

Mitcorp

X2000 HD

VIDEOSCOPE SYSTEM



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Safety & Cautions

CE NOTICE

The Videoscope System is in conformance with the following standards:

- 2014/30/EU Electromagnetic Compatibility Directive
-

RoHS NOTICE

The X2000 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 warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

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.
- Never replace the battery by yourself.

 **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** 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

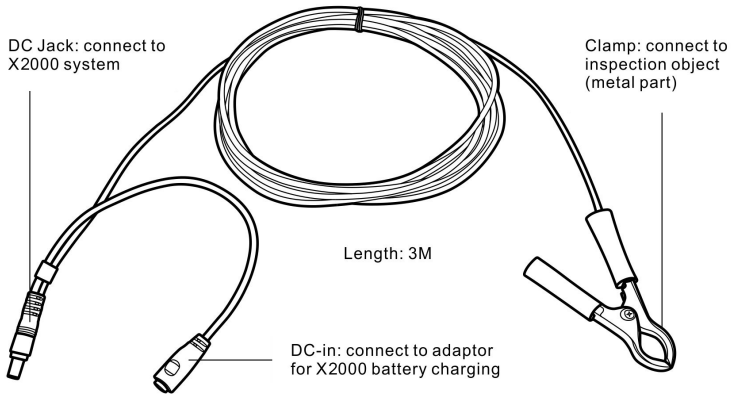
- Please refer to Chemical resistance below. Contact the store you purchased for unsure chemical solutions for further information.

Chemical Resistance

- Water
- Brake fluid
- Gasoline
- Diesel fuel
- Transmission fluid

CAUTION Grounding

- When the probe passed through ungrounded metal test piece, the base unit might be shock by the static electricity. Ground wire is included in the accessory pack. Please follow the instruction below.



CAUTION Camera High Temperature warning

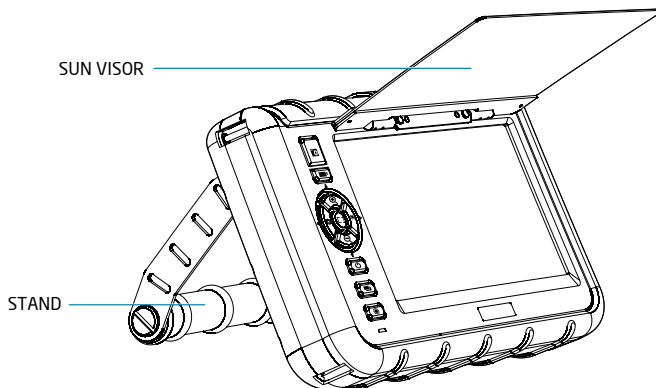
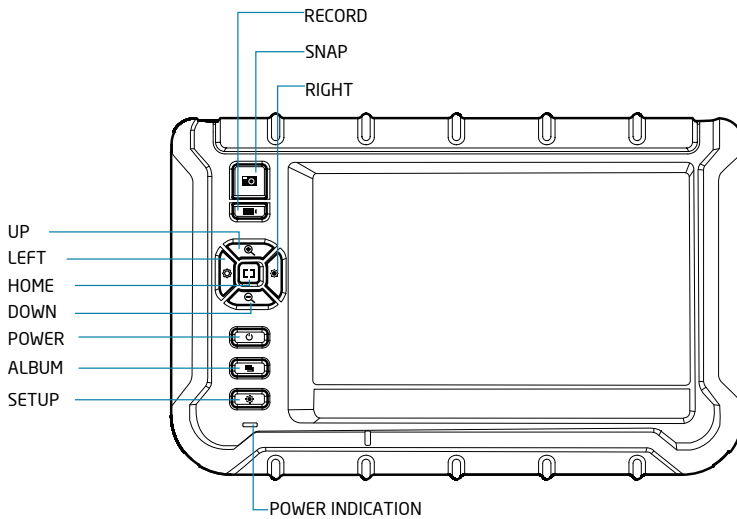
- Prevent using the camera head in over 100°C environment.
- The base unit shows 3 levels (60°C/80°C/100°C) camera temperature warning signals. Take out the tube when the 100oC warnings signal pop up.

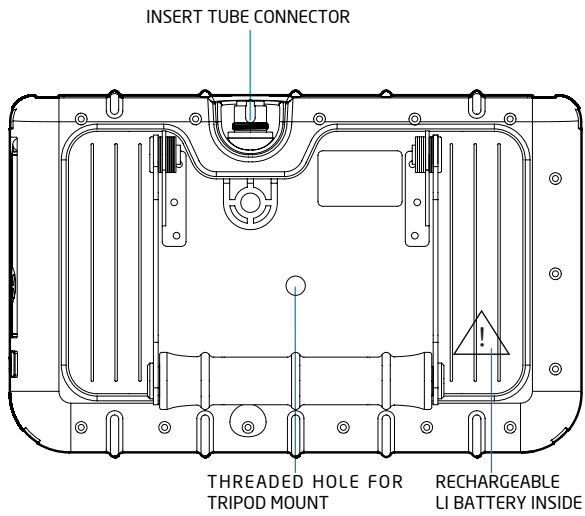
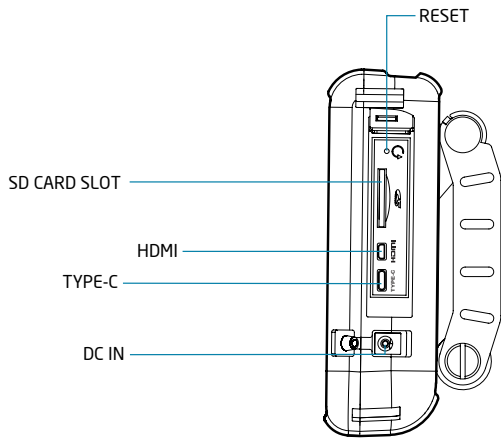
CAUTION Changing probes

- The system don't support probe hot-swapping. Properly shut down the system before you change the probes.
- The X2000 base unit is compatible to Mitcorp's MX series 3.9mm Articulation probe. The firmware driver and some function user interface are conditionally different by each other. The system reboot process will detect the probe type. When changing different type probes, the system will show a reminding message on screen and auto shut down. Users should reboot again to enter the proper firmware.

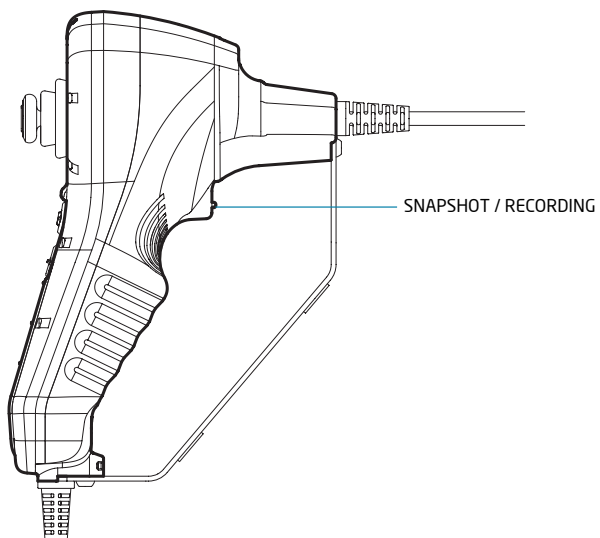
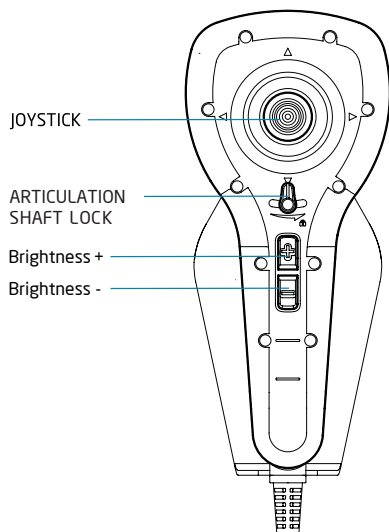
Part I Product Outlook

• 1.1 X2000 Base unit



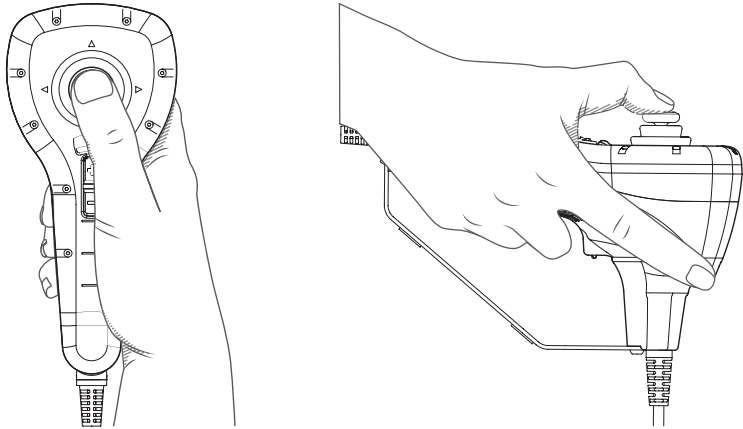


• 1.2 Joystick Console



Frequent operations

Generally, use your thumb to control the joystick, and use other fingers to grip the handle.




The joystick operations





Lock mode: The articulation angle can be fixed by every joystick movement.

Capture images

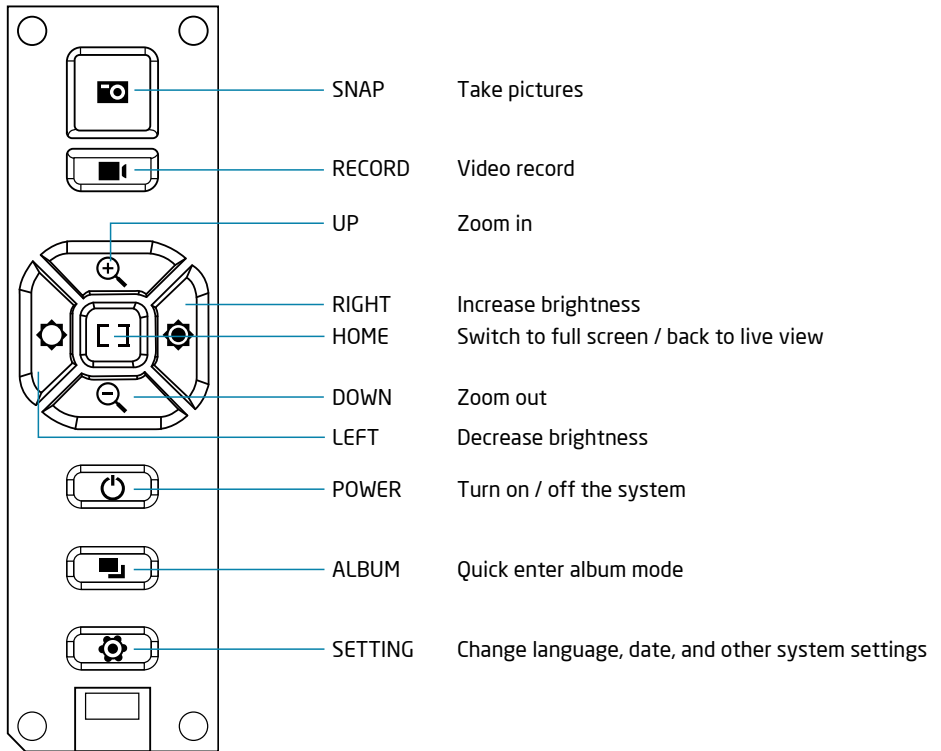
- Press  to capture desired image.
- Press long (for 2 secs) to record video. Press again to snapshot while recording.
Press long (for 2 secs) again to stop recording.

Adjust brightness

- Press  increase brightness.
- Press  decrease brightness.

Part II Main button function

• 2.1 Main UI



Live View screen UI

- 2.2 Live view Screen Overlays



Full Screen

Press the [] button to hide/display function buttons on two sides.

- 2.3 Zoom in/Out

Press the  /  button. Digital zoom 3x adjustable.


- 2.4 Brightness Control

Press the  /  button. 10 levels adjustment.

The X2000 system provides live view manual exposure function to get rid of glare reflection (such as metal surfaces..., etc). Tap the glare spot on the screen, the system will automatically tune to optimize the brightness of the image. Tap the dark spot will get brightness view (higher exposure gain value).


PS. When the manual exposure is enabled, the screen will show on a "[°]" icon .
Touch the icon can go back to normal auto exposure mode.

- 2.5 Snapshot

Press the  button. Time stamp/Logo watermark/Grid will be record on the photo when they are enabled.

- 2.6 Video Recording

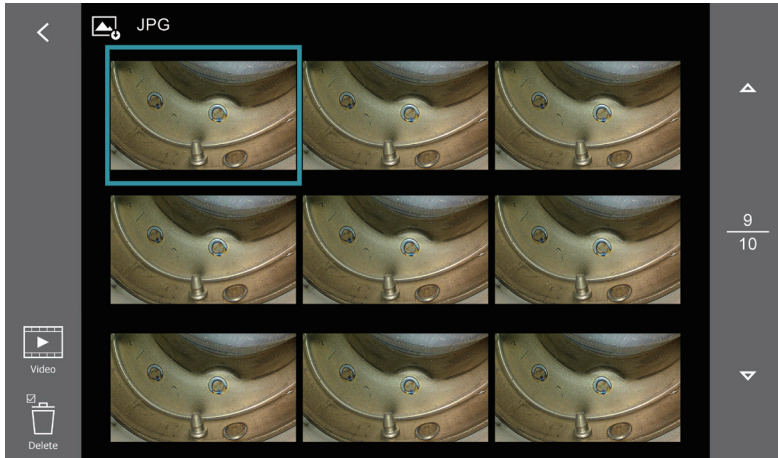
Press the  button to start / stop recording video.

During recording, press the  button can take and save the real time screenshot image photo.

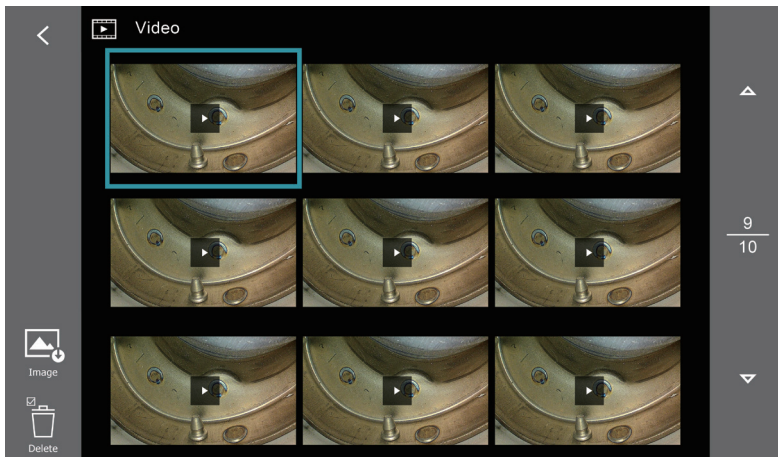
PS. For system constrain, the video length are automatic separated into 5 minutes each. Total recordable length rely on SD card memory space.

- 2.7 Album




- 2.7.1 Photo Gallery: touch  button to view video gallery.



- 2.7.2 Video Gallery: touch  button to view video gallery.




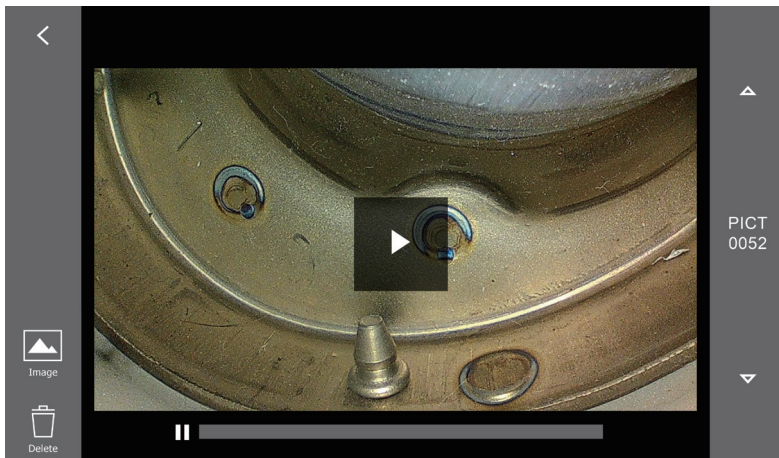
- 2.7.3 Single photo view:

touch  button to view single video file.
The  and  instruction is in next section.



- 2.7.4 Single video view:

touch  button to view single photo file. Touch any position of the screen to play / pause.

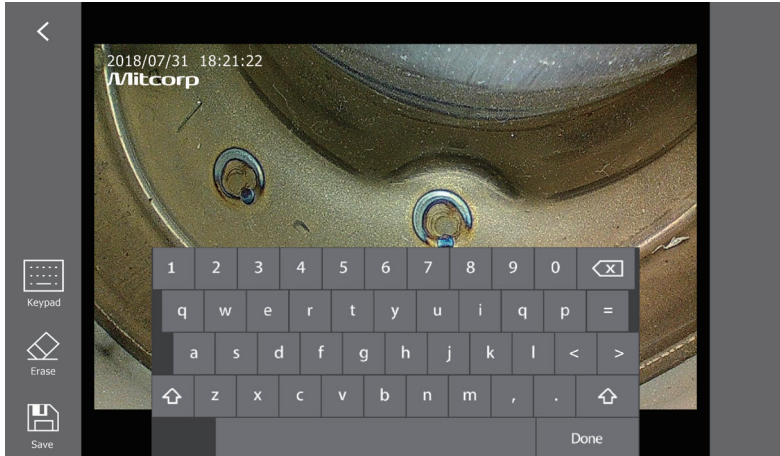


- 2.8 Album - Photo annotation function


The X2000 system allows user add maximum 10 notes on a photo. Each note can key in maximum 24 characters. The edit steps as follow:

- 2.8.1 Add one note:

 [key in]-> [Done]. Then a note can be done.




- 2.8.2 Add more note:


 [key in]-> [Done].



- 2.8.3 Move note position.

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.

- 2.8.4 Erase note 

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

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

- 2.8.5 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.

- 2.9 Album - Compare function

Touch the "□;○" key to compare the live view with any stored image file.



To move the compared photo to target position.



To switch the left / right side viewing window.





To replace another compared photo.

Note:

Push the [] key to go back to live view.

Note:

Concerning the necessary usage of accessing stored images files, the  and  functions will be disable when there is no SD card installed in console.

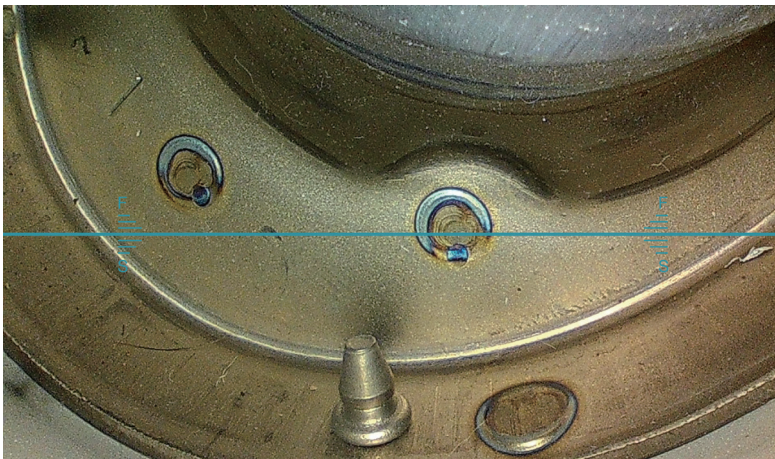
Part III Touch-screen key functions



• 3.1 Function list

| Function | Button | Description |
|-------------------------------|--------|--|
| Light Boost | | Maximize the EV to get brighter view in dark space. |
| Light Off | | Front LED on/off |
| Mirror | | Mirror image |
| Grid | | Assemble the contact pin and enable to get a reference 2 dimensions measurement(inch/cm) on screen. |
| Compare | | Compare a chosen image in SD card with live view. |
| Wireless | | To enable / disable wireless connection. |
| Particle Free | | Assemble the side-view mirror and enable to get rid of particle on the image (system auto Zoom 1.1x to get optimized view area). |
| Dual View ^{(*)1} | | Assemble the dual-view mirror and enable, monitor provide F(front) and S(side) label on image. |
| Light Direction | | When using the dual-view mirror, switch the LED direction to get better image illumination. |
| Image ^{(*)2} | | Drag the adjustment bar to get better image effect. |
| Negative | | Negative image effect |
| White Balance ^{(*)3} | WB | 3 mode: Default / Calibration / Custom |

- Dual View^(*) (While using 6.0mm dual view mirror)



- Image ^{(*)2}

To get better image effect in different inspection circumstances, the system provides 3 adjustable image configuration- Brightness 、 Contrast 、 Sharpness.

PS. Tap the "Default" icon can go back to system default.



- White Balance ^{(*)3}

- Default: Factory default setting.

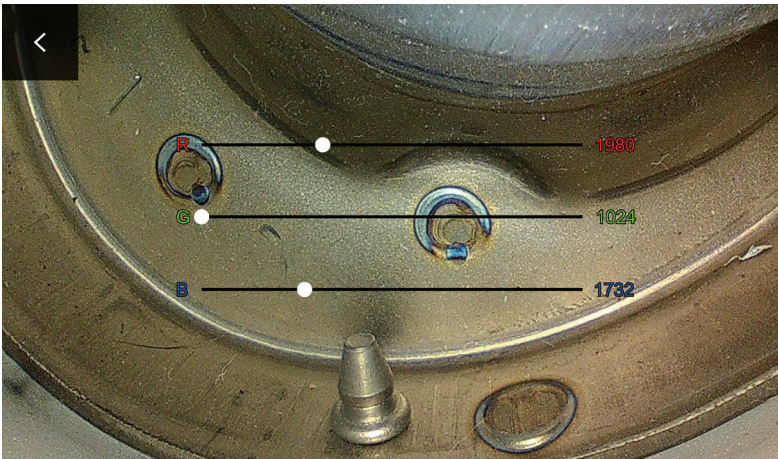
- Calibration: Subject to various inspection environment, it's suggested to calibrate the white balance before each usage to get the best image hues. Steps as follow:

1. Tap "CALIBRATION" button.



2. Point the lens toward a plain white paper and try to let the rectangle area on screen looks near nature white as possible.
3. Tap the "<" button up-left the screen then tap confirm, the calibration process is done.


- Custom: Users can custom own setting by the R/G/B parameter bar.





- 3.2 Wireless function

- 3.2.1 Enable wireless



In a few seconds, the  indicator shows up, then the system is ready to be searched and connected by mobile devices.

- 3.2.2 Wi-Fi connection with mobile devices

Open your mobile Wi-Fi setting and search the system SSID. The SSID and password can be found in the  / .

Connect the system with your mobile device.

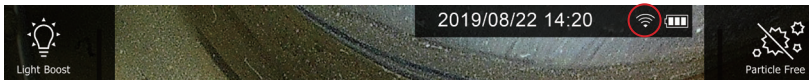
Note:

- Typically, the Wi-Fi system will be added to your favorite Wi-Fi network list after first time connecting. The favorite Wi-Fi network will store the SSID/ password.
- The main system allows 1 console to 2 mobile connection simultaneously.
- When use a new mobile device to connect the system, please check there is not any existing mobile device enabling Wi-Fi and connect to the system. It may cause the connecting step being rejected then fail.

- 3.2.3 Live share and access the image of the system.

Launch the “VideoscopeNow” APP.

When the system start streaming image to mobile APP, the wireless indicator will show up on the OSD.



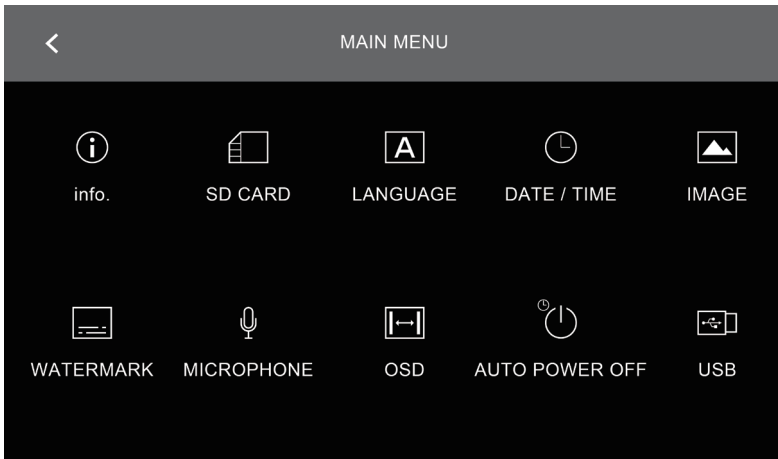
Note:

- MITCOPR provide the "VideoscopeNow" APP for X2000 wireless usages.

'VideoscopeNOW' is a tool specifically designed industrial videoscopes that can share the live view from the main portable console system through Wi-Fi connection. It can also act as a remote controller to make the console taking photos or recording clips. In the APP, user can link to the system to access the album and download the photos/clips on the local mobile devices.

Part IV Main MENU settings

•4.1 Menu

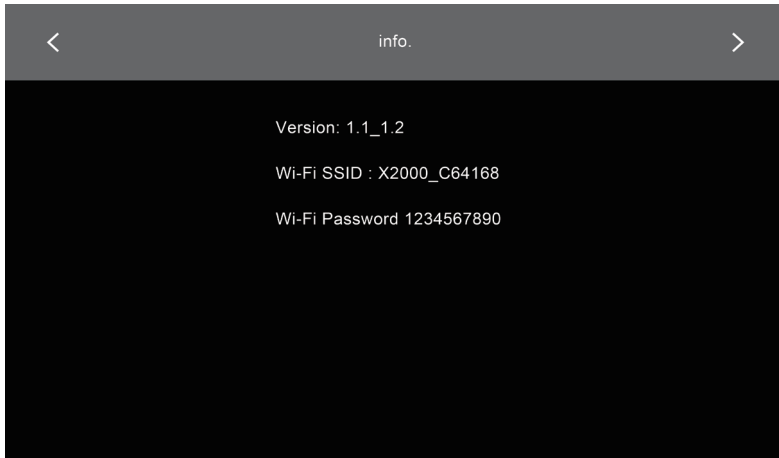


• 4.2 Info.

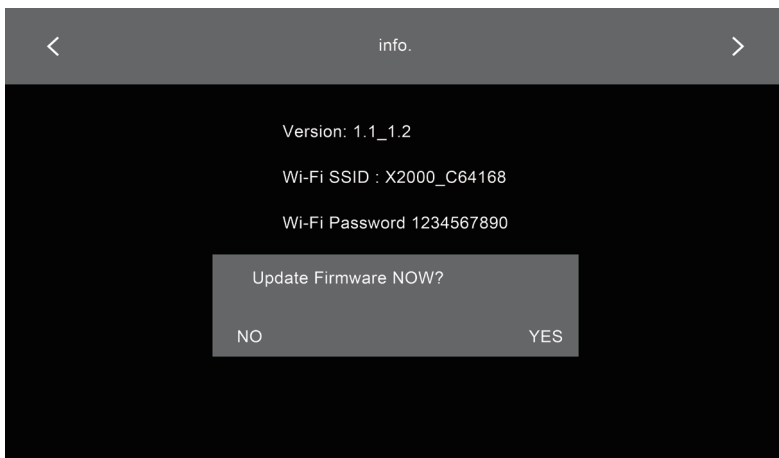
Include firmware information.

- Current version
- Wi-Fi SSID: X2000_(identify code)
- Wi-Fi password: 1234567890
- Firmware upgrade: When there is new version firmware be suggested, save the file (.BRN file format) in the SD card root dictionary.

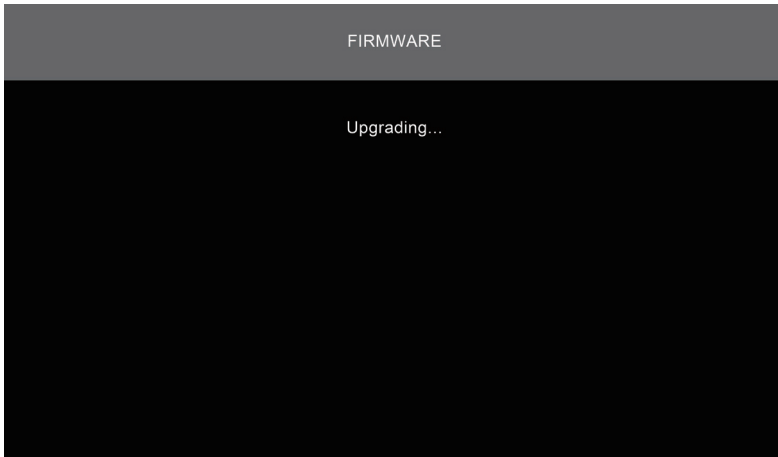
1. Tap the ">" button up-right the screen.



2. Follow the instruction.

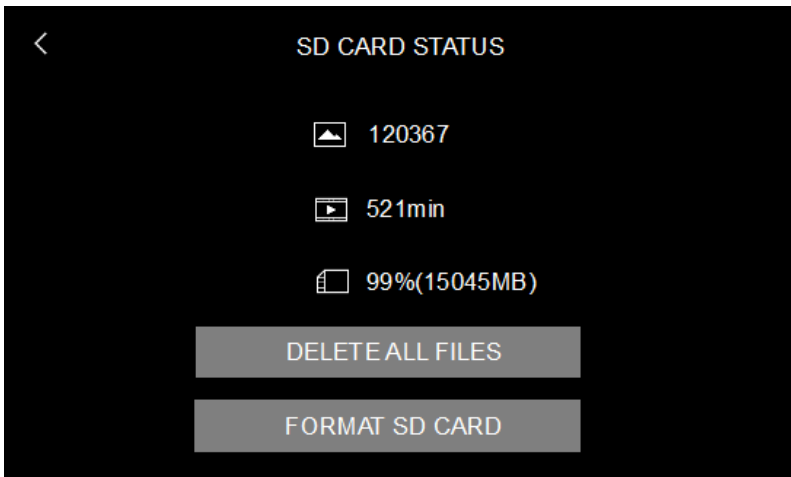


3. The system will automatically shut down when the upgrade is done. Reboot the system then check if new version is properly installed.



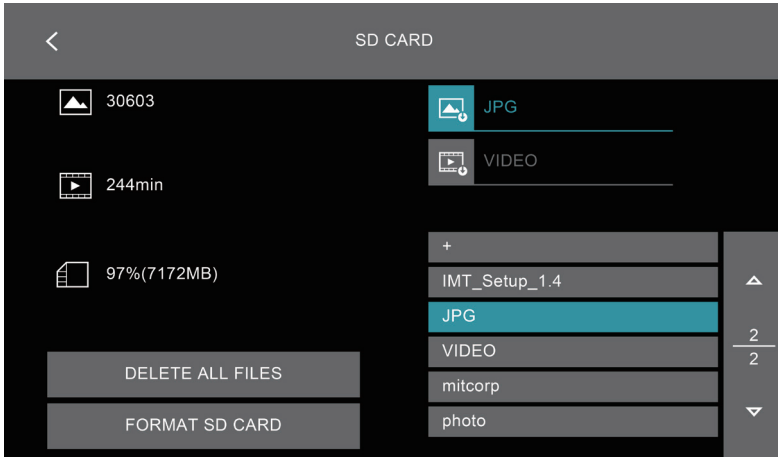
• 4.3 SD card status

1. Storage information.
 - X2000 system support user define/build files storage folder.
 - The default storage folders: JPG (for still images) / VIDEO(for recorded videos) will be built when new SD card been inserted.

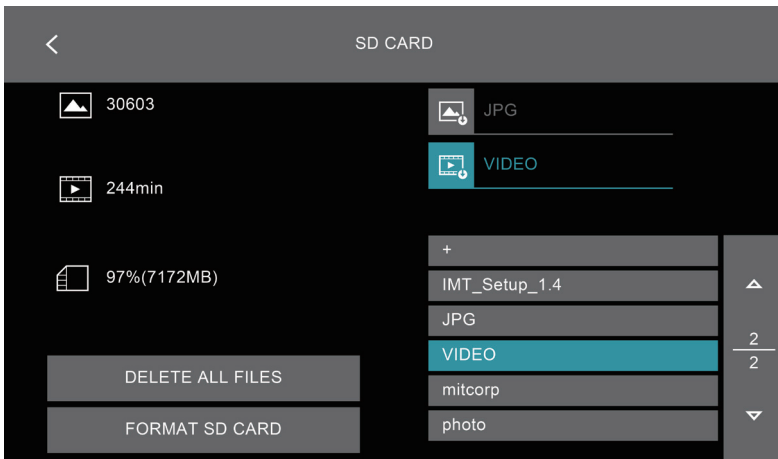


2. User build image folder:

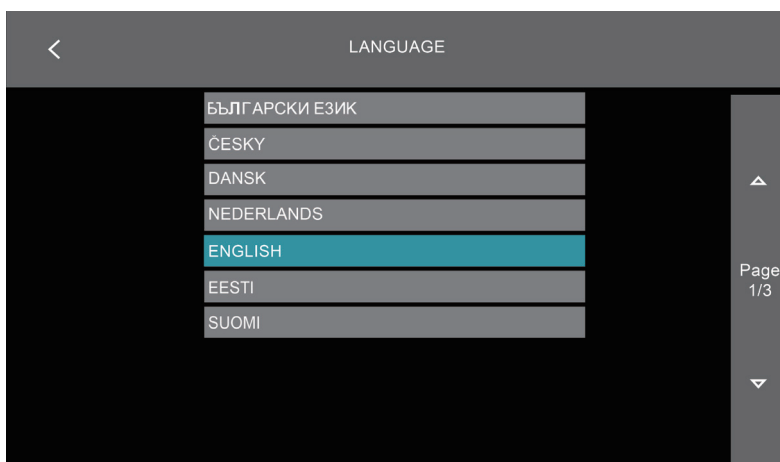
- Tap the JPG(image icon)-> Existing folders will be listed below. Tap the folder to assign storage path.
- Tap the "+" icon to build new folder as need. The folder name must be English characters and Arabic numerals composition. System provides on screen keypad for typing.
- The folders cannot be deleted on the system. Manage the SD card folder on your PC devices.



3. User build video folder: (same operation processes as image folder)



• 4.4 Language



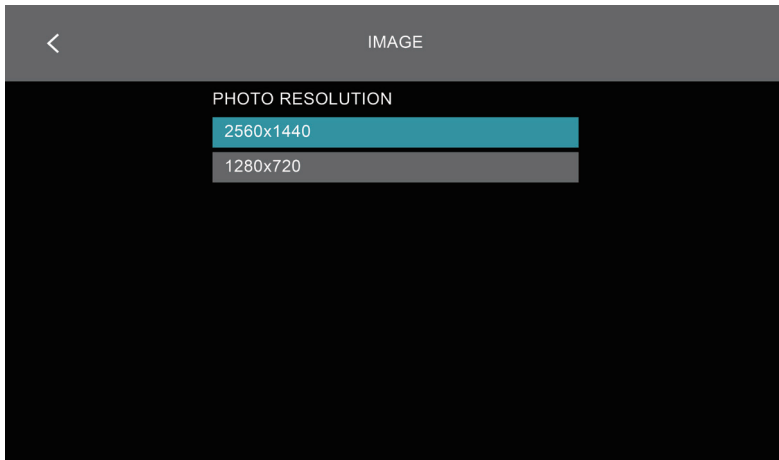
• 4.5 Time setting



• 4.6 Image

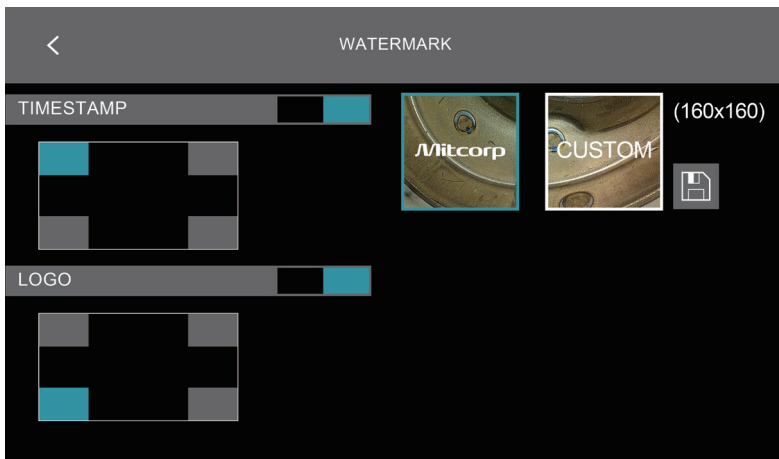
- Snap shot photo resolution options:

(1) FINE mode: 2560*1440 ; (2) STANDARD mode:1280*720.



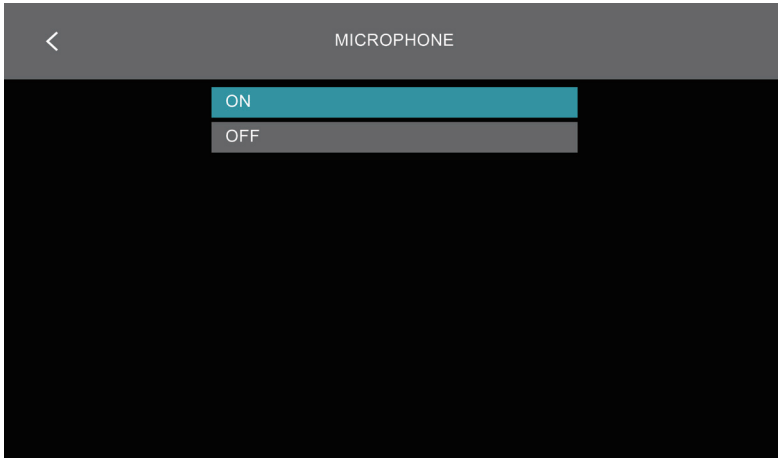
• 4.7 Watermark

- On/off switch for both timestamp and Logo watermark on snap shot photos.
- Timestamp and Watermark position are adjustable to 4 corners of the photos. Tap the position block icon as need.
- The Watermark logo can be replaced:
 1. Save logo file in SD card on root directory. File format: 160*160 resolution; JPG; black background (RGB-0.0.0)
 2. System will show the exiting file list below. Tap the file then the "save" icon to load it into system memory. The logo should shows in the right side preview window ("CUSTOM" as the sample case) when the process are properly done.
 3. Tap the preview window to enable custom logo watermark.



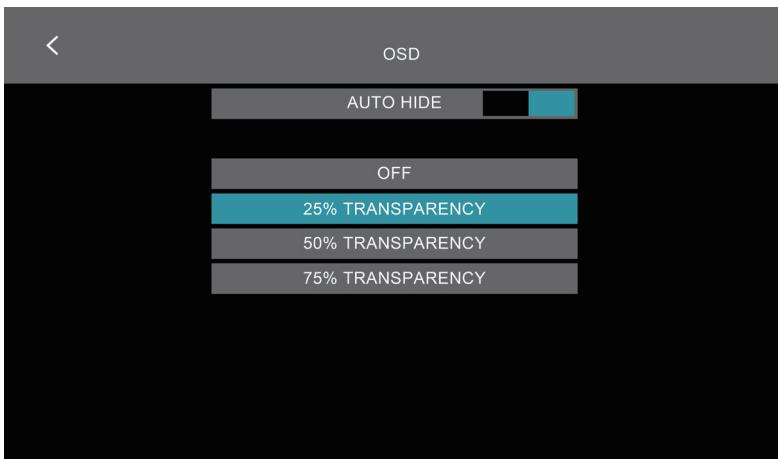
• 4.8 Microphone

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

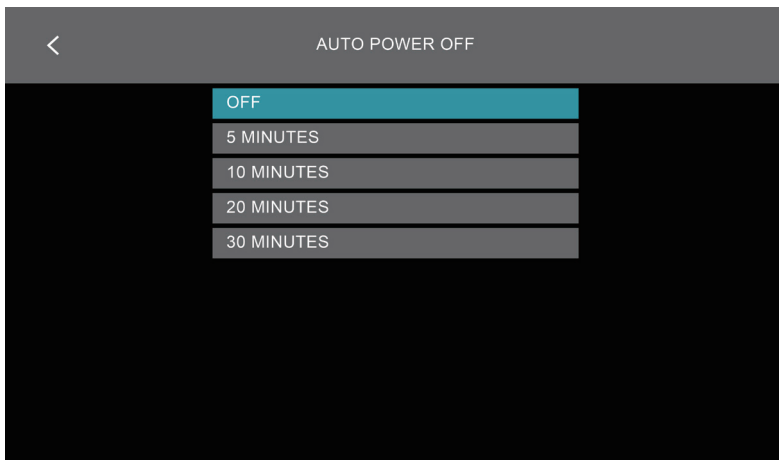


• 4.9 OSD

- AUTO HIDE on/off switch of the OSD (On-Screen Display) function bars on 2 sides.
- The transparency of the function bars are 4 levels adjustable.

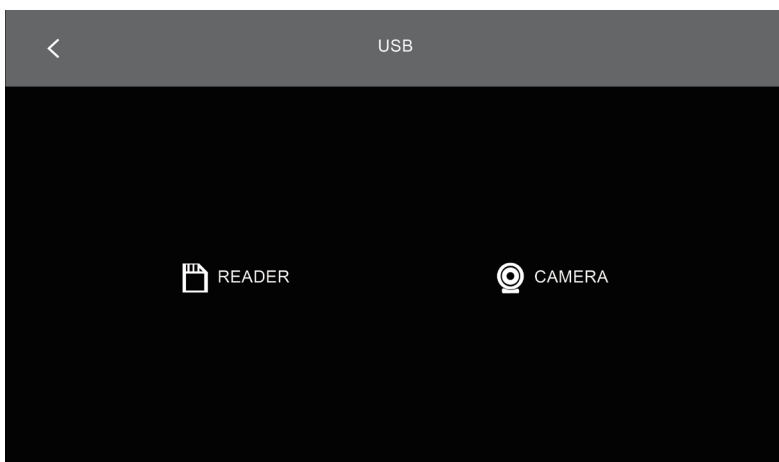


• 4.10 Auto power off



• 4.11 USB

- When the USB port is connected to PCs, choose output to be:
(1) SD card reader ; (2) Camera.




Note:

Users need to install the specific PC software-"USB VIDEO SCOPE" before connecting PC with the CAMERA mode.

The "USB VIDEO SCOPE" software can be download from the www.mitcorp.com.tw website.

Specifications

| X2000 | | |
|---|---|---|
|  | | |
| Display | 7" LCD, Resolution 1024x600 | |
| Power Supply | AC adapter: | 100V~240V, 12V 2.5A. 50~60Hz |
| | BATTERY | Rechargeable Li Battery 3.6V 9800mAH, approximately operation time: 5hrs, charging time: 4 hrs. |
| Video Output | HDMI | TYPE D; HDMI 1.4 transmitter with 3D format and CEC support |
| | USB | USB TYPE C, supporting USB full-speed and high-speed data transmission |
| | Wi-Fi | IEEE802.11B/G |
| Operating temperature ^(*) | in air 0~40°C with AC power adapter: 0-40°C charging temp: 0~35°C | |
| Drop resistance | 1m | |
| Relative humidity | Max 95% non-condensing | |
| Dust proofing and water proofing | IP57 | |
| Insert Tubes interchangeability | 6.0mm HD series; MX3.9mm series | |

* High temperature during charging/operation may cause battery degradation of performance and life.

| Software Features | |
|-------------------------|--|
| Image features | Digital zoom 3X, 10 steps brightness control |
| Image effect | Brightness, Contrast, sharpness adjustment |
| Annotation | 10 text annotation (24 characters) |
| Timestamp / watermark | For snapshot / video recording (on/off) |
| Image management | User define pic / video folder available |
| Image display functions | Light boost, light off, mirror, grid, compare, wireless, particle free, dual view, light direction, negative, auto white balance |
| White balance | Manual adjustable (default, calibration, custom) |

| Recording Management | | |
|-------------------------|--------------------------------|---------------------------------|
| Storage media | SDHC up to 32G | |
| Overlay | YY/MM/DD h:m, battery capacity | |
| Thumbnail image display | 9 grids album mode | |
| Still image | Resolution | 2560x1440 (S-HD); 1280x720 (HD) |
| | Recording format | .jpg |
| Video | Resolution | 1920x1080 |
| | Recording format | .mov/H2.264 |
| | Audio input | Built-in microphone (on/off) |
| Frame rate | 30FPS | |

6.0mm 360 Articulation Probe



| | |
|---|---|
| Joystick console Dimensions (WxDxH) | 139.4x193x84.2mm (w/o SR and insert tubes) |
| Net weight | 2m:770g/ 3m:866g (approximately) |
| Joystick console buttons | Brightness +, Brightness -, snapshot / record |
| Lock and move | Lock / unlock switch on console |
| Probe head diameter | 6.0mm |
| Probe length | 2m / 3m |
| Probe head material | Stainless Steel |
| Probe material | Tungsten braid |
| Probe head length | 19.3mm |
| Direction of View | Front view |
| Field of View (FOV) | 90° |
| Depth of Field (DOF) | 10mm~100mm |
| Illumination | Front / Side LEDs |
| Articulation angle (up/down/right/left) | 2m, 3m full ways $\geq 120^\circ$ |
| Operating temperature | In air: -10~100°C In water: 10~30°C |
| Dust proofing and water proofing | Joystick console: IP 54 Insert Tube: under water 1m for 30 minutes |
| Relative humidity | Max 95% non-condensing |
| Liquid resistance | Operable when exposed to machine oil, light oil or 5% saline solution |

| Accessories | | |
|---------------------------|---|--|
| HDMI cable (AV-out) | 1.8m, HDMI 1.4a, D TYPE | |
| USB cable (data transfer) | 1m, type C to standard type A | |
| USB charging cable | 1m, USB-DC jack (for power bank) | |
| SD card | 16G | |
| DC power adapter | 100V~2401V, 12V 2.5A 50~60 Hz | |
| Side-view mirror | 6.0mm | |
| Shoulder strap | Polyester | |
| Hand strap | Polyester | |
| Sun visor | Steel / Plastic | |
| Dual-view mirror | 6.0mm | |
| Ground wire | 3m with DC jack / PC-in / clamp | |
| Insulation cap | Ø20mm, 90mm rubber | |
| Rigid sleeve | Grip material: Rubber/ Aluminum/ Plastic Tube material: Stainless steel | |
| | for 6.0mm probe: | for 3.9mm probe: |
| | OD: 8mm / ID: 7mm Protection ring: OD: 10mm extension joint ring OD: 11.2mm | OD: 6mm / ID: 5mm Protection ring: OD: 8mm extension joint ring OD: 10mm |
| Trolley case | HDPE EVA with storage reel | |

• Accessories



6.0mm
dual view



6.0mm
side view



6.0mm
pin



Rigid Sleeve



Power adaptor



USB charging cable
(For power bank)



HDMI



TYPE-C



Shoulder strap



Hand strap



Sun visor



Insulation cap




Trolley case

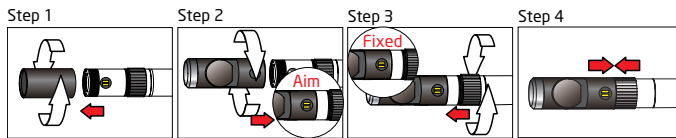


Ground Wire

* Also include : clean set, SD card, user manual.

- Working with Side / Dual View Mirror Adaptor

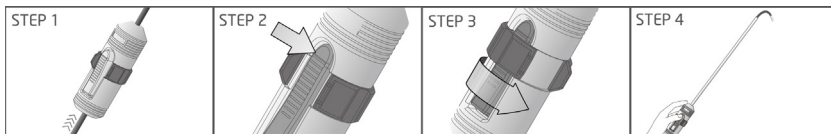
- Remove the protective ring from probe tip
- Screw tight the side / dual view mirror adaptor
- Toggle the led illumination direction by press  for best visual performance.



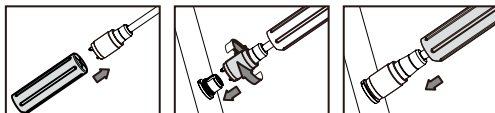
- Working with pin to measure sophisticated object

- Remove the protective ring from probe tip
- Screw tight the pin to start measurement (Extra application installation is needed)

- Working with Rigid Sleeve

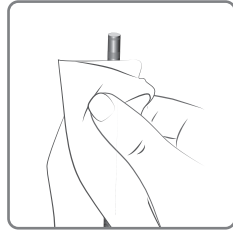
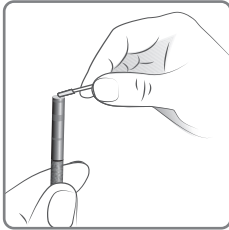
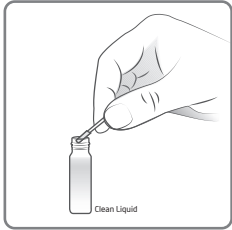


- Insulation cap

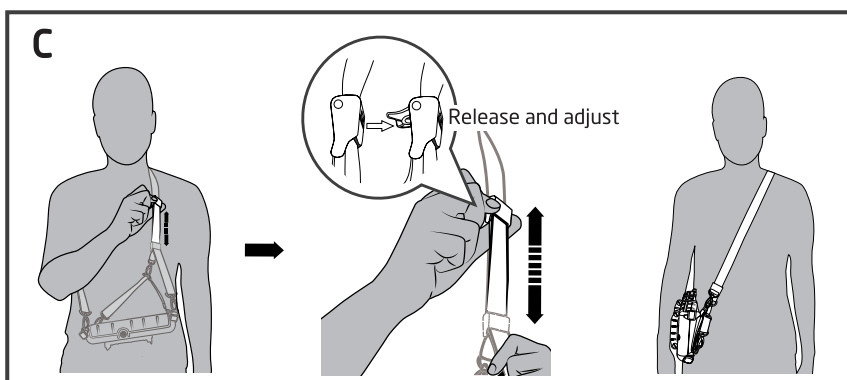
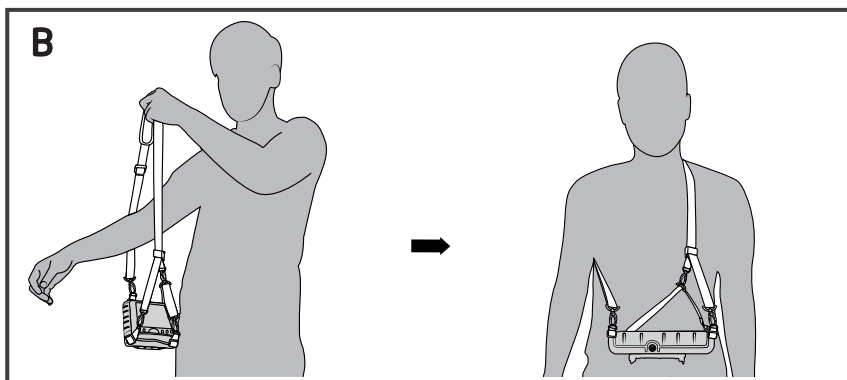
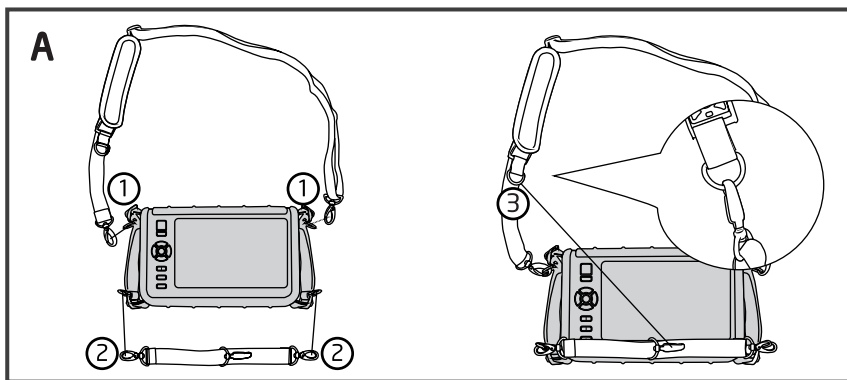


TO CLEAN THE PROBE TIP

- Check and clean the probe tip before / after use
- Use cotton swab to dip the clean liquid (provided inside) then wipe the len carefully. You might also use mild fluid detergent or clear water to clean, do not use any corrosive liquid such as alcohol.
- Use dry, clean and soft cloth to clean the probe



• Shoulder strap



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