11   RS-232 COMPUTER CONTROL OF THE SCAN CONVERTER

11.1 Setup

All of the functions for the Scan Converter can also be controlled via a computer by using the RS-232 port on the unit, an RS-232 Serial Cable and a terminal emulation program on the computer. Alternatively, the Scan Converter can be controlled from your own custom software, provided that you have skills and resources to set up a serial communications port in the programming language you are using.

The Scan Converter uses the following settings on its communications port:
  ➢ 8 bit data, no parity, 1 stop bit
  ➢ No flow control
  ➢ Set the Baud rate on the computer and the Scan Converter to the same value (usually 9600).
Instruction on how to set the above port settings can be found within your own systems help file or the help file of the software you wish to use in sending commands. The following method is based on using a terminal emulation program.

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11.2 Sending Commands

Commands are sent over the RS-232 in one of two ways:

➢ Send the 'adjust name' followed by = and a *number* (plus a carriage return) to alter any setting you see displayed on the lower line of the LCD display. For example, if you were using a terminal emulator program, you could type the following command to immediately set flicker reduction to 6-Lines:
Flicker Red = 6

➢ Send just the 'adjust name' (plus a carriage return) to retrieve back the current value for a setting. For example, typing the following returns the correct value back from the Scan Converter (e.g. '6'):
Flicker Red

11.3 Responses to Commands

The response from the Scan Converter can be one of three things:

➢ ? if something is not understood, e.g., an adjustment name is misspelled.
➢ > if the command has been executed.
➢ nnnnn (i.e., a five digit number from 0 to 99999, followed by a CR and LF) if a setting value is returned.

11.4 Notes on Sending Commands

➢ Settings that are one of two values (e.g. NTSC or PAL), have to be sent as 0 or 1. 0 corresponds to the Off or '-' state, and 1 corresponds to the On or '+' state.
➢ You only have to send a maximum of 4 characters in order for the command name to be recognized, e.g., "Flicker Red = 2" could be shortened to "Flic = 2".
➢ Spaces and line-feeds (ASCII code 10) are completely ignored.
➢ The case is ignored (i.e., you can use upper case or lower case).
➢ You must always send a carriage-return (ASCII code 13) at the end of your command or request.
➢ The Scan Converter response should at most be within 20ms of the receipt of the carriage-return character.   Of course, delays due to slow baud rates will play a greater part than this.
➢ The Scan Converter input buffer is limited to 32 bytes, so do not send any more characters (including CR, LF, etc.) than this.
➢ For more information on controlling the different functions, see relevant sections of this manual.

11.5 Restricting RS-232 Commands to Certain Units

If you have a number of units all connected to the same computer serial port, i.e., running in parallel, then you can use the RS-232 ID feature to restrict certain commands to go to only certain Scan Converters.   The following points outline this method:

➢ Make each 'RS-232 ID' setting unique to each Scan Converter, unless you want multiple units to respond to the same commands (in which case, make them the same ID value). Default value is 0.
➢ Send the command 'ID Restrict nnn' where nnn is the number of the Scan Converter you wish to control (from 0 to 255).
➢ Follow this with the commands you wish to send. Units where 'RS-232 ID' is not identical to the 'ID Restrict' value will not respond to or acknowledge these commands.
➢ To disable this feature, you have to make the RS-232 ID the same on all units (recommended value 0), and of course set 'ID Restrict' to this value.

11.6 Changing Baud Rates

Details on how to change the Baud rate are in the Advanced Features section of this manual, but the relationship between number and baud rate is given in the table below. Any number up to 191 can be selected, but only certain Baud rates are generally used. The most common ones are outlined in the table below. For numbers not included in the table, the Baud rate associated with those numbers can be found by using the following equation:

$$Baud = \frac{223722}{Number + 1}$$

So to obtain the relevant number to be used:

$$Number = (\frac{223722}{Baud}) - 1$$

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Table of commonly used baud rates

Baud Rate	No.
115200	1
57600	3
38400	5
28800	7
19200	11

Baud Rate	No.
14400	15
9600*	**22***
4800	46
2400	92
1200	185

*22, Baud rate = 9600 is the default setting.

Table of all RS-232 commands available

Adjustment	Values*	Comment
ADC Ref.	100 to 200	Adjusts maximum input RGB voltage.
Adj. Osc.	-200 to 200	Fine-adjusts subcarrier frequency when not genlocking.
AutoTrack	0 or 1	Set to 1 to initiate AutoTrack
Baud Rate	0 to 191	Actual baud rate = 230400/(n+1)
Buttons	Off, On	Off = disable front-panel
CSync In Frq	0 to 140	Alter to suit incoming sync frequency when using a composite sync input.
CV Filter	0 to 40	Applies a variable filter to Composite Video signals.
DAC Ref.	40 to 120	Brightness level
Flicker Red.	2, 4, 6	Lines of flicker reduction
Genlock	Off, On	On=Unit will synchronize its output with incoming reference video signal. (VP-705SC and VP-706SC)
H Phase	-18 to 18	Sets the unit's Horizontal phase, relative to reference signal. (VP-705SC and VP-706SC)
H. Soften	Off, On	On=Soften image horizontally.
ID Restrict	n	Restricts RS-232 control only to those units which have RS-232 ID already set to this value.
Image Freeze	Off, On	On=Image Frozen. Do not adjust any other settings when this is active.
Infra Red	Off, On	On=Infra red remote control is enabled.
Locked	Off, On	On=Disables all front-panel buttons and infra red remote control functions
Overscan	Off, On	On=Overscan
Out H-Center:	n	Adjusts image left/right position
Out H-Width:	n	Adjusts image width
Out V-Center:	n	Adjusts image up/down position
Out V-Height:	n	Adjusts image height
Output Sig	YUV, RGB	Selects appropriate output signal type.
Pan X Pos:	n	Adjusts Pan left/right position when in Zoom mode (higher value = Panned to the right).
Pan Y Pos:	n	Adjusts Pan up/down position when in Zoom mode (higher value = Panned to the bottom).
Reset	Off, On	On=does a reset to user settings. Automatically goes back to Off.
RGB Term.	Off, Auto	Auto=try to detect if monitor is attached, and terminate RGB appropriately.
RS-232	Mouse, Control	If you change this to Mouse, RS-232 commands no longer function!
RS-232 ID	0 to 255	Sets the unit's RS-232 identification, where multiple units are controlled from one serial port.

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SC/H Phase	0 to 7	Selects subcarrier to H-sync phase when not genlocking.
SC Ph. Shift	0, 180	Coarse-adjusts the final subcarrier phase shift. (VP-705SC and VP-706SC)
SC Phase	-150 to 150	Fine-adjusts the unit's colour subcarrier phase relative to reference signal, when synchronizing to external source. (VP-705/6SC)
Sense	1 to 3	Adjusts the AutoTrack feature's sensing level
Sound	Off, On	Turns the internal speaker on or off.
Store Settings	-, *	Sets the current settings as the power-on default.
Sync In	0 to 3	0=VGA HV, 1=Grn+sy, 2=Pin 13, 3=Pin 15
Sync Out	0 to 3	0=-CS-CS, 1=+CS+CS, 2=-HS-VS, 3=+HS+VS
Total Lines	Read only	Returns number of lines in PC image, including vert blanking lines.
Vert. Freq	Read only	Returns vertical frequency of PC image (to nearest 1Hz).
VGA Bot/4:	n	Tells the unit where the bottom of the image is within the PC signal. (divided by 4).
VGA Left:	n	Tells the unit where the left-hand edge of the image is within the PC signal.
VGA Store	-, *	Stores the VGA settings, so they are used in the future.
VGA Top/4:	n	Tells the unit where the top of the image is within the PC signal. (divided by 4).
VGA Width:	n	Tells the unit how wide the image is within the PC signal.
Video Std	NTSC, PAL	Sets the video standard
Y/C Delay	0 to 3	Adjusts luminance delay relative to chrominance.
Zoom	Off, On	Turns zoom mode on and off

*Where two text values are given (e.g. Off, On), the first relates to the setting used when '0' is sent to the unit, and the second relates to the setting used when '1' is sent to the unit.