PTZ41 Pipe Inspection Camera

Operation Manual

■ Please read the manual carefully before using the product.

■ Please keep it for easy reference

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Product instruction

PTZ41 pipe inspection camera is a new nondestructive flaw detection equipment, which combine with optics, electronic technical, precision machinery and micro-camera shooting.

○ Optical detection

The Controller adopts high brightness LCD, micro-small CCD/ CMOS camera, the video signal was processed and amplified, and the detection results will be clearly displayed on the 7inches LCD. High definition, reliability, and stability shows that the industrial videoscope has a good detection capabilities.

○ Precision Machinery

The bending part adopts precision machinery, 4-way articulation, bending angle≥90°.

○ Application

This product can be used in the area, such as Automobile, Industrial Machinery, Electronics, Petrochemical, Aviation, Shipbuilding, Special Survey, Construction and so on.

○ Portable

One controller can match the camera with different diameters, such as 40mm camera, 24mm camera, articulation borescope probe and the rigid borescope probe.

System components

（The actual configuration prevails）

Controller

30m Fiber glass cable with reel

24mm wide angle camera

40mm color rotation camera

Articulation borescope probe

Rigid borescope probe

Replaceable battery

12V1A charger

Hardware instruction

Controller front

A: Capture button B: Video button C: Menu button D: OK button

E: Power on/ off button and return button F: LED + G: LED -

H: Close focus button I: Far focus button J: Up button

K: Right button L: Left button M: Down button N: Power indicator

O: Charging indicator

Capture button: In real-time image mode, press this button to take pictures.

Video button: In real- time image mode, press this button to start or stop recording

Menu button: Press this button to enter the menu interface when it is in real-time image mode.

Ok button: To confirm the item that was chose.

Power on/ off and return button: Press this button for about 2 seconds to turn on, and then entering real-time image mode; Press this button again for 3-5 seconds,the system prompts whether to shut down,press”OK”to turn off.

When the system is working, shortly press the button, the system entering power-saving sleep state,and then press it again, waking up the device to work.During work.There is no any respond when operating the system, press this button to reset, also this button has the returning function.

LED +： LED +.

LED -： LED -.

Close focus button: After connecting with 40mm camera, press this button to zoom in.

Far focus button: After connecting with 40mm camera, press this button to zoom out.

Up button: In image mode, press this button to control the rotation of the 40mm camera; In menu mode, press this button to move the cursor up.

Right button: In image mode, press this button to control the rotation of the 40mm camera; In menu mode, press this button to move the cursor right.

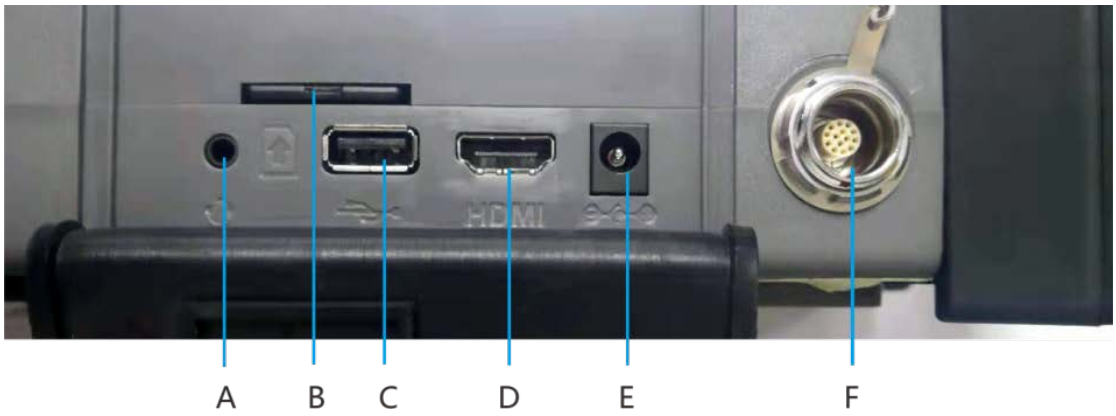
Left button: In image mode, press this button to control the rotation of the 40mm camera; In menu mode, press this button to move the cursor left.

Down button: In image mode, press this button to control the rotation of the 40mm camera; In menu mode, press this button to move the cursor down.

Power indicator: this indicator is on after the system was turned on.

Charging indicator: this indicator is on when charging.

Controller interface



A: Headphone interface B: SD card slot C: USB interface

D: HDMI interface E: Charging interface

F: External connecting cable interface

Headphone interface: During video playback, by connecting the headphone to listen for sounds picked up by the detection probe.

Card slot: Inserting SD card.

USB interface: It is used for data transfer by connecting the system to external PC.

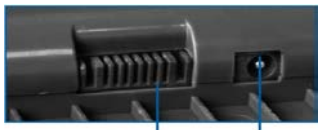
HDMI interface: Used for connecting the system to external monitor, to transfer the video from system to external monitor.

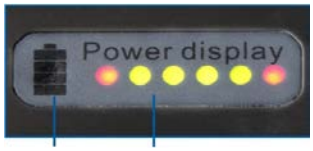
Charging interface: Charging to the system by connecting with the charger.

External connecting cable interface: to connect with probes or 30m cable with reel.

Back of the Controller

Battery instruction and Charging indicator

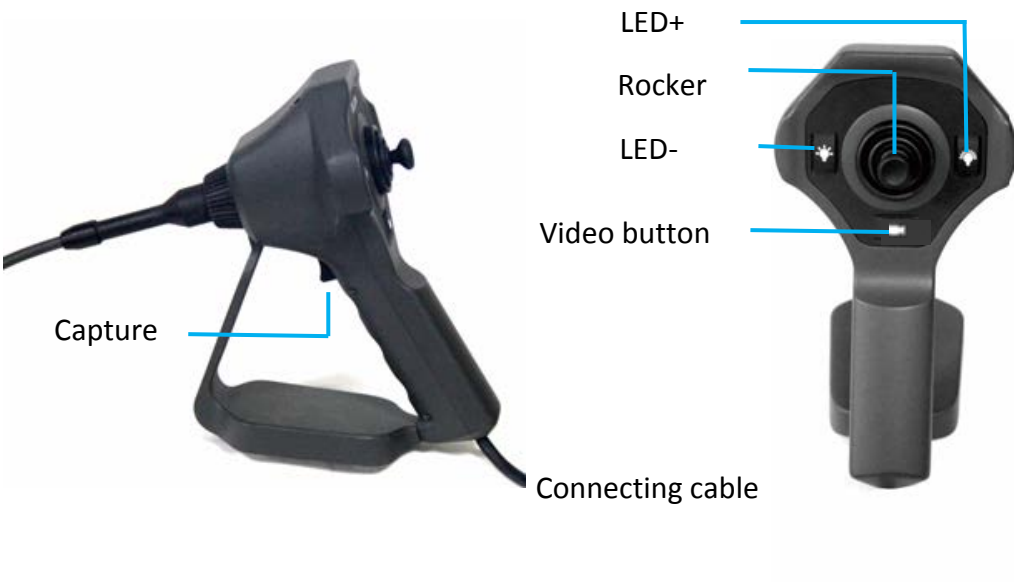




When using the system, press“ ”, the battery level indicator will display the battery level, please charge to the system when only has two green the indicators is on.

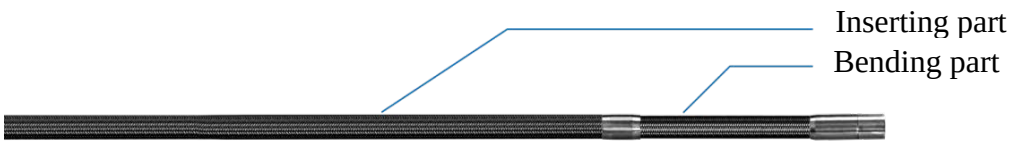
Note： When the battery is completely exhausted,do not directly connect the charger to the controller to go on the detection. This may damage the battery. The right way is to stop detection and charge it.

Articulation borescope probe



Rocker： to control the bending part on the tip of the probe.

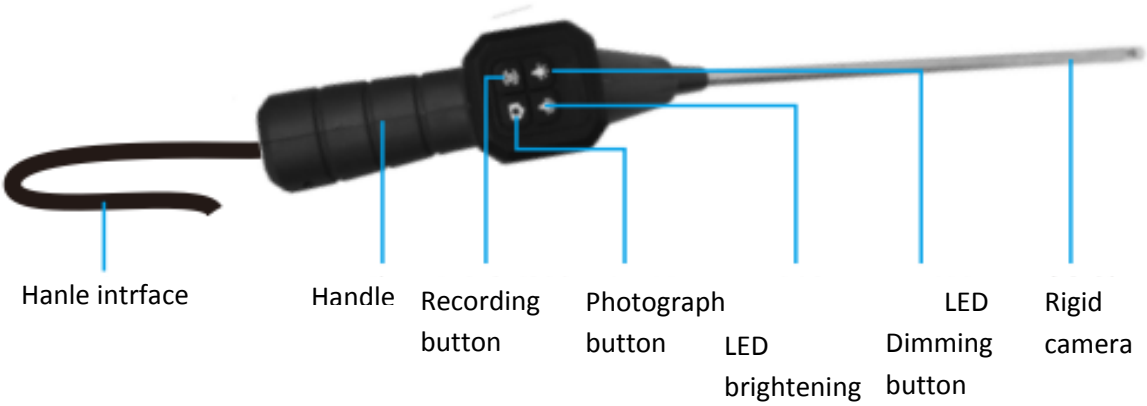
Connecting cable: connecting with the controller.



Inserting part：using the material of tungsten wire, IP67 waterproof.

Bending part：4-way articulation, Ip64 or IP67 waterproof(customized).

Rigid camera



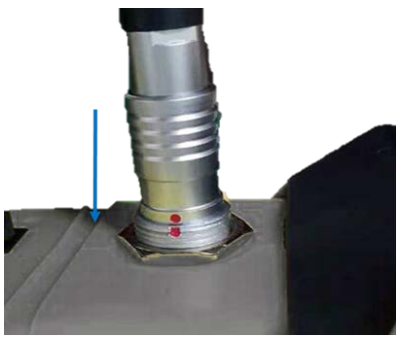
Video key: Press this key to start or end video recording; when the rigid borescope is equipped with both a front view camera and a side view camera, press this key to swit ch between the front view or side view screen.

The other buttons have the same functions as the corresponding buttons on the controller.

Installation Notes

Connect the controller and handle

Align the red mark on the plug interface on the reel with the red mark on the controller and insert it, and it cannot be rotated after connection!



Install the protective frame

A、Take out the 40mm camera.

B、Push the locking ring away from the elastic claw, install the protective frame on the camera, pay attention to the installation in place, the elastic claw of the protective frame should be clipped into the camera’s latch groove.

C、After being installed in place, push the locking ring to the top of the elastic claw, and the protective frame is installed at this time.

D、After the inspection is completed, first push the locking ring away from the elastic claws, and then slowly remove the protective frame from the camera. Be careful not to use brutal operations to damage the lens.

Install the camera

Unscrew the protective cap at the camera connection on the cable reel, insert the end of the 40MM color rotating camera with the protective frame into the camera connection port of the cable reel, and tighten it.

Install support wheels

A、Open the support wheel.

B、As shown in the figure, install the connection point shown in the figure on the supporting wheel, and tighten the supporting wheel (when installing, make sure that the left and right supporting wheels are engaged with each other without loosening), and the installation is complete.

C、After the test, as shown in the figure, press the elastic part of the support wheel with both hands at the same time, open the support wheel and remove it.

Operating instruction

Operations

1. Before use, install the corresponding lens according to the working conditions.

2. When using, first confirm that the device has installed the battery and SD card, and press and hold the on/off button to turn on the host.

3.Observe the object

a Press the LED dimming button to turn on the LED light source;

b According to the requirements of the working condition, before entering the working condition, the protective frame and supporting wheel can be installed to wait for the observation lens to achieve a safer and more convenient observation effect;

c Insert the lens into the observation body to reach the observation position;

d By controlling the rotation/flipping/far and near focus of the lens, and adjusting the brightness of the lens, the best real-time picture effect can be achieved;

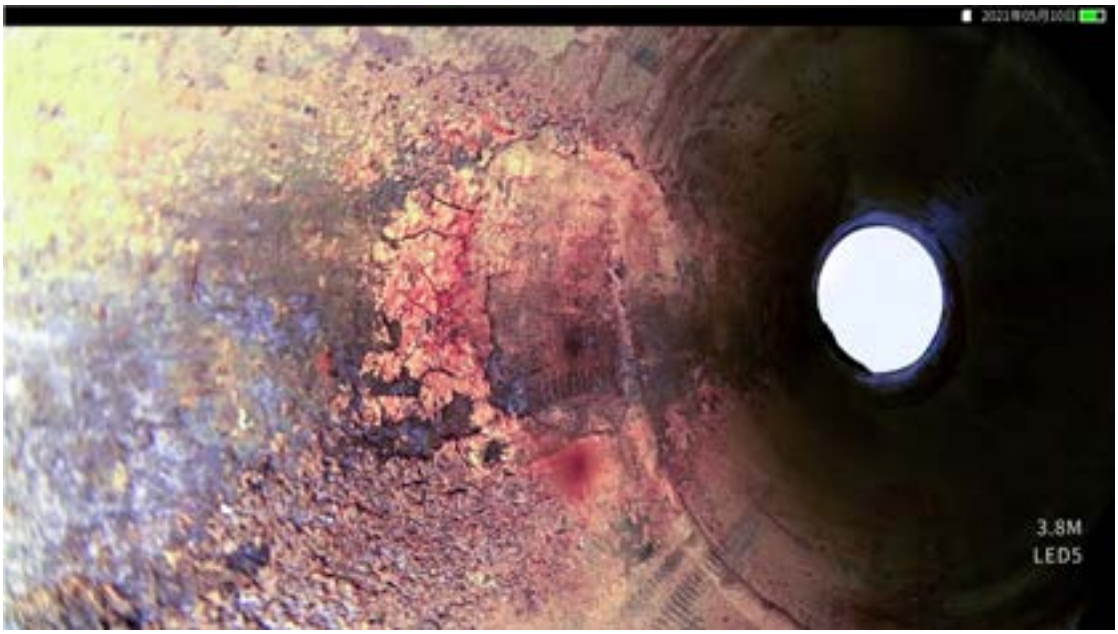
e. After the observation position is adjusted, the test results can be photographed/recorded and stored through the function buttons of the device.

4. After the observation is completed, safely exit the observation body and disconnect the power supply.

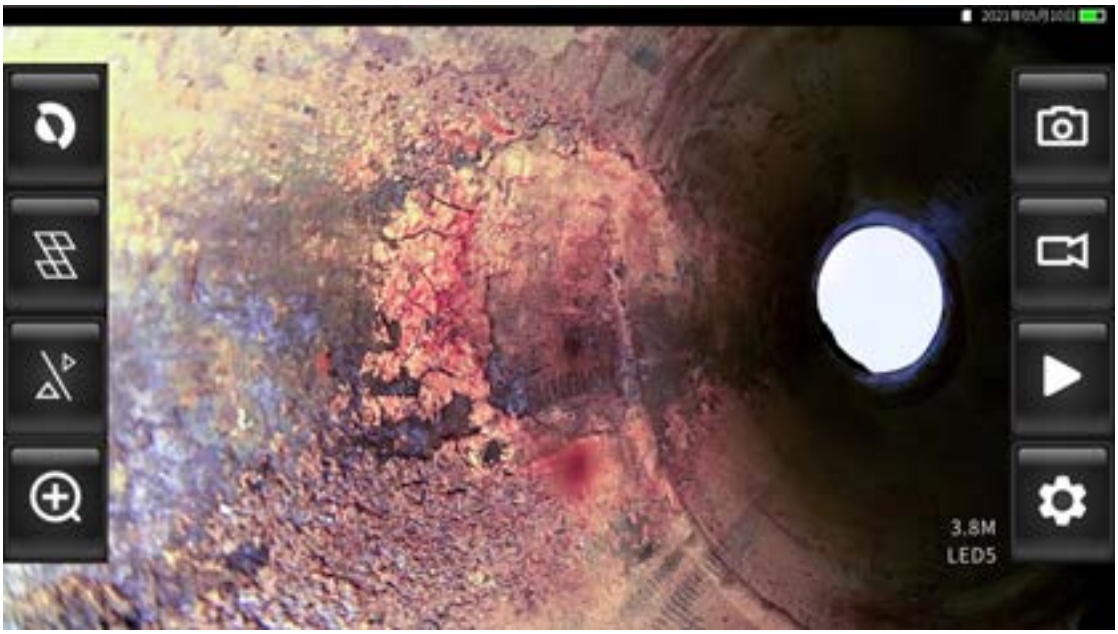
5. Storing the instrument.

Menu operation

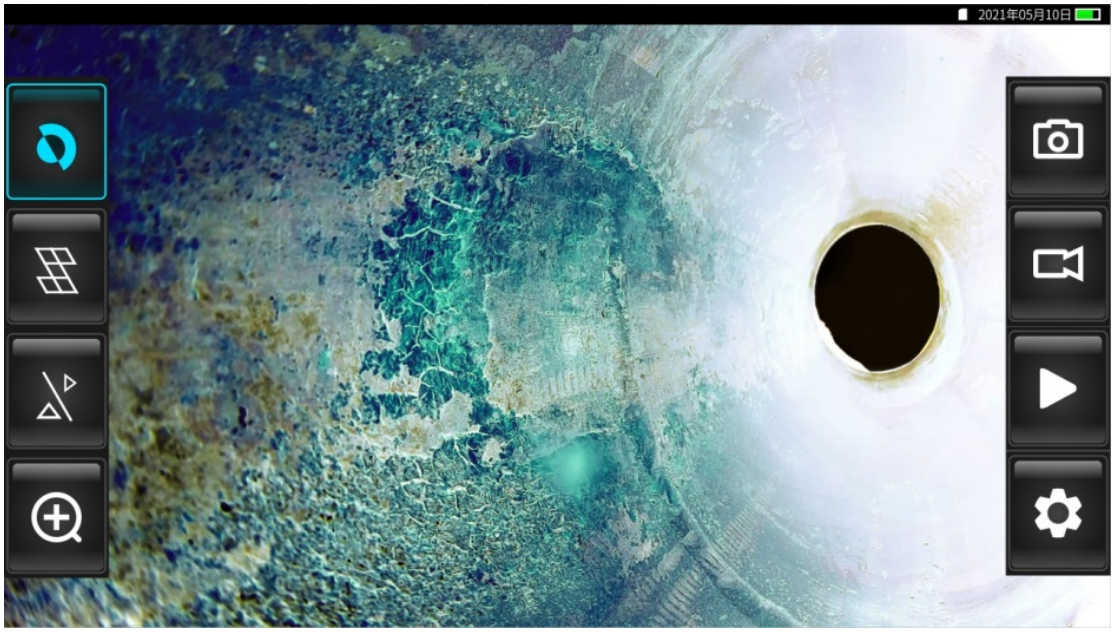
After the device is turned on, it will automatically enter the video interface with full screen. The bottom right corner shows the length of the cable out of the reel and the brightness level of the camera light.



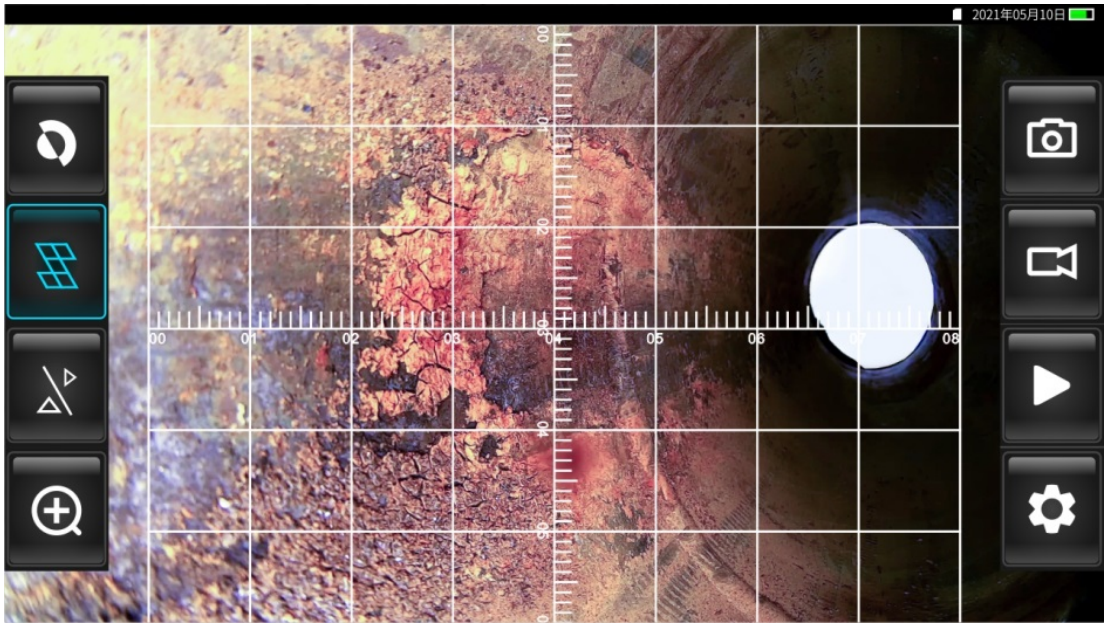
Click any point on the screen to call up the touch screen button interface. After about 8 seconds of inactivity, the button interface will be automatically hidden.



Negative film: click the icon , the image enters the negative film state;

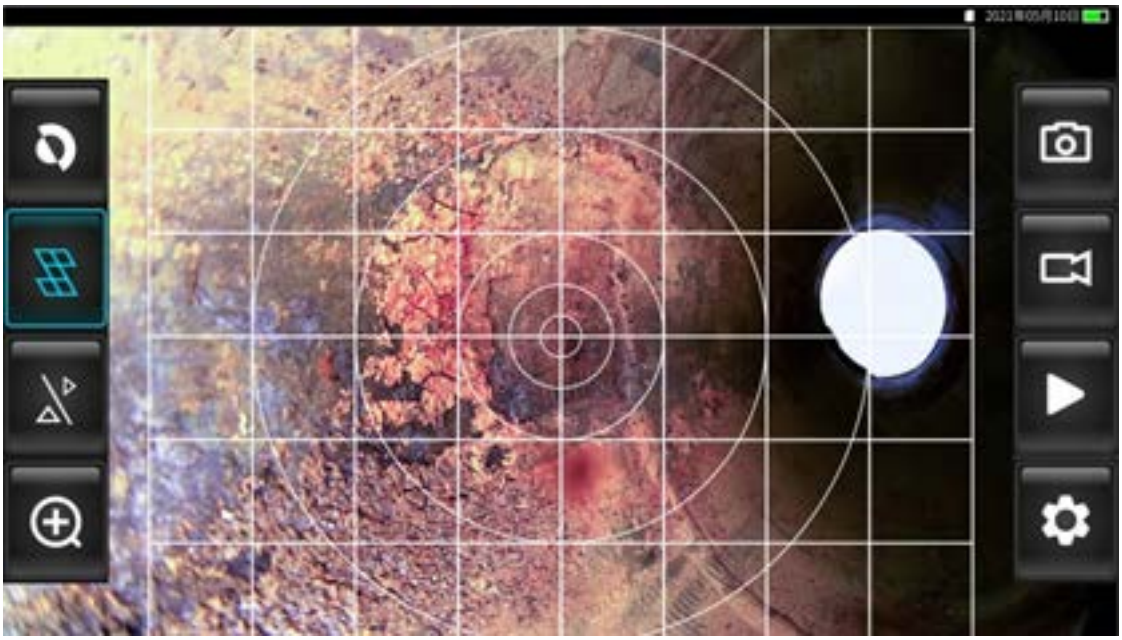


Ruler: when the menu is set to "ruler 1", click the icon to turn on or off the XY cross ruler for comparison measurement;



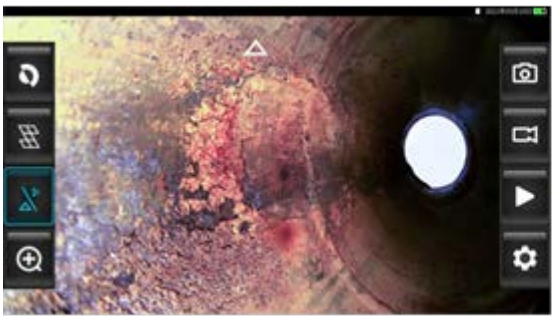
XY cross ruler display

When the menu is set to "Ruler 2", click the icon to turn on or off the circular ruler; (The menu settings will be described in detail in the menu introduction later.)

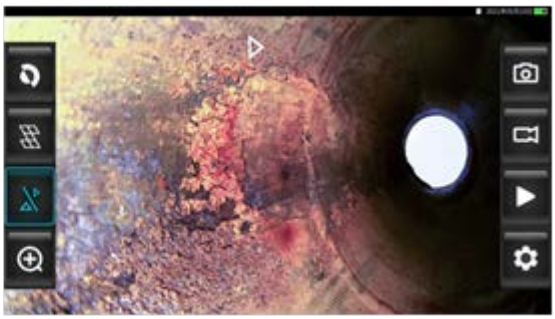


Circular ruler display

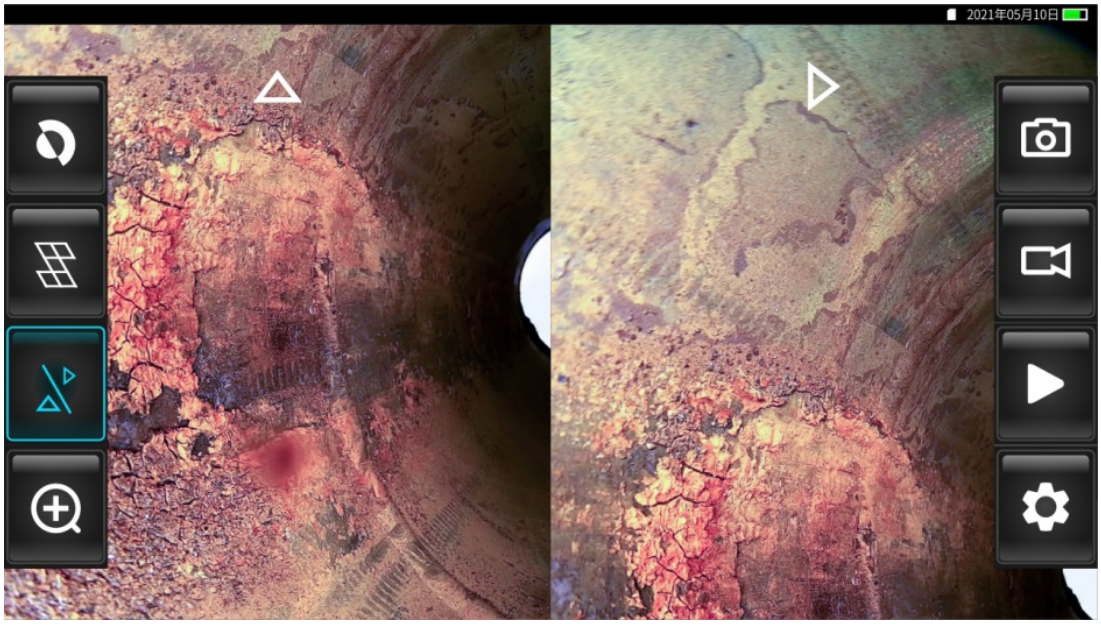
Split screen switching: cycle the button and click the icon to display in sequence, forward-view full screen, side- view full screen, forward/side view split screen display. This function only suitable for such special camera ---- forward-side view integrated camera. Other cameras do not have this function.



Forward -view full screen

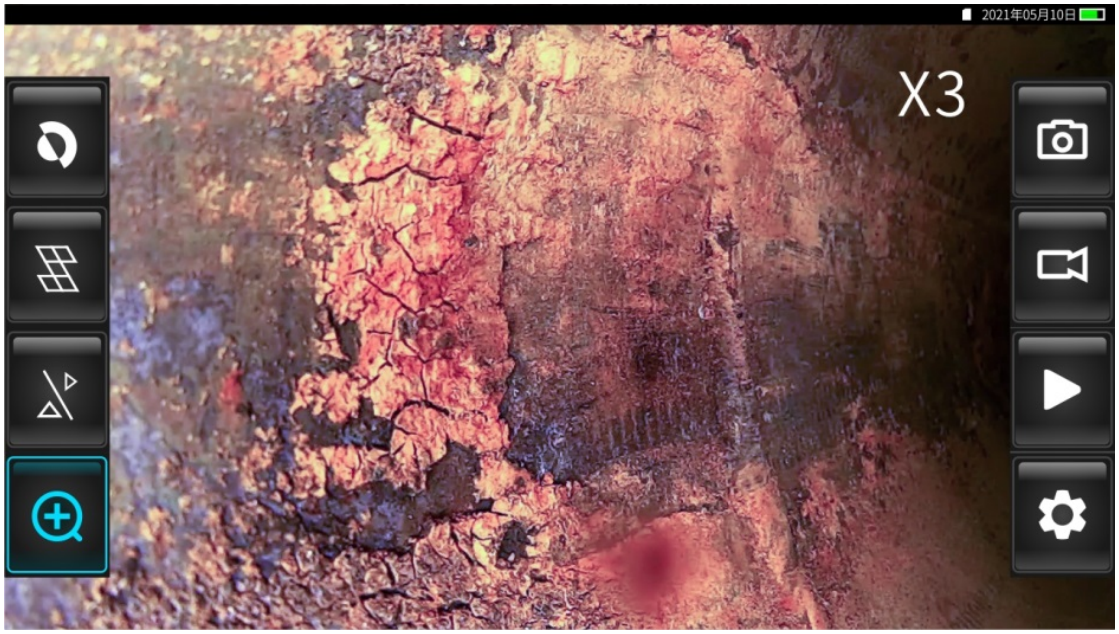


Side-view full screen

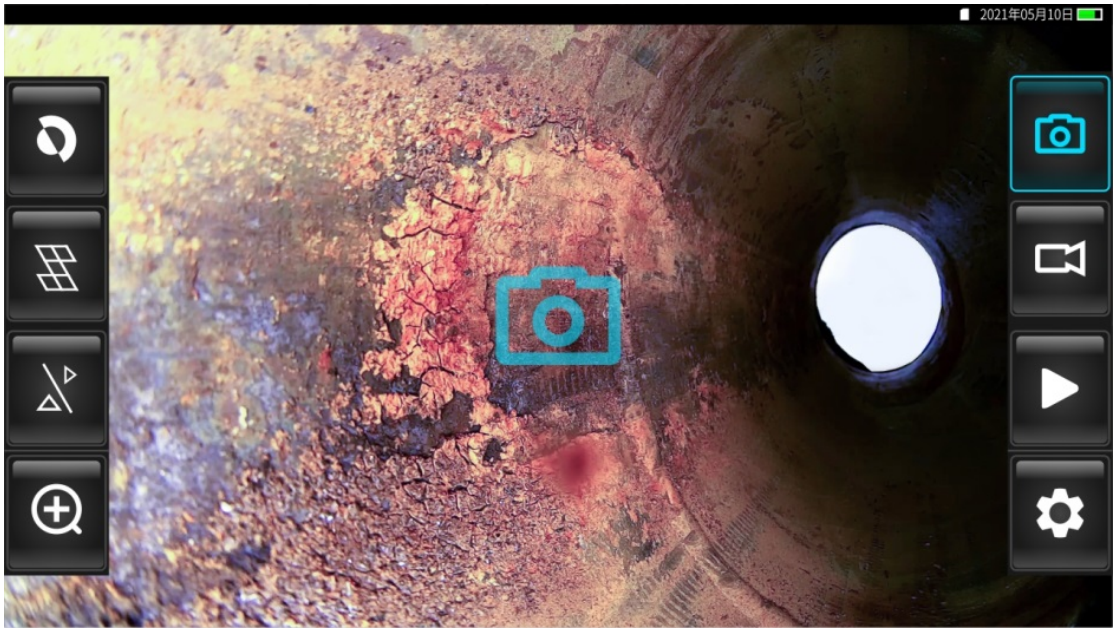


Foward/side view split screen display

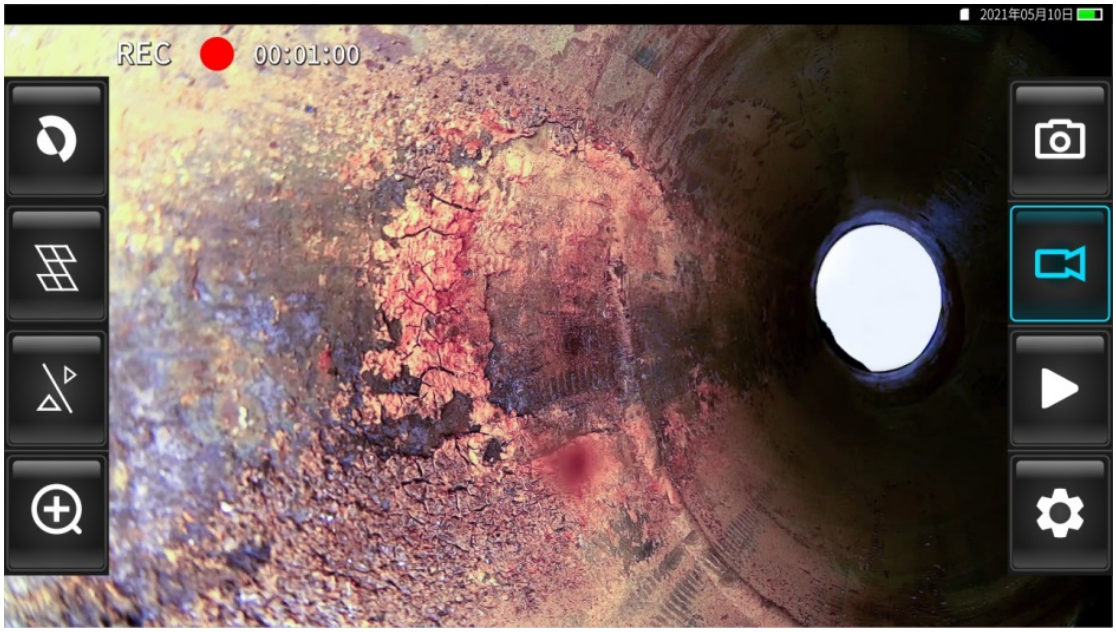
Image zoom in: Click the icon to zoom in the image, up to 3 times.



Take a photo: Click the icon or the photograph button to take a photo. If the photo is successful, the photo instruction will be displayed, as shown in the figure.



Video: Click the icon or the video button to record. When recording, the video indicator flashes and the video duration is displayed at the same time. Touch the screen or press the icon or the video button again to exit the video state.



Replay : press into image and video replay mode, press or to trasnsfer image review and video review. Click up and down on the vertical blue scroll bar on the right side or the up and down buttons to turn pages in the interface. Click the image and videos or press the left and right buttom to select files.

Picture file

Video file

Double-press the image /video or press the OK button to browse a single file, press or or Up and down keys can switch front and back files. Press to Zoom in or zoom out the picture; press on the video to automatically enter the video playback, press , it change to , video paused, Click the playback progress bar at the bottom of the video to fast forward and rewind; press or short press start/ off buttom, quiet video play.

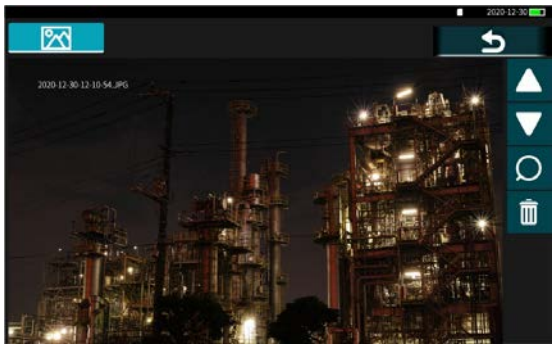
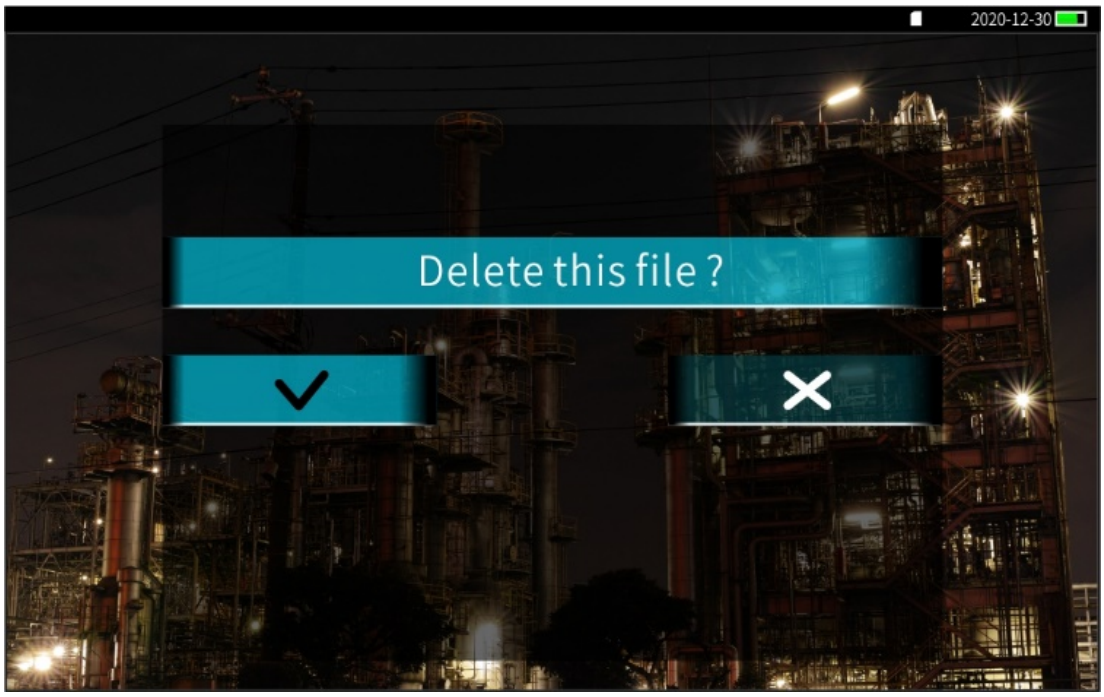


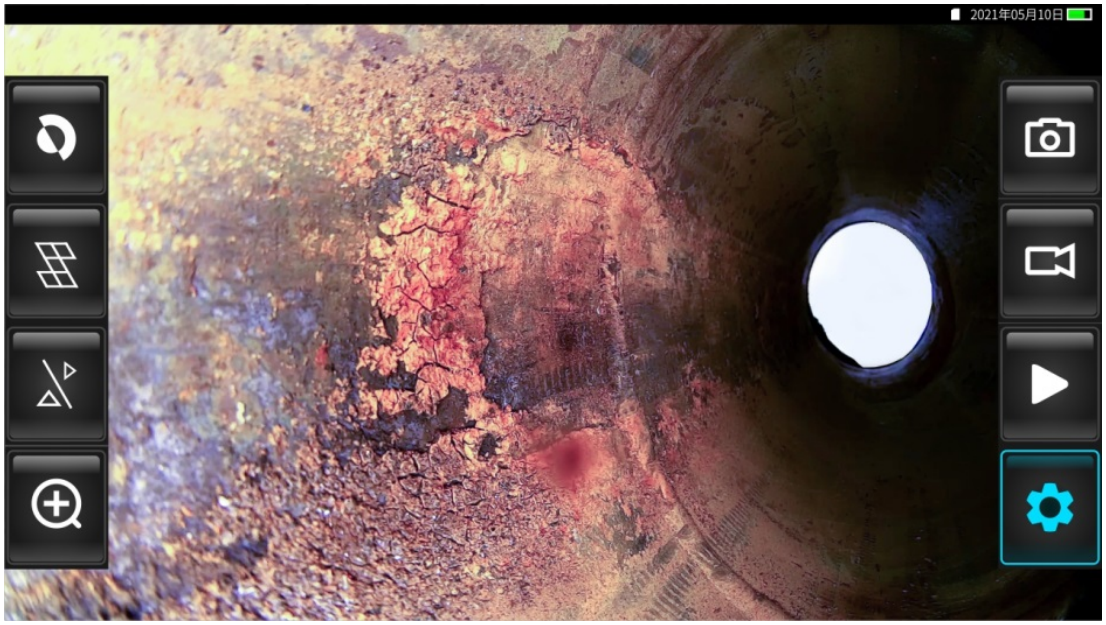
Image review interface

Video review interface

When previewing image files and video files, click the to enter the delete interface to choose whether to delete the file.



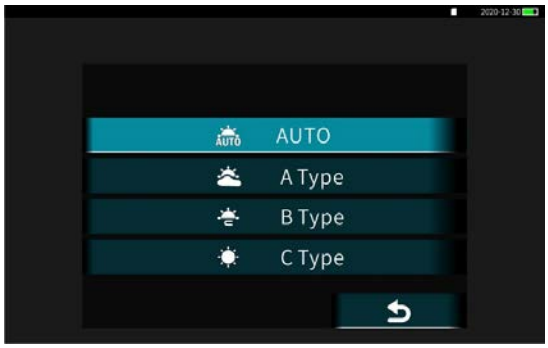
Setup : press or menu buttom into menu initerface.



Video setup

Enter menu interface, press the corresponding icon at the top of the screen to enter the video settings respectively. Screen setup Application setup system setup .

White balance: the camera image can accurately reflect the color condition of the subject, with automatic, cloudy, incandescent, daylight and other methods. Double press the "white balance" light bar to enter the sub-menu, double-click the parameter you want to select or press the icon to return to the previous menu. You can also press the up/down key to select the main menu, press the enter key to enter the sub-menu, then press the up/down key to select parameters, and then press the enter key to complete the setting. Short press the switch button to exit.



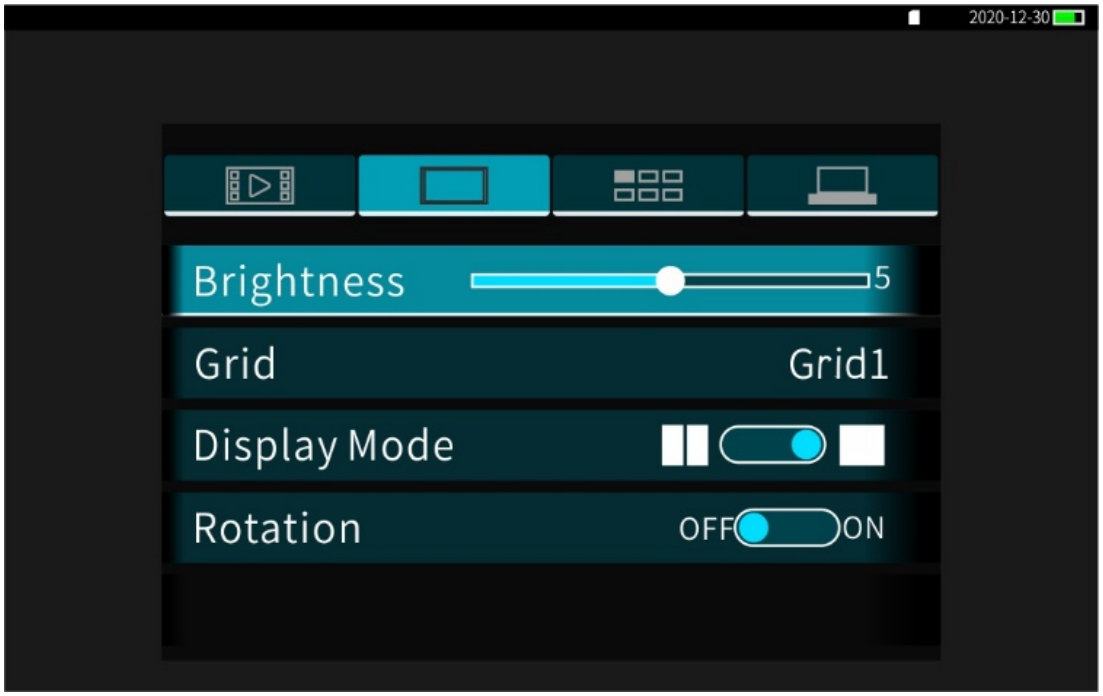
Contrast: press the icon bar cursor or press the left and right keys to adjust the contrast. The user can choose according to actual needs. The setting method is the same as above.

Hue: Drag the icon cursor or press the left and right keys to adjust the height of the color. The user can choose according to actual needs. The setting method is the same as above.

Negative film: Click "on" or "off" to turn on or off the negative film state, and press the enter key to switch between on and off. The user can choose according to actual needs, and the setting method is the same as above.

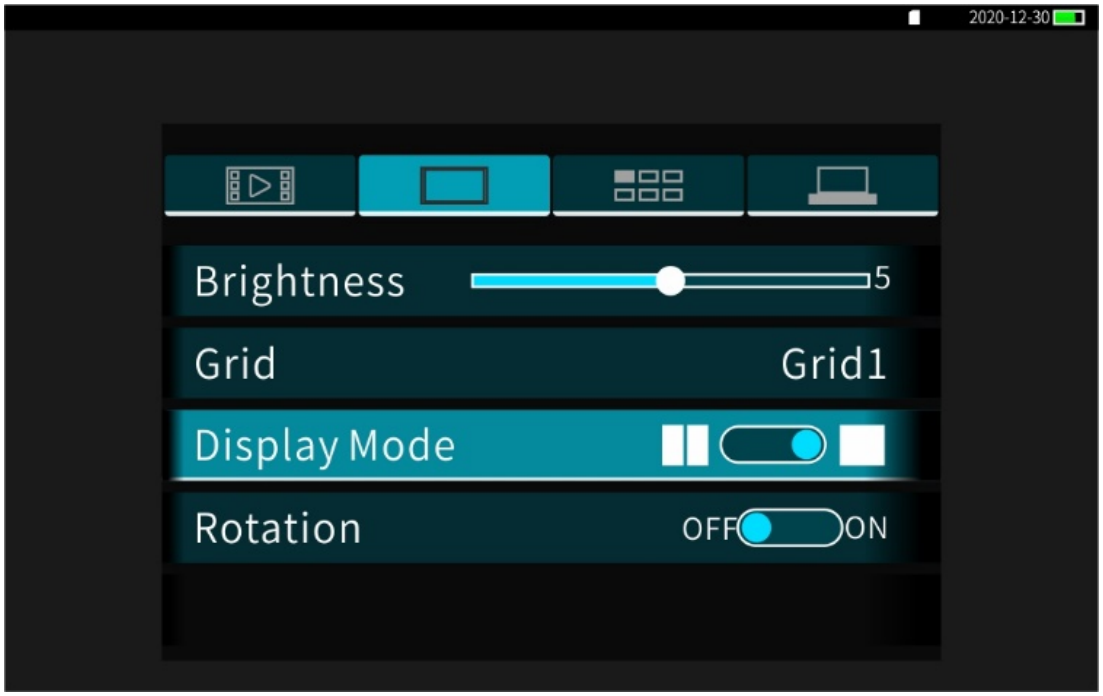
Screen settings

Screen brightness: Drag the icon cursor or press the left and right buttons to adjust the screen brightness. The user can choose according to actual needs. The setting method is the same as above.

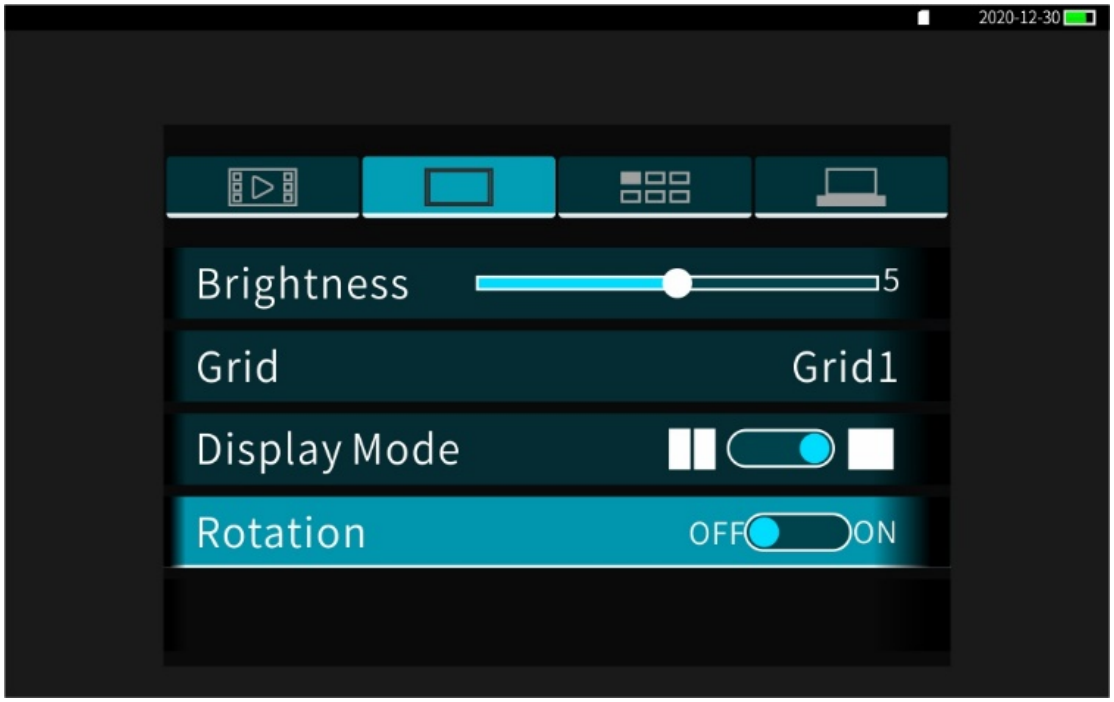


Ruler: press this cursor or enter the submenu to choose to open or close the ruler. Ruler 1 is an XY cross ruler, and ruler 2 is a circular ruler. The user can choose according to actual needs. The setting method is the same as above.

Display mode: Click the left or right side of the ○-shaped icon in the figure or the confirm button to select the display mode. The user can choose according to actual needs. The setting method is the same as above.



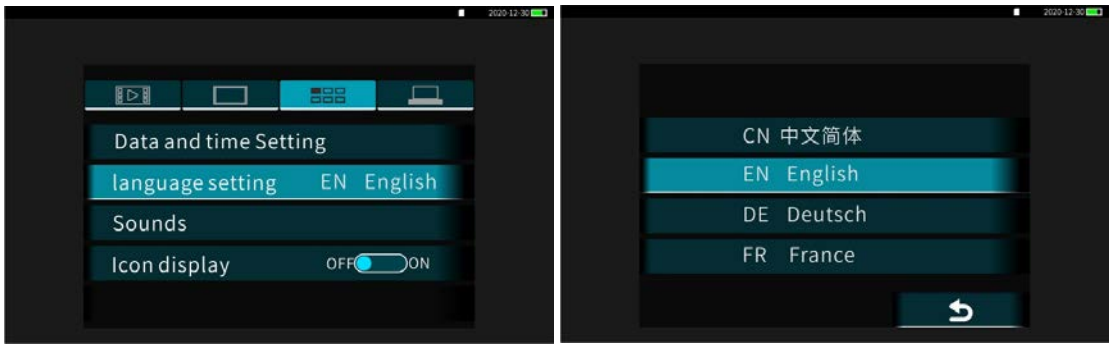
Screen rotation: press on the left or right of the ○-shaped icon in the figure or the confirm button to rotate the screen at 0° and 180°. The user can choose according to actual needs. The setting method is the same as above.



Application setup

Date setting: press the date setting light bar or enter the date and time sub-menu, you can adjust and choose year/month/day/hour/minute, when the cursor selects the parameter, press or , or up and down to set parameter adjusting , Press the confirm button to complete the adjustment of the date and time. Users can choose according to actual needs, and the setting method is the same as above.

Language: This product supports multi-language selection such as simplified Chinese, English, etc. The user can set it by himself, and the method is the same as above.



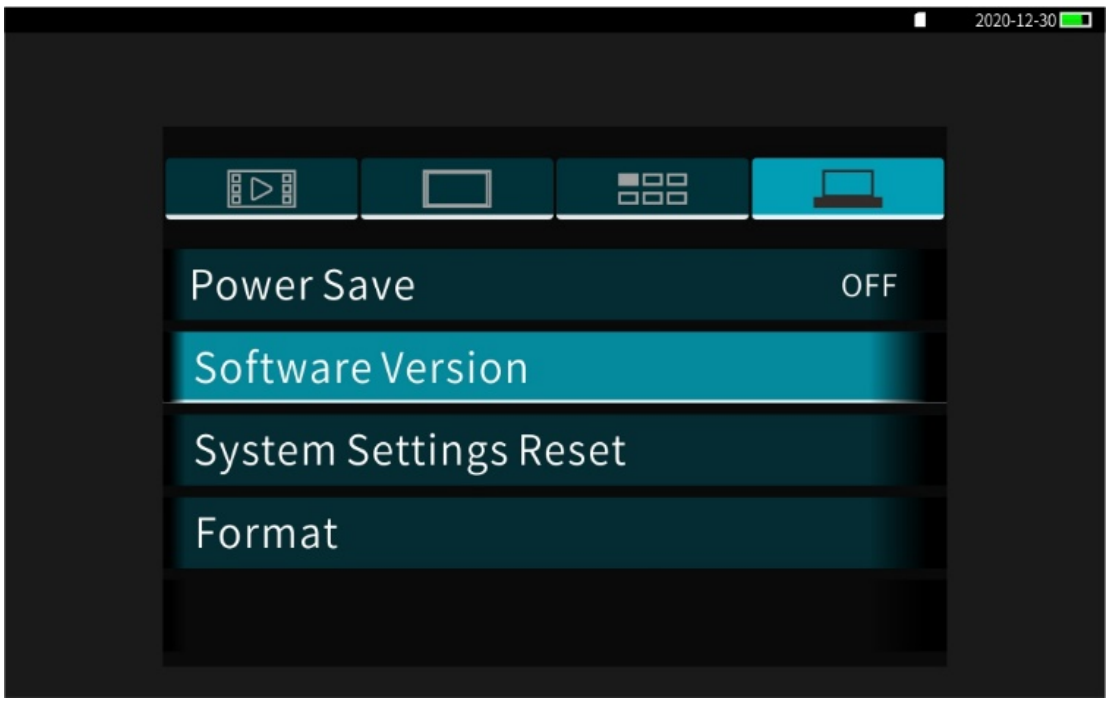
Sound: The user can choose whether to turn on or not according to actual needs, the method is the same as above.

Icon display: After turning on the icon display status, in the real-time image status, the SD card ID, date and battery power will be displayed on the screen. Users can choose according to actual needs, and the setting method is the same as above.

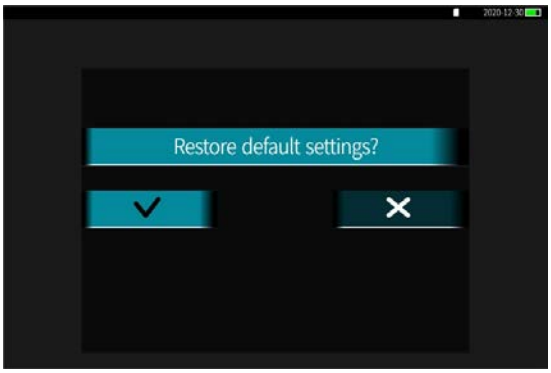
System setup

Automatic shutdown: The user can set the length of the automatic shutdown time according to actual needs. When the device is within the set time without any operation, the device will automatically shut down.

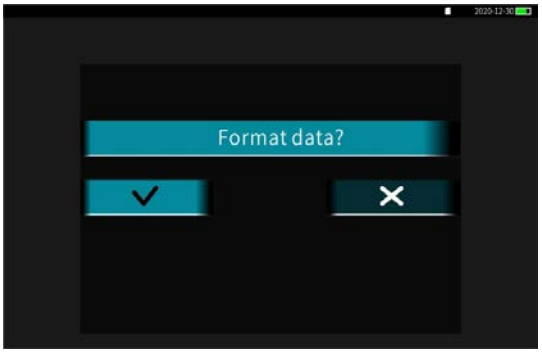
Software version: The software version is fixed and is used to display the version status of the software. The device can be upgraded via SD.



Settings recovery: Users can choose whether to restore the factory settings of the device according to their needs, in the same way as above.



Formatting: The user can choose whether to format the memory card or not, as required, in the same way as above.



Product technical specifications

Controller section

Model	Controller
LCD monitor	7 inch
Resolution	1280*720
Fps	30 fps
Screen brightness	400cd/m²
Screen contrast	800
Touch screen	Capacitive touch screens
Video output	HMDI high resolution
USB interface	Data transfer
Memory card	32G SD
Video resolution	1280*720
Picture resolution	1280*720
WIFI	Optional
Software	Negative, grid
Language	Multiple language
Li-ion	11.1V 7000MAH
Charger	12V 1A
Charging time	8 hours
Battery working hour	>5 hours
Operation temperature	-10 ℃~50℃
Storage temperature	-10 ℃~50℃

Pushrod cable section

40mm color rotation camera	Camera dia.	41mm
	Camera length	60mm
	Pixel	720P
	Light source	12 LEDs
	Camera housing material	Stainless steel
	Tilt	180°
	Pan	360°
	Manual focus	YES
	Image sensor	CMOS 1/4
	Ingress protection	IP67
	Waterproof depth	1m
24mm wide angle camera	Camera dia	24mm
	Camera length	42mm
	Pixel	720P
	Light source	12 LEDs
	Camera housing material	304 Stainless steel
	Field of view	>100°
	Image sensor	CMOS 1/4
	Depth of focus	25mm~∞
	Ingress protection	IP67
	Waterproof depth	1m
	Insertion cable length	30M
	Cable dia.	5.5mm
30m Fiber glass cable with reel	Cable material	Fibreglass
	Ingress protection	IP67
	Meter counter	Available
	Metre counting accuracy	3%

Scope unit(optional)

Insertion cable section

Dia.	8.4mm
Length	3M
Outer layer	Tungsten braided
Bending angle	>120°
Ingress protection	IP64

8mm front and side view scope unit

Dia.	8.4mm
Image sensor	CMOS 1/4
Pixel	720P
Field of view	>90°
Depth of focus	25mm-infinity
Outer material	Stainless steel
Ingress protection	IP64

Rigid borescope section(optional)

6mm rigid borescope

Dia.	6.2 mm
Length	25mm
Material	304 stainless steel
Light resource	LED
Image sensor	CMOS 1/12
Pixel	720P
Depth of focus	Dual view: front view: 8mm-80mm, side view: 5mm-25mm Front view: 15mm-infinity Side view: 8mm-80mm
Field of view	>90°

Note: The above parameters are subject to change without notice.

Trouble shooting

Description	Possible causes	Solutions
Cannot turn on the instrument	Battery is out	Charge the battery or connect directly to an external power supply
Mnitor blue or blinking	Camera is not installed properly	Re-install the camera
Abnormal video display colours	Error in parameter adjustment on screen display	Adjusting the hue, contrast and other parameters of the screen
Image blurry	Lens slide/protector stained	Switch off and wipe the lens
The instrument does not shut down properly	The equipment is subject to strong magnetic interference, causing system errors	Remove the battery and reinstall it

Precautions

1. Before using the equipment be sure to check whether the equipment has installed batteries and whether the batteries are charged, whether the detection wire of the electronic mirror handle has parts coiled around it, and prohibit the operation of the rocker in the state of the detection wire coiled around it to avoid damage to the wire inside the detection wire. Try not to bend the rigid glass fibre wire excessively in use, so as not to cause irreversible bending.

2. During installation, the communication data interface must not be rotated after insertion.

3. When taking photos and videos, ensure that the brightness of the camera light is appropriate and that the probe end is stable and does not shake; during use, users should not look directly at the lens light to avoid burning their eyes.

4. At the end of the use of the equipment, adjust the bending part straight, and then pull out the measured body, prohibit hard pulling and tugging.

5. When the device is finished, please turn off the power supply, and at the same time do a good job of protecting the lens pins by installing a protective cover for the pins (or directly to the built-in cable tray connection port) to avoid damage to the pins.

6. Do not soak and rinse the product, use a soft cloth to clean the probe and controller to avoid dirt corrosion and damage to the product performance. Then put the device into a special equipment box and protect it properly to prolong its service life.

7. Do not subject the device to extrusion, collision or impact to avoid unnecessary damage; be sure to remove the battery when the device is not in use for a long time to avoid battery damage and corrosion of the instrument.

8. When charging, be sure to use the charger provided with the device, with a voltage of 12 volts and a current of no more than 2000 MA.

9. Do not use at temperatures outside the range of -10°C to 50°C.

10. Do not use or place the product in a corrosive environment.

11.Do not expose the product to rain and do not leave the probe in liquid for a long time except for waterproof probes.

12. Do not place the product near objects with strong magnetic force.

13.Do not use in environments with excessive smoke and dust.

14.Do not scratch the screen and keep the body clean.

15.Do not attempt to disassemble the product yourself, repair work should only be carried out by authorized staff of the original manufacturer.

After-sale Service

1. Service Commitment

1.1 The main body of the product is guaranteed for one year, the warranty period for the parts replaced by the repair is six months, the warranty period for the parts only repaired without replacement is three months, man-made damage is not covered by the warranty, lifetime repair is only charged for the cost of repair. The effective warranty period for repaired products shall be the longer of the following two periods.

a. The remaining warranty period of the product.

b. Ninety days from the date of repair.

Transportation and handling costs for the product to and from the after-sales service department are borne by the purchaser.

1.2 The warranty period starts from the date of shipment. During the warranty period, if there is a problem with the quality of the product itself in terms of machine parts and materials under normal use and a fault occurs, the company will provide free repair services after verification of authenticity.

1.3 During the warranty period, the parts and labour used in the repair or replacement of the product will not be charged to the purchaser for non-human damage. All replaced parts, circuit boards or equipment will belong to us.

1.4 This service is only available to the initial purchaser of the product.

2. Non-warranty liability

In the event that your product breaks down during normal use, our company only commits to the above free warranty service. In the event of the following, you are invited to choose our paid service. Our 'service commitment' is limited to the repair of faulty hardware of the product.

2.1 Your product is repaired by our after-sales service department and continues to be covered by the warranty period for the original machine. If the repaired part exceeds the free warranty period, please pay a repair service fee, which will be customised by our after-sales service department, for your product.

2.2 We are not responsible for and reserve the right not to provide warranty service if the equipment has been subject to abnormal use, improper storage, unauthorised modification of connection, maintenance, misuse, abuse, accident, alteration, incorrect installation, force majeure (e.g. fire, earthquake), etc.

2.3 Defects and faults which are not notified to the manufacturer in time by the purchaser and which are beyond the valid warranty period at the time of reporting are also covered by the warranty.

3. Maintenance period

If the equipment is inspected and requires repair, we will complete the repair task within one month of receipt of the equipment. In case of special circumstances, if the repair cannot be completed within the deadline, the customer service staff will call you in advance to negotiate the repair date, and the aforementioned repair time does not include the time for the equipment to travel back and forth.

(Note: All the above terms, product features and specifications are subject to change at any time without prior notice)