OPERATING INSTRUCTIONS

PRODUCT RANGE

WELCOME TO YOUR NEW VUCAM®

Thank you for choosing a viZaar product for your inspection service!

Please read these operating instructions carefully before first use and save them for later referral.

> The electronic version of this manual has linked menus and submenus for easy operation. In order to go to the desired chapter, press or click the chapter in the menus/submenus.

CUSTOMER SERVICE

If you experience problems or malfunctions that are not listed in the operating instructions, please contact vi-Zaar® directly or your local viZaar® representative.

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REPAIR SERVICE

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Please do not return any equipment without contacting us via telephone/fax.

viZaar® also offers an on-site repair service for contaminated equipment in nuclear facilities (available by request only).

TABLE OF CONTENTS

1.1	PRIOR TO FIRST USE

Before using the VUCAM, the operator must read and understand these operating instructions completely in order to avoid damage to the product or the equipment that is being inspected and also avoid injury or harm to the user. Operation of the device without understanding the operating instructions is not permitted.

The device must not be connected to electrical mains power if you have not understood these instructions including safety warnings or if you cannot or do not want to use the device according to the regulations.

1.2	INTENDED USE AND USER

This device is used to examine and observe the interior of machines, devices, materials and other objects without damaging the object in question.

Extensive knowledge of the device, the testing technology, the safety instructions and the industrial field of application is absolutely necessary for both a damage-free operation of the device and not endangering the personnel and the working environment. The device is designed exclusively for industrial use by suitably trained technical personnel.

The device is not a medical device as defined within the EU directive 93/42/EEC. Therefore, the device and parts of it are never allowed to be inserted into body cavities of humans or animals!

Avoid any contact of the device to electrical conductors. There is a risk of injury or death.

Generally, we recommend using gloves in order not to be injured from possible probe damage or residue of the application when retracting the probe.

The VUCAM units are NOT explosion proof and should NOT be used in areas where there is a risk of explosion.

Do NOT use the device in areas where explosive gases may form. The corresponding ambient conditions must be observed.
OTHER APPLICATIONS ARE NOT ALLOWED!

The examined object must not contain any corrosive substances that could attack the components of the device. This includes acids in particular. viZaar® does not assume any liability for any corrosion damage caused by such substances.

1.3   SAFETY INSTRUCTIONS

Please read these operating instructions carefully before first use and save them for later referral.

MANDATORY REGULATIONS
Be sure or read prior to first use!

SPECIFIC SAFETY INSTRUCTIONS

DANGER

signifies a danger which, if not avoided, will lead to death or severe injuries.

WARNING

signifies a situation which, if not avoided, can cause death or severe injuries.

CAUTION

signifies a situation which, if not avoided, might result in minor or moderate injury.

ATTENTION

signifies possible property and environmental damage.

Important information for proper operation

Useful tips for proper operation

STORAGE

CAUTION	Risk of falling due to uneven surfaces: **Possible injury and damage to the device** · never store or put down the case and/or the device on uneven ground
ATTENTION	Physical impact on probe or device: **Risk of damaging probe, device and/or single components** · the product should only be stored in the transport case designed by the manufacturer · avoid strong coils and knots · do not pull the probe · do not step on the probe · do not drop the probe nor its optical adapters
ATTENTION	The battery remains in the device: **Negative effects on the performance and possible damage to the battery** · remove the battery from the device when stored · make sure to store the battery at room temperature
ATTENTION	Humid environment, high temperatures, lots of dust and suspended particles: **Possible damage to the device and/or components** · do not expose the transport case and base unit to water · store the device in a dry environment, even when it is stored in its case · do not store in direct sunlight · do not store in environments that contain halogenated gases · do not store in very dusty environments

TRANSPORTATION

ATTENTION	Denting of the probe or base unit: **Possible damage of the device or components** · always transport the device and accessories in the transport case designed by the manufacturer
ATTENTION	Tensile load of probe or cable: **Possible damage of the device or components** · do not move the device by pulling probe or cable

PUTTING INTO SERVICE

CAUTION	Damaged probe coating: **Risk of cutting injuries** · check the probe coating for damage before using it · always wear protective gloves to prevent possible injuries
ATTENTION	Penetration of liquids (in test environment): **Possible damage to the probe** · check the probe coating for damage before using it
ATTENTION	Application and device have different operating temperatures: **Possible damage to the device / lower performance** · check the temperature of the application and the permissible temperature of the device
ATTENTION	Formation of condensation (e.g. when going from cold to warm environments): **Damage to or malfunctioning of the device caused due to voltage flashover** · do not use the device when condensation has formed · before putting into service, adjust the device to ambient temperature and wait until it is dehumidified.

IN USE

WARNING	Inspection of power sockets **Electrical shock which can cause injuries or death** · Although the size of the probe fits into a power socket, never use the VUCAM to inspect power sockets!
WARNING	Physical damage caused by insertion: **Internal injures** · never insert the probe or parts of the device into body orifices of a human or animal
WARNING	Applications containing flammable gases/liquids and/or lots of dust: **Risk of fire and explosion, risk of physical damage or death** · check the content of the application · do not use the device in flammable and explosive environments
WARNING	Crossive chemicals: **Risk of physical damage and damage to the device** · check the application for corrosive elements · do not insert the probe into corrosive chemicals · never touch solvent based liquids with the probe
WARNING	Rotating components in the application: **Risk of physical damage and destruction of the probe** · only operate the device in plant components and areas that are shut down
CAUTION	Light at probe head: **Possible damage to the eye/retina, risk of dazzling and temporary or permanent loss of sight** · never look directly into the light at the probe head
ATTENTION	Risk of overheating and/or short circuit: **Damage to device and environment** · always turn off the device after inspections and during work interruptions and disconnect it from the mains power.
ATTENTION	Covering the base unit with a blanket or tarp: **Risk of damage to the device** · covering the base unit can impact the ventilation and cooling system of the device, therefore it should never be covered when it is in use
ATTENTION	Removing external data carriers (e.g. USB-sticks) while copying data: **Possible data loss or damage to the system** · make sure the data carrier is connected correctly · wait until the process is finished before removing the carrier

MAINTAINANCE / CLEANING / REPAIR	
WARNING	Batteries from third-party manufacturers: **Risk of fire and explosion** · only use original parts from the manufacturer
WARNING	Repair and modification: **Risk of physical damage to the user and damage to the device** · modifications and repairs are only permissible when done by our viZaar repair service · Please contact our customer service
ATTENTION	Technical problems or malfunction of the videoscope **Risk of damage to the device** · in case of technical problems or malfunctions, the system has to be checked by the manufacturer · precautionary, the system should be checked at least once a year · in case of technical problems or malfunctions, the system has to be shut down immediately and be disconnected from the mains power, to prevent from further damage and potential risks
ATTENTION	Cleaning with solvents: **Damage to device, probe, components** · do not use solvents for cleaning · waterproof components can be cleaned with a cloth and soap water · wipe away dust and dirt with a cloth if possible

DISPOSAL	
ATTENTION	Incorrect disposal of battery, device or components: **Damage to the environment** · adhere to every law concerning the disposal of your product · we are happy to help you with disposing the device or components (except for by radioactive contaminated components) · if you have further questions concerning the disposal, please contact our customer service

2 SPECIFICATIONS – SCOPE OF DELIVERY – ACCESSORIES

2.1	**SPECIFICATIONS VUCAM® XO/XO+**

VUCAM®-MODEL	VUCAM® XO	VUCAM® XO+
Item number	VXX-10-000157 | VXX-10-000158 | VXX-10-000159	VXX-10-000185 | VXX-10-000186 | VXX-10-000187
VIDEOSCOPE		
Diameter	6.0 mm / 0.23"	6.0 mm / 0.23"
Working length	2.2m/7.2ft | 3.3m/10.8ft. | 6.6m/21.6ft	2.2m/7.2ft | 3.3m/10.8ft. | 6.6m/21.6ft
Articulation	4 x 130° | 4 x 120° | 4 x 100°	4 x 130° | 4 x 120° | 4 x 100°
Top layer material	Tungsten braid	Tungsten braid
Construction	4 layers	4 layers
Mobility	torsion-resistant, flexible	torsion-resistant, flexible
OPTICAL SPECIFICAT.		
Field of view (FOV)	45°	45°
Direction of view (DOV)	0°	0°
Focal range	15 mm to ∞	15 mm to ∞
ILLUMINATION		
Type	Hybrid LED	Hybrid LED
Light conduction	Glass fiber	Glass fiber
Light control	Digital	Digital
Luminosity power	Output: 6 watts, daylight quality: 6.500 K	Output: 6 watts, daylight quality: 6.500 K
White balance	Auto/Manual	Auto/Manual
OPERATING UNIT		
Display type	LED backlight TFT touchscreen	LED backlight TFT touchscreen
Display size	5,7"	5,7"
Display resolution	640 x 480 px	640 x 480 px
Mains connection voltage	Input: 100 - 240 VAC Output: 12 V	Input: 100 - 240 VAC Output: 12 V
Mains connection frequency	50/60 Hz	50/60 Hz
Mains connection current	max. 2.5 AMP	max. 2.5 AMP
Battery type	LiFePo	LiFePo
Battery voltage	6.4 V	6.4 V
Battery charging time	< 2 Hrs	< 2 Hrs
Battery runtime	up to 2,5 Hrs	up to 2,5 Hrs

VUCAM®-MODEL	VUCAM® XO	VUCAM® XO+
Item number	VXX-10-000157 | VXX-10-000158 | VXX-10-000159	VXX-10-000185 | VXX-10-000186 | VXX-10-000187
Video interface	-	TV-Out
Audio interface	-	Audio In/Out
Network interface	-	LAN
Data storage	16 GB SD card	16 GB SD card
Direct access buttons	Digital image and video recording; Illumination; System on/off	Digital image and video recording; Illumination; System on/off
Dimensions	75 mm (h), 196 mm (w), 73 mm (l)	75 mm (h), 196 mm (w), 73 mm (l)
Housing material	Carbon fiber	Carbon fiber
Monitor material schock absorption	Elastomer bumpers	Elastomer bumpers
Handle material	Coated high-strength aluminium	Coated high-strength aluminium
Tripod/Holder	1/4" connection	1/4" connection
Weight	from 1.5 kg	from 1.5 kg
AMBIENT CONDITIONS		
Water and pressure resistance control unit	IP 54	IP 54
Water and pressure resistance probe	1,5 bar/22 psi fully immersible over full length IP68	1,5 bar/22 psi fully immersible over full length IP68
Schock resistance	50g 11ms half sine 3 axis	50g 11ms half sine 3 axis
Vibration	3g random at 20 Hz to 2 kHz, 10 min per axis	3g random at 20 Hz to 2 kHz, 10 min per axis
Temperature Operating unit	System storage: -40°C (-104°F) to +85°C (+158°F) Operation: -20°C (-4°F) to +70°C (+122°F)	System storage: -40°C (-104°F) to +85°C (+158°F) Operation: -20°C (-4°F) to +70°C (+122°F)
Temperature probe	Operation: -10°C (+14°F) to +80°C (+176°F)	Operation: -10°C (+14°F) to +80°C (+176°F)
FUNCTIONS		
Digital data recording format	Image: JPEG Video: MPEG4	Image: JPEG Video: MPEG4
Resolution	RGB 263.000 colours, 640 x 480 px	RGB 263.000 colours, 640 x 480 px
Recording	Flashback: 30 sec. Pre-Trigger, Stop: Auto, Spilt: Auto	Flashback: 30 sec. Pre-Trigger, Stop: Auto, Spilt: Auto
Image display	Zoom: digital, 3x Mirror image: vertical/horizontal Rotate user interface: 360° Full screen mode: YES	Zoom: digital, 3x Mirror image: vertical/horizontal Rotate user interface: 360° Full screen mode: YES

VUCAM®-MODEL	VUCAM® XO	VUCAM® XO+
Item number	VXX-10-000157 | VXX-10-000158 | VXX-10-000159	VXX-10-000185 | VXX-10-000186 | VXX-10-000187
MENU		
Operation	Touch, Direct access buttons	Touch, Direct access buttons
Languages	English, German, French, special language package	English, German, French, special language package
Brightness	Auto/Manual	Auto/Manual
Contrast	Auto/Manual	Auto/Manual
Saturation	Auto/Manual	Auto/Manual
Colour control	Real time	Real time
Date and time	Show/Hide	Show/Hide
Systemstatus	YES	YES

Equipment is not intrinsically safe or explosion-proof. Do not use in potentially explosive atmospheres.

These specifications may change or deviate without notice in the interest of technical progress or safety. Errors and typing errors cannot be excluded.

2.2 SPECIFICATIONS VUCAM® AM/AM+

VUCAM®-MODEL	VUCAM® AM	VUCAM® AM+
Item number	VXX-10-001193 | VXX-10-001194 | VXX-10-001195	VXX-10-001203 | VXX-10-001204 | VXX-10-001205
VIDEOSCOPE		
Diameter	4.0 mm / 0.15"	4.0 mm / 0.15"
Working length	1.1m/3.61ft | 2.2m/7.2ft. | 3.3m/10.8ft	1.1m/3.61ft | 2.2m/7.2ft. | 3.3m/10.8ft
Articulation	4 x 160°	4 x 160°
Top layer material	Tungsten braid	Tungsten braid
Construction	4 layers	4 layers
Mobility	torsion-resistant, flexible	torsion-resistant, flexible
OPTICAL SPECIFICAT.		
Field of view (FOV)	40°	40°
Direction of view (DOV)	0°	0°
Focal range	15 mm to ∞	15 mm to ∞
ILLUMINATION		
Type	Hybrid LED	Hybrid LED
Light conduction	POF	POF
Light control	Digital	Digital
Luminosity power	Output: 6 watts, daylight quality: 6.500 K	Output: 6 watts, daylight quality: 6.500 K
White balance	Auto/Manual	Auto/Manual
OPERATING UNIT		
Display type	LED backlight TFT touchscreen	LED backlight TFT touchscreen
Display size	5,7"	5,7"
Display resolution	640 x 480 px	640 x 480 px
Mains connection voltage	Input: 100 - 240 VAC Output: 12 V	Input: 100 - 240 VAC Output: 12 V
Mains connection frequency	50/60 Hz	50/60 Hz
Mains connection current	max. 2.5 AMP	max. 2.5 AMP
Battery type	LiFePo	LiFePo
Battery voltage	6.4 V	6.4 V
Battery charging time	< 2 Hrs	< 2 Hrs
Battery runtime	Up to 2,5 Hrs	Up to 2,5 Hrs

2 SPECIFICATIONS – SCOPE OF DELIVERY – ACCESSORIES

VUCAM®-MODEL	VUCAM® AM	VUCAM® AM+
Item number	VXX-10-001193 | VXX-10-001194 | VXX-10-001195	VXX-10-001203 | VXX-10-001204 | VXX-10-001205
Video interface	-	TV-Out
Audio interface	-	Audio In/Out
Network interface	-	LAN
Data storage	16 GB SD card	16 GB SD card
Direct access buttons	Digital image and video recording; Illumination; System on/off	Digital image and video recording; Illumination; System on/off
Dimensions	75 mm (h), 196 mm (w), 73 mm (l)	75 mm (h), 196 mm (w), 73 mm (l)
Housing material	Carbon fiber	Carbon fiber
Monitor material schock absorption	Elastomer bumpers	Elastomer bumpers
Handle material	Coated high-strength aluminium	Coated high-strength aluminium
Tripod/Holder	1/4" connection	1/4" connection
Weight	from 1.5 kg	from 1,2 kg
AMBIENT CONDITIONS		
Water and pressure resistance control unit	IP 54	IP 54
Water and pressure resistance probe	1,5 bar/22 psi fully immersible over full length IP68	1,5 bar/22 psi fully immersible over full length IP68
Schock resistance	50g 11ms half sine 3 axis	50g 11ms half sinde 3 axis
Vibration	3g random at 20 Hz to 2 kHz, 10 min per axis	3g random at 20 Hz to 2 kHz, 10 min per axis
Temperature Operating unit	System storage: -40°C (-104°F) to +85°C (+158°F) Operation: -20°C (-4°F) to +70°C (+122°F)	System storage: -40°C (-104°F) to +85°C (+158°F) Operation: -20°C (-4°F) to +70°C (+122°F)
Temperature probe	Operation: -10°C (+14°F) to +80°C (+176°F)	Operation: -10°C (+14°F) to +80°C (+176°F)
FUNCTIONS		
Digital data recording format	Image: JPEG Video: MPEG4	Image: JPEG Video: MPEG4
Resolution	RGB 263.000 colours, 640 x 480 px	RGB 263.000 colours, 640 x 480 px
Recording	Flashback: 30 sec. Pre-Trigger, Stop: Auto, Spilt: Auto	Flashback: 30 sec. Pre-Trigger, Stop: Auto, Spilt: Auto
Image display	Zoom: digital, 3x Mirror image: vertical/horizontal Rotate user interface: 360° Full screen mode: YES	Zoom: digital, 3x Mirror image: vertical/horizontal Rotate user interface: 360° Full screen mode: YES

VUCAM®-MODEL	VUCAM® AM	VUCAM® AM+
Item number	VXX-10-001193 | VXX-10-001194 | VXX-10-001195	VXX-10-001203 | VXX-10-001204 | VXX-10-001205
MENU		
Operation	Touch, Direct access buttons	Touch, Direct access buttons
Languages	English, German, French, special language package	English, German, French, special language package
Brightness	Auto/Manual	Auto/Manual
Contrast	Auto/Manual	Auto/Manual
Saturation	Auto/Manual	Auto/Manual
Colour control	Real time	Real time
Date and time	Show/Hide	Show/Hide
Systemstatus	YES	YES

Equipment is not intrinsically safe or explosion-proof. Do not use in potentially explosive atmospheres.

These specifications may change or deviate without notice in the interest of technical progress or safety. Errors and typing errors cannot be excluded.

2.3   **SPECIFICATIONS VUCAM® XF/XF+**

VUCAM®-MODEL	VUCAM® XF	VUCAM® XF+
Item number	VXX-10-001206 | VXX-10-001207 | VXX-10-001208	VXX-10-001209 | VXX-10-001210 | VXX-10-001211
VIDEOSCOPE		
Diameter	4.0 mm / 0.15"	4.0 mm / 0.15"
Working length	1.1m/3.61ft | 2.2m/7.2ft. | 3.3m/10.8ft	1.1m/3.61ft | 2.2m/7.2ft. | 3.3m/10.8ft
Articulation	4 x 160°	4 x 160°
Top layer material	Tungsten braid	Tungsten braid
Construction	4 layers	4 layers
Mobility	torsion-resistant, flexible	torsion-resistant, flexible
OPTICAL SPECIFICAT.		
Field of view (FOV)	85°	85°
Direction of view (DOV)	0°	0°
Focal range	4 mm to ∞	4 mm to ∞
ILLUMINATION		
Type	Hybrid LED	Hybrid LED
Light conduction	POF	POF
Light control	Digital	Digital
Luminosity power	Output: 6 watts, daylight quality: 6.500 K	Output: 6 watts, daylight quality: 6.500 K
White balance	Auto/Manual	Auto/Manual
OPERATING UNIT		
Display type	LED backlight TFT touchscreen	LED Backlight-Tochscreen
Display size	5,7"	5,7"
Display resolution	640 x 480 px	640 x 480 px
Mains connection voltage	Input: 100 - 240 VAC Output: 12 V	Input: 100 - 240 VAC Output: 12 V
Mains connection frequency	50/60 Hz	50/60 Hz
Mains connection current	max. 2.5 AMP	max. 2.5 AMP
Battery type	LiFePo	LiFePo
Battery voltage	6.4 V	6.4 V
Battery charging time	< 2 Hrs	< 2 Hrs
Battery runtime	Up to 2,5 Hrs	Up to 2,5 Hrs

VUCAM®-MODEL	VUCAM® XF	VUCAM® XF+
Item number	VXX-10-001206 | VXX-10-001207| VXX-10-001208	VXX-10-001209 | VXX-10-001210| VXX-10-001211
Video interface	-	TV-Out
Audio interface	-	Audio In/Out
Network interface	-	LAN
Data storage	16 GB SD card	16 GB SD card
Direct access buttons	Digital image and video recording; Illumination; System on/off	Digital image and video recording; Illumination; System on/off
Dimensions	75 mm (h), 196 mm (w), 73 mm (l)	75 mm (h), 196 mm (w), 73 mm (l)
Housing material	Carbon fiber	Carbon fiber
Monitor material schock absorption	Elastomer bumpers	Elastomer bumpers
Handle material	Coated high-strength aluminium	Coated high-strength aluminium
Tripod/Holder	1/4" connection	1/4" connection
Weight	from 1.5 kg	from 1.5 kg
AMBIENT CONDITIONS		
Water and pressure resistance control unit	IP 54	IP 54
Water and pressure resistance probe	1,5 bar/22 psi fully immersible over full length IP68	1,5 bar/22 psi fully immersible over full length IP68
Schock resistance	50g 11ms half sine 3 axis	50g 11ms half sine 3 axis
Vibration	3g random at 20 Hz to 2 kHz, 10 min per axis	3g random at 20 Hz to 2 kHz, 10 min per axis
Temperature Operating unit	System storage: -40°C (-104°F) to +85°C (+158°F) Operation: -20°C (-4°F) to +70°C (+122°F)	System storage: -40°C (-104°F) to +85°C (+158°F) Operation: -20°C (-4°F) to +70°C (+122°F)
Temperature probe	Operation: -10°C (+14°F) to +80°C (+176°F)	Operation: -10°C (+14°F) to +80°C (+176°F)
FUNCTIONS		
Digital data recording format	Image: JPEG Video: MPEG4	Image: JPEG Video: MPEG4
Resolution	RGB 263.000 colours, 640 x 480 px	RGB 263.000 colours, 640 x 480 px
Recording	Flashback: 30 sec. Pre-Trigger, Stop: Auto, Spilt: Auto	Flashback: 30 sec. Pre-Trigger, Stop: Auto, Spilt: Auto
Image display	Zoom: digital, 3x Mirror image: vertical/horizontal Rotate user interface: 360° Full screen mode: YES	Zoom: digital, 3x Mirror image: vertical/horizontal Rotate user interface: 360° Full screen mode: YES

VUCAM®-MODEL	VUCAM® XF	VUCAM® XF+
Item number	VXX-10-001206 | VXX-10-001207| VXX-10-001208	VXX-10-001209 | VXX-10-001210| VXX-10-001211
MENU		
Operation	Touch, Direct access buttons	Touch, Direct access buttons
Languages	English, German, French, special language package	English, German, French, special language package
Brightness	Auto/Manual	Auto/Manual
Contrast	Auto/Manual	Auto/Manual
Saturation	Auto/Manual	Auto/Manual
Colour control	Real time	Real time
Date and time	Show/Hide	Show/Hide
Systemstatus	YES	YES

Equipment is not intrinsically safe or explosion-proof. Do not use in potentially explosive atmospheres.

These specifications may change or deviate without notice in the interest of technical progress or safety. Errors and typing errors cannot be excluded.

2.4 SCOPE OF DELIVERY

When unpacking, memorise the position of the individual parts. To repack the device, proceed in reverse order.

1	VUCAM®
2	Power supply with mains charging cable/ VULINK-Cable**
3	VULAN-Cable for network connection*
4	Vehicle charging cable (only with charger)
5	USB drive
6	Adapter for int. power sockets
7	Shoulder strap
8	Manual
9	Option: Optical adapter (storage case included)*
10	Option: Spare batteries (changeable on site)*
11	Option: Battery charger*

⚠ **Store the probe carefully! When storing the probe, make sure that it is only placed in the area of the case provided for this purpose! Otherwise the probe and the camera head may be damaged!**

⚠ **Make sure to not trap the probe anywhere in the carrying case when closing it.**

⚠ **Do not articulate the probe while it is still in the carrying case. Otherwise the probe may be damaged.**

* only with the VUCAM® Accessories Kit Pro/Premium
** only with VUCAM®+ models

In this chapter, the parts with which the VUCAM® is delivered are listed. The scope of delivery varies depending on which model you have chosen.

1		VUCAM® with standard direction of view 0° and field of view 45° (depends on model)
2		Protection ring (XO/XF only)
3		Batteries (already in the battery compartment)
4		Power supply unit (plus adapter for int. sockets)
	4.1	Power-supply-to-VUCAM® adapter and for optional battery charger
	4.2	VULINK-Cable (TV-Out, Audio IN/OUT, charging function)*
5		Vehicle charging cable**
6		VULAN-Cable for network connection*
7		Headphone with integrated microphone and carrying bag*
8		SD card 16 GB (FAT32 file format)
9		VUCAM® manual
10		LAN-LAN inline coupler*
11		Software package with configuration software on USB drive*.
12		USB to USB Mini cable
13		Carrying case

1

2

3

4

4.1

4.2

5

6

7

8

9

10

11

12

13

* Only with VUCAM®+
** Only with battery charger

2.5 ACCESSORIES

For more information about optional accessories, see

1	Storage box for optical adapter
1.1	Optical adapter front view: DOV 0°, FOV 120° (XO/XO+)
1.2	Optical adapter side view (near focus): DOV 90°, FOV 120° (XO/XO+)
1.3	Optical adapter side view (RF): DOV 90°, FOV 45°* (XO/XO+)
1.4	Optical adapter side view DOV 90°, FOV 85° (XF/XF+)
2	Mounting aid XF adapter (rubber ring)
3	External battery charger
4	SD card 32 GB (FAT32 file format)
5	Shoulder strap
6	Protective film
7	Spare batteries

These accessories are included in the VUCAM® Accessories Kit Pro or Accessories Kit Premium, which can be purchased separately.
In the premium version, a second protective film for the touch screen is also supplied.

* Only with VUCAM® Accessories Kit Premium

3.1 BUTTONS AND POSITIONS

1	LCD-Touchscreen
2	White balance
3	Digital image recording
4	Digital video recording
5	File manager/Last saved file
6	Main menu
7	Lighting -
8	Lighting +
9	Battery indicator/Fullscreen

10	ON/OFF Switch ➡ **4.3 DIRECT ACCESS BUTTONS, page 51**
11	Red dots in one line with handle for neutral position (0°-Position)
12	Lighting - ➡ **4.3 DIRECT ACCESS BUTTONS, page 51**
13	Lighting + ➡ **4.3 DIRECT ACCESS BUTTONS, page 51**

14	SD card slot
15	Digital video recording ➡ **4.3 DIRECT ACCESS BUTTONS, page 51**
16	Digitale image recording ➡ **4.3 DIRECT ACCESS BUTTONS, page 51**
17	Display can be tilted
18	Articulation control ➡ **3.5 PROBE ARTICULATION, page 32**
19	Articulation fixation ➡ **3.5 PROBE ARTICULATION, page 32**
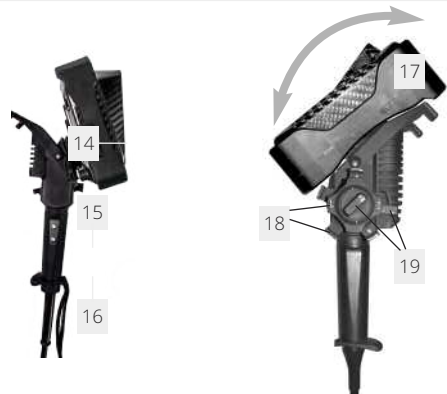
20	¼" connection for mounting, e.g. on a tripod
21	Network connection for VULAN cable*
22	VULINK cable connection for Power supply/charger/audio recording

3.2 APPLICATION

Horizontal position

The special design of the VUCAM® allows operation in the horizontal position. The display can also be tilted.

Vertical position

The special design of the VUCAM® allows operation in the horizontal position. The handle is designed for easy operation. This eliminates the need for constant user handling.

* Only with VUCAM®+ models

On a tripod

Use the ¼" connection in order to attach the sy-stem to a tripod.

Via magic arm

Use the ¼" connection in order to attach the system to a magic arm.

With the shoulder strap

Read this chapter to learn how to attach the VUCAM® onto the shoulder strap:

➜ **5.2 OPTION: SHOULDER STRAP, page 68**

3.3   COMMISSIONING

The VUCAM® can be operated via power supply unit or rechargeable batteries. When using via power supply unit, connect the power supply unit or the car charger cable (1) to the VUCAM® adapter (2) and the VUCAM® adapter to the VUCAM® (3). Plug the power adapter into the socket or the car charger cable into your car's cigarette lighter.

TO FIT (CONNECT)

TO REMOVE (ANTICLOCKWISE)

When using via batteries, make sure that the batteries are in the battery compartment of the VUCAM® and are charged. More information:

➡ **3.8 CHANGING THE BATTERY, page 35**

> ℹ **The batteries cannot be charged in the device at temperatures below 0°C and above +60°C!**

Proceed with system start up:

1. Shortly press

in order to start the VUCAM®. After starting up, you will find yourself in the operation menu.

3.4   IMAGE UND VIDEO RECORDING

Image and video recordings can be taken either via the keyboard or the touch screen.

1. Perform a white balance before operation. To do so, press

 or and

Touchscreen   VUCAM-Handle

Pressing the check configures the white balance; pressing "x" closes the window again with no changes made. Confirm the white balance by pressing the check. The white balance button flashes red until white balance is complete.

2. After a successful white balance, you are now ready to start your inspection.

3. If you want to capture a digital image, press either

 or

Touchscreen   VUCAM-Handle

to freeze the image.

4. Save a digital image by pressing one of the buttons displayed again:

 or

Touchscreen   VUCAM-Handle

The display of the VUCAM® flashes shortly. This means that your image has been saved.

5. If you want to capture a digital video, press either

   or

Touchscreen   VUCAM-Handle

If you want to stop the video recording, press either

   or

Touchscreen   VUCAM-Handle

During recording, the video button flashes red.

6. If you want to save a still image during video recording, press either

   or

Touchscreen   VUCAM-Handle

Just as with digital image recording without video recording, the image freezes. Press again either

   or

Touchscreen   VUCAM-Handle

to save the image. The display of the VUCAM® flashes shortly. This means that your image has been saved. Video recording will be resumed automatically after the image was taken.

7. Check your last saved file (image and/or video) by pressing the button:

When you have finished recording, wait five seconds before removing the SD card.

Before removing the SD card, release it first from the device. To do this, open the submenu "Release memory card". Removing the SD card without menu command may damage the SD card and the data on it!

Do not store the system in low temperature environments!

Do not remove the SD card while taking photos or videos. It may lead to loss of the image/video and damage to the SD card!

Video recording requires an SD card with fast writing speed. We recommend an SD card with 80x (or higher) writing speed.

3.4.1 FLASHBACK RECORDING

The "pretrigger" recording allows the recording of events that took place a few seconds before the actual start of the video recording. This function is deactivated by default. If you want to activate flashback recording, read the following chapter:

➡ **4.1.1.2 CAPTURE SETTINGS, page 41**

Once you have configured the flashback recording according to your wishes (0-30 seconds), start recording by pressing

  or

The VUCAM® now saves - according to your settings - also 5-30 seconds prior to the moment when you start recording.

3.5 PROBE ARTICULATION

The VUCAM® has two handwheels that allow you full control over the probe articulation.

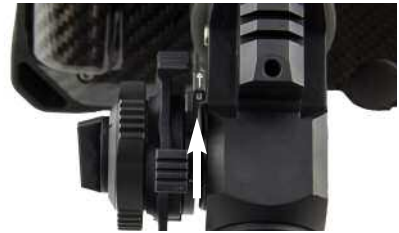1. Turn the large handwheel to move the probe up or down as desired.

2. Turn the small handwheel to move the probe left or right as desired.

3. Once you have reached the desired position, apply the brakes (lever and knob, Figs. 3a and 3b) to fix the angle.

4. Return the probe to the starting position (0° position) by centring the two red dots to the position shown. If necessary, release the brakes first.

3.6 **CONNECTION OF PROTECTION RING***

Check before each operation that the protection ring is screwed onto the probe. Proceed very carefully when mounting and screwing. Never use force. If in doubt, ask our service department for advice.

⚠️ **Never use the probe without the protection ring. Otherwise, the probe head may be damaged.**

To attach the protection ring to the probe (double thread), follow the steps below:

1. Mount the protection ring onto the first thread of the head of the probe.

1

🔃 **TO FIT (CLOCKWISE)**

🔄 **TO REMOVE (ANTICLOCKWISE)**

2. Slightly press the protection ring to the second thread. Mount the protection ring onto the second thread. To remove the protection ring, please proceed in reverse order.

2

🔃 **TO FIT (CLOCKWISE)**

🔄 **TO REMOVE (ANTICLOCKWISE)**

3

* Only with VUCAM® XO/XF-Models

⚠️ **The thread on both the probe and the adapters is very fine due to their small dimensions. To avoid damage, pay attention to small impurities in the thread!**

⚠️ **The optical adapters may only be changed by trained or experienced personnel.**

3.7	CHANGING THE OPTICAL ADAPTERS*

In order to mount a optical adapter, remove the protection ring from the probe. Be careful when putting on and tightening the adapter. Never use force. If in doubt, ask our service department for advice and instruction.

For more information, see chapter

1. Prepare the probe of the VUCAM®.

⟳ **TO FIT (CLOCKWISE)**

⟲ **TO REMOVE (ANTICLOCKWISE)**

⚠ **The thread on both the probe and the adapters is very fine due to their small dimensions. To avoid damage, pay attention to any debris within the thread!**

2. Mount the optical adapter clockwise onto the tip of the probe. Hold the optical adapter at the ribbed

⟳ **TO FIT (CLOCKWISE)**

⟲ **TO REMOVE (ANTICLOCKWISE)**

end.

* only with VUCAM® XO/XF models

To remove the optical adapter, proceed in reverse order.

⚠ **The optical adapters may only be changed by trained or experienced personnel.**

⚠ **Be very careful when mounting the optical adapter onto the probe!**

⚠ **Make sure that the optical adapter is always clean on the inside.**

3.8 CHANGING THE BATTERY

In order to change the battery of the VUCAM®, proceed as follows:

1. Open the battery slot on the back of the VUCAM® housing (Figs. 1a and 1b)

2. Unlock the battery by carefully folding the metal clip towards the stopper (Fig. 2).

⚠ **Never pull out the battery on the bracket!**

3. Press the metal bracket inwards to fold it down completely (Fig. 3).
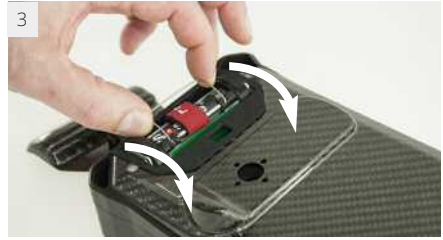
4. Pull out the batteries by pulling them on the textile strap. The batteries may only be used within the battery holder (Fig. 4).

5. To remove the batteries from the battery pack, remove its side covers. Then pull out the batteries (Figs. 5a and 5b).

To reinsert the batteries, proceed in reverse order. Note the following statement:

1. When inserting the batteries into the battery holder, make sure they are in the correct position (Fig. 1).

2. Make sure that the pins of the attachment snap into the inserts of the VUCAM®. The contact surfaces must face in the direction of the handwheel when inserting (Figs. 2a and 2b).

4.1 MAIN MENU

1	File manager ➜ **4.5 FILE MANAGER, page 54**
2	Video in
3	Display settings
4	System settings
5	Colour settings
6	Remove SD card
7	Shutdown device
8	Restart device
9	Confirm/Access menu
10	Up
11	Down
12	Cancel/Leave
13	Battery status/Full screen

💡 **In each menu there is the option "undo settings". All changes you make in the menu you currently are in will be undone.**

Your system starts in the operation menu. In order to go to the main menu, press

You can scroll through the menus/submenus by pressing

  or

Confirm your selection by pressing

Leave the current menu by pressing

Alternatively, you can use the "Direct Access Buttons".

➜ **4.3 DIRECT ACCESS BUTTONS, page 50**

4.1.1 VIDEO IN

Enter general picture settings and capture settings.

A	Image settings
B	Capture settings

4.1.1.1 IMAGE SETTINGS
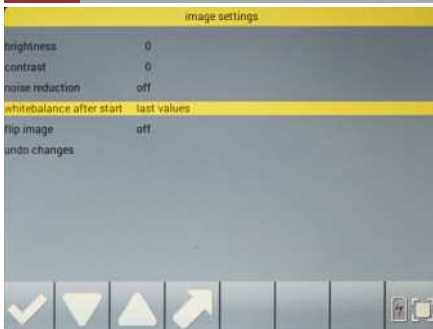
A	Brightness
B	Contrast
C	Noise reduction
D	White balance after start
E	Flip image (horizontal, vertical, both)
F	Undo changes

Select the desired settings. You see your changes directly in the operation menu.

Press

  or

to make the changes take effect. Confirm your selection or go back to the options menu.

You can also adjust the white balance manually and flip the image by using the direct access buttons. An overview of the combinations can be found here:

A Brightness: Adjust the brightness of the image on the VUCAM display. You can choose between -9 (darkest) and +9 (brightest setting).

B Contrast Adjust the contrast of the image on the VUCAM display. You can choose between -9 (darkest) and +9 (brightest setting).

C Noise reduction Adjust whether the image on the VUCAM display is shown with or without noise reduction. As soon as you select the option by pressing the check button, the VUCAM switches to the operation menu. In that menu, the grey bar at the top of the display indicates which option is currently selected. Use the arrow buttons to switch between the three modes available: On (noise reduction is activated), Off (noise reduction is deactivated) and Automatic (the VUCAM uses noise reduction if necessary). Confirm your selection by pressing

The VUCAM saves your selection and switches back to the menu "image settings".

Please note: Noise reduction will be deactivated as soon as "lighting boost" is activated (LEDs on brightest level).

D White balance after start Adjust the white balance mode. As soon as you select the option "white balance after start" by pressing the check button, the

VUCAM switches to the operation menu. In that menu, the grey bar at the top of the display indicates which option is currently selected. Use the arrow buttons to switch between the three modes: "Neutral", "Continuous" and "Last values".

"Neutral" mode: White balance will be performed on startup.

"Continuous" mode: White balance will be performed continuously, i.e. is constantly adapted to the inspection environment. **Please note:** This mode only becomes active after restart. As soon as you perform a new manual white balance, the white balance is not performed continuously anymore.

"Last values" mode: The VUCAM uses the white balance settings configured last.

Confirm your selection by pressing

The VUCAM saves your selection and switches back to the menu "image settings".

E Flip image Select whether the image on the VUCAM display should be mirrored vertically, horizontally or both vertically and horizontally. As soon as you select the option "flip image" by pressing the check button, the VUCAM switches to the operation menu. In that menu, the grey bar at the top of the display indicates which option is currently selected. Use the arrow buttons to switch between the four modes: Off (image is not flipped), Horizontal (image is flipped horizontally), Vertical (image is flipped vertically), Horizontal and Vertical (image is flipped both horizontally and vertically).

Confirm your selection by pressing

The VUCAM saves your selection and switches back to the menu "image settings".

As soon as you now enter the operation menu, the current flip mode is displayed on the right hand side of the image.

Depending on which mode you have selected, either no symbol (Flip image off), the left symbol (Flip image horizontally), the right symbol (Flip image vertically) or both symbols together (Flip horizontally and vertically) appear on the screen.

F Undo changes Resets all settings that you have currently made in this menu.

4.1.1.2   CAPTURE SETTINGS

A	Pretrigger in s
B	Direct image capture
C	Undo changes

A Pretrigger in s.: Set the flashback recording time. You can choose between zero and 30 seconds in five consecutive steps.

B Direct image capture: If this option is set to "on", only the camera image (Direct Image Capture) is recorded during video/image capture. The "off" option captures the camera image including the user interface (screen capture). The latter also saves aspects such as full screen or zoom.

C Undo changes: Resets all settings that you have currently made in this menu.

4.1.2   DISPLAY SETTINGS
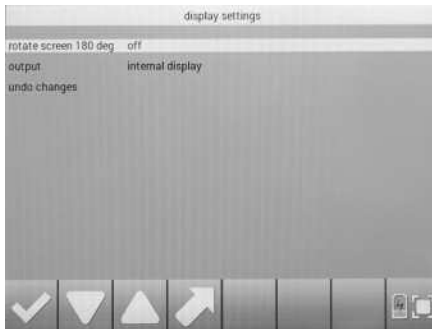
A	Rotate screen 180 deg
B	Output (internal display, TV-Out)
C	Undo changes

You can set the display rotation and image output destination here.

A Rotate screen 180 deg: Both internal display and user interface are rotated 180°, allowing overhead work. This function is only possible for the VUCAM® screen, not for external monitors or streaming.

B Output (internal display, TV-out): Displays the picture on internal display or on an external monitor using composite/NTSC.

C Undo changes: Resets all settings that you have currently made in this menu.

4.1.3   SYSTEM SETTINGS

A	System status
B	Set date/time
C	Annotation
D	format SD card
E	Light
F	Language
G	Restore factory settings
H	Configuration data
I	Reset file counter
J	Network configuration
K	System messages
L	Copy log file

4.1.3.1   SYSTEM STATUS

Check the software version, the capacity of your SD card or the battery status and get more information on your VUCAM®.

4.1.3.2 SET DATE/TIME

Set date and time in this menu.
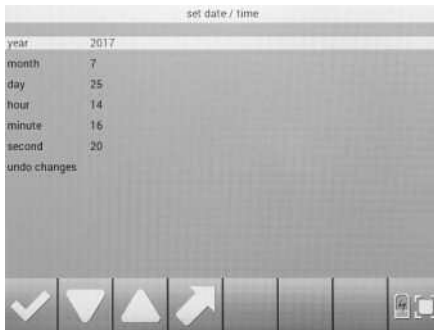
A	Year
B	Month
C	Day
D	Hour
E	Minute
F	Second
E	Undo changes

4.1.3.3 ANNOTATION

Set whether the date and time are to be displayed in the operation menu or not.

A	Show date/time (on/off)
B	Undo changes

4.1.3.4 FORMAT SD CARD

Format the SD card. Warning: All data on the SD card will be deleted.

To delete the data on the SD card, select the option "Format SD card now" and confirm your selection by pressing

The formatting process takes about 30 seconds.

4.1.3.5 LIGHT

Configure light settings of the VUCAM® on system startup.
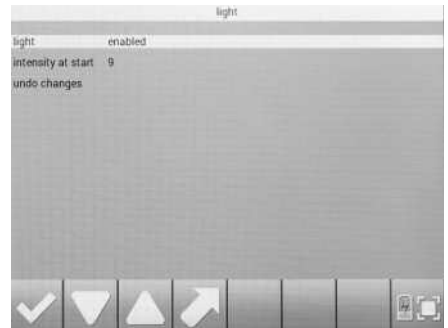
By default, the "enabled" option is set here. The light of the probe tip is switched on in this setting. The light intensity can be controlled via the direct access keys or the touch screen.

If the "disabled" option is activated, the light of the probe is switched off. The camera starts without light when you start the VUCAM® with these settings.

Light intensity on startup: Indicates how intense the light is on system startup. You can choose between the intensities 0 (=off) to 10.

4.1.3.6   LANGUAGE

Select your desired system language (English, German, French or special language package*). After you have made your selection, return to the parent folder to make the changes take effect. It can take up to ten seconds for the language file to load.

4.1.3.7   RESTORE FACTORY SETTINGS

If necessary, reset your system to factory settings. After confirming your selection, the system restarts.

> ℹ **Resetting your system deletes all your individual settings.**

> ℹ **Resetting the file counter will overwrite all files recorded on the same day with the new count. Your old files will be lost!**

4.1.3.8   CONFIGURATION FILES

Select the pre-installed or self-created configuration file to configure the VUCAM® for network use. The file must be located in the "VUCAM" folder of the SD card and has to have the file extension .cfg

4.1.3.9   RESET FILE COUNTER

The VUCAM® saves files by the following convention: INVIZ_counter_Date (YYYYMMDD).avi/jpg.
The counter has four digits and is incremented continuously. Resetting the counter restarts file numbering from 0000.

* must be ordered when purchased. Contains Japanese, Polish, Turkish, Russian, Spanisch and Hungarian

4.1.3.10   NETWORK CONFIGURATION

Configure the settings for data transfer. Select the connection type (unicast, broadcast) and specify whether streaming should be activated at system startup or not. More detailed information in this chapter:

➡ **4.8 SET UP NETWORK CONNECTION, page 58**

4.1.3.11   SYSTEM MESSAGES

Shows the last 20 lines of the log file. Any error messages are saved in the log file.
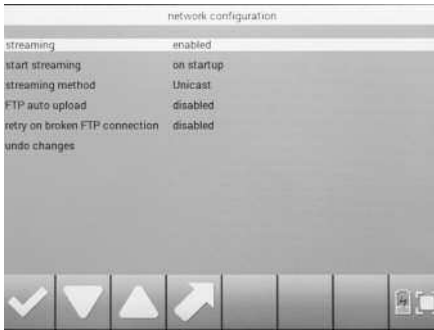
4.1.3.12   COPY LOG FILE

Copy the log file onto the inserted SD card by selecting "copy file" and confirm with

You are now able to view the log file on you laptop/PC.
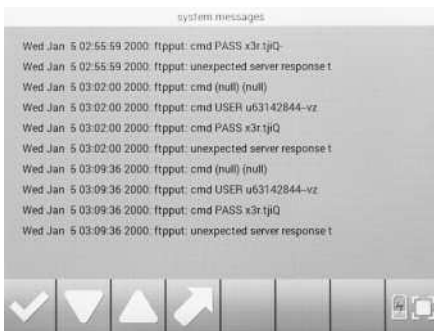
4.1.4 COLOUR SETTINGS

Choose your colour settings for menu text, background, menu bar text, menu bar, selection bar and selected text.
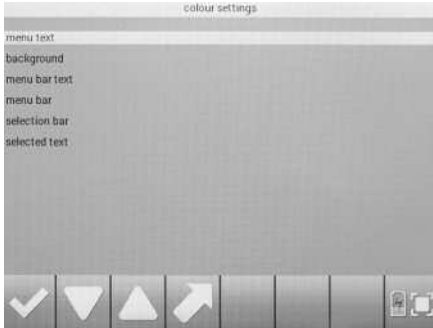
💡 **Changes that are made in the colour settings do not affect the text generator.**

4.1.5 REMOVE SD CARD

If you want to remove the SD card from the system, release the card in this menu by selecting "Release SD card" and confirm your selection by pressing the check button.

⚠ **Always go to the "Remove SD card" menu to remove the SD card! Removal without a menu command can damage the SD card and the data on it!**

4.1.6 RESTART DEVICE/ SHUTDOWN DEVICE

In this menu, you can restart or shut down your system.
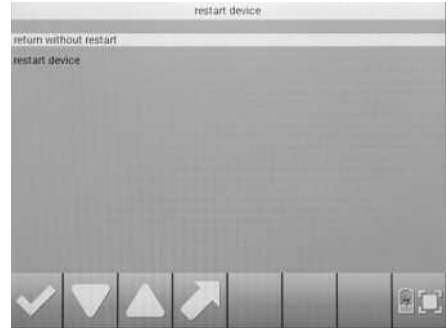
Alternatively, you can shut down the VUCAM by pressing

on the handle.

4.2	OPERATION MENU

1	White balance ➡ **4.2.5 BUTTONS (TOUCHSCREEN), page 49**
2	Digital image recording ➡ **3.3 COMMISSIONING, page 30** ➡ **4.2.5 BUTTONS (TOUCHSCREEN), page 49**
3	Digital video recording ➡ **3.3 COMMISSIONING, page 30** ➡ **4.2.5 BUTTONS (TOUCHSCREEN), page 49**
4	File manager/last saved file ➡ **4.5 FILE MANAGER, page 54**
5	Main menu ➡ **4.1 MAIN MENU, page 39**
6	Lighting - ➡ **4.2.5 BUTTONS (TOUCHSCREEN), page 49**
7	Lighting + ➡ **4.2.5 BUTTONS (TOUCHSCREEN), page 49**
8	Fullscreen/Battery status ➡ **4.2.5 BUTTONS (TOUCHSCREEN), page 50**
9	Inspection field
10	Text field

💡 **The system starts in the operation menu by default.**

4.2.1 FULLSCREEN MODE

To enable/disable full screen mode, press the button Fullscreen/Battery status at the bottom right of the screen. **Note: The toolbar is not displayed in full screen mode.** You can return to the standard view by pressing the lower right edge of the screen.

4.2.2 ZOOM

You can choose between various zoom levels (1/1.6/2/3). Press the inspection field several times in order to activate the desired zoom level.

💡 **Zoom can also be activated in fullscreen mode. You can switch to the corresponding fullscreen mode in each zoom level. Available zoom levels: 1.2/1.6/2/3.**

4.2.3 LOGO ON/OFF

Press the viZaar® logo above the toolbar in order to show/hide the logo.

4.2.4 DATE AND TIME ON/OFF

In order to show/hide date and time, press on date/time in the upper right corner of the screen. You can also activate/deactivate the date/time display in the main menu -> "system settings" -> "annotation".

4.2.5 **BUTTONS (TOUCHSCREEN)**

1		WHITE BALANCE	Press **WHITE BALANCE**, in order to enhance the inspection image before inspection. Confirm your action by pressing on the check button.
2		DIGITAL IMAGE RECORDING	Press **DIGITAL IMAGE RECORDING** in order to freeze the image. Press the exact button again in order to save the image displayed on the screen.
3		DIGITAL VIDEO RECORDING	Press **DIGITAL VIDEO RECORDING** in order to start the recording of a video. The video symbol in the toolbar flashes red. Press the exact button again in order to save your video.
4		FILE MANAGER/ LAST SAVED FILE	Press **FILE MANAGER/LAST SAVED FILE** in order to view the last file you have recorded (image/video). Videos will start automatically. Press ▌▌ in order to stop the video playback. Use ▼ and ▲ in order to navigate through the files. Press ■ in order to return to the operation menu.
5		MAIN MENU	Go back to **MAIN MENU** in order to configure system settings. Change the user interface, remove the SD card etc. Alternatively, you can go to the file manager via the main menu.
6		LIGHTING + / -	Press **+** in order to add illumination. Press **-** in order to reduce illumination. Choose between nine different illumination levels.
7		LIGHTING AUTO	**LIGHTING AUTO** is activated with the ninth level of illumination. Reduce illumination in order to deactivate lighting auto.
8		LIGHTING BOOST	**LIGHTING BOOST** is activated when pressing + after you have reached the highest level of illumination. This gives you an approximate 30 percent higher luminosity. Press - in order to deactivate boost. **ATTENTION: Lighting Boost significantly shortens the service life of the batteries.**

9		**FULLSCREEN/ BATTERY STATUS**	This button shows the current battery status. Press **Fullscreen/Battery status** in order to activate full-screen mode.
10		**ON/OFF**	**ON**: Press this button shortly in order to start the system. **OFF:** Press this button for about five seconds in order to shut down the system. Press for ten seconds in order to force shut down.

4.3   DIRECT ACCESS BUTTONS

1		**DIGITAL IMAGE RECORDING**	Press **DIGITAL IMAGE RECORDING** in order to freeze the image. Press the exact button again in order to save the image displayed on the screen.
2		**DIGITAL VIDEO RECORDING**	Press **DIGITAL VIDEO RECORDING** in order to start the recording of a video. The video symbol in the toolbar flashes red. Press the exact button again in order to save your video.
3		**LIGHTING + / -**	Press **+** in order to add illumination. Press **-** in order to reduce illumination. Choose between nine different illumination levels.

4.3.1 FEATURES

The direct access buttons allow simple and quick working. In addition to access standard functions such as light intensity, video and image recording, further functions can be accessed via combination of two buttons.

4.3.1.1 SETUP

1. To access the main menu, shortly press and hold

2. To scroll upwards in the menu, press

To scroll downwards in the menu, press

Confirm your selection by pressing

In order to exit the menu/submenu you are currently in, press

4.3.2 HOT KEYS

You can navigate quickly and easily through the various menus by pressing the following buttons on the handle of the VUCAM®.

4.3.2.1 FULLSCREEN MODE

Simultaneously press

 and

and immediately release the buttons to activate/deactivate fullscreen mode.

4.3.2.2 ZOOM

Simultaneously press

 and

and immediately release the buttons to activate/deactivate zoom. Press the two buttons again in order to switch between the different zoom levels (1,6; 2; 3).

4.3.2.3 WHITE BALANCE

In order to perform the white balance, simultaneously press

 and

and immediately release the buttons. Confirm the pop-up window on the touchscreen by pressing

4.3.2.4 FLIP-FLOP MODE

You can flip the image horizontally and/or vertically using the direct access keys. In order to do so, simultaneously press

 and

and immediately release the buttons to mirror the image. To switch through the different modes, press both buttons again simultaneously.

4.4   TEXT GENERATOR
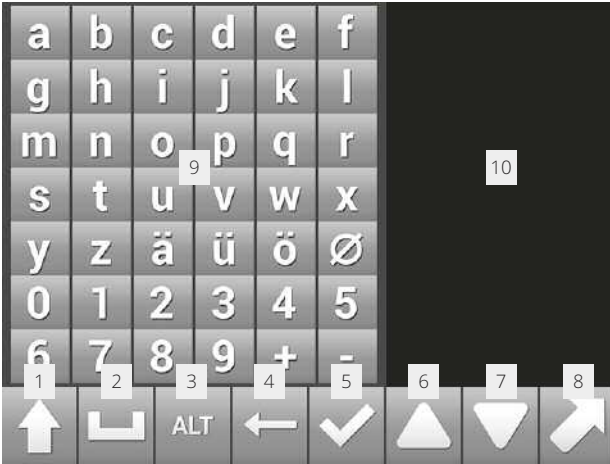
Press the text filed (10) on the touchscreen in order
to open the text generator.

1	SHIFT
2	Space
3	ALT
4	Erase last item entered
5	Confirm
6	Up
7	Down
8	Cancel without saving
9	Keyboard
10	Text field

A	Keyboard with SHIFT key activated
B	Keyboard with ALT key activated

4.4.1 **BUTTONS**

1		SHIFT	Press **SHIFT** in order to change to uppercase letters on the keyboard.
2		ALT	Press **ALT** in order to change to special characters on the keyboard.
3		ERASE LAST ITEM ENTERED	Erase the last item you entered using the keypad.
4		CONFIRM	Confirm the text entry/text change and return to operation menu.
5		UP/DOWN	Press **UP/DOWN** in order to navigate through the individual text lines (max. eight lines of text).
6		CANCEL WITHOUT SAVING	Cancel the text input/text change and return to operation menu. The changes will not be saved.

4.5 FILE MANAGER
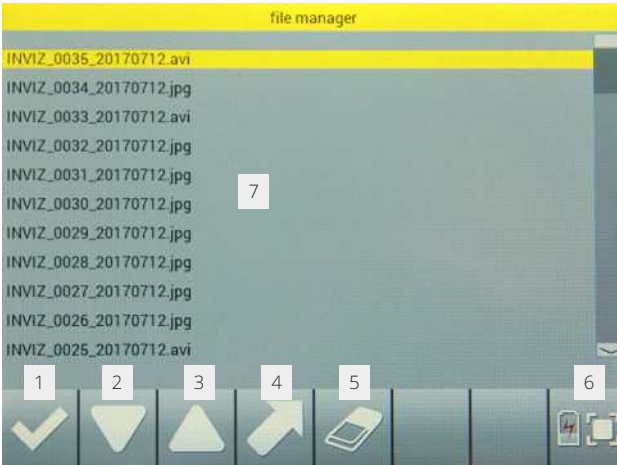
In order to access the list view of your recorded images and videos, open the file manager from the setup. To do so, press

Now choose "file manager" and confirm your selection by pressing

1	Confirm
2	Up
3	Down
4	Cancel/Leave
5	Delete file
6	Battery status/fullscreen
7	Files

When opening the file manager directly via the operation menu, recorded files are only displayed in playback mode. The list view is NOT available here!

Press

or

in order to select the desired file. Confirm your selection by pressing

The VUCAM® opens the file. Videos are played automatically, a square button left of the „Battery status/fullscreen" botton lights green while the video is playing. When video playback is finished, the square appears gray on the display.

If you want to delete a file, press

To hide the option bar, press

Leave the file manager by pressing
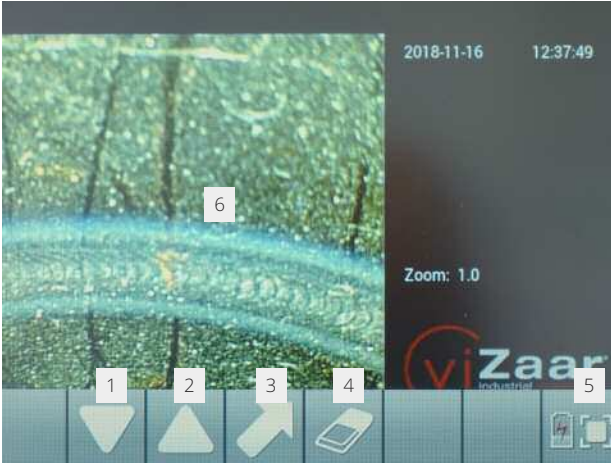
To browse your recorded images and videos, you can either – as described on page 58 – select a file in the file manager by pressing

or you can directly press the button

in the operation menu.

Please note: Pressing this button will only take you to the last recorded image resp. video if you have recorded a image or a video since the last startup. In all other cases, pressing this button will not entail any action.

Please note: Opening thie file manager via this button does not allow you to access the list view. The list view can only be accessed via the main menu.

When opening the file manager directly via the operation menu, recorded files are only displayed in playback mode. The list overview is NOT available here!

1	Up
2	Down
3	Cancel/Leave
4	Delete file
5	Battery status/fullscreen
6	Files

Press

   or

in order to navigate to the next image resp. video.

If you want to delete a file, press

To hide the option bar, press

Leave the image resp. video view by pressing

4.6 AUDIO RECORDING*

The VUCAM®+ gives you the opportunity to add audio comments to your video recording.

1. Connect the VULINK-Cable to the VULINK-Cable connection.

2. Connect the headphones to the black plug of the VULINK-Cable.

3. Start your video recording by pressing

   or
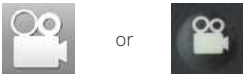
and speak into the microphone while recording.

4. Stop the recording by pressing

   or

again.

5. Press

in order to view your last recorded file. The audio commentary that you just recorded runs parallel to the recording and can be listened to by using the headphones.

* only with VUCAM®+

4.7 TV-OUT*

You can playback the image signal on an external monitor using a jack cable. **Note: The VUCAM® display is automatically switched off as soon as you playback the image on a monitor.**

1. Connect the VULINK-Cable to the VULINK-Cable connection.

2. Plug one end of a TV-out cable into the white jack of the VULINK cable. Connect the other end of the TV-out cable to the video input of your external monitor.

3. Press

in order to open the main menu of the VUCAM®. In the menu, select "Display settings". Confirm your selection by pressing

Set the entry for "output" to "TV-Out" using the up/down keys and confirm your selection. The display of your VUCAM® will then turn black, the image will be displayed on the external monitor

5. Now, please use the direct access buttons on the handle to navigate through the menu.

* only with VUCAM®+

To record images or videos, use the buttons on the handle as well.

6. In order to stop the VUCAM® displaying the image on an external monitor, got to the "display settings" menu and select under "output" the option "internal display". Confirm you selection with

on the handle of the VUCAM®.

7. After confirming your selection, the image is now displayed again on the internal display of the VUCAM®. You can now disconnect the TV-out cable.

| 4.8 | SET UP NETWORK CONNECTION* |

The VUCAM®+ can be connected to various devices, such as a PC or a router. This gives you the opportunity to transmit your data conveniently. Due to the large number of possible target devices and configurations, only the most important options are described here.

MODES OF TRANSMISSION

Several modes of transmission are available:

VUCAM®-PC Direct: Stream the image that is also displayed on your VUCAM®+ onto an additional device, e.g. PC or Laptop. **The „Push to FTP" function is not available with this setting.**
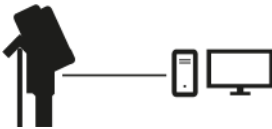
➡ **4.8.2 VUCAM®-PC Direct, page 59**

VUCAM®-LAN-PC: The image is streamed to one (unicast) or all devices (broadcast) in the network area that are within the same IP range. With this setting, you can watch the stream on several devices. You can also use the "Push to FTP" function here.

➡ **4.8.4 VUCAM®-LAN-PC, page 61**
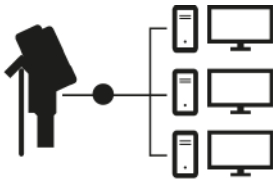
Push to FTP: Your images and video material can be stored directly on an FTP server in parallel to streaming. You can use our test server, but of course you

*only with VUCAM+ models

can also use your own FTP server. The push-to-FTP function requires an inserted SD card.

➡ **4.8.6 PUSH TO FTP, page 65**

| 4.8.1 | CONFIGURING THE TARGET DEVICE |

VUCAM+® and target device must be configured for all three transmission modes. Use the supplied configuration program (Windows 7 and higher). You can also request the configuration program by e-mail: **marketing@vizaar.com**
The following describes what settings must be made to stream image content to your target device. All points apply to both unicast and broadcast (Fixed PC/Laptop or all devices within the same IP range).

1. Insert the supplied USB stick into your PC/Laptop and open the drive detected by your computer.

2. Copy the configuration program **"ViZaar.VuCam.Network.Configurer.exe"** on your PC/Laptop. We recommend storing the file on your desktop.

3. Remove the USB stick from your device. Make sure that no other external storage media (such as USB sticks or SD cards) are connected to the device, otherwise you may receive error messages during configuration.

4. If inserted, remove the SD card from the SD card slot of the VUCAM®+. Do not forget to remove the SD card in the menu first.

5. Insert the SD card into the SD card slot of your PC/Laptop and close any pop-up windows.

6. Right-click the file **"ViZaar.VuCAM.Network.Con-figurer.exe"** that you have copied onto your device earlier on and select "Run as administrator" in the context menu. If Windows asks you if you want to open the program, click "Yes".

> ℹ **Administrator rights are mandatory for the target device! Make sure you have the VLC media player installed.**

7. The initial screen of the configuration program appears on the screen of your device.

Here you can find general information and the version number of the software. To proceed, click at the bottom right on

> ℹ **Make sure you have disabled all other network connections. Only the LAN socket connected to the VUCAM®+ may be activated.**

 4.8.2   VUCAM-PC DIRECT

1. To use the VUCAM®+ with unicast, select "network and streaming configuration". Leave the "Push to FTP" option unchecked. **This only works if your device is connected to a network.** You can read which settings you have to make in this chapter:

➡ **4.8.6 PUSH TO FTP, page 65**

Confirm your selection by clicking the "Next" button at the bottom right.

2. Now connect the green "VULAN cable for network connection" to your VUCAM®+. Remove the cover flap on the VUCAM®+ first in order to do so. If necessary, use the supplied LAN-LAN inline coupler (LAN-LAN connection adapter).

3. Connect the other end of the VULAN cable to your PC/Laptop.

4. Select the option "VUCAM-PC direct" in the menu "Select connection type" on your PC/Laptop and proceed by clicking

5. The configuration program shows that all settings have been made. One folder named "VUCAM" has been saved to the SD card, another folder named **"VuCAM_network_config"** has been saved to your desktop. If you have not inserted a SD card, the configuration files have been saved in a folder on your desktop.

6. Exit the configuration program by clicking on

7. Open the folder **"VuCAM_network_config"** on

your desktop. Double-click on the subfolder "Compu-ter_settings". Then right-click the file **"VuCAM-Net-work.bat"**. Left-click the "Run as administrator" option in the context menu. Confirm the pop-up window by clicking "Yes".

Your PC/Laptop will now configure the IP address of your LAN connection. Exit the program by pressing any key.

8. Remove the SD card from the SD card slot of your PC/Laptop.

4.8.3   PREPARING THE VUCAM

1. Insert the SD card with the configuration data taken from your PC/Laptop into the SD card slot of your VUCAM®+.

2. Open the main menu of the VUCAM®+ by pressing

3. Select "system settings" and confirm your selection by pressing

4. Now select "Configuration data" using the arrow buttons and confirm your selection by pressing

5. In the following menu, you will find a file named **"Custom_Netw_fix-206.cfg"**. The file is already se-lected. Confirm your selection by pressing

Your VUCAM®+ will now reboot. After approximately 30 seconds, the network file is successfully loaded and you will find yourself again in the operation menu.

6. Open the setup and select "system settings". Con-firm your selection by pressing

7. Select "network configuration" using the arrow buttons and confirm your selection by pressing

8. Make sure that the settings are set as follows: "Streaming: active", "Start streaming: on startup", "Streaming type: unicast".

9. Exit the menu and go back to the operation menu by pressing

three times.

Your VUCAM®+ is now ready for streaming. In order to start the stream, follow the steps in this chapter:

➡ **4.8.5 START STREAM, page 64**

4.8.4   VUCAM-LAN-PC

1. Follow the steps in chapter 4.8.1: "Configuring the target device" before proceeding.

➡ **4.8.1 CONFIGURING THE TARGET DEVICE, page 58**

2. Now, select the option „network and streaming configuration". You can also select the "Push to FTP" option here. Instructions on which settings must be made in order to store your data directly on an FTP server can be found here:

➡   **4.8.6 PUSH TO FTP, page 65**

In this case, however, leave the "Push to FTP" function unselected.

> ⚠ **A broadcast in a network that connects WiFi and LAN in the same IT address space can cause all LAN/WiFi connections to become unstable or lead to malfunction of the network.**

4. Now connect the green "VULAN cable for network connection" to your VUCAM®+. Remove the cover flap on the VUCAM®+ first in order to do so. If necessary, use the supplied LAN-LAN inline coupler (LAN-LAN connection adapter).

5. Connect the other end of the VULAN cable to your router/network. **Note: The other end of the VULAN cable must be connected to a network and not to a PC/Laptop!**

6. Take another network cable and connect one end to your router/network (the device where you have connected the VULAN cable. Connect the other end of the cable to your device, e.g. PC or Laptop.

> ⓘ **Make sure that both devices (VUCAM®+ and PC/Laptop) are connected to the same network. If you want to push your files to an FTP server later on, the network has to have access to the internet.**

7. Go back to your PC/Laptop and continue the network configuration by clicking

in the configuration menu.

4.8.4.1   STREAM TO ONE DEVICE ONLY

1. Choose option "VUCAM®-LAN-PC" in the menu "select connection type" and click on

> ⚠ **To use the VUCAM®-LAN-PC functions, the LAN/WiFi connection MUST be assigned a dynamic IP. The image is not streamed onto the device if your PC/Laptop has a static IP. In case you experience problems, contact your network administrator.**

2. In the next menu ("video stream configuration") select the option "stream to one target (unicast) stream target will be this PC" and click on the bottom right button

3. The configuration program shows that all settings have been made. One folder named "VUCAM" has been saved to the SD card, another folder named **"VuCAM_network_config"** has been saved to your desktop. If you have not inserted a SD card, the configuration files have been saved in a folder on your desktop.

4. Exit the configuration program by clicking on

5. Remove the SD card with the configuration files from the SD slot of your PC/Laptop and insert it into your VUCAM®+.

6. Follow steps 1 to 4 in chapter 4.8.3.

➡ **4.8.3 PREPARING THE VUCAM, page 60**

7. In the following menu, you will find a file named **"Custom_Netw_fix-206.cfg"**. The file is already selected. Confirm your selection by pressing

Your VUCAM®+ will now reboot. After approximately 30 seconds, the network file is successfully loaded and you will find yourself again in the operation menu.

8. Open the setup and select "system settings". Confirm your selection by pressing

9. Select "network configuration" using the arrow buttons and confirm your selection by pressing

10. Make sure that the settings are set as follows: "Streaming: active", "Start streaming: on startup", "Streaming type: unicast".

11. Exit the menu and go back to the operation menu by pressing

three times.

💡 **For more detailed information on network configuration, consult your IT network administrator!**

12. Your VUCAM®+ is now ready for streaming. In order to start the stream, follow the steps in this chapter:

➡ **4.8.5 START STREAM, page 64**

4.8.4.2 STREAM TO VARIOUS DEVICES

1. Follow the steps in chapter 4.8.1: "Configuring the target device" before proceeding:

➡ **4.8.1 CONFIGURING THE TARGET DEVICE, page 58**

2. Now follow the steps 1 to 7 in chapter 4.8.4.

➡ **4.8.4 VUCAM®-LAN-PC, page 61**

3. Select "VUCAM-LAN-PC" in the menu "select connection type" and proceed by clicking

4. Now select "stream to everybody in same LAN (broadcast)" and confirm your selection by pressing

5. The configuration program shows that all settings have been made. One folder named "VUCAM" has been saved to the SD card, another folder named **"VuCAM_network_config"** has been saved to your desktop. If you have not inserted a SD card, the configuration files have been saved in a folder on your desktop.

6. Exit the configuration program by clicking on

7. Remove the SD card with the configuration files from the SD slot of your PC/Laptop and insert it into your VUCAM®+.

8. Follow steps 1 to 4 in chapter 4.8.3.

➡ **4.8.3 PREPARING THE VUCAM, page 60**

9. In the following menu, you will find a file named **"Custom_Netw_fix-206.cfg"**. The file is already selected. Confirm your selection by pressing

Your VUCAM®+ will now reboot. After approximately 30 seconds, the network file is successfully loaded and you will find yourself again in the operation menu.

10. Open the setup and select "system settings". Confirm your selection by pressing

11. Select "network configuration" using the arrow buttons and confirm your selection by pressing

10. Make sure that the settings are set as follows: "Streaming: active", "Start streaming: on startup", "Streaming type: broadcast".

11. Exit the menu and go back to the operation menu by pressing

three times.

12. Your VUCAM®+ is now ready for streaming. In order to start the stream, follow the steps in this chapter:

➡ **4.8.5 START STREAM, page 64**

> ⚠ **Broadcasting places substantial demands on network hardware and payload management. This can lead to a temporary network failure. Consult your IT network specialist.**

> ⚠ **To ensure that your VUCAM® works perfectly in professionally set up, equipped and maintained networks, viZaar has taken all precautions and carried out extensive network tests. Due to the multitude of network components and network combinations, viZaar assumes no liability of any kind for network failures. The user is obliged to set up suitable risk management for broadcast operations and to take appropriate measures.**

4.7.5   START STREAM

1. Go back to your PC/Laptop. Make sure that you have installed VLC media player (standard configuration). If you have closed the folder earlier on, go to your desktop and double-click the folder "VuCAM_network_config". Now, double-click the sub-folder "Computer_settings" followed by double-clicking the file

View_VuCAM_Stream.bat

The VLC media player opens. You can now watch the stream on your PC/Laptop.

2. **Only if VUCAM®-LAN-PC is chosen:** In order to view the stream on additional devices, follow steps 1 to 6 in chapter 4.8.4.2.

Start the stream on your PC/Laptop by double-clicking the file **"View_VuCAM_Stream.bat"**. You find that file in the folder "VuCAM_network_config" -> "Computer_settings". You can now watch the stream on your PC/Laptop.

3. In order to watch the stream on additional devices, follow these steps:

A. Copy the configuration file on the desktop of the additional device on which you intend to watch the stream.

B. Right-click the file **"ViZaar.VuCAM.Network.Configurer.exe"** that you just copied onto your device and select "Run as administrator" in the context menu. If Windows asks you if you want to open the program, click "Yes".

C. The initial screen of the configuration program appears on the screen of your device. Here you can find general information and the version number of the software. To proceed, press at the bottom right on

D. Check the box next to "Configure computer for streaming" and proceed by clicking

E. The configuration program tells you that a folder named **"VuCAM_network_config"** has been saved to your desktop.

F. Exit the configuration program by pressing

G. Open the folder "VuCAM_network_config" on your desktop. Then open the subfolder "Computer_settings". Right-click the file
View-VuCAM-Stream.bat
and select "Run as administrator" in the context menu. If Windows asks you if you want to open the program, click "Yes".

H. The VLC media player opens. You can now watch the stream on this device.

4.7.6   PUSH TO FTP

1. Follow the steps 1 to 7 in chapter 4.8.1. In this manual we use the viZaar® test server as an example.

➡ **4.8.1 CONFIGURING THE TARGET DEVICE, page 58**

Note: In order to use "Push to FTP", you have to **choose one of the VUCAM®-LAN-PC alternatives for streaming**.

➡ **4.8.4 VUCAM®-LAN-PC, page 61**

2. In the following menu, choose "network and streaming configuration" and confirm your selection by clicking

3. In the menu "What do you want to do?" select "Push to FTP configuration" by ticking the box next to the text. If you have already made the settings for the option VUCAM®-LAN-PC (unicast or broadcast), leave the box next to "network and streaming configuration" blank. To proceed, click on

Note: If you have not made the settings for the option VUCAM®-LAN-PC, go to chapter 4.8.4.1 resp. 4.8.4.2 and follow the instructions. Afterwards, proceed with point four in this chapter.

> ℹ **Please note that your pictures and videos can only be saved on an FTP server if you have made the settings for VUCAM®-LAN-PC. Which option (unicast or broadcast) you choose does not have any influence on the transfer process.**

4. Make sure that your network has access to the internet, otherwise you might get an error message during the configuration process.

5. In the next window, the option "automatically push files to FTP" is activated by default. Leave it at that option. If you want to use your own FTP server, enter the data in the fields below. If you want to use our test server, check "use viZaar test-server instead". The fields "IP or domain of FTP server" as well as "Username" and "Password" in the lower area will be filled in automatically. "Remote directory" remains empty. The data is stored in the root folder of our server.

6. Write down the login data of the viZaar® test server (i.e. "Username" and "Password"). You will need them to log in later on. Press

to proceed.

7. "Please wait..." on white background is now displayed on screen. The program now executes the configuration. If your firewall pops up, please allow the configuration file access to the network by ticking the box and clicking on "Allow access".

8. After a short wait the configuration data has been created and successfully saved on your SD card. The configuration program tells you in which folder and drive the files have been saved. In addition, a folder named "VUCAM" has been saved on your desktop. Exit the configuration program by clicking

9. Remove the SD card from your PC/Laptop and insert it into your VUCAM®+.

> ℹ **In order to use "Push to FTP", a SD card has to be inserted in your VUCAM®.**

10. Open the setup on your VUCAM® by pressing

11. Select "system settings" using the arrow keys and confirm your selection by pressing

12. Now choose "configuration data" using the arrow keys and confirm your selection by pressing

13. You now find two files in the menu. The first one is **"Custom_Netw_dyn.cfg"** which you have already loaded earlier on. If not, please read the chapter 4.8.4.

14. Select the file **"Custom_FTPUpl_test-vizaar.cfg"** using the arrow keys and confirm your selection by pressing

Your VUCAM®+ will now reboot. After approximately 30 seconds, the network file is successfully loaded and you will find yourself again in the operation menu.

15. Files will be now uploaded to the FTP server as soon as you now start recording an image or video.

In order to start video recording, press

or

Touchscreen   VUCAM handle

To stop your recording, press the respective button again.

In order to record an image, press twice

or

Touchscreen   VUCAM handle

More information on how to record images or videos:

➡ **3.4 IMAGE AND VIDEO RECORDING, page 30**

16. This buttons is red as long as your VUCAM® uploads your media to an FTP server:

> ⚠ **When using our test server, please note that the uploaded data is deleted every day with an odd number at 1 AM. Make sure you back up your data and do not upload sensitive data!**

5.1 OPTION: OPTICAL-ADAPTER

Various opional optical adapters are available for the VUCAM®-XO/XF system. To mount a optical adapter, proceed as follows:

➡ **3.7 CHANGING THE OPTICAL ADAPTERS, page 34**

5.2 OPTION: SHOULDER STRAP

To attach the optional shoulder strap to the system, follow these steps:

1. Attach the first two connectors to the upper

A   Attach shoulder strap here

part of the handle (Figs. 1a and 1b).

2. Attach the third connector to the hand strap (Fig.

2).

3. Put the shoulder strap around your neck. The

VUCAM® is now ready for use.

5.3 OPTION: ADDITIONAL BATTERIES

💡 **Operating time: approx. 2 hours. Loading time: approx. 1.5 to 2 hours.**

To remove the batteries from the VUCAM®, follow these instructions:

➡ **3.8 CHANGING THE BATTERY, page 35**

ℹ **The batteries cannot be charged in the device at ambient temperatures below 0°C and above +60°C!**

To charge the batteries, follow these steps:

1. Connect either the supplied power supply of the VUCAM®, the car charger plug or the supplied USB-to-Mini-USB cable to the charger. Now connect the charger to the mains (power supply), the cigarette lighter of your vehicle (car charger plug) or to a computer/laptop (USB).

2. Make sure the charging mode ist set to „Li-FeP"

Li-FeP

⚠ **Charging the batteries in any other mode will damage the batteries!**

using the two black buttons below the display.

3. Put the batteries in the battery charger. The batte-

ries are now being charged.

⚠ **Remove the batteries from the VUCAM® and from the charger before taking long breaks or long storage periods. Never store the system with completely discharged batteries!**

4. As soon as the batteries are fully charged, the text "FULL" appears on the diplay of the charger. You can now remove the batteries from the charger and reinsert them into your VUCAM®.

➡ **3.8 CHANGING THE BATTERY, page 35**

💡 **Classification of batteries: UN 3481 Lithium-ion batteries packed with equipment.**

6.1 MAINTENANCE BY THE MANUFACTURER

Even if your device is fully functional, routine maintenance and inspection by viZaar® is recommended annually in order to ensure the high level of performance expected of a viZaar® product. **Our contact details can be found on page 3 before the table of contents.**

- Inspection of the probe, the articulation section and the camera for watertightness.

- Inspection or exchange of the seals on the camera lens, inspection of the camera and optical qualities.

- Full inspection of the length of the probe section, inspecting for crushing damage, braiding damage and overall condition. Any damage will be fully documented.

- Inspection and test of the illumination system (LED and light guide).

- Safety check in accordance with accident prevention regulations and VDE.

- Final report.

Using the preventative maintenance program can prevent unexpected failures and expensive repairs. We recommend annual maintenance intervals or after 480 hours of operation.

> ⚠ **viZaar® is not liable for accidents or equipment damage caused by repair attempts by unauthorized persons. viZaar® does not repair systems that are contaminated with hazardous substances.**

6.2 CLEANING

In this subchapter you will find information and tips for cleaning your VUCAM®.

6.2.1 CLEANING THE SYSTEM

The system and components can be cleaned with a wet cloth and soapy water. If it is very dirty, contact our customer service for advice, before using strong cleaning agents.

6.2.2 CLEANING THE PROBE

A dirty probe, if waterproof, can be cleaned with soapy water.
A optical adapter can be cleaned with a very soft cotton swab and a little acetone or pure alcohol.

6.3 TRANSPORT

The system can be shipped with an optional case without outer packaging by courier service or transported by yourself. The case should be strapped to prevent accidental opening.

> 💡 **Due to the strict requirements of courier services on the packaging, we recommend that all fragile accessories are well stowed with bubble wrap.**

6.4 CUSTOMER SERVICE

If you experience problems or malfunctions that are not listed in the operating instructions, please contact your official sales and distribution partner or our customer service.

Our contact details can be found on page 3 before the table of contents.

7.1 DISPOSAL

Please read this chapter on disposal of the system and the batteries carefully.

7.1.1 DISPOSAL OF THE SYSTEM

All devices by viZaar® described in this manual will be taken back free of charge for the disposal of viZaar® upon request of the owner. viZaar® will not be responsible for the costs of delivery. The device has to be in clean condition without adhering product residues or other toxic contaminations. The device must never be disposed of with public household or bulky waste, but must be separated into components of the same type and fed into the commercial recycling circuit.

7.1.2 DISPOSAL OF THE BATTERY

The device contains electrochemical (storage) backup batteries and small amounts of heavy metals, which must be disposed of and recycled professionally within the EU in accordance with the applicable guidelines.

LiFeP04

7.2 EU DECLARATION OF CONFORMITY

The VUCAM® series of devices carries the CE marking and has been designed in compliance with the European directives 2014/30/EU and 2014/35/EU.

The declarations of conformity are held by the manufacturer:

viZaar industrial imaging AG
Hechinger Straße 152
72461 Albstadt / Germany
+49 7432 98375-0
+49 7432 98375-50

The manufacturer declares that the following products:

- VUCAM® XO/XO+ in lengths:
  2.2m | 3.3m | 6.6m
- VUCAM® AM/AM+ in lengths:
  1.1m | 2.2m | 3.3m
- VUCAM® XF/XF+ in lengths:
  1.1m | 2.2m | 3.3m

are in compliance with the following standards:

- EN 61000-6-2:2006-03+Ber.1 2011-06
- EN 61000-4-2:2009-12
- EN 61000-4-3:2011-04
- EN 61000-4-4:2013-04
- EN 61000-4-5:2015-03
- EN 61000-4-6:2014-08
- EN 61000-4-11:2005-02
- EN 61000-6-4:2011-09
- EN 55011:2011-04

Albstadt, November 2019

Kersten Zaar (CEO)

QUALITY IS OUR FOCUS!

In order to provide you with the most innovative and reliable products and services at highest level, we are constantly working on progress in all our business areas.

This is an ongoing process of our employees and processes, which are certified by experts.

DIN / EN / ISO 9001

DIN / EN / ISO 14001

SCCᴾ

KTA 1401