WOLFVISION ®
Visualizer

INSTRUCTIONS MANUAL
SCB-1

XGA Color Camera Block

This product is not available for normal distribution.

ENGLISH

Table of Contents

1. OUTLINE

The SCB-1 is an ultra-compact color-camera-module with XGA-resolution (1024x768) and 20 frames per second. With the integrated frame-rate-converter the camera is able to produce a 60Hz or 75Hz XGA-image.

The SCB-1 has a high quality lens with 12x optical zoom and 2x digital zoom. The camera module has an auto-focus.

There are special features like: 9 Presets (remain stored when disconnected from power), Positive/Negative, 4 image memories plus Freeze.

The camera can be controlled by either RS-232 (SCOTI) or by an external connectable key-matrix. It is possible to transfer images via SCOTI at up to 921.600 baud.

Supply-voltage is 12VDC (+/- 10%).

A camera sample includes also the SCB-1 Interface board, a power supply, a high speed RS-232 I/O extension card incl. cables.

2. TECHNICAL SPECIFICATIONS

Image sensor	1-CCD 1/3" Progressive Scan
Active Pixels	1024 (H) x 768 (V)
Pictures per second	30fps (output is frame-rate converted to 60Hz or 75Hz)
Horizontal resolution	640 TV-Lines (with perfect edge focus)
Lens / Zoom	12x Optical Zoom, f=5.8 to 69.6 mm, F=2.8 to 3.0
Digital zoom	2x (12x optical zoom + 2x digital zoom = 24x zoom)
Focus	Continuous AF, One-Push AF, Manual focus
Lens structure	10 groups, 13 pieces (2 spherical)
Min. optical distance (MOD)	Tele: 0.5m, Wide: 50mm (optional: proxer for shorter distance)
XGA-Output	RGB HD/VD, R/G/B: 0.7 Vpp into 75 Ohm, HD/VD: 3.2 Vpp into 2.2 kOhm, Vertical frequency: 60Hz or 75Hz
Min. Illumination	5 Lux typ.
Iris / Shutter / Gain	Auto-Iris, Manual Iris / Exposure / Gain
White-Balance	Continuous Auto-Tracking, One-Push-Auto, Manual
Operating temperature	0°C to +40°C
Power requirements	12 V DC (+/-10%), 0.5 A typ.
Dimensions	64mm (W) x 59mm (H) x 96mm (D)
Weight	220g

Interfacing Board (Optional)	
Connectors	RGBHV, 15 pin Sub HD; RS 232, 9 pin Sub D; 12V Power In
Push Buttons	Tele / Wide, Focus Near / Far - Auto-Focus, Menu up / down / left / right, Shift, Freeze, User 1 / 2 / 3 / 4

Proxer (Optional)	
Close Up lens	f=477mm, 2.1 dpt. (inclusive mounting ring)

3. DIMENSIONS

42.4

42.4

63.3

32.3

42

31

35   18.5

31

94.7

35

18.5

59.5
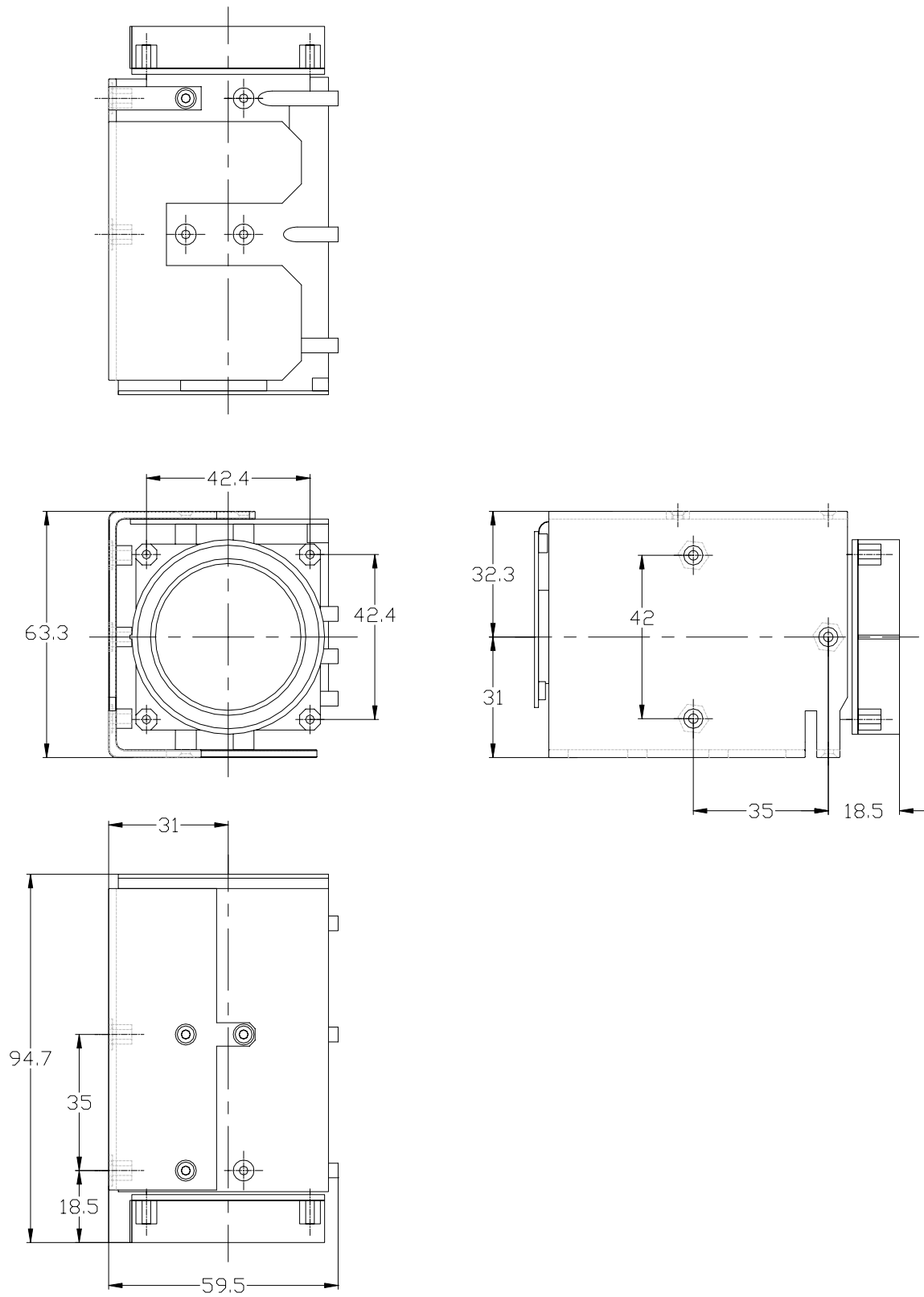
all dimensions in mm

4. PIN ASSIGNMENT

Connector position:

J18 J1 J5 J6
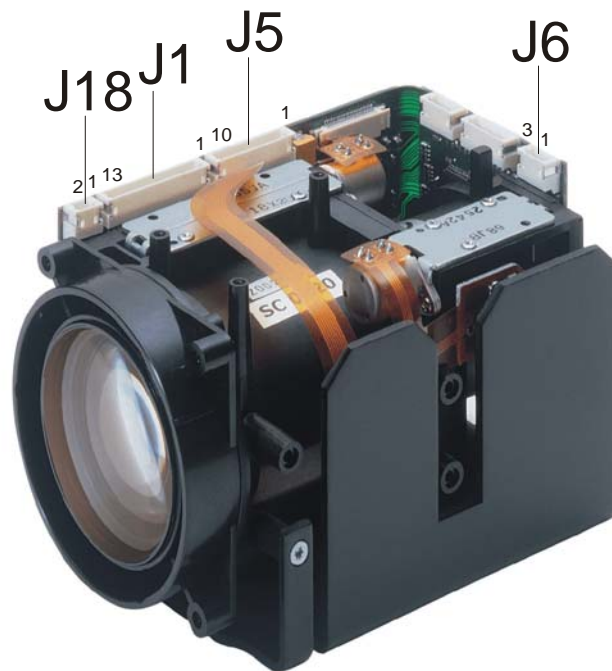
J1 Key Control

Board side: JST S13B-ZR
Cable connector housing: JST ZHR-13

Pin 1	Key-Matrix Row 1	
Pin 2	Key-Matrix Row 2	
Pin 3	Key-Matrix Row 3	
Pin 4	Key-Matrix Row 4	4 keys of the matrix are reserved for the user, they can be checked via SCOTI (RS-232)
Pin 5	Key-Matrix Column 1	
Pin 6	Key-Matrix Column 2	
Pin 7	Key-Matrix Column 3	
Pin 8	Key-Matrix Column 4	
Pin 9	GND	
Pin 10	AF-LED	
Pin 11	User-LED 1	User LEDs are reserved for the user and can be controlled via SCOTI (RS-232)
Pin 12	User-LED 2	
Pin 13	User-LED 3	

J5 XGA-Output

Board side: JST S10B-ZR
Cable connector housing: JST ZHR-10

Pin 1	R	0.7 Vpp into 75 Ohm
Pin 2	GND	
Pin 3	G	0.7 Vpp into 75 Ohm
Pin 4	GND	
Pin 5	B	0.7 Vpp into 75 Ohm
Pin 6	GND	
Pin 7	HD	3.2 Vpp into 2.2k Ohm
Pin 8	GND	
Pin 9	VD	3.2 Vpp into 2.2k Ohm
Pin 10	GND	

J6 Serial Control (RS-232)

Board side: JST S3B-ZR
Cable connector housing: JST ZHR-3

Pin 1	RxD	RS-232C, 9600baud, 8, n, 1 (Data from host)
Pin 2	TxD	RS-232C, 9600baud, 8, n, 1 (Data to host)
Pin 3	GND	

The baud rate is changeable up to 921600 baud for image transfer.

J18 Power

Board side: JST S2B-ZR
Cable connector housing: JST ZHR-2

Pin 1	+12V DC; (0.5A typical, 0.7A max)	+/- 10%
Pin 2	GND	

5. FUNCTIONS

The SCB-1 can be controlled through a key-matrix or via RS-232 (SCOTI).
With the WolfVision SCB-1 Interface board the basic control functions can be done for evaluation-purposes.

5.1 ZOOM
The SCB-1 uses an 12x zoom lens as well as a 2x digital zoom.
    Optical 12x, f=5.8 to 69.6 mm (F=2.8 to 3.0)

The digital zoom is automatically switched ON at the tele end of 12x optical zoom range, with progressive effect from 1 to 2, giving a total maximum 24x zoom ratio. Digital zoom increases the picture element size and reduces the resolution.

Extended control of zoom:
- Direct zoom position
- Get current zoom position
- Zoom speed selection (15 speeds)
- Digital zoom can switched ON/OFF
- OSD-message or stop of zooming when digital-zoom is entered (selectable)

5.2 FOCUS
The minimum focus distance (MOD) is below 50mm at optical wide end and below 500mm at optical tele end, and is independent of digital zoom. If shorter distance are necessary, a high quality close up lens is available *(see optional accessories).* An Auto-Focus (AF) function is also available (enabled by default).

Extended control of focus:
- Direct focus position
- Get current focus position
- Manual Focus speed selection (15 speeds)
- Focus can switched to Auto-Focus (permanent), One Push Auto- or Manual Focus
- Auto-Focus region can be switched between center (AF measures in the center area of the image) and large (measure the complete image)
- Focus Priority: "Auto" - activates Auto-Focus by pressing a ZOOM-key

5.3 IRIS
After power-on AI, ASC and AGC are enabled by default.

Extended control of Iris:
- Direct Iris position
- Get current Iris position
- Manual Iris speed selection (2 speeds)
- Iris Priority: "Auto" - activates Automatic Exposure Mode by pressing a ZOOM-key
- Automatic / manual: Iris, Shutter and Gain

Auto Iris (AI)

The iris changes automatically according to the brightness of the subject. If ASC and / or AGC are enabled, they change also automatically if necessary.

Auto Shutter Control (ASC)

If enabled, the shutter virtually extends the iris-range if the iris is closed as much as possible. If disabled, the shutter can be set from 1 (very short exposure time) to 1188 (maximum exposure time).

Auto Gain Control (AGC)

If enabled, the gain virtually extends the iris-range if the iris is fully opened. If the AGC is disabled, it can be set to any gain-value from 0dB to 32dB.

Manual Iris

The iris can be opened or closed manually. If ASC or AGC are enabled, they extend the possible adjustment-range. The Iris can also be set directly between 000 to FFF (in hexadecimal), the higher the value, the brighter the picture.

Exposure Compensation

Exposure compensation allows you to fine-adjust the image-brightness in steps from -10 (darker) to +10 (brighter) in the auto-iris-mode.

5.4 White Balance

Each time the lighting conditions change, adjust the white balance so that the optimal color reproduction is obtained.

- ATW: Auto Tracking White Balance
  The WB is automatically adjusted as the color temperature changes.
- One Push WB: One Push auto tracking White Balance (store values in Manual WB)
  (OWB)   Press the keys "Shift" + "Freeze" simultaneously, the message "White Balance" appears on the screen while the white level is being adjusted. When the adjustment is done, the message "White OK" appears on the screen. The adjusted level is automatically stored in the memory, even if the camera's power is turned off.
- Manual WB: Manual control of R and B gain (-120 to +120 each)

White balance adjustment errors

If the white balance adjustment is not successful, an error message appears on the screen. If this happens, take the necessary measures.

Error message	Description and remedy
White: Too Bright!	The video signal level is too high. Take one or more of the following measures and then perform the OWB again: • Remove any brightly illuminated objects • Decrease the illumination • Close the iris opening • Decrease the video gain
White: Too Dark!	The video signal level is too low. Take one or more of the following measures and then perform the OWB again: • Increase the illumination • Widen the iris opening • Increase the video gain
White: Out of Range!	Place a white sheet of paper and perform the OWB again.

5.5 User-OSD (On Screen Display)

Beside the on-screen-menu and other camera-messages the SCB-1 also allows the user to display his own messages. If the User-OSD is enabled, the SCB-1 displays no own messages, the menu is not selectable.

The camera can display 15 lines of up to 30 characters. The top line can be displayed in the double character height.
Following colors can be set: black, red, green, yellow, blue, purple, cyan and white.
The color can be set for each line.

5.6 Image Memory

The SCB-1 has an image memory from which a stored image can be output as a still image. You can store four images plus one frozen image in the memory.

Press one of the MEMORY-keys (1 - 4) for 2 seconds to store a image into memory. To recall press the MEMORY-key quickly.

To capture the image into memory, use the FREEZE-key. The captured image is output.

5.7 Preset Function

The SCB-1 offer the possibility of programming 9 presets plus 1 power-on preset for the functions Zoom, Focus, Iris, Positive/Negative and Black/White.
Preset 1 to 4 can be stored and recalled be the 4 PRESET-keys on the SCB-1 Interface board. Press one of the PRESET-keys (1 - 4) for 2 seconds to store preset into memory. To recall press the PRESET-key quickly. The presets 5 to 9 can only be controlled via SCOTI (RS-232).

You can store the current setting as power-on-preset by selecting "Store Power-On-Preset" in the menu. This preset is recalled when the camera is switched on.

5.8 On-Screen Menu

By pressing the MENU-key for 1 second, the on-screen menu appears on the screen. To navigate in the menu, use the UP/DOWN-keys, LEFT/RIGHT-keys. The standard settings are in italics. The menu can not be operated via SCOTI.

SCB-1 Menu:

Color Settings
      White Balance   *AUTO-TRACKING*
                                     ONE-PUSH
                   Trigger by pressing the WB-button (SHIFT+FREEZE)
                                     MANUAL
                                      R Gain   +0 (-120 to +120)
                                      G Gain   +0 (-120 to +120)
      Color/Contrast Setting   *1* (0, 2)
      Return
Misc Settings
      Detail   *High*   (OFF, MEDIUM)
      Focus Priority   *MANUAL*   (AUTO)
      Iris Priority   *MANUAL*   (AUTO)
      Digital Zoom   *ON* (OFF)
      Dig. Zoom Warning   *STOP* (MESSAGE, NONE)
      AF Region   *CENTER* (LARGE)
      Return
Power-On Settings
      Store Power-On-Preset
      Display Logo   *ON* (OFF)
      Return
Pos/Neg. Mode   *POSITIVE* (NEGATIVE)
Color / B/W   *COLOR* (BLACK/WHITE)
Output Frequency   *75Hz* (60Hz)
Reset Complete Menu   Are you sure   YES
                                                         NO

Exit

Note: If a setting is marked with "!", then this setting is changed with the RS-232 control software. This is only a temporary change until the camera is disconnected from the power. To change a setting permanently, change the setting in the on-screen menu.

Color/Contrast Setting
Default is 1. For stronger contrast set to 0, for softer color-reproduction set to 2.

Detail
Also called contrast-enhancement or aperture. Default is HIGH. MEDIUM makes the picture look softer, OFF disables the detail-function and outputs the data as seen from the CCD.

Display Logo
Default is ON. If changed to OFF, the "WolfVision SCB-1" logo is not displayed during power-up.

6. CONTROL METHODS

Basic camera functions can be controlled by the interface board.

The Camera can be also controlled via RS-232.

Controller D-SUB 9pin   Camera J6 JST ZHR-3
1. CD   1. RxD
2. RxD   2. TxD
3. TxD   3. GND
4. DTR
5. GND
6. DSR
7. RTS
8. CTS
9. RI

Controller D-SUB   Camera J6 JST ZHR-3
     25pin
1. FG   1. RxD
2. TxD   2. TxD
3. RxD   3. GND
4. RTS
5. CTS
6. DSR
7. GND
20. DTR
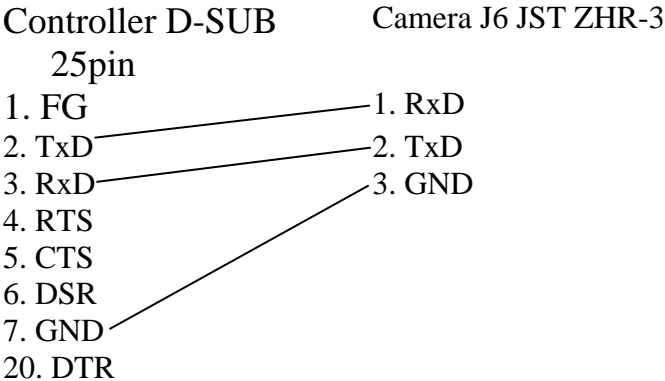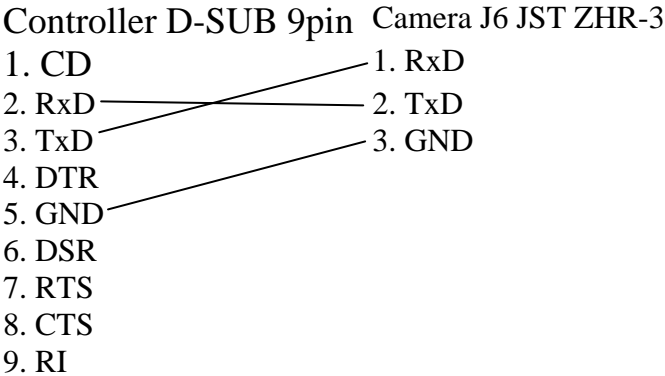
For more details, see the command list on page 14.

7. INSTALLATION
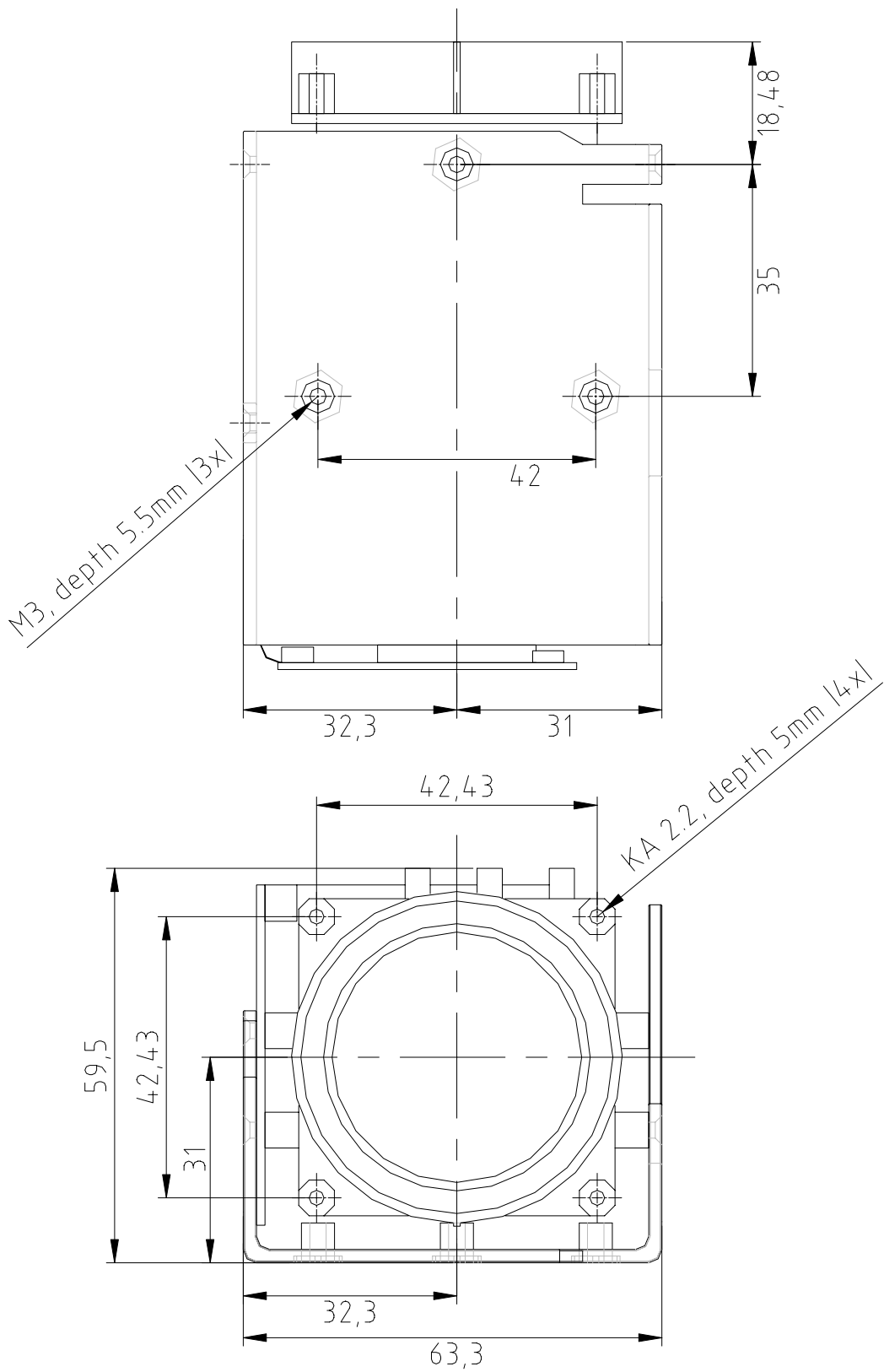
all dimensions in mm

8. ECLIPSE

This part should
not be covered.

28°

optical
axis

40
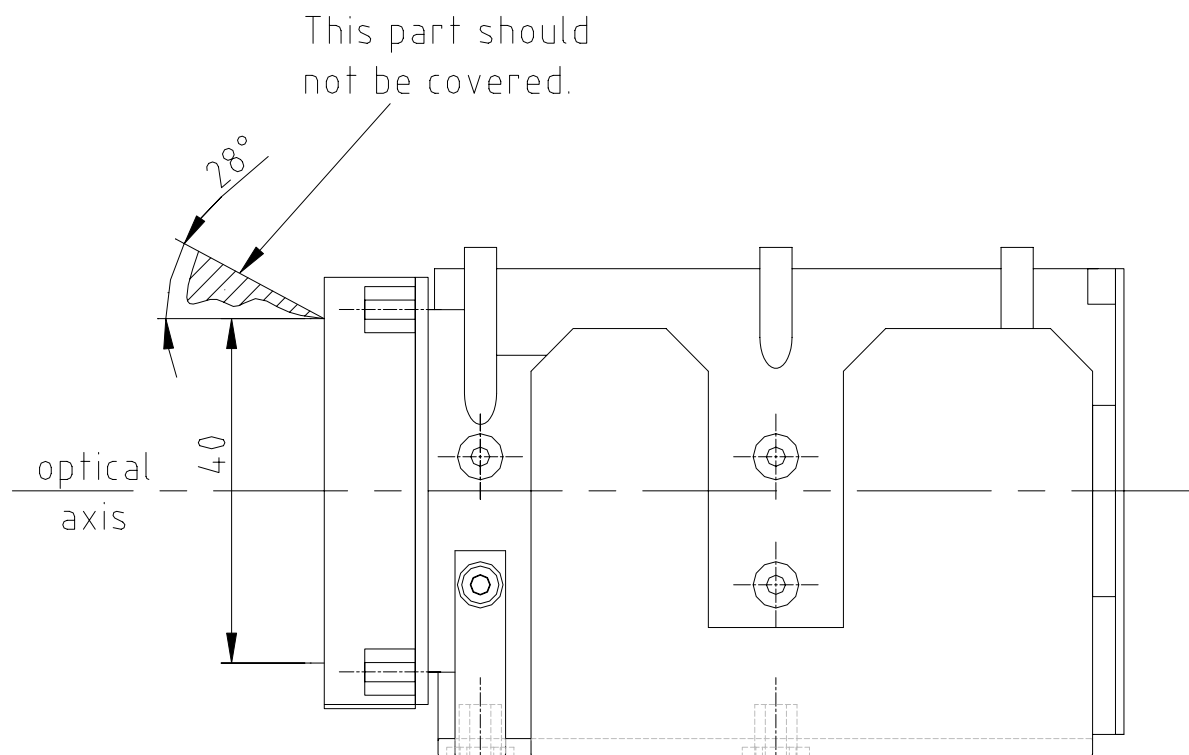
all dimensions in mm

9. HANDLING PRECAUTIONS

9.1 Handling

Avoid spilling water or any liquids on to the camera. Do not allow metallic objects to fall inside the body or contact the electronic boards.

9.2 Operation and storage locations

Avoid operation or storing the camera in the following locations:
- Extremely hot or cold places (operation temperature: 0°C to +40°C)
- In direct sunlight for long periods, or close to heating equipment (e.g., near heaters)
- Places subject to excessive dust or oil or gas
- Places where there are strong electromagnetic waves or magnetism, the picture could be distorted.
- Places where there are radiation, this could damage the CCD and other components and cause a malfunction
- Places where the camera would be subject to strong vibrations. This could damage components and degrade the picture.

9.3 Cleaning

Remove dust or dirt on the surface of the front lens with air pressure.

9.4 Other

- Do not apply excessive force to the printed circuit boards.
- Do not apply excessive voltage, use only the specific voltage
- Prevent static electricity; wear a wrist band when touching the camera. Use a antistatic bag to package the camera.
- Repack the camera as it was originally for transport.
- Do not block air circulation around the camera to prevent internal heat buildup.

9.5 Software

Turn on the camera first and then start the camera control software on your PC. The Camera Control Software (for Microsoft Windows 95, 98, ME, 2000 and XP) operates the SCB-1 via SCOTI (RS-232).

(Microsoft, Windows are trademarks of Microsoft Corporation.)

10. COMMAND LIST

10.1 Specification of SCOTI (SCB Operating & Transfer Interface)

Overview
The SCB-1 can be controlled via a RS-232-interface. The used protocol is called SCOTI (for **SCB o**perating and **t**ransfer **i**nterface)**.**

The baud rate is set to 9600 (8, n, 1, no handshaking) out of the factory. It can be changed to 19200, 38400, 57600, 115200, 230400, 460800 or 921600. The high transfer-rates are useful if you want to transfer images via RS-232 (not possible with 9600). Please note that baud rates above 115200 are not supported by all PC and may require special drivers and/or hardware. We can recommend you serial-port-cards that support 921600 baud. You can get the latest Camera Control software (see page 15) from http://www.wolfvision.com/wolf/camera_control.exe. This software uses the SCOTI-protocol and demonstrates all possibilities and can be used for image-transfers.

The communication is packet-oriented: The host sends a packet and the SCB replies to it with "OK" or an error (e.g. if the checksum was incorrect). A new packet from the host can be sent after the reply from the previous packet was received (or a timeout occurred).

Change baud rate
To change the baud rate, start the WolfVision Camera Control software. Set the new baud rate in the "Extras"-menu. To permanently store the new setting, select "Memorize Current Baud rate".
If the Camera Control software is not available, use the RS-232 commands on page 23.

Following baud rates are supported since firmware v1.03a and Camera Control software v1.3:
        19200 baud/s
        38400 baud/s
        57600 baud/s

Packet-Format

Short-Packet-Format: For short packets (up to 15 Byte Data):
00hex   Len+F0hex   Data[1]   Data[2]...   Data[Len]   Checksum

Long-Packet-Format: For long packets (up to 61439 Byte Data):
00hex   Len H   Len L   Len-Checksum   Data[1]...   Data[Len]   Data-Checksum

The long-packet-format-data can also be used for short packets (below 15 bytes of data). (However, only one of the two possible formats will be used in this document.) The long packet-format is mainly used for the "OSD Write Line"-command and for image transfers.

Len H and Len L are the High- and Low-Byte of the 16 bit Length. The High-Byte is not allowed to get F0hex or higher, as this would indicate the short-packet-format. In the short-packet-format, F0hex is added to the length, so F1hex is for 1 byte length, F2hex for 2 byte, etc.

The checksum is the ones-complement (bit-wise NOT) of the sum of all length- and data-bytes (truncated to 8 bit).

The length-checksum is the ones-complement (bit-wise NOT) of the sum of both length-bytes (truncated to 8 bit).

The data-checksum is the ones-complement (bit-wise NOT) of the sum of all data-bytes (truncated to 8 bit).

The shortest possible packet has a length of 4 Bytes (using the short-packet-format): 1 Byte Header, 1 Byte Length, 1 Byte Data and 1 Byte Checksum. For example, if Data is 01hex:

00hex   F1hex   01hex   0Dhex
Header   Length   Data   Checksum
                            (F1hex+01hex=F2hex,
                         Ones-Complement=0Dhex)

Following message in the long-packet-format would have the same effect:

00hex   00hex   01hex   FEhex   01hex   FEhex
Header   Length H   Length L Check Len   Data   Checksum Data
                        (00hex+01hex=01hex,   (01hex=01hex,
                     Ones-Complement=FEhex)   Ones-Complement=FEhex)

The host and the camera should both ignore all the data that they receive if a header is not detected (however, the camera will respond to 76hex with a version-string) If the camera detects a checksum-error, it will reply with a checksum-error-packet and the host should resend the packet. If e.g. the header from the host is corrupted, the camera will not detect the header and will not respond to the packet. The host should then time-out and resends the packet. If a false header is detected (e.g. a Data-Byte is 00hex) a checksum-error will be generated. If the camera receives the start of a packet, but not enough data, it will timeout after 1 second and send a time-out-error-packet.

Version Check

A special command, which is the only command that does not use the packet-format is 76hex (ASCII 'v'). If the camera receives this command, it will respond with "SCB-1 Vx.xxx"+CR+LF. This command can be used for easy communication-check with a terminal program and is also included for compatibility with other WolfVision Products.

Replies from the camera

	H	L	D	C	Remarks
Command OK:	00	F1	01	0D	reply within max. 0.5s
Illegal Command:	00	F1	10	FE	
Command failed:	00	F1	11	FD	Command not possible in the moment
Parameter wrong:	00	F1	12	FC	(or wrong command length)
Checksum Error:	00	F1	20	EE	
Timeout Error:	00	F1	21	ED	after the 00-header, the rest of the command must be sent within 1 sec.
Command to long:	00	F1	22	EC	(Receive Buffer Overflow)

Short Inquiry Reply: 00   Fx   60   R[1]   R[2] ... R[x-1]   C
(no Command Ok will be sent)

Long Inquiry Reply: 00   Len H   Len L   C   60   R[1]   R[2] ... R[Len-1]   C
(no Command Ok will be sent)

(all numbers are hex, C=Checksum, H=Header, L=Length, D=Data)

Commands

C=Checksum, P=Position (1 Byte), PH/PL: Position (2Byte) High/Low-Byte, Sp=Speed, H=Header, L=Length; VL=Value

Commands of Camera, Future

The SCOTI protocols of all WolfVision cameras (stand alone) are almost the same.
Only some commands more or less are supported on other camera-types due to the different technologies.
In the future (at higher firmware-versions) further commands may be added which are not supported yet (listed commands are available with v1.03a).

Zoom

Function	H	L							Remarks
Zoom Tele	00	F2	01	20	C				with Speedup after 1 sec, disables freeze / memories
Zoom Wide	00	F2	01	30	C				with Speedup after 1 sec, disables freeze / memories
Zoom Stop	00	F2	01	10	C				
Optical Zoom Tele w/ var. Speed	00	F3	01	21	Sp	C			Sp=Speed from 1 (slow) to F (fastest)
Optical Zoom Wide w/ var. Speed	00	F3	01	31	Sp	C			Sp=Speed from 1 (slow) to F (fastest)
Optical Zoom to Position	00	F4	01	40	PH	PL	C		PH/PL: Zoom-Position 0hex=Wide, FFFhex=Tele
Digital Zoom to Position	00	F4	01	41	PH	PL	C		PH/PL: Digital Zoom-Position, 0hex=Wide (1x), FFFhex=Tele (2x)
Get Optical Zoom-Pos	00	F2	01	60	C				
Reply:	00	F3	60	H	L	C			HL=Optical Zoom-Position from 0hex (wide) to FFFhex (tele)
Get Digital Zoom-Pos	00	F2	01	61	C				
Reply:	00	F3	60	H	L	C			HL=Digital Zoom-Position from 0hex (wide) to FFFhex (tele)
Disable Digital Zoom	00	F2	01	50	C				When zooming towards tele, digital zoom will not be automatically activated
Enable Digital Zoom	00	F2	01	51	C				Digital zoom will be automatically activated at tele
Enable Digital Zoom w/ Stop	00	F2	01	52	C				Zoom will stop at tele and a message will appear. When zooming is started again, digital zoom will be activated.
Enable Digital Zoom w/ Message	00	F2	01	53	C				Digital Zoom will be automatically activated at tele and an info-message will appear.

Focus

Function	H	L							Remarks
Focus Near	00	F2	02	20	C				with Speedup after 1 sec, switches AF off, disables freeze / memories
Focus Far	00	F2	02	30	C				with Speedup after 1 sec, switches AF off, disables freeze / memories
Focus Stop	00	F2	02	10	C				
Focus Near w/ var. Speed	00	F3	02	21	Sp	C			Sp=Speed from 1 (slow) to F (fastest), switches AF off
Focus Far w/ var. Speed	00	F3	02	31	Sp	C			Sp=Speed from 1 (slow) to F (fastest), switches AF off
Focus to Position	00	F4	02	40	PH	PL	C		PH/PL: Focus-Position 0hex=Near, FFFhex=Far, switches AF off
AF Off	00	F2	02	50	C				
Perform One Push AF	00	F2	02	51	C				disables freeze / memories
Continuous AF	00	F2	02	52	C				
Get Focus-Pos and AF-Setting	00	F2	02	60	C				
Reply:	00	F4	60	H	L	AF	C		HL=Optical Zoom-Position from 0hex (near) to FFFhex (far), AF: 0=OFF, 1=ON, 2=One-Push-AF in progress

Iris

Function	H	L							Remarks
Iris Open	00	F2	03	20	C				with Speedup after 1 sec, switches AI off, disables freeze / memories
Iris Close	00	F2	03	30	C				with Speedup after 1 sec, switches AI off, disables freeze / memories
Iris Stop	00	F2	03	10	C				
Iris Open w/ var. Speed	00	F3	03	21	Sp	C			Sp=Speed 1 (slow) or 2 (fast), switches AI off
Iris Close w/ var. Speed	00	F3	03	31	Sp	C			Sp=Speed 1 (slow) or 2 (fast), switches AI off
Iris to Position	00	F4	03	40	PH	PL	C		PH/PL: Iris-Position 0hex=Close, FFFhex=Open, switches AI off
Gain to Position	00	F3	03	41	P	C			P: Gain in dB (from 0 to 32dec), switches AGC off
Shutter to Position	00	F4	03	42	PH	PL	C		PH/PL: Shutter-Position (TBD, to be determined), switches ASC off
Exposure Compensation (Brightness level adjustment)	00	F3	03	43	P	C			P: -10 to +10 (default=Zero), Twos-Complement
AI Off	00	F2	03	50	C				Auto-Iris, if disabled, also AGC and ASC will not work, disables freeze / memories
AI On	00	F2	03	51	C				disables freeze / memories
AGC Off	00	F2	03	52	C				Auto-Gain-Control
AGC On	00	F2	03	53	C				
ASC Off	00	F2	03	54	C				Auto-Shutter-Control
ASC On	00	F2	03	55	C				
Get Iris-Pos	00	F2	03	60	C				
Reply:	00	F7	60	HI	LI	G	HS	LS	M	
									C	HI,LI=Optical Iris-Position from 0hex (close) to FFFhex (open), G=Gain in dB (0-34dec), HS,LS=Shutter-Setting (TBD), M(bit0):ASC, M(bit1): AGC, M(bit2): AI (1=ON, 0=OFF)

White Balance

Function	H	L							Remarks
Manual WB	00	F2	04	50	C				
Perform One-Push-WB	00	F2	04	51	C				
Auto-Tracking WB	00	F2	04	52	C				
Set Manual WB	00	F4	04	40	PR	PB	C		PR: Red gain (-120dec to 120dec) PB: Blue gain (-120dec to 120dec) (Twos-Complements)
Get WB-Settings	00	F2	04	60	C				
Reply:	00	F4	60	R	B	M	C		R: Red Gain (-120dec to 120dec) B: Blue gain (-120dec to 120dec) M: 0=ATW, 1=AWB, 2=Manu

Presets

Function	H	L							Remarks
Store Preset	00	F3	05	40	P	C			P=Preset no. (1 to 9)
Recall Preset	00	F3	05	41	P	C			P=Preset no. (1 to 9)
Store Power-On-Preset	00	F2	05	10	C				
Recall Power-On-Preset	00	F2	05	11	C				

Image Memories

Function	H	L							Remarks
Store Memory	00	F3	06	40	P	C			P=Memory no. (1 to 4)
Recall Memory	00	F3	06	41	P	C			P=Memory no. (1 to 4)
Freeze, Update Freeze	00	F2	06	10	C				
Unfreeze, Memory Off	00	F2	06	11	C				
Get Memory-Settings	00	F2	06	60	C				
Reply:	00	F2	60	M	C				M=0: Live, 1-4: Memory 1-4, FFhex: Freeze On

Color / Contrast Setting

Function	H	L							Remarks
Set Color / Contrast	00	F2	04	80	VL	C			VL=0, 1, 2
Get Color / Contrast - Settings	00	F2	04	A0	C				returns value "0", "1", "2"

User I/O

Function	H	L								Remarks
Set User LEDs	00	F3	07	40	P	C				P=LED-Bit-Pattern (0 to 7), if Bit is set, LED is on. Bit 0: User-LED 1 Bit 1: User-LED 2 Bit 2: User-LED 3
Get User Keys	00	F2	07	60	C					
Reply:	00	F2	60	K	C					K(bit 0): Userkey 1, K(bit 1): Userkey 2, K(bit 2): Userkey 3, K(bit 3): Userkey 4 (1=pressed, 0=unpressed)

Image

Function	H	L								Remarks
Set XGA/60Hz	00	F2	08	10	C					Change is memorized in EEPROM
Set XGA/75Hz	00	F2	08	11	C					Change is memorized in EEPROM
Positive Mode	00	F2	08	12	C					
Negative Mode	00	F2	08	13	C					
Set Detail	00	F3	08	40	P	C				P=Detail: 0=OFF, 1=MED, 2=HIGH
Get Resolution	00	F2	08	60	C					
Reply:	00	F3	60	10	F	C				10=Color, XGA, 1CCD, F=V-Frequency in Hz (e.g. 4Bhex=75Hz)
Get Positive/Negative	00	F2	08	61	C					
Reply:	00	F2	60	N	C					N=0: Positive, N=1: Negative
Get Detail	00	F2	08	62	C					
Reply:	00	F2	60	D	C					D=0: Detail off, 1:low, 2:high
Image Rotate 180°	00	F2	0C	10	C					
Image orientated normal	00	F2	0C	11	C					Image not rotated and not mirrored
Image mirrored hor.	00	F2	0C	12	C					Image mirrored horizontally
Image mirrored vert.	00	F2	0C	13	C					Image mirrored vertically
Store mirror/rotate settings permanently	00	F2	0C	20	C					

Image Transfer

Function	H	L								Remarks
Capture Picture	00	F4	09	10	PM	PC	C			PM=Memory: 0=Live, 4-7=Memory 0-3 PC=Capture Mode: 0: Full Resolution 80-8F: Updated Preview Tile 0-15 C0-CF: Not Updated Preview Tile 0-15 Not available at 9600 baud.
Get Picture Block 4k	00	F2	09	60	C					Not available at 9600 baud.
Get Picture Block 1k	00	F2	09	61	C					Not available at 9600 baud.
Get Picture Block 256Byte	00	F2	09	62	C					Not available at 9600 baud.
Get Picture Block 32Byte	00	F2	09	63	C					Not available at 9600 baud.
Get Picture Block 8Byte	00	F2	09	64	C					Not available at 9600 baud.

Key-Lock Control

Function	H	L								Remarks
Key-Lock On	00	F2	05	60	C					
Key-Lock Off	00	F2	05	61	C					
Get Key-Lock	00	F2	05	62	C					
Reply:	00	F2	60	D	C					D=1: Key-Lock not activated D=2: Key-Lock activated

User OSD

Function	H	L							Remarks
Activate User OSD and Clear OSD	00	F2	0A	10	C				Enables User-OSD-Commands and resets the OSD. SCB-1-OSD-Messages and Menu are suppressed.
Disable User OSD	00	F2	0A	11	C				Disables User-OSD-Commands and allows Menu and SCB-1-Messages.
First line double Height on	00	F2	0A	12	C				Default: off
First line double Height off	00	F2	0A	13	C				
Set line color	00	F4	0A	40	PL	PC	C		PL: Line (0 to 14), PC: Color (0 (black) to 7 (white, default))
Write Line	00	Fx	0A	50	PL	PC	PT	...	C	PL: Line (0 to 14), PC: Column (0 to 29), PT: ASCII-Code of text (up to 30 characters per line) The remainder of the line is not deleted. (For longer texts you need the long-packet-format!)
Get User OSD	00	F2	0A	60	C				
Reply:	00	F2	60	D	C				D=0: User OSD inactive, 1: User OSD active

Firmware Update

Function	H	L							Remarks
Enter Bootloader	00	Fx	FF	10	Px	P..	C			Px...=Password
Get Version	00	F2	FF	60	C				
Reply:	00	F2	60	V1	V2	..	Vx	C		Version-String (ASCII-Codes) in Format "SCB-1 Vx.xxx", e.g. „SCB-1 V1.03a"

Set Baud rate

Function	H	L							Remarks
SetBaudrate (non-permanent)	00	F3	FF	20	P	C				P = Baudrate: 0=9600, 1=115200, 2=230400, 3=460800, 4=921600, 5=19200, 6=38400, 7=57600
Memorize current Baudrate in EEPROM	00	F2	FF	21	C				

11.   WolfVision Camera Control Software

The WolfVision Camera Control Software can be used to operate the SCB-1 XGA-color-camera via SCOTI (RS-232). It is also possible to transmit images in preview- and full-resolution to the PC.

Software Installation
Install Camera Control software (available on supplied CD-ROM or downloadable from Internet http://www.wolfvision.com/wolf/camera_control.exe). Connect the SCB-1 camera to the computer via RS-232 cable and start the Camera_Control.exe. At the start, the program automatically scans COM1 to COM4 at all possible baud rates. If a SCB-1 camera is found the connection is established, otherwise you can either retry or operate the software in the demo-mode without a camera.
First, turn on the camera and then start the camera control software on your PC. The camera control software (for Microsoft Windows 95, 98, ME, 2000 and XP) operates with the SCB-1 via SCOTI (RS-232).

Control of the SCB-1

Basic functions like Zoom and Focus are accessible on the left-side of the main-screen. For further functions use the Control Panel (SCB-1 Interface board) or the User OSD Panel in the Functions Menu. Virtually all commands can be performed with this program (the commands without a button can be performed by entering the code directly in the "Extras - Custom Command"-menu).
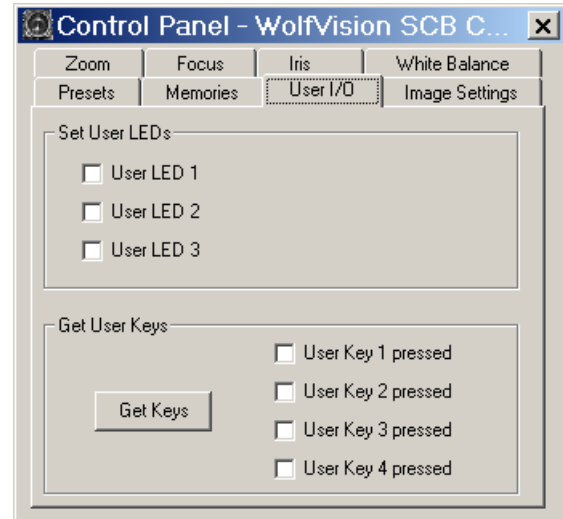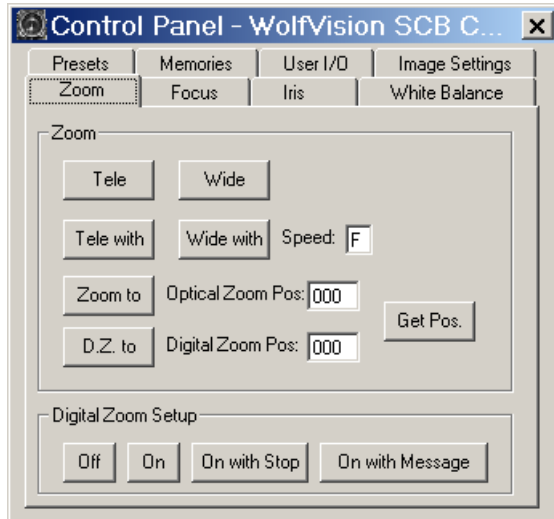

User I/O

The User I/O can be controlled and queried via RS-232 (SCOTI) and with the Interface board. The User keys and LEDs can be used to build an application-specific user-interface which can be controlled via SCOTI.

Image Transfer

To start an image-transfer, press either the PREVIEW-button for a quick preview at low resolution, the CONT.(PREVIEW)-button for an continuous live preview or the GET FULL PICTURE-button for a full resolution snapshot. In the PICTURE VIEW menu you can select if the transmission of the full picture is done in an interleaved or a progressive way. The interleaved (default) way has the advantage that you get a quick overall view (at low resolution) of the picture which is refined during the transfer. The progressive way on the other hand has optimum sharpness on all transmitted data, which is useful if you are not sure if the captured picture is perfectly sharp or not. All image-transfers can be aborted by pressing the ABORT-button below the progress bar which indicates how much of the transfer is completed. Additionally, you can select in the PICTURE VIEW menu, how often the during the transfer the screen is updated. Short update intervals increase the total transfer time. How much the difference is depends on the speed of your PC. After transfer, you can either store the image as .bmp-file or print it on a printer.

Key Lock
If the camera doesn't react to a keystroke (keys on the camera itself and on the IR-remote control), then check if the keylock is activated.
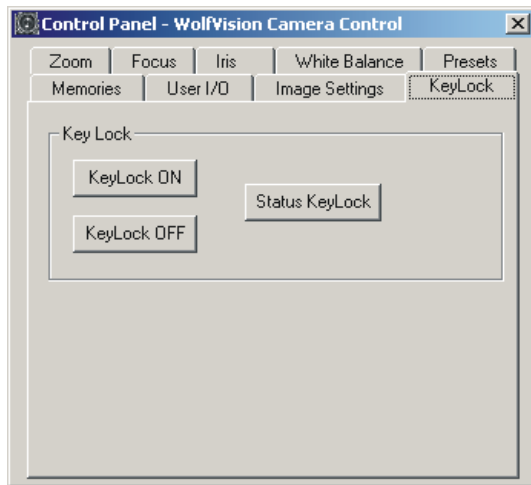
Firmware update
Download new firmware from the Internet (http://www.wolfvision.com/wolf/fware.html#c).

Hints
For the image-transfer, the serial port is the bottleneck, because a lot of data has to be transmitted. To reduce this bottleneck, the SCB-1 support baud rates up to 921600 baud. However, most PCs support only up to 115200 baud and require special extension cards for higher baud rates (a high speed RS-232 extension card is optional available, see page 27). For this high baud rates, short RS-232 cables are necessary (below 2m is recommended).

If operating commands work fine, but image transfer does not, you may try to reduce the transmit block size in the Picture View Menu (at the cost of transfer speed). At very high baud rates, you can also set the transmit size to 4K (default is 1K) to further optimize the speed.

To change the SCB-1 baud rate temporarily, use the commands in the Extra Menu. If the selected baud rate works, you can store this setting permanently in the SCB-1-EEPROM by selecting MEMORIZE CURRENT BAUDRATE.

Another option in the PICTURE VIEW Menu is to select how the image is displayed on the screen. The NATIVE setting provides the best quality, but may be too large to fit onto the screen. The other two settings resize the picture to fit onto the screen. They differ in quality and in the speed of resizing (e.g. when the window size is changed). The resized image can also be stored in a file, which is useful if you do not need the full resolution.

It is recommended to use the true-color (24bit) mode of your PC
(selectable in Properties -> Display in the Windows Start-menu) for best picture reproduction.
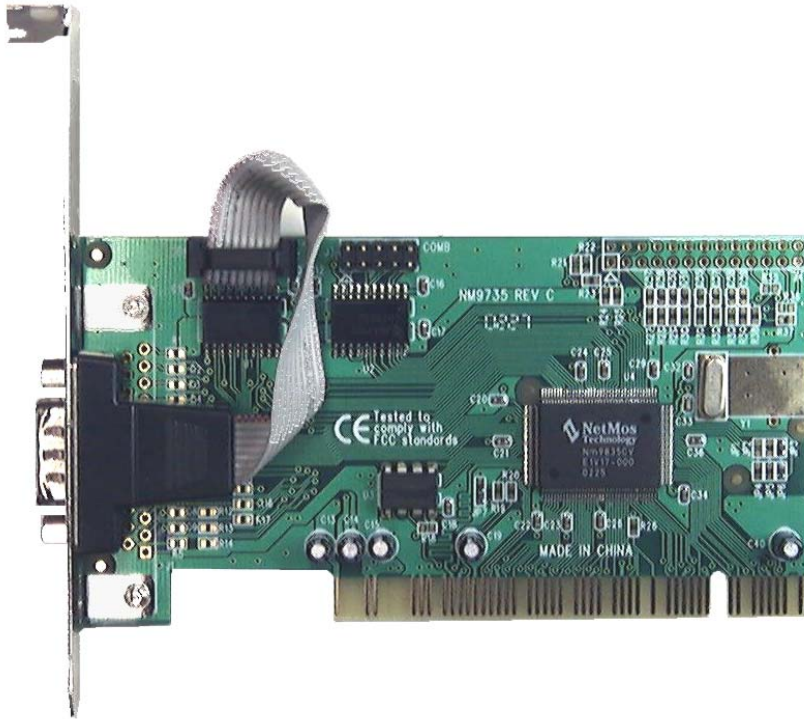
Note
Microsoft, Microsoft Windows are trademarks of Microsoft Corporation.
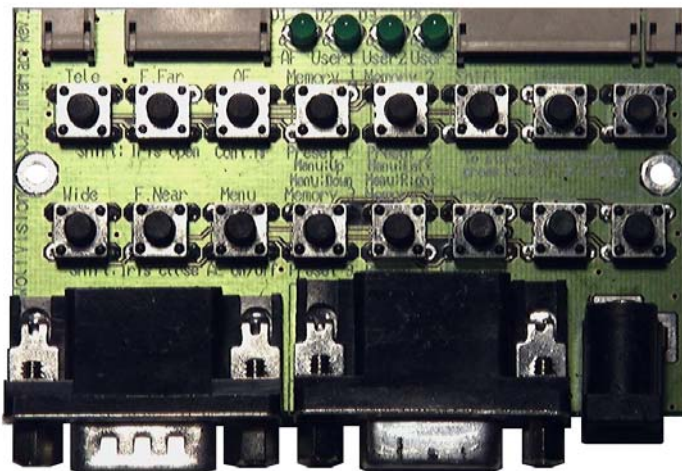
12.   OPTIONAL ACCESSORIES

The sample kit includes a high speed RS-232 extension card and the WolfVision interface
board, all necessary cables (5 pieces) and a power supply.
The proxer (close up lens) is not supplied normally.
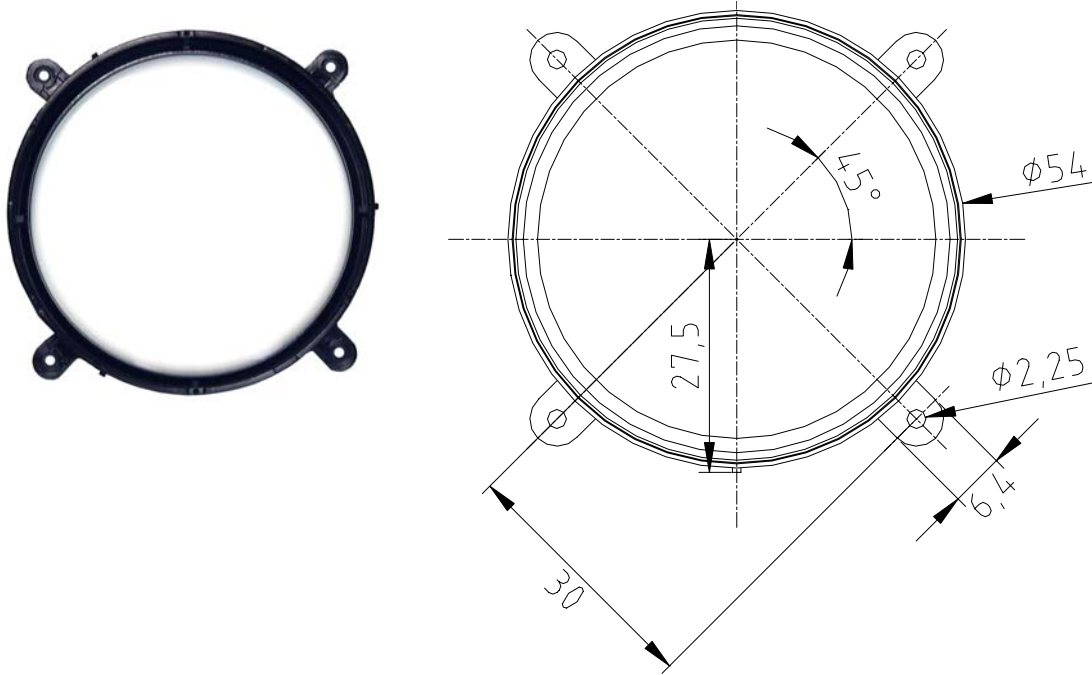
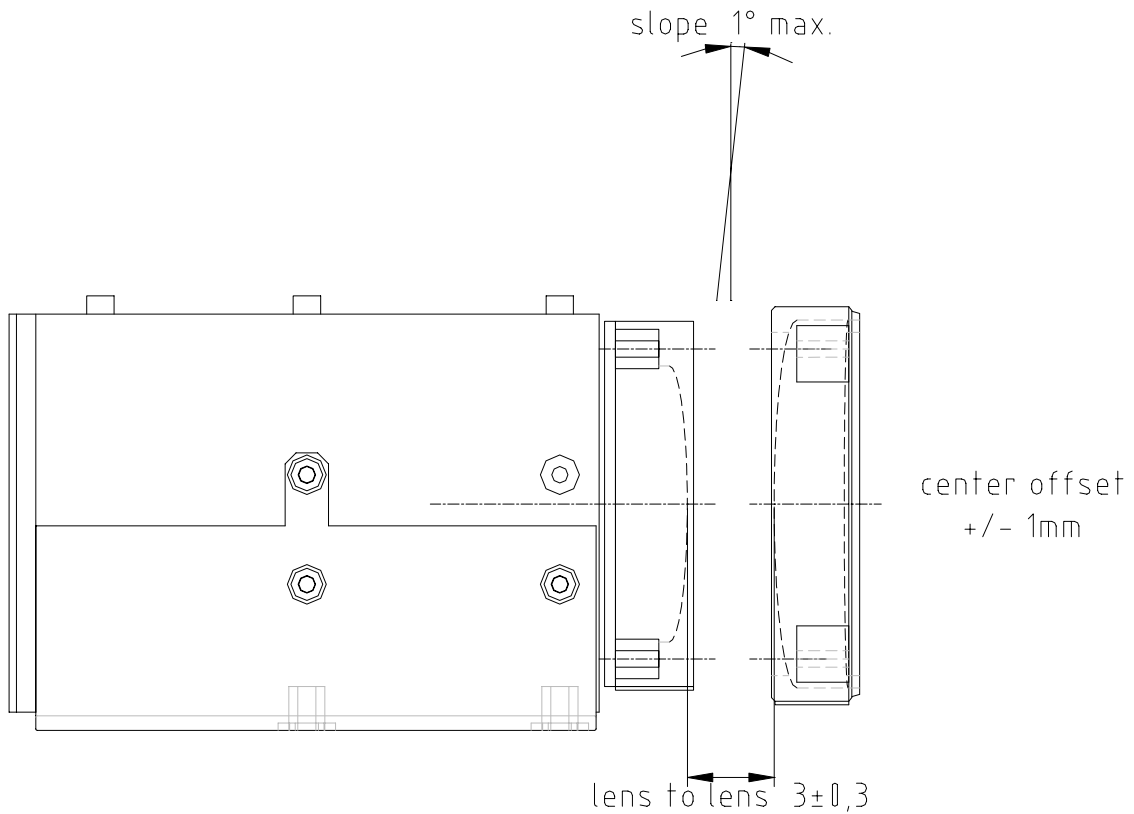## 12.1 High speed RS-232 extension card

12.2 SCB-1 Interface board

12.3 Proxer

Technical data: f=477mm, 2.1 dpt. inclusive mounting ring

ø54

27,5

ø2,25

6,4

30

45°

all dimensions in mm

slope 1° max.

center offset
+/- 1mm

lens to lens 3±0,3

WOLFVISION®
Visualizer

Touchboards

Design and specifiaction are subject to change!

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