Industrial Videoscope
User Manual
COANTEC C68 Series

Please read the User Manuals carefully before using this instrument.

Copyright Statement

The User Manuals are applicable to Coantec C68 series videoscope. The copyright is the property of Coantec Ltd. The contents of the User Manuals are protected by Chinese laws and regulations pertaining to copyright. Without the written permission of Coantec, the duplication, copy or translation of the User Manuals or any data and information contained, or circulation of the User Manuals in any form will not be allowed. Anyone who violates this will be held legally liable for relevant consequences.

Notice:

The Company is committed to continuously improving product functionality and service quality and it reserves the right to change any product and software program described in the User Manuals and the contents of the User Manuals without prior notice. We have rigorously proofread and repeatedly reviewed the User Manuals. Even so, we may not guarantee that all errors and omissions are eliminated. The User Manuals only serve as a guidance to help the user use the Coantec instrument properly. However, it does not represent any description of the software and hardware configuration of this product.

In case of any questions, please call our after-sales service personnel. **Tel.: +86 -755-89728626**

Contents

1. User Notices

1.1 Purpose and Application Scope

This product is only applicable to real-time industrial examination and analysis. It can directly check the inner surfaces of pipes, turbines, cylinders, engines and other devices for defects and abnormalities. This product is characterized by direct viewing and supports real-time photo taking and video recording, enabling the user to collect relevant data.

1.2 Repair and Refitting

This product has no parts or components that can be repaired by the user. Do not try to disassemble, refit or repair the instrument by yourself, and Coantec will not assume any responsibility for injury or loss caused to the user thereby. This product can only be repaired by Coantec and its authorized dealers.

1.3 Safety Precautions

- **When using this product, please observe the following instructions to avoid accidental injury or instrument damage due to improper operations:**

① Do not use this instrument to check human or animal bodies.

② Do not work on the object under test while it is electrified in order to avoid electric shock.

③ Do not touch the lens end with a bare hand during operation; otherwise, it may cause burns.

④ Do not look directly at the strong light from the front end of the probe at close range as it may affect your vision.

⑤ Do not bend, stretch, twist or roll over the tube excessively.

⑥ The image will be blurred if the lens is stained. Please wipe the lens clean with a lint-free wiper dipped in a little alcohol before using the instrument.

⑦ Keep the insertion tube away from liquids other than water, saline, engine oil and light oil.

⑧ Please clean the instrument in time after use.

⑨ Make sure that the insertion tube is straightened before turning on the instrument. Do not make turns when the insertion tube is curled up. During operation, toggle the joystick slowly to control the probe orientation and do not keep the probe at the maximum bending angle for a long time; otherwise, its service life will be affected.

⑩ If the instrument does not function properly, please stop examination immediately and adjust the probe to the middle position, carefully retract the insertion tube and turn off the instrument. Contact the manufacturer or distributor in time.

2. Products Description

The Coantec C68 series high-performance industrial videoscope is a new visual inspection instrument independently developed by Coantec for non-destructive testing. It features a high-quality image sensor, an IPS wide-view HD LCD touch panel and advanced image processing technology, delivering high-quality images of accurate color and more details. The combination of the electric joystick and the virtual joystick on the touch panel provides users with better manipulability, flexibility, and comfort. This instrument enables users to see into areas that are impossible to examine with the naked eye, offering a better guarantee for product quality and equipment operation safety. It is applicable to the sectors of aviation, aerospace, energy, electric power, chemicals, machinery, automobile, military, and special equipment inspection.

3. Operation Process

① Unpacking of instrument: Open the instrument case and take out the host, handle and umbilical cable. Please hold the probe properly during unpacking and do not bump it. Connect the umbilical cable to the host and handle according to the instructions.

② Preparation before turning on: Check whether all parts of the instrument are in good condition, confirm that the battery and USB flash disk have been correctly installed, and long press the power button to turn on the instrument.

③ Real-time examination: Extend the tube into the equipment or device to be examined, and control the moving direction of the front-end probe by operating the joystick.

④ Brightness adjustment: Adjust the brightness of the light source to obtain appropriate illuminance and the clearest image possible.

⑤ Examination: Adjust the parameters such as the observation angle, movement mode and speed of the probe as needed to examine the target in real time, and carry out operations such as photographing, video recording, browsing files and graffiti.

⑥ Tube retraction: Adjust the probe movement mode to the release to unlock the probe for automatic resetting. Retract the tube slowly after it is approximately straight.

⑦ Storage of instrument: Turn off the power switch, unplug the umbilical cable, sort out and store all parts of the instrument into the case, close the upper cover and fasten the lock catch.

4. User Manuals

4.1 Buttons and Interfaces

The functional buttons and interfaces of the C68 series industrial videoscope are shown in Fig. 1 and Fig. 1-1, and the functional buttons and interfaces for handle operation are shown in Fig. 1-2:

Fig. 1

Fig. 1-1

Electric Joystick   Mechanical Joystick

Fig. 1-2

① Power/return/display or hide main menu button: Long press the button to turn on/off the instrument; press the button briefly to display/hide the main menu, or return to the parent menu.

② Menu selection button: Rotate the button to switch among the menus, and press the button to select the current menu.

③ HDMI interface: The high-definition multimedia interface is used to connect an external display to output video images.

④ VGA interface (optional): It is an analog signal output interface to connect an external display for video image output.

⑤ USB3.0 interface: It is used to connect USB flash disk for image data storage.

⑥ USB3.0 interface: It is used to connect USB flash disk for image data storage.

⑦ HP interface: It is used to connect the headset for audio signal output.

⑧ Cable interface (host end): It is for the cable connecting the operating handle to the host.

⑨ Bracket: It is used to adjust the sitting angle of the host.

⑩ Charging interface: It is used to connect an adapter for online charging of the instrument.

⑪ Knurled screw: The cover of battery compartment can be open or closed by adjusting the screw.

⑫ Battery compartment: It holds the battery module. Loosen/tighten the knurled screw to open/close the rear cover of the battery compartment.

⑬ Cable interface (handle end): It is for the cable connecting the operating handle to the host.

⑭ Joystick: It controls the movement direction and angle of the probe. Press the button in the middle to switch the probe to the release/lock mode.

⑮ OFF button: Long press the button to turn off the instrument directly.

⑯ Zoom button: It is used to zoom in or out the real-time inspection image.

⑰ LED brightness adjustment button: It is used to adjust the LED illuminance.

⑱ Indicator: When the probe is unlocked and in tracking mode, the indicator will light up in green; when the probe is locked and in steeping mode, the indicator will light up in red.

⑲ Photo/video button: It is used to take photos and record videos under photo/video mode.

4.2 Operation Interface

Long press the power button for about 3 seconds to turn on the host, and the indicator at the upper left of the operating handle will light up in green. The system boots up and the startup picture shows on the display. After the program

is loaded, the home interface of real-time examination will show on the display (as shown in Fig. 2). Extend the insertion tube into the target to be examined to start the examination.

Note: Before the examination, the insertion tube shall be straightened. Do not make turns when the insertion tube is curled up.

Press the power button briefly or double-click the blank area on the screen to enable the menu function setting (press the button briefly again to hide the menu). Rotate the menu selection button to switch over among the menus available and press the button to confirm the selection.

The buttons in the main menu correspond to the functions described below (as shown in Fig. 2):
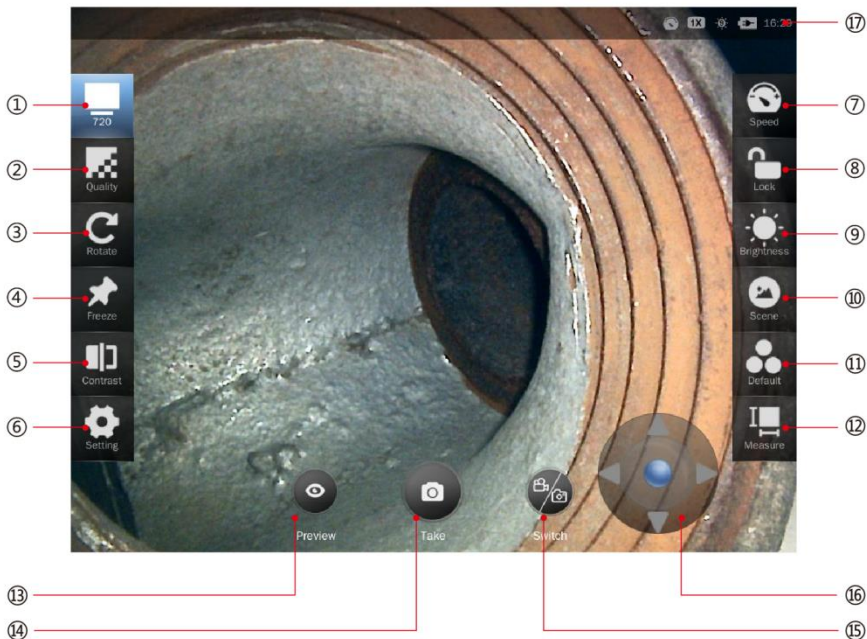
Fig. 2

① Image resolution: The video resolution can be set to 640*360, 640*480 and 1280*720. (Note: The resolution options may vary depending on the tube size.)

② Image quality: This button is used to adjust the brightness, contrast, tone, saturation, definition, gamma of the image and reset the image quality to default.

③ Rotation: Click this button to rotate the real-time examination image clockwise by 90° every time.

④ Freezing: Click the button to freeze the real-time examination image.

⑤ Comparison: Click this button to compare the real-time examination image with the image saved.

⑥ Settings: Click this button to enter the setting interface where the following operations can be performed:

- WLAN: Enable the WLAN and enter the password to access the WLAN available.

- User management: Set the instrument to administrator, visitor, standard user (set by administrator) mode.

- About the instrument: Check the instrument information, check for upgrade available, and upgrade the instrument to the latest version.

- Display: Adjust the brightness (by automatic sensing or manual setting). Enable or disable the virtual joystick, the watermark (of time and location) and the rulers (none, cross ruler, circular ruler or reference line). Set the language (simplified Chinese and English), date and time.

- Help document: It provides product instructions.

⑦ Speed: Adjust the moving speed of the probe. There are two options, fast and low.

⑧ Release: Lock/release the probe.

⑨ Illuminance: Set the illuminance of the probe LED. It is adjustable from level 0 to level 9.

⑩ Scenario: Provide the attribute of the target to be examined, metal or non-metal.

⑪ Image: Set the image quality to default, monochrome, negative, bright, highlighted, or soft.

⑫ Measurement: Enter 3D measurement mode (applicable to binocular camera only).

⑬ Preview: Enter the file browsing interface.

⑭ Photo taking: Take photos and save them automatically.

⑮ Switching: Switch between photo/video modes.

⑯ Virtual joystick: Drag the blue roller in the middle of the virtual joystick to turn the probe orientation.

⑰ Icon display: The icons in the upper right corner of the screen indicate the current status: probe locked (no icon if the probe is released), probe moving speed (fast/slow), image magnification (1~5 times), LED illuminance level (0~9), battery power and system time.

4.3 User Management

The user management is mainly used to provide permissions for functions such as photographing, video recording and report generation (as shown in Fig. 3). Enter the user management interface from the setting function on the home interface（as shown in .Fig. 3-1）. Log in as an administrator (the initial password

is "123456"), and then the user may create a standard user, delete a user, and change the password. Information such as images taken and reports generated in different user management modes can only be viewed and processed in the current mode. The default mode is visitor mode, requiring no login.
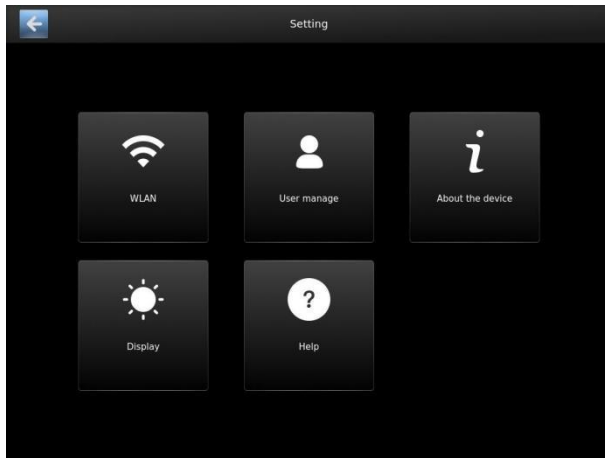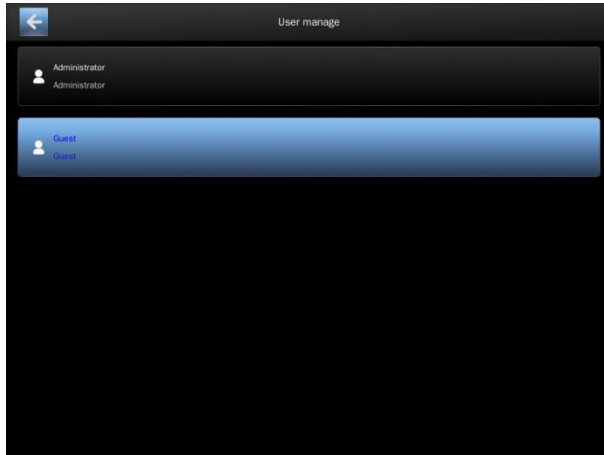

Fig. 3

Fig. 3-1

4.4 Movement Control

In the real-time examination mode, the direction and angle of probe movement can be controlled by toggling the joystick or using the virtual joystick, and the probe movement mode can be switched by pressing the lock/release button or the middle button of the joystick in the main menu interface (as shown in Fig. 4).

Release: The probe bends towards the joystick moving direction. Release the joystick, and the probe will automatically reset. Under this mode, the user may identify the target to be examined quickly;

Locking: Toggle the joystick and the probe will inch. This ensures accurate control of the probe moving angle, thus facilitating precise observation of the

target to be examined. The middle button of the joystick can release the locked probe (automatic reset).

Virtual joystick: Set to display the virtual joystick on the main menu to enable relevant functions. Drag the blue roller in the middle of the virtual joystick to turn the probe and differentiate release/lock mode.
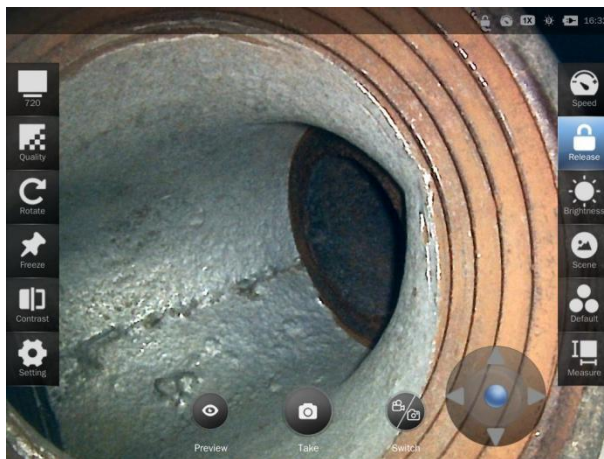

Fig. 4

4.5 Speed Control

In the real-time examination mode, the moving speed of the probe can be controlled by the speed control button（as shown in .Fig. 5）. The current moving mode is displayed in the upper right corner of the screen.
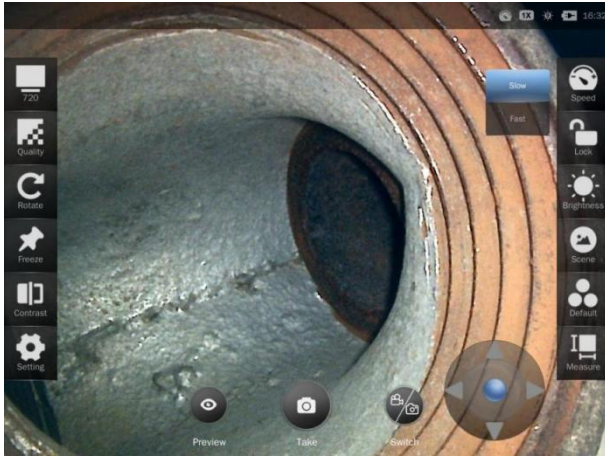
Fig. 5

4.6 Illuminance Control

In the real-time examination mode, the illuminance of the front-end probe LED can be controlled by the illuminance adjustment button (as shown in Fig. 6 and Fig. 6-1) to obtain a better observation view. The illuminance is adjustable from Level 0 to Level 9. At Level 0, the LED is off, while at Level 9, the highest illuminance will be given. The current illuminance level is displayed in the upper right corner of the screen.
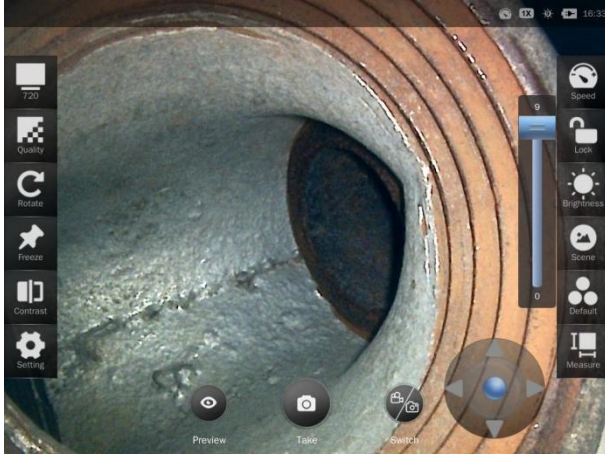
Fig. 6

Fig. 6-1

4.7 Image Quality Adjustment

Enter the image quality adjustment interface from the home interface. The user may adjust the following parameters of the image or restore the default settings (as shown in Fig.7) according to the actual situation. The parameters are adjustable within the following ranges:

Image brightness: -64~64

Contrast: 0~64

Tone: -40~-40

Saturation: 0~128
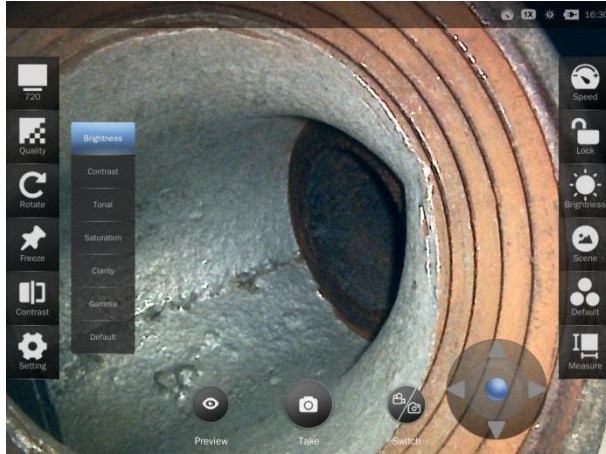
Definition: 0~6

Gamma: 72~500

Fig. 7

4.8 Photo/Video

Photo: The real-time examination will be performed in photo mode by default. The user may take photos directly by pressing the photo button on the touch screen, or briefly press the photo/video button on the host handle to take and save the photos (as shown in Fig. 8).

Video: Switch to the video mode by pressing the photo/video switch button to record/save the video, to pause the image, or to make a screenshot, etc. (as shown in Fig. 8-1), or press the photo/video button on the host handle to start

recording, and press it again to stop recording and save the video. It supports
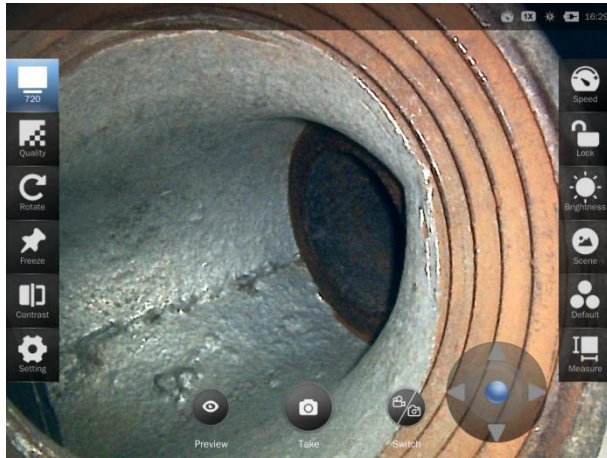
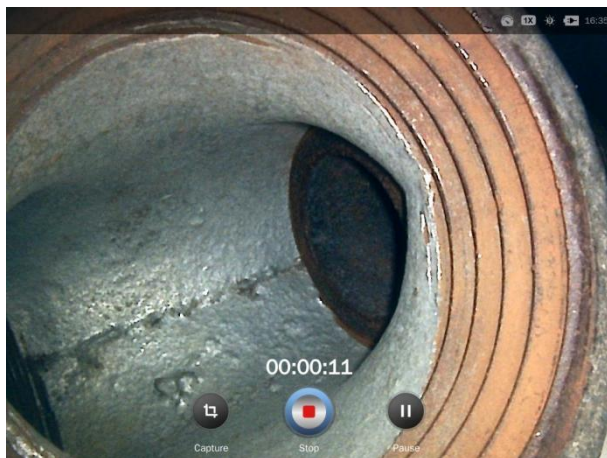screenshot during video recording.

Fig. 8

Fig. 8-1

4.9 Image Comparison

Enter the image comparison interface from the home interface to compare the real-time image with the image in the gallery. The user may browse and select an image, or select the previous image or the next image. The real-time image can be frozen and rotated. The virtual joystick is also available in this function (as shown in Fig. 9).
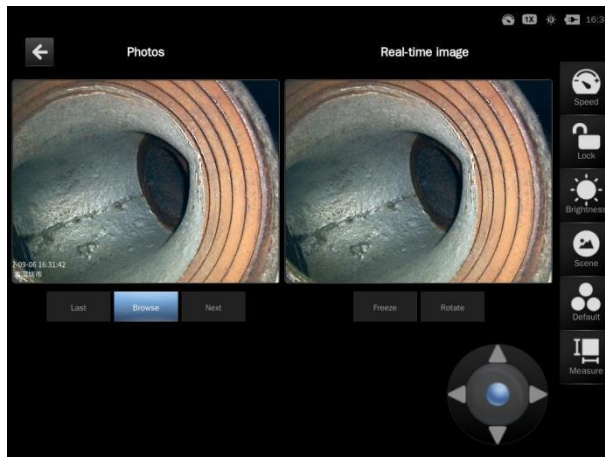

Fig. 9

4.10 File Preview

Press the preview button to enter the playback mode to view pictures, videos, measurement diagrams, reports (as shown in Fig. 10) and search files.
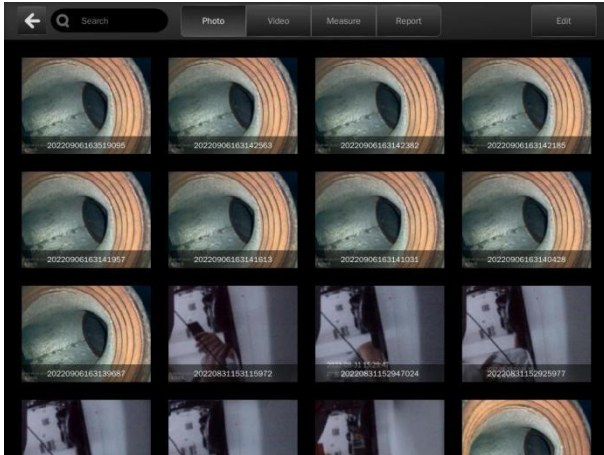
Fig. 10

Select a picture/video and enable editing. The user may share the picture to USB flash disk, Bluetooth, LAN and Internet, or select all/no pictures and delete the pictures (as shown in Fig. 11). Before selecting the corresponding sharing mode, perform corresponding operations and settings in advance:

USB flash disk: Insert the USB flash disk.

Bluetooth: Turn on the Bluetooth of the receiving device.

LAN: Connect the instrument to WLAN. Search the photo of WLAN QR code in the mobile browser or scan the code directly (or scan the code with other phone app and open the link in the browser). After that, the mobile phone and the instrument will be in the same network segment, and the user may view, privately save, save and share the pictures on the mobile phone, and extract the

text in the pictures. If a video file is shared, the user may download or play the video online.

Internet: After the device is connected to WLAN, the sharing method is the same as above.
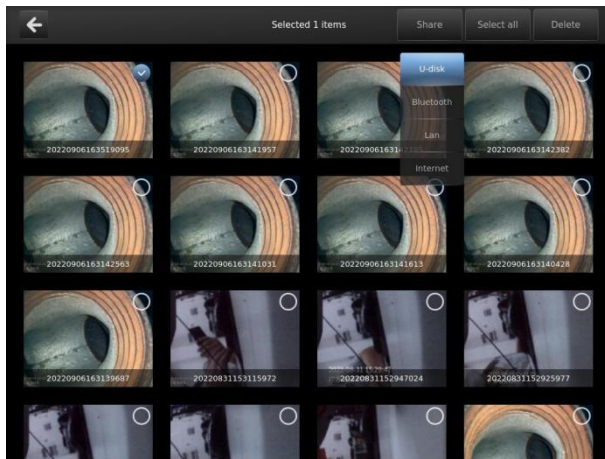

Fig. 11

Video file: Open the video file, and the user may play or pause the video, drag the progress bar to adjust the play progress, or delete the video (as shown in Fig. 12).
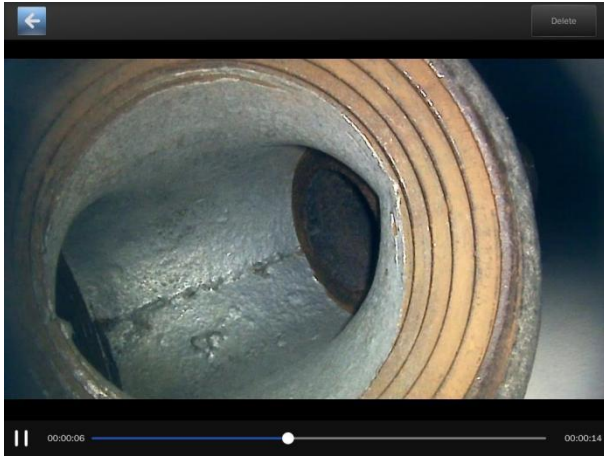
Fig. 12

4.11 Picture Editing

Open the picture file, and the user may rename the file, rotate and delete the picture (as shown in Fig. 13).

Graffiti: The graffiti function can be used to mark the pictures (as shown in Fig. 14). The main features include moving, brush, rectangle, oval, arrow and text. It supports setting of the brush color and thickness, canceling and restoring of the previous operation, saving and returning.

Rename: The user may rename the image file in English or simplified Chinese.

Rotate: Click the button to rotate the picture clockwise by 90° each time.

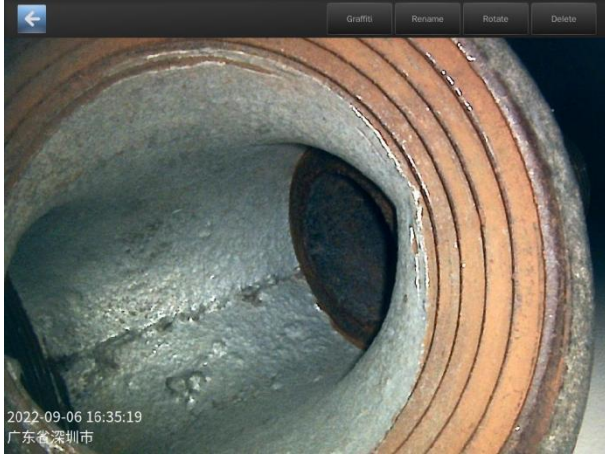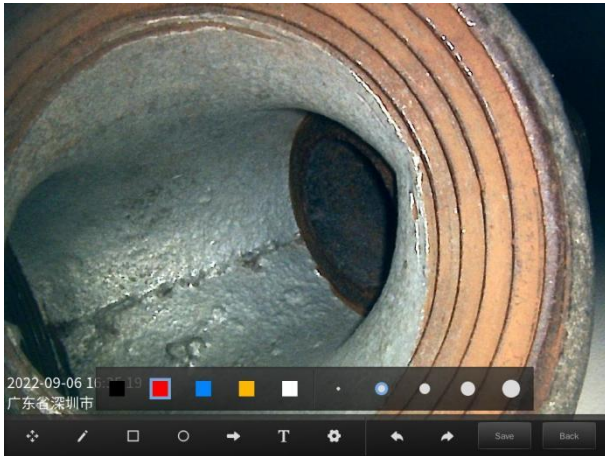Delete: Directly delete the image.

Fig. 13

Fig. 14

4.12 Report Generation

Enter the file preview from the home interface and select the report function to create and edit the report (as shown in Fig. 15).

Create report: Edit the title, model and specification, and test content.

Edit report: Share the report to a USB flash disk (insert the USB flash disk in advance) or Bluetooth (turn on the Bluetooth of the receiving device in advance), select all/none files, delete files, etc.
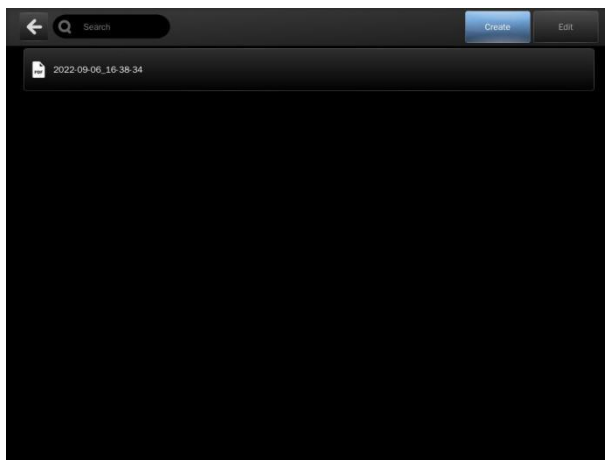

Fig. 15

4.13 File Reading

The instrument is configured with 2 USB ports to connect external USB flash disks for data storage. Pull the USB flash disks out and insert them into the computer to read the picture or video files stored directory. To transfer the data in the instrument to the USB flash disk, the user may share the picture/video to the USB flash disk through the preview function.

Note: Type C interface can only be used for program writing and recording, not for reading the data stored in the instrument or USB flash disk.

4.14 Video Output

Connect the external display to the instrument host with HDMI cable. Select an HDMI signal input, and the real-time display image will show on the external display directly (as shown in Fig. 16).

Fig. 16

5. 3D Measurement

5.1 Measurement Interface

The 3D measurement function is only applicable to instruments equipped with binocular measurement system. Enter the measurement mode from the home interface. The functions of the areas on the measurement interface are provided below (as shown in Fig. 17):
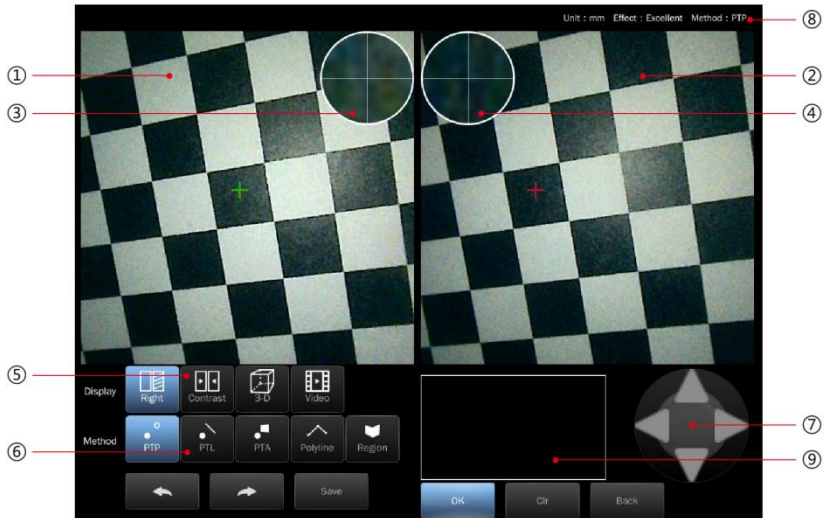
Fig. 17

The measuring points are indicated by the cross cursors (a green one and a red one) in the left and right pictures. Only the cross cursor measuring point in the left window can be moved, and the right cross cursor measuring point will automatically move to the corresponding position according to the left cursor.

1-----Left display window, displaying images taken by the left camera during measurement.

2-----Right display window, displaying right images, contrast images, 3D images, and videos subject to selection.

3-----Enlarged image of cross cursor position in the left display window.

4-----Enlarged image of cross cursor position in the right display window (when the right image is selected to display)

5-----Select the right display window to display images.

Right image: It shows the image taken by the right camera during measurement.

Contrast image: It displays the matching of images taken by the left and right cameras at the same position.

Color description:

Black --- unmatched point

The change of red, yellow, and blue indicates different distances. Specifically, the redder the red, the closer the measured object is to the camera, the bluer the blue, the farther the measured object is from the camera, and yellow is between red and blue. Different distances correspond to different colors, and the same color corresponds to the same distance.

3D image: It displays the high-low 3D dynamic image of the object surface and the height information of the middle position of the image.

Video: It displays the real-time image of the left camera.

6----Selection of measurement modes

7-----Move button of the measuring point which controls the slight movement of the measuring point position.

8-----Prompt description

For example:

MM----Unit of measurement: mm

Excellent----Rating of measurement matching effect: excellent, good, fair, and poor

Point-to-point ---- Current measurement mode

9-----Display window of measurement data

Button description:

Return button-----Return to the previous operation

Next button-----Proceed to the next operation

Save button-----Save the measurement photo (viewable in the preview menu)

OK button----Confirmation of adding measuring point

Clear button-----Clear the data in the measurement window

Back button-----Back to the home interface

5.2 Measurement Steps

Move the front-end probe and adjust the illuminance of the LED indicator to make sure that photos taken at the measuring position have a high definition and contrast. Fix the probe, click the measurement button, and do not move the probe during measurement and photo taking. After photo taking is completed,

check whether the measurement region is in the middle of the photo taken and whether the definition and illumination of the measuring point are good. If the photo is good, enter the measurement interface, otherwise return to the home interface and repeat the above measurement and photo taking process.

The measurement mode can be selected from the point-to-point, point-to-line, point-to-plane, Multi-segment and region. The right display window can be selected to demonstrate the right image (as shown in Fig. 18), contrast image (as shown in Fig. 18-1), 3D image (as shown in Fig. 18-2), and video (as shown in Fig. 18-3) for image comparison during point selection measurement to help select accurate measuring points and improve measurement accuracy.
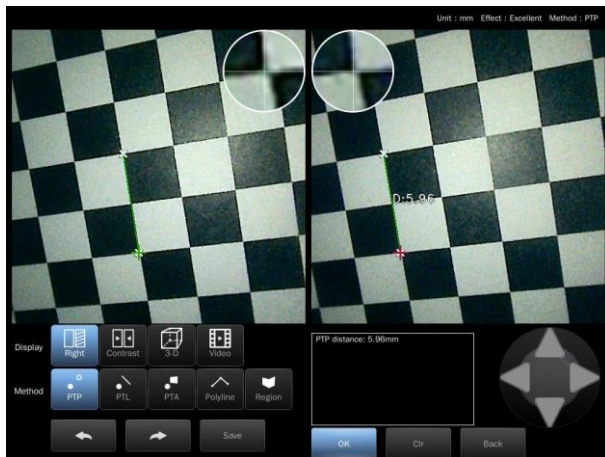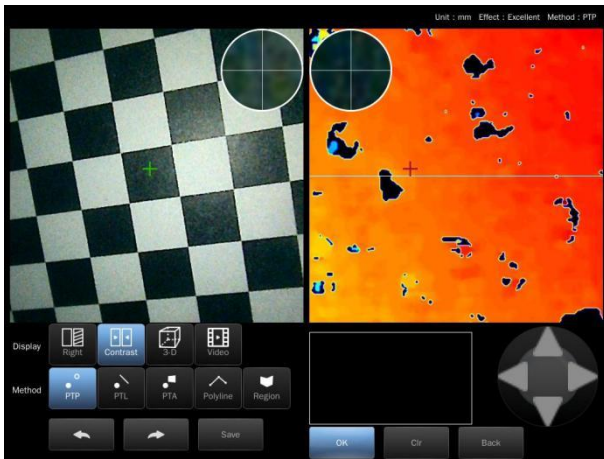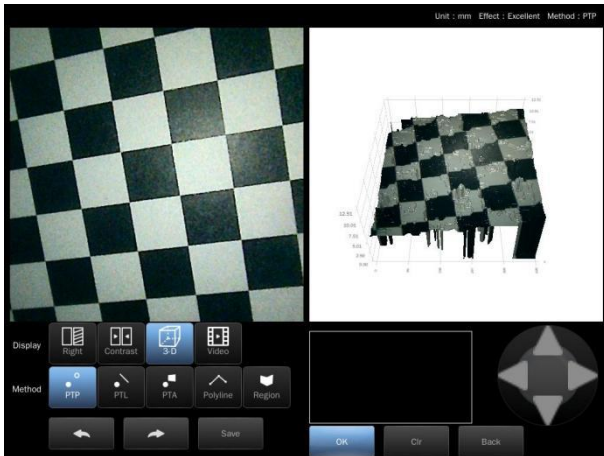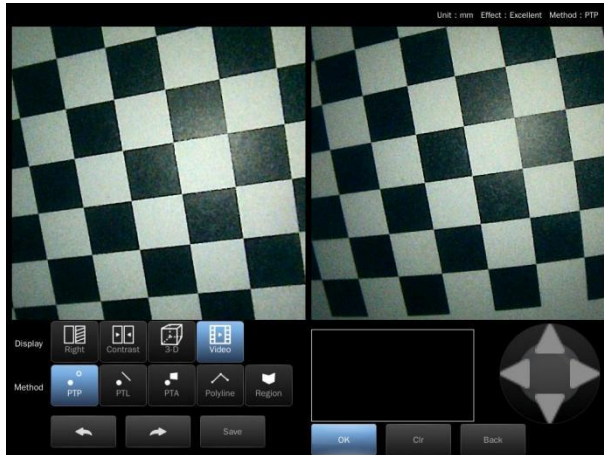

Fig. 18

Fig. 18-1

Fig. 18-2

Fig. 18-3

To perform stereo measurement, a pair of corresponding points (same position) must be determined in the two images on the left and right sides, which is called matching. The software has an automatic matching function. With image processing, the correct corresponding point may not be obtained if the same shape exists in a similar position to the specified point in the image. After completing the measurement, always make sure to check the pointer positions in the left and right images and confirm that they represent the same points on the object as the corresponding points. If the corresponding point is incorrect, the measured value may not be reliable. In this case, the angle of view can be changed (by moving the end of the insertion tube) and the measurement can be resumed. However, for some surface reflective objects whose images cannot be

matched, such as clean stainless steel pipes, an attempt should be made to change the angle of view to obtain more accurate measurement results.

The object distance measurement calculates the distance between the end of the optical adapter and the object in the real-time, frozen, or stereometric image. When the object image is blurred, the measurement will be affected. In this regard, please slowly move the end of the insertion tube. When the object distance measurement is applied to real-time images, the displayed measurement values are a result of measurement from some frames before the current image. If the stereo measurement is enabled when performing the object distance measurement, the object distance measurement value may be different from the stereometric result for the distance between the insertion tube end and the specified point.

Enter the measurement interface, and the prompt in the upper right corner of the screen indicates the rating of the measurement matching effect. The better the measurement matching effect rating, the better the measurement effect, and the more accurate the measurement result. Click "contrast" in the display option to check the matching effect and whether the region to be measured matches. It can be used only when the matching effect is relatively good, and the image quality prompt is "excellent" or "good".

If the color of the matching image is messy and there is no complete and related region, indicating that most regions are not matched or matched incorrectly. Under this circumstance, measurement cannot be carried out.

After confirming that the image matching effect can be used, click "right image" in the display option, and the images taken by the left and right cameras will be displayed in the left and right display windows. If the point-to-point measurement mode is selected, first select a measuring point in the left display window, move the measuring point to the position to be measured through the measuring point move button, and check whether the corresponding point in the right display window is also in the corresponding position. If the measuring points in the two images are located at the same point, the selected measuring point can be used. Then click the OK button, and the content "selected point: 1" will be displayed, that is, the first measuring point is successfully added to the image. Other measuring points can be selected by moving the measuring cursor. After adding a new measuring point in the same way, "selected points: 2" will be shown. The left and right images automatically display the distance between the two points, and the specific measurement data can be seen in the measurement data display window.

If it is prompted that "the measuring point is poorly matched", the measurement cannot be realized, and the point shall be selected again.

On the premise of good matching, select points through the touch screen, click the measuring point move button to move the measuring cursor to the position to be measured, and the measurement mode can be selected from the point-to-point (as shown in Fig. 19), point-to-line (as shown in Fig. 19-1), point-to-plane (as shown in Fig. 19-2), Multi-segment (as shown in Fig. 19-3), and region (as shown in Fig. 19-4).

Point-to-point: Measurement of the distance between two points, which needs adding two measuring points.

Point-to-line: Measurement of the vertical distance from a point to a line. This mode requires 3 points, of which the first point is the point to be measured, and the second and third points are to determine the line to be measured.

Point-to-plane: Measurement of the vertical distance from a point to a plane. In this mode, 4 points are needed, among them, the first point is the point to be measured, and the second, third and fourth points are to determine the plane to be measured.

Multi-segment: Measurement of the total length of two or more line segments, which needs to add 3 points in sequence.

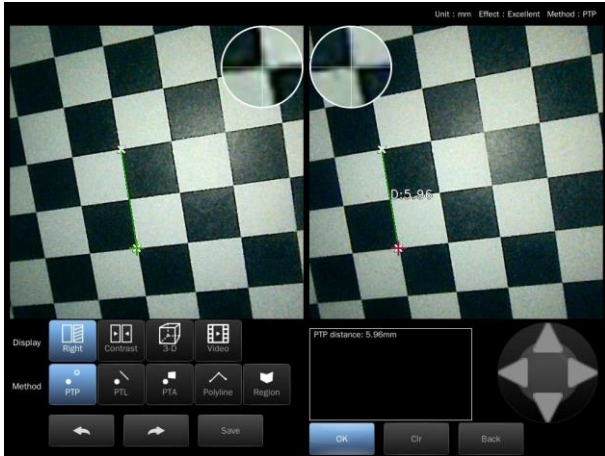Region: Measurement of the area and perimeter of a region, which also needs to add 3 points in sequence.
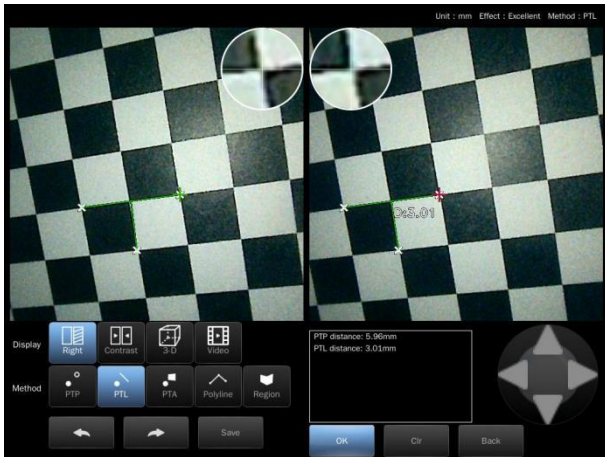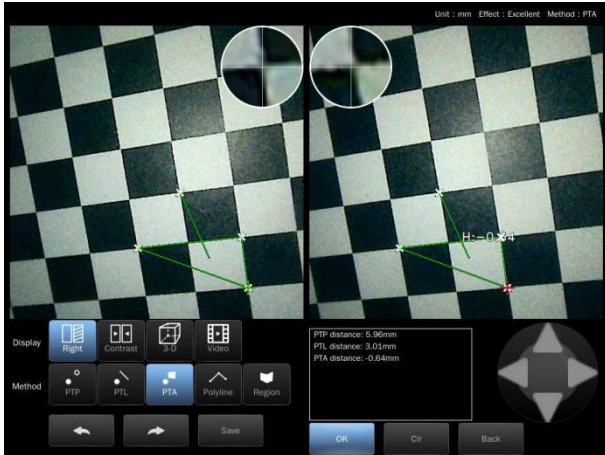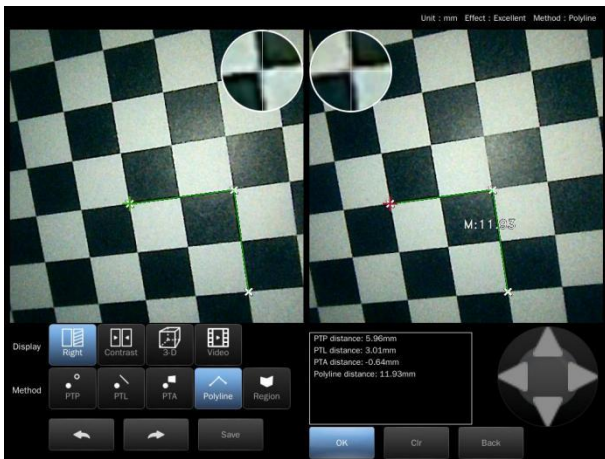
Fig. 19
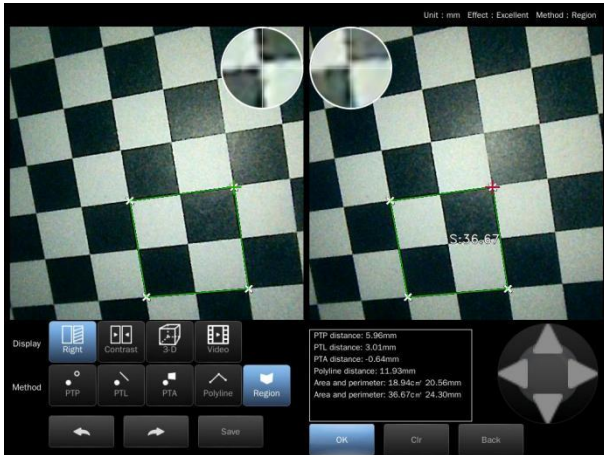

Fig. 19-1

Fig. 19-2

Fig. 19-3

Fig. 19-4

6. Cable Assembly and Disassembly

Part I: Cable installation

Align the red dot on the cable connector with the red mark at the aviation connector of the host, and push the cable connector in hard until a "click" sound is heard, indicating that the installation is successful (Fig. 20).

Fig. 20

Part II: Take out tube

Push out the locking ring at the cable connector, and pull out the tube from the aviation connector of the host to directly separate the cable from the host (Fig. 20-1).

Fig. 20-1

7. Basic Configuration

Host*1, insertion tube*1, power adapter*1, charging cable*1, USB flash disk*1, HDMI cable*1, lint-free wiper*1, special instrument case*1, spare battery*1, battery charger*1, user manual*1

8. Storage and Maintenance

① Please store the instrument in a clean, dry and stable place, keep it horizontal and keep it at normal room temperature;

4

② It is strictly prohibited to store the instrument in high temperature, high humidity, strong light, strong vibration, high dust, pollution or corrosive environment;

③ Do not let the instrument collide with other objects or handle it roughly during storage;

④ In order to avoid over-discharge of the battery, which may result in failure to charge the battery in the future, when it is prompted that the battery is insufficient in power during use, the battery shall be fully charged in time before use;

⑤ When the instrument is idled for a long time, it shall be stored after being fully charged, and attention shall be paid to charging and replenishing the battery every 3 months.

9. Analysis and Troubleshooting of Common Faults

S/N	Fault	Cause	Troubleshooting method
1	Startup failure	Low battery or no battery installed	Charge or replace with a new battery
2	Automatic shutdown	Low battery	Charge or replace with a new battery
3	The system stops on the startup screen	System startup failure	Remove and reinstall the battery and restart the system
4	Image cannot be recorded or viewed	The USB flash disk is damaged or has insufficient capacity	Replace USB flash disk or delete useless files

COANTEC

YouTube   Facebook   Coantec Website