

# Serial Protocol of VZ-7, VZ-5N/97

No: **T-96/11**

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## Introduction

The VZ-7 (and the VZ-5N/97 which is technically identical to the VZ-7) 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-7 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: Remove the lower case of the VZ-7 (the one with the switches for power and light in it) by loosen the two screws at the back and the three clips under the unit. Switch the mini-switch JP1 (in the corner of the small PCB with the 9-pin-Sub-D-connector) towards the working-plate. Put the lower case back onto the unit. Especially take care of the IR-Receiver: It should fit into the hole of the IR-cover.

## Control-Commands

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The controlling of the Visualizer is done by sending codes (1 byte) to the Visualizer. These codes perform the desired action. There is no need for Carriage Return, Linefeed or similar (the \$-sign in front of the Hex-codes just indicates that the number is hexadecimal and must not be sent !). By default the Visualizer doesn't respond to the commands on the serial-port (except commands which return status-information like zoom-position or AF on/off, etc.). With special commands this behavior can be changed so that Visualizer sends a reply after each command (for details see "Reply Mode Control").

All commands are stored in a buffer when they are received, even when they cannot be executed immediately. Up to 15 bytes can be stored in this buffer. Please note that some commands have a quiet long execution time (especially the preset-commands). All commands which are received while that period will be executed after the current command-execution is completed.

## 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
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
128	\$80	Stop Zoom/Focus/Iris	This command stops zooming, focusing and iris-movement (if activated with the respective „Start xxx“-command before).	
161	\$A1	Read Zoom-Position	After sending this command the Visualizer sends back the current 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).	2, 3, 4
162	\$A2	Set Zoom-Position	After this command the Visualizer echoes a questionmark ('?') with no LF and CR. After this questionmark 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

## 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.	5
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.	5
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.	5
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.	5
128	\$80	Stop Zoom/Focus/Iris	This command stops zooming, focusing and iris-movement (if activated with the respective „Start xxx“-command before).	
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

## 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.	6
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.	6
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.	6
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.	6
128	\$80	Stop Zoom/Focus/Iris	This command stops zooming, focusing and iris-movement (if activated with the respective „Start xxx“-command before).	
167	\$A7	Autolris on	Switches the Autolris on.	
166	\$A6	Get Autolris	This function returns '1'+LF+CR if the Autolris is switched on and '0'+LF+CR if the Autolris is switched off.	4

## 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.)	7
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

## White-Balance-Control

Dec. Code	Hex. Code	Command	Description	see Notes
241	\$F1	Auto-White-Balance	This command activates the Auto-White-Balance which is continues working. (Default setting when the Visualizer is switched on.)	
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. 5800K.	
210	\$D2	One-Push-White-Balance	This command performs a exact auto-white-balance immediatly 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

## Presets-Control

Dec. Code	Hex. Code	Command	Description	see Notes
200	\$C8	Power on / Factory-Preset	This command activates the factory-preset (which is also used when the unit is switched off and on). (approx. DIN A5)	8, 9, 10
202	\$CA	Preset 1	This command recalls Preset 1.	11
203	\$CB	Preset 2	This command recalls Preset 2.	11
216	\$D8	Save Preset 1	This command stores the current camera-settings as Preset 1.	11
217	\$D9	Save Preset 2	This command stores the current camera-settings as Preset 2.	11
229	\$E5	Preset Max. Wide	This command zooms to the maximum wide position.	8, 9
230	\$E6	Preset DIN A4	This command zooms to approx. DIN A4-size.	8, 9, 10
231	\$E7	Preset DIN A5	This command zooms to approx. DIN A5-size.	8, 9, 10
232	\$E8	Preset DIN A6	This command zooms to approx. DIN A6-size.	8, 9, 10
233	\$E9	Preset DIN A7	This command zooms to approx. DIN A7-size.	8, 9, 10
234	\$EA	Preset DIN A8	This command zooms to approx. DIN A8-size.	8, 9, 10
235	\$EB	Preset Max. Tele	This command zooms to the maximum tele position.	8, 9
236	\$EC	Preset Slide Film	This command zooms to approx. slide film size.	8, 9

## Reply Mode Control

(Software V1.02a and higher; VZ 7 Ser. No. >07 0820)

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.	14, 15
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.	14, 15, 16
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.	14, 15, 16
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, 14, 15, 16

## 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 read for receiving commands.	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.: 'VZ7PAL V1.00c '+LF+CR or 'VZ7NTSC V1.01a '+LF+CR	4, 12, 13
160	\$A0	Get Status	This command returns all settings of the Visualizer in following format: 'Zoom:47D Image:1 AI:1 AF:1 KeyLock: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-position is an 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. (Starting with V1.02a, if Jumper JP3 is set, the Auto-Iris is not switched on).
2. Read zoom-position may shortly interrupt zooming or similar with the IR-remote-control.
3. Not all zoom-positions in the range from 000 to FFF are supported („missing codes“). Reading the zoom-position always returns the exact position. Setting the zoom-position zooms to the wished position as exact as possible.
4. Text under 'quotation marks' are ASCII-strings. The quotation marks must not be sent to the VZ-7 and are not sent by the VZ7. CR means Carriage Return (\$0D), LF is for Line Feed (\$0A).
5. Focusing switches off AF.
6. Changing the iris switches off the Autolris.
7. Switching the image on and activates the Autolris.
8. This presets are fixed and cannot be modified. The AutoFocus, the Autolris and the image are switched on.
9. The exact size of the picture depends very much on the adjustments of the monitor / video-projector.
10. DIN A8 = 52mm x 74mm [≈2" x 2.9"], DIN A7 = 74mm x 105 [≈2,9" x 4.1"], DIN A6 = 105mm x 148mm [≈4.1" x 5.8"], DIN A5 = 148mm x 210mm [≈5.8" x 8.3"] and DIN A4 = 210 x 297mm [≈8.3" x 11.7"]
11. Following camera-settings are stored/recalled: Zoom-Position, AF on/off, Focus-Position (if AF off), Autolris on/off, Iris-Position (if AI off), Image on/off, White-Balance-Mode.
12. The Visualizer-type (PAL or NTSC) is only valid if the unit runs for more than 7sec. Immediately after switching on the power on the type may be incorrect.
13. The current version number of today for example "V1.02a".
14. Available starting with V1.02a
15. 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 the changed the reply mode, i.e. after \$9C there is never a reply, after \$9F the Visualizer always sends 'OKAY'+LF+CR, etc.
16. The reply is always sent immediately after a command is received. When a command returns a status, this status is returned after the reply. E.g.: Reply mode = String Mode, Autolris = on: When the Visualizer receives \$A6 (i.e. Get Autolris) the unit replies 'OKAY'+LF+CR+'1'+LF+CR.

## 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.