

Serial Protocol of VZ-7D(G)

No: T-98/04

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Introduction

The VZ-7D (and the VZ-7DG with genlock-extension) can be controlled via the RS-232-port by a computer or a control-system. It is possible to perform all functions of the IR-remote-control such as Zoom, Focus, Presets, etc. as well as a lot of other functions like changing white-balance-mode, reading and setting zoom-position, etc.

Connection

The serial-port of the VZ-7D is a standard 9-pin-Sub-D-connector which can be found on most computers too. Only pin 2(RxD), 3(TxD) and 5(GND) must be connected. Pin 7(RTS) and 8 (CTS) are short-cut on the Visualizer-side.

The baudrate is (by default) 19200. There is no parity, 8 data-bits and 1 stop-bit.

Changing the Baudrate

It is possible to change the baudrate from 19200 (factory-setting) to 9600: Change switch 1 of the DIP-switches at the connector-panel to the ON-position. The new baudrate is activated after the unit is switched off and on again.

Control-Commands

The controlling of the Visualizer is done by sending codes (each code is 1 byte) to the Visualizer: these codes perform the desired action. There is no need for Carriage Return, Linefeed or similar. By default the Visualizer doesn't respond to the commands on the serial-port (except commands which return status-information like zoom-position or Get Light on/off, etc.). With special commands this behavior can be changed so that the Visualizer sends a reply after each command (for details see "Reply Mode Control"). Some commands have a quiet long execution time therefore you shouldn't send different codes immediately one after another. If you want to check if the Visualizer is ready to receive new commands, you can send code 32 (' ') until the unit answers with 32 (' ') (Blank Echo). While the unit is not ready, there is no answer.

If you want to test the commands with a terminal-program, you may prefer to enter the commands as ASCII-text. To do so, press underscore ('_'), the Visualizer will respond with a question mark. Then enter the 3 digit decimal number within three seconds. The command will then be performed (e.g. type '_ 2' '0' '0' for Power On or '_ '0' '4' '9' to select command page 1).

In the following tables you will find the decimal and the hexadecimal codes. The dollar-sign ('\$') in front of the numbers indicates that the respective number is a hexadecimal number. The dollar-sign must not be sent.

Zoom-Control

Dec.-Code	Hex.-Code	Command	Description	see Notes
195	\$C3	Zoom wide	By sending this command the Visualizer zooms towards wide-position. For continuous zooming repeat sending this code repetitively as long as you want to zoom.	1
199	\$C7	Zoom tele	By sending this command the Visualizer zooms towards tele-position. For continuous zooming repeat sending this code repetitively as long as you want to zoom.	1
129	\$81	Start Zoom wide	This command starts to zoom towards the wide-position. The Visualizer zooms until the „Stop Zoom/Focus/Iris“-command or a different Start-Command is received.	1, 2
130	\$82	Start Zoom tele	This command starts to zoom towards the tele-position. The Visualizer zooms until the „Stop Zoom/Focus/Iris“-command or a different Start-Command is received.	1, 2
128	\$80	Stop Zoom/Focus/Iris	This command stops zooming, focusing and iris-movement (if activated with the respective „Start xxx“-command before).	2
161	\$A1	Read Zoom-Position	After sending this command the Visualizer sends back the actual zoom-position as a 3-digit hexadecimal number in the range from '000' (wide) to 'FFF' (tele) as an ASCII-string followed by LF and CR. The response may last a little bit (max. 1second).	3, 4
162	\$A2	Set Zoom-Position	After this command the Visualizer echoes a question mark (?) with no LF and CR. After this question mark the controller should send the wished zoom-position as 3-digit hexadecimal number in the range from '000' (wide) to 'FFF'(tele) within max. 3 seconds. No CR or LF is needed. After receiving the 3rd digit the Visualizer zooms to this position.	3, 4, 5

Focus-Control

Dec.-Code	Hex.-Code	Command	Description	see Notes
194	\$C2	Focus far	By sending this command the Visualizer focuses towards far. For continuous changing the focus sending this code repetitively as long as you want to change the focus.	6
198	\$C6	Focus near	By sending this command the Visualizer focuses towards far. For continuous changing the focus sending this code repetitively as long as you want to change the focus.	6
131	\$83	Start Focus far	This command starts to focus towards far. The Visualizer change the focus until the „Stop Zoom/Focus/Iris“-command or a different Start-Command is received.	2, 6
132	\$84	Start Focus near	This command starts to focus towards near. The Visualizer change the focus until the „Stop Zoom/Focus/Iris“-command or a different Start-Command is received.	2, 6
128	\$80	Stop Zoom/Focus/Iris	This command stops zooming, focusing and iris-movement (if activated with the respective „Start xxx“-command before).	2
239	\$EF	AutoFocus On	Switches the AutoFocus on.	
240	\$F0	AutoFocus Off	Switches the AutoFocus off.	
173	\$AD	Get AutoFocus	This function returns '1'+LF+CR if the AF is switched on and '0'+LF+CR if the AF is switched off.	4
163	\$A3	Read Focus-Position	After sending this command the Visualizer sends back the actual focus-position as a 3-digit hexadecimal number in the range from '000' (near) to 'FFF' (far) as an ASCII-string followed by LF and CR.	3, 4, 5
164	\$A4	Set Focus-Position	After this command the Visualizer echoes a question mark (?) with no LF and CR. After this question mark the controller should send the wished focus-position as 3-digit hexadecimal number in the range from '000' (near) to 'FFF'(far) within max. 3 seconds. No CR or LF is needed. After receiving the 3rd digit the Visualizer moves to this position.	3, 4

Iris-Control

Dec.-Code	Hex.-Code	Command	Description	see Notes
193	\$C1	Iris open / Brightness up	By sending this command the Visualizer opens the iris. For continuous opening the iris sending this code repetitively as long as you want to open iris.	7
197	\$C5	Iris close / Brightness down	By sending this command the Visualizer closes the iris. For continuous closing the iris sending this code repetitively as long as you want to close iris.	7
133	\$85	Start Iris open	This command starts to open the iris. The Visualizer opens the iris until the „Stop Zoom/Focus/Iris“-command or a different Start-Command is received.	2, 7
134	\$86	Start Iris close	This command starts to close the iris. The Visualizer closes the iris until the „Stop Zoom/Focus/Iris“-command or a different Start-Command is received.	2, 7
128	\$80	Stop Zoom/Focus/Iris	This command stops zooming, focusing and iris-movement (if activated with the respective „Start xxx“-command before).	2
167	\$A7	Autoliris on	Switches the Autoliris on.	
168	\$A8	Autoliris off	Switches the Autoliris off.	
166	\$A6	Get Autoliris	This function returns '1'+LF+CR if the Autoliris is switched on and '0'+LF+CR if the Autoliris is switched off.	4
165	\$A5	Read Iris-Position	After sending this command the Visualizer sends back the actual iris-position as a 3-digit hexadecimal number in the range from '000' (close) to 'FFF' (open) as an ASCII-string followed by LF and CR.	3, 4, 7
169	\$A9	Set Iris-Position	After this command the Visualizer echoes a question mark (?) with no LF and CR. After this questionmark the controller should send the wished iris-position as 3-digit hexadecimal number in the range from '000' (close) to 'FFF'(open) within max. 3 seconds. No CR or LF is needed. After receiving the 3rd digit the Visualizer moves to this position.	3, 4, 5, 7

Image On/Off-Control

Dec.-Code	Hex.-Code	Command	Description	see Notes
192	\$C0	Image on	By sending this command the Visualizer switches the image on. (The VZ-7 softly fades in the picture within approx. 1-2 sec.)	8
196	\$C4	Image off	By sending this command the Visualizer switches the image off. (The VZ-7 softly fades out the picture within approx. 1-2 sec.)	
170	\$AA	Get Image on or off	This function returns '1'+LF+CR if the image is switched on and '0'+LF+CR if the image is switched off.	4

Light On/Off Control

Dec.-Code	Hex.-Code	Command	Description	see Notes
204	\$CC	Light on	By sending this command the Visualizer switches the light on (and the lightbox off). If the light was already on, the lightbox (if connected to the unit) is switched on and the light is switched off.	
205	\$CD	Light off	By sending this command the Visualizer switches the light and the lightbox off.	
178	\$B2	Light on, LightBox off	This command switches the light on and the lightbox off.	
179	\$B3	LightBox on, Light off	This command switches the lightbox on and the lightbox off.	
172	\$AC	Get Light on or off	This function returns '1'+LF+CR if the light is switched on and '0'+LF+CR if the light is switched off.	4
180	\$B4	Get LightBox on or off	This function returns '1'+LF+CR if the lightbox is switched on and '0'+LF+CR if the lightbox is switched off.	4

White-Balance-Control

Dec.-Code	Hex.-Code	Command	Description	see Notes
241	\$F1	Auto-White-Balance	This command activates the Auto-Tracking-White-Balance which is continuously working.	
242	\$F2	Indoor-White-Balance	This command activates the fixed Indoor-White-Balance for color temp. Of approx. 3200K.	
243	\$F3	Outdoor-White-Balance	This command activates the fixed Outdoor-White-Balance for color temp. Of approx. 5600K.	
210	\$D2	One-Push-White-Balance	This command performs a exact auto-white-balance immediately and then holds this setting. When the illumination changes, this command has to be performed again.	
177	\$B1	Get Auto-White-Balance	This function returns '1'+LF+CR if the Auto-White-Balance is switched on and '0'+LF+CR if the Auto-White-Balance is switched off.	4

Reply Mode Control

Dec.-Code	Hex.-Code	Command	Description	see Notes
156	\$9C	No Reply	By sending this command the Visualizer changes to the no reply mode. In this mode the unit does not send a reply when a command is received. This is the default mode after the mains power is switched on.	9
157	\$9D	Reply One Byte	By sending this command the Visualizer changes to the one byte-reply mode. In this mode a byte is replied after each command that is received via the serial interface. If a valid command was received, the byte \$06 is replied. If an invalid command was received \$0F is replied.	9, 10
158	\$9E	Reply Two Bytes	By sending this command the Visualizer changes to the two byte-reply mode. This mode is similar to one byte-reply mode except that the byte which was just received is replied before the \$06 or \$0F. e.g. if the Visualizer receives \$C8 (i.e. Power On) it replies \$C8 \$06. If it receives \$10 (i.e. an invalid command) it replies \$10 \$0F.	9, 10
159	\$9F	Reply String	By sending this command the Visualizer changes to the string-reply mode. In this mode the Visualizer replies 'OKAY'+LF+CR if a valid command was received or 'ERROR'+LF+CR if an invalid command was received.	4, 9, 10

Power / Presets Control

Dec.-Code	Hex.-Code	Command	Description	see Notes
200	\$C8	Power on/Factory-Preset	If the Visualizer is in standby-mode, the unit is switched on. Then the factory-preset is recalled (even if the unit was already switched on). (approx. DIN A5, Light on)	11, 12, 13, 14
201	\$C9	Power off	This command puts the unit in standby-mode (camera, light, etc. are switched off).	
171	\$AB	Get Power on or off	This function returns '1'+LF+CR if the power is switched on and '0'+LF+CR if the unit is in standby-mode.	
202	\$CA	Preset 1	This command recalls Preset 1.	13
203	\$CB	Preset 2	This command recalls Preset 2.	13
216	\$D8	Save Preset 1	This command stores the actual Visualizer-settings as Preset 1.	13
217	\$D9	Save Preset 2	This command stores the actual Visualizer-settings as Preset 2.	13
229	\$E5	Preset Max. Wide	This command zooms to the maximum wide position, light is switched on.	11, 12
230	\$E6	Preset DIN A4	This command zooms to approx. DIN A4-size, light is switched on.	11, 12, 14
231	\$E7	Preset DIN A5	This command zooms to approx. DIN A5-size, light is switched on.	11, 12, 14
232	\$E8	Preset DIN A6	This command zooms to approx. DIN A6-size, light is switched on.	11, 12, 14
233	\$E9	Preset DIN A7	This command zooms to approx. DIN A7-size, light is switched on.	11, 12, 14
234	\$EA	Preset DIN A8	This command zooms to approx. DIN A8-size, light is switched on.	11, 12, 14
235	\$EB	Preset Max. Tele	This command zooms to the maximum tele position, light is switched on.	11, 12
236	\$EC	Preset Slide	This command zooms to approx. slide-film size, light is switched off and the lightbox (if connected to the unit) is switched on.	11, 12
237	\$ED	Preset DIN A4-LightBox	This command zooms to approx. DIN A4-size, the lightbox is switched on.	11, 12, 14
238	\$EE	Preset DIN A5-LightBox	This command zooms to approx. DIN A5-size, the lightbox is switched on.	11, 12, 14

Miscellaneous Commands

Dec.-Code	Hex.-Code	Command	Description	see Notes
32	\$20	Blank-Echo (' ')	This command (\$20 is the ASCII-value of a blank) echoes a blank (' ', without CR or LF) back to the controller. This may be useful for checking if the Visualizer is ready for receiving commands, but generally we recommend using reply-mode-commands for that purpose.	4
118	\$76	Visualizer-Type and Software-Version output ('v')	This command returns the Visualizer-Type and the version no. of the built-in Software (EPROM-version) back to controller. The output-format is as follows: e.g.: 'VZ7D V2.00a '+LF+CR	4, 15
160	\$A0	Get Status	This command returns all settings of the Visualizer in following format: 'Zoom:47D Focus:7FF Iris:797 Power:1 Image:1 AI:1 AF:1 Light:1 LightBox:0 AWB:1'+LF+CR (The Values are for example only, '1' means that the respective item is on, '0' means that it is off. The zoom, focus and iris-positions are a 3 digit HEX-number in the range from 000 to FFF.) In the future further items may be added.	3, 4

Notes:

1. Zooming switches on AF and Auto-Iris. (If DIP-switch 3 is set (Manual-Iris-Priority-Mode), the Auto-Iris is not switched on).
2. It is necessary to send the Stop Zoom/Focus/Iris-command even when the operation stopped by itself because the end of the range is reached (e.g. when you send Start Zoom Wide and the maximum wide position is reached, the unit stops zooming, of course), because the command remains still active although the unit does not perform an action. If you do not send the Stop Zoom/Focus/Iris-command, the further operation would be disturbed. Power On (not factory-preset!) also stops a Start-command.
3. Not all zoom/focus/iris-positions in the range from 000 to FFF are supported („missing codes“). Reading the position always returns the exact position. Setting the position zooms to the wished position as exact as possible. The range of the focus-position is not linear. Reading the position when the unit is in standby returns undefined results. Text under ‘quotation marks’ are ASCII-strings. The quotation marks must not be sent to the VZ-7D and are not sent by the VZ-7D. CR means Carriage Return (\$0D), LF is for Line Feed (\$0A).
4. Text under ‘quotation marks’ are ASCII-strings. The quotation marks must not be sent to the Visualizer and are not sent by the Visualizer. CR means Carriage Return (\$0D), LF is for Line Feed (\$0A).
5. It is also possible to send the zoom/focus/iris-position immediately after the set-command, even before the question mark is received, because the position is stored in the buffer. The question mark is sent by the VZ-7D anyway. Please note that this method is incompatible to the VZ-7 and VZ-15b/35b/45b.
6. Focusing switches off AF.
7. Changing the iris switches off the Autoliris.
8. Switching the image on and activates the Autoliris.
9. The reply mode is changed immediately after the respective command was received. This means that the new reply mode is already active for the command that changed the reply mode, i.e. after \$9C there is never a reply, after \$9F the Visualizer always sends ‘OKAY’+LF+CR, etc.
10. The reply is always sent immediately after a command-execution is started. When a command returns a status, this status is returned after the reply. E.g.: Reply mode = String Mode, Autoliris = on: When the Visualizer receives \$A6 (i.e. Get Autoliris) the unit replies ‘OKAY’+LF+CR+‘1’+LF+CR.
11. This presets are fixed and cannot be modified. The AutoFocus, the Autoliris and the image are switched on.
12. The exact size of the picture depends very much on the adjustments of the monitor / video-projector.
13. Following camera-settings are stored/recalled: Zoom-Position, AF on/off, Focus-Position (if AF off), Autoliris on/off, Iris-Position (if AI off), Image on/off, White-Balance-Mode.
14. DIN A8 = 52mm x 74mm [\approx 2" x 2.9"], DIN A7 = 74mm x 105 [\approx 2.9" x 4.1"], DIN A6 = 105mm x 148mm [\approx 4.1" x 5.8"], DIN A5 = 148mm x 210mm [\approx 5.8" x 8.3"] and DIN A4 = 210 x 297mm [\approx 8.3" x 11.7"]
15. The current version number of today (January 2007) is V4.10c.

Undocumented Commands

The serial protocols of all WolfVision Visualizers are almost the same. Only some commands more or less are supported on other Visualizer-types due to the different technologies.
(The VZ-7D has e.g. Auto Focus commands but no e.g. Sync-On-Green-command.) In the future (at higher FIRMWARE-versions) further commands may be added which are not supported yet.