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Command List of SCB-12 and EYE-12

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General Information

About WolfVision Command List

This Command list includes all commands for the EYE-12 and SCB-12.

Introduction

The EYE-12 and SCB-12 can be controlled at trough either RS-232, USB or Ethernet.

The control system can be a computer, room management system or something else.

It is possible to perform all functions of the IR-remote-control and the key-panel on the unit such as Zoom, Focus, Presets, etc. as well as a lot of other functions like reading and setting zoom-position, OSD-settings, etc. as well as many other functions.

Control-Commands

The control of the Visualizer is done by sending codes to the Visualizer (each code exists of at least 1 Byte up to 255 Bytes). These codes perform the desired action. There is no need for Carriage Return, Linefeed or something similar. By default the Visualizer does not 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 long execution time and therefore one should not send different codes immediately after one 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.

The commands are split into SET-, GET- and GET-Block commands.

Future

In the future (with higher firmware-versions) further commands may be added which are not supported yet.

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Minimum System Requirements

Software Requirements

IBM-Compatible Computer

Microsoft Windows 95, 98, ME, NT 4.0, 2000, XP or Vista

Terminal Software

To use all functions of the command list, following software is necessary:

Microsoft Excel 2003, [Microsoft Excel Viewer 2003](#) (or later)

Microsoft Internet Explorer 5 (or later)

Alternatively, the static protocol can be used

Apple Macintosh Computer

Mac OS 10.2 or higher

Terminal Software

To use all functions of the command list, following software is necessary:

Microsoft Excel

Microsoft Internet Explorer

Alternatively, the static protocol can be used

Hardware Requirements

IBM-Compatible Computer

Pentium II 500 MHz (Pentium III 1GHz or more recommended)

32 Mbytes RAM (more recommended)

400 Mbytes available disk space (more recommended)

Display resolution of 800 x 600 (1024 x 768 or more are recommended)

256 colors (65535 colors or more are recommended)

One free 10BASE-T port (100BASE-TX is recommended)

or

One free RS-232 port (supported speed is depending on the setting of the Visualizer, 9600Baud/s up to 115200Baud/s)

or

One free USB port (USB 2.0 standard is recommended)

Apple Macintosh Computer

G4 with 1 GHz or better

256 Mbytes RAM (512 Mbytes recommended)

400 Mbytes available disk space (more recommended)

Display resolution of 800 x 600 (1024 x 768 or more are recommended)

256 colors (65535 colors or more are recommended)

One free 10BASE-T port (100BASE-TX is recommended)

or

One free RS-232 port (supported speed is depending on the setting of the Visualizer, 9600Baud/s up to 115200Baud/s)

or

One free USB port (USB 2.0 standard is recommended)

Connection

RS-232

The serial port of the Visualizer is a standard 9-pin-Sub-D-connector which can be found on most computers. Only pin 2 (RxD), 3 (TxD) and 5 (GND) must be connected. The baud rate is by default set to 115200Baud/s and can be changed in the extra menu. There is no parity, 8 data-bits and 1 stop-bit.

It is possible to change the baud rate from 115200 to 9600, 19200, 38400, 115200 or 57600. To change the baud rate switch the unit on and press the MENU-key on the remote control or unit for 4 seconds until the Extra-Menu appears. Then enter the Serial Port-Sub-Menu. This is where the baud rate can be changed.

USB

The USB port of the Visualizer is a standard USB socket type B.

WolfVision Visualizer released 2007 and later support standard USB 2.0. The units are backward compatible with USB 1.0 and USB 1.1 but with lower speed.

Ethernet

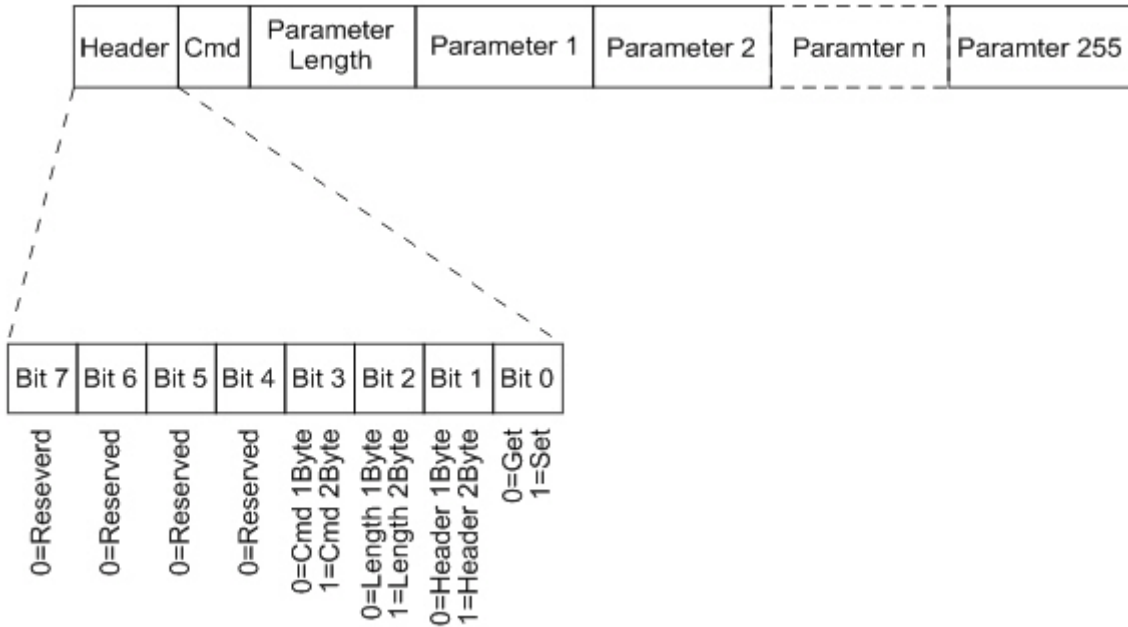
The LAN port (10BASE-T/100BASE-TX) of the Visualizer is a standard RJ45 jack and auto negotiation is supported.

For the right settings of the Visualizer see help document for "WolfVision Web Server".

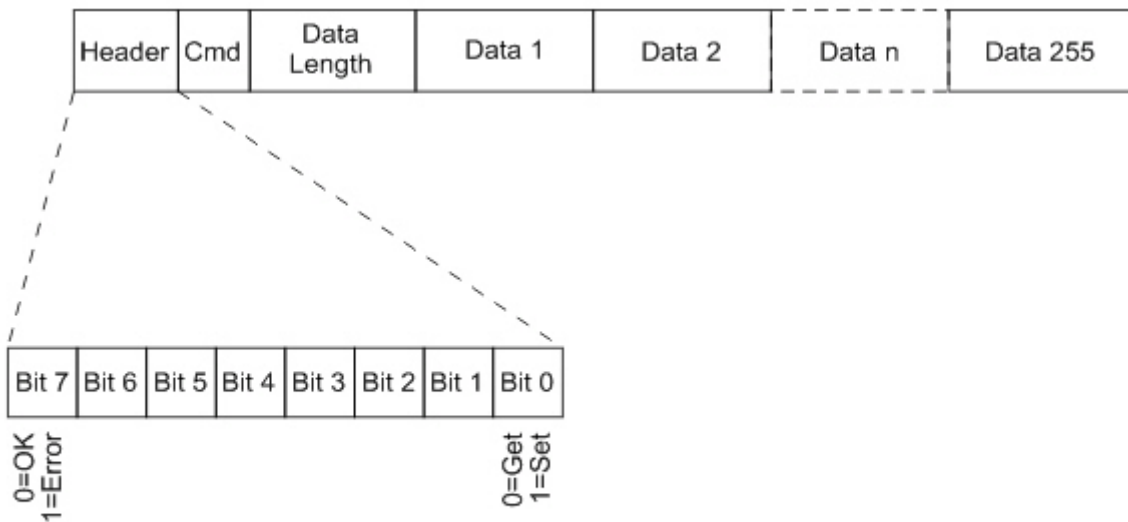
Currently the EYE-12 supports Power over Ethernet (PoE) - see respective user manual.

Packet Structure

GET/SET Commands



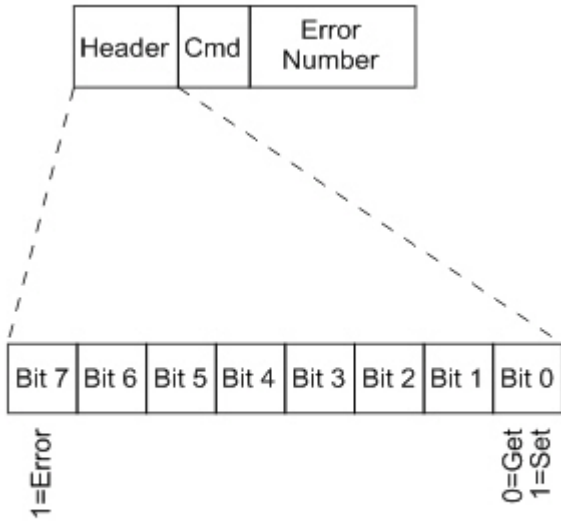
OK Reply



Please note

The command 0xFF is reserved as an Error Code (unknown command).

Error Reply



Error Numbers

1	Time out
2	Invalid Cmd
3	Invalid Parameter
4	Invalid Length
5	Fifo Full
6	Firmware Update Error
7	Access Denied

Examples

	Command	Reply	
SET Power to On	01 30 01 01	01 30 00	OK
	01 30 01 80	81 30 03	Error: Invalid Parameter
	01 11 01 01	81 11 02	Error: Invalid Command
GET Power	00 30 00	00 30 01 01	OK: Power On
	00 30 01 01	80 30 03	Error: Invalid Parameter
	00 11 01 01	81 11 02	Error: Invalid Command

Terminal Input

All inputs and outputs are in hex numbers.

For easier use with a terminal software (like HyperTerminal or Telnet) two short cuts are added (on previous Visualizers models only the shortcut "_" was available)

SET-Mode

Short Mode

Send "/" to start the Short SET-mode. Then the Visualizer waits for 3 seconds for a command as a 2 digit number in ASCII input (i.e. "30" for "Set Power"). The Visualizer replies with a question mark "?" and is waiting for 3 second for an input of a value. This value has to be a 1 digit number in hex (ASCII) in the range of 0 to 9 (i.e. "1" for Power On). The Visualizer performs the command immediately.

Only commands with a length of 1 Byte can be executed in this SET-mode.

Long Mode

Send "+" to start the Long SET-mode. Then the Visualizer waits for 3 seconds for a command as a 4 digit hex number in ASCII input The first two digits are the commands and the last 2 digits are the Length in crumbs(i.e. "3001" for "Set Power"). The Visualizer replies with a question mark "?" and is waiting for 3 seconds for an input of a value. This value has to be as many digits as the defined Length in hex (ASCII) with character range of 0 to F (i.e. "01" for Power On). The Visualizer performs the command immediately.

The Long SET-mode complies exactly with the protocol specification and can be used all SET-commands inclusive short commands with 1 Byte.

GET-Mode

Send "*" to start the GET-mode. The desired commands have to be entered within 3 seconds (i.e. "30" for "Get Power").

The Visualizer sends back the requested data. If the requested data is in hex, then the Visualizer outputs the prefix "0x" (i.e. "0x01" when power is on).

Room Control Systems

When room control systems with Ethernet are in use, the commands have to be sent trough the port 50915.

Backward Compatibility

The old serial protocol will be supported.

The first Byte is being used for differentiation. The first nibble of the first Byte is "0" for the Protocol 2 . Otherwise the command is corresponding to the Protocol 1 (supported by all WolfVision Visualizers).

Protocol Instructions

All commands are in hexadecimal.

To handle the tables, select the respective sheet (SET, GET or GET-block).

For a better overview the desired unit can be selected in row "I" and following. The auto-filter function of Excel will hide all unsupported commands on the selected unit. This is helpful because all functions are listed on the sheets. and the units can be compared with supported commands.

SET Commands

I.e. Power part of the SET command list:

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment
Power Control	Power On/Off	01 30 01 yz	00	Power Off
			01	Power On
			02	Power Toggle
	PowerOn Preset	01 34 01 yz	00	PowerOn Preset Off
			01	PowerOn Preset On
			02	PowerOn Preset Toggle
	Display Logo	01 35 01 yz	00	Display Logo Off
			01	Display Logo On
			02	Display Logo Toggle
	Mains-On	01 36 01 yz	00	Mains-On Off
			01	Mains-On On
			02	Mains-On Toggle
	Auto-Power-Off Time	01 37 01 yz	FF	Auto-Power-Off function Off
			1E	30min until Auto-Power-Off
			3C	1h until Auto-Power-Off
78			2h until Auto-Power-Off	
B4			3h until Auto-Power-Off	
F0			4h until Auto-Power-Off	

The variables in the command row have to be replaced by the desired variable, i.e.: Power Off: 01 30 01 00

GET Commands

I.e. Power part of the GET command list:

Function	Command Description	Command Packet [hex]	Reply Packet [hex]	Variable [hex]	Comment
Power Control	Power On/Off	00 30 01	00 30 01 yz	00	Power Off
				01	Power On
				02	Power Toggle
	PowerOn Preset	00 34 01	00 34 01 yz	00	PowerOn Preset Off
				01	PowerOn Preset On
				02	PowerOn Preset Toggle
	Display Logo	00 35 01	00 35 01 yz	00	Display Logo Off
				01	Display Logo On
				02	Display Logo Toggle
	Mains-On	00 36 01	00 36 01 yz	00	Mains-On Off
				01	Mains-On On
				02	Mains-On Toggle
	Auto-Power-Off Time	00 37 01	00 37 01 yz	FF	Auto-Power-Off function Off
				1E	30min until Auto-Power-Off
				3C	1h until Auto-Power-Off
78				2h until Auto-Power-Off	
B4				3h until Auto-Power-Off	
F0	4h until Auto-Power-Off				

The variables in the Reply Packet row have to be replaced by the desired variable, i.e.: Power Off: 00 30 01 00

Glossary

C

crumb: term for two computer bits

N

nibble: term for a half Byte (4 Bits)

Protocol

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Variable [hex]	Comment	Note		
Motor Control	Stop all motors	01 2F 01 00		Iris, Focus, Zoom					
Zoom Control	Zoom	01 20 01 yz	01	Zoom Wide (Step)					
			02	Zoom Tele (Step)					
			11	Start Zoom Wide					
			12	Start Zoom Tele					
		01 20 02 yz wx	00 00 to 0F FF	Set zoom position absolutely					
	Macro	01 2B 01 yz	00	Macro Off					
01			Macro 11x						
02			Macro 12x						
03			Macro Toggle						
Digital Zoom	Set Digital Zoom	01 28 02 yz wx	00 00 to 0F FF	set digital zoom position absolutely					
	Digital Zoom	01 29 01 yz	00	Digital Zoom Off					
			01	Digital Zoom 2x					
			02	Digital Zoom 4x					
	Digital Zoom Warning	01 2A 01 yz	00	Digital Zoom Warning Stop					
			02	Digital Zoom Warning None					
02			Digital Zoom Warning None						
Focus Control	Focus	01 21 01 yz	01	Focus Far (Step)					
			02	Focus Near (Step)					
			11	Start Focus Far					
			12	Start Focus Near					
		01 21 02 yz wx	00 00 to 0F FF	set focus position absolutely					
	Auto focus	01 31 01 yz	00	AF Off					
01			AF On						
02			AF Toggle						
10			One-Push-AF						
Iris Control	Iris Open (Step)	01 22 01 yz	01	Iris Open (Step)					
			02	Iris Close (Step)					
			11	Start Iris Open					
			12	Start Iris Close					
	Set Iris Position	01 22 02 yz wx	00 00 to 0F FF	set Iris position absolutely					
	Auto Iris	01 32 01 yz	00	Auto Iris Off					
			01	Auto Iris On					
			02	Auto Iris Toggle					
	Iris Priority	01 33 01 yz	00	Iris Priority Auto					
			01	Iris Priority Manual					
			02	Iris Priority Toggle					
	Arm and Mirror Control	Arm	01 23 01 yz	00	Arm Up				
01				Arm Down					
02				Arm Toggle					
Mirror		01 24 01 yz	01	Mirror Up (Step)					
			02	Mirror Down (Step)					
			11	Start Mirror Up					
	12		Start Mirror Down						
Set Mirror Position	01 24 02 yz wx	00 00 to 0F FF	set mirror position absolutely						
Height Adjustment Control	Start Height Adjustment	01 2D 01 yz	00	Start Manual Adjustment					
			01	Start Auto Adjustment					
	Light Mirror control	01 25 01 yz	01	Mirror Left					
			02	Mirror Right					
			11	Start Mirror Left					
			12	Start Mirror Right					
				01 25 02 yz wx	00 00 to 0F FF	set mirror X position absolutely			
				01 26 01 yz	01	Mirror Up			
			02	Mirror Down					
			11	Start Mirror Up					
			12	Start Mirror Down					
		01 26 02 yz wx	00 00 to 0F FF	set mirror Y position absolutely					
Light focus control	01 27 01 yz	01	Light Focus Far (Step)						
		02	Light Focus Near (Step)						
		11	Start Light Focus Far						
		12	Start Light Focus Near						
	01 27 02 yz wx	00 00 to 0F FF	set mirror X position absolutely						

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Variable [hex]	Comment	Note	
Preset Control	Recall Preset	01 40 01 yz	00 to 7F	Reserved for user programmable Presets	00	Power On Preset		
					01	Preset1		
					02	Preset2		
						03	Preset3	
			80 to FF	Reserved for factory pre-defined Presets	E5	Preset Max Wide		
					E6	Preset DIN A4		
					E7	Preset DIN A5		
					E8	Preset DIN A6		
					E9	Preset DIN A7		
					EA	Preset DIN A8		
					EB	Preset Max Tele (No dig Zoom)		
					EC	Preset Slide		
					ED	Preset X-Ray, DINA4-Lightbox		
					EE	Preset X-Ray, DINA5-Lightbox		
	Store Preset	01 41 01 yz			00	Power On Preset		
			01	Preset1				
			02	Preset2				
			03	Preset3				
	Preset Special Function Key	01 42 02 yz wx	01	Preset1	00	PRESET		
					01	POS_NEG		
					02	BLUE		
					03	BLACK_WHITE		
					04	WB		
					05	FREEZE		
					06	IMAGE		
					07	ONEPUSH_AF		
					08	LIGHT_ON_OFF		
09					SLIDE_ON_OFF			
0A					TEXT			
0B					LIGHT			
02			Preset2	00	PRESET			
				01	POS_NEG			
				02	BLUE			
				03	BLACK_WHITE			
				04	WB			
				05	FREEZE			
03			Preset3	00	PRESET			
				01	POS_NEG			
				02	BLUE			
				03	BLACK_WHITE			
				04	WB			
				05	FREEZE			
Store Mirror-Pos	01 4D 01 yz	00	Store Mirror-Pos Off					
		01	Store Mirror-Pos On					
Power Control	Power On/Off	01 30 01 yz	00	Power Off				
			01	Power On (PowerOn Preset)				
			02	Power Toggle				
	PowerOn Preset	01 34 01 yz	00	PowerOn Preset Off				
			01	PowerOn Preset On				
	Display Logo	01 35 01 yz	00	Display Logo Off				
			01	Display Logo On				
	Mains-On	01 36 01 yz	00	Mains-On Standby				
			01	Mains-On Power-On				
			02	Mains-On Toggle				
	Auto-Power-Off Time	01 37 01 yz	FF	Off				
			1E	30min until Auto-Power-Off				
			3C	1h until Auto-Power-Off				
			78	2h until Auto-Power-Off				
			B4	3h until Auto-Power-Off				
			F0	4h until Auto-Power-Off				

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Variable [hex]	Comment	Note
Light Control	Light, Lightbox On/Off	01 A0 01 yz	00	Light Off, LB Off			
			01	Light On, LB Off			
			02	Light Off, LB On			
			03	Light Off, SlideBox On			
			10	Light Toggle (Light->LB->Off)			
			11	Light Off, LB Toogle			
			80	Lampchange			
	Reset Lamp 1 Hours	01 A3 01 81					
	Reset Lamp 2 Hours	01 A4 01 81					
	Lamp Voltage	01 A1 01 yz					
	Laser	01 A2 01 yz					
Reply Mode (only RS232)	Reply Mode	01 AA 01 yz	00	Reply Mode Off			
			01	Reply Command			
ImageTurn Command	Image Turn On/Off	01 83 01 yz	00	Image Turn Off			doesn't matter which orientation was selected
			01	Image Turn On			
			02	Image Turn Toggle			same function as Image Turn key on the remote control (Mode as selected in the OSD)
	ImageTurn Rotation	01 84 01 yz	00	Cycle			
			01	-90° (Rechts)			
			02	180°			
			03	+90° (Links)			
Miscellaneous Command	Keylock On/Off	01 80 01 yz	00	Keylock Off			
			01	Keylock On			
			02	Keylock Toggle			
	IR Code	01 81 01 yz	1C	Code A			
			1D	Code B			
			1E	Code C			
			1F	Code D			
			97	Code 1			
			98	Code 2			
			99	Code 3			
			9A	Code 4			
			9B	Code 5			
	9C	Code 6					
	9D	Code 7					
	9E	Code 8					
9F	Code 9						
	Number of IR Codes	01 18 01 yz	00	Number of IR Codes 4			
			01	Number of IR Codes 9			
	Mounting Position	01 19 01 yz	00	Mounting Position Regular			
			01	Mounting Position Flipped			
Miscellaneous Command	OSD Level	01 82 01 yz	00	Quiet			
			01	Talk			
			02	Verbose			
	Text Enhancer On/Off	01 85 01 yz	00	Text Enhancer Off			
			01	Text Enhancer On			
			02	Text Enhancer Toggle			
	Image On/Off	01 86 01 yz	00	Image Off			
			01	Image On			
			02	Image Toggle			
	LCD Brightness	01 87 01 yz	00 to FF				
	Zoom Wheel Calibration	01 8B 01 00					
	Pixel Calibration	01 8C 01 00					
	Debug On/Off	01 88 01 yz	00	Debug Off			
			01	Debug On			
			05	Demo Mode			
Adjustmentmenu	01 8D 01 00						
Servicemenu	01 8E 01 00						
Baudrate	01 89 01 yz	00	9600 baud/s				
		01	19200 baud/s				
		02	38400 baud/s				
		03	57600 baud/s				
		04	115200 baud/s				
Recall Factory Settings	01 8F 01 00						
Visualizer Menu Control	Menu On/Off	01 98 01 yz	00	Menu Off			
			01	Menu On			Unlock menu first
			02	Menu Toggle			Unlock menu first
	Unlock Menu	01 9A 01 00					
	Unlock Extra Menu	01 9B 01 00					
	Menu control	01 99 01 yz	02	Function Up			
			08	Function Down			
			04	Data Left			
			06	Data Right			
			05	Enter			
10			Help				
80			Reset Menu				

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Variable [hex]	Comment	Note			
Output Control	Resolution RGB	01 50 01 yz	FF	Off						
			00	Auto						
			01	SVGA/60						
			02	SVGA/75						
			03	SVGA/85						
			04	XGA/60						
			05	XGA/75						
			06	XGA/85						
			07	1152/75						
			08	SXGA-/60						
			09	SXGA-/85						
			0A	SXGA/60						
			0B	SXGA/75						
			0C	SXGA/85						
			0D	UXGA/60						
			0E	UXGA/70						
			0F	UXGA/75						
			10	1792/60						
			11	1856/60						
			12	SXGA+/60						
			13	SXGA+/75						
			14	VGA/60						
			15	720p/50						
			16	720p/60						
			17	1080p/50						
			18	1080p/60						
			19	XGA 16:9						
			1A	WSXGA/60						
			1B	WXGA/60						
				Resolution DVI	01 51 01 yz	FF	Off			
			00			Auto				
			01			SVGA/60				
	02	SVGA/75								
	03	SVGA/85								
	04	XGA/60								
	05	XGA/75								
	06	XGA/85								
	07	1152/75								
	08	SXGA-/60								
	09	SXGA-/85								
	0A	SXGA/60								
	0B	SXGA/75								
	0C	SXGA/85								
	0D	UXGA/60								
	0E	UXGA/70								
	0F	UXGA/75								
	10	1792/60								
	11	1856/60								
	12	SXGA+/60								
	13	SXGA+/75								
	14	VGA/60								
	15	720p/50								
	16	720p/60								
	17	1080p/50								
	18	1080p/60								
	19	XGA 16:9								
	1A	WSXGA/60								
	1B	WXGA/60								
		Video Format	01 52 01 yz			00	NTSC			
	01					PAL				
	02					Off				
		Detail	01 53 01 yz	00	Off					
	01			Low						
	02			Medium						
	03			High						
		Pos/Neg/Blue	01 54 01 yz	00	Positiv On					
	01			Negativ On						
	02			Blue On						
	03			Pos/Neg/Blue Toggle						
		Color/BW	01 55 01 yz	00	Color On					
	01			Black/White On						
	02			Color/BW Toggle			alternatively 01 6D 01 05 can be used			
		Freeze On/Off	01 56 01 yz	00	Freeze Off					
	01			Freeze On						
	02			Freeze Toggle						
		Intern/Extern	01 57 01 yz	00	Intern On					
	01			Extern On						
	02			Intern/Extern Toggle						
	03			Intern/Extern Toggle						
		AutoSense ExternIn On/Off	01 58 01 00	00	AutoSense ExternIn Off					
	01			AutoSense ExternIn On						
	02			AutoSense ExternIn Toggle						

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Variable [hex]	Comment	Note
Output Control	Extern/Freeze Output	01 59 01 xy					
	Preview Ouput control	01 5A 01 00	00	Preview Ouput is Preview			
			01	Preview Ouput is Regular			
Image Storing Command	Image Mirror	01 5B 01 xy					
	Memory Off	01 90 01 00					
	Memory Recall	01 91 01 yz	01	Recall Memory1			
			02	Recall Memory2			
			03	Recall Memory3			
			04	Recall Memory4			
			05	Recall Memory5			
			06	Recall Memory6			
			07	Recall Memory7			
			08	Recall Memory8			
			09	Recall Memory9			
	Memory Store	01 92 01 yz	01	Store Memory1			
			02	Store Memory2			
			03	Store Memory3			
			04	Store Memory4			
			05	Store Memory5			
			06	Store Memory6			
			07	Store Memory7			
			08	Store Memory8			
			09	Store Memory9			
			10	Snapshot			
			20	Erase Memory			
	ShowAll On/Off	01 93 01 yz	00	ShowAll Off			
			01	ShowAll On			
			02	ShowAll Toggle			
	Erase Memory behaviour	01 94 01 yz	00	Erase Mem. Manual			
			01	Erase Mem. Standby			
02			Erase Mem. Toggle				

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Variable [hex]	Comment	Note			
Exposure	Gain	01 60 01 yz	00	0dB						
			01	1dB						
			02	2dB						
			03	3dB						
			04	4dB						
			05	5dB						
			06	6dB						
			07	7dB						
			08	8dB						
			09	9dB						
			0A	10dB						
			0B	11dB						
			0C	12dB						
			0D	13dB						
			0E	14dB						
			0F	15dB						
			10	16dB						
			11	17dB						
			12	18dB						
			40	Auto Low						
			80	Auto Med						
			C0	Auto High						
			Shutter	01 61 01 yz	00	Step				
					01	Variable see Speed (Shutter=variable)				
					02	Auto				
					03	Off				
			Speed (Shutter=step)	01 62 01 yz	00	1/30s				
					01	Flickerless				
	02	1/50s								
	03	1/60s								
	04	1/100s								
	05	1/120s								
	06	1/250s								
	07	1/500s								
	08	1/1000s								
	09	1/2000s								
	0A	1/3000s								
	Speed (Shutter=variable)	01 63 02 yz wx	0000 to FFFF	Exposure Time in lines						
	Image Brightness	01 64 01 yz	F6	-10						
			F7	-9						
			F8	-8						
			F9	-7						
			FA	-6						
			FB	-5						
			FC	-4						
			FD	-3						
			FE	-2						
			FF	-1						
			00	0						
			01	+1						
			02	+2						
			03	+3						
			04	+4						
			05	+5						
			06	+6						
			07	+7						
			08	+8						
			09	+9						
			0A	+10						
	Trigger Mode On/Off	01 6A 01 yz	00	Trigger Mode Off						
			01	Trigger Mode On						
			02	Trigger Mode Toggle						
	Trigger Edge Pos/Neg	01 6B 01 yz	00	Trigger Edge Positive						
			01	Trigger Edge Negative						
			02	Trigger Edge Toggle						
	Back Light Compensation	01 6C 01 yz	00	Off						
			01	Medium						
			02	High						
	Color	White Balance	01 65 01 yz	00	White Balance AUTO					
				01	White Balance One-Push					
				02	White Balance Manual					
				10	Perform WB					
				50	Perform WB for Manual					
		R Gain (WB=Manual)	01 66 01 yz	00 to 7F						
		B Gain (WB=Manual)	01 67 01 yz	00 to 7F						
		Gamma Normal Mode	01 68 01 yz	00 to 03	Gamma Level for Normal Mode					
		Gamma Text Mode	01 69 01 yz	00 to 03	Gamma Level for Text Mode					
		Color Mode	01 6D 01 yz	00	Black/White				alternatively 01 55 01 uv can be used	
				01	Presentation				pre-defined Saturation- and Gamma setting	
				02	Natural				pre-defined Saturation- and Gamma setting	
				03	Video Conference				pre-defined Saturation- and Gamma setting	
				04	Manual					
	05			Black/White Toggle				alternatively 01 55 01 uv used		
	Saturation	01 6E 01 yz	00 to C8	0% to 172% in steps of 1%						

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Variable [hex]	Comment	Note
Ethernet	DHCP On/Off	01 70 01 yz	00	DHCP off			
			01	DHCP on			
			02	DHCP toggle			
	IP Address	01 71 04 yz wx uv st	01 to FF	IP Address in hex (1 to FF for each oktet)			
	Subnet Mask	01 72 04 yz wx uv st	00 to FF	Subnet Mask in hex (00 to FF for each oktet)			
	Gateway IP	01 73 04 yz wx uv st	00 to FF	Gateway IP Address in hex (00 to FF for each oktet)			
	Ethernet Mode	01 74 01 yz	00	Off			
			01	Image Only			
			02	Control Only			
			03	Image and Control			
			04	FW Update Only			
			05	Image and FW Update			
			06	Control and FW Update			
			07	Image, Control and FW Update			
	Multicast Mode	01 75 01 yz	00	Off			
			01	Auto			
			02	Cont			
	Multicast IP Address	01 77 04 yz wx uv st	00 to FF	Multitask IP Address in hex (00 to FF for each oktet)			
	Multicast Port	01 78 02 yz wx	22 60 to 23 28	Port 8800 to 9000 in hex			
	Multicast Format	01 79 01 yz	00	Native			
			02	SVGA/75			
			03	SVGA/85			
			00	SXGA-			
			01	XGA			
			06	XGA/85			
			07	1152/75			
			02	768x576			
			03	VGA			
			04	QVGA			
			05	N/A			
			0C	SXGA/85			
			0D	UXGA/60			
			0E	UXGA/70			
			0F	UXGA/75			
			10	1792/60			
			11	1856/60			
			06	SXGA			
			13	SXGA+/75			
			07	UXGA			
			08	720p			
			09	576p			
			0A	432p			
			0B	288p			
			19	XGA 16:9			
			0C	144p			
Multicast Framerate	01 7A 01 yz	00	Low				
		01	Medium				
		02	High				
Description	01 18 yz AB CD EF ... FF		max. Len = 255				

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Variable [hex]	Comment	Note
Unit	Firmware Upload Erase Flash	01 B0 01 00					
Firmware Update	Firmware Upload Data Start	01 B1 04 yz wx uv st		length of firmware data			
	Firmware Upload Data	05 B2 yz wx AB CD EF ...FF	yz wx	Length of Byte of long data block in hex USB max Länge = 508 (512-4) ETH max Länge = 1440			
	Firmware Upload Data Stop	01 B3 01 00					
	Firmware Downgrade	01 B4 01 00		Kommando vor Upload der alten FW ausführen			
OSD	Transparency	01 C0 01 yz	00	Transparency Off			
			01	Transparency On			
	Size	01 C1 01 yz	00	Size Small			
			01	Size Large			
	Menu Horizontal Position	01 C2 01 yz	00 to 64	0 to 100% in steps of 1%			
	Menu Vertikal Position	01 C3 01 yz	00 to 64	0 to 100% in steps of 1%			
	Status Position	01 C4 01 yz	00	Status Position Top			
			01	Status Position Bottom			
	Selection Bar Color	01 C5 01 yz	00	Black			
			03	Red			
			0B	Orange			
			0C	Green			
			15	Darkgrey			
			28	Mint			
			2A	Grey			
			2F	Yellow			
			30	Blue			
			33	Magenta			
			3C	Cyan			
			3F	White			
			Selected Text Color	01 C6 01 yz	00	Black	
	03	Red					
	0B	Orange					
	0C	Green					
	15	Darkgrey					
	28	Mint					
	2A	Grey					
	2F	Yellow					
	30	Blue					
	33	Magenta					
	3C	Cyan					
	3F	White					
	Menu Text Color	01 C7 01 yz			00	Black	
			03	Red			
			0B	Orange			
			0C	Green			
			15	Darkgrey			
			28	Mint			
			2A	Grey			
			2F	Yellow			
			30	Blue			
			33	Magenta			
			3C	Cyan			
			3F	White			
			Menu Headline Color	01 C8 01 yz	00	Black	
03	Red						
0B	Orange						
0C	Green						
15	Darkgrey						
28	Mint						
2A	Grey						
2F	Yellow						
30	Blue						
33	Magenta						
3C	Cyan						
3F	White						
Menu Status Text Color	01 C9 01 yz	00			Black		
		03	Red				
		0B	Orange				
		0C	Green				
		15	Darkgrey				
		28	Mint				
		2A	Grey				
		2F	Yellow				
		30	Blue				
		33	Magenta				
		3C	Cyan				
		3F	White				

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Reply Packet [hex]	Variable [hex]	Comment	Note
Zoom Control	Position	00 20 00			00 20 02 wx yz	00 00 to FF FF	wx yz ... Position	'xyz\n'
	Macro	00 2b 00			00 2b 01 yz	00	Off	
						01	11x	
Digital Zoom	Digital Zoom Position	00 28 00			00 28 02 wx yz	00 00 to FF FF		'xyz\n'
	Digital Zoom Mode	00 29 00			00 29 01 yz	00	Off	'0\n'
						01	2x	'1\n'
						02	4x	'2\n'
	Digital Zoom Warning	00 2a 00			00 2a 01 yz	00	Stop	'0\n'
Focus Control	Position	00 21 00			00 21 02 wx yz	00 00 to FF FF		'xyz\n'
	AF	00 31 00			00 31 01 yz	00	off	'0\n'
						01	on	'1\n'
						10	OPAF (one push auto focus) running	
							commands with length 0x00 allowed only, Prot1 compat	
Iris Control	Position	00 22 00			00 22 02 wx yz			
	Auto Iris	00 32 00			00 32 01 yz	00	Off	
	Iris Priority	00 33 00			00 33 01 yz	00	Auto	
Arm and Mirror Control	Arm	00 23 00			00 23 01 yz	00	Down	
						01	Up	
						02	Macro 11x	
						03	Macro 12x	
						04	Undefined	
Height Adj. Control	Mirror Position	00 24 00			00 24 02 wx yz			
	Heightadjustment	00 2d 00			00 2d 01 yz	00	Stop	
						01	Running	
	Mirror X Position	00 25 00			00 25 02 wx yz	00 00 to FF FF		
Preset Control	Mirror Y Position	00 26 00			00 26 02 wx yz	00 00 to FF FF		
	Light Focus Position	00 27 00			00 27 02 wx yz	00 00 to FF FF		
	Preset Special Function Key	00 42 01 wx	01	Preset1	00 42 02 01 yz	00	PRESET	
					01	POS_NEG		
					02	BLUE		
					03	BLACK_WHITE		
					04	WB		
					05	FREEZE		
					06	IMAGE		
					07	ONEPUSH_AF		
					08	LIGHT_ON_OFF		
					09	SLIDE_ON_OFF		
					0A	TEXT		
					0B	LIGHT		
			02	Preset2	00 42 02 02 yz	00	PRESET	
						01	POS_NEG	
						02	BLUE	
						03	BLACK_WHITE	
						04	WB	
						05	FREEZE	
						06	IMAGE	
						07	ONEPUSH_AF	
						08	LIGHT_ON_OFF	
						09	SLIDE_ON_OFF	
						0A	TEXT	
						0B	LIGHT	
			03	Preset3	00 42 02 03 yz	00	PRESET	
						01	POS_NEG	
						02	BLUE	
						03	BLACK_WHITE	
						04	WB	
						05	FREEZE	
						06	IMAGE	
						07	ONEPUSH_AF	
						08	LIGHT_ON_OFF	
						09	SLIDE_ON_OFF	
						0A	TEXT	
						0B	LIGHT	
	List of SFK functions	00 43 00			00 43 ## ..	01	POS_NEG	Variable Liste mit unterstützen Funktionen (ohne Preset), Terminierung mit 0xff
						02	BLUE	
						03	BLACK_WHITE	
						04	WB	
						05	FREEZE	
						06	IMAGE	
						07	ONEPUSH_AF	
						08	LIGHT_ON_OFF	
						09	SLIDE_ON_OFF	
						0A	TEXT	
						0B	LIGHT	
	Store Mirror-Pos	00 4d 00			00 4d 01 yz	00	Off	
						01	On	

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Reply Packet [hex]	Variable [hex]	Comment	Note
Power Control	Power	00 30 00			00 30 01 yz	00	Off	'0\n'
						01	On	'1\n'
	Power On Preset	00 34 00			00 34 01 yz	00	Off	'0\n'
						01	On	'1\n'
	Display Logo	00 35 00			00 35 01 yz	00	Off	
						01	On	
	Mains-On	00 36 00			00 36 01 yz	00	Standby	
						01	Power-On	
	Auto-Power-Off Time	00 37 00			00 37 01 yz	FF	Off	
						1E	30min until Auto-Power-Off	
					3C	1h until Auto-Power-Off		
					78	2h until Auto-Power-Off		
					B4	3h until Auto-Power-Off		
					F0	4h until Auto-Power-Off		
Light Control	Light	00 a0 00			00 a0 01 yz	00	Off	
						01	Light On, LB Off	
						02	LB On, Light Off	
						03	Slidebox On	
Light Control	Lamp Blown	00 a4 00			00 a4 01 yz	00	No Lamp Blown	
						01	Lamp 1 Blown	
						02	Lamp 2 Blown	
Light Control	Lamp 1 Hours	00 a3 00			00 a3 02 wx yz	00 00 to FF FF	in hours [hex]	
	Lamp 2 Hours	00 a4 00			00 a4 02 wx yz	00 00 to FF FF	in hours [hex]	
	Lamp Voltage	00 a1 00			00 a1 01 yz	00	Longlife	
						01	Economic	
Reply Mode (RS232)	Reply Mode	00 aa 00			00 aa 01 yz	00	Off	
						01	Command	
ImageTurn Command	Image Turn	00 83 00			00 83 01 yz	00	0°	
						01	-90°	
						02	180°	
						03	90°	
	ImageTurn Rotation	00 84 00			00 84 01 yz	00	Cycle	
						01	-90°	
Misc. Command	Keylock	00 80 00			00 80 01 yz	00	Off	
						01	On	
	IR Code	00 81 00			00 81 01 yz		yz see SET	
	OSD Level	00 82 00			00 82 01 yz	00	Quiet	
						01	Talk	
						02	Verbose	
	Text Enhancer	00 85 00			00 85 01 yz	00	Off	
						01	On	
	Image	00 86 00			00 86 01 yz	00	Off	
						01	On	
	LCD Brightness	00 87 00			00 87 01 yz			
	Debug	00 88 00			00 88 01 yz	00	Debug Off	
					01	Debug On		
Baudrate	00 89 00			00 89 01 yz		yz see SET		
Number IR Codes	00 18 00			00 18 01 yz				
Mounting Position	00 19 00			00 19 01 yz				
VZ Menu Control	Menu	00 98 00			00 98 01 yz	00	Off	
						01	On	
	Menu Unlock	00 9a 00			00 9a 01 yz	00	Off	
						01	On	
Output Control	Menu Extra Unlock	00 9b 00			00 9b 01 yz	00	Off	
						01	On	
	Resolution RGB	00 50 00			00 50 01 yz			
	Resolution DVI	00 51 00			00 51 01 yz		yz see SET	
	Video Format	00 52 00			00 52 01 yz			
	Detail	00 53 00			00 53 01 yz	00	Off	
						01	Low	
						02	Medium	
						03	High	
	Pos/Neg/Blue	00 54 00			00 54 01 yz	00	Pos	
					01	Neg		
					02	Blue		
Color/BW	00 55 00			00 55 01 yz	00	Color		
					01	BW		
Freeze	00 56 00			00 56 01 yz	00	Off		
					01	On		
Ext/Int	00 57 00			00 57 01 yz	00	Intern		
					01	Extern		
Output Control	Autosense Ext/Int	00 58 00			00 58 01 yz	00	Off	
						01	On	
	Extern/Freeze Output	00 59 00			00 59 01 xy			
	Preview Output is	00 5a 00			00 5a 01 yz	00	Preview	
						01	Regular	
Image Mirror	Image Mirror	00 5b 00			00 5b 01 yz	00	Off	
						01	Horizontal	
						02	Vertical	
						03	H+V	

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Reply Packet [hex]	Variable [hex]	Comment	Note	
Image Storing Cmd	Memory	00 90 00			00 90 01 yz	00 01	Off On		
	ShowAll	00 93 00			00 93 01 yz	00 01	Off On		
	Erase Memory	00 94 00			00 94 01 yz	00 01	Manually Standby		
Exposure	Gain	00 60 00			00 60 01 yz		yz see SET (commands with length 0x00 allowed only, Prot1 compat)		
	Shutter	00 61 00			00 61 01 yz		yz see SET		
	Speed (Shutter=step)	00 62 00			00 62 01 yz		yz see SET (commands with length 0x00 allowed only, Prot1 compat)		
	Speed (Shutter=variable)	00 63 00			00 63 02 wx yz				
	Image Brightness	00 64 00			00 64 01 yz				
	Trigger Mode	00 6a 00			00 6a 01 yz	00 01	Trigger Off Trigger On		
	Trigger Edge	00 6b 00			00 6b 01 yz	00 01	Positive Edge Negative Edge		
Color	White Balance AUTO	00 65 00			00 65 01 yz	00	Auto		
						01	OPWB		
						02	Manual		
						10	OPWB		
						50	OPWB for Manual		
	R Gain (WB=Manual)	00 66 00			00 66 01 yz	00 to 7F	-64...+63 (decimal)		
	B Gain (WB=Manual)	00 67 00			00 67 01 yz	00 to 7F	-64...+63 (decimal)		
	Gamma Normal Mode	00 68 00			00 68 01 yz	00 to 03			
	Gamma Text Mode	00 69 00			00 69 01 yz	00 to 03			
	Color Mode	00 6d 00			00 6d 01 yz	00 01 02 03 04	Black/White Presentation Natural Video Conference Manual		
Saturation	00 6e 00			00 6e 01 yz	00 to C8	0 %...172%			
Ethernet	DHCP	00 70 00			00 70 01 yz	00 01	Off On		
	IP Address	00 71 00			00 71 04 st uv wx yz				
	Subnet Mask	00 72 00			00 72 04 st uv wx yz	00 to FF	Subnet Mask in hex (00 to FF for each packet)		
	Gateway IP	00 73 00			00 73 04 st uv wx yz	00 to FF	Gateway IP Address in hex (00 to FF for each packet)		
	Ethernet Mode	00 74 00				00 74 01 yz	00	Off	
							01	Image Only	
							02	Control Only	
							03	Image and Control	
							04	FW Update Only	
							05	Image and FW Update	
							06	Control and FW Update	
	07	Image, Control and FW Update							
	Multicast Mode	00 75 00			00 75 01 yz	00 01 02	Off Auto Continuous		
	Multicast Running	00 76 00			00 76 01 yz	00 01	No Yes		
	Multicast IP Address	00 77 00			00 77 04 st uv wx yz	00 to FF	Multicast IP Address in hex (1 to FF for each packet)		
Multicast Port	00 78 00			00 78 02 wx yz	22 60 to 23 28	Port 8800 to 9000 in hex			
Multicast Format	00 79 00			00 79 01 yz		yz see SET			
Multicast Framerate	00 7A 00			00 7A 01 yz		yz see SET			
Multicast Resolution Table	00 7B 00			00 7B XY ab cd ef ..		max. Len = 255	???		

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Reply Packet [hex]	Variable [hex]	Comment	Note						
Unit	Model	00 11 00			00 11 xy ab cd ..									
	Serialnumber	00 12 00			00 12 04 st uv wx yz									
	Version	00 13 00			00 13 0X ab cd ef ..		replies installed firmware version	i.e. "V1.10a"						
	Adjuster	00 14 00			00 14 0X ab cd ef ..		max. Len = 255							
	Date	00 15 00			00 15 02 wx yz		replies production date in week, year	i.e. "36,07"						
	Features					00 16 08 ab cd ef ..	0 or 1 for each Bit8 Bytes: to specify the ava	Byte0:	Bit7:Zoom Bit6:Iris Bit5:Mirror Bit4:Focus Bit3:AF Bit2:Power Bit1:Light Bit0:ExtIn					
								Byte1:	Bit7:Text Bit6:WB Bit5:Reset Bit4:Image Bit3:ImageTurn Bit2:Freeze Bit1:Arm Bit0:Macro					
								Byte2:	Bit7:Preset1 Bit6:Preset2 Bit5:Preset3 Bit4:Preset4 Bit3:Preset5 Bit2:Preset6 Bit1:Preset7 Bit0:Preset8					
								Byte3:	Bit7:Preset9 Bit6:Memory1 Bit5:Memory2 Bit4:Memory3 Bit3:Memory4 Bit2:Memory5 Bit1:Memory6 Bit0:Memory7					
								Byte4:	Bit7:Memory8 Bit6:Memory9 Bit5:ShowAll Bit4:Menu Bit3:OnePushAF Bit2:Reserved Bit1:Reserved Bit0:Reserved					
								Byte5:	Bit7:FWUpdate Bit6:PT_dZoom Bit5:PT_ImageTurn Bit4:PT_dem_dZoom Bit3:PT_dem_0deg Bit2:PT_dem90deg Bit1:PT_dem180deg Bit0:PT_dem270deg					
								Byte6: Reserved	Reserved					
Byte7: Reserved								Reserved						
Resolution Table								00 17 00			00 17 yz ab cd ef ..		xy: max 224 Bytes16*14Byte:Name (8Bytes), Width (2Bytes), Height (2Bytes), Index (2Bytes)	i.e. "SXGA-000, 0x500, 0x3C0, 0x00
Description								00 18 00			00 18yz ab cd ef ..		max. Len = 255String	
HD TV Mask Position	00 19 00			00 19 01 ab		-50 to 50								

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Reply Packet [hex]	Variable [hex]	Comment	Note
Firmware Update	Firmware Upload Erase Flash	00 b0 00			00 b0 01 yz		0x00...0x64: 0% to 100% firmware erased	State of firmware erasing
Picture Transfer	Picture Header	00 b8 01 yz	Bit7: Motion, 0=still image, 1=countinuous Bit6: Format, 0=BMP, 1=JPG Bit5,4: Quality, 0=best, 1=good, 2=average, 3=low Bit3..0: Index, Index of Restable		00 18 12 ab cd ef ..	Byte0: Breite HB Byte1: Breite LB Byte2: Höhe HB Byte3: Höhe LB Byte4: Flags Byte5: ModeByte Byte6: Maximale Blockgröße HHB Byte7: Maximale Blockgröße HB Byte8: Maximale Blockgröße LB Byte9: Maximale Blockgröße LLB Byte10: Extended Byte Bit7: Reserved Bit6: 0=no light supported or light off; 1=light on Bit5: 0=not triggered images in triggermode, 1=triggered image in triggermode Bit4: 0=normal (live) mode, 1=Extern mode Bit3: 0=Digital Zoom off, 1=Digital Zoom on Bit2: 0=4:3, 1=16:9(HDTV) Bit1..0: Detail (00=Aoff, 01=Low, 10=Medium, 11=High)		
	Get Picture Block	00 b9 0a ab cd ef gh ijkl mn op qr st			00 b9 01 yz		ab: Flags off Picture Header cd: Mode Byte off Picture Header ef gh ij kl: Offset from image start (BMP: in lines; JPG: in Bytes) mn op qr st: Block length Return: 0x00: OK 0x01: Failed	Return: 20 Bytes
Block Inquiry	Positions	00 10 01 00			00 10 10		Byte3=Blocknumber, see BlockGet description	
	Flags and unit information	00 10 01 01			00 10 10		See detailed BlockGet description	
	Menu 1	00 10 01 02			00 10 10		See detailed BlockGet description	
	Menu 2	00 10 01 03			00 10 10		See detailed BlockGet description	
	Menu Ethernet	00 10 01 04			00 10 16		See detailed BlockGet description	

Function	Command Description	Command Packet [hex]	Variable [hex]	Comment	Reply Packet [hex]	Variable [hex]	Comment	Note	
OSD	Transparency	00 c0 00			00 c0 01 yz	00	Transparency Off		
						01	Transparency On		
	Size	00 c1 00			00 c1 01 yz	00	Size Small		
						01	Size Large		
	Menu Horizontal Position	00 c2 00			00 c2 01 yz	00 to 64	0 to 100% in steps of 1%		
	Menu Vertikal Position	00 c3 00			00 c3 01 yz	00 to 64	0 to 100% in steps of 1%		
	Status Position	00 c4 00			00 c4 01 yz	00	Status Position Top		
						01	Status Position Bottom		
	Selection Bar Color	00 c5 00				00 c5 01 yz	00	Black	
							03	Red	
							0B	Orange	
							0C	Green	
							15	Darkgrey	
							28	Mint	
							2A	Grey	
							2F	Yellow	
							30	Blue	
							33	Magenta	
							3C	Cyan	
							3F	White	
							00	Black	
							03	Red	
							0B	Orange	
	0C	Green							
	15	Darkgrey							
	28	Mint							
	2A	Grey							
	2F	Yellow							
	30	Blue							
	33	Magenta							
	3C	Cyan							
	3F	White							
	Selected Text Color	00 c6 00				00 c6 01 yz	00	Black	
							03	Red	
							0B	Orange	
							0C	Green	
							15	Darkgrey	
							28	Mint	
							2A	Grey	
							2F	Yellow	
							30	Blue	
							33	Magenta	
							3C	Cyan	
							3F	White	
							00	Black	
03							Red		
0B							Orange		
0C	Green								
15	Darkgrey								
28	Mint								
2A	Grey								
2F	Yellow								
30	Blue								
33	Magenta								
3C	Cyan								
3F	White								
Menu Text Color	00 c7 00				00 c7 01 yz	00	Black		
						03	Red		
						0B	Orange		
						0C	Green		
						15	Darkgrey		
						28	Mint		
						2A	Grey		
						2F	Yellow		
						30	Blue		
						33	Magenta		
						3C	Cyan		
						3F	White		
						00	Black		
						03	Red		
						0B	Orange		
0C	Green								
15	Darkgrey								
28	Mint								
2A	Grey								
2F	Yellow								
30	Blue								
33	Magenta								
3C	Cyan								
3F	White								
Menu Headline Color	00 c8 00				00 c8 01 yz	00	Black		
						03	Red		
						0B	Orange		
						0C	Green		
						15	Darkgrey		
						28	Mint		
						2A	Grey		
						2F	Yellow		
						30	Blue		
						33	Magenta		
						3C	Cyan		
						3F	White		
						00	Black		
						03	Red		
						0B	Orange		
0C	Green								
15	Darkgrey								
28	Mint								
2A	Grey								
2F	Yellow								
30	Blue								
33	Magenta								
3C	Cyan								
3F	White								
Menu Status Text Color	00 c9 00				00 c9 01 yz	00	Black		
						03	Red		
						0B	Orange		
						0C	Green		
						15	Darkgrey		
						28	Mint		
						2A	Grey		
						2F	Yellow		
						30	Blue		
						33	Magenta		
						3C	Cyan		
						3F	White		
						00	Black		
						03	Red		
						0B	Orange		
0C	Green								
15	Darkgrey								
28	Mint								
2A	Grey								
2F	Yellow								
30	Blue								
33	Magenta								
3C	Cyan								
3F	White								

Block GET Command List

Command: 00 10 01 00

Positions

Byte	Bit	Comments	Byte	Bit	Comments	Byte	Bit	Comments	
0	7	0	6	7	0	12	7	0	
	6	0		6	6		0	6	0
	5	0		5	5		0	5	0
	4	0		4	4		0	4	0
	3	Zoom Position (HL)		3	Iris Position (HL)		3	Mirror Y Position (HL)	3
2	2		2	2					
1	1		1	1					
0	0		0	0					
1	7	Zoom Position (LH)	7	7	Iris Position (LH)	13	7	Mirror Y Position (LH)	
	6			6			6		
	5			5			5		
	4			4			4		
	3	Zoom Position (LL)		3	Iris Position (LL)		3	Mirror Y Position (LL)	3
2	2		2	2					
1	1		1	1					
0	0		0	0					
2	7	0	8	7	0	14	7	0	
	6	0		6	6		0	6	0
	5	0		5	5		0	5	0
	4	0		4	4		0	4	0
	3	Digital Zoom (HL)		3	AR Position (HL)		3	Light Focus Pos. (HL)	3
2	2		2	2					
1	1		1	1					
0	0		0	0					
3	7	Digital Zoom (LH)	9	7	AR Position (LH)	15	7	Light Focus Pos. (LH)	
	6			6			6		
	5			5			5		
	4			4			4		
	3	Digital Zoom (LL)		3	AR Position (LL)		3	Light Focus Pos. (LL)	3
2	2		2	2					
1	1		1	1					
0	0		0	0					
4	7	0	10	7	0		7	0	
	6	0		6	6		0	6	0
	5	0		5	5		0	5	0
	4	0		4	4		0	4	0
	3	Focus Position (HL)		3	Mirror X Position (HL)		3	0	3
2	2		2	2					
1	1		1	1					
0	0		0	0					
5	7	Focus Position (LH)	11	7	Mirror X Position (LH)		7	0	
	6			6			6		
	5			5			5		
	4			4			4		
	3	Focus Position (LL)		3	Mirror X Position (LL)		3	0	3
2	2		2	2					
1	1		1	1					
0	0		0	0					

Block GET Command List

Command: 00 10 01 01

Flags and unit information

Byte	Bit	Comments	Byte	Bit	Comments	Byte	Bit	Comments
0	7	Power	6	7	Serial 1	12	7	Version 3
	6	AF		6			6	
	5	AI		5			5	
	4	Light		4			4	
	3	LB		3			3	
	2	Slide		2			2	
	1	Text Enhancer		1			1	
	0	Keylock		0			0	
1	7	Extern	7	7	Serial 2	13	7	Version 4
	6	Color/BW		6			6	
	5	Pos/Neg/Blue		5			5	
	4	Pos/Neg/Blue		4			4	
	3	Show All		3			3	
	2	Freeze		2			2	
	1	Portrait		1			1	
0	Portrait	0	0					
2	7	Lamp Blown	8	7	Serial 3	14	7	Version 5
	6	Lamp1 Blown		6			6	
	5	Lamp2 Blown		5			5	
	4	OSD Menu		4			4	
	3	0		3			3	
	2	0		2			2	
	1	0		1			1	
	0	0		0			0	
3	7	0	9	7	Serial 4	15	7	Version 6
	6			6				
	5			5				
	4			4				
	3			3				
	2			2				
	1			1				
	0			0				
4	7	0	10	7	Version 1		7	
	6			6				
	5			5				
	4			4				
	3			3				
	2			2				
	1			1				
	0			0				
5	7	Model	11	7	Version 2		7	
	6			6				
	5			5				
	4			4				
	3			3				
	2			2				
	1			1				
	0			0				

Block GET Command List

Command: 00 10 01 02

Menu 1

Byte	Bit	Comments	Byte	Bit	Comments	Byte	Bit	Comments				
0	7	Gain	6	7	R Gain	12	7	Preview Output is				
	6			0								
	5			0								
	4			0								
	3			0								
	2			0								
	1			0								
	0			0								
1	7	Shutter	7	7	B Gain	13	7	Freeze RGB				
	6	0		6			Freeze DVI					
	5	0		5			Freeze Video					
	4	0		4			Freeze LCD					
	3	Shutter Speed (var.,HL)		3			Ext-In RGB					
	2			2			Ext-In DVI					
	1			1			Ext-In Video					
	0			0			Ext-In LCD					
2	7	Shutter Speed (var.,LH)	8	7	Normal Gamma	14	7	PowerOn Preset				
	6			6			Display Logo					
	5			5			MainsOn					
	4			4			0					
	3	Shutter Speed (var.,LL)		3	0							
	2			2	0							
	1			1	0							
	0			0	0							
3	7	Shutter Speed (step)	9	7	Detail	15	7	Auto Power Off Time				
	6			6			0					
	5			5			0					
	4			4			0					
	3			Video Format	3		0					
	2				2							
	1				1							
	0				0							
4	7	Iris Priority	10	7	Resolution VGA		7					
	6	0		6								
	5	0		5								
	4	0		4								
	3	Image Brightness		3								
	2			2								
	1			1								
	0			0								
5	7	WB	11	7	Resolution DVI			7				
	6			6								
	5			5								
	4			4								
	3			Pos, Neg, Blue						3		
	2									2		
	1									1		
	0									0		
		Color / BW										
		0										

Block GET Command List

Command: 00 10 01 03

Menu 2

Byte	Bit	Comments	Byte	Bit	Comments	Byte	Bit	Comments	
0	7	Preset 1 SFK	6	7	Erase Memory	12	7	Lamp 2 Hours (H)	
	6			Auto Sense Ext In	6				
	5			Macro	5				
	4			0	4				
	3			Digital Zoom	3				
	2				2				
	1			Digital Zoom Warning	1				
	0				0				
1	7	Preset 2 SFK	7	7	LCD Brighthness	13	7	Lamp 2 Hours (L)	
	6						6		
	5						5		
	4						4		
	3						3		
	2						2		
	1						1		
	0						0		
2	7	Preset 3 SFK	8	7	ImageTurn Rotation	14	7	0	
	6				6		0		
	5			Laser	5		0		
	4				4		0		
	3			Lamp Voltage	3		0		
	2				2		0		
	1			0	1		0		
	0			0	0		0		
3	7	0	9	7	Baudrate	15	7	0	
	6	0		6			0		
	5	0		5			0		
	4	Store Mirror Pos		4			0		
	3	Preset 1 Height		3			Image Mirror	3	0
	2						2	0	
	1			Numbers IR Codes			1	0	
	0			0			0	0	
4	7	Preset 2 Height	10	7	Lamp (1) Hours (H)		7	0	
	6						6	0	
	5						5	0	
	4						4	0	
	3	Preset 3 Height		3				3	0
	2						2	0	
	1						1	0	
	0						0	0	
5	7	OSD Level	11	7	Lamp (1) Hours (L)		7	0	
	6			6			0		
	5	0		5			0		
	4	0		4			0		
	3	IR Code		3				3	0
	2						2	0	
	1						1	0	
	0						0	0	

Block GET Command List

Command: 00 10 01 04

Menu Ethernet

Byte	Bit	Comments	Byte	Bit	Comments	Byte	Bit	Comments	Byte	Bit	Comments	
0	7	0	6	7	IP LB	12	7	Gateway HHB	18	7	Multicast IP LB	
	6	0		6			6			6		6
	5	0		5			5			5		5
	4	Ethernet Mode		4			4			4		4
	3			3			3			3		
	2			2			2			2		
	1			1			1			1		
0	DHCP	0	0	0	0							
1	7	Streaming Format	7	7	IP LLB	13	7	Gateway HB	19	7	Multicast IP LLB	
	6			6			6			6		
	5			5			5			5		
	4			4			4			4		
	3			3			3			3		
	2			2			2			2		
	0			0			0			0		
2	7	Streaming Frame Rate	8	7	Subnet HHB	14	7	Gateway LB	20	7	Multicast Port HB	
	6			6			6			6		
	5			5			5			5		
	4	Streaming Mode		4			4			4		4
	3			3			3			3		
	2			2			2			2		
	0			0			0			0		
3	7	0	9	7	Subnet HB	15	7	Gateway LLB	21	7	Multicast Port LB	
	6	0		6			6			6		6
	5	0		5			5			5		5
	4	0		4			4			4		4
	3	0		3			3			3		3
	2	0		2			2			2		2
	0	0		0			0			0		0
4	7	IP HHB	10	7	Subnet LB	16	7	Multicast IP HHB	17	7	Multicast IP HB	
	6			6			6			6		
	5			5			5			5		
	4			4			4			4		
	3			3			3			3		
	2			2			2			2		
	0			0			0			0		
5	7	IP HB	11	7	Subnet LLB	17	7	Multicast IP HB	17	7	Multicast IP HB	
	6			6			6			6		
	5			5			5			5		
	4			4			4			4		
	3			3			3			3		
	2			2			2			2		
	0			0			0			0		

Serial Protocol of SCB-12 and EYE-12

No: T-07/01

Revised 30th January 2008 / AR

Introduction

The SCB-12 and EYE-12 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 and the key-panel on the unit such as Zoom, Focus, Presets, etc. as well as a lot of other functions like reading and setting zoom-position, etc.

The protocol is upward compatible to the one of the VZ-9plus.

Connection

The serial-port of the Visualizer 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. The baud rate is (by default) 115200 and can be changed in the extra menu. There is no parity, 8 data-bits and 1 stop-bit.

Changing the Baud rate

It is possible to change the baud rate from 115200 to 9600, 19200, 38400, 115200 or 57600. To change the baud rate, switch the unit on and press the MENU-key for four seconds, until the Extra-Menu appears. Then enter the Serial Port-sub-menu. There you can change the baud rate.

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.

Page-Commands

The commands are split into two pages (because for one command-page too many commands exist). Basically each command is a two Byte command, page-command + control-command.

If the command-reply mode is switched on, then the Visualizer sends a reply for each Byte, a reply for the control-command and also for the page-command (for details see "Reply Mode Control").

The standard command page is "0", that means, if you want to execute a command from the page "0" (standard page), then it's not necessary to select the page "0" before. If you want to execute a command from the page "1" then you must select the page "1" and input now your command.

If the page "1" command is executed, then the Visualizer switches automatically back to the page "0".

Check "Page" column for command page in the following tables.

Select Page Control

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	048	\$30	SER_Page0	By sending this command the Visualizer switches to the page "0" and waits for the control command. Page "0" is the standard page and it is not necessary to select it	
0	049	\$31	SER_Page1	By sending this command the Visualizer switches to the page "1" and waits for the control command. After the control command is executed (i.e. 136 for Show All) the Visualizer changes back to the standard page (page 0)	

Zoom Control

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	195	\$C3	Zoom wide	By sending this command the Visualizer zooms towards wide-position. For continuous zooming send this code repetitively (min. 10Hz) as long as you want to zoom.	1
0	199	\$C7	Zoom tele	By sending this command the Visualizer zooms towards tele-position. For continuous zooming send this code repetitively (min. 10Hz) as long as you want to zoom.	1
0	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 (or the mechanical end-position is reached).	1
0	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 (or the mechanical end-position is reached).	1
0	128	\$80	Stop All	see Miscellaneous Commands on page 9/11	
0	161	\$A1	Get 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 + CR.	2, 3
0	162	\$A2	Set Zoom-Position	After this command the Visualizer echoes a question-mark ('?') with no LF + 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 3 rd digit the Visualizer zooms to this position.	2, 3
1	163	\$A3	Set Digital Zoom	After this command the Visualizer echoes a question-mark ('?') with no LF + CR. After this question mark the controller should send the wished digital 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 3 rd digit the Visualizer zooms to this position.	3
1	164	\$A4	Get Digital Zoom	After sending this command the Visualizer sends back the current digital zoom-position as a 3-digit hexadecimal number in the range from '000' (wide) to 'FFF' (tele) as an ASCII-string followed by LF + CR.	3

Focus Control

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	194	\$C2	Focus far	By sending this command the Visualizer focuses towards far. For continuous changing the focus, send this code repetitively (min. 10Hz) as long as you want to change the focus.	
0	198	\$C6	Focus near	By sending this command the Visualizer focuses towards near. For continuous changing the focus, send this code repetitively (min. 10Hz) as long as you want to change the focus.	
0	131	\$83	Start Focus far	This command starts to focus towards far. The Visualizer changes the focus until the „Stop Zoom/Focus/Iris“-command or a different Start-Command is received (or the mechanical end-position is reached).	
0	132	\$84	Start Focus near	This command starts to focus towards near. The Visualizer changes the focus until the „Stop Zoom/Focus/Iris“-command or a different Start-Command is received (or the mechanical end-position is reached).	
0	128	\$80	Stop All	see Miscellaneous Commands on page 9/11	
0	163	\$A3	Get Focus-Position	After sending this command the Visualizer sends back the current focus-position as a 3-digit hexadecimal number in the range from '000' (near) to 'FFF' (far) as an ASCII-string followed by LF + CR.	2, 3
0	164	\$A4	Set Focus-Position	After this command the Visualizer echoes a question-mark ('?') with no LF + 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 3 rd digit the Visualizer moves to this position.	2, 3
0	239	\$EF	AF-ON	Switches the Auto Focus on.	
0	240	\$F0	AF-OFF	Switches the Auto Focus off.	
0	173	\$AD	Get Auto Focus	This function returns '1' +LF+CR if the AF is switched on and '0' if the AF is switched off.	3

Iris Control

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	193	\$C1	Iris open / Brightness up	By sending this command the Visualizer opens the iris. For continuous opening the iris, send this code repetitively (min. 10Hz) as long as you want to open iris.	4
0	197	\$C5	Iris close / Brightness down	By sending this command the Visualizer closes the iris. For continuous closing the iris, send this code repetitively (min. 10Hz) as long as you want to close iris.	4
0	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 (or the mechanical end-position is reached).	4
0	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 (or the mechanical end-position is reached).	4
0	128	\$80	Stop All	see Miscellaneous Commands on page 9/11	
0	167	\$A7	Auto Iris on	Switches the Auto Iris on.	
0	168	\$A8	Auto Iris off	Switches the Auto Iris off.	
0	166	\$A6	Get Auto Iris	This function returns '1'+LF+CR if the Auto Iris is switched on and '0'+LF+CR if the Auto Iris is switched off.	3
0	165	\$A5	Get Iris-Position	After sending this command the Visualizer sends back the current iris-position as a 3-digit hexadecimal number in the range from '000' (close) to 'FFF' (open) as an ASCII-string followed by LF + CR. This command has no effect on shutter and gain.	2, 3
0	169	\$A9	Set Iris-Position	After this command the Visualizer echoes a question-mark ('?') with no LF + CR. After this question mark 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 3 rd digit the Visualizer moves to this position. This command has no effect on shutter and gain.	2, 3, 4

Power / Presets Control

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	200	\$C8	Power on / PowerOn-Preset	If the Visualizer is in standby-mode, the unit is switched on. Then the PowerOn-preset is recalled (even if the unit was already switched on). (approx. DIN A5, Light on)	5, 6, 7
0	201	\$C9	Power off	This command puts the unit in standby-mode (camera, light, etc. are switched off).	
0	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.	3
0	186	\$BA	Power toggle switch	By sending this command the Visualizer switches on if it is off, or switches off if the Visualizer is on. (The power cord must be connected)	
0	154	\$9A	Recall Preset	This command sends "?" back and waits for character input "1"- "3" for preset number. Then the Preset recalls. (max. 3 seconds time for the character input)	7
0	155	\$9B	Store Preset	This command sends "?" back and waits for character input "1"- "3" for preset number. Then the Preset stores. (max. 3 seconds time for the character input)	7
0	213	\$D5	Preset 0 PowerOn-Preset	This command recalls the PowerOn-Preset. (approx. DIN A5, Light on)	5, 6, 7, 8
0	202	\$CA	Preset 1	This command recalls Preset 1.	7
0	203	\$CB	Preset 2	This command recalls Preset 2.	7
0	253	\$FD	Preset 3	This command recalls Preset 3.	7
0	216	\$D8	Save Preset 1	This command stores the current unit-settings as Preset 1.	7
0	217	\$D9	Save Preset 2	This command stores the current unit-settings as Preset 2.	7
0	254	\$FE	Save Preset 3	This command stores the current unit-settings as Preset 3.	7
0	229	\$E5	Preset Max. Wide	This command zooms to the maximum wide position	5, 6
0	230	\$E6	Preset DIN A4	This command zooms to approx. DIN A4-size	5, 6, 8
0	231	\$E7	Preset DIN A5	This command zooms to approx. DIN A5-size	5, 6, 8
0	232	\$E8	Preset DIN A6	This command zooms to approx. DIN A6-size	5, 6, 8
0	233	\$E9	Preset DIN A7	This command zooms to approx. DIN A7-size	5, 6, 8
0	234	\$EA	Preset DIN A8	This command zooms to approx. DIN A8-size	5, 6, 8
0	235	\$EB	Preset Max. Tele (no digital zoom)	This command zooms to the maximum optical tele end position, light is switched on.	5, 6

Visualizer Menu, Camera control

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	218	\$DA	Unlock Visualizer-Menu	This command unlocks the Visualizer-menu. After sending this command the menu can be entered by sending 206.	
0	206	\$CE	Visualizer-Menu on/off	This command enters the Visualizer menu (can be unlocked with 218!) which is then displayed on the screen. If the Menu is locked, then send this code 1 sec. With 10 Hz (repetitively). By sending this command again, the menu disappears and is locked again.	
0	139	\$8B	Unlock Extra-Menu (Baud rate, modem-settings)	This command unlocks the Visualizer-extra-menu. After sending this command the menu can be entered by sending 206.	9
0	208	\$D0	Function Up	Moves the menu-cursor up (if the menu is activated).	
0	209	\$D1	Function Down	Moves the menu-cursor down (if the menu is activated).	
0	210	\$D2	Data Right / White Balance	Changes the data of the current menu-item if the menu is activated. If the menu is not activated, a white-balance is performed.	
0	151	\$97	White Balance	By sending this command the camera performs a white balance. (Also works, when the menu is on.)	
0	211	\$D3	Data Left	Changes the data of the current menu-item if the menu is activated.	
0	214	\$D6	Help	This command gives a description off the settings in the Visualizer-menu.	
0	220	\$DC	Data Left + Data Right	This command behaves like if you press Data Right and Left together, i.e. the menu-item is preset to the default value.	
0	246	\$F6	Reset Menu	This command resets all Visualizer-menu-settings except resolution/refresh rate and Presets to their default-settings.	

Image On/Off Control

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	185	\$B9	Image toggle switch	By sending this command, the Visualizer toggles between image OFF and image ON.	
0	192	\$C0	Image on	By sending this command the Visualizer switches the image on.	
0	196	\$C4	Image off	By sending this command the Visualizer switches the image off.	

Reply Mode Control

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	156	\$9C	Reply Mode Off	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.	10, 11
0	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. The Visualizer replies also a command if you send only the page select command.	10, 11, 12
0	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 repeated 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.	10, 11, 12
0	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.	3, 10, 11, 12

Image Storing Commands

Page	Dec. Code	Hex. Code	Command	Description	see Notes
1	140	\$8C	Memory Store x	This command sends “?” back and waits for character input “1”-“9” for memory number. Then the Memory stores (max. 3 seconds time for the character input).	
1	141	\$8D	Memory Recall x	This command sends “?” back and waits for character input “1”-“9” for memory number. Then the Memory recalls (max. 3 seconds time for the character input).	
1	142	\$8E	Memory Off	This command switches to the Live image.	
1	143	\$8F	Snapshot	This command stores one memory after the other memory, until all 9 memories are stored.	
1	136	\$88	Show All On/Off	This command toggles the Show All mode. (If this function is activated, the Visualizer is showing all stored images on the screen at the same time).	
1	137	\$89	Show All On	This command switches the Show All Memories mode On.	
1	138	\$8A	Show All Off	This command switches the Show All Memories mode Off.	
1	165	\$A5	Erase Memory	This command erases all stored memories.	
1	139	\$8B	Get Show All	This function returns ‘1’+LF+CR if the Show All memories mode is active and ‘0’+LF+CR if the Show All memories mode is inactive.	
0	215	\$D7	Freeze On/Off	This command toggles the Freeze-Mode	
1	166	\$A6	Freeze On	This command freezes the current image.	
1	167	\$A7	Freeze Off	This command switches from the frozen image to live image	
1	168	\$A8	Get Freeze	This function returns ‘1’+LF+CR if the Freeze mode is active and ‘0’+LF+CR if the Freeze mode is inactive.	

Image Turn Commands

Page	Dec. Code	Hex. Code	Command	Description	see Notes
1	132	\$84	Image Turn	This command toggles the Image turn mode (behaves same as the Image Turn key).	13
1	133	\$85	Portrait On	This command activates the image turn mode and turns the image by -90° .	
1	134	\$86	Image Turn Off	This command switches the image turn mode Off. Doesn't matter which setting was selected.	
1	135	\$87	Get Image Turn	When the image is turned by 0° , this command returns '0'+LF+CR, turned by -90° '1'+LF+CR, turned by 180° '2'+LF+CR and when it is turned by $+90^{\circ}$ this command returns '3'+LF+CR.	

Miscellaneous Commands

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	032	\$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.	3
0	118	\$76	Visualizer-Type and Software-Version output ('v')	This command returns the Visualizer-Type and the version no. of the built-in Software (firmware-version) back to controller. The output-format is as follows: e.g.: 'EYE-12 V1.10a '+LF+CR	3, 14
0	250	\$FA	Debug Mode on	This command switches the debug mode on.	
0	063	\$3F	Status	This command works only if the debug mode is activated.	
0	251	\$FB	Debug Mode off	This command switches the debug mode off.	
0	095	\$5F	ASCII ('_')	This command initiates direct ASCII-text input: After receiving '_', the Visualizer responds with a question-mark. After that you have to send the three-digit decimal-number of the desired command within three seconds. These three digits are echoed back by the Visualizer. This command will then be performed. (No CR or LF is needed.) This is useful for testing commands with a standard terminal-program.	
0	128	\$80	Stop All	This command stops zooming, focusing and iris movement (if activated with the respective „Start xxx“-command before).	
0	175	\$AF	Key Lock On	This command activates the Key Lock. When the Key Lock is active the Visualizer can only be controlled via RS-232 and not with the IR-remote-control or the keys on the unit.	
0	176	\$B0	Key Lock Off	This command deactivates the Key Lock. When the Key Lock is inactive the Visualizer can be normally operated with the keys on the unit, the IR-remote-control or via RS-232.	
0	174	\$AE	Get Key Lock	This function returns '1'+LF+CR if Key Lock is active and '0'+LF+CR if the Key Lock is inactive.	3

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	160	\$A0	Get Status	This command returns all settings of the Visualizer in following format (i.e. with firmware v 1.10a): 'Zoom:225 DigitalZoom:000 Focus:F48 Iris:FFF Power:1 AF:1 KeyLock:0 ImageTurn:0 ShowAll:0 Negative:0 ResolutionDVI:AUTO OSD-Menu:0' +LF+CR (in one line) (The Values are for example only, '1' means that the respective item is on, '0' means that it is off. The zoom/iris/focus-positions are 3 digit HEX-numbers in the range from 000 to FFF.) In the future further items may be added. Therefore you should search for a specific item-string (e.g. 'ShowAll') within the complete string and then analyze the next character(s). GetStatus-messages are depending on the installed firmware version!	2, 3
0	221	\$DD	Switch IR-Code	This command switches between IR-code A, B, C and D (,A , B, ..). It's useful if you have up to four Visualizers close together with separate remote-controls.	

Output Signal Setting Commands

Page	Dec. Code	Hex. Code	Command	Description	see Notes
1	151	\$97	Switch Positive On	This command switches to the positive image mode.	
1	152	\$98	Switch Negative On	This command switches to the negative image mode.	
1	153	\$99	Switch Negative Blue On	This command switches to negative blue image mode.	
1	154	\$9A	Get Positive/Negative	This function returns '0'+LF+CR if the Positive mode is active, '1'+LF+CR for the Negative mode and '2'+LF+CR for the Negative /Blue mode.	
1	155	\$9B	Switch Color On	This command switches the color image On.	
1	156	\$9C	Switch Black/White mode On	This command switches the image to a black/white image.	
1	157	\$9D	Get Black/White	This function returns '0'+LF+CR if the Color-mode is active and '1'+LF+CR if the Black/White mode is active.	
0	225	\$E1	Detail Off	This command de-activates the contour sharpness for soft contours with low detail.	
0	226	\$E2	Detail Medium	This command switches to average contour sharpness.	
0	227	\$E3	Detail High	This command changes to highest contour sharpness for most details.	

Output Resolution Commands

Page	Dec. Code	Hex. Code	Command	Description	see Notes
1	144	\$90	Resolution UP	This command switches the Output resolution on both outputs up (RGB and DVI).	15
1	145	\$91	Resolution Down	This command switches the Output resolution on both outputs down (RGB and DVI).	15
1	146	\$92	Resolution AUTO	This command switches the Output resolution on both outputs to AUTO-detect (RGB and DVI).	16
1	169	\$A9	Get Resolution	This function returns the current resolution setting on all outputs (RGB and DVI). E.g. "XGA/75Hz" for XGA-standard at 75Hz refresh rate.	

Trigger function Commands

Page	Dec. Code	Hex. Code	Command	Description	see Notes
0	145	\$91	Trigger On	This command switches the trigger function on.	
0	146	\$92	Trigger Off	This command switches the trigger function off.	
0	147	\$93	Trigger Edge Negative	This command switches to negative trigger edge.	
0	148	\$94	Trigger Edge Positive	This command switches to positive trigger edge.	

Notes

1. Zooming switches on the Auto-Iris.
2. Not all zoom-, focus- and iris-positions in the range from 000 to FFF are supported („missing codes“). Reading the position always returns the exact position. Setting the position moves to the wished position as exact as possible.
3. 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).
4. Changing the iris switches off the Auto Iris.
5. These presets are pre-defined and cannot be modified. Auto Focus, Auto Iris are switched on, and the Text Enhancer is switched off.
6. The exact size of the picture depends very much on the adjustments of the monitor / video-projector.
7. Following Visualizer-settings are stored/recalled: Zoom-Position, Focus-Position, Auto Iris on/off, Iris-Position (if AI off), Light on/off, Light box on/off, Text Enhancer on/off.
8. Image size depends on distance to the object. 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"]
9. In this sub-menu it's possible to change the Baud rate of the Visualizer.
10. The verification if a command is valid or invalid is only done very roughly. E.g. if the Visualizer receives a zoom-command while the unit is in standby-mode, it recognizes a valid command and replies \$06 although the unit doesn't perform any action. Also the Visualizer identifies a valid code for commands that are only supported on the VZ-57 (and replies \$06 for a valid command), etc.
11. 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.
12. 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, Auto Iris = on: When the Visualizer receives \$A6 (i.e. Get Auto Iris) the unit replies 'OKAY'+LF+CR+'1'+LF+CR.
13. Image rotation depends on the settings in the on-screen menu (miscellaneous settings): +90°, 180°, -90° or cycle.
14. The current released version no. of today will be found on: <http://www.wolfvision.com/wolf/fware.html>.
15. These commands switches the output resolution on both outputs (VGA and DVI) up or down (i.e. VGA=XGA at 75Hz and DVI=XGA at 85Hz => "Resolution UP-command" => VGA=XGA at 85Hz and DVI= SXGA at 60Hz).
16. This command switches both outputs (VGA and DVI) to Auto detect equal which settings were selected before.

Commands of other Visualizers, Future

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. telescope-arm-command.)

In the future (at higher firmware-versions) further commands may be added which are not supported yet.