

# yateks<sup>®</sup>

## Portable Industrial Borescope User Manual for Q Series



Warnings: Please read the User Manual carefully before using the instrument.



# User Instructions

Please read the user instructions carefully before operating the instrument.

Thank you for using the products manufactured by Shenzhen Yateks Co., LTD. (hereinafter referred to as Yateks) , we hope that this product can make you satisfied and help your work in the long term.

Please read the User Manual carefully before operating this product. If you have any questions, please consult our technical personnel before using, so as to avoid equipment damage or personnel and property losses.

If you encounter problems that you can't handle during use, please consult our technicians or distributors, we will do our best to provide fast and powerful after-sales service, and do our best to avoid affecting your work.

## **Danger**

1. Do not use the instrument to detect human or animals.
2. Do not use or store the device at the places with inflammable materials, strong magnetic field and inflammable gas, otherwise it may cause fire or explosion.
3. Do not operate the observing object under the electrified conditions.

## **Warnings**

1. Do not repair, disassemble or refit the product by yourself. Yateks gives no warranties and maintenance in this case.
2. Do not let any liquid except water contact the tube, otherwise it may cause

damage to the tube.

3. Please make sure to turn off the power before putting the instrument into the case.
4. Do not touch the camera tip at the end of the insertion tube directly during the use. Contact the camera after using in the high temperature environment may get you burned.
5. In the event of smoking or abnormal noise, stop using the instrument immediately and cut off the power.
6. Do not look straight at the light from the front end of the insertion tube, avoiding the strong light affecting your eyesight.
7. If any anomaly felt in the angular adjustment, stop immediately using the instrument and turn off the power.

### **Precautions**

1. Do not use the device beyond the temperature range for operation.
2. Do not bend, twist or fold the the insertion tube improperly.
3. Make sure to use the original power adaptor.
4. When removing the insertion tube from the observation object, do not remove it by force and pay attention to the following:
5. When the angle is locked or is partially bent, do not pull back the insertion tube directly, but set the insertion tube to straight status before pulling it.
6. In the process of pulling back, if the insertion tube is stuck, please gently move the joystick so that the distal end of insertion tube is straight before pulling back.

7. After the operation of the instrument, the front camera bending should be reset, and it is not advisable to control the camera in a certain direction for a long time, which will put the instrument in a high load state and will affect the service life.
8. Please note the following during the operation of the distal end of the insertion tube:
  9. Do not crash the front of the insertion tube or drag it by force;
  10. Do not crash its bending section, or bend it excessively. Otherwise, it may cause the damage to the glass lens and precision components which are located at front of insertion tube and angle bending part.
  11. Wipe the camera with alcohol or acetone before use to avoid fouling, corrosion and deformation.
  12. When performing the angle bending operation, if you feel any abnormality, do not force the operation, otherwise it may cause damage to the insertion tube or the observed object.
  13. Do not let metal objects, foreign objects through the interface, the opening into the main machine, may cause failure or electric shock.
  14. Do not strongly impact or press the screen, also do not use hard or sharp objects delimit the screen, otherwise it will cause cracks or scratches to the screen.
  15. Do not cover the main unit with plastic bags or other objects during use. If the instrument is overheated, it may cause damage to the instrument.
  16. Do not store the instrument in the following environment, otherwise it

may damage the instrument:

17. High temperature, high humidity and a lot of dust or particles in the environment.
18. A place with direct sunlight or radiation.
19. A place containing halide gas.

### **Battery treatment method**

Follow the instructions about danger, warnings and precautions described below when handling batteries.

### **Danger**

1. Be sure to use specially intended batteries and battery chargers for this instrument.
2. Do not invert the battery electrode and use it.
3. Do not use metal objects to connect the battery electrodes to each other, and do not carry or store the battery and metal objects together.
4. Do not throw the battery into the fire or heat the battery, otherwise there is a risk of explosion.
5. Do not attempt to open or modify the battery, otherwise there is a risk of explosion or fire.
6. Never immerse the battery in fresh or salty water, and never expose the battery to moisture.
7. Never charge the battery near an open fire or in direct sunlight, otherwise there is a risk of explosion or fire.

8. Do not pierce the battery or make it subjected to strong impact or stress, otherwise there is a risk of explosion or fire. Do not drop or throw the battery or make the battery hit violently.
9. Place the instrument on a stable position to remove the batteries. If the instrument is unstable, the batteries could drop and hit the ground from a high position, causing an explosion and a fire.

### **Warnings**

1. Do not use batteries which don't fit with the instrument. Battery model is 18650 with protective circuit/plate, 3.6V lithium battery.
2. Do not attempt to recharge any battery that is not intended for this instrument.
3. Do not use abnormal batteries, such as leakage, discoloration, deformation and other abnormal conditions.
4. If the battery liquid comes into contact with your skin or clothes, wash immediately with running water, otherwise it may cause skin injury. If necessary, seek immediate medical attention.
5. Do not deform the battery box or put foreign body in it.
6. Keep away from flammable materials during charging, and do not cover the battery charger with flammable materials.

### **Precautions**

1. Do not use or store the battery in a high-temperature environment, such as in direct sunlight, in an enclosed car or in front of a heating instrument.

2. The battery will get hot after long time operation. Do not remove the battery immediately after use to avoid burning hands.
3. Do not put batteries where children can reach them.
4. Do not leave the battery in humidity, water leakage, or extreme high or low temperatures.
5. Do not touch the battery electrode with wet hands.
6. Recharge the battery for the first time after purchase or before reusing it after a long period of not using.
7. If the battery is not used for a long time, be sure to remove it from the instrument. Otherwise, battery leakage or heat buildup could lead to fire or injury.



### **Prompt**

1. Use the battery correctly, as improper use may lead to leakage, excessive heat and damage. When replacing the battery, please check the insertion direction and install it correctly.
2. The performance of a battery usually deteriorates as the ambient temperature drops. Please note that battery performance, which is reduced by low temperature, can be restored when the temperature rises to normal levels.
3. When batteries run out of life, be sure to recycle them in accordance with local regulations.
4. Recommended temperature range for lithium-ion battery operation.  
Discharge (while using instrument) : 0°C to 40°C



Charge: 0°C to 40°C

Storage: -10°C to 40°C

5. Using batteries outside the above temperature range will result in reduced performance and service life. When storing batteries, be sure to remove them from the instrument.
6. Battery is consumable accessory.
7. After the battery is used in the instrument for a period of time, it is recommended to use the 18650 lithium battery charger to fully charge the battery, because there may be power difference of each battery after use.

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# I. Product Overview

5.5 inch high definition OLED touch screen, quick and convenient for operation. Adopting the Yateks patented technology, the probe can be rotated for 360° in all directions to realize remote image transmission. It can enter the deeper position for pipeline detection. The use of general computing graphics processor technology makes the image and video processing algorithm faster, so that the image is more clear and smooth. The highest use of high definition camera makes the observation more delicate. New features such as color mode setting, adjustable screen brightness and personalized image annotation etc. are added, so that the users can adjust these adjustable parameters according to the onsite condition to get the best view during inspections.

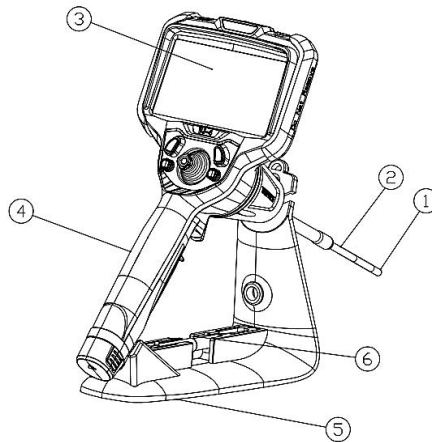


Figure 1 Product Schematic Diagram

- ① Camera
- ② Insertion tube
- ③ OLED screen
- ④ Main unit
- ⑤ Stand
- ⑥ Stylus

## II. Model definition

In order to meet the needs of different environments, users can choose insertion tubes according to their actual needs. The selection of insertion tubes mainly includes tube diameter, length, cameras, depth of field and other parameters. The specific parameters are expressed in codes, which refer to the following table:

Parts Code	Description	Notes
<b>A (Product Series)</b>		
Q	Q Series	Portable Industrial Borescope
<b>B (Tube Diameter)</b>		
1	1.0 mm	
2	1.7 mm	
3	2.2mm	
4	2.8 mm	
5	4mm	
6	6mm	
7	8.4mm	
<b>C (Length)</b>		
10	1.0m	Refer to the below different camera options.
15	1.5m	
20	2.0m	
30	3.0m	

50	5.0m
80	8.0m

### D (Focus Range)

N	Near focus
M	Middle focus
F	Far focus

### E (Light Type)

W	White light
U	UV
I	IR light
D	Dual Light (White + IR)

### F (Illumination)

L	Distal LED
F	Fiber

### G (Camera Code)

PM	2.2 mm /LED /120°/3-50mm	Diameter: 2.2mm, Length: 1-2m
PA	2.8 mm /LED /120°/3-50mm	Diameter: 2.8mm, Length: 1-2m
XH	4mm /LED /100°/8-100mm	Diameter: 4mm, Length: 1-3m
XC	4mm /fiber / 110°/8-150mm	Diameter: 4mm, Length: 1-3m
XB	6mm /LED/ 100°/8-100mm	Diameter: 6mm, Length: 1-3m
XE	6mm /fiber /110°/8-150mm	Diameter: 6mm, Length: 1-3m
WR	6mm /fiber /80°/50 ~ +∞mm	Diameter: 6mm, Length: 1-3m

PF	6mm interchangeable forward camera /LED /120° /7-80 mm	Diameter: 6mm, Length: 1-3m
	6mm interchangeable side camera /LED /120° /7-80 mm	Diameter: 6mm, Length: 1-3m
UV	4mm /UV LED /120°/3-50mm	Diameter: 4mm, Length: 1-3m
	6mm /UV LED /120°/3-50mm	Diameter: 6mm, Length: 1-3m

Notes: More options with product development. Please check details in the latest model number list.

### III. Main performance parameters

<b>System</b>	Dimension	345*157*185mm
	Net weight	0.95 kg
	Display screen	5.5 inch OLED touch screen
	Screen resolution	1920 x 1080
	Joystick control	Mechanical rocker for 360° rotation
	Functions	Photography, video recording, brightness adjustment, image locking
	Memory	64G SD card
	Data I/O port	HDMI, Type C, SD card, earphone
	Battery	Two 18650 lithium batteries (rechargeable)
	Standby time	3h
	Operation Mode	Hand-held, portable

	Screen Brightness	10 degrees brightness adjustment
	External light (on the main unit)	Two light options: White light or 365nm UV light
	Controlling mode	Two multi-function mini joysticks
<b>Software</b>	Operation System	Real-time multitasking operating system
	User Interface	Pop-up drive operation, menu navigation
	File management	Support photo or video playback, delete, reformat
	Image Editing	Text editing, graffiti, renaming etc.
	Digital zoom	Continuous (2.5 times, 10 levels)
	Image control	Image freeze, image flip, zoom in/out, playback
	Photo format	BMP, PNG, JPG
	Video format	AVI , MP4
	Language	En, Fr, Sp, Pt, Kr, De, RU, JP, Traditional CN, Simplified CN, Polish
	Color Settings	Adjustable color specifications
	measurement	Reference measurement
	Software upgrade	Upgrade by SD card service pack
	<b>Other</b>	Pixel
Bending Angle		0 °~180 °(Depending on different insertion tube lengths)

## IV. Application Industry

The instrument is widely used for modern core industrial production, processing, maintenance and other links of industries such as aviation,



automobile, shipbuilding, electrical, chemical, electric power, energy, manufacturing etc. With the feature of direct visibility, it can directly observe whether there are defects or abnormalities on the inner surface of large equipment such as pipes, turbines, cylinders and engines etc. Real-time photography and video recording can be performed to provide indispensable data collection for analyzing the use status of equipment and equipment production guarantee.

## V. Working Environment

Operating temperature of the main unit	- 10 °C ~ 50 °C
Operating temperature of the insertion tube	- 20 °C ~ 60 °C
Storage temperature	- 10 °C ~ 40 °C
Probe dust-proof and waterproof grade	Probe: IP67

## VI. Name and Function of Each Part

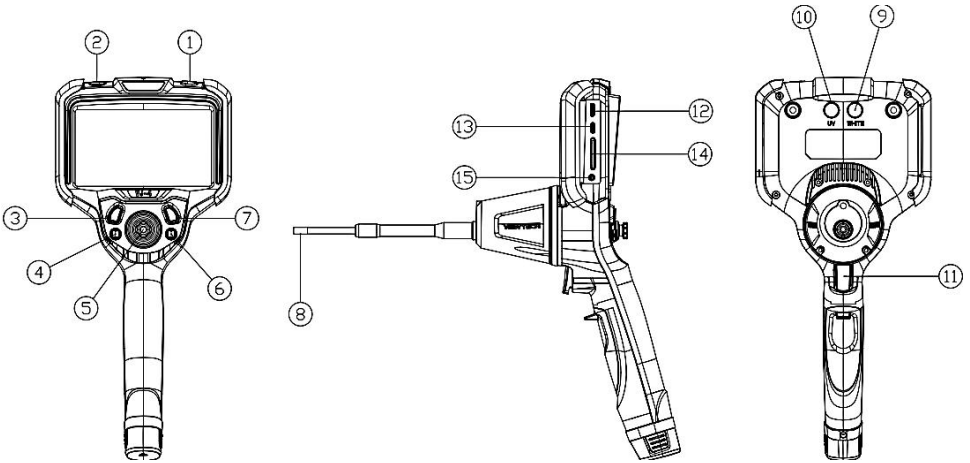


Figure 6 Name and figure of each part of the main unit

The names and functions of each part of the main unit in Figure 6 are shown in the table below:

No.	Description	Serial No.	Description
①	Power on/off button	②	Flashlight switch/on/off button
③	Left button	④	Left mini-joystick
⑤	Main joystick	⑥	Right mini-joystick
⑦	Right button	⑧	Camera
⑨	White light flashlight	⑩	UV light flashlight

⑪	Take photos /camera switch	⑫	HDMI video output port
⑬	Type-C charging port	⑭	SD card port
⑮	Earphone port		

## VII. Preparation before Inspection

### 7.1 Handling of boxes

#### Precautions

- Before handling the boxes, please check whether there is any abnormality at the handle and buckles of the box.
- Please use standard boxes to prevent damage to the instrument.

#### ■ Before holding the handle

Make sure the buckle is tightly fastened before lifting the case.

#### Precautions

- If the buckle is not fully fastened, the box cover may open accidentally when the box is being lifted.
  - Do not kick or move the box with feet.
- #### ■ Take the instrument out of the box
- Before taking the instrument out of the box, make sure that the cover is completely opened. Be careful to prevent the box cover from closing by

accident to cause damage to the instrument.

- Do not put the main unit in the box to operate. Be careful to prevent the box cover from accidentally closing to pinch hands.



### **Precautions**

- Place the box horizontally to keep it stable.
- Please loosen the clasp on the front of the box before opening the box cover.
- The insertion tube should be handled with care when being removed from the box. If the force is too large, the insertion tube may be damaged.
- When the main unit is taken out of the box, do not use the insertion tube to fix it.
- If there is any foreign body on the main unit screen, please wipe it with a non-dust cloth.

## **7.2 Install the Main Unit**

When using the main unit, there are two ways of placing: side placement, stand horizontal placement.



### **Precautions**

- Position the main unit horizontally with a stand to keep it stable.
- Please do not put the main unit on a high position to prevent the main unit from slipping and damage.
- If the main unit needs to be hanged, please fix the main unit in a place that

can support its weight.

## 7.3 Power Supply

### ■ Replace the battery

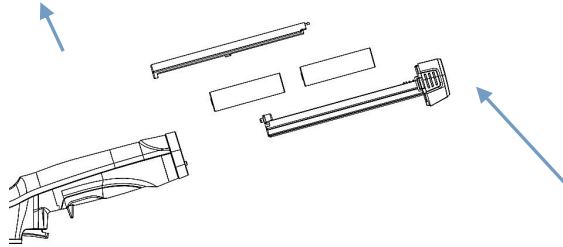


Figure 7-1 Open the battery compartment

Press and hold the battery compartment unlock button according to the arrow instructions, and take out the battery compartment (see Figure 7-1). Install the 18650 battery in the battery compartment according to the requirements of positive and negative indicators.

### **Precautions**

- Batteries shouldn't be placed in opposite directions.
- Two 18650 lithium batteries should be placed before the instrument use.
- Standard 18650 lithium battery is with protective circuit. If you need to purchase the batteries locally, please choose the 18650 lithium battery with protective circuit.

### **Warnings**

- Please check whether the power cable is intact before use.

- Adapter output voltage: 12V; electric current: 3A.
- The power adapter has the requirement of input voltage 100-240 V (50/60 Hz) AC. If connected to a socket that does not meet the rated voltage, it may result in fire or electric shock.
- Do not use unintended power adapters, which may cause malfunction or damage to the instrument.
- The power adapter is not waterproof and may cause electric shock when it encounters water.

### ■ External Charging

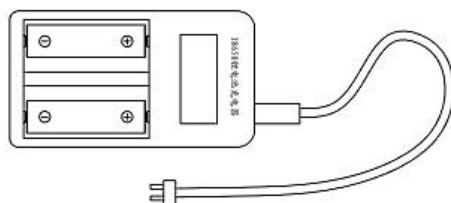


Figure 7-2 External Charging

- (1) Put the batteries correctly into the battery charger slot according to battery pole indicator. Connect it to power and then the batteries will be in charging process.
- (2) When the red light is on, the charging is in progress; when the green light is on, the charging is completed.

### Precautions

- Make sure the lithium battery is placed in the right direction.
- In the process of charging, the two batteries are independent from each other, with functions such as anti-overload, over-current, short circuit etc.

## 7.4 Check Insertion Tube

### ■ Check the appearance of the insertion tube

- (1) Check whether the outer material of the entire insertion tube is intact.
- (2) Check whether the outer covering material of the insertion tube (not bending section) is loose or not.

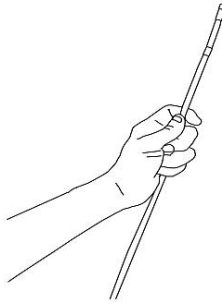


Figure 7-3. Check the insertion tube appearance



### Precautions

- If the insertion tube gets deformed, it may not be possible to remove it from the inspected objects.
- If the outer material of the insertion tube is damaged, please use with much care to avoid injury.

### ■ Check the distal end of insertion tube

- (1) Make sure the power is turned off.
- (2) If you find a foreign body in the camera, please clean it with a dust-free cloth, cotton swab or soft brush.



Figure 7-4 Camera cleaning

### Warnings

- Internal heating caused by electrical components will make the distal end of the insertion tube hot. Please turn off the LED light before wiping the camera and allow it to cool down before touching it.


### Precautions

- If the camera collects dust or water, it may damage the optical adapter or the distal end of the insertion tube.
- Probe bending section consists of precision components. Do not pull the front end of the insertion tube. Do not manually force the distal end of the insertion tube to bend. These actions may cause damage to the inside components at the bending section.



## VIII. Basic operation

### 8.1 Start up

Long press [Power On/Off] button  on the right side of the top of the instrument, the instrument starts and displays real-time image.

### 8.2 Insertion Tube

#### 8.2.1 Check the probe bending function

- (1) Straighten the insertion tube to check the probe bending direction is consistent with the joystick operation direction.
- (2) Operate the joystick slowly to ensure the probe bending section can move smoothly.

#### Prompt

When the probe bending direction is inconsistent with joystick operation direction, please slightly rotate the spiral rubber to make its arrow marks adjusted to the right above. (Remark: Spiral rubber is at the connecting part of insertion tube and the main unit.)

#### 8.2.2 Insert the insertion tube

##### ■ Hold the operating handle and the insertion tube

- 1) Use thumbs to move the joystick for operation.
- 2) All other buttons can be reached and pressed by thumbs.

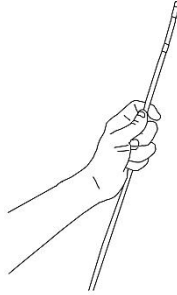


Figure 8-1 Tube insertion operation

### ■ Insertion tube

- (1) When viewing the screen, carefully examine the insertion tube and slowly insert the insertion tube into the inspected area, move the joystick with care and use even force to operate the probe bending.
- (2) When withdrawing the insertion tube, make sure that the distal end of the insertion tube is in a straight position (the joystick is in the middle position, not moved), and then slowly withdraw it.

### ■ Angle bending operation

- (1) According to the needs of on-site inspection, the joystick is used to control the probe camera bending for observation.
- (2) Adjust the LED brightness to achieve the desired brightness, so that the live image can be the best.

### ⚠ Prompt

- (1) The habit of “slowly” moving the joystick should be developed.
- (2) If the bending control mechanism function stops working, or if there is

any abnormality in the operation of the instrument, please stop using it immediately. Release the joystick and let it go to zero (center) position, carefully remove the insertion tube from the inspected area.

- (3) If you hear a jarring sound from inside the instrument when moving the joystick, please stop using it. After checking that there is no abnormality, it can be then put into use.
- (4) Repeated bending of the insertion tube will reduce the maximum bending angle. Keep the insertion tube as straight as possible.
- (5) Make sure the insertion tube and camera are straightened before starting. When the insertion tube is in the state of crouching, it is forbidden to move the joystick for probe bending, so as not to damage the traction mechanism.
- (6) The illumination from the fiber +LED is very high and intensive, please do not look straight at the light source, or it will cause harm to eyesight.

### **8.2.3 Take out the insertion tube**

- (1) Release the bending angle.
- (2) Remove the insertion tube.



#### **Warnings**

- Do not remove the tube when the probe camera is at the status of bending. This may damage the probe camera and inspected objects.
- After a short time of use in high temperature environment, the temperature

of the front end of the insertion tube becomes high. Please use it after cooling.

- If the insertion tube is abnormal in the process of withdrawing, please gently move the joystick to take it out. Do not exert too much force, or it may cause damage.

### **8.2.4 Details of Insertion Tube Operation**

#### **■ The direction of joystick**

Move the joystick to control the 360° rotation of the instrument camera in real time. If you need to position and observe, move the joystick to the observation angle; if you need to reset the probe camera, move the joystick and release it, then the camera will reset to original position automatically.

### **8.2.5 Shoulder Strap Attachment**

#### **■ Shoulder strap**

To hang the instrument on your shoulder, please attach the shoulder strap. Please use the original shoulder strap provided by Yateks.



Figure 8-2 Shoulder strap hanging

 **Warning**

- Do not use the shoulder strap to carry objects other than the instrument, or the strap may be damaged, unable to tightly lock the instrument.
- Before use, please confirm that there are no problems with the shoulder strap, such as wear to cloth fiber or damage to metal parts.
- Do not put excessive load on the shoulder strap, such as shaking the instrument or placing heavy objects on the instrument.
- When using the shoulder strap, please do not bump the instrument against other objects.

 **Precaution**

- When installing or removing the shoulder strap, be careful to prevent the

instrument from falling.

- Do not store the instrument in a hanging way, or it may damage the shoulder strap.
- Carefully check to ensure that the shoulder strap hooks are securely fastened to the instrument.

### ■ **Shoulder strap attachment**

Install the 4 buckles of the shoulder strap to the 3 fixed positions of the instrument respectively.

- 1) Respectively hang a buckle on the left and right sides of the back of the main unit (see Figure 8-3), as the ①, ② fixed positions;

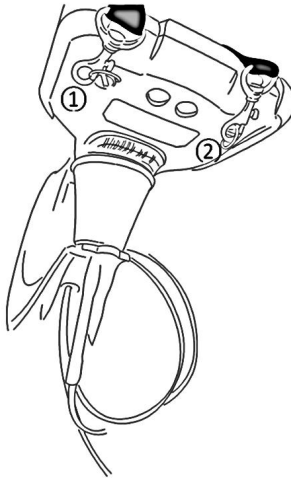


Figure 8-3 ① and ② fixed positions

- 2) Hang the two remaining buckles on the back of the battery compartment bottom(see Figure 8-4), as the ③, ④ fixed positions;

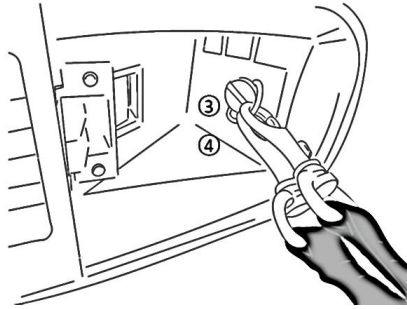


Figure 8-4 ③ and ④ fixed positions

- 3) Adjust the strap length to the suitable length, then hang the strap on the shoulder; use the soft rubber strap to fix the insertion tube in order to avoid the accidental damage during the hanging of the insertion tube.

### 8.3 Buttons and Mini-joystick function description

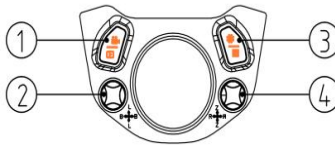


Figure 8-5 Button Diagram

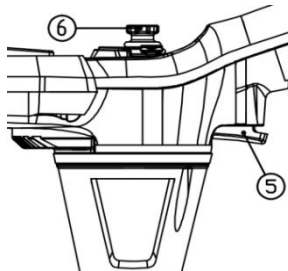


Figure 8-6 Button Diagram

The name and mode of the buttons in Figure 8-2 are shown in the table below:

No .	Name	Operating way	Live image mode (Four icons only on main screen)	Menu Navigation Mode (All icons on main screen)	System Setting Mode
①	Left button	Short press	Video recording /stop	Video recording, /stop	Cancel /Exit
		Long press	Image playback	Video /Image playback	-
②	Left mini-joystick	Move up/down	LED brightness adjustment	Navigate to up and down to select	
		Move left/right	Screen brightness adjustment	Navigate to left and right to select	
		Press down the center	Default screen brightness level 5 /LED on or off	Confirm the selection	
③	Right button	Short press	Switch between the live image mode and the menu navigation mode		OK
		Long press	Enter the system setting mode		
④	Right mini-joystick	Move up/down	Image zoom in /out	Navigate to up and down to select	
		Move left/right	Image flip	Navigate to left and right to select	
		Press down the center	Switch to default setting/current	Confirm the selection	



			status	
⑤	Trigger	Short press	Take a photo	
		Long press	Switch camera	
⑥	Main joystick	Move to all directions	Control the probe articulation and bending	

## 8.4 Menu

Main menu navigation mode interface (see Figure 8-7) :



Figure 8-7

In System Settings, you can set the [Icon Hide Delay] time of the icons. If the some icons are hidden (see Figure 8-4) to change to Live Image Mode, please touch the screen or short press the right button to display all icons (changed to Menu Navigation Mode).



Figure 8-8

### 8.4.1 Camera brightness adjustment

**Touch operation:** touch the [camera brightness adjustment] icon on the screen, and touch the arrows on both sides of the icon to adjust the camera brightness. The brightness level is 1~10, and the default brightness level is 5.



**Mini-joystick operation:** in live image mode, the camera brightness can be adjusted by moving [left mini-joystick] to up and down; in the menu navigation mode, the camera brightness can be adjusted by moving [left mini-joystick] to left and right.

### 8.4.2 Screen brightness adjustment

**Touch operation:** touch the [Screen Brightness Adjustment] icon on the screen, and touch the arrows on both sides of the icon to adjust the screen brightness. The brightness level is 1~10, and the default brightness level is 5.



**Mini-joystick operation:** in live image mode, the screen brightness can be adjusted by moving [left mini-joystick] to left and right; in the menu navigation

mode, the screen brightness can be adjusted by moving [left mini-joystick] to up and down.





### 8.4.3 Display ratio adjustment

**Touch operation:** touch the [Display ratio adjustment] icon on the screen, and touch the arrows on both sides of the icon to adjust the screen ratio to one of the three display ratio options such as 16:9, 4:3, 1:1;

**Min-joystick operation:** move [left mini-joystick] to left and right to change the display ratio.

### 8.4.4 Color mode adjustment

**Touch operation:** touch the [Color Mode Adjustment] icon on the screen, and touch the arrows on both sides of the icon to adjust the color modes to one of the four modes such as "Middle range mode", "Near range mode", "Far range mode", "User-Defined" " mode.

- Middle range mode  , for general distance inspection;
- Far range mode  , for far distance inspection;
- User-Defined  , for users to define the color settings and save;
- Near range mode  , for near distance inspection;

**Mini-joystick operation:** move [left mini-joystick] to left and right to change the color mode.

In the case of selecting the icon [User-Defined], touch the icon itself to enter the color parameter setting interface, after changing the settings based on actual needs, please touch the [OK] to save the settings, or touch the [Cancel] to cancel the action of setting change, or touch the [Default] to restore all color

parameters to default setting in this mode.

### 8.4.5 Grid Measurement

**Touch operation:** touch the [Grid Measurement] icon on the screen, and touch the arrows on both sides of the icon to adjust among the three different grid measurement size options such as 1, 2, 4.



The actual distance of the corresponding square side length is 20mm;



The actual distance of the corresponding square side length is 10mm;



The actual distance of the corresponding square side length is 5mm.

The user can estimate the size of a specific object through the grid size;

**Mini-joystick operation:** move [left mini-joystick] to left and right to change to different sizes of grids.



#### **Prompt**

Grid measurement is related to the actual distance taken by the camera. If this function is needed to be used, the distance of the camera needs to be adjusted by yourself.

### 8.4.6 Image browsing

**Touch operation:** touch the [Image Browsing] icon on the screen to enter the image browsing interface (see Figure 8-5). See 8.6 Image Browsing for detailed instructions.

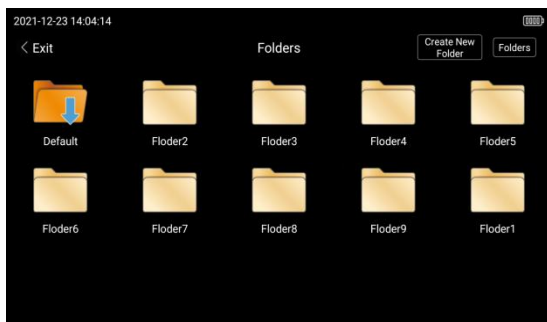


Figure 8-9

### 8.4.7 Zoom function


**Touch operation:** touch the [Zoom Function] icon on the screen, and touch the arrows on both sides of the icon to adjust among 10 different zoom ratios such as 1.15, 1.30, 1.45, 1.60, 1.75, 1.90, 2.05, 2.20, 2.35, 2.50.





**Mini-joystick operation:** in live image mode, move [right mini-joystick] to the up and down to change to different zoom ratio; in menu navigation mode, move [right mini-joystick] to left and right to change to different zoom ratio.

### 8.4.8 Image flip


**Touch operation:** touch the [Image flip] icon on the screen, and touch the arrows on both sides of the icon to adjust among four different modes:


 is the actual image, the default setting;

 is 180° rotation based on actual image;

 is the left and right mirroring based on actual image;

 is the up and down mirroring based on actual image;

 is 90° rotation based on the actual image;

 is 270° rotation based on the actual image.



**Mini-joystick operation:** in live image mode, move the [right mini-joystick] to the left and right to change the image flip modes; in menu navigation mode, move the [right mini-joystick] to the left and right to change the different image flips.

#### 8.4.9 Negative color

**Touch operation:** touch the [Negative Color] icon on the screen, and touch the arrows on both sides of the icon to change between normal color and negative color.



**Mini-joystick operation:** move the [Right mini-joystick] to the left and right to change between normal color and negative color.



#### 8.4.10 Image freeze

**Touch operation:** touch the [Image freeze] icon on the screen, and touch the arrows on both sides of the icon to change between live image  and frozen image. 

**Mini-joystick operation:** move the [Right mini-joystick] to the left and right to change between normal color and negative color.

### 8.4.11 White balance adjustment

**Touch operation:** touch the [White Balance Adjustment] icon on the screen, and touch the arrows on both sides of the icon to change between automatic white balance  and manual white balance .

**Mini-joystick operation:** move the [Right mini-joystick] to the left and right to change between change between automatic white balance  and manual white balance .

### 8.4.12 System Settings

Touch operation: touch the [System Settings] icon on the screen to enter the System Settings interface. See 8.5 System Settings for detailed instructions.

## 8.5 System Settings

There are two controlling ways to the main interface or system settings: button operation or touch operation.

### **Button operation:**

- (1) Both [left mini-joystick] and [right mini-joystick] can control the system settings main interface to select up, down, left and right;
- (2) The center button of both mini-joysticks can be used as confirmation button of function selection in main interface of the system setting;
- (3) [Left button] Short press can be used as the return function in the main interface of the system setting;
- (4) [Right button] Short press can be used as confirmation function in the

main interface of system settings;

### Touch operation:

Main interface of system setting (see Figure 8-10) :

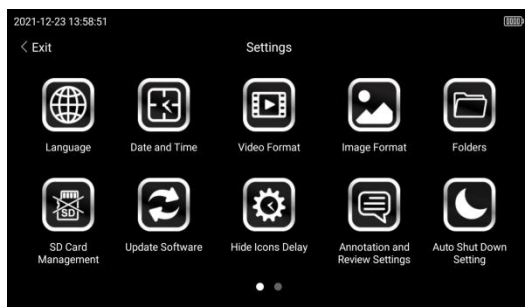


Figure 8-10

- (1) Swipe the menu to the left, it will switch to the second page (see Figure 8-11) :

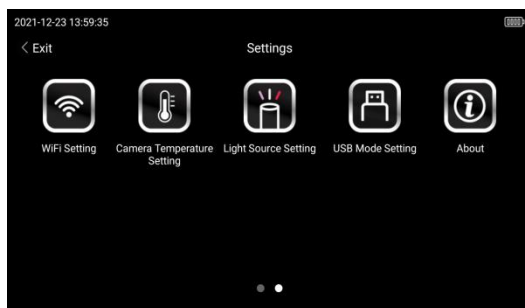


Figure 8-11

- (2) Swipe the menu to the right , it will switch to the first page.
- (3) Touch any icon on the screen to do the corresponding settings.

### 8.5.1 Language Setting

Touch the [Language] icon on the main interface of system setting to enter the



language setting (see Figure 8-12) :

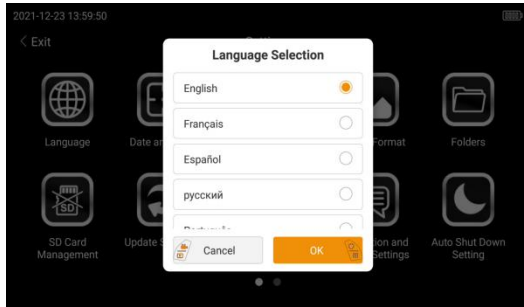


Figure 8-12

Ten different languages (English, French, Spanish, Portuguese, Russian, Korean, Japanese, German, Simplified Chinese, Traditional Chinese, Polish) are optional. Touch the button of the corresponding language to switch, and the software will reset automatically, touch the "Cancel" to cancel the operation.

### 8.5.2 Time Setting

Touch the [Time] icon on the main interface of system setting to enter the time setting (see Figure 8-13).

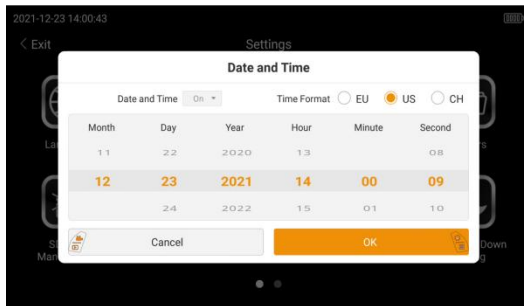


Figure 8-13

Time setting is divided into three formats: USA, European and Chinese. Set whether the time is displayed on the main interface. After setting, touch [OK] to save the setting, or touch [Cancel] to exit the time setting interface. **The time**

format is applied to the time watermark on saved images, and the “On/Off” for Date and Time is to control whether there is a time watermark for photos or videos.

### 8.5.3 Video Format Setting

Touch the [Video Format] icon on the main interface of system setting to enter the video format setting (see Figure 8-14) :

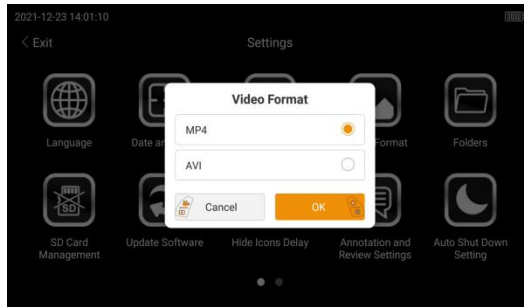


Figure 8-14

Video format: Set the video format before video recording. Touch to select AVI or MP4, touch [OK] to confirm or touch [Cancel] to cancel this change.

### 8.5.4 Image format

Touch the [Image Format] icon on the main interface of system setting to enter the photo format setting (see Figure 8-15) :

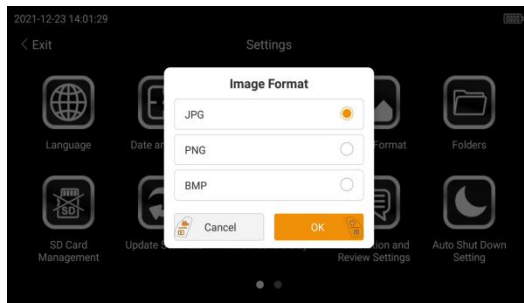


Figure 8-15

Image format: set the image format before taking a photo. Touch to select among JPG or PNG or BMP, touch [OK] to confirm or touch “Cancel” to cancel the operation. (Note: BMP is the biggest size; JPG is the smallest size.)

### 8.5.5 Folder Management

Touch the [Folders] icon on the main interface of system settings to quickly enter the interface of saved photos and videos.

### 8.5.6 SD Card Reformatting

Touch the icon [SD card management] on the main interface of system settings; touch [OK] to reformat the SD card, or touch [Cancel] to cancel the operation. (see Figure 8-12) :

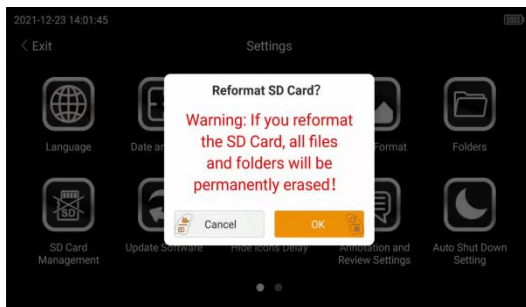


Figure 8-16

### 8.5.7 Update Software

First copy the update file "Scope" to the SD card, insert the SD card into the instrument, touch [Update Software], touch [OK] to update the software, touch [Cancel] to cancel the operation, and the software will be restarted after the software update is completed.(Figure 8-17) :

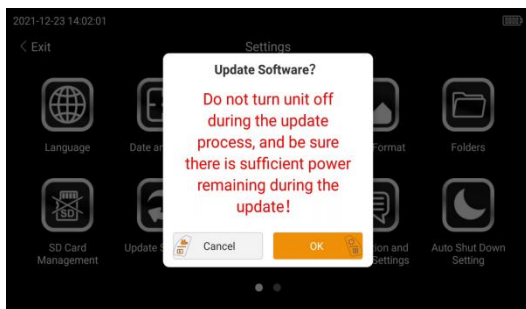


Figure 8-17

### Prompt

During software update progress, the borescope shouldn't be powered off. Pay attention that the power should be sufficient.

After updating the software, please only touch "Open", do not touch "Done", or it will enter the developer mode and unable to turn off. If mistakenly touch "Done", please remove the battery compartment to turn the unit off.

### 8.5.8 Hide Icons Delay Settings

Touch the [Hide Icons Delay] icon on the main interface of system setting to enter the icon hidden delay setting interface (see Figure 8-14) :

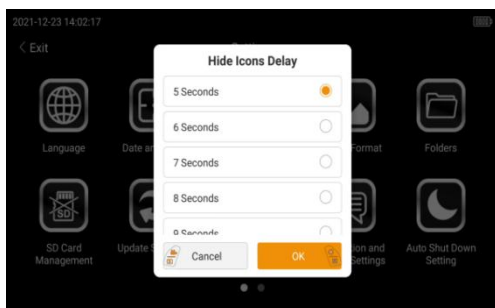


Figure 8-18

Hide Icons Delay refers to the delay time when it will automatically change

from Menu Navigation Mode(all icons displayed on the main screen) to Live Image Mode(only four icons displayed on the main screen). The time can be set as 5, 6, 7, 8, 9, 10, 15 seconds.

### 8.5.9 Annotation Settings

Touch the [Annotation and Review Settings] icon on the main interface of system settings to enter the settings of photo annotations, video annotations and instant photo review time (see Figure 8-15) :

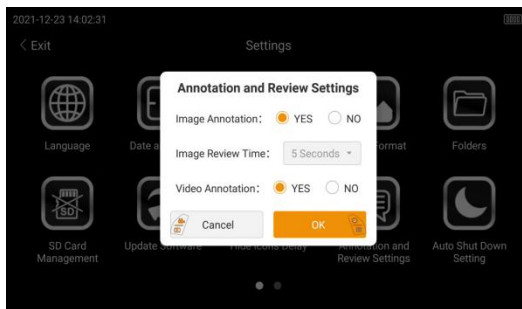


Figure 8-19

- **Photo Annotation:** set whether to annotate the photo after taking a photo;
  - (1) Set to "YES", after taking a photo, the dialog box will pop up asking to annotate or not. If selecting “Yes”, the annotated photos will be both saved; if selecting “No”, give up annotation.
  - (2) Set to "NO", after taking a photo, it won't ask whether to annotate or not.
- **Image Review Time:** the time the photo stays on screen temporarily for instant review after it is taken. When the time ends, it will automatically return to the live image interface, or you can also press the [right button] to manually return to live image mode in advance.
- **Video Annotation:** set whether to annotate the video before recording;
  - (1) Set to "YES", the dialog box will pop up before the video is taken. After

the annotation is completed, the video will display the annotation texts during the recording and playback.

(2) Set to "NO", the dialog box will not pop up before the video is taken.

### 8.5.10 About

Touch the [About] icon on the main interface of system setting to enter the system information and view the software version number(see Figure 8-20) :

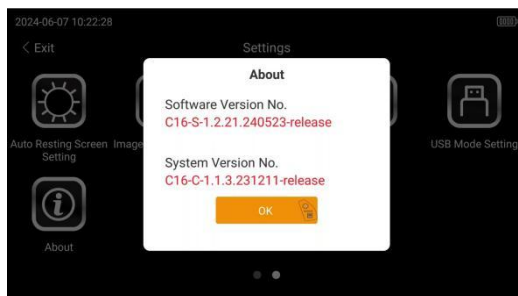


Figure 8-20

### 8.5.11 WIFI Settings

Touch the [WIFI Settings] icon on the main interface of system settings to set WIFI (see Figure 8-21) :

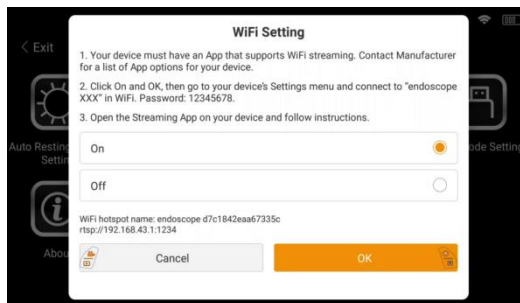


Figure 8-21

Turn to "On" and tap "OK", follow the instructions to download an App for your device, and connect the device with the borescope WiFi. The live image


can be wirelessly displayed on your device.

### **App Name for different devices:**

For iPhone: Screensharing

For Android Smartphones/computers: VLC

Please contact manufacturer or distributor for detailed instructions.

- 1) When the WiFi is turned on, please exit to live image, the borescope has turned on the WiFi hotspot and show the  icon.
- 2) Connect the device to the borescope WiFi hotspot, the name is endoscope and device ID and the password is 12345678. After successful connection, open the specialized APP or video software to access the live image.

Notes: For some APP, the IP address (rtsp://192.168.43.1:1234) should be input, so that the borescope can push the video stream to the smartphone or computers.

Mobile phone operation steps:

### **Android phone or computer:**

1. Download and install the VLC APP from the app store;
2. After connecting the WiFi, access the VLC APP;
3. Click "New Stream", enter the URL: rtsp://192.168.43.1:1234, click to enter, and wait for the connection.

### **IPhone:**

1. Download and install the ScreenSharing APP from the App store.
2. After connecting to the WiFi, access the ScreenSharing APP;
3. Click the Settings icon to enter Connection Settings, enter the URL: rtsp://192.168.43.1:1234, click Open Network in Series, and wait for the connection.

### 8.5.12 FTP settings

Touch the icon [FTP] in the main interface of system setting to set “On” and then touch “OK” (see Figure 8-22) :



Figure 8-22

The prerequisite for enabling the FTP function is to enable the WIFI function. If the FTP function is enabled successfully, a message will be displayed indicating that the FTP function is enabled successfully. Click it again to display the FTP address and password (as shown in Figure 8-2).

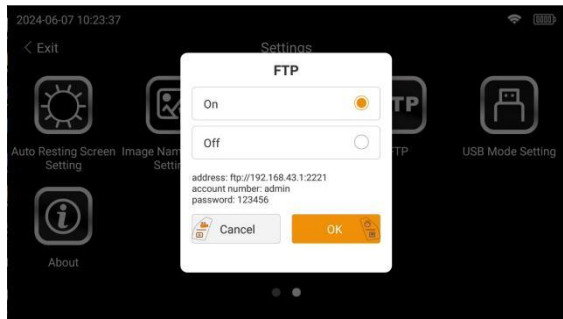


Figure 8-23

After connecting to the hotspot of the device, you can access the files of the device on the PC or mobile phone. The mobile phone needs to install the APP/software, you can directly enter the address and password in the address bar of File Explorer on the PC( as shown in Figure 8-24).



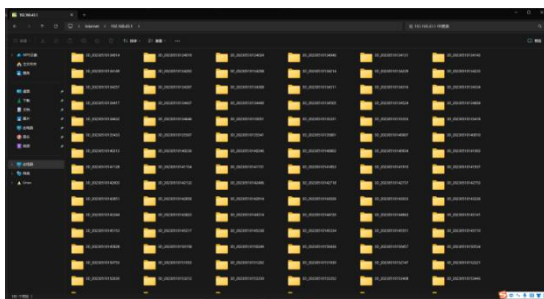
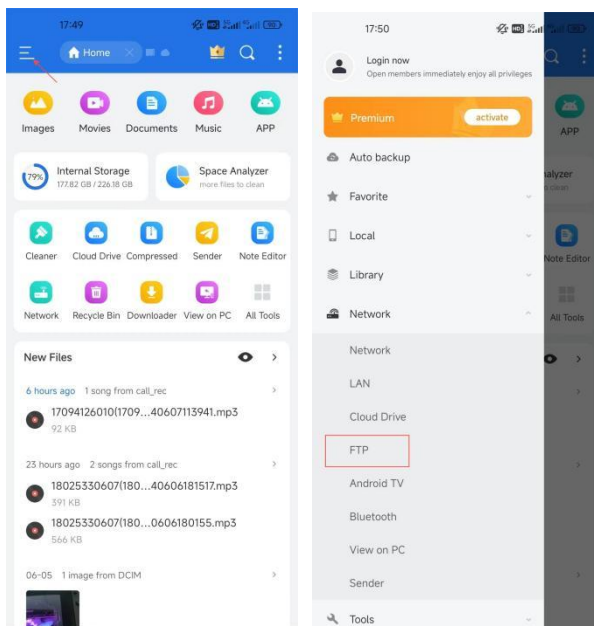


Figure 8-24

Mobile phone operation steps:

Android phone:

1. Download and install the ES File Browser APP in the app store;
2. After connecting to WiFi, access the ES File Browser APP;
3. Click the icon in the upper left corner, click the icon in Network, click the icon in FTP, click New, select FTP, enter as shown in Figure 8-28, click to enter, and wait for the connection.



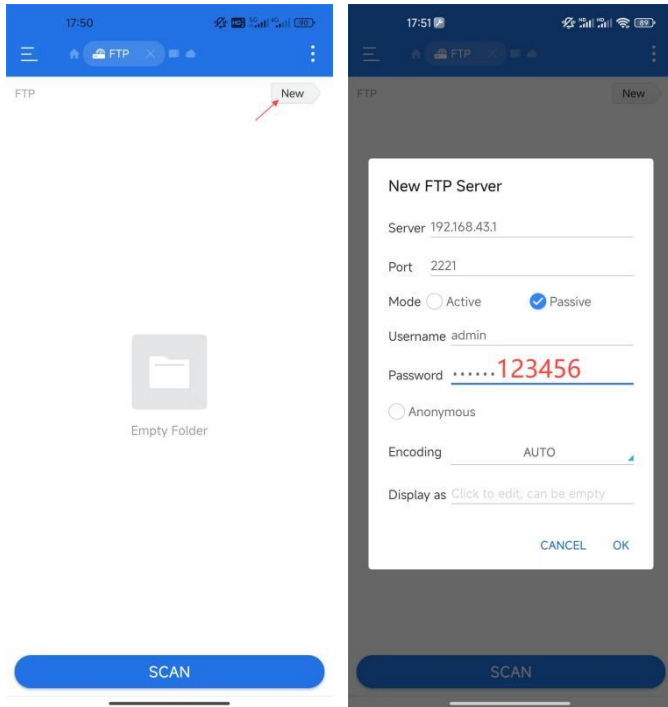


Figure 8-25

IPhone:

1. Download and install the ES File Browser APP in the app store;
2. After connecting to wifi, access the ES File Browser APP;
3. Tap Services, select FTP, enter the parameters as shown in Figure 8-29, tap Connect, and wait for the connection.

### 8.5.13 Auto Shut Down Setting

Touch the icon [Auto Shut Down Setting] in the main interface of system setting to set time for auto shutdown. (see Figure 8-26) :

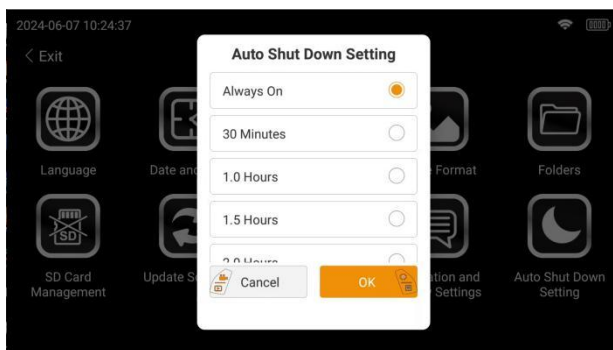


Figure 8-26

Click Auto Shut Down Settings to select Never, 30 minutes, 1H, 1.5H, 2H. After selecting the time, if no operation is performed within the specified time, the system will automatically shut down, and the operation or touch screen will restart to accumulate the shutdown time.

#### 8.5.14 Auto Resting Screen Setting

Touch the icon [Auto Resting Screen Setting] in the main interface of system setting to set time for auto resting screen. (see Figure 8-27) :

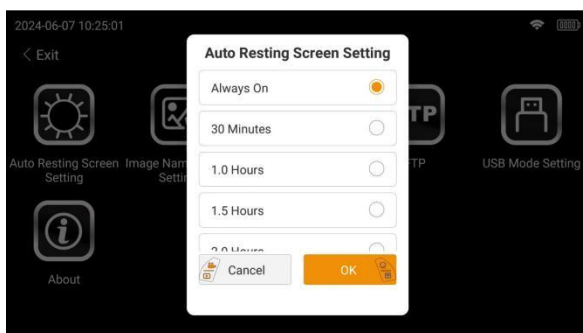


Figure 8-27

Click the Auto Resting Screen Setting to select Never, 30 minutes, 1H, 1.5H, 2H. After selecting the time, if there is no operation within the specified time, the screen will automatically change to level 1 screen brightness, and the operation or touch screen will automatically return to the original screen

brightness.

### 8.5.15 Image Name Format Settings

Touch the icon [Image Name Format Settings] in the main interface of system setting to set the image name format (see Figure 8-28) :

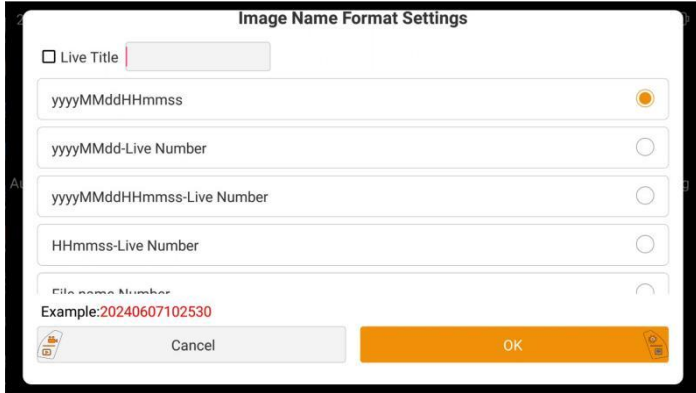


Figure 8-28

Select different naming formats and click OK. When taking photos and recording videos, the image names will be named according to the corresponding naming formats.

### 8.5.16 USB Mode Setting

Touch the icon [USB Mode Setting] in the main interface of system setting to set the USB mode setting (see Figure 8-29) :

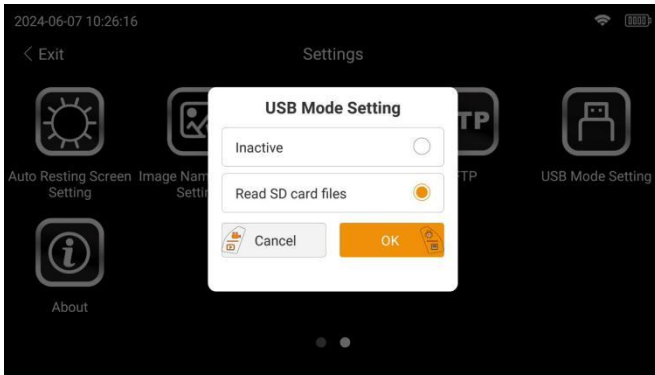


Figure 8-29

### 8.5.17 Camera Temperature Setting (optional)

Touch the icon [Camera Temperature Setting] in the main interface of system setting to set the camera temperature (see Figure 8-30) :

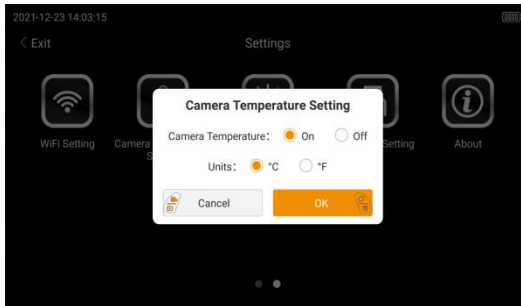


Figure 8-30

The camera temperature setting includes setting whether to display the temperature on the screen in real time and the unit of temperature (°C or °F).

#### **Prompt**

Camera Temperature Setting needs corresponding camera support. Please pay attention to the model no. Options when you purchase borescopes.

### 8.5.18 Light Source Setting (optional)

Touch the [Light Source Settings] icon on the main interface of system setting to set the light source (see Figure 8-31) :

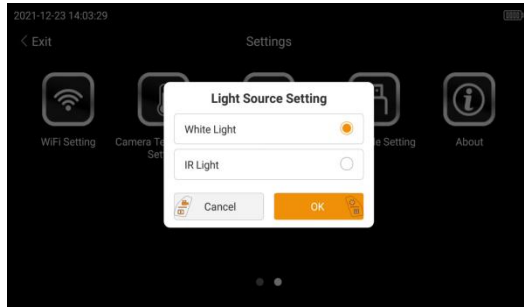


Figure 8-31

Touch to select the white light or infrared light source. When it is set to infrared light source, there will be a prompt message of “IR ACTIVE” on the main interface to remind the user that the IR light is active and not to look straight at the camera tip with invisible IR light.

#### Prompt

Light source setting needs corresponding camera support. Please pay attention to the model no. options when you purchase borescopes.

## 8.6 Image Browsing

Image browsing interface (Figure 8-32) :



Figure 8-32

Touch [Create New Folder] icon on the right top corner to create a new folder, enter the name of the folder, and touch [OK] to save this new folder (see Figure 8-33) :

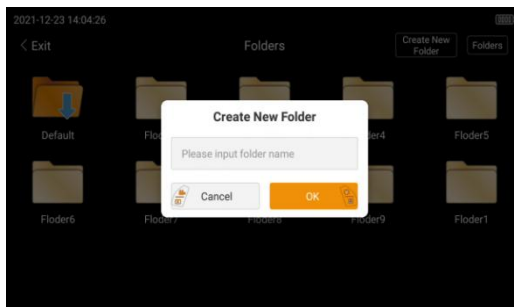


Figure 8-33

### 8.6.1 Folders Management

Touch [Folders] icon on the right top corner to manage the corresponding folder such as renaming, deleting, making active folder. After operation, touch [Cancel] on the right top corner to return to previous level (see Figure 8-34) :

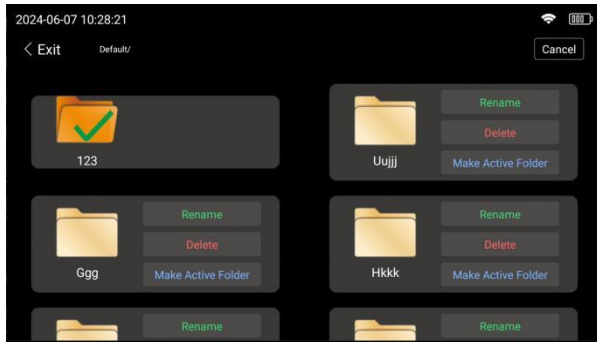


Figure 8-34

Touch [Rename] to rename the folder, touch [OK] to save the renamed results or touch [Cancel] to cancel the operation (see Figure 8-35):

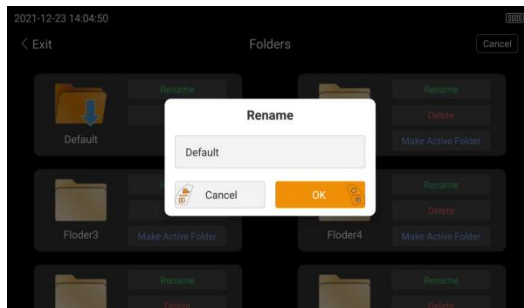


Figure 8-35

Touch [Delete] to delete the current folder, touch [OK] to delete or touch [Cancel] to cancel the operation (see Figure 8-36) :

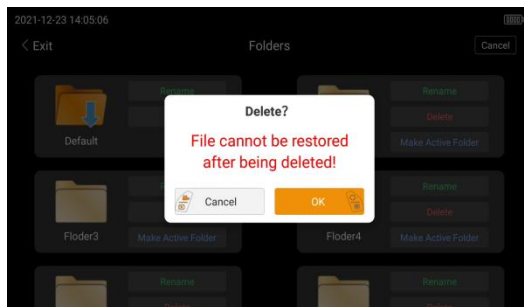


Figure 8-36



Touch [Make Active Folder] to set the current folder as the active folder. When the folder is active, all newly taken photos and videos will be saved into this folder. **When browsing folders, long press a folder to directly set it as the default folder.**

### Prompt

- The active folder icon has an arrow, and the icon color is darker than that of other inactive folders.
- When the unit is completed to a computer, if the user reformat all files by the computer, the files will all be deleted.

## 8.6.2 Saved Photo and Videos

When it's in image browse mode(not in the folder management mode), touch any folder to browse inside saved photos, videos and folders.

Touch any folder to browse inside saved photos and videos (see Figure 8-37) :

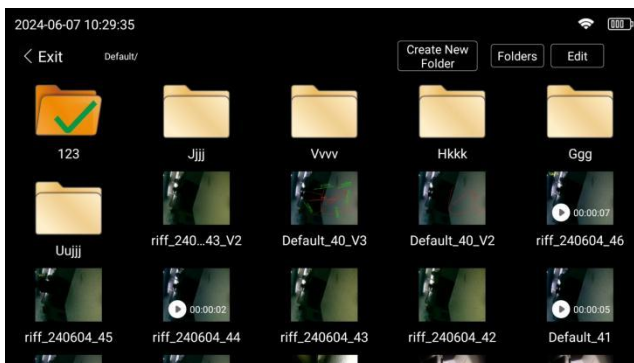


Figure 8-37

Touch [Edit] to enter the multi-selection mode, and multiple photos, videos or folders can be selected to delete together. After the operation, touch [Cancel] on the right top corner to exit from this mode (see Figure 8-38) :

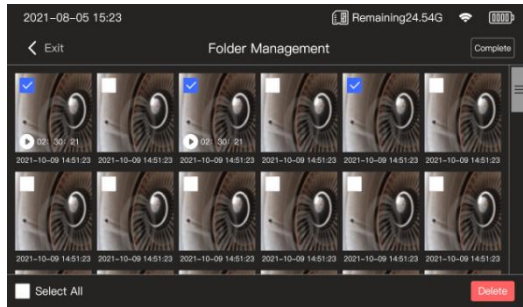


Figure 8-38

When browsing the saved photos or videos,

(1) Touch the image to do some editing on the image(see Figure 8-39) :

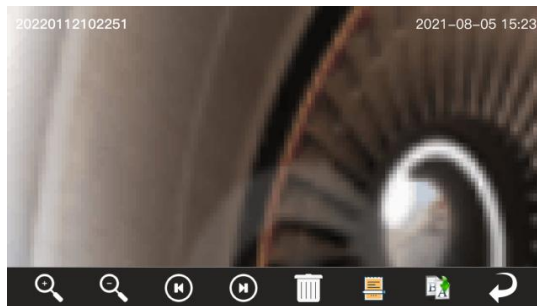


Figure 8-39

- Touch the [Zoom in] icon to zoom in on the photo;
- Touch the [Zoom out] icon to zoom out on the photo;
- Touch the [Forward and Backward] icons to go to the previous image and the next image;
- Touch the [Delete] icon to delete the current image;
- Touch the [Edit] icon to enter the editing mode;
- Touch the [Rename] icon to rename the current image.

### **Image edditing mode:**

Touch the curve icon to draw lines on the photo (see Figure 8-40) :

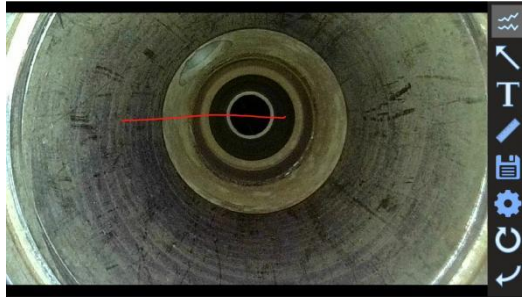


Figure 8-40

Touch the arrow icon to draw arrows on the photo (see Figure 8-41) :

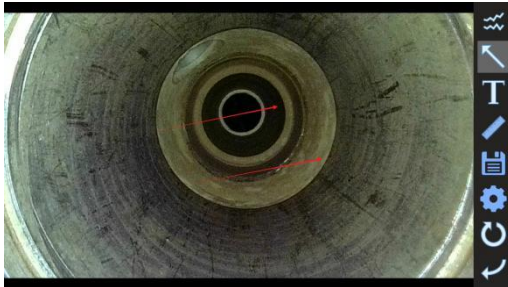


Figure 8-41

Touch the “T” icon to add text watermarks to the photo. After the operation, the watermark can be dragged to any positions on the image (see Figure 8-42) :



Figure 8-42

Touch the ruler icon to enter the mode of reference measurement (see Figure 8-43) :

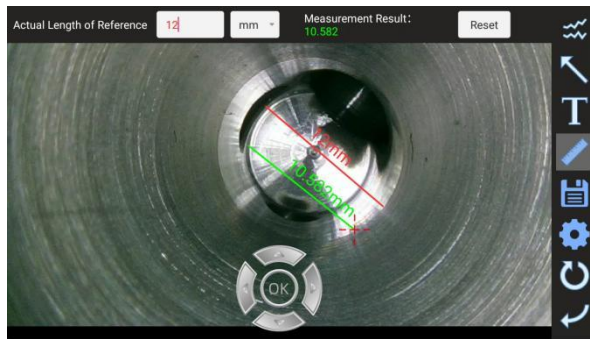


Figure 8-43

Follow each step prompt at the top of the screen to operate step by step:

- Choose a reference on the image. Touch two points on the screen to indicate the Reference Line, a red line;
- Input the actual length of the reference line (red line), the measurement result can automatically be output;
- Touch two points on the screen to indicate the Length to be Measured, a green line, it will show the measured results;
- Users can also touch another two points to generate a green line with measured results;
- Touch [Reset] icon, it will reset to original default settings.

Touch the [Save] icon to save the currently edited image.

Touch the [Settings] icon to set the font size, line size, font color, curve color,

arrow color of corresponding functions (see Figure 8-44):

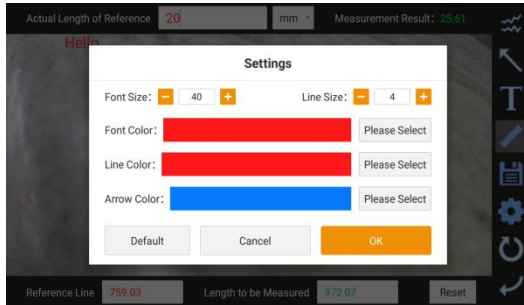


Figure 8-44

Touch the [Undo] icon to undo the most recent operations, select any icons (curve, arrow, watermark), touch the Undo icon, it can undo the curve, arrow, watermark.

Touch the [Exit] icon to exit image editing mode.

- (2) Touch the thumbnail of the video file to browse the video, as shown in the figure below (8-45) :

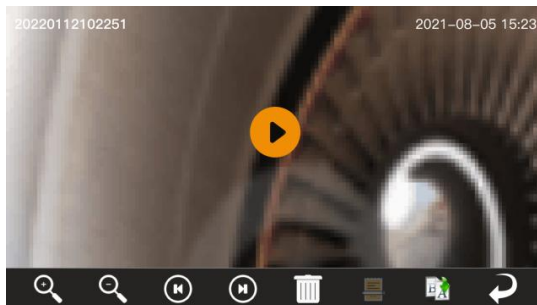


Figure 8-45

Touch the middle playback button to start playing back the video.

## 8.7 HDMI output

The HDMI cable is respectively connected to the HDMI interface of the borescope and the external monitor to realize the video output interface and the dual display (Images will be displayed on both the borescope screen and the external monitor screen simultaneous.).

## 8.8 Video pause/marker function

When recording a video, click the "Mark" icon on the lower left side (as shown in Figure 8-46). When the video is playing back, a red mark will be displayed on the corresponding progress bar (as shown in Figure 8-47).



When recording a video, click the  icon in the lower right corner (as shown in Figure 8-46), it will pause recording. Click the  icon in the lower right corner, it will continue recording the video. When the video is playing back, the image during the pause will not be recorded (as shown in Figure 8-47).





Figure 8-46



Figure 8-47

## IX. Instrument Storage & Maintenance

### 9.1 Cleaning

#### ■ Cleaning the insertion tube

- (1) Wipe the foreign body on the insertion tube with a dust-free cloth.
- (2) If there is a liquid (waste water or oil) touching the insertion tube, wipe it in the following order: ①Wipe it with a dust-free cloth or cotton cloth; ②Wipe it with neutral detergent and dust-free cloth; ③Wipe it with a clean cloth dipped in water; ④Wipe the water stains with a dust-free cloth.



## **Precautions**

- To extend the life of the insertion tube, clean it with a non-dust cloth.
- Do not flush the camera directly with running water, as this may damage the instrument.
- Store the instrument horizontally at room temperature, and keep the room clean and dry.
- Do not collide with other objects when storing, please handle with care and use safely.
- When not used for a long time, the function of the instrument should be checked regularly.



## **Warnings**

- Keep the instrument out of reach of children and be familiar with the rules before using it.
- It is strictly prohibited to store the instrument in high temperature, high humidity, strong light, strong earthquake, high dust, pollution or corrosive environment.

### **■ Cleaning the screen**

If the screen is found to have fingerprints or stains, please use a dust-free cloth to wipe.

### **■ Clean the main unit and probe**

If it is found that the main unit or probe is dirty, please use a dust-free



cloth to wipe.

### **Precautions**

- Do not use tap water to clean the instrument directly, or it may cause damages to the instrument.

## **9.2 Repacking**

### **Precautions**

- (1) Store the insertion tube and base unit in the correct order, if not, the insertion tube is easy to be damaged.
- (2) Please handle the insertion tube gently when putting it back to the box, otherwise it will damage the insertion tube.
- (3) When storing the insertion tube, make sure it does not bend.
- (4) Please buckle the clasp of the box correctly. If not properly buckled, the box cover may open during moving or transportation.
- (5) Before putting the main unit back into the box, please lay the box flat and close the box cover carefully. Do not get your hands pinched by the box cover or pinch the instrument accessories.
- (6) Please use the standard box to store the instrument, otherwise it may cause damage or malfunction to the main unit.

#### **■ Buckle the box**

If the box is hit during movement, the box cover may open. During the handling period, please check whether the box is tightly fastened.

### **Precautions**

Fasten the two buckles of the box.

## **9.3 Precautions for Storage**

- (1) Store the instrument at normal room temperature and humidity.
- (2) Please turn off the power of the instrument before packing.
- (3) Place the instrument on a clean, dry and firm surface.

### **Precautions**

- (1) Do not store the instrument in places with high temperature, high humidity, excessive dust or fine particles, direct sunlight or radioactive substances, otherwise it may damage the instrument.
- (2) When storing the instrument, please handle it with care, and do not collide with other objects, otherwise it may cause failure.

## **X. Troubleshooting**

If the fault cannot be eliminated by referring to the following methods, please stop using the instrument, and contact Yateks for advice:

- ① Check the instrument for any apparent malfunction as described in Chapter 8.
- ② Exception that cannot be solved according to [10.1 Troubleshooting Guide].

## 10.1 Troubleshooting Guide

<b>The fault</b>	<b>Probable cause</b>	<b>Suggestions</b>
Stuck image	Maybe there's something wrong with the color settings	Restart the main unit
Unable to power on the unit	The system is busy and running	Please wait for a moment. If it's not solved, please re-plug the battery and restart it.
SD card is inserted, but still showing no card	The SD card is not properly inserted	SD card needs to be re-inserted into the card slot.
Abnormal prompt during use of SD card on computer	When the computer detects the SD is abnormal or partially damaged, a prompt will pop up to ask whether to fix it or not.	Do not click "Yes" to fix it, please just close the prompt window by clicking the "X" on the right top corner.
Automatic shutdown	The high ambient temperature will trigger an automatic shutdown	Stop the check, let the instrument cool down, and then restart it.
	Low battery power will trigger an automatic shutdown	Charge the instrument

The image is not clear enough	The probe camera or touch screen is dirty	Use a clean, dust-free cloth or cotton swab to wipe
The joystick slightly squeaks	Articulation noise.	It's normal situation.
Angle bending operation load is becoming heavier	There are many turns of the inspected objects.	Extend the insertion tube as much as possible to reduce the amount of detour.


## 10.2 Instrument Repair

- (1) Please contact our company before returning the instrument for repair. When returning the instrument for repair, include faults and a detailed description of the environment in which the fault occurs.
- (2) According to the warranty agreement, any fault occurring during the warranty period can be repaired free of charge.
- (3) This instrument does not have any parts that can be repaired by the user. Do not disassemble, refit or repair it. Therefore, the company does not assume any responsibility for the loss caused by the user. The repair service of this instrument is only provided by the Company and authorized dealers.

### Warnings

Yateks will not be responsible for any damage caused by maintenance of personnel or companies other than Yateks.

## XI. External Usage Standards

Low voltage instruction and EMC instruction	Comply with the CE	<b>CE</b>
WEEE directive	Comply with the WEEE	 <b>—</b>
The RoHS directive	Comply with the RoHS	<b>RoHS</b>
FCC directive	Comply with the FCC	<b>FC</b>

