



Industrial Videoscope

Operating Instructions



Warnings: Please read the operating manual carefully before using the instrument.

User Instructions

General safety precautions:

Please abide by the following precautions when using the device. The information will be presented with the supplement regarding to danger, warning and precautions in each chapter. Improper use is not allowed.

Danger

1. Do not use the device to detect humans 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 detect the electrified object to avoid an electric shock.

Warnings

1. Do not repair, disassemble or refit the device by yourself, otherwise Shenzhen Yateks Co., Ltd., hereinafter referred to as Yateks, shall not provide the warranty and repair services.
2. Do not let any liquid but water contact the insert tube, otherwise it may damage the insert tube.
3. Please make sure to cut off the power before putting the device into the case.
4. Do not touch the lens at the end of the rotating axis directly during the operation period, because it may burn you after used in the high temperature environment.
5. In case of smoke or abnormal noise, please stop using it immediately shut down the power and cut off the power.
6. Do not straightly look at the light from the end of the rotating axis of the videoscope to avoid affecting your eyesight.
7. If fell abnormal in the angular adjustment, stop the current operation immediately and cut off the power supply.

Precautions

1. Do not insert the insert tube into the object in an environment beyond the temperature range for operation.
2. Do not bend or twist the insert tube. Continued operation may damage the device or reduce its performance.

3. Make sure to use the power wire and adapter designated by Yateks and connect the power wire with the three-phase power socket conforming to its rated parameter range. Otherwise it may cause smoke, fire or electric shock.
4. When you insert the insert tube into the object and feel something abnormal, do not try to enforce the operation and please withdraw the insert tube carefully. Please pay attention to the matters below when withdrawing the insert tube:
 - a) When the testing angle is locked or the curve part is bent a bit, do not try to withdraw the insert tube from the object;
 - b) If the insert tube is stuck on the way back, rotate the control device slightly while withdrawing the insert tube.
5. The front end lens shall be straightened after operation; it is not good to make the lens direct to one direction for a long time, otherwise, it will make the equipment in a high load state with its service life affected.
6. Please pay attention to the following matters when operating the end of the insert tube:
 - a) Do not crash the end or drag it by force;
 - b) Do not crash its curve part, or bend it excessively. Otherwise, it may cause the damage of the glass lens and precision components.
7. Long-term use of the product will dirt the lens, causing image blur and influencing data acquisition, so please clean it with alcohol or acetone before use to avoid dirt agglomeration, corrosion and deformation.
8. Do not try to operate it by force when something abnormal felt in curve bending operation. Otherwise it may cause the damage of the insert tube or the object.
9. Do not let metals or other foreign substances enter into the host by port or other openings. Otherwise it may cause fault or electric shock.
10. Do not crash, press hardly or scratch the LCD monitor with hard or sharp things. Otherwise, there may be a crack or scratch on the LCD monitor, which may cause personal injury.
11. Do not cover the host with plastic bag or other objects during the use. The failure in cooling inside the device may cause the damage of the device.
12. Please make sure to align with the red point in the connection between the quick fittings and the video instead of operating by force.

13. Do not store the device in the following environment; otherwise it may cause the damage of the device.

- a) The environment of high temperature and humidity with a lot of dust or particles.
- b) A place of direct sunlight or radiation.
- c) A place with halide gas.

Battery treatment method

For battery disposal, observe the hazards, warnings, and cautions described below.

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.
8. The product pictures and displayed content in the manual are for illustration only, the actual product effect (including but not limited to appearance, color, size) and displayed content (including but not limited to background, UI, picture) may be different, please refer to the actual product .
9. In order to provide as accurate product information, product parameters, and product characteristics as possible, Yateks may adjust and correct the text expressions and picture effects in the manual to ensure that it is consistent with the actual product performance, specifications, parameters, parts and other information. match. Due to real-time changes in product batches and production supplier factors, if it is necessary to make the above modifications and adjustments, no special notice will be made. Please refer to the information on the corporate website .

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I. Product Overview

The industrial videoscope mainly consists of five parts: camera, insert tube, host, display screen and operating handle. It is a new type nondestructive testing device integrated with optics, precision machinery, electronic machinery, electronic technology and microscopic camera technology and is always applied in the detection of surface defect of imperceptible part that the conventional nondestructive testing technology cannot reach.

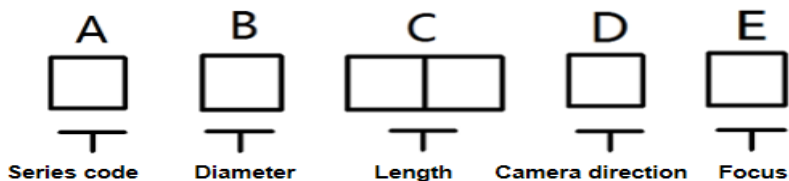


Figure 1.1 Industrial videoscope

The industrial videoscope applies 8" IPS HD LCD touch screen with an ultra HD image and resolution ratio as high as 1024*768. Meanwhile it has touch screen, making operation faster and more convenient; the industrial videoscope applies Yateks leading patent technology, able to rotate the probe at 360 degree and transmit the image over a long distance so that a deeper pipeline detection can be observed; it applies HD camera module making the image clearer; besides, with the highlight LED lighting techniques, the LED brightness can be adjusted to Grade Five on the basis of the HIE series products, reaching more than 15,000Lux. The brightness can be adjusted to the best condition for the inspection work based on the brightness of the inspection site; it also applies industrial control board, making it faster in processing and clearer in imaging.

II. Model Definition

In order to meet the requirements of different environments, the User can select insert tube with proper diameter and length based on the actual need. The product model is named according to the code of the diameter and length of the insert tube. The rule of the product model is as follows.



Code	Description	Note
A (Series code)		
P plus		
B (Diameter of tube)		
2	2.2mm	
3	2.8mm	
4	4mm	
6	6mm	
C (Length)		
10	1.0m	Refer to the below different camera options.
15	1.5m	
D (Camera direction)		
PM	2.2mm /120°/Front	Diameter:: 2.2mm Length: 1-1.5m
YB	2.8mm Fiber /120°/Front	Diameter: 2.8mm Length: 1-2m

PA	2.8mm /120°/Front	Diameter:: 2.8mm Length: 1-2m
PG	3.9mm/ 120°/Front	Diameter:: 4mm Length: 1-5m
YC	3.9mm Fiber/100° /Front	Diameter:: 4mm Length: 1-3m
YD	3.9mm interchangeable forward Camera/Fiber/70°	Diameter:: 4mm Length: 1-3m
FA	4mm Fiber/100°/Front	Diameter:: 4mm Length: 1-3m
FD	4mm Front Side Dual camera /Front 100°s Side 120°	Diameter:: 4mm Length: 1-3m
SC	4mm Side camera/90°	Diameter:: 4mm Length: 1-3m
TC	4mm Fiber/110°/Front /F4.0	Diameter:: 4mm Length: 1-3m
UV	4mm/120°/Front	Diameter:: 4mm Length: 1-3m
	6mm/120°/Front	Diameter:: 6mm Length: 1-3m
PB	6mm/ 120°/Front	Diameter:: 6mm Length: 1-8m
PD	6mm Dual camera/ 80°	Diameter:: 6mm Length: 1-8m
TE	6mm Fiber/110°/Front/F4.0	Diameter:: 6mm Length: 1-3m
YE	6mm Fiber/90°/Front	Diameter:: 6mm Length: 1-3m
YF	6mm Fiber interchangeable camera /70°	Diameter:: 6mm Length: 1-3m
PR	6mm/ Infrared camera/80°/Front	Diameter:: 6mm Length: 1-3m
WR	6mm Fiber/80°/Front	Diameter:: 6mm Length: 1-3m
BM	6mm 3D/120°/Dual camera front	Diameter:: 6mm Length: 1-3m
E (Depth of Field List)		
A1	7-80mm	PG、PB、TE
A3	3-30mm	YE、YD、YF、SC
A4	5-80mm	YD、YF
A5	8-150mm	YC、YD、YF、TE、TC

A6	10+∞	YD、YF、TE、TC
A9	10mm-100mm and 5mm-50mm	PD
B1	50+∞	PR、WR
B5	3-50mm	YB、PM、PA、UV
B6	5-100mm	BM、FA
B7	Side 3-50mm and Front 5-100mm	FD

III. Main performance parameters

system	Dimension	246mm*321mm*123mm
	Weight	2.3kg
	Display screen	8" IPS industrial high definition touch LCD screen with resolution ratio of 1024*768
	Control lever	Electric rocker with a lens able to rotate in 360 degrees
	Probe reset	Automatic reset
	Direction fine tuning	Direction fine tuning adjustable
	Function	Photography, video, brightness control, locking and fine tuning
	Internal storage	32G high speed SD card
	Data I/O port	SD card interface, HDMI video signal interface, charge interface and USB interface
	Battery	4 × 18650 Li-ion batteries (replaceable)
	Standby time	4H
	Operating mode	Portable
	Brightness control	10-grade brightness adjustment
	Combining	Host + control unit

	form				
Front video probe	Working length	0~1m	1~2m	2~3m	3~8m
	Bending angle	180±10°	150±10°	120±10°	100±10°
	Effective pixels	Direct view of 1,000,000 pixels			
Software	Operation system	Real time multitasking operation system			
	User interface	Touch screen operation menu			
	File management	Support image and video play, delete, format and naming			
	Image control	Zoom in/out, playback			
	Image format	JPEG/JPG/PNG (record the date and time)			
	Video format	AVI/MP4 (record the date and time)			
	Language	Simplified Chinese, English, French, Spanish, Russian, Japanese, Korean, Traditional Chinese, German, Portuguese			
	Software upgrading	Upgrading available by interfaces			

IV. Purpose and application scope

This device is widely use for modern core industrial production and inspection for aviation, automobile, watercraft, electric and chemical. Characterized by direct visualization, it can check if the inner surfaces of the large equipment like pipelines, turbines, cylinders and engines have defect or abnormity. Besides, it allows real time photography and video recording to provide indispensable data collection for the equipment's condition analysis and equipment production support.

V. Working environment

Host Working temperature	-10 °C~50°C
Tube Working temperature	-20~60 °C
Temperature for storage	-10 °C~40°C
Dust proofing and water proofing of video probe	IP67

VI. Inspection of packing list

No.	Description	Unit	Qty.	Remark
1	Host	Set	1	
2	Operating handle	Pcs	1	
3	Signal cable	Pcs	1	
4	Li battery	Pcs	8	
5	Charger	Pcs	1	
6	Mini USB data wire	Pcs	1	
7	AC adapter	Pcs	1	
8	HDMI cable	Pcs	1	
9	32G SD card+ card box	Pcs	1	
10	SD card reader	Pcs	1	
11	Bar magic sticker	Pcs	2	
12	Device shoulder strap	Pcs	1	
14	Touch pen	Pcs	1	
15	Non-dust cloth	Pcs	1	
16	Rubber cap	Pcs	1	
17	Instructions	Pcs	1	
18	Certificate of compliance	Pcs	1	
19	Warranty card	Pcs	1	

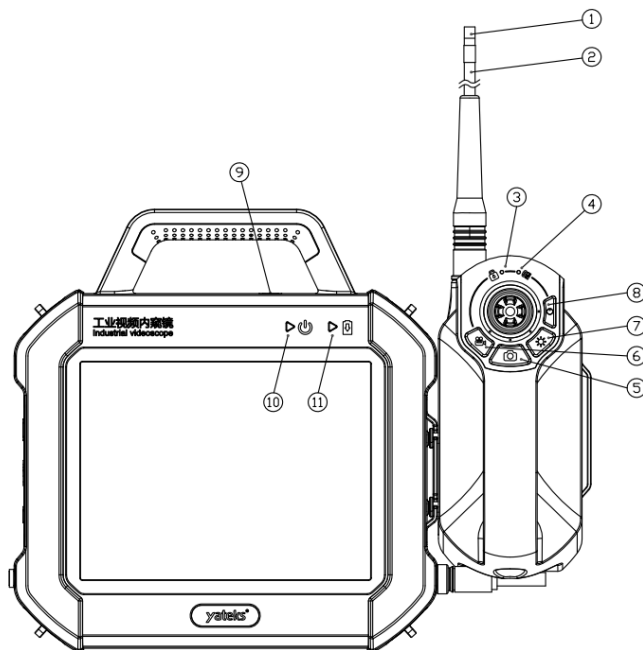


Figure 6.1 Name and figure of each part of the host

VII. Name and function of each part of the device

No.	Description	No.	Description
①	Camera	⑦	Brightness
②	Insert tube	⑧	Locking / tuning
③	Locking / tuning	⑨	Host switch
④	Power indicator	⑩	Power on/off indicator
⑤	Photograph/ Dual camera switching	⑪	Charging indicator
⑥	Video		

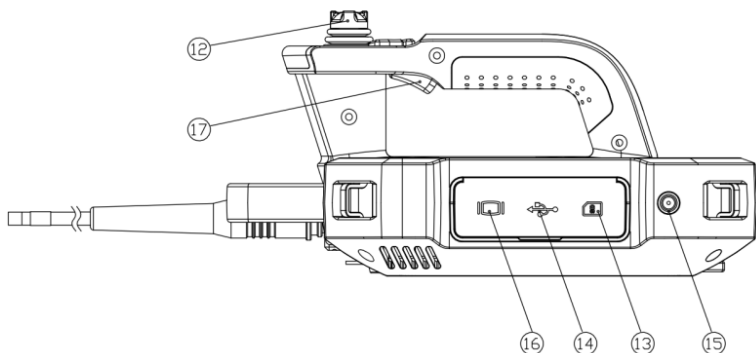


Figure 7-1 Name of each part of operating handle

No.	Description	No.	Description
⑫	Rocker	⑯	HDMI interface
⑬	SD card interface	⑰	Photograph/ Dual camera switching
⑭	USB interface	⑰	Quick coupling
⑮	DC interface	⑲	Signal cable

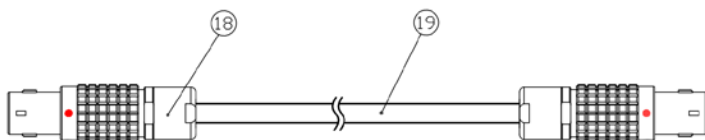


Figure 7-2 Diagram of signal cable

VIII. Preparation and inspection before detection

8.1 Case handling



Notes

- Please check if the handle and the fasteners of the case are normal before

transporting.

- Only the standard transport case supplied by Yateks is allowed, or it may damage the device.

■ When using the handle of case

- 1) Make sure the fasteners are locked tightly before lifting the case.
- 2) The case is allowed to be moved by wheels on the flat surface.

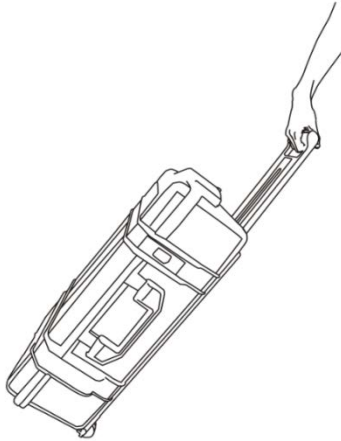


Figure 8.1 Take the device out of the case

Notes

- If the fasteners are not closed completely, the cover may be open accidentally when lifting the case.
- Do not kick the case or move it with foot.

■ Take the device out of the case

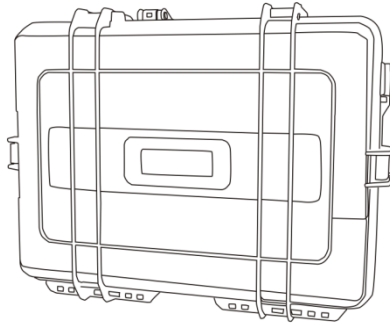


Figure 8.2 Take the device out of the case



Warnings

- Make sure the case cover is completely open and then take the device out of the case, to avoid the cover closing suddenly and cause injury.
- Do not operate the device while it is in the case, to avoid the cover closing suddenly to clamp the hands or single cables.



Notes

- Put the case on the horizontal surface to keep it steady.
- Please loose the fastener at the front of the case to open the cover.
- Do not take the insert tube out of the groove pad with too much force. Otherwise the insert tube may be damaged.
- Do not use the insert tube or general cable to fix the operating handle or host while taking out from the case.

Check if the insert tube, host and the quick couplings of the operating handle are clean, if there is dust or dirt, please clean it with clean soft cloth.

8.2 Installation of host

The host can be placed in two ways: by supporter or hanging the handle.



图8-3 主机支撑架摆放

Notes

- Place host horizontally and keep it steady.
- Do not put the host at a high place, or else the host may be damaged by falling down.
- If hanging the host, please make sure it can withstand its weight.

8.3 Power supply

■ Open the battery cover

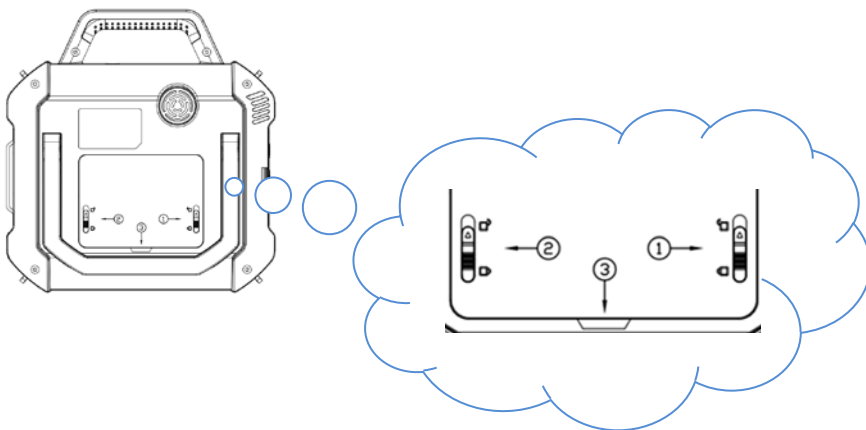


Figure 8.4 Open the battery cover

- 1) Push the slide key of ① shown in the picture to the unlocking position .
- 2) Push the slide key of ② shown in the picture to the unlocking position , and hold it.
- 3) Pull the ③ shown in the picture with hand to open the battery cover.

■ Load the batteries

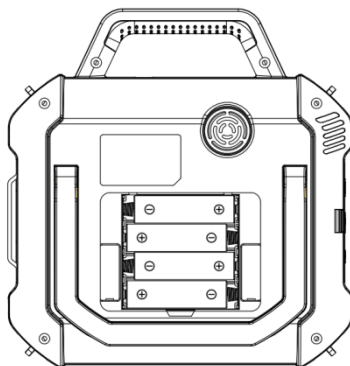


Figure 8.5 Load the batteries

Load 18650 Li batteries into the device in the sequence of positive and negative as shown in the picture.

Notes

- The batteries cannot be loaded with wrong positive and negative sequences.
- Four 18650 Li batteries are needed.
- The standard Li batteries provided by Yateks have a circuit protective function.
If need to change the batteries, please select those with circuit protective function.

■ Built-in charging

- 1) Take out the adapter, and connect to the DC interface of host.
- 2) Make sure the power supply cable is connected to the DC interface of the

host.

- 3) Insert the plug of power supply cable into the power socket properly.
- 4) When the red lamp is on, it means it is charging; when the green lamp is on, it means charging finished.

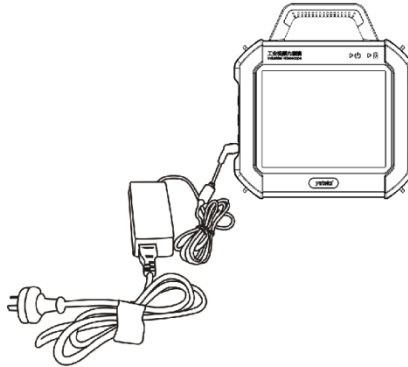


Figure 8.6 Host charging

Warnings

- Check if the power wire has damages before use.
- The input voltage of the adapter is 100 - 240 V (50/60 Hz) AC. If connected to the socket not meeting the rated voltage may cause fire or electric shock.
- Do not use non-special AC power adapter, otherwise it may cause failure or damage of the device.
- The AC power adapter is not waterproof, and it may cause electric shock if contacted with water.
- Charging input voltage is DC 19V, current is 3.4A.

External charging

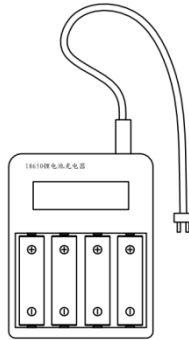


Figure 8.7 External charging

- 1) Load the Li batteries into the charger correctly according to the marks, and then connect it with power socket.
- 2) When the red lamp is on, it means it is charging; when the green lamp is on, it means charging finished.



Notes

- Make sure the batteries are loaded in a right direction.
- Four batteries are independent without mutual interference during the period of charging, and have the functions of anti-overload, anti-overcurrent and anti-short circuit, etc.
- Don't use the host power adapter to charge the external charger.

8.4 Inspection of insert tube

■ Appearance inspection of insert tube

- 1) Check if the external materials of the whole insert tube and the signal cable are complete or not.
- 1) Check if the external covering material of the insert tube (not the bending part) is loose.

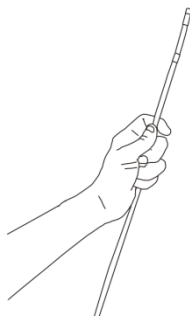


Figure 8.8 Appearance inspection of insert tube

Notes

- If the insert tube becomes deformed, it may can not be taken out of the observed object.
- If the external material of the insert tube is damaged, please use it with extreme caution to avoid hurting.

■ Inspection of fore-end (front end) of the insert tube

- 1) Make sure the power is cut off.
- 2) Remove the cap from the fore-end of the insert tube.
- 3) If there is foreign mater on the lens and the fore-end of the insert tube, please clean it with soft cloth, cotton bud or brush.



Figure 8.9 Lens cleaning

Warnings

- The fore-end of the insert tube will become hot because of the inner heat caused by electrical components. Before cleaning the camera, please cut off the power supply, and only allowed to contact unless the fore-end is cooled.



Notes

- The dust or water on the lens will damage the optical adapter or the fore-end of the insert tube.
- The bending part consists of precision parts. Please do not drag the fore-end of the insert tube or push it to bend by hand, or it may damage the parts of the bending part.

8.5 Installing the operating handle on the host

The operating handle can be installed onto the host of the body as required.

- 1) Aim the H-shape notch of the operating handle at the U-shape notch of the host; please vertically press the operating handle down into the U-shape notch of the host;
- 2) When fetching the operating handle from the host, please vertically lift the operating handle up from the host.



Notes

- If the operating handle is fixed on the side of the host, please hold the handle of the host when carrying. If the operating handle is held to lift the host up, the host might fall.
- Be careful not to let the general cable and the insert tube directly touch the ground under the condition of the operating handle and the host are fixed together when carrying. Otherwise you may be thrown down and the damage device.
- The strength should be well-distributed when installing the operating handle onto the host, to avoid damaging the H-shape notch.

8.6 Install and remove the shoulder strap

If you need to hang the device on your shoulder, please install the shoulder strap. Please note that the original shoulder strap provided by Yateks is necessary.

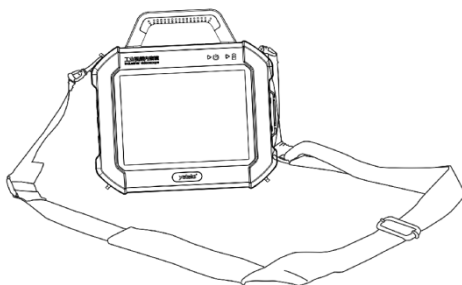


Figure 8.10 Install the shoulder strap

 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.

 Notes

- When placing or removing the shoulder strap, be careful not to drop the device.
- When placing the shoulder strap, do not place the host in the transport case. Otherwise the LCD or the shoulder strap might be damaged.
- Do not hang to store the device, otherwise it may damage the strap.
- Check to be sure that the hooks of the shoulder strap are firmly fixed on the host. Otherwise the host might be dropped when it is lifted by the shoulder strap.

■ **Placing the shoulder strap**

- (1) When pressing the hook lever of the shoulder strap, installing the hooks on the four buckles of the host.
- (2) Adjust the length of the shoulder strap using its length adjuster.
- (3) When walking with operating handle installed on the right side of the host, please insert the signal cable between the handle and the host. Otherwise you may be thrown down by the cable and damage the device.



Figure 8.11 Hanging by the shoulder strap

- (4) When holding the host and the operating handle, you can fix the insert tube on the handle by the magic sticker.



Figure 8.12 Demonstration of holding

■ Removing the shoulder strap

To remove the strap, please press and hold the hook lever of the shoulder strap, at the same time, remove the shoulder strap from the buckles of the host.

IX. Basic operations

9.1 Connecting the host and the operating handle

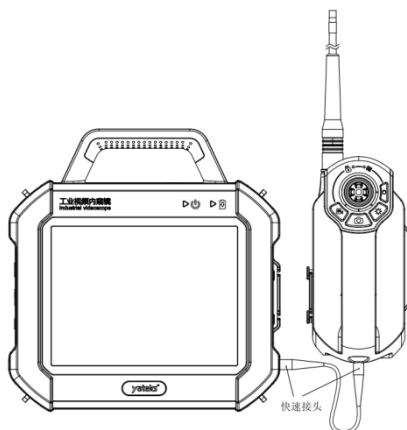


Figure 9.1 The diagram for connecting the host and the operating handle

Notes: Aim the red point on the operating handle at the red point on the interface on host as shown in Figure 9.2.

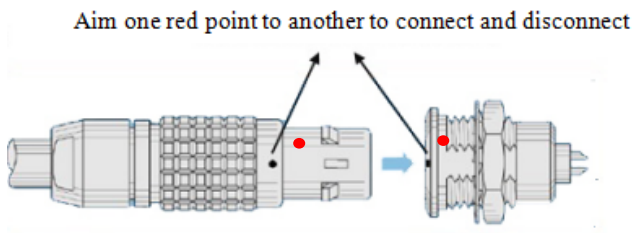


Figure 9.2 Diagram for quick coupling

9.2 Operation instructions for the host

9.2.1 The diagram for the host

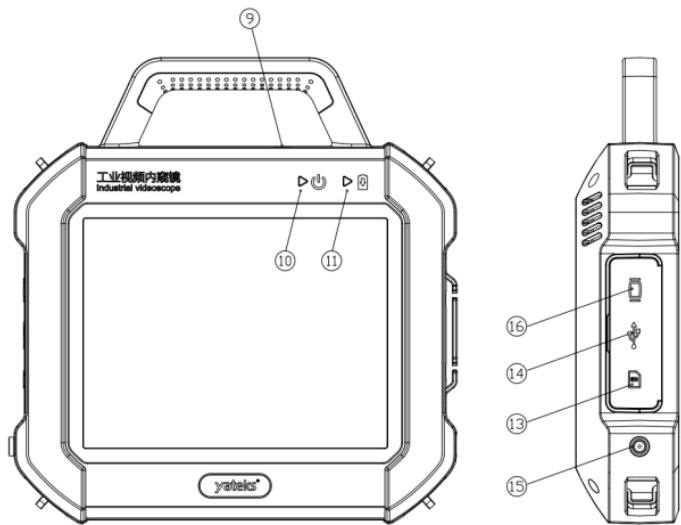


Figure 9.3 The diagram for host

Figure 9.3 The functions of the components in the host diagram are introduced in the following table:

No.	Name	Function
⑨	Power switch of the host	Control the power supply of the host
⑩	Power-on indicator	Indicate the power-on
⑪	Charging indicator	Indicate the charging state
⑬	SD card connector	Insert the SD card and store the data
⑭	USB connector	Connect the USB data wire
⑮	DC connector	Connect the adapter to charge the host
⑯	HDMI connector	Use the HDMI cable to connect the external monitor

9.2.2 Power-On and Power-Off

- 1) Tap the switch of the host for **one second**. If the power-on indicator is red, it starts up and loads the program.
- 2) Enter the home screen after starting up.

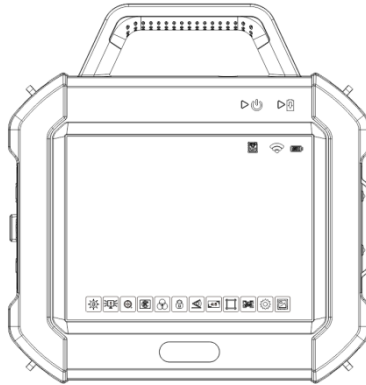


Figure 9.4 Interface of the main menu

- 3) Press and hold the host power button for 3 seconds, the system will automatically shut down.

Tips

Tap the power switch the host, and hold for six seconds and then the system is forced to shut down.

9.2.3 Installing SD card

Press SD card against SD connector and insert it into the card slot straightly.

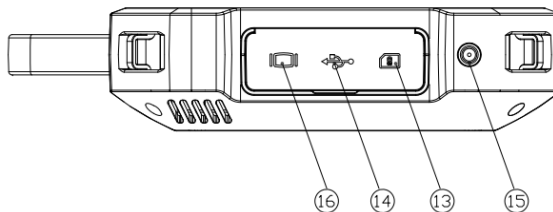


Figure 9.5 Diagram for interfaces

Notes

- When the SD card is not inserted into the device, the icon on the upper right corner of the display will be changed to  from . The screen will show "SD missing" when taking photo or video.
- When the icon on the right-hand corner is still  after inserting the SD card, it needs to wait for about 15 seconds. If no response, maybe the SD card is not inserted correctly and it needs to insert into the slot again.

9.3 Menu

Main menu navigation mode interface (see Figure 9-3) :

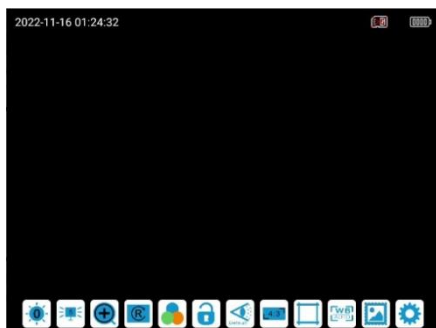


Figure 9.6

If no operation is performed, the menu will automatically hide after 20 seconds, and the menu can be displayed again by clicking the screen.

9.3.1 [Camera brightness adjustment]

Touch operation: :touch the [camera brightness adjustment] icon on the screen adjust the camera brightness. The brightness level is 1~10.

joystick operation: in live image mode, you can also select the brightness of the camera by short pressing the "brightness" button on the handle.

9.3.2 [Screen brightness adjustment]

Touch operation: Click the [Screen Brightness Adjustment] icon on the top of the screen to adjust the screen brightness. The brightness level is 0~10.

9.3.3 [Display ratio adjustment]

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

9.3.4 [Color mode adjustment]

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

In the case of selecting the switch color mode icon custom mode, an edit icon will appear, click the edit icon to enter the color parameter setting interface.

Select the [Default] button to restore the factory default value, select the [OK] button to save the color and return to the main menu.

9.3.5 [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;



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.

9.3.6 [Image browsing]

Touch operation: touch the [Image Browsing] icon on the screen to enter the image browsing interface (see Figure 9-7). See 8.6 Image Browsing for detailed instructions.



Figure 9.7

9.3.7 [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.

9.3.8 [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.

9.3.8 [Negative color]

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

9.3.9 [Image freeze]

Touch operation: Click the [Freeze Function] icon on the screen to freeze  and unfreeze  the interface;

9.3.10 [White balance adjustment]

Touch operation: Click the [White Balance Adjustment] icon on the screen to adjust the white balance on the interface. The white balance is divided into two modes: automatic white balance  and manual white balance .

Note: Some cameras do not have automatic white balance function, please refer to the actual situation.

9.4 System setting

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

9.4.1 system setting

System settings main interface (Figure 9-8):

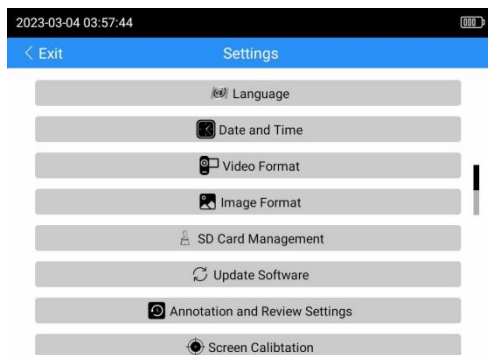


Figure 9-8

Swipe the menu to the up, it will switch to the second page(Figure 9-9):



Figure 9-9

Swipe the menu to the right, it will switch to the first page

9.4.2 Language

Touch the [Language] icon on the main interface of system setting to enter the language setting (see Figure 9-10) :

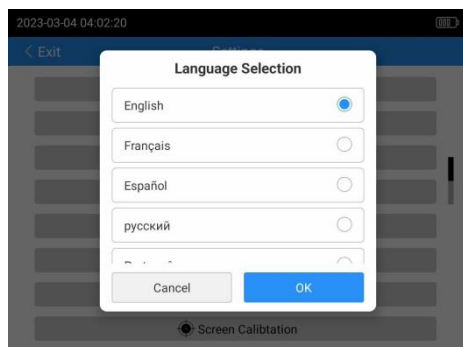


Figure 9-10

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

9.4.3 Time setting

Touch the [Time] icon on the main interface of system setting to enter the time setting (see Figure 9-11).

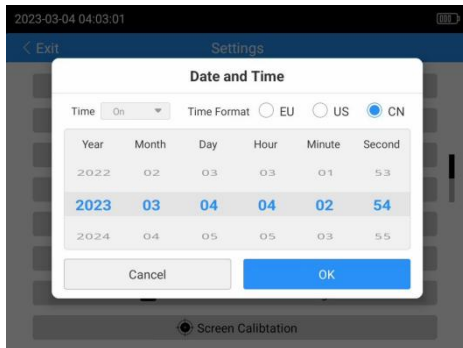


Figure 9-11

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.

9.4.3 Video format setting

Touch the [Video Format] icon on the main interface of system setting to enter the video format setting (see Figure 9-12)

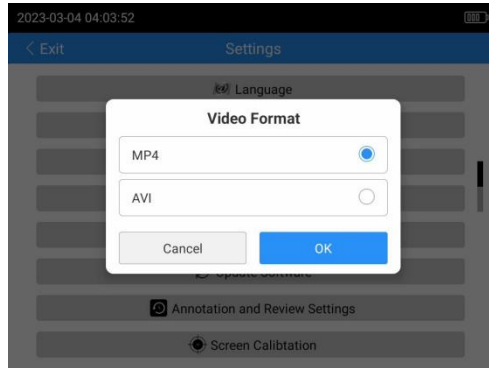


Figure 9-12

Video format: Set the video format before video recording. Touch to select AVI or MP4

9.4.3 Image format

Touch the [Image Format] icon on the main interface of system setting to enter the photo format setting (see Figure 9-13) :

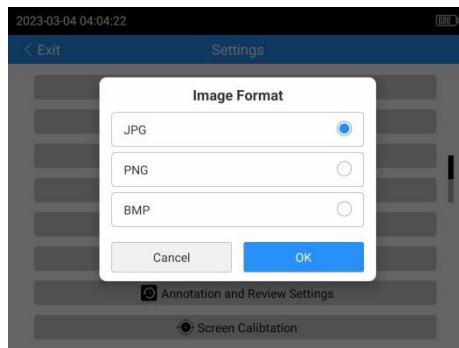


Figure 9-13

Image format: set the image format before taking a photo. Touch to select among JPG or PNG or BMP

9.4.4 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 9-14) :

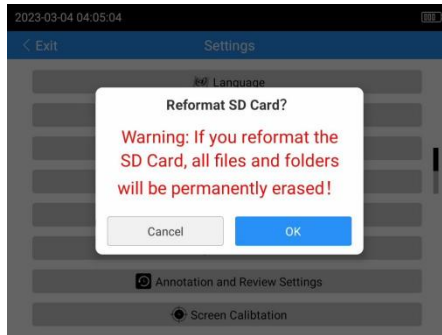


Figure 9-14

9.4.5 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 9-15) :



Figure 9-15

Prompt

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

9.4.6 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 9-16) :

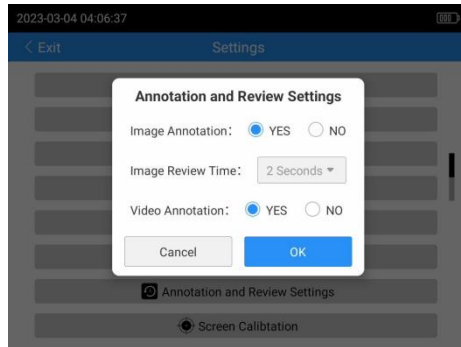


Figure 9-16

- **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.
- **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.
- **Picture dwell time:** The amount of time the picture stays after taking the picture and prompting "whether to add a annotation".
 - (1) The picture stay time can be selected from 2 seconds to 15 seconds, prompting "whether to add annotation", if the picture comment selects "NO", the picture will not stay after taking pictures;
 - (2) Set as optional time. If "YES" is selected for the picture annotation, the picture will stay for a corresponding time after the picture is taken so that the user can preview it instantly. When the time is over, the picture will automatically return to the real-time monitoring interface.

9.4.7 Screen calibration

Click "Screen calibration" and then the interface of system calibration is popped up (as shown in Figure 9.16). From the left-hand corner, tag the red points in the center of cross for five times. The host will restart automatically after that.

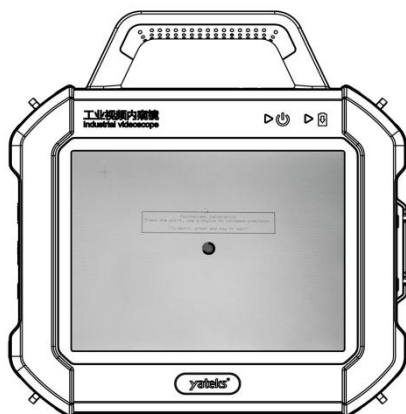


Figure 9-16 Screen calibration

9.4.8 About

Touch the [About] icon on the main interface of system setting to enter the system information and view the software version number and handle version number, system version number. (Figure 9-17)

About

Software Version No.

C20-S-1.0.0.230307-beta

Handle Version No.

XXXX

System Version No.

C20-C-1.0.0.230109-release



Figure 9-16

9.4.9 WIFI setting

Touch the [WIFI Settings] icon on the main interface of system settings to set WIFI (see Figure 9-17) :

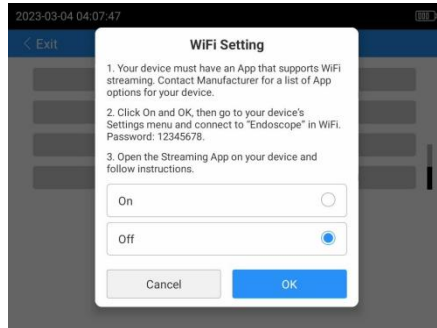


Figure 9-17

After the WIFI function is turned on, return to the implementation monitoring screen. At this time, the endoscope host has turned on the WIFI hotspot and displayed the icon;

Connect user (mobile phone or computer) WIFI to the borescope host hotspot name: borescope, password: 12345678, and then open the dedicated APP or video application software to enter the real-time monitoring camera screen after the connection is successful.

Note: Some application software needs to enter the network address (rtsp://192.168.1.43:1234) provided by the endoscope on the APP side, and the instrument will push the video to the mobile phone or computer through this network address.

9.4.10 Camera temperature setting (optional)

Touch the icon [Camera Temperature Setting] in the main interface of system setting to set the camera temperature (see Figure 9-18) :

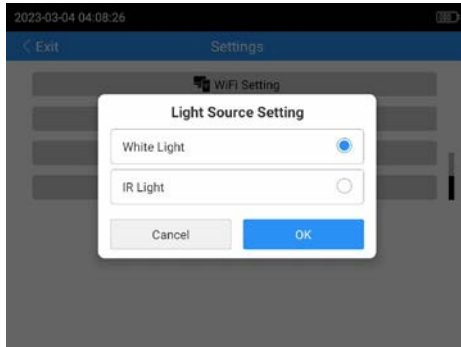


Figure 9-18

The camera temperature setting includes setting whether to display the temperature on the screen in real time and the unit of temperature ($^{\circ}\text{C}$ or $^{\circ}\text{F}$).

⚠ Prompt

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

9.4.11 Camera angle setting (hidden function)

Click the [Camera Angle Settings] icon on the main interface of the system settings to set the camera bending angle value and the joystick movement speed (see Figure 9-19):

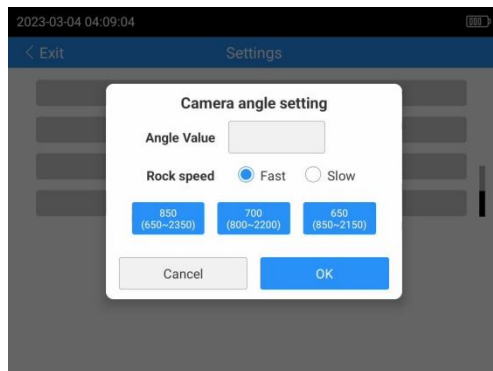


Figure 9-19

(1) Enter the camera angle setting, you can choose 850, 700, 650, 3 angle values, you can also customize the angle value, click OK and the setting is successful.

(2) The joystick movement speed setting can choose "fast" and "slow" two movement modes.

Note: 【Camera Angle Setting】 need to contact the manufacturer for setting.

9.4.12 Light source setting (optional)

Touch the [Light Source Settings] icon on the main interface of system setting to set the light source (see Figure 9-20) :

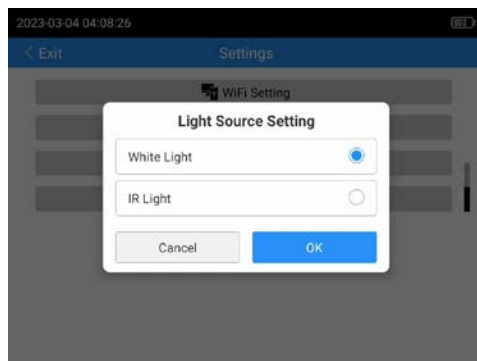


Figure 9-20

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.

Prompt

Light source setting needs corresponding camera support. Please pay attention to the model no. options when you purchase borescopes. [Light source settings] need to quickly click [WiFi settings] 10 times to display or hide this function.

9.5 Image browsing

Image browsing interface (Figure 9-21) :



Figure 9-21

Click [Folder] to create new folder, enter the folder name, and click Save to create new folder to complete (see Figure 9-22):

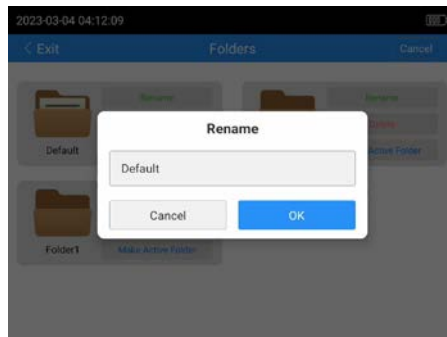


Figure 9-22

9.5.1 Folders management

Click [Folder Management File] to enter the management operation mode, and click [Finish] to exit the folder management mode (see Figure 9-23):

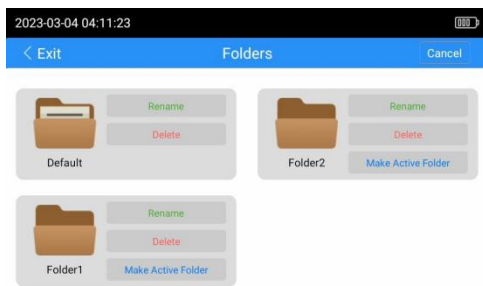


Figure 9-23

Touch [Rename] to rename the folder (see Figure 9-24):

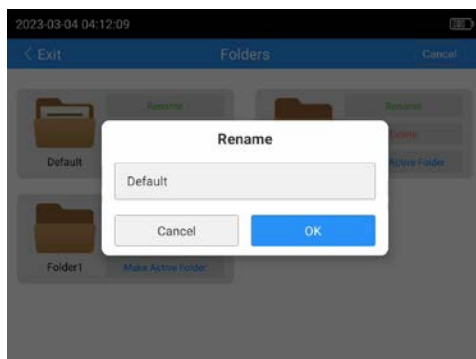


Figure 9-24

Touch [OK] to save the renamed results

Touch [Cancel] to cancel the operation (see Figure 9-25):

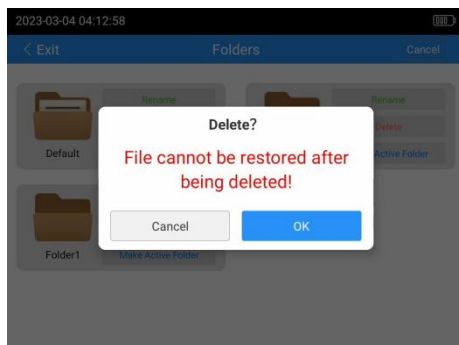


Figure 9-25

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.



Prompt

- The default folder map is different than the normal folder.
- The host computer is connected to the computer to read the data, and the contents inside the SD card folder can be deleted, copied and other operations on the computer.

9.5.2 Image and video browsing

When it's in image browse mode, touch any folder to browse inside saved photos and videos (see Figure 9-26):

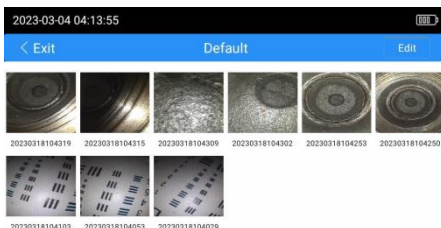


Figure 9-26

Touch the [Edit] icon , it will take you to the multi-selection mode to delete saved photos and videos (see Figure 9-27):

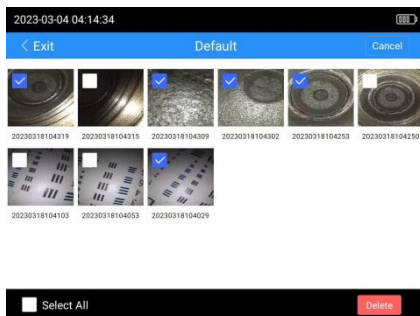


Figure 9-27

Without entering the multi-selection mode, click on the picture to enter the picture browsing mode (as shown in Figure 9-28):



Figure 9-28

- 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 [Rename] icon to rename the current image.
- Touch the [Edit] icon to enter the editing mode
- After entering the picture editing mode, click the curve icon to draw a line on the picture (see figure 9-29):

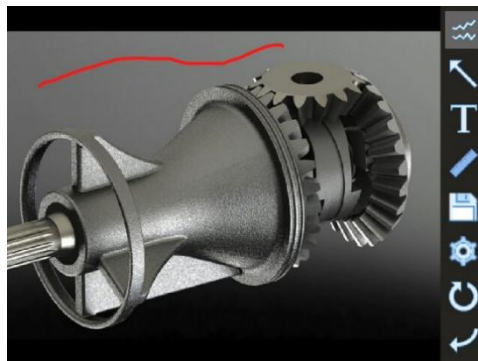


Figure 9-29

Touch the arrow icon to draw arrow on the photo (see Figure 9-30):



Figure 9-30

Touch the “T” icon to add text watermarks on the photo (see Figure 9-31)



Figure 9-31

Touch the ruler icon to enter the mode of reference measurement (see Figure 9-32)

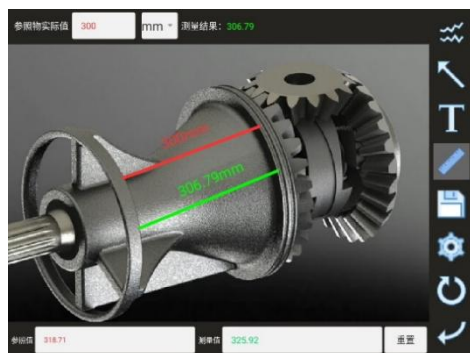


Figure 9-32

(1) First select the position of the reference object in the picture by touching (the red

line in the middle of Figure 9-32);

(2) Measure the required position (the green line in the middle of Figure 9-32), and the actual value required for the measurement can be obtained;

(3) Finally, enter the reference real value;

(4) Click Reset to re-measure.

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

Touch the [Setting] icon to set the line color or font size of each function (see Figure 9-33):

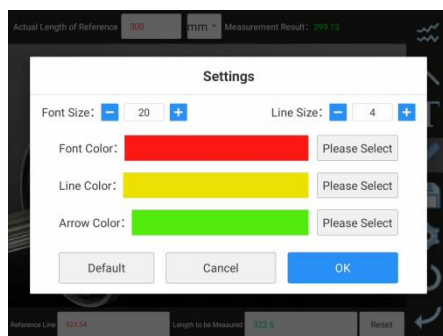


Figure 9-33

Touch the [Reset] icon, it will reset to original default settings.

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

Touch the thumbnail of the video file to browse the video, as shown in the figure below (9-34)

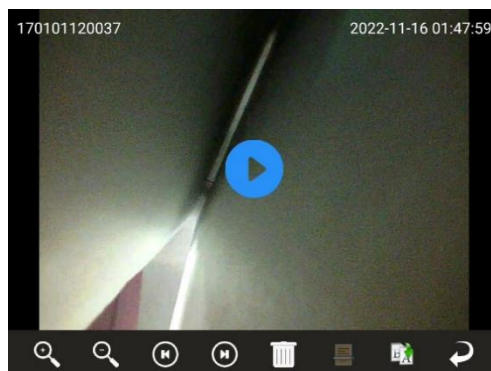


Figure 9-34

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

9.6 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.).

9.6.1 Demonstrating the touch screen function

The resistive touch screen is adopted for this device which can be used in bad environment. Any operation (e.g, taking pictures, shooting video) on the host interface can be done by hand or the touch pen.

Note: Do not use sharp objects to press the touch screen! The touch pressure cannot be greater than 120g!

9.6.2 Data transmission

While SD card is installed on the SD card slot on the left side of the host, pictures and videos will be automatically saved in the SD card. After SD card is withdrawal, its data can be read in PC by the card reader. In addition, the data line can be used to connect PC and the device under power-on condition so that data in SD card can be read directly or edited.

9.6.3 PC synchronous images

Firstly connect HDMI cable with the LCD and the HDMI connector of the host respectively. And then open the host. It can output the video to the other interface and realize the display on two interfaces which are the host interface of the device and the external display of HDMI.

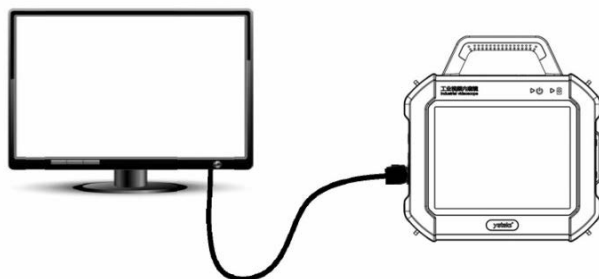


Figure 9-34 Connecting the host and the LCD

9.7 Handle operation guide

9.7.1 Introduction to the operation handle

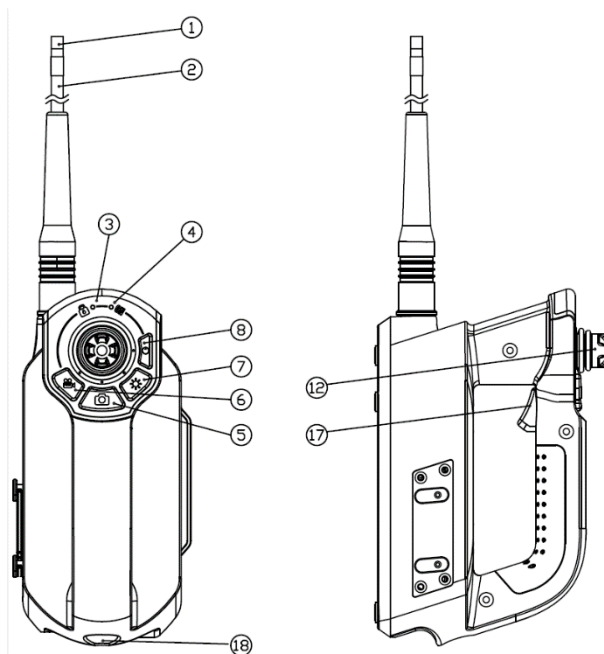


Figure 9-35 The diagram of operating handle

No	Name	Function
③	Locking/tuning indicator	Locking/tuning indicator
④	Power indicator	Indicate the power
⑤	Take photos/ Dual camera switch	Shot press to take photos/ Long press to switch dual camera (optional)
⑥	Shooting videos	Shooting videos
⑦	Brightness control	Brightness control button has the function of adjusting the LED brightness. There are two regulating modes, low brightness and high brightness, which has 5 levels to be selected in all (as shown in Figure 9.22).
⑧	Locking and tuning	Locking and tuning function of the direction
⑫	Joystick	Direction control function
⑱	Quick coupling	Connect with the host

9.7.2 Checking the illuminating lights

- (1) Click the icon “Real-time monitoring” on the home screen to enter the shooting function. Make sure that the brightness indicator  is displayed on the screen.
- (2) The brightness control button has the LED brightness control function to increase the illumination intensity. Tag the brightness control button to check whether LED brightness is changed gradually or not. There are five levels of brightness from dark to brightest, which change step by step.
- (3) The brightness indicator  is located on the display to observe the brightness

of the insert tube.

- (4) Long press the brightness control button to switch low brightness mode and high brightness mode.

 Warnings

- While the device is not used, be sure that the brightness of the panel of the host is set to 0 to turn off the light.
- Do not directly shine the light illuminated by the end of the insert tube on your eyes. Otherwise your eyes may hurt.

9.7.3 Check the bending function

- (1) Straighten the insert tube.
- (2) Manipulate the joystick of the operating handle slowly to make sure that bending part moves smoothly.

 Note

The bending movement shall match with the angle and direction of the joystick movement.

9.7.4 Check the angle lock and locking and tuning

- (1) Move the joystick to the observing angle and hold for three seconds. If the locking/tuning indicator is green, the angle is automatically locked.
- (2) If it needs to reset the camera, move the joystick at will and then loosen it. The camera is automatically reset and the locking/tuning light of the device goes out.

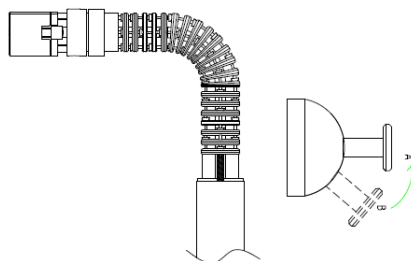


Figure 9-35 Bending check and locking and tuning

- (3) Based on the locking function, if it needs to fine-tune the direction, directly press the “locking and tuning” button. When the “locking/tuning” indicator is red, the joystick can be moved to fine-tune the direction.
- (4) If it needs to reset the camera, press the “locking/tuning” button again. The camera is automatically reset and the locking/tuning light of the device is off.

Notes

- When entering the locking and tuning function, do not operate heavily for bending by hand when moving the joystick.

9.7.5 Installing optical adapter (only apply to the IL series)

- (1) Check if there is dust or water in or out of the objective lens. If it is, please hold the hard end part of the tube. Wipe it with a soft gauze or cotton swab.
- (2) Fix position of the optical adapter by the end of the insert tube. And then insert the optical adapter into the end of the insert tube.

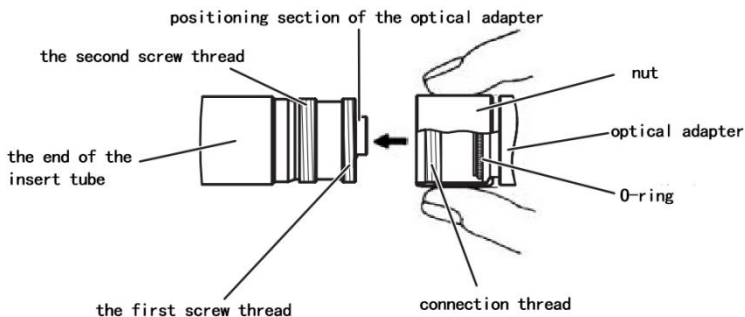


Figure 9-36 Component of the optical part

- (3) Rotate the nut of the optical adapter clockwise until the first screw thread goes through the connection thread.



Figure 9-37 Optical adapter

- (4) Once going through the first screw thread, please rotate the whole optical adapter clockwise. At the same time, slightly push it to the positioning part by the end of the insert tube until it cannot be rotated again.

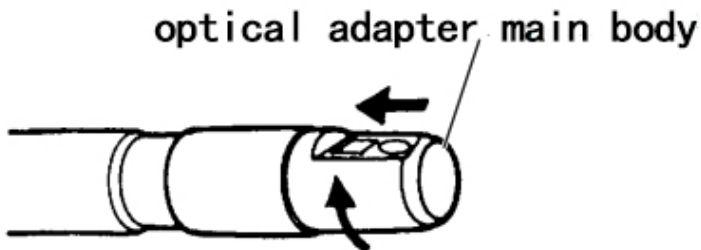


Figure 9-38 Optical adapter main body

- (5) Rotate the nut of the optical adapter clockwise until the second screw thread is

twisted on the connection thread. Tighten the nut until it cannot be moved any more.

9.7.6 Inserting the insert tube

■ Holding the control unit and insert tube

- (1) In general, the joystick of the operating handle is manipulated with the thumb of the hand.
- (2) Other buttons are also to be manipulated with the thumb of the hand pressing the button of the operating handle.

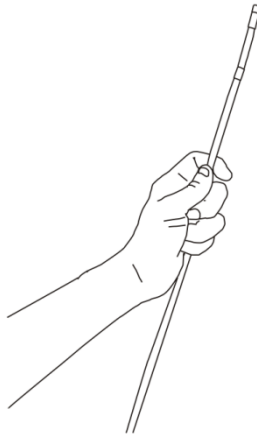


Figure 9.23 Handle manipulation

■ Inserting the insert tube

- (1) While observing the screen of the monitor, carefully check the insert tube and slowly insert the tube into the observed object. Perform the bending operation as required during insertion. Be careful not to apply excessive pushing force, twisting or tension to the insert tube.
- (2) While withdrawing the insert tube, be sure that the fore-end of the insert tube is in the straight direction (the joystick is in the middle) and then withdraw it slowly.

■ Manipulating the bending

- (1) Manipulate the joystick to control the bending of the fore-end to make the observation easy as required by the on-site testing.
- (2) Adjust LED brightness to receive the proper brightness so as to achieve the clearest picture effect.

Notes

- (1) If the bending control mechanism stops or the operation of the device is abnormal, please stop the operation immediately. Loosen the joystick to make it automatically reset to the central position. And withdraw the insert tube from the observed object carefully.
- (2) If the sharp noise current occurs to the internal device when moving the joystick, do not bend it further reluctantly.
- (3) Form the habit of moving the joystick slowly.
- (4) The repeated bending operation will decrease the maximum bending angle limit of the bending section. Keep the insert tube as straight as possible to achieve the best effect of the device.
- (5) Be sure that the insert tube and the camera are straight. When the insert tube is bent, it is forbidden to carry out the steering operation so that it can avoid damaging the drawing mechanism.

9.7.7 Withdrawing the insert tube

- (1) Release the bending lock.
- (2) Withdraw the insert tube.

Warnings

- Do not withdraw the insert tube under the condition of the angle bending and the angle locking or tuning. Otherwise it might damage the insert tube and/or the observed objects.
- In a short time after use under high temperature, the end of the insert tube will be very hot. Do not use until it is cooled.
- If the insert tube is stuck in the withdrawing process, gently steer the joystick,

while continuing to withdraw it. Do not use excessive force to avoid damaging the insert tube or the observed objects.

9.7.8 Introduction to the operating handle button

■ Direction joystick

The joystick can control the 360 degrees steering and locking function of the camera of the videoscope in real time. If it needs the positioning observation, you can move the joystick to the observing angle and hold for three seconds, if the locking indicator is green, the angle is locked automatically. If it needs to reset the camera, move the joystick at will and then loosen it. The camera is automatically reset and the device indicator goes off.

■ Direction joystick

The brightness adjustment key has the function of 1-10 level LED brightness adjustment.

Note: The old handle has two modes of low brightness and high brightness, long press the brightness adjustment button to switch:

(1) Low brightness mode(1-5)

Click the brightness adjustment button to adjust the brightness of the LED light. There are 5 levels of brightness from off to brightest, and the levels change in turn.

(2) High brightness mode(6-10)

Click the brightness adjustment button to adjust the brightness of the LED light. There are 5 levels of brightness from off to brightest, and the levels change in turn.

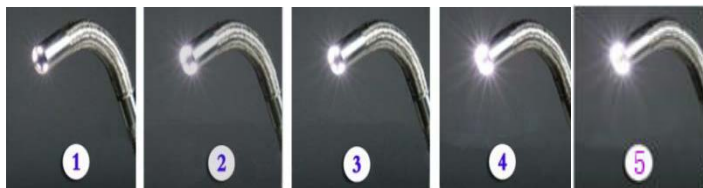


Figure 9.24 LED brightness control demonstration

The new handle has only one mode function, 1-10 levels of LED brightness adjustment, 0

level to turn off the LED light, long press the brightness adjustment button "turn off the LED light, turn on the LED light" to switch between 2 modes.

■ Taking pictures

Camera button has the function of taking pictures. Tag the camera button and then take pictures.

■ Shooting videos

Shooting button has the shooting function. Tag the shooting button and then shoot videos.

■ Indicator

- 1) Locking/tuning indicator of the direction joystick; the locking indicator is red, while tuning is green.
- 2) Power indicator is red when it is working.

■ Interface for connecting to the host

Quick coupling to connect with the host.

■ Locking and tuning

As for the tuning control function of the direction, when it enters the tuning function, "locking/tuning" indicator is red. Tag the [Locking/tuning] button again, the indicator goes out. The angulation lock is unlocked. The angle returns to the initial position.

X. Storage and maintenance

10.1 Cleaning

■ Cleaning the insert tube

- (1) Use a no-dust cloth to wipe any dirt or other foreign matter off of insert tube.
- (2) If a liquid such as waste water or machine oil is attached to the insert tube, it has to be wipe by the following step: ①Wipe it with a soft cloth or cotton, ②Wash well

by using a neutral detergent solution and pieces of gauze, ③Wipe it with a piece of soft gauze moistened with clean water, ④Wipe off the moisture well and dry.

Notes

- Clean the scope immediately after withdrawing the insert tube.
- Do not clean the optical adapter under running water. Otherwise, the device may be damaged.
- Keep the device in a horizontal level and store it under the room temperature. And keep the room clean and dry.
- Do not subject the device to strong impact of other objects or treat it rudely during storage.
- If the device isn't used for a long term, check its functions regularly.

Warnings

- The device shall be located out of the reach of children. And it is forbidden for those who are unfamiliar with the product rules.
- Do not store the equipment in a place subject to high temperature, high humidity, highlight, excessive dust or particles, strong shock and polluted or corrosive environment.

■Cleaning LCD

If the LCD is dirty or with fingerprint, wipe it with the no-dust soft cloth.

■Cleaning the host and the operating handle

If the host is dirty, wipe it with the no-dust soft cloth.

Notes

- Do not clean the equipment under running water. Otherwise, the device may be damaged.

10.2 Repacking the case

Repack the equipment at the sequence of: operating handle → Host

 Notes

- (1) Store the operating handle, insert tube and host in the right order. Otherwise, it may damage the insert tube.
- (2) Do not use an excessive force when placing the insert tube into the groove of the case. Otherwise, the insert tube may be damaged.
- (3) Ensure that the insert tube won't be bent when storing.
- (4) Make sure that the case fastener is locked properly. If not, the top cover may open during transport.
- (5) When returning the host to its case, place the case in a stable place before repacking the equipment and take care of your hands.
- (6) Use only the standard case provided by Yateks. Otherwise, the operating handle or the host may be damaged or fail.

■Securing the case

The top cover of the case may open if the impact by heavy force when being moved. Check whether the case is locked well or not when transporting.

 Note

Secure the four fasteners of the case.

10.3 Storage precautions

- (1) Store the equipment under the normal room temperature and humidity.
- (2) Turn off the power of the device before packing.
- (3) Store the equipment on a clean, dry and stable surface.

 Danger

Do not bend, stretch, twist or crush the signal cables with excessive force. Otherwise, a break in a signal cable may cause a fire or electric shock hazard.

 Notes

- (1) Do not store the equipment in a place subject to high temperature, high humidity,

excessive dust or fine particles, direct sunlight or radioactive emissions. Otherwise it could damage the equipment.

- (2) Handle it gently when storing. Do not hit it against other objects. Otherwise it could cause a failure.

XI.Troubleshooting

Please contact Yateks if can not solve by referring to the following method, and do not use the device.

- ①Inspect the equipment as described in Chapter 8, or have obvious problem.
- ②If the problem can not be solved by referring Chapter 11.1

11.1 Troubleshooting guide

Failure	Possible cause	Solutions
The system cannot be turned off.	Pause or halt occurs incidentally to the system.	Long press the on-off button of the host and hold for six seconds to restart it.
Video playback	It can't play the video of AVI format.	It can be played by using the VLC media player which is the professional software as provided by our company or QQ Player.
Pictures and videos cannot be recorded	SD card is full or isn't inserted	Delete the files in SD card or insert the SD card
No card is still shown after the insertion of the SD card	The SD card is inserted well	It needs to insert it to the groove again.
Shut down automatically	The device is used in the environment of high temperature will trigger the automatic shutdown.	Terminate the inspection to cool the device down. And then restart it.
	The low battery power will	Charge the battery

	trigger the automatic shutdown.	
The image is not sharp.	The object lens on the videoscope end or the optical adapter is dirty.	Wipe it with a clean piece of gauze or cotton swab.
The operating handle makes the squeak.	The motor noise	It is normal.
The load is more and more strenuous when the bending is manipulated	Bending control motor overloads.	Stretch the insert tube as far as possible to reduce the looping amount.
The bending can't return to the initial position.	Set up the bending locking	Move the joystick in any way to release the bending locking.
	The locking and tuning function might be entered. At this time "Locking/tuning" indicator is red.	Press "Locking/tuning" button again and then the "Locking/tuning" indicator goes out and the bending locking is released. The angle returns to the initial position. It can reposition the direction.

11.2 Returning the device for repair

- (1) Before returning the instrument for repair, contact Yateks, please. It shall include the failure and a detailed description of the conditions under which it occurs when returning the device.
- (2) Failures that occur during the warranty period are repaired at no charge according to the warranty agreement. Be sure to attach the warranty agreement when returning the device for repairs.
- (3) Any parts of this product are not provided for the autonomous repair by users. Do not attempt to dispatch, modify and repair. Otherwise, Yateks does not undertake

any responsibility for the damages and losses of users caused by those. The repair service of this product is only offered by Yateks and its authorized agencies.

 Warning

Yateks doesn't have any responsibility for any hurt or damage caused by the repair other than those made by Yateks.

FCC Caution.

§ 12.1 Labelling requirements.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

§12.2 Information to user.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

§ 12.3. Information to the user.

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

more of the following measures:

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

Specific Absorption Rate (SAR) information:



This equipment complies with **FCC** radiation exposure limits set forth for an uncontrolled environment. End user must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

- The portable device is designed to meet the requirements for exposure to radio waves established by the FCC. These requirements set a SAR limit of 1.6 W/kg averaged over one gram of tissue.

XII.External use standard

Low voltage instruction and EMC instruction	Comply with the CE	CE
WEEE directive	Comply with the WEEE	
The RoHS directive	Comply with the RoHS	RoHS
FCC directive	Comply with the FCC	FC



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