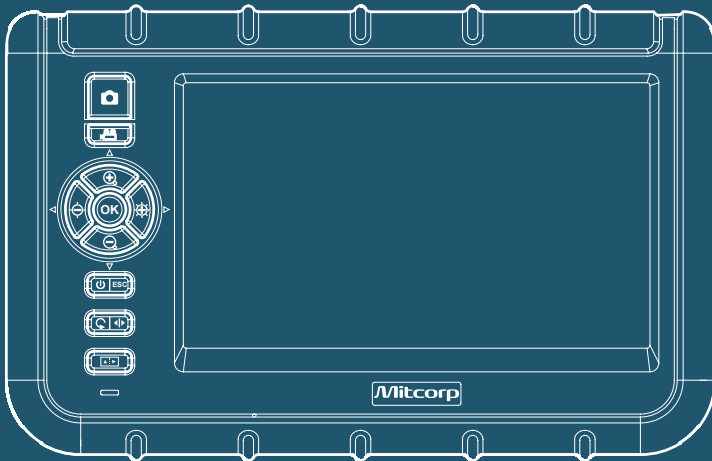


X1000

VIDEOSCOPE SYSTEM

User Manual



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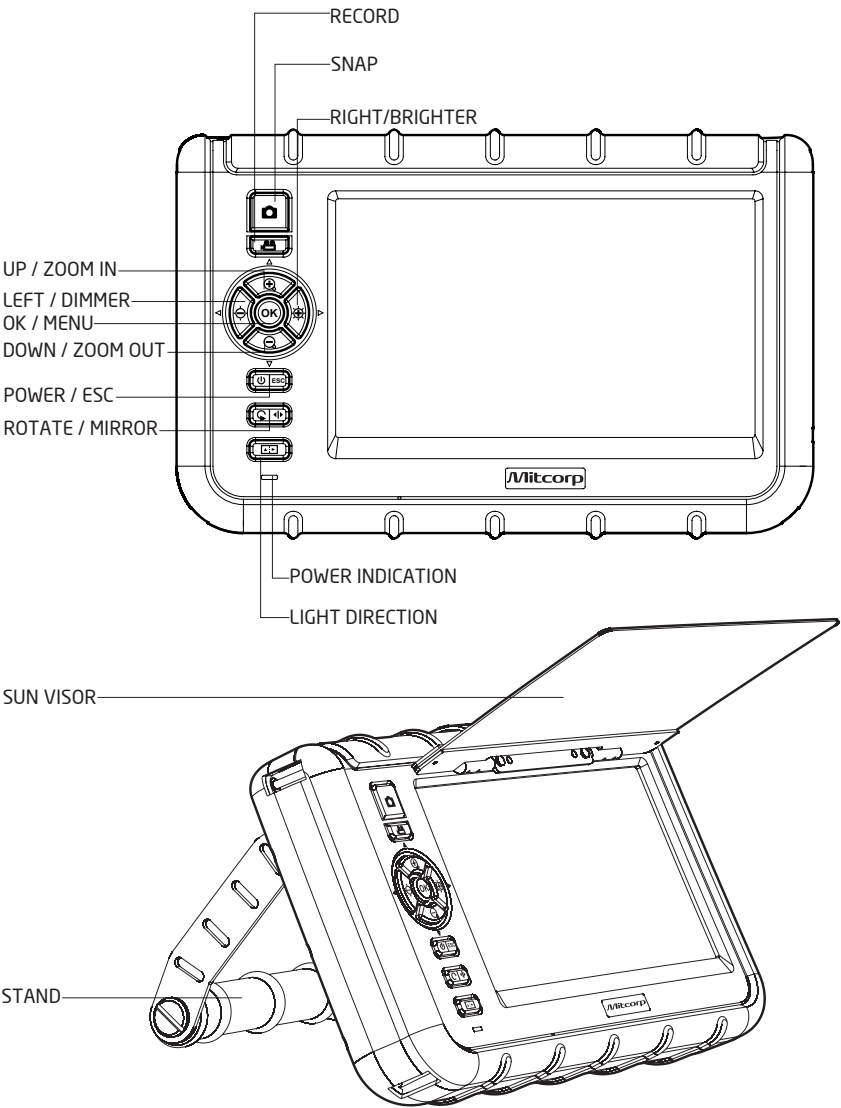
System Unit.....29

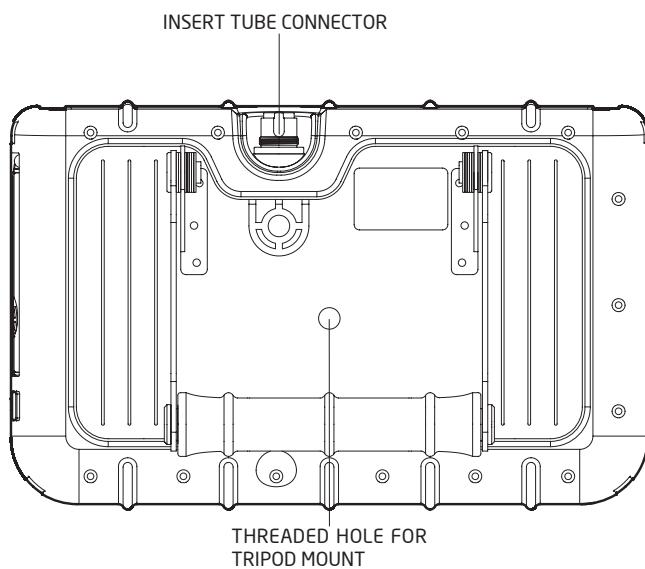
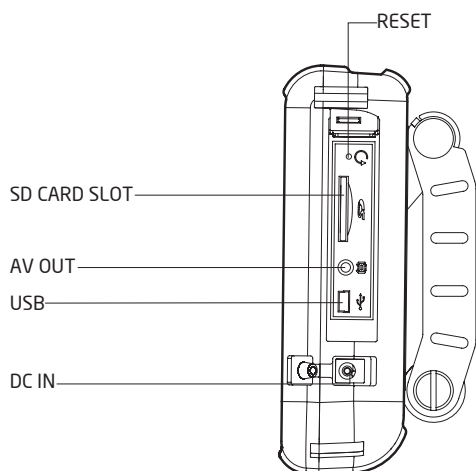
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INTRODUCTION

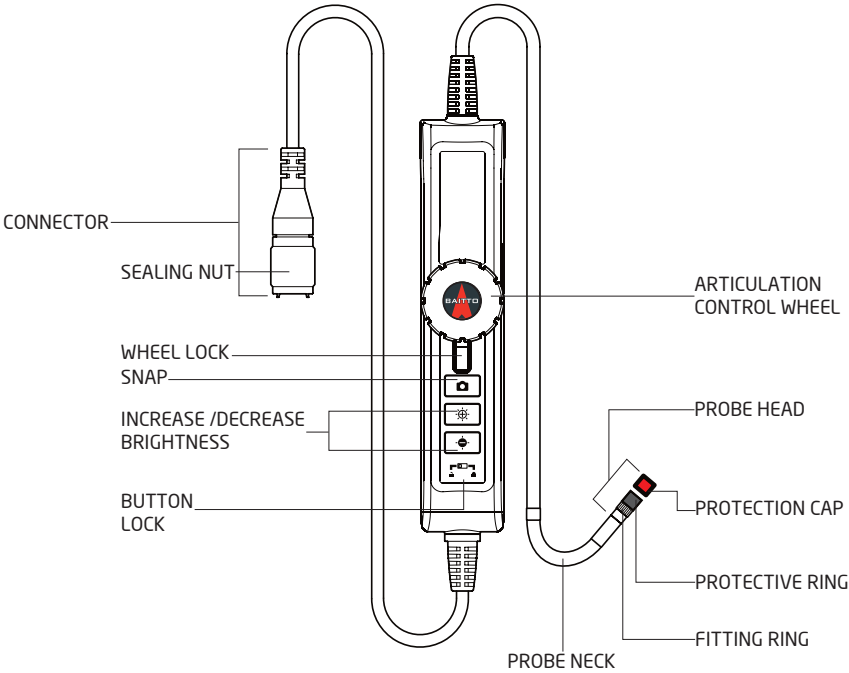
SYSTEM OVERVIEW

System Unit

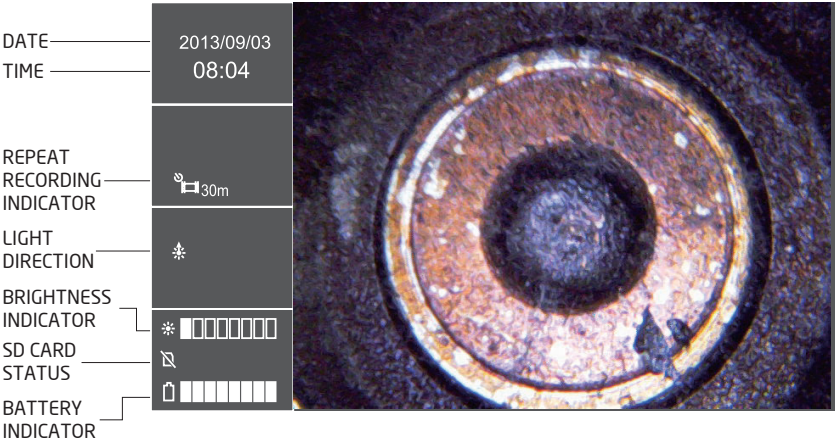




Insert Tube



Screen Display



Frequent operations

Setting Up the System

1. Remove the Insert Tube and the system unit from the case.
2. Attach the to the system unit
 - Connect the tail cord connector of the Insert Tube to the input connector of the system unit, screw tight the sealing nut.
3. Power on the system by press and hold the **ESC** for 3 seconds.
4. Insert the SD card
 - Open the peripheral cover on the side of the system unit and insert the SD card.

Capturing Images

1. Guide the probe to the inspection area.
2. Aim the camera
 - Deflect the probe tip by rotating the control wheel.
3. Capture the image.
 - Press  to capture desired image.
 - Hold  to keep freezing the frame.

Recording Video

- Press  to start recording video.
- Press  again to stop recording.

Review Images or Videos

- Press **ESC** to enter browse mode.
- Press **OK** to start playing recorded video.

Turn Off the System

- Press and hold **ESC** for 3 seconds to turn off the system.

About the battery

The system is powered by a non-interchangeable Li-Polymer battery, which provides approximately 6 hours capacity while fully charged. It takes about 3 hours for the battery to be fully charged from empty. The system must be charging at room temperature for best charging capacity.

About the SD card usage

The X1000 videoscope system uses SD card to storage captured images and videos. The estimated total images and video length on a par with SD card capacity is shown below:

SD card Capacity	4 GB	8 GB	16 GB	32 GB
Total Images	31130	62259	124518	249037
Video Length	135 mins	270 mins	539 mins	1079 mins

LEGAL AND OTHER NOTICES

This Mitcorp product is warranted to be free from defects in material and workman shop for 1 year from the date of purchase. Mitcorp agrees to repair or replace the product, at its own option and at no charge. This warranty shall not apply to any product, which has been subject to connect to a faulty accessories, alteration, negligence, accident or to any product which has been installed other than in accordance with these instructions.

Warranty is subject to void under unauthorized attempt to disassemble the system unit, insert tubes or modification of any kinds, even attempted only, of the system. Mitcorp will not be responsible for damages caused by following situations:

- Defaced, modified or removed serial number label or warranty seal
- Modifications of components without Mitcorp's authorization
- Damages caused by natural phenomena or uncontrollable forces, such as lightning, flooding, fire, earthquake...etc.

WEEE NOTICE

- The cross-out wheeled bin symbol indicates that according to the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment, this product must be collected in a separated way instead of being disposed of as unsorted municipal waste.
- Contact your local dealer for procedures of recycling this equipment.

CE NOTICE

The X1000 Videoscope System is in conformance with the following standards:

- 1999/5/EC Radio and Telecommunications Terminal Equipment Directive.
- 2004/108/EC Electromagnetic Compatibility Directive

FCC NOTICE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation

Federal Communications Commission Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RoHS NOTICE

The X1000 Videoscope System is in conformance with the requirements of the European law on the Restriction of Hazardous Substances (RoHS) directive. This means that our product is both lead-free and without the hazardous substances either in the manufacturing process or in the final product

CONTACT INFORMATION

Please contact the store you purchased for assistance if you have any question about this product.

CHEMICAL COMPATIBILITY

All insertion tubes made by Mitcorp passed following liquid immersion test:

- Water
- Engine oil
- Brake fluid oil (DOT4)
- Unleaded Gasoline
- Diesel
- Transmission oil

SAFETY GUIDE

USER MUST PAY ATTENTION TO THE INFORMATION PROVIDED HERE TO ENSURE SAFETY.

We suggest you read the following statements carefully before using the system.

**WARNING**

If this product is used without observing the information given under this symbol, it might cause injuries or loss of life.

CAUTION

If this product is used without observing the information given under this symbol, it might cause to this product.

**WARNING**

HAZARD ENVIRONMENT

- Do not use this system in explosive environments such as gasoline or alcohol storage tank.

**WARNING**

FLAMMABLE GASES

- Do not use this system near flammable gases.

**WARNING**

INDUSTRIAL USAGE ONLY

**WARNING**

INTENSIVE LIGHT MAY CAUSE EYE INJURY

- Avoid looking at the probe head while LED is on.

CAUTION

CERTAIN SUBSTANCES MAY DAMAGE THE PROBE

- Please refer to Chemical Compatibility section on page 10 please contact the store you purchased for unsure chemical solutions for further information.

INSPECTION AND CAPTURING FUNCTIONS

STEERING THE PROBE

Put the insert tube into the opening hole of the target, hold and steer in the inspection area.

To articulate the probe neck, rotate the control wheel on the handset. Push aside the stay latch to lock the deflection angle.

ZOOMING

When viewing in live image, you can zoom in and zoom out by pressing ⊕ and ⊖. The zoom ratio is linearly scale from 1.0x to 4.0x.

- Press ⊕ zoom in
- Press ⊖ zoom out

ROTATING AND INVERTING

Sometimes you need to rotate the live image without twisting the probe, or flip live image horizontally when work with reflection mirrors.

To Rotate

- Press 

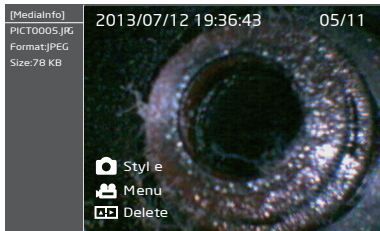
To Flip Horizontally

- Press and hold 

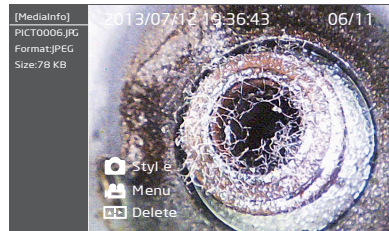
ENHANCING IMAGE EDGE(CLARITY+)

You can enhance the image edge by turning on the Clarity+ option (default is ON). Slight noise might occur while this function is activated.

Main Menu → Function Menu → Clarity+ <On/Off>



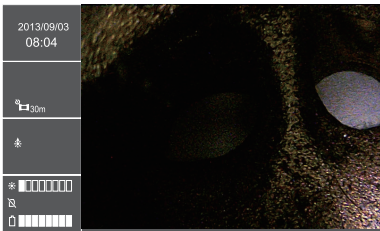
Original



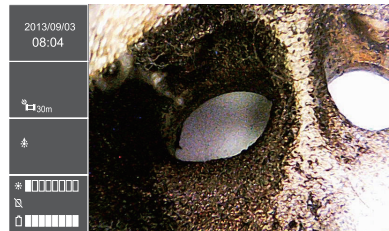
Clarity+

BOOST IMAGE BRIGHTNESS(BOOST+)

In case of operating in very dark environment even the lengthened exposure time doesn't provide enough brightness, you can boost the live image brightness significantly by turning on the Boost+ option. When this function is activated, noise might occur during your inspection.



Original

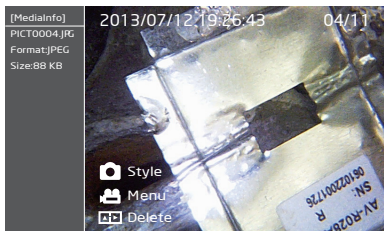


Boost+

ENHANCING IMAGE CONTRAST (NEGATIVE+)

When subtle details are not very obvious in low light environment, you can turn on the Negative+ option. The Negative+ option inverts the live image luminance and enhances the contrast, which will make the small details stand out for inspection.

Main Menu → Function Menu → Negative+ <On/Off>



Original



Negative+

ANTI REFLECTION

While inspect in a shiny metal or mirror surface, you might press  to reduce the reflection



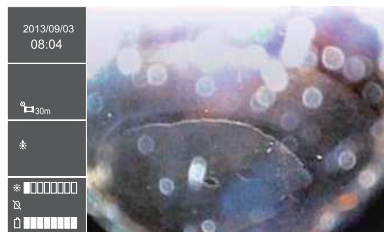
Original



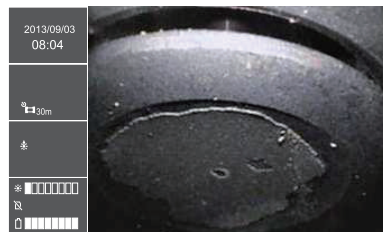
Anti-Reflection

PARTICLE FREE

When you using side view mirror on your inspection, you don't need to wipe out the dust on the mirror, press  to get dust free images



Original



Particle free

CAPTURING AN IMAGE / FREEZING LIVE IMAGE

When the current live image is the one interest you, you can capture the image by pressing . The captured image file name will be shown on the information box on the left sidebar. If  is kept being held, the live image freeze until  is released.

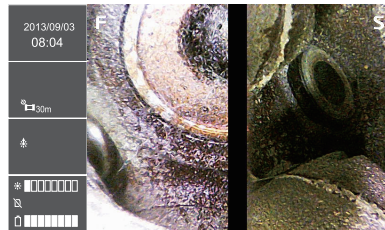
- Press  Capture an image
- Press and hold  Freezing live image

You can also capture image by pressing  from

1. remote control
2. anticalculation probe

DUAL VIEW INSPECTION

When you properly install dual view mirror adaptor, the screen will display front view and side view simultaneously as below.



RECORDING A VIDEO

Recording Operation

You can start recording a video anytime during inspection. Press  once will start the recording session while press  again to stop it. The recorded video file name will be shown on the information box. You can also record voice comment via built-in microphone.

- Press  Start recording video
- Press  again Stop recording video

Note: Rotate / flip and all image manipulation functions are not available during recording.

Repeat Recording

Repeat recording is useful when you want to record videos repeatedly, and each clip is sliced by a pre-defined time length. If the repeat recording function is disabled, the recording operation will cease either when the  button is pressed or by the time video length reaches 30 minutes.

To enable repeat recording:

<MAIN MENU> <REPEAT RECORDING> <5 MINUTES> or <10 MINUTES> or <20 MINUTES> or <30 MINUTES>

To disable repeat recording:

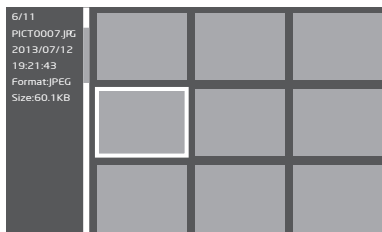
<MAIN MENU> <REPEAT RECORDING> <OFF>

PLAYBACK FUNCTIONS

BROWSE / ALBUM MODES

There are two types of multiple files presentation : browse mode and album mode. In browse mode, 4 file thumbnails are shown in a filmstrip like sidebar, while the current selection is displayed on the right. The album mode on the other hand, displays thumbnails in 3 x 3 grids.

- Press **ESC** in live preview mode enters the browse mode
- Press  to change between the browse mode and the album mode
- Press **OK** to enter single file playback mode.



DELETE FILE

Delete Single File

You can delete single file in the browse mode, the album mode or in the single file playback mode.

- Move selection box to the image you want to erase and press  button.
- Use   to select <YES> and press **OK** to confirm.

Delete Multiple Files

It is possible to delete multiple files simultaneously.

- Move selection box to the file you intend to delete.
- Press  to tag the file of current selection
- When all files intended to be deleted are tagged, press .
- Use   to select <YES> and press **OK** to confirm

Single frame /Close-up Playback

While the browse mode or the album mode is convenient for skimming through captured files. Close-up playback is only available in the single frame playback mode.

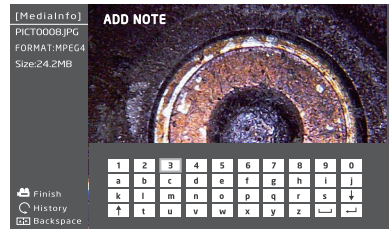
- Move selection box over an image. Pressing **OK** enters single frame playback mode
- Press **OK** to change the close-up playback ratio.
- Use     to move the ROI(region of interest).

ADD NOTE

Annotation is useful if you want to put comparison information or some comments on the image. The X1000 videoscope system supports text annotation. The annotated image will be automatically duplicated and saved.

To annotate:

- Move the selection box on top of the intended image, press  to pop-up the operation dialog, select <Annotate>.
- Use the virtual keypad to select character, pressing  to input character.
- Press  to confirm.
- Press  to backspace.
- Press  to select text from history.

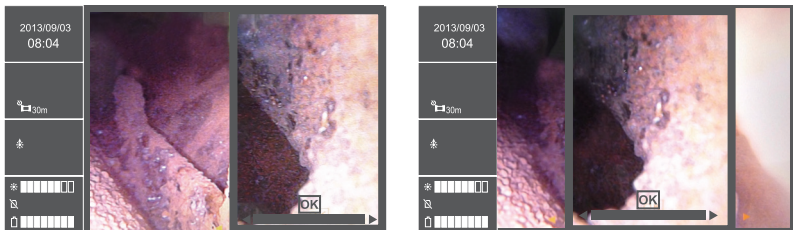


COMPARE STORED IMAGE WITH LIVE VIEW

The side-by-side comparison of a still image with the live view allows user to clearly verify the difference of an area between different times.

To compare:

- Move the selection box on top of the intended image, pressing .
- The comparison window show on the live view, use   to adjust the image offset, pressing **OK** to confirm.
- Press  to pop-up operation box, select <Window pos>, use   to move the window left or right, press **OK** to confirm.
- Press  to pop-up operation box, select <Off> to close the comparison window.



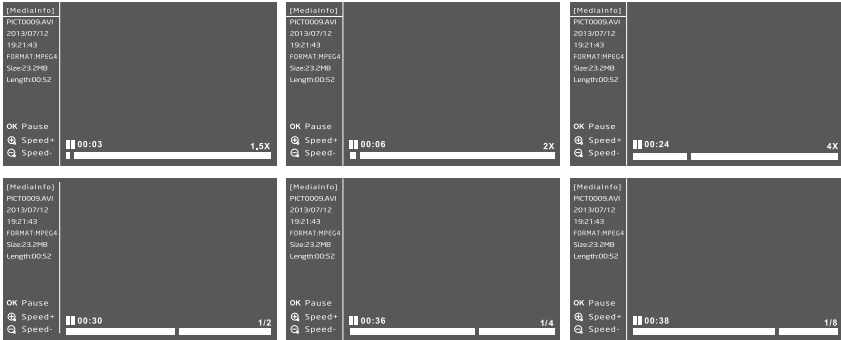
*You can adjust the stored image frame during your inspection on the screen.

Video Playback

The X1000 videoscope system supports various operation during video playback.

To playback a video:

- In browse mode or album mode, move selection box over a video.
- Press **OK** enters video playback mode
- Press **OK** pauses playback, press **OK** again to resume.
- Press **⊕** to speed up playback, press **⊖** to slow down.
- Press and hold **⊕** for fast forward, press **⊖** for fast rewind.



MENU AND SETTINGS

GENERAL MENU OPERATION

- Press **OK** in live view mode to enter main menu.
- Use **⊕** **⊖** to navigate between menu items.
- Press **⊗** or **OK** to enter submenu.
- Press **ESC** to back to upper tier.

IMAGE FUNCTIONS

<Clarity+>

<MAIN MENU> <FUNCTION> <CLARITY+>

- For more information about <CLARITY+>, refer to Enhancing Image Edge (Clarity+).

<Boost+>

<MAIN MENU> <FUNCTION> <BOOST+>

- For more information about <BOOST+>, refer to Boost Image Brightness (Boost+).

<Dual View>

<MAIN MENU> <FUNCTION> <DUAL VIEW+>

- For more information about <DUAL VIEW>, refer to Working with Dual View Mirror .

<Negative+>

<MAIN MENU> <FUNCTION> <NEGATIVE+>

- For more information about <NEGATIVE+>, refer to Enhancing Image Contrast (Negative+).

<Display Grid>

<MAIN MENU> <FUNCTION> <DISPLAY GRID>

- For more information about <Display Grid>, refer to Working with Measurement Tool.

LANGUAGE SELECTION

To change UI language:

<MAIN MENU> <SETTINGS> <LANGUAGE>

- Use   to select desired language, press **OK** to confirm.

ADJUST DATE AND TIME

To adjust system time:

<MAIN MENU> <SETTINGS> <DATE / TIME> <SYSTEM TIME>

- Use   to navigate between fields.
- Use   to adjust.
- Press **OK** to confirm.

To change time format:

<MAIN MENU> <SETTINGS> <DATE / TIME> <FORMAT >

- Use   to navigate to <FORMAT> field
- Use   to change time format.
- Press **OK** to confirm.

To change timestamp setting:

<MAIN MENU> <DATE / TIME>

- Use   to navigate to <TIMESTAMP> field.
- Use   to select <ON> or <OFF>
- Press **OK** to confirm.

ADJUST AUTO POWER OFF TIMER

To adjust the auto power off timer:

<MAIN MENU> <SETTINGS> <AUTO POWER OFF>

- Use   to select between <5 MINUTES> <10 MINUTES> <15 MINUTES> <30 MINUTES> or <OFF>.
- Press **OK** to confirm.

SD CARD OPERATION

To check the SD Card status:

<MAIN MENU> <SD CARD STATUS>

To format the SD card:

<MAIN MENU> <SD CARD STATUS>

- Select <Format SD Card>, use   select <YES>

To delete all files on the SD card:

<MAIN MENU> <SD CARD STATUS>

- Select <Erase All Files>, use   select <YES>

USB FUNCTIONS AND AV OUTPUT

USB FUNCTIONS

The USB interface is the de facto standard of PC connection. The X1000 videoscope supports two USB modes: Reader Mode and Camera Mode.

USB Reader Mode

To use the USB reader function:

<MAIN MENU> <USB> <READER>

- Connect the system to a computer with the provided USB cable.
- Use   to select <READER>, press **OK**
- The X1000 videoscope system appears as a mass storage device in **"My Computer"**.
- You can escape the USB reader mode by press **ESC**.

USB Camera Mode

To use the USB camera function:

<MAIN MENU> <USB> <CAMERA>

- Connect the system to a computer with the provided USB cable.
- Use   to select <CAMERA>, press **OK**
- Use the provided software to watch the live video on PC.
- You can escape the USB camera mode by press **ESC**.

AV Output

The X1000 videoscope supports AV output to leverage the big screen of TV. (SDTV only, HDTV not supported.)

To use the AV output:

- Connect the system to a SDTV with the provided AV cable.
- Use   to select <NTSC> or <PAL> according to the TV, press **OK**.
- You can escape the AV output mode by press **ESC**.

CHANGING PROBE AND CALIBRATION

In case of probe is malfunctioned and need to be replaced with a new one, follow below procedure to calibrate the probe to reach it's fully performance.

To change the probe:

- Turn off the system.
- Screw loose the sealing nut, remove the malfunctioned probe from system.
- Connect the new probe , insure the indication point on both connector is matched, screw tight the sealing nut.

To calibrate:

- Turn off the system
- Press and hold both  and **ESC** simultaneously to enter factory mode.
- Select <Calibration>, press **OK** .
 - The calibration consists of two steps: bright scene calibration and dark scene calibration.
 - 1. Brightscene:aiming the camera to a bright scene until whole screen is pure white. Press  when ready. Holding still while calibrating. You may lock the exposure value of a rather darker scene by press , this will help finding a bright scene.
 - 2. Darkscene:aiming the camera to a dark scene until whole screen is pure black. Press  when ready. Holding still while calibrating. You may lock the exposure value of a rather bright scene by press , this will help finding a dark scene.
- When the calibration is done, restart the system.

UPGRADING FIRMWARE

There might be addition and/or modification of functions after initial release. We will release updated version firmware for system upgrade.

To check the current firmware version:

- Turn off the system
- Press and hold both  and **ESC** simultaneously to enter factory mode.
- Select <information>
- The firmware information will be displayed.

To update firmware:

- Turn off the system.
- Copy the firmware file to a SD card, then put inside the system.
- Press and hold both  and **ESC** simultaneously to power on and the system will start updating procedure automatically.
- When firmware update is done, the X1000 videoscope system will power off automatically.

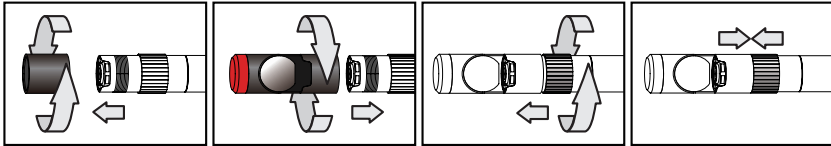
INSERT TUBE ACCESSORIES

Working with Side View Mirror Adaptor

When there is no enough space for the probe neck to bend, the side view mirror comes into play

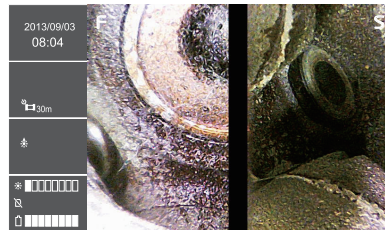
To attach the side view mirror adaptor:

- Remove the protective ring from probe tip
- Screw tight the side view mirror adaptor
- Toggle the led illumination direction by press  for best visual performance.



Working with Dual View Mirror Adaptor

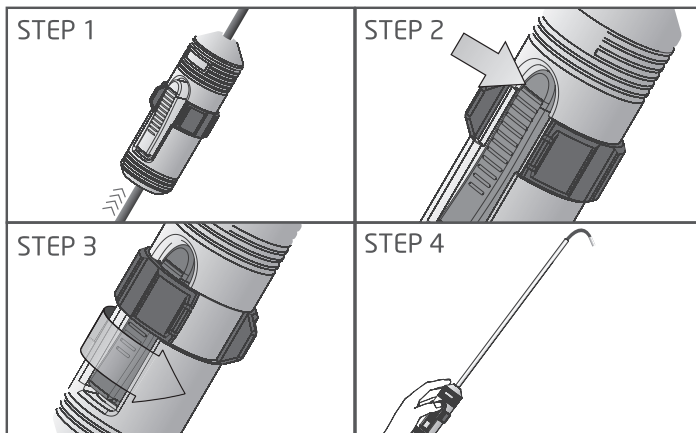
- Remove the protective ring from probe tip
- Screw tight the dual view mirror adaptor



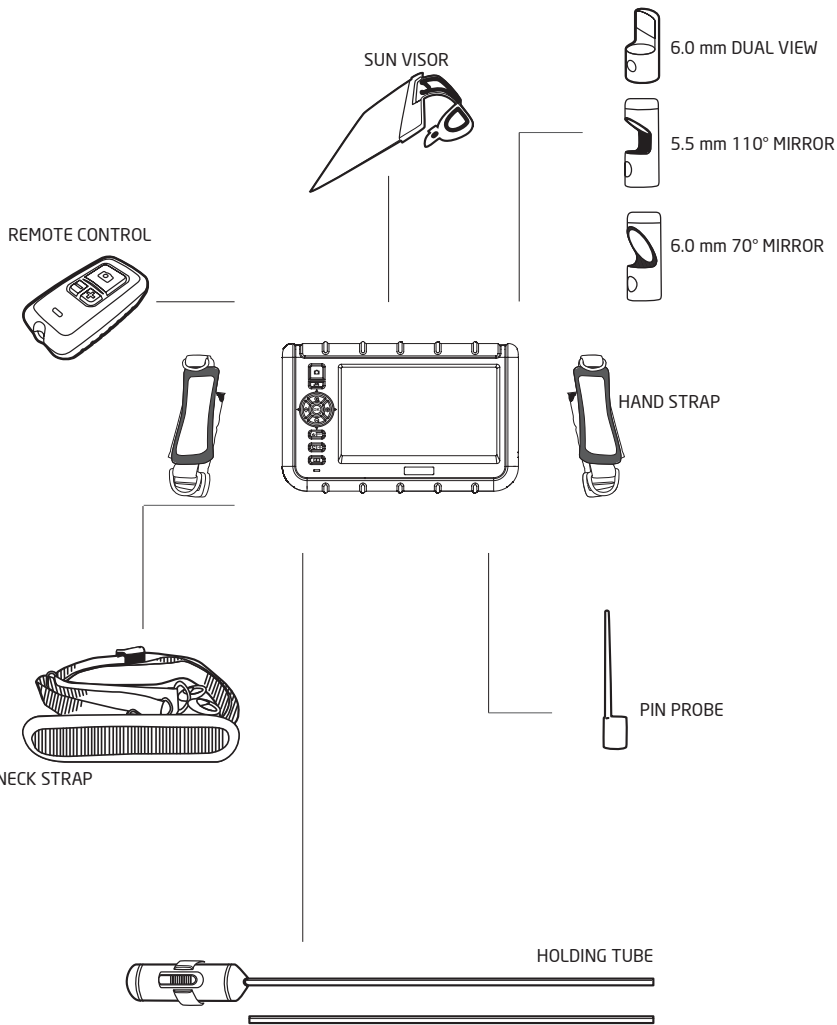
Working with Holding Tube extender

The extender is a rigid thin pipe which helps the insertion tube to reach the area above below eye level.

To attach the extender:



SYSTEM UNIT ASSESSORIES



SPECIFICATIONS

SYSTEM UNIT

Features	Description
LCD	7" LCD (800 x 480)
Snapshot	640 * 480, jpeg
Recording	640 * 480 , MPEG4 (with audio)
Dimension	240 * 154 * 47mm
Weight	1.3kg (2.86 lb)
Dust & Water proof	IP57 resistant
Drop height	1m
Battery	Li-polymer (Non-Interchangeable) 6 hours capacity / 3 hours charge to full
Working temperature	-10 ~ 60°C
Storage temperature	-20 ~ 80°C
USB	mass storage mode webcam mode
Storage	SD card , up to 32G
AV output	NTSC / PAL
Audio input	Built-in microphone
Audio output	Headphone Jack
Brightness Adjust	8 + 1 (Boost) levels
UI Languages	28

2 WAY ARTICULATION TUBE

Features	Description
Probing head diameter	6.0mm
Tube length	2m
Articulation	2 way
Sensor	VGA
LED	Front / Side
Button	Snapshot / LED + / LED -
Button lock	Lock up buttons function

NOTE

