

Mitcorp

X750

User Manual



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Safety & Cautions

Safety Conformances

CE NOTICE

The Videoscope System is in conformance with the following standards:

- 2014/30/EU Electromagnetic Compatibility Directive.
-

RoHS NOTICE

The 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.

FCC NOTICE

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

RF Exposure Information (SAR)

This device meets the government's requirements for exposure to radio waves. This device is designed and manufactured not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission of the U.S. Government.

The exposure standard employs a unit of measurement known as the Specific Absorption Rate, or SAR. The SAR limit set by the FCC is 1.6 W/kg. Tests for SAR are conducted using standard operating positions accepted by the FCC with the EUT transmitting at the specified power level in different channels.

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.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

CAUTION BATTERY

- Risk of explosion if battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions.



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 damage to this product.



WARNING HAZARDOUS ENVIRONMENTS

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



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 Changing Probes/Base Unit

- **MUST** follow the "Basic Installation" instructions in the manual and use proper tools to complete the concerned operations.

CAUTION Recharging Battery

- **MUST** use the original accessory charging units. Do not try using any other electronic charger or recharging method for the batteries.

CAUTION Media Files Compatibility

- The media files captured and saved by the X750 system, including photos and videos, are not compatible with any other Mitcorp product.
- The X750 system cannot read media files from any other Mitcorp product.

General Cautions

The following caution statements apply to use of the Mitcorp’s videoscope probes in general. Caution statements that apply specifically to particular procedures appear in the corresponding sections of the manual.

HANDLE PROBE CAREFULLY. Keep the insertion tube away from sharp objects that might penetrate its outer sheath. Keep the whole insertion tube as straight as possible during operation; loops or bends anywhere in the tube decrease its ability to steer the probe tip. Avoid bending the insertion tube sharply.

Note: Always unlock the articulation button to release the tension of the bending neck before withdrawing insertion tube from inspection area or putting probe away. Never pull, twist, or straighten the bending neck by hand; internal damage may result. At the first sign of damage, return the probe for repair. Certain substances may damage the probe.

Common Damages Causes (out of warranty)

Chemical Damage	• Do not allow any liquids other than below to be attached to the probe. Otherwise, the probe may be damaged. ✦ Water ✦ Brake fluid ✦ Gasoline ✦ Diesel fuel ✦ Transmission fluid • Always rinse and clean with water thoroughly after use.
Over Temperature	• Prevent using the probe in an environment that exceeds the operating temperature range. • The base unit shows 3 levels of camera temperature warning signals. Remove the probe when the 100°C warning signal pops up, the continued use may damage the camera module and precision components. *The temperature warning function is not available on X600 probes or 2.8mm and 1.9mm probe on X-series.*

Severe Impact or Pulling	- Do not subject the probe head and articulation section to strong impact or pulling. If you notice any abnormal resistance while inserting the probe into the inspection object, stop immediately. Do not force insertion; instead, carefully withdraw probe. - Avoid applying excessive pressure or bending to the articulation section. *If you sense any abnormality during articulating, discontinue the operation at once. Do not force the articulation, as this may cause damage to probe or the inspection object.*
Pulling out without caution	- Do not withdraw the probe while the articulation is locked or the articulation section is bent. - If the probe becomes caught during withdrawal, gently rotate it while continuing to pull it out. 
Damages due to Improper storage	- Make sure that the probe is not twisted before storing it. - Don't roll the probe too tight. *The diameter of the rolled up probe should at least be 30 cm. Rolling the probes too tightly can damage the insertion probes.* 

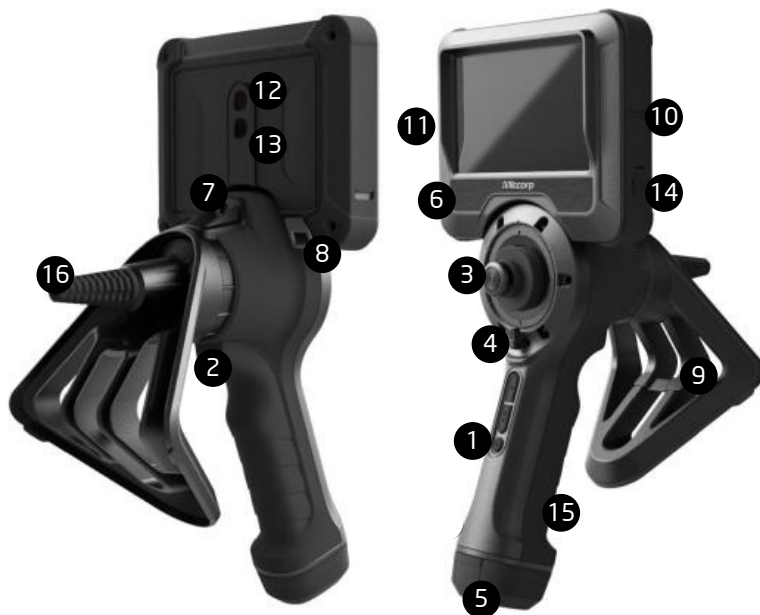
Part I Product

• 1.1 Scope of Delivery



- Base Unit*1
- Probe Unit*1(Including Probe Stand)
- Battery Unit*2
- Charging Unit*1
- User Manual*1
- HDMI Cable*1
- EMI core*4(detachable for USB or HDMI cable's connector ends)
- USB cable*1
- USB Charging Adaptor*1
- Shoulder Strap*1
- Trolley Case*1
- Rigid Sleeve*1

• 1.2 X750 Overview



No.	Item	No.	Item
1	Function Buttons (1~3)	9	Probe Stand
2	Trigger Button	10	I/O Port(Right Side)
3	Articulation Joystick	11	I/O Port(Left Side)
4	Articulation Lock Switch	12	Secondary Camera
5	Battery (Detachable)	13	LED Light
6	Base Unit	14	Power Indicator LED
7	Base Unit Connector	15	Ergonomic Handgrip
8	Shoulder Strap Handle	16	Tube Strain Relief

• 1.3 Brightness Control Button

Press the <up>/<down> (button 1/button 2) to adjust the brightness. There are 13 levels of brightness control: 1-5->Tip LED light. 6-10->Exposure Value. 11-13->Exposure Time.

The X750 system provides live-view focus exposure gain control to get rid of glares and reflections (such as on metal surfaces..., etc).

Tap the glare spot on the screen; the system will auto-tune to optimize the image brightness. Tapping a dark area will increase image brightness (higher exposure gain value).

Ps. the gain control dynamic range is conditionally constrained.

• 1.4 Custom Hotkey Function Button

Round button 3 on the handgrip allows setting up hotkey functions from the setting menu. Default:

- Short pressing the button: Switch the back light LED ON/OFF.
- Long pressing the button: Freeze the Image.



- 1.5 Snapshot

Short press the [Trigger] button. Timestamp/Logo Watermark/Grid will be recorded on the photo when enabled.

- 1.6 Video Recording

Long press the [Trigger] button to start/stop recording the video.

During recording, short press the [Trigger] button can take and save the real-time screenshot photo.



- 1.7 Articulation Joystick / Articulation Lock Switch

The articulation joystick allows for easy maneuvering the probes.

1. Moving the joystick handle into the desired direction will prompt the probe to articulate.

The articulation lock switch can be found below the joystick.

2. Flip the switch to the right to enable the lock.
3. A clicking sound will indicate successful articulation lock.
4. The probe will be locked in place after releasing the joystick.

CAUTION: Release the articulation lock by flipping the switch to the left before removing the probe from an object to avoid damage.



- 1.8 Battery Changing/ Charging

- 1 Press and hold the bottom robber mark to unload the battery.
- 2 Insert the battery into the charging dock and connect to the power socket with the attached USB cable and adaptor. Notice the latch click feedback when the insertion was successful.
- 3 Reload a full recharged battery into the X750 handgrip set.



Ps. The 2 slots charging dock is equipped with an independent LED charging indicator.

Green light: Power on / Full charged.

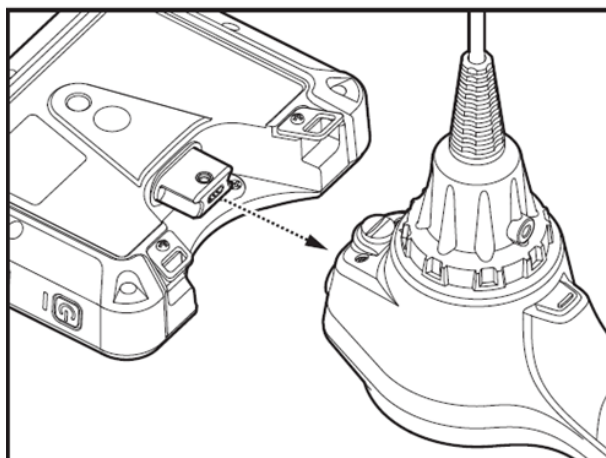
Orange light: Charging / Battery partial full.

- 1.9 Assembly/Disassembly / Handling & Care

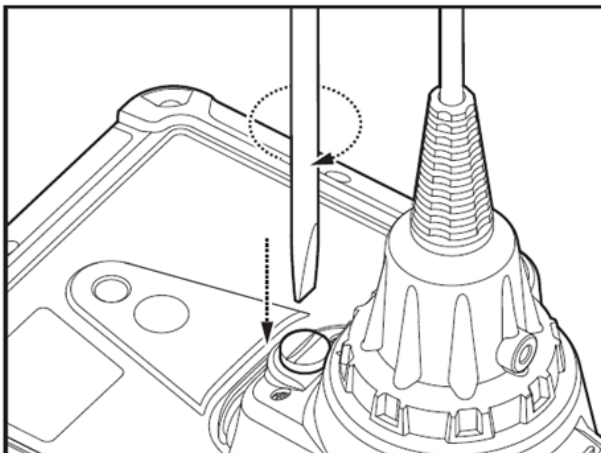


1.9.1 Base Unit + Tube Unit Installation

1. Place the Probe Stand upright.
2. Place the base unit on the base unit connector on the articulation probe.



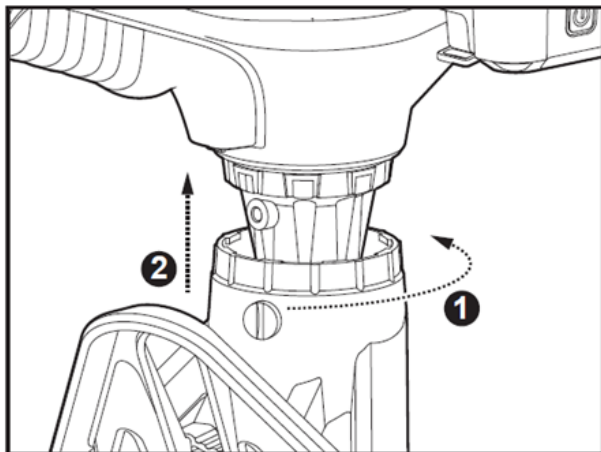
3. Fasten the screw



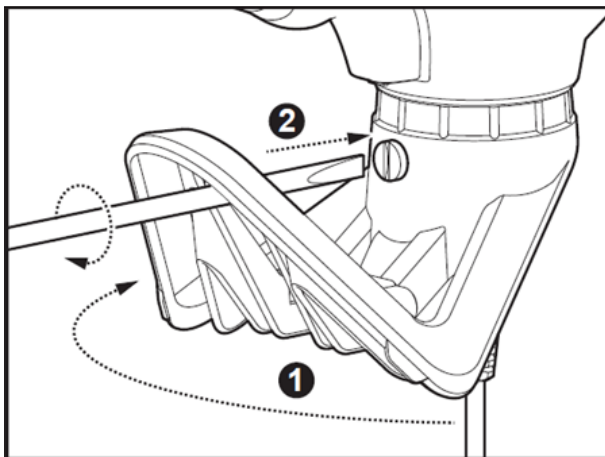
CAUTION: Do not remove the screw from the probe stand.
Be careful to not overtighten the screw.
Always use a screwdriver to fasten screws.

1.9.2 Tube Unit + Probe Stand Installation

1. Carefully lift up the articulation probe.
2. Move the Probe Stand along the articulation probe towards the probe strain relief.



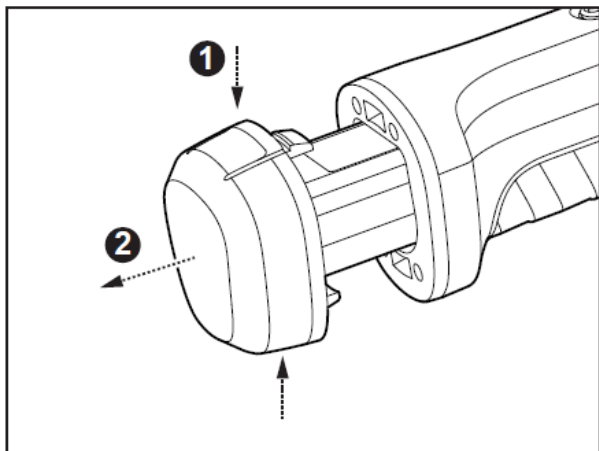
3. Align the Probe Stand's screw with the connector on the articulation probe (the long side of the stand must face inwards toward the battery release of the probe).
4. Carefully tighten the screw.



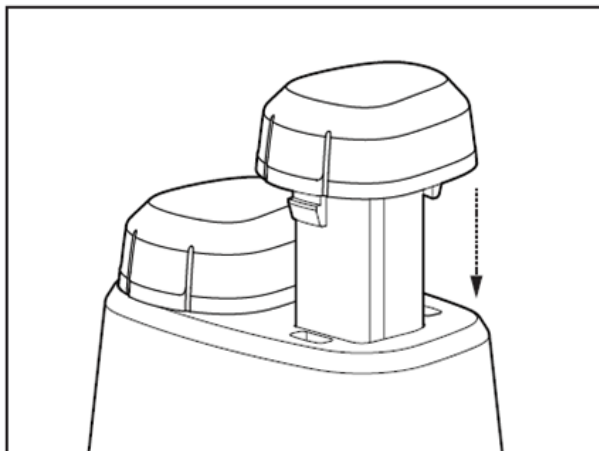
CAUTION: Do not remove the screw from the probe stand.
Be careful to not overtighten the screw.
Always use a screwdriver to fasten screws.

1.9.3 Battery Unit Installation

1. To remove the batteries carefully squeeze the top of the batteries lengthwise

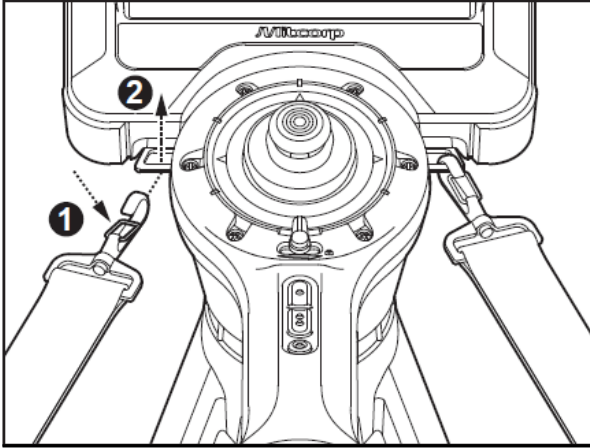


- 2 Slowly pull to remove the battery from the X750
- 3 Place the battery back in the charging station



- 4 Repeat the process and push the new battery into the battery holder of the X750

1.9.4 Shoulder Strap



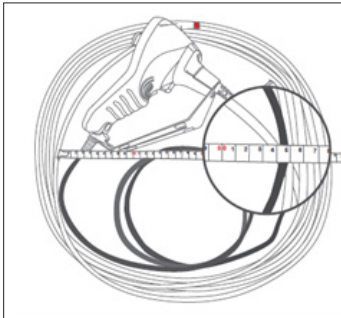
1.9.5 Handling & Care

CAUTION:

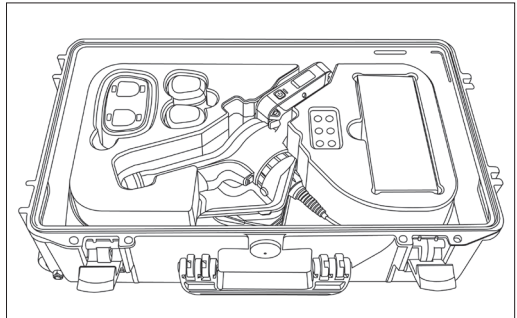
1. Always store the insertion probes, the base unit and the batteries properly

To Storage

Keep at least 35 cm diameter circle

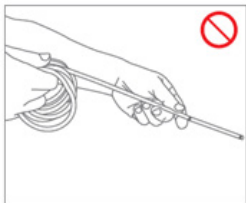


Using packing standard cushion to tangle tube



2. Do not roll the probes up too tightly (aim for a diameter of at least 15cm)

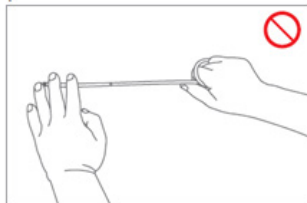
Do not
curl



twist

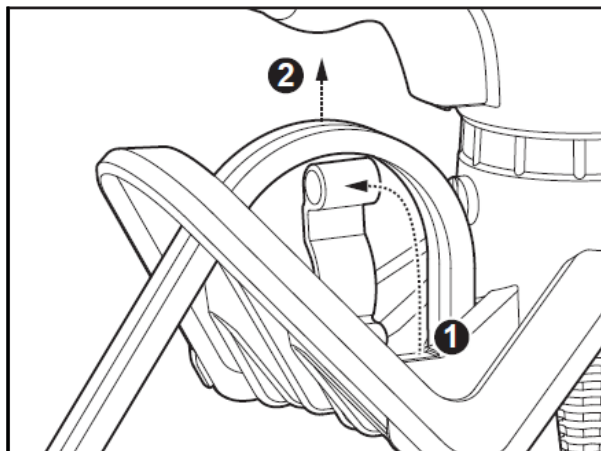


pull and stretch

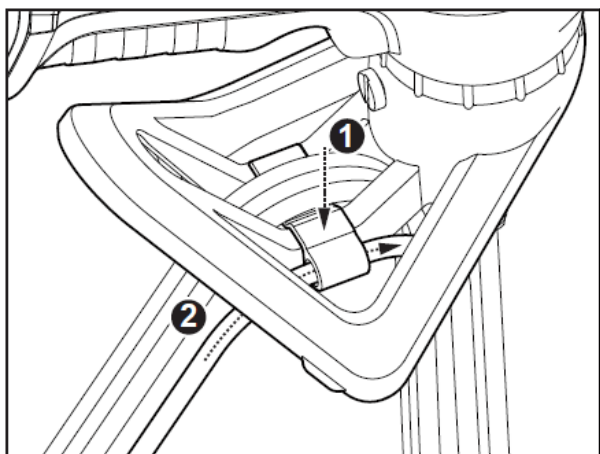


- 1.10 Roll - Up Tubes / Probe Stand

Lift up the probe holder and pass through the rolling tube.



Put down the holder and let the tube hang on to it. Insert the tip end and bending neck through the holder hole above 20 cm. The tube can be fixed.



• 1.11 I/O Ports Connection

I/O Port -Right Side	USB Type-C	→ Use the accessory or compatible USB cable. → When connected to PCs, choose output: (1) SD card reader; (2) Camera. Download & install the "UsbVideoScope" software from Mitcorp website to hire remote control of the system. → When connected to a USB power adaptor can act as a power supply for real-time operations (low recharging effect)
	Reset	Stab with a blunt pin when the system accidentally crashes.
Power Indicator	Green / Red	The indicator will show: Green - When the device is turned on / fully charged Red - When the device is charging
I/O Port -Left Side	HDMI Type-D	→ Use the accessory or compatible HDMI cable. → The system can output the live view and saved images when connecting to monitors/TVs. → The touch screen function buttons of two sides won't be output and keep on the unit screen during operations. → Live view image won't keep on-screen during output operations. → When playing back album photos & videos, images will keep on-screen during output operations.
	Micro SD	Push-push type micro SD card slot. Install the SD card by connecting the finger side up. When covering the outside robber cover, please avoid hard push to this position. Just push stoppers around the cover.

• 1.12 Secondary Camera/ LED

X750 equipped with secondary camera along with illumination LED for taking outlook photos of devices under inspection.

The fix focus camera output 2550*1440 resolution photos that being saved in the SD card. Users can switch camera by the on display button. When switch to this camera, the LED light up simultaneously by default.

The LED light is controlled by the hotkey button by default or the on display light control button under secondary camera mode.

Part II On Screen Display (OSD) functions

• 2.1 Live View screen UI

- Overlay information: Date/Wi-Fi Status/GPS Status/Battery Status
- Function buttons of the two sides are introduced in section [2.2]

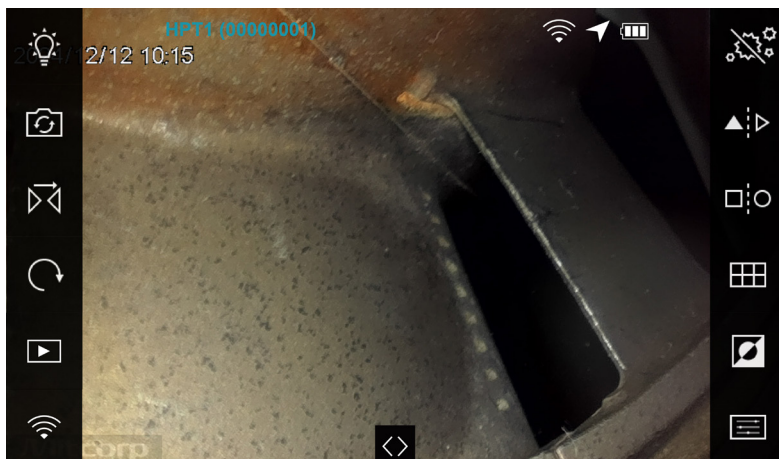


Notice:

The GPS module only works well in open outdoor space. The signal indicator might correspond to conditions:

1. System first boost:15 minutes.
2. Cold boost(change battery): 2~13 minutes.
3. Warm boost: about 1 minute.

• 2.2 Function list

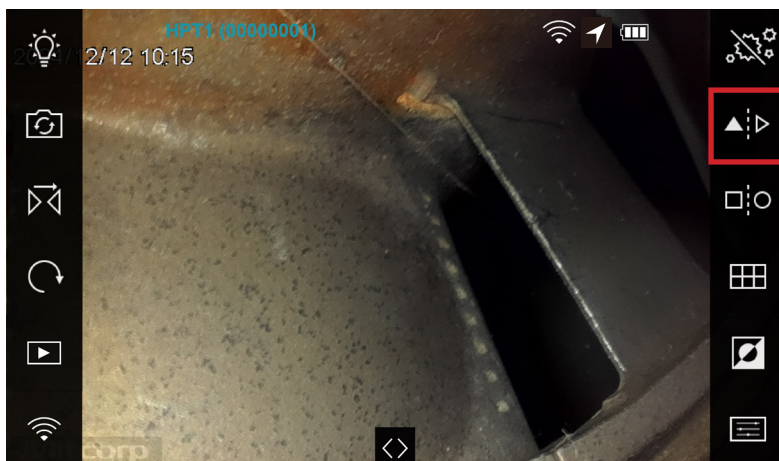


Function	Button	Description
Light Control	Left-1	Tap to let tip LED back to level-5 default.
Camera switch	Left-2	Switch between probe tip camera and back secondary camera.
Mirror	Left-3	Mirror the image horizontally.
Rotate	Left-4	Rotate the image 90 degrees clockwise with every click.
Album	Left-5	Open the saved images and videos of the corresponding folder. (More details in section-2.5 to 2.7).
Setting	Left-6	Setting menu. When enable Wi-Fi function, this turns to a signal icon. (Refers to section 3.2)
Particle Free	Right-1	Assemble the side-view mirror and enable it to get rid of particles on the image (system auto zooms to 1.1x to get optimized view area).
Dual View ^(*)	Right-2	Assemble the dual-view mirror and enable it. The monitor will provide F (front) and S (side) label on the image (only for 6.0 mm probe). When connect to dual camera probes, this function turns to be switch between front/side camera(LED simultaneously).
Compare	Right-3	Compare a chosen image in the SD card with the live view image.

Grid	Right-4 	Assemble the contact pin and enable the function to get a reference 2-dimensional measurement scale (inch/cm) on the screen.
Negative	Right-5 	Enable negative image view.
Image ^(*)	Right-6 	Drag the adjustment sliders to get enhance the image.
Full Screen	Bottom 	Press the bottom to disable live-view screen overlays.

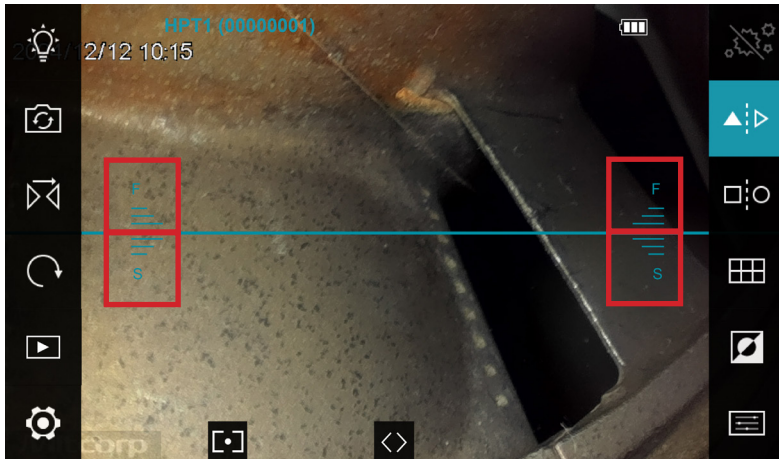
- Dual View^(*)

To activate the dual view, press the icon on the right hand side of the screen



When connecting with dual camera probes, this function turns to switch between front view and side view (the LED simultaneously). There won't be any separate line on the live view picture.

Once the dual view is activated, a line will appear that separates the screen. With the dual view mirror attached, the front view will be indicated by the F letter and the side view by the S letters respectively.

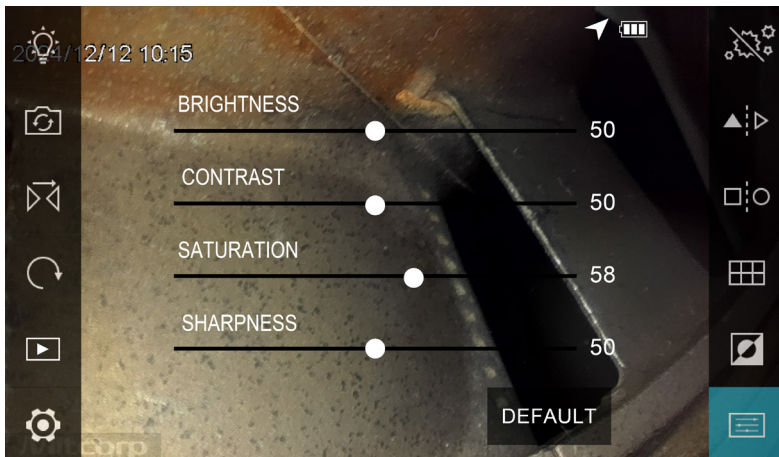


The Line will aid as a border between the two sides of the mirror and ease navigation and orientation.

First press: show on the line. Second press: switch the LED to side direction. Third press: remove the line and switch the LED to front direction.

- Image^{(*)2}

To get better image results in various inspection circumstances, the system provides 4 adjustable image configurations: Brightness, Contrast, Saturation, and Sharpness.



- 2.3 Full screen

Press the "**<>**" button on the bottom of screen to hide or display function buttons on the two sides.

Ps. When connect 3.9 mm probes, the display portion is 1:1. The full screen button will enlarge the live view image portion to 16:9 with some correspond distortion while the storage image still keeping as 1:1(1600*1600 resolution).

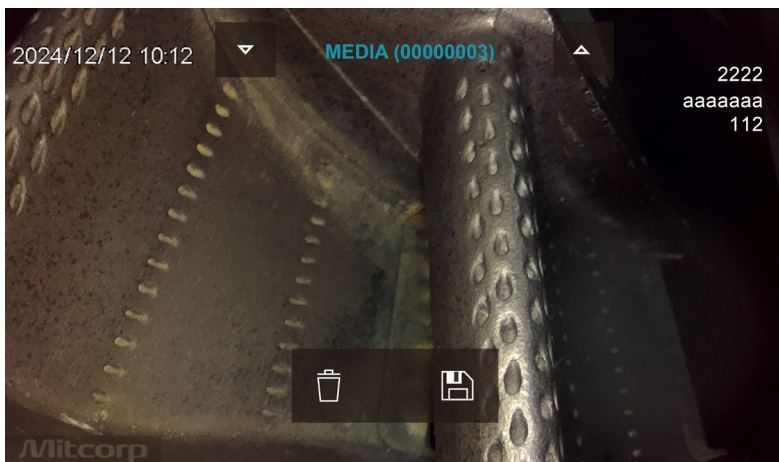
- 2.4 Zoom In/Out

Touch screen control by 2 fingers gesture. Digital zoom 3x adjustable.

- 2.5 Snapshot/Record

Short press the trigger button on probe handgrip, the screen live view 'freeze' and pop-up window asks if to save the still image. The top of screen also show-up a 'file name switch' window for editing image file name being saved. (the serial number will auto update when exiting files are deleted).

Press the <up>/<down> button on hand grip to switch Delete/Save options. Press the <Trigger> button to confirm the operation. This 'freeze' function is default enable and can be disabled in the setting menu (refers to section 3.12 FREEZE SCREEN)



Timestamp/watermarks/grid will be printed on the photo if they are enabled.

Video Recording:

Long press the [Trigger] button to start/stop recording the video.

During recording, short press the [Trigger] button can take and save the real-time screenshot photo.

• 2.6 Album

2.6.1 Photo Gallery:

The files are sorted chronologically (newest will be shown on the bottom-right). The shown yellow timestamp indicates the date of the first file by orders.

Tap any block to enter single photo view. Tap the  icon to view video gallery.



Ps. the files are sorted chronologically (newest will be shown on the bottom-right). The shown yellow timestamp indicates the date of the first file by orders.

2.6.2 Video Gallery:

Tap any block to enter single video view. Press the  icon to switch to the photo gallery.



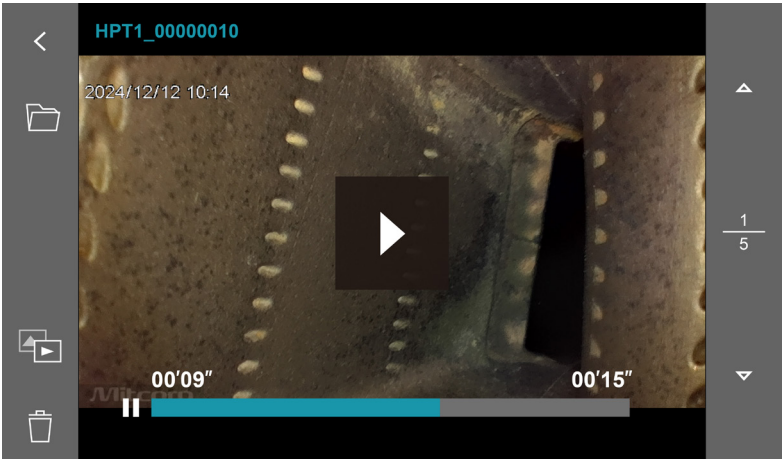
2.6.3 Single photo view:

Tap the  button to view video files. The [Add Note]  instruction is in next section. The scalar measurement's instruction is in section [2.9]



2.6.4 Single video view:

Tap any position of the screen to play/pause. Tap the  button to view video files.

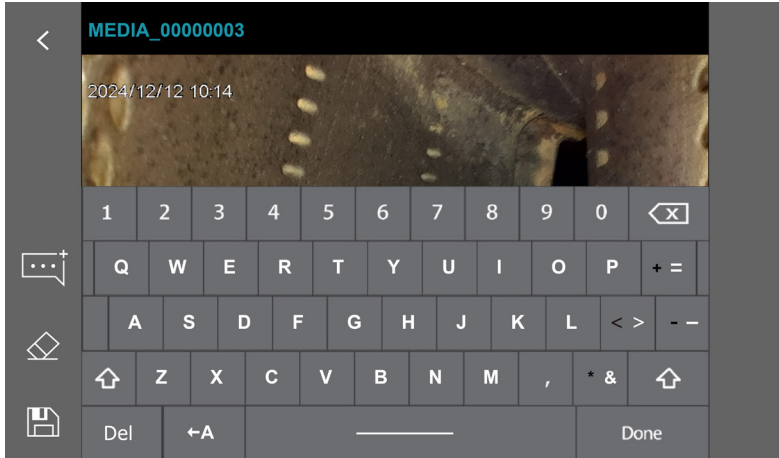


- 2.7 Album --Photo annotation function

The X750 system allows user add maximum 10 notes on a photo. Each note can key in maximum 24 characters. The edit steps as follow:

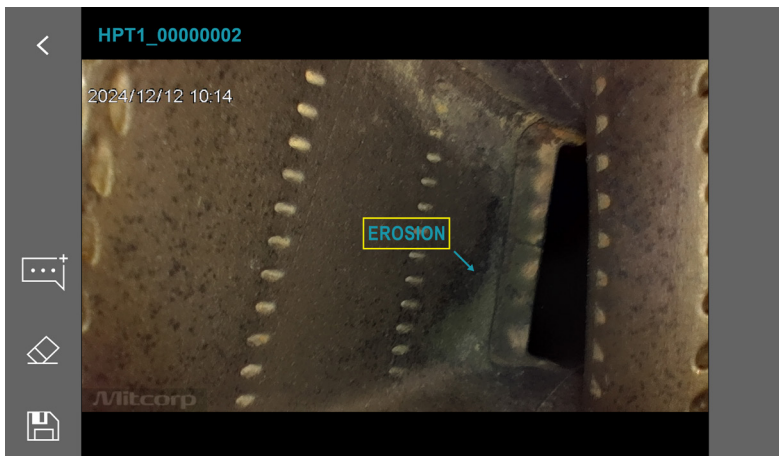
2.7.1 Add one note:

To add a new note press: [Add Note] -> [key in] -> [Done].



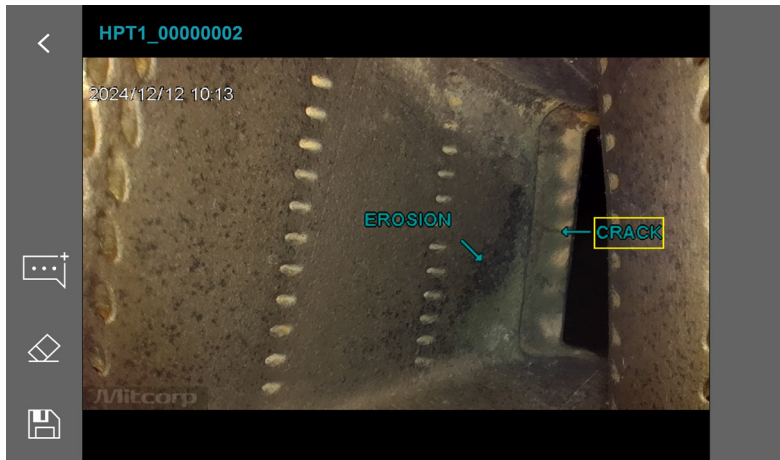
2.7.2 Add more note:

Add more notes by pressing:  [Keypad] -> [key in]-> [Done].



2.7.3 Add one note:

Touch any note been made on screen then it shows a green frame. The note frame can be dragged to any position you want to mark on the photo.



2.7.4 Erase note

Touch any note been made on screen then it shows a green frame. Touch the [Erase] to delete the note frame.

During keying any note, use the [Erase] function to erase all characters.

2.7.5 Save

[Save] Please make sure saving the photo with notes you made. The system creates a new file in the album. The original photo will not be covered.

• 2.8 Album -Compare function

Touch the "Compare" key to compare the live view with any stored image file.



Move

To move the compared photo to target position.



Switch

To switch the left / right side viewing window.

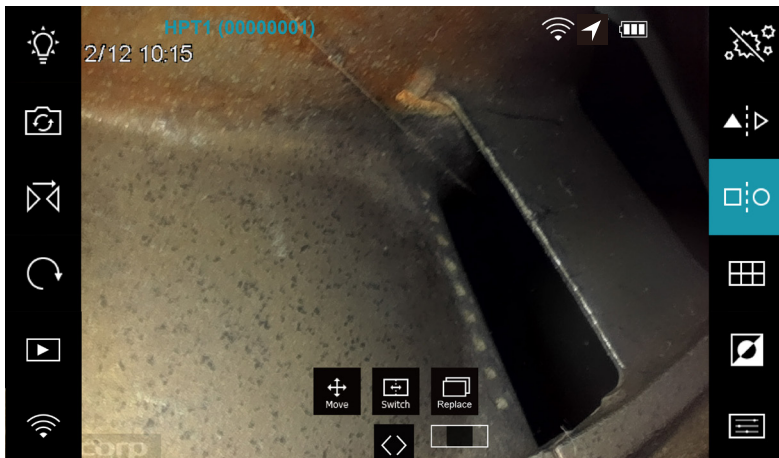


Replace

To replace another compared photo.

Note:

Concerning the necessarily usage of accessing stored images files, the [wireless] and [compare] functions will be disabled when no SD card is inserted.



• 2.9 Scalar Measurement

This function is to make a known length object in saved photo as a reference scale to measure other parts of the screen's length.

Tap the icon to access the scalar measurement. Follow the steps to set up the scales and measurements.



1. Set up and adjust the scale/unit by request. The system provides cm / inch unit options. The default scale is 2.54 cm / 1 inch. To adjust the scale, tap the right side [1]/[.1]/[.01] digit icon to switch the digit, then tuning up / down by the direction arrow.



2. Tap and make the 2 end points of the reference object, system will make a red mark on it.



3. Tap and make any 2 end points of the measured object, system will shown the real-time result and make a blue mark on it.



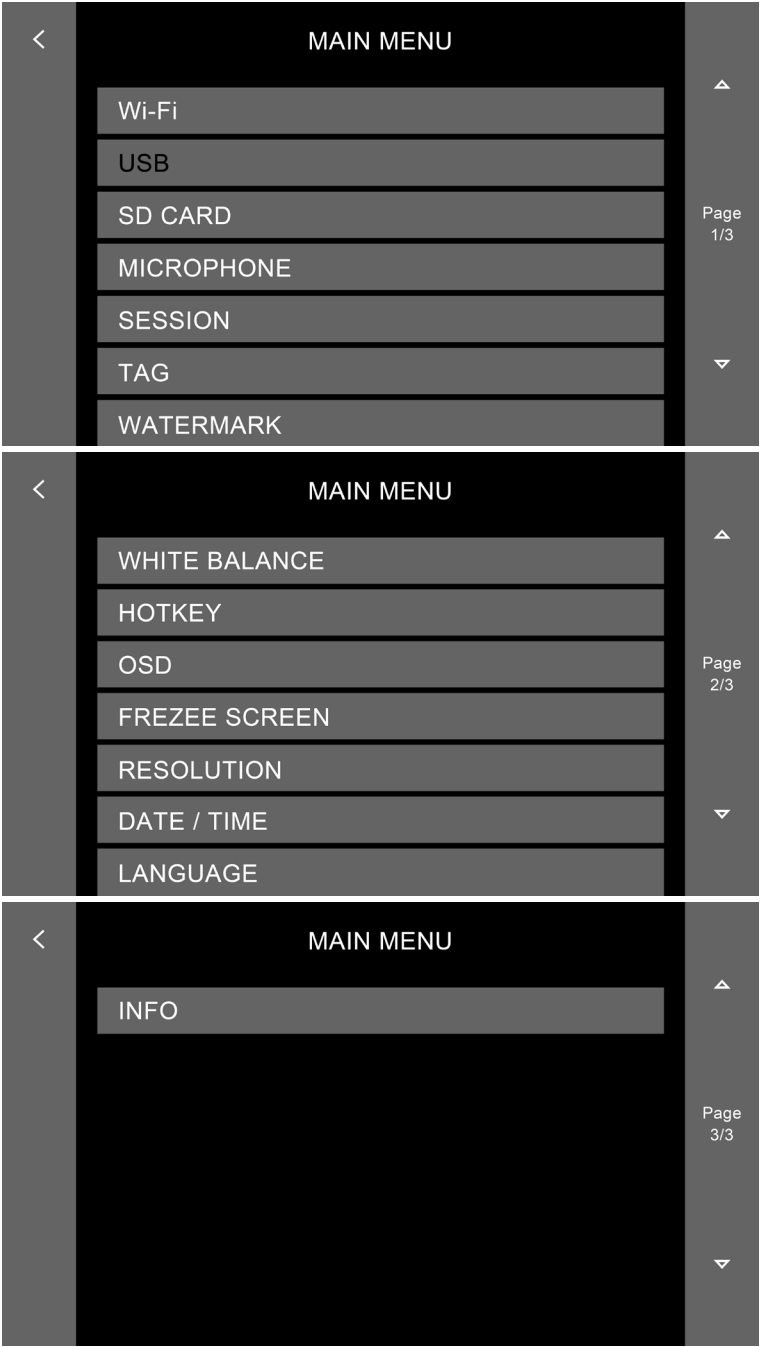
4. Make any other measurement if needed. Save the image before end the process. The system will saved as another file in the storage media.

Note:

The measurement is based on scalar reference of the surface. So the camera/ surface angle will be the main error factor of the accuracy. More closer to 90 degree angle between the surface and camera makes more accurate result. Users should evaluate the effect when make use of this function.

Part III Main MENU settings

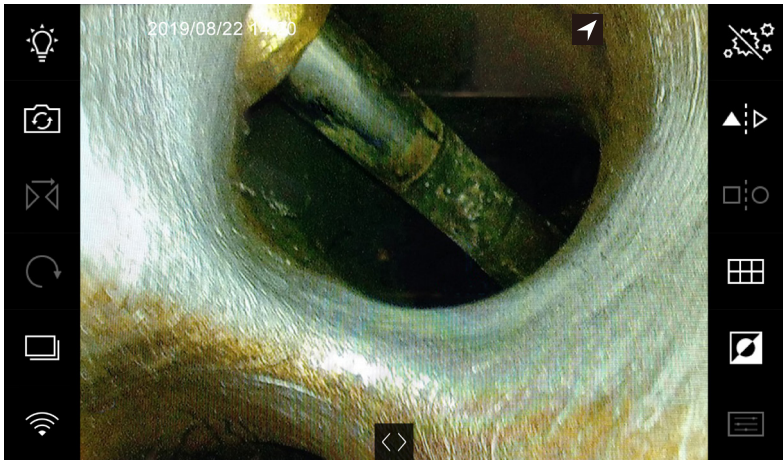
• 3.1 MENU



• 3.2 WIRELESS FUNCTION

3.2.1 Tap the Wi-Fi button (the menu's first item). The system will switch back to live view after a few seconds with a signal icon on the top of the screen (next to the GPS symbol) and on the left bottom replacing the settings icon.

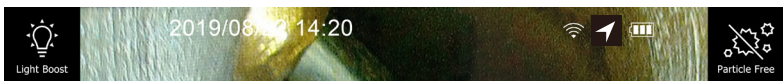
3.2.2 To stop the Wi-Fi connection, tap the Wi-Fi icon on the bottom left.



3.2.3 Wi-Fi connection with mobile devices:

Open your Wi-Fi settings on your mobile. Search the system SSID in your available Wi-Fi list. The X750's SSID and password can be found in the [3.13] INFO.

Connect the X750 system with your mobile device. When the system is connected, the wireless indicator will show up on the OSD.



Note:

Typically, the Wi-Fi system will be added to your favorite Wi-Fi network list after first connecting. The favorite Wi-Fi network list will store the SSID/password.

The X750 system allows connecting to up to 2 mobile devices simultaneously.

When connecting a new mobile device, please ensure that not any other previously connected mobile device is blocking the connection to the system. It may cause the connection attempt to be rejected and fail.

3.2.4 Live share and access the image of the system:

- MITCOPRP provides the “VideoscopeNow” APP for X750 wireless usage.
- Detailed instructions can be found in the <VideoscopeNow user guide>

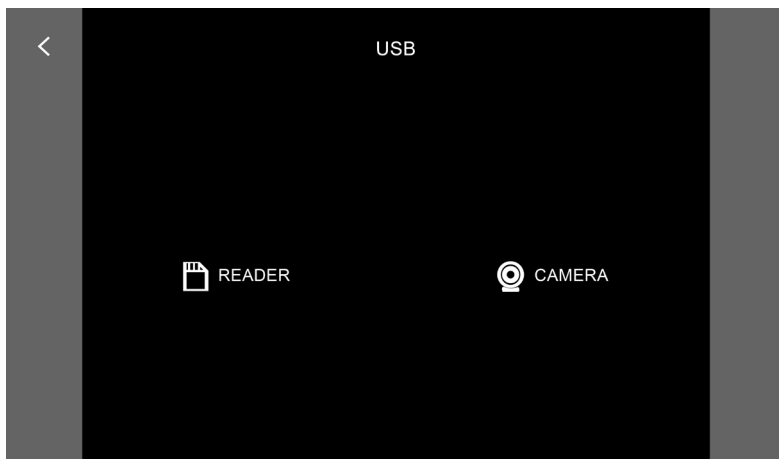


'VideoscopeNOW' is a tool specifically designed for industrial videoscopes that can share the live view of Mitcorp videoscopes through a Wi-Fi connection. It can also act as a remote controller for taking photos or recording clips. Through the APP, users can link to the system to access the album and download the photos/clips.

• 3.3 USB

When the USB cable is connected to PCs, choose the output to be either:

(1)SD Card Reader- to read the files on your SD card ; (2) Camera - to view the live view of the camera.



1. Webcam mode

The live image can be viewed on a video monitor or connected to a PC show the inspection via online meeting app for real-time sharing. Connect the X750 to PC and log on the online meeting app, select the X750 as the camera from setting. The PC will share the same inspection view on the X750. Support Google Meet, Zoom, Microsoft Teams, Skype.

2. USB videoscope

The software enables Mitcorp videoscope to work on PC. Download the software USB Video Scope to PC. After the driver is correctly installed connect the X750 to PC with USB cable. Turn on the X750, select CAMERA then turn on the software USB Video Scope.

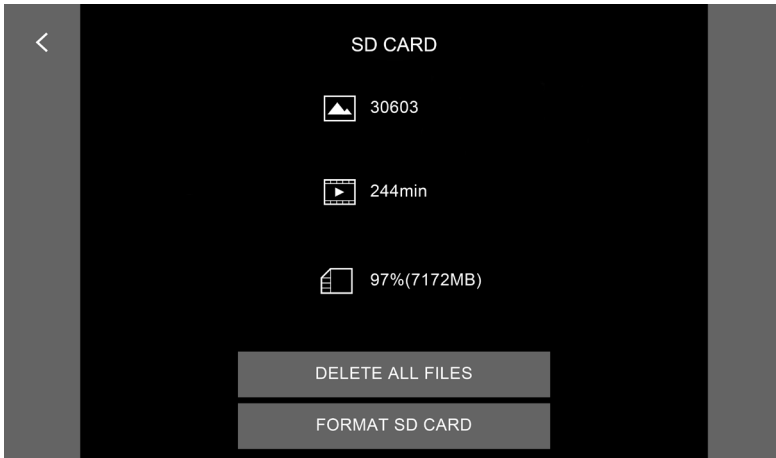
Operating system: Win10 and higher version.

System requirement: CPU: AMD Athlon II 2GHz above (Quad core)/ Independent graphics card / RAM 4G or above.

•3.4 SD CARD STATUS

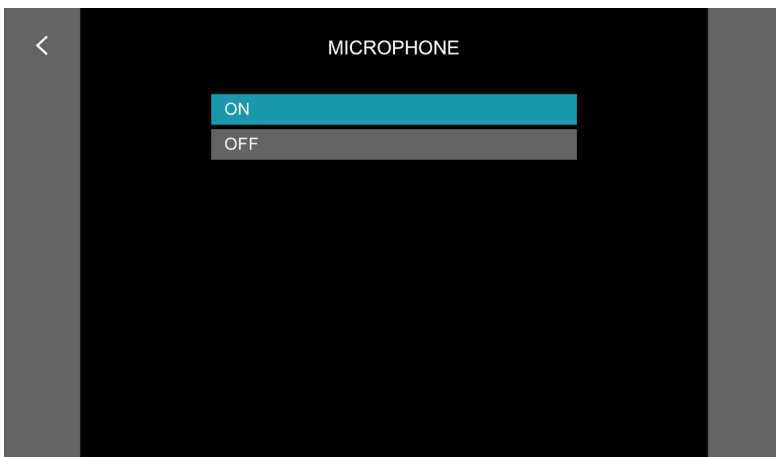
1.) Storage information.

- The system displays existing image numbers, total video length, and lasting storage space.
- [DELETE ALL FILES] will delete all saved files but not user built folders by the SESSION function.
- [FORMAT SD CARD] will delete all saved files and user built folders and format into a default "MEDIA" folder.



•3.5 MICROPHONE

User can turn on/off the built-in microphone.



• 3.6 SESSION

The X750 system allows to custom build photo/video-storage folders under the SESSIONS Setting. When a new SD card installed, the default folder-MEDIA will be built.

The editing steps as below:

The following steps illustrate the editing process for session folders:

- Initial State:** The 'SESSION' menu shows a list of folders: 'MEDIA' (highlighted in blue), '1', '2', '3', '4', and '5'. The left sidebar contains icons for back, folder, add, edit, and delete. The right sidebar shows 'Page 1/2'.
- Editing Function Buttons:** The 'MEDIA' folder is selected, and the left sidebar icons are highlighted with red boxes and labels:
 - Back to settings menu (Back arrow icon)
 - Editing function buttons (Folder icon, Add icon, Edit icon, Delete icon)
- Jump to the 'TAG' editing page:** The 'MEDIA' folder is selected, and the left sidebar icons are highlighted with red boxes and labels:
 - Jump to the 'TAG' editing page (Back arrow icon)
 - Add & edit new folders (Add icon)
 - Rename the selected folder (Edit icon)
 - Delete the selected folder (Delete icon)
- Pop-up keypad in editing modes:** The 'MEDIA' folder is selected, and the left sidebar icons are highlighted with red boxes and labels:
 - Pop-up keypad in editing modes (Add icon)
- Final State:** The 'SESSION' menu shows the 'MEDIA' folder with a text input field containing 'TUBE1'. The left sidebar contains icons for back, folder, add, edit, and delete. The right sidebar shows 'Page 1/1'. The bottom of the screen shows a 'Done' button.

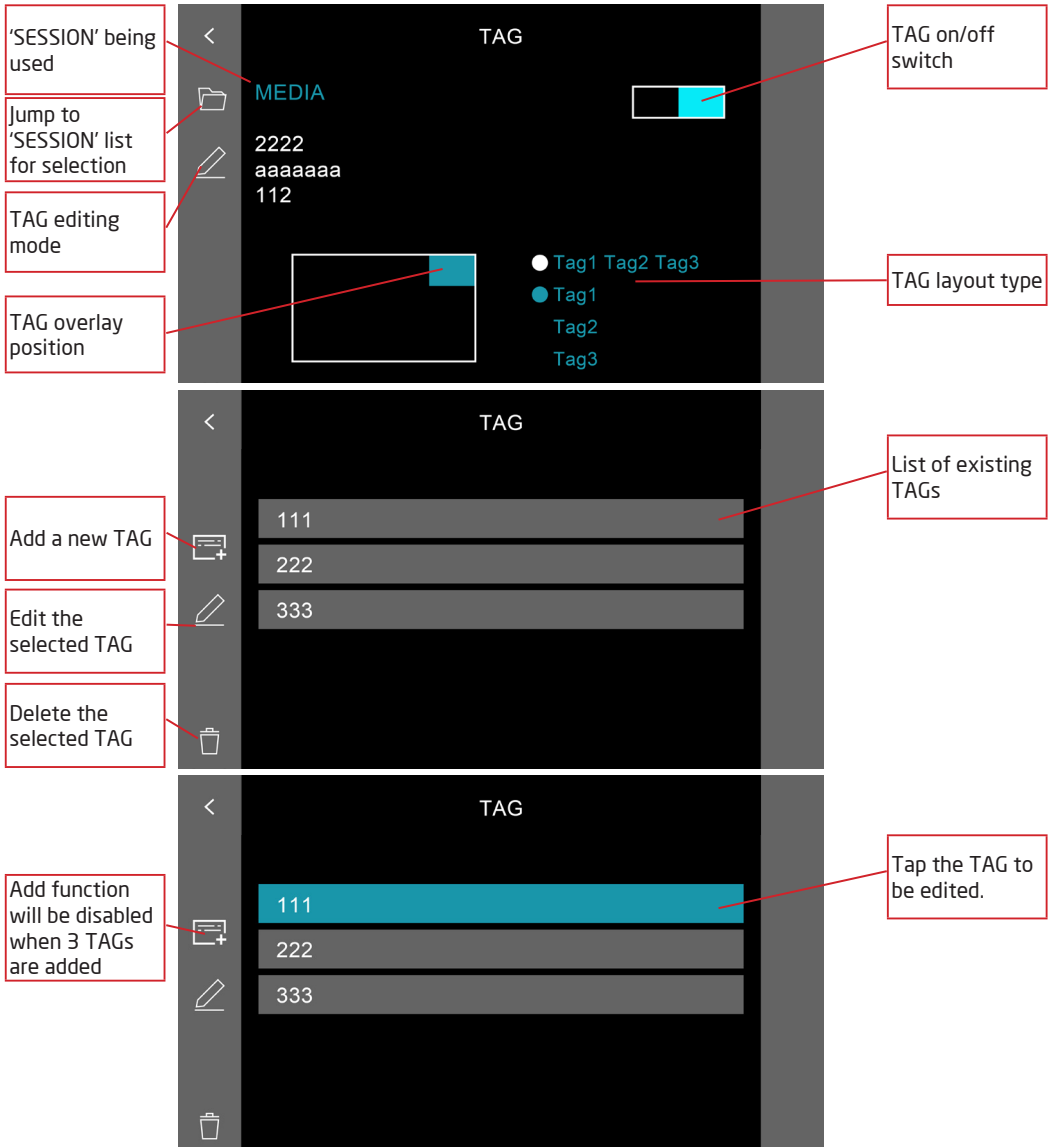
Existing session folders: 'MEDIA' is the build-in folder and cannot be edited. Tap the folder to be hired or edited.

Tap 'Done' to finish editing

•3.7 TAG

For each session folder, the system provides 3 editable tags to put as overlay text on every single still image. (Tag texts usually refer to inspection parts or environment information.)

The editing steps as below:



Pop-up keypad
in editing
modes



Tap 'Done' to
finish editing

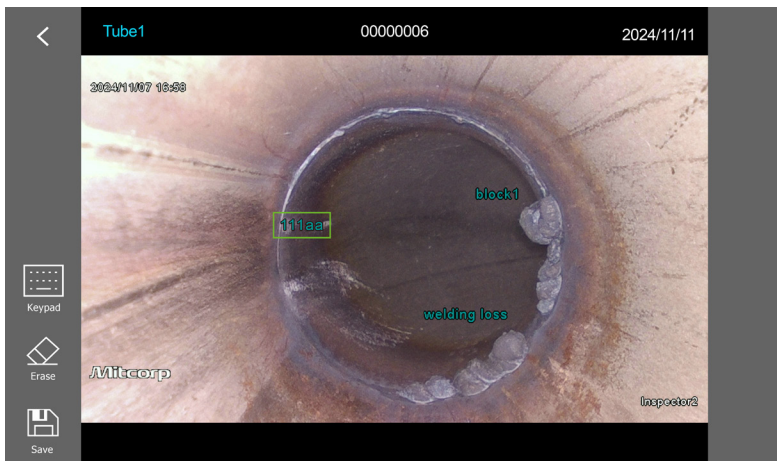
Note:

- SESSION and TAG custom settings are saved in the systems internal memory. All editing steps mentioned above need to be done on the X750 base unit. You cannot edit the SD card via any other PCs.
- When you replace the SD card, the custom SESSION and TAG settings will be automatically applied. If the SD card contains folders with the same names, then that folder will be hired directly. Other data/files in that SD card will not be changed or moved.

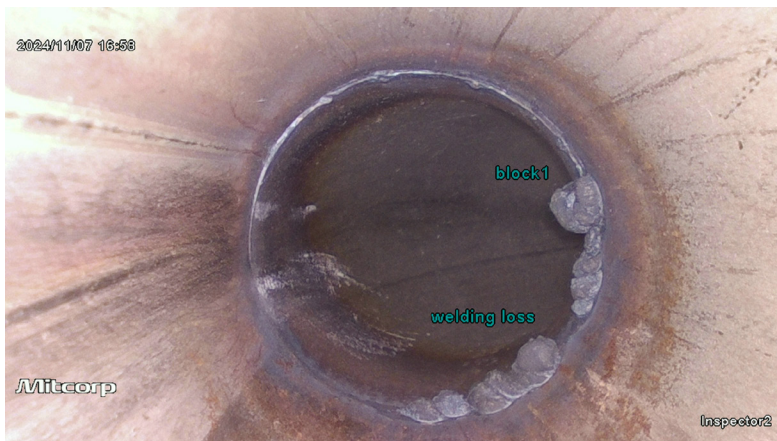
The 'EVENT' and 'MEDIA' folders are system default that cannot be changed. In this application case, user-'Inspector2' got a task to inspect metal tubes thus using the SESSION function and build two new folders. (Below chart shows the SD card status under PC's file manager)



After on-site inspection, 'Inspector2' find the Tube1_00000006 have some defects thus using annotation function to remark the image.



With the TAG watermark enabled, all the information will be saved like below.

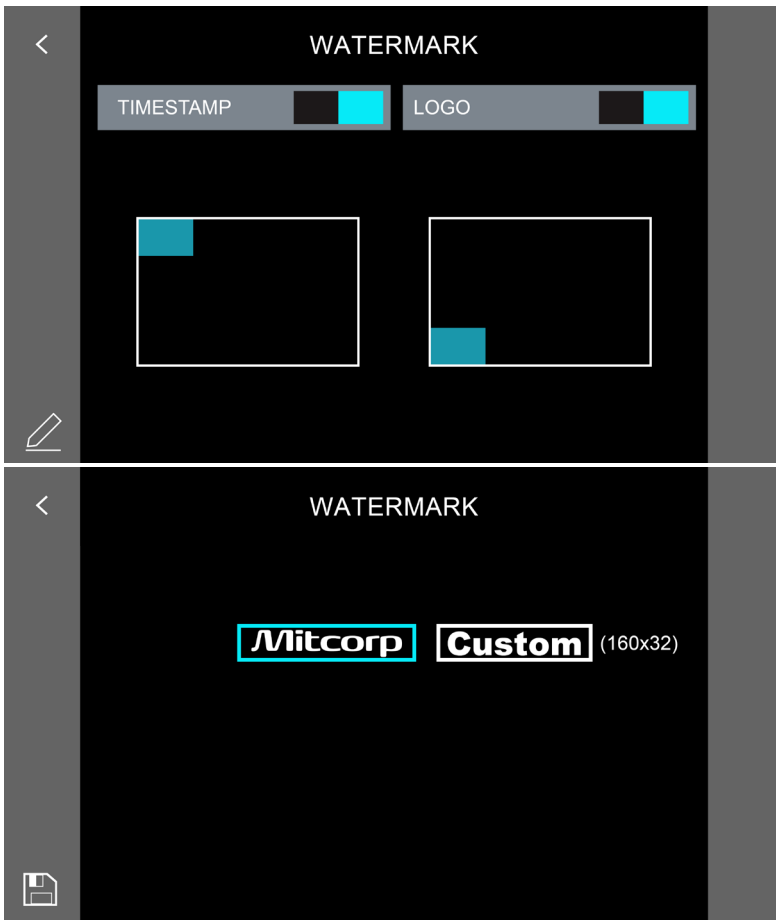


•3.8 WATERMARK

'On/off' switch for each "timestamp" and "Logo" watermark to be shown on photos. Watermark positions are to print on the corners of the photos as shown.

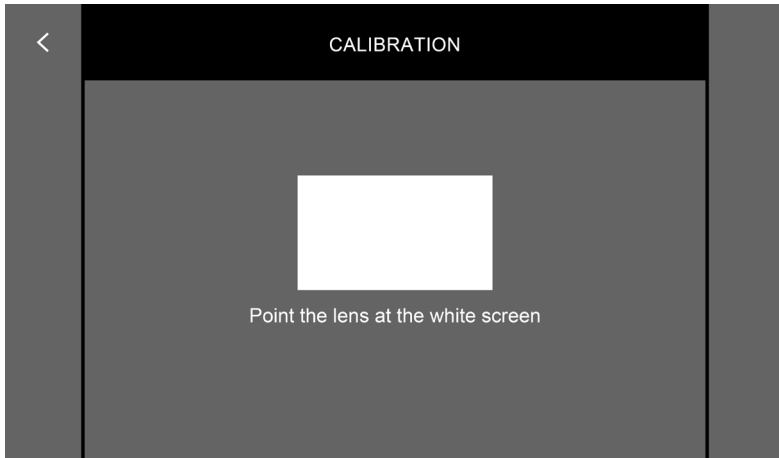
The Watermark logo can be replaced:

- 1.) Save the logo file on the SD card in the root directory. Resolution: 160*32; File Format: .JPG; black back (RGB-0.0.0.)
- 2.) The system will show the existing file list below. Tap the file then the "save" icon to load it into the systems memory. The logo should then show in the preview window on the right ("Yours" as the sample case) when the process is properly completed.
- 3.) Tap the preview window to enable the custom logo watermark.

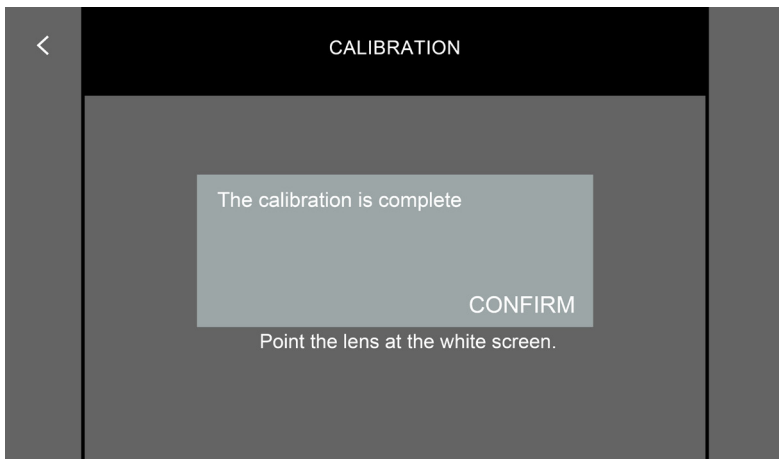


• 3.9 WHITE BALANCE

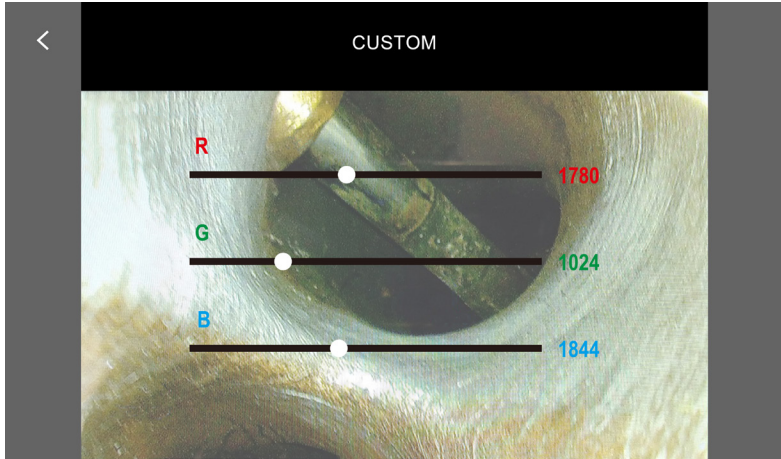
- Default: Factory default setting.
- Calibration: Subject varies according to inspection environment, it's suggested to calibrate the white balance before each use to get the best image hues. Steps as follow:
 - 1.) Tap "CALIBRATION" button.
 - 2.) Point and move the camera toward a plain white paper until the rectangle area of the screen display a nature white status.



- 3.) Tap the "<" button up-left the screen then finish the calibration.

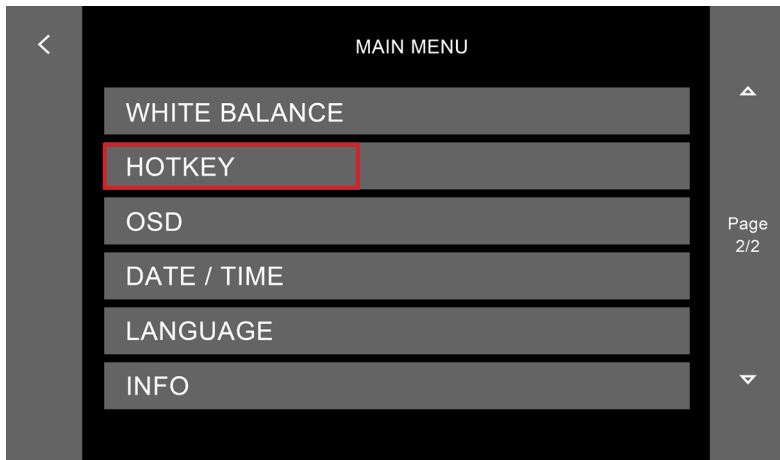


- Custom: Users can customize settings by dragging the R/G/B parameter bars.

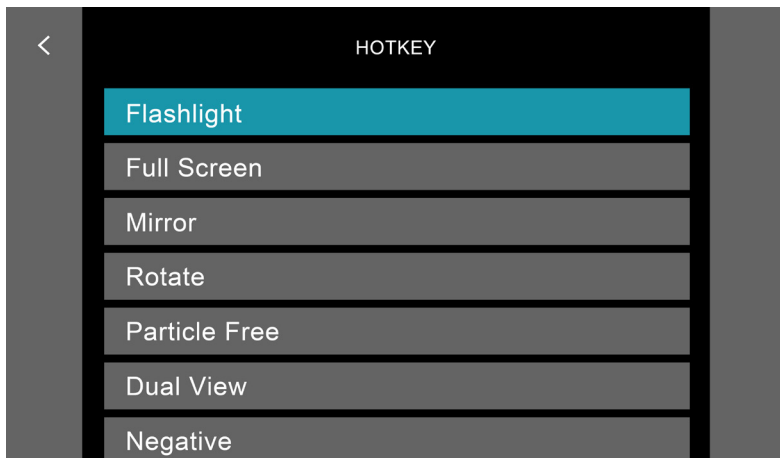


• 3.10 HOTKEY FUNCTIONS

1.) To customize your hotkey, press the hotkey function button in the main menu.



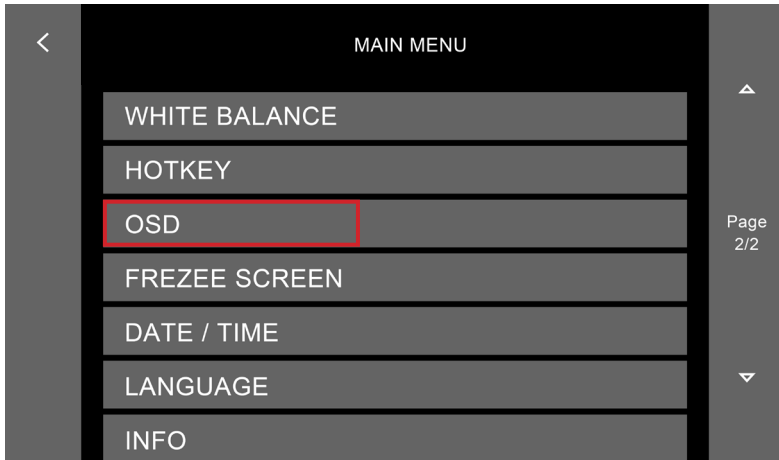
2.) Select the function you wish to be activated upon pressing the hotkey and confirm.



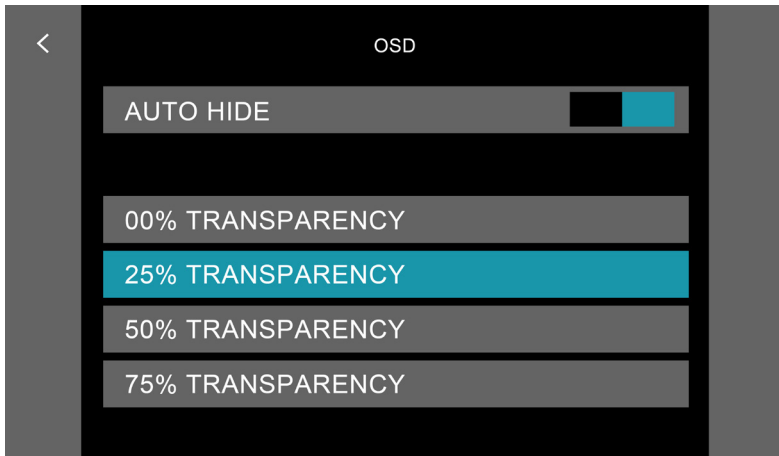
3.) Close the menu. The hotkey function has been changed.

• 3.11 OSD FUNCTIONS

1.) To change the OSD settings, open the main menu and click on OSD.

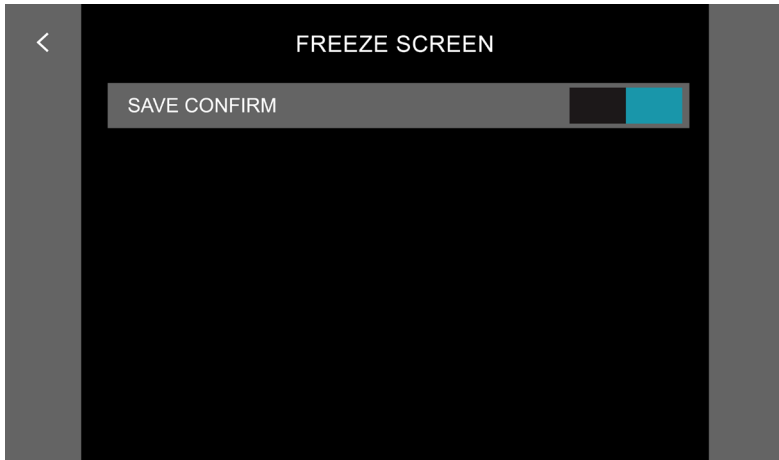


2.) Click on the desired transparency level for the OSD and/ or enable/disable the Auto Hide function.



• 3.12 FREEZE SCREEN

This 'freeze' function is default enable and can be disabled in the setting menu. Short press the trigger button on probe handgrip, the screen live view 'freeze' and pop-up window asks if to save the still image.

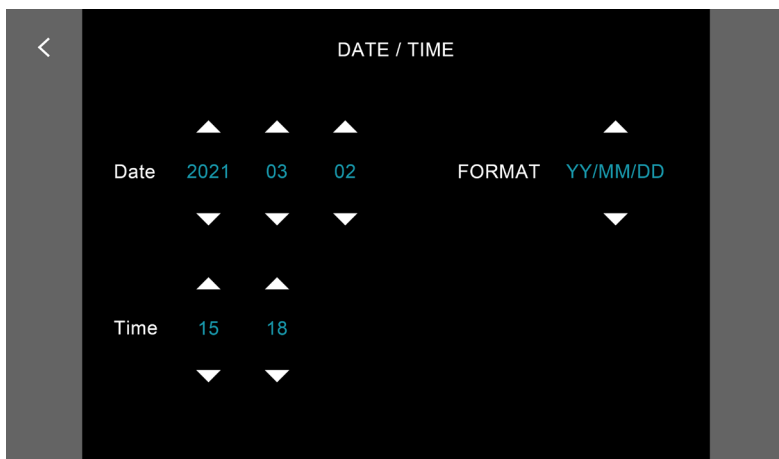


• 3.13 RESOLUTION

The system provides 2 options of still image saved resolution.



• 3.14 TIME SETTING



• 3.15 LANGUAGE

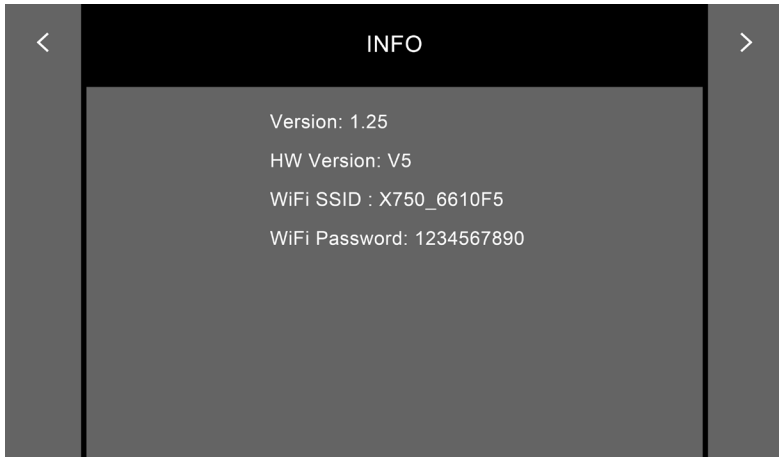


•3.16 INFO.

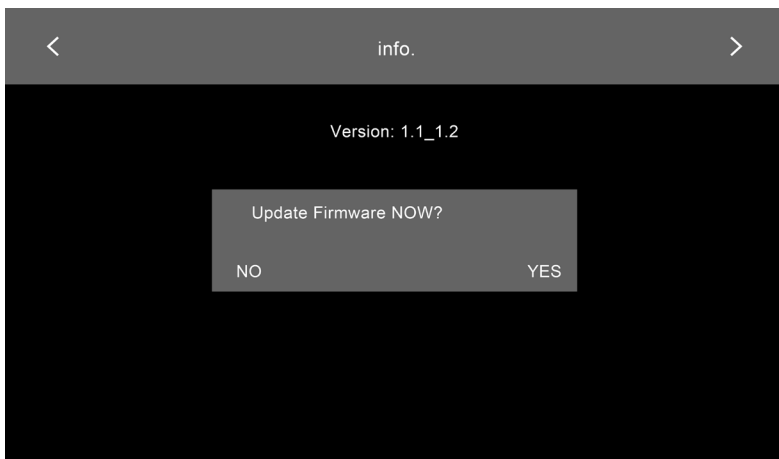
Include firmware information.

- Current version
- Wi-Fi SSID: X750_ (identify code)
- Wi-Fi password: 1234567890
- Firmware upgrade: When there is a new firmware available, load the file SPHOST.BRN into the root directory with your SD card.

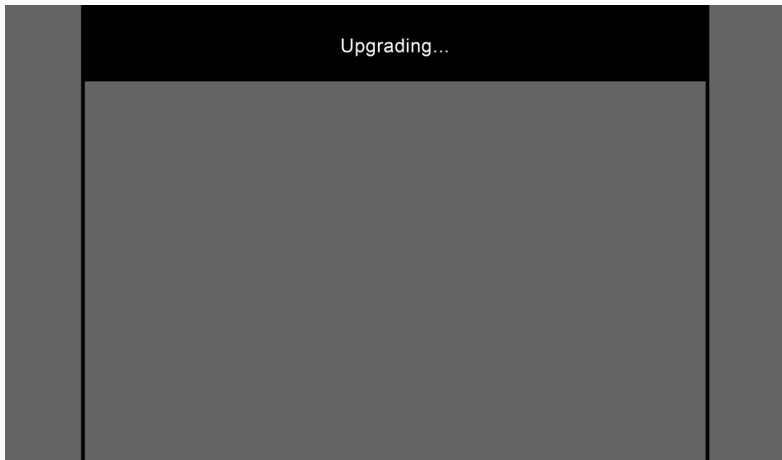
1.) Tap the ">" button on the upper-right of the screen.



2.) Follow the instructions and confirm the Firmware update.



3.) The system will auto shut down when the upgrade is done. The LED of the probe tip will keep flashing while the update is ongoing



Once the update is completed, reboot the system then check if the new version is properly installed.

Specifications

BASE UNIT

Hardware	
Operating System	Mitcorp's OS
Display	5" LCD Detachable touchscreen
Display Resolution	800 x 480
Weight	1230g (w/2m tungsten probe)
Size	327.5x152.8x201.3 mm
Dimensions Of Carrying Case	574x361x225mm
Battery	4900mAh replaceable Li-ion battery approximate operation time; 3hrs (with 3m probes), charging time: 6hrs for 2 batteries
Drop Resistance	1 Meter
Backside Camera	2560x1440, .JPG

Connections

HDMI	TYPE-D HDMI
Data Transfer	USB TYPE-C
Wi-Fi	IEEE 802.11.b/g/n
App Connection	VideoscopeNOW
Power Supply	USB TYPE-C
Storage Media	MicroSD Card. Up to 128GB
Microphone	Built-in
GNSS	GPS, GLONASS Dual Mode

Software Manipulations

Image Manipulations	Digital zoom and brightness control
Note Text Options	Text annotation
Watermark	Timestamp and *.png logo
Tags	Text tags
Image Configuration	Mirror, negative, grid (for dimensions)
Image Titration	White balance setup, brightness, contrast, saturation, and sharpness.
Folder Management	Sessions and folders
High Temperature Warning	3 Levels of warning, 60°C, 80°C, 100°C (Turn off)
Brightness Control	13 Levels, 1 to 5 LED illumination control, 6 to 10 exposure value, 11 to 13 exposure time

Operating Environment

System Operating Temperature	-10°C~50°C
Battery Charging Temperature	0°C~45°C
Storage Temperature	-20°C~60°C
In Water	Not operable in water
Relative Humidity	Max 95% non-condensing
Dust And Water Resistance	IP54

ACCESSORIES

Cables	Power adapter, HDMI cable, TYPE-C cable,
Others	Rigid sleeve, cleaning set, neck strap Centering devices for 6.0mm probes: 18mm, 38mm, 65mm

REGULATORY

MIL-STD Compliance

International Standards Organization (IEC)	MIL-STD-810G-CHG-1 Method 514.7
Electromagnetic Compatibility (EMC)	MIL-STD-810G-CHG-1 Method 516.7
Federal Communications Commission (FCC)	MIL-STD-810G-CHG-1 Method 511.6

Other Regulatory

International Standards Organization (IEC)
Electromagnetic Compatibility (EMC)
Federal Communications Commission (FCC)
PSE (Circular)
WEEE
Restriction of Hazardous Substances 2011/65/EU (RoHS 2)
Restriction of Chemicals Materials EC 1907/2006 – REACH
Transportation for Lithium Batteries UN38.3

PROBES

Full Articulation Probes - Dual View

Model	60D4W-FS	60D4W-FS	60D4W-FS	60D4W-FS	60D4W-FS	39D4W-FS	39D4W-FS
Diameter	6.0mm	6.0mm	6.0mm	6.0mm	6.0mm	3.9mm	3.9mm
Length	2M	3M	5M	7M	10M	1.5M	3M
Direction Of View	Dual view	Dual view	Dual view	Dual view	Dual view	Dual view	Dual view
Probe Head Length	21.5 mm	21.5 mm	24.4 mm	24.4 mm	24.4 mm	21.6 mm	21.6 mm
Field Of View (FOV)	95°	95°	95°	95°	95°	120°	120°
Front Depth Of Field (DOF)	8 mm~∞	8 mm~∞	8 mm~∞	8 mm~∞	8 mm~∞	5~100 mm	5~100 mm
Side Depth Of Field (DOF)	7 mm~∞	7 mm~∞	5~200 mm	5~200 mm	5~200 mm	5~100 mm	5~100 mm
Still Image Resolution	2560x1440	2560x1440	2560x1440	2560x1440	2560x1440	1600x1600	1600x1600
Video Resolution	2560x1440	2560x1440	2560x1440	2560x1440	2560x1440	1600x1600	1600x1600
Articulation	Full way	Full way	Full way	Full way	Full way	Full way	Full way
Articulation Angle	≥ 145°	≥ 145°	≥ 130°	≥ 125°	≥ 110°	≥ 120°	≥ 120°
Probe Head Material	S.Steel	S.Steel	S.Steel	S.Steel	S.Steel	S. Steel	S. Steel
Probe Material	Tungsten	Tungsten	Tungsten	Tungsten	Tungsten	Tungsten	Tungsten
Operating Temp. In Air	-10~100°C	-10~100°C	-10~100°C	-10~100°C	-10~100°C	-10~100°C	-10~100°C
Operating Temp. In Water	10~30°C	10~30°C	10~30°C	10~30°C	10~30°C	10~30°C	10~30°C
Max Pressure Resistance	3 bar	3 bar	3 bar	3 bar	3 bar	1 bar	1 bar
Optional Protective Cap ¹	-	-	-	-	-	-	-
Optional Plastic Sleeve ²	-	-	-	-	-	-	-

Hydraulic Fluids Resistance Gasoline, diesel, brake oil, transmission oil, engine oil

Full Articulation Probes - Front View

Model	60D4W-F	60D4W-F	60D4W-F	60D4W-F	39D4W-F	39D4W-F	
Diameter	6.0mm	6.0mm	6.0mm	6.0mm	3.9mm	3.9mm	
Length	2M	3M	5M	7M	1.5M	3M	
Direction Of View	Front view	Front view	Front view	Front view	Front view	Front View	
Probe Head Length	19.3 mm	19.3 mm	19.3 mm	19.3 mm	13 mm	13 mm	
Field Of View (FOV)	90°	90°	90°	90°	120°	120°	
Front Depth Of Field (DOF)	25 mm~∞	25 mm~∞	25 mm~∞	25 mm~∞	5~100 mm	5~100 mm	
Side Depth Of Field (DOF)	-	-	-	-	-	-	
Still Image Resolution	2560x1440	2560x1440	2560x1440	2560x1440	1600x1600	1600x1600	
Video Resolution	2560x1440	2560x1440	2560x1440	2560x1440	1600x1600	1600x1600	
Articulation	Full way	Full way	Full way	Full way	Full way	Full way	
Articulation Angle	≥ 120°	≥ 120°	≥ 80°	≥ 80°	≥ 140°	≥ 140°	
Probe Head Material	S.Steel	S.Steel	S. Steel	S. Steel	S. Steel	S. Steel	
Probe Material	Tungsten	Tungsten	Tungsten	Tungsten	Tungsten	Tungsten	
Operating Temp. In Air	-10~100°C	-10~100°C	-10~100°C	-10~100°C	-10~100°C	Tungsten	
Operating Temp. In Water	10~30°C	10~30°C	10~30°C	10~30°C	10~30°C	10~30°C	
Max Pressure Resistance	1 bar	1 bar	1 bar	1 bar	1 bar	1 bar	
Optional Protective Cap ¹	-	-	-	-	-	-	
Optional Plastic Sleeve ²	-	-	-	-	-	-	

Hydraulic Fluids Resistance Gasoline, diesel, brake oil, transmission oil, engine oil

Accessories



1 Lithium-ion Batteries:

Quickly removable batteries that provide 3 hours of operation each.

2 Probe Adapters:

The X750 comes with a Side View and Dual View Mirror adapter as well as a Pin adapter for measurements.

3 Accessory Box:

A variety of different power adapters are available to recharge your X750. A mini-HDMI cable, EMI core*4(detachable for USB or HDMI cable's connector ends), a USB Type-C cable, a memory card and a cleaning kit are also included.

4 Rigid Sleeve:

Rigid sleeves are available for 6.0 mm and 3.9 mm probes. Each rigid sleeve comes with two parts that can be connected to extend the sleeve.

5 Neck Strap:

The X750 comes with a detachable neck strap that can be easily attached or detached.

6 Trolley Case:

The trolley case is lightweight and dust and waterproof. It is rugged and ensures that your X750 stays safe during your travels.

7 Centering Devices:

3 outer diameter centering devices for 6 mm probe included.

= Appendices =

USB videoscope

The software enables Mitcorp videoscope to work on PC. Connect your PC to the video scope base unit USB port, select the "CAMERA" mode, then launch this software. Download the software to PC.

Operating system: Win10 and higher version.

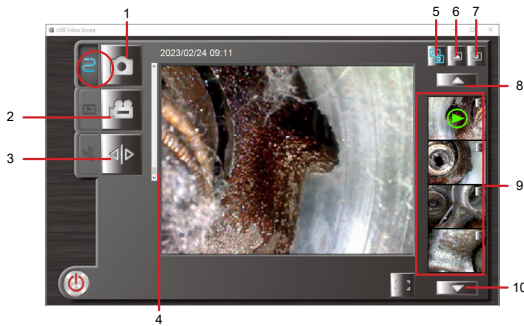


System requirement: CPU AMD Athlon II 2GHz above (Quad core) / Independent graphics card / card / RAM 4G or above. The software function breakdown into 3 mode: Instant Mode (live view) / Browse Mode / Setting Mode.

Detail instruction as follow:

OPERATION

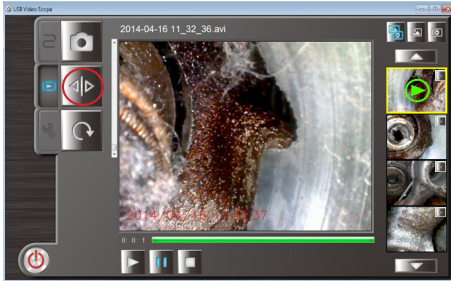
Instant mode



1. Snapshot - Click button or `[space bar]` from the application window, or press the Snap button on the console to take a photo.
2. Video record - Click button or `[Ctrl] + [R]` key on the application window to start recording video. To stop recording, click the Rec button on the application.
3. Mirror - Click or `[Ctrl] + [M]` key to flip the image horizontally.
4. Zoom in - Roll up the bar to zoom in the image from x1.0 to x4.0, You can also click the key on your PC to zoom in, click the key on your PC to zoom out.
5. Preview both photos/videos or `[Alt] + [A]` key.
6. preview photos only, or `[Alt] + [P]` key.
7. Preview videos only, or `[Alt] + [V]` key.
8. Click to previous file, or `[PgUp]` key.
9. Display 4 latest photo/video, press `[1] ~ [4]` key to preview
10. Click to next file, or `[PgDn]` key.

Browse Mode

Press 2nd TAB on the screen or press any picture/video on the preview window. The Browse mode will not function if no pictures/videos in the folder.



Mirror

Click  or **Ctrl** + **M** key to flip the image horizontally.

Rotate

Click  or **F2** key to rotate image counter-clockwise 90°.

Screenshot on video

You can click  or **space bar** key anytime during video playing to get still image.

Video Play

Click  to play selected video, or **Ctrl** + **P** key.

Click  to pause, click  to continue play, or **Ctrl** + **P** key.

Click  to stop the video, or **Ctrl** + **S** key.

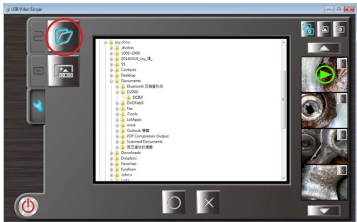
Delete

Select the image click  on the up right of the photo / video image or **Delete** key.

* Back to instant mode, click **ESC** key.

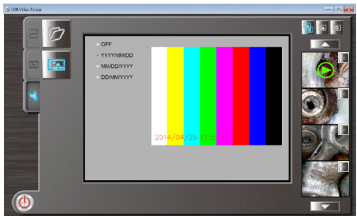
Setting Mode

Destination folder set up



Select the destination folder to save images and videos, click  to change setting or  to skip and keep the default setting. (C:\Users\Documents\USB VideoScope)

Time stamp set up

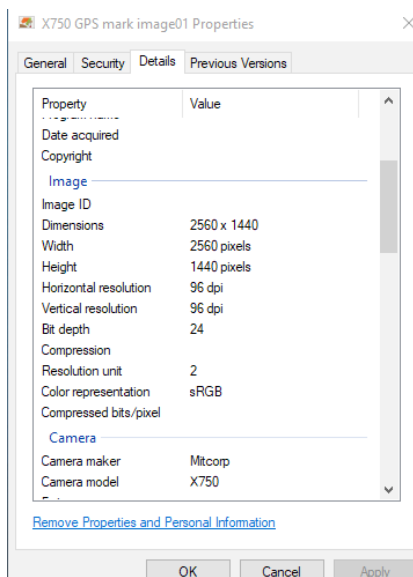
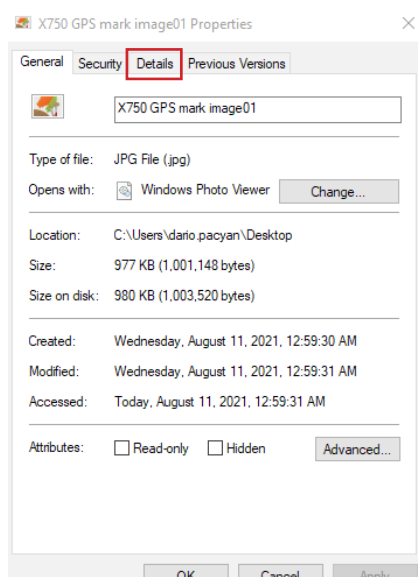


Select the time stamp display format, all photos and videos will be saved with selected format on left bottom.

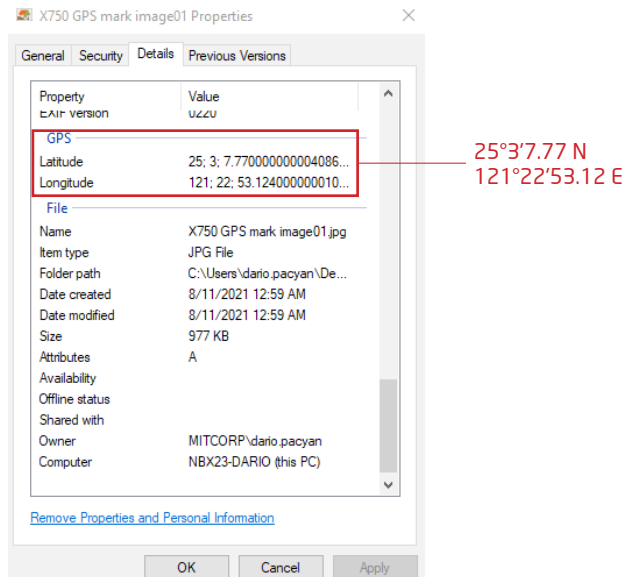
* Back to instant mode, click  key.

Probable usage of GPS marks data of X750 images

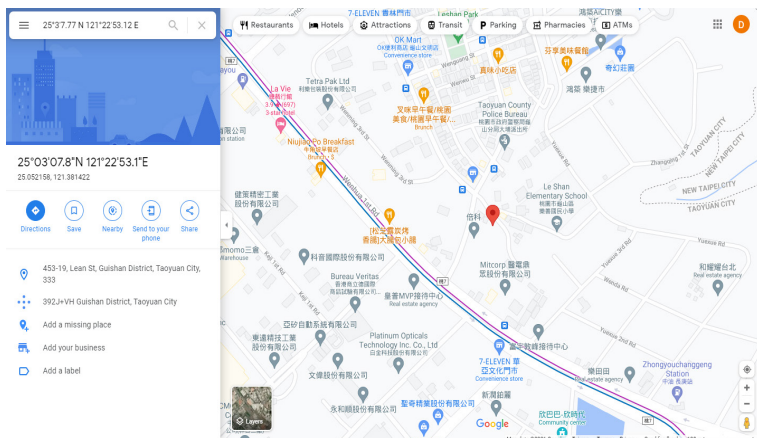
- Access the optional “Insight” software
 1. The “Insight” software is an optional exclusive report generation and GPS mapping software provided by the Mitcorp Company for video scopes utility.
 2. Download the Insight software quick guide from Mitcorp’s website and follow if your scope of purchase including it.
- Without the optional “Insight” software
 1. Right click X750’s image file and get to the “file detail” tag sheet.



2. Scroll down and check the GPS data was successfully saved.
Take a note of that data.



3. Move to the Google Map application or other global map utility software.
Enter the GPS mark: 25°3'7.77 N 121°22'53.12 E and look up the photo shooting location information.



X750 Basic Troubleshooting

- Do not use the equipment if there are any obvious malfunctions or damage and contact Mitcorp for repairs.
- Do not use the instrument when you suspect even the slightest irregularity.
- This troubleshooting guide is for basic problems only, if the problem cannot be resolved through the described action, please stop using the product and contact Mitcorp for assistance.
- Common Issues: Main System

Defect	Possible Cause	Recommended action
Cannot power on	1. Out of battery	Please connect the power cord to charge
	2. The probe is not connected properly	Please screw on the probe connector tightly
	3. The environmental temperature is too low or too high	Please place the system in a normal temperature environment
	4. The Base Unit is broken	Please contact Mitcorp or your local distributor for repair
When there is no image / the image is freezing after powering on	1. Abnormal power on	Please reset the system
	2. The Probe doesn't connect properly	Please screw on the probe connector tightly
	3. A Hot-swap was performed	Please power on the console after connecting the probe
	4. The console or the probe is broken	Please contact Mitcorp or your local distributor for repair
Cannot record	No SD card	Insert SD card
Cannot activate Wi-Fi		
No GPS Signal	Reboot	Time to find GPS signal: System first boot: 15 mins Cold boot (e.g. changing batteries): 2~13 mins Warm boot: about 1 min
Color tone is not correct	White balance error	Check / calibrate white balance
Charging set LED flashing	Poor battery conducting	1. Withdraw the battery from the charging set 2. Withdraw the power input from the charging set 3. Install the power input and battery again

- Common Issues: Insertion Probes

Defect	Cause	Recommended action
The probe doesn't articulate fully	1. The probe is rolled up	Please spread the probes out
	2. The probe is twisted	
	3. The probe was pulled with too much force	Please avoid pulling the probe excessively
	4. The probe head is interfered by another force	Please reserve the room for articulation
	5. The Probe head is broken	Please sent it back to Mitcorp for RMA
The image is unclear	1. The lens is dirty	Please clean the lens with the cleaning kit
Front LED light is off	1. Particle free feature is on	Please turn it off and check again
	2. Light off feature is on	
The screen is white	1. Light boost is on	



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