



Instruction Manual

X2U / X4U

EN



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1. Foreword

We thank you for purchasing our product and welcome you to IT Concepts!

Diverse inspection objects, materials and lighting conditions often make it difficult to obtain sharp and high-quality images. Our product is easy to adjust to your application to obtain optimal inspection images even in difficult situations.

Always keep the operating instructions of our endoscope system nearby. It contains all important information for safe and efficient operation of the system. Read this manual carefully before using the system to ensure proper operation.

This system is for viewing the inside of materials, machines, components and other objects without damaging them. Should you have any further questions, please contact our service team.

2. Warnings and Precautions

Symbols and terms



Danger

Describes a dangerous situation which can lead to serious injury or even death if the operating instructions are not followed.



Caution

Describes a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

"Caution" – signs may also refer to unsafe use or a possible resulting material damage.



Notice

Points out additional information.

General warnings and precautions



Danger

Do not use this system to view the inside of people or animals!

Do not use the system in areas with explosion hazards!



Caution

Do not open the housing. There is a risk of electric shock from live parts.

Do not use the system in running or electrically live objects. There is a risk of electric shock to the user.

Stop using the appliance immediately if smoke rises from the appliance, it smells abnormal, unusual noises are produced or other unusual operating phenomena occur.

Before storing the system, be sure to turn off the power and remove the battery.

When using power supply units without protective ground connection and without electrical isolation, voltage may be conducted on the tungsten braid. Therefore, only power supply units authorized by us should be used.

Do not use the system if condensation has formed. If condensation has formed inside the lens and you continue to use the system, the system may be damaged.

Do not use the system while it is wrapped in a plastic bag or similar. This will hinder cooling of the system.

Only use accessories approved by us.



Caution

Avoid damage, shocks and dropping the device.

Do not use the probe if it may come into contact with liquids other than fresh and saltwater, diesel oil or machine oil.

Do not continue to use the device if there is an unusual behavior of the angulation. Do not use force when using the angle control.

Prevent the lens from falling. The lens optics may be damaged if the lens is dropped.

Prevent the system from falling when cables or other devices are connected. The connections may be damaged.

If system connections are wet or dirty, clean the connections first before continuing to use the system.

Do not open any connections if your hands are wet or you are in an environment with high humidity.

Do not remove the battery or AC adapter while the system is in operation.



Caution

Do not continue to use the device when the battery indicator is flashing. Switch off the device and use an external power supply. The device may power down when the battery level is low and unsaved data may be lost.

Do not exert excessive force when removing the system from the case.

Further specific safety measures can be found in the chapters under the description of handling.

Warnings on handling the battery



Danger

Only use the battery authorized by us.

Prevent short circuits between the contacts.

Prevent the battery electrodes from being connected by metal objects. Do not transport the battery together with other metal objects.

Prevent the battery from getting wet.

Do not throw the battery into fire and do not expose the battery to excessive heat.

Do not open or modify the battery pack.



Danger

Do not puncture the battery or hit it with any object.

Do not use the battery in places where it is exposed to extreme heat or direct sunlight.

If battery acid should get in your eye when the battery is damaged, it can cause blindness. Rinse your eye with tap water and consult a doctor immediately.



Caution

Do not cover the charger during charging.

If the battery gets hot during the charging process, noises are produced, smell or smoke develops, stop the charging process immediately.

Do not use batteries that are leaking liquid, deformed, discolored, or show other unusual signs.

Rinse leaked battery acid immediately from your skin or clothing. Consult a doctor if necessary.

Ensure that there are no foreign objects in the battery compartment or that the battery compartment is not deformed.

Do not use commercially available travel adapters when charging the device.

Do not store the battery in very hot or cold places.

Avoid touching the battery contacts with wet hands.

Should the device not be used for a longer period of time, remove the battery from the device and store it in a dry place.



Notice

Charge the battery fully before first use or after a long period of storage.

If the battery is used outside the recommended operating temperature, this may result in reduced performance and operating time.

Notes on disposal and recycling



Our system is an electronic device and must not be disposed of in household waste. According to the European Directive 2002/96/EC on electrical, electronic and waste equipment and its implementation in national law, power tools that are no longer in use must be collected separately and recycled in an environmentally friendly manner.



Recycling. Take-back of batteries according to battery regulation (BattV): According to battery regulation (BattV) we are obliged to inform you about the regulations and obligations for disposal and taking back of used batteries and accumulators. End consumers are obliged to return used batteries and accumulators according to §7 BattV. Batteries and accumulators containing harmful substances are marked with a crossed-out wheeled bin, under which the chemical symbol of the heavy metal they contain appears (Cd for cadmium, Hg for mercury and Pb for lead). Batteries and accumulators must not be disposed of with household waste. They can be disposed of free of charge at any collection and return point provided for this purpose. Batteries and accumulators received from us can of course be returned or handed over to us after use.

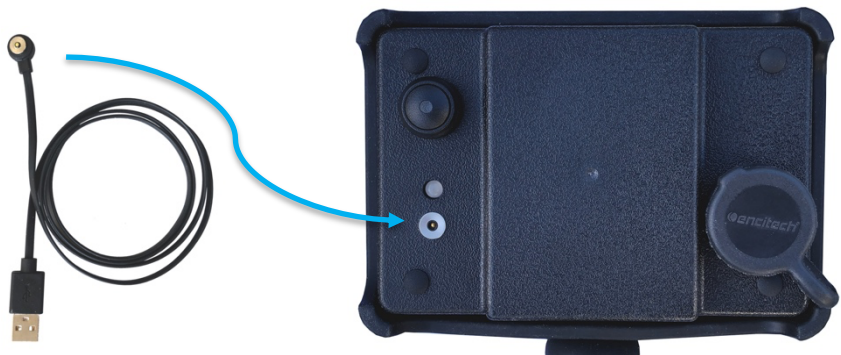
3. Introduction



- | | |
|-----------------------|---|
| 1) Documentation unit | 7) Power button on/off with LED |
| 2) 4.3" Touch screen | 8) Status LED |
| 3) Articulation 2-way | (blue = loading / green = charging completed) |
| 4) Articulation 4-way | 9) Magnetic charging port 5V DC / 1A (5W) |
| 5) Bend protection | 10) USB connector / no charging |
| 6) Sun shield | 11) USB protection cap |

Preparation of the power supply

Charging the battery



- **Caution**
Only the supplied charging cable may be used to charge the battery.
- **Caution**
Do not use USB port for charging
- **Caution**
Always unplug the power cord by the plug. Pulling on the power cord may cause damage and malfunction.
- **Caution**
Warning when charge level reaches 20%

Switching on the system

To turn on the system, press the Power button on backside.

The system will start and show the home screen.

The LED lights up blue when the device is switched on

To switch off the system after use, use the button again.

- **Caution**

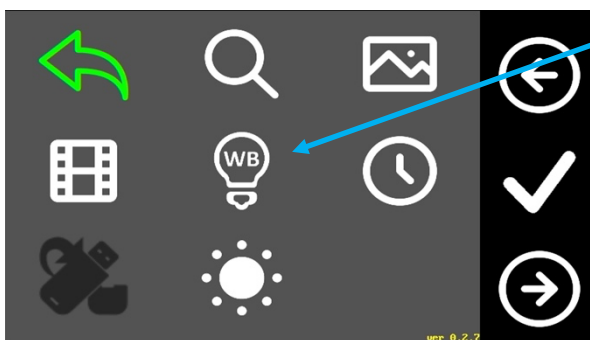
The LED illumination starts directly by switching on the system. Do not look directly into the light of the distal end, this can cause permanent damage to your retina.

Setting of white balance

Perform white balance before using the system.

To perform the white balance, hold a white, non-reflecting object, such as a white sheet of paper, about 20mm to 40mm in front of the lens. Then push white balance button at the device. The image is frozen for a few seconds. After that the white balance is done.

White balance is used to adjust the camera to the color temperature of the light source.



Checking the deflection unit and control.

First, lay the probe out straight. To check the mobility of the deflection unit, first move the control lever U/D from one maximum position to the other so that the deflection unit moves in a vertical plane. Then set the control lever to the neutral position again.

Move the control lever R/L (only X4U) analogously so that the deflection unit moves in a horizontal plane. Then return the control lever to the neutral position.

- **Caution**

If problems occur during this check, discontinue use and contact our technical service.

Inspection before and after use

Before and also after use, the components of our system must be checked for damage or soiling. The following part lists what has to be checked and if there is a fault or contamination, how to remedy it.

Head unit

Is there any dirt, e.g. foreign bodies such as dirt or liquid on the housing, the battery compartment cover or one of the connectors?

If so, please observe the cleaning instructions under "Cleaning and care" -> "Main unit".

Are there any damages, e.g. cracks, deformations or other conspicuous features?

If so, this component must be repaired or replaced. Please contact us.

Display

Is there any dirt, e.g. foreign bodies such as dirt or liquid, on the system display?

If so, please observe the cleaning instructions under "Cleaning and Care" -> "Display".

Are there any damages, e.g. cracks, deformations or other conspicuous features?

If so, this component must be repaired or replaced. Please contact us.

Probe

Is there any contamination, e.g. foreign bodies such as dirt or liquid, on the probe or the sheathing?

If so, please observe the cleaning instructions under "Cleaning and Care" -> "Probe".

Are there any damages, e.g. cracks, deformations or other conspicuous features?

If so, this component must be repaired or replaced. Please contact us.

Distal end

Is there any contamination, e.g. foreign bodies such as dirt or liquid, on the probe or the sheathing?

If so, please observe the cleaning instructions under "Cleaning and Care" -> "Distal end".

Are there any damages, e.g. cracks, deformations or other conspicuous features?

If so, this component must be repaired or replaced. Please contact us.

- **Caution**

The distal end can heat up during use due to its own heat or heat from the inspected object. Do not touch the distal end immediately after use, let it cool down first to avoid burns.

Do not inspect an object until the distal end has been cleaned to avoid damage.

Never use the system if you detect a loose component. Loose components can fall into the object to be inspected.

Lens

Are there dirt or water drops on the outside or inside of the lens or on the lens thread?

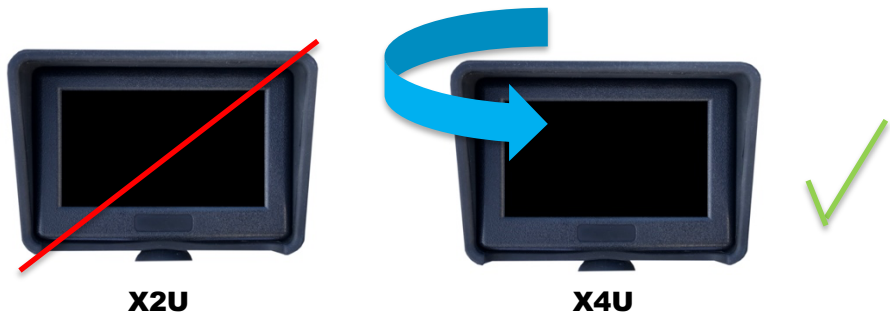
If so, please observe the cleaning instructions under "Cleaning and Care" -> "Lens".

Are any components loose, deformed or is the lens thread worn out?

If so, the component must be repaired or replaced. Please contact us.

4. System operation

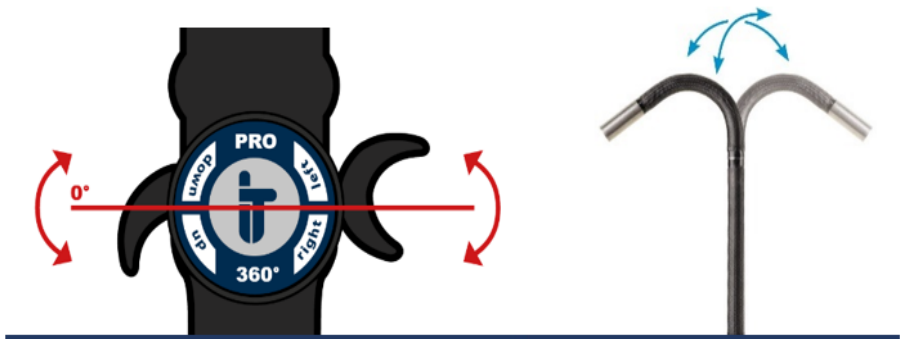
Rotating the display unit



Control the deflection of the endoscope

The deflection unit can be moved in two planes (see figure) using the control levers.

The figure shows the operating levers in the "neutral" starting position. In this position, the angular deflection unit is straight.



Passing bends

Expansion and bending of the object to be examined must be large enough to allow the movement of the bending unit and the probe head. Prior to inspection, the general feasibility shall be checked visually or by means of a design drawing.

The procedure described below must be carried out analog to the described procedure for each bending. If resistance or other problems occur, the probe must be carefully withdrawn.

Figure A

Under observation via the display the probe is careful inserted until the beginning of the bend.

A

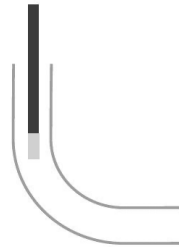


Figure B

With simultaneous observation via the display move the angular deflection unit through the bend of the cavity by means of the control levers

B



Figure C

The insertion process is to be continued under observation on the display
The angle of the deflection unit must be adjusted to the curvature of the object bit by bit during the further course of insertion process.

C



Figure D

After passing the bend the angular deflection unit is returned to the neutral position using the operating levers.

D



Retracting the endoscope

When retracting the endoscope, the deflection unit must first be straightened, i.e. the control levers must be positioned in the neutral position.

By observing the display and moving the operating levers accordingly, an even distance between the probe head and the walls of the room must be maintained during the return process.



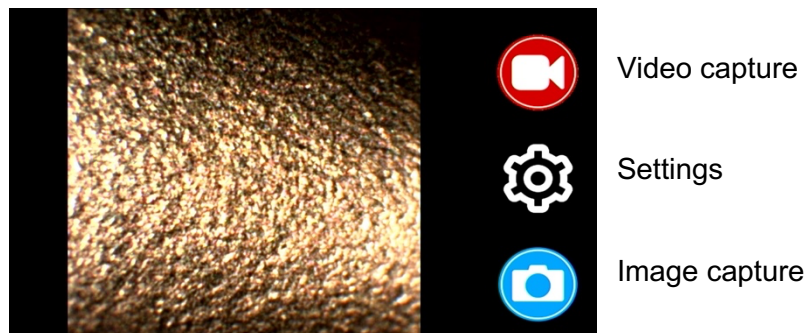
- **Caution**

Both control levers of the deflection unit must be brought into the neutral position before retracting the probe!

- **Notice**

If there is resistance during retraction, it is advisable to rotate the probe slightly in both directions around its longitudinal axis and move it carefully back and forth until the probe is released.

5. Operating System



Settings:

1 2 3 4

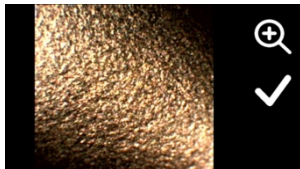


1	2	3	4
Go back	Zoom	Image gallery	Move left
Video gallery	White balance	Set date & time	Select
Brightness of the LED	Move data to USB*		Move right

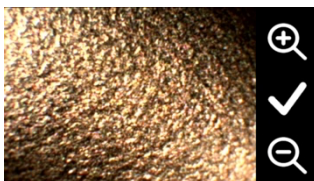
* Only visible if USB storage is inserted. otherwise USB icon is grey colored

Zoom settings:

Standard Zoom/View



1 x Zoom



Zoom in

Zoom out

2 x Zoom



Zoom out

Image gallery:



Previous image

Back to home screen

Next image

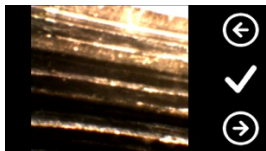
By touching the screen one's, operation panel will remove.

To show operation panel touch again

Video gallery:

Tap on screen play/pause video.

Video playing

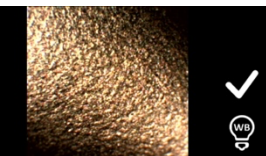


Previous video

Back to home screen

Next video

White balance:



Back to home screen

White balance (page 13)

Set time & date:

Tap on screen to advance to next value.

Set date

23/03/2021

10:56:22

UTC:+02

+

✓

-



Set time

23/03/2021

10:56:22

UTC:+02

+

✓

-



Set timezone

23/03/2021

10:56:22

UTC:+02

+

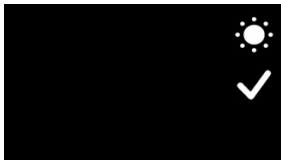
✓

-

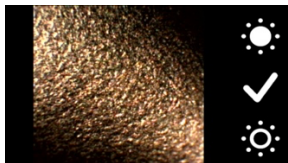


Setting light:

LED off



2nd brightness level



10th brightness level

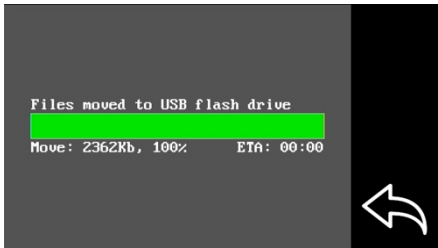


Brighter

Back to home screen

Darker

Move data to USB:



Back to home screen

Caution

By moving data to USB the storage at the device will be completely deleted

6. Cleaning and care

Cleaning the probe

If the probe is dirty, use a cloth moistened with clean water or a soft sponge and then wipe it with another dry and clean cloth.

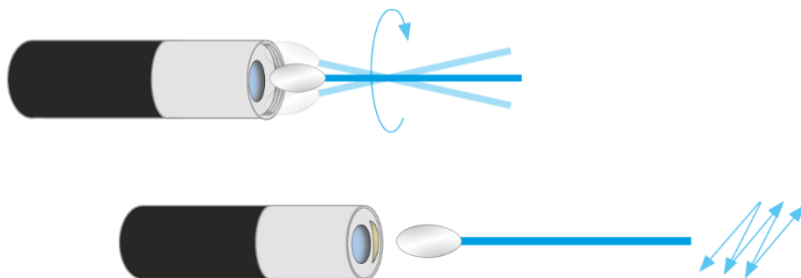
- **Caution**

Dirt on the probe must be removed immediately after use. If the contamination remains for a longer period of time, this can lead to corrosion of the tungsten braiding.

Cleaning the distal end

Dirt on the lens

Hold the distal end by the sheath and remove dirt or moisture with a clean and dry cotton cloth or cotton swab. If necessary, use a cloth or cotton swab moistened with water.



- **Caution**

Make sure that no dirt or moisture remains on the distal end. This can lead to disturbed illumination, increased heat development and damage to the lens or distal end.

Dirt on the lens thread

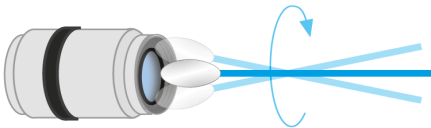
If possible, use a small brush or a cotton swab to remove existing dirt or liquid residues.

Regular cleaning will maintain the water resistance.

Cleaning the lens

If the removable lens becomes dirty, use a clean and soft cotton cloth or cotton swab. If necessary, use a cloth moistened with a commercially available ethanol solution and then wipe it with another dry and clean cloth.

If the back of the lens is dirty, use a cotton swab moistened with a commercially available ethanol solution and clean until no more residue is left on the cotton swab.



- **Caution**

Do not use rough or hard cloths, they may damage the lens and reduce the image quality.

Cleaning the display

If the display is dirty, e.g. by fingerprints, use a cloth moistened with clean water and then wipe it with another dry and clean cloth.

- **Caution**

Do not use solutions containing alcohol such as ethanol or isopropyl alcohol solutions, these are too aggressive and can damage the display.

Do not use dirty or hard cloths, they can scratch the display.

Cleaning the main unit

If the main unit becomes dirty, use a cloth moistened with clean water and then wipe it with another dry and clean cloth.

- **Caution**

Never clean the system under running water.

- **Notice**

Make sure that any dirt on the battery compartment, the connector for the multi-port, the connector for the power source and the USB connector is also removed.

Battery

Battery life depends on the ambient temperature and the frequency of use. However, if the battery life is unusually short, please contact us for information.

Storing the system

Turn off the system or disconnect the power cord. Align the deflection unit so that it is straight.

Also observe the points listed under "Before and after use".

Store the system at normal room temperature and humidity. For details on storage temperature and humidity, refer to the specifications, for each unit, starting. Store the system on a flat surface.

- **Caution**

Prevent kinking, pulling and twisting of the probe.

7. Standard scope of delivery

- 1) Device
- 2) Magnetic charging cable



- 3) USB charger



8. Service

If your system should show an error, please do not hesitate to contact us! We will process your request quickly!

In order to facilitate troubleshooting and reduce processing time, we ask you to fill out the return form and inform us in advance of the reason for return.

Do not open the system by yourself! Repairs may only be carried out by IT Concepts GmbH.

Many thanks!

Contact

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9. Technical data

	X2U 2-way	X4U 4-way		
Control unit				
Display size:	4.3"			
Resolution:	800x480 Pixel			
Power supply:	5 V DC			
Working time:	smart power function, chargeable with a powerbank			
	6 hours / expandable			
	up to more than 6 hours (smart power)			
Storage:	Internal memory / USB stick			
Video format:	MPEG4 (.avi)			
Image format:	JPEG (.jpg)			
Ergonomics:	One hand operation			
Housing:	Rugged PU			
Tip operating temperature:	-25°C to +80°C			
System operating temp.:	-25°C to +46°C			
Storage temperature:	-25°C to +60°C			
Relative humidity:	95% less than - non condensing			
Dimensions Head (mm):	94 x 134 x 55	94 x 134 x 55		
Dimensions Handle (mm):	342 x 48 x 59	315 x 85 x 90		
Weight:	580g without probe			
Insertion tube				
Image Sensor:	AIT advanced CMOS image sensor			
Direction of view:	0°			
Field of View (FOV):	90°			
Depth of Field (DOF):	10 to 80 mm			
Illumination:	High power LED on the Tip			
Lamp life:	up to 50,000 hours			
Tube construction:	Durable multi-layer tube with tungsten braid on PU jacket			
Protection class:	Distal end	67		
	Probe	67		
	Handle	54		
	Control unit	65		
PROBES (mm)				
	X2U	X2U	X4U	X4U
	4.0	6.0	4.0	6.0
Working length (m):	1.0	1.0	1.5 / 2.0 / 3.0	1.5 / 2.0 / 3.0
Articulation:	2-way	2-way	4-way	4-way

Revision 0.0

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