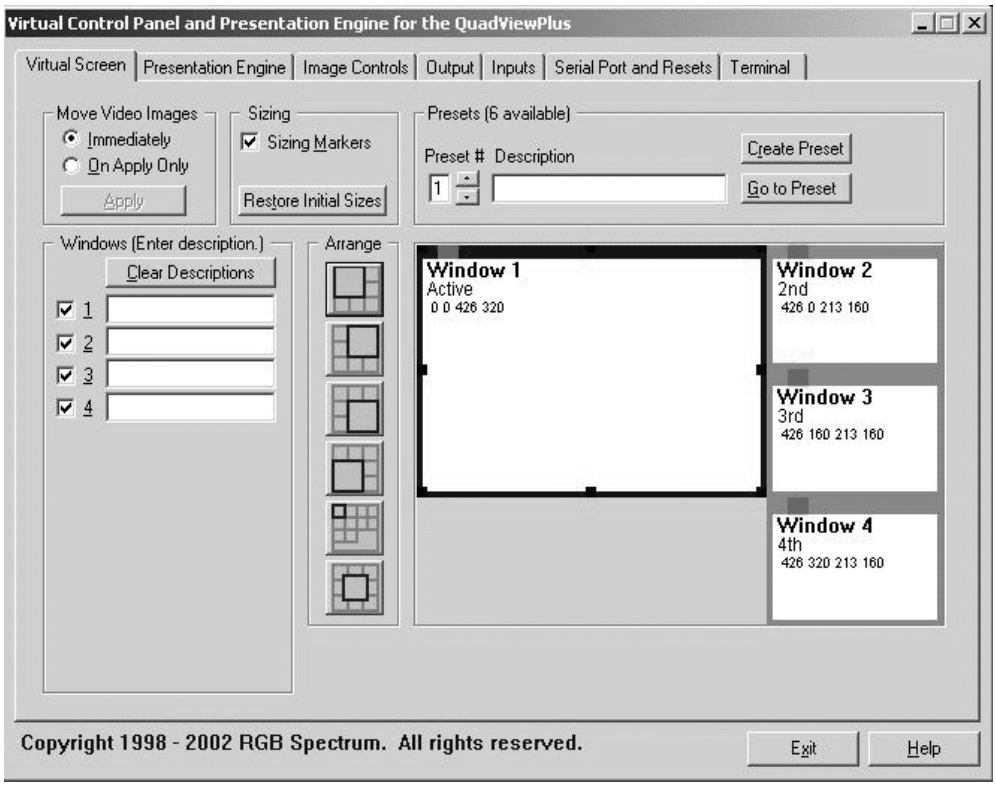

FIGURE 2. **VCP Screen Shot**

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The VCP comes with an online "Help" feature, so the application instructions are not covered in this User Manual. If you have purchased the VCP control software, please refer to the online help, accessible on each section of the software via the “Help” button located in the bottom right corner of the screen.