Industrial Videoscope

User Manual

COANTEC C68 Series

Please read the User Manuals carefully before using this instrument.

Copyright Statement

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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):

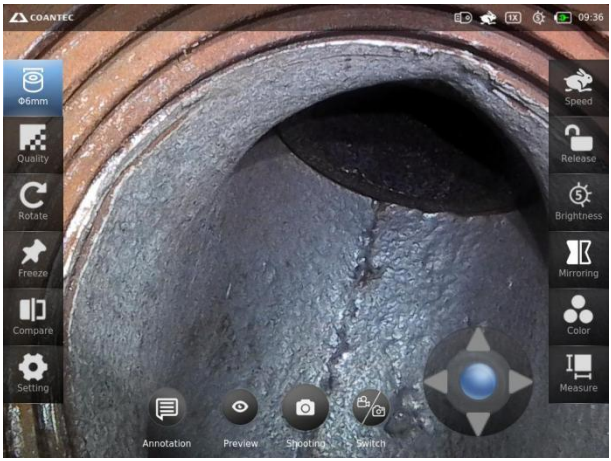

Fig. 2

① Tube diameter: The system automatically checks and displays the diameter of the current insertion tube.

② Image quality: adjust the image brightness, contrast, tone, saturation, definition and gamma, and restore defaults.

③ Rotation: rotate the real-time examination image clockwise by 90° each time.

④ Image freezing: freeze the real-time examination images.

⑤ Comparison: compare the real-time examination images with the saved images.

⑥ Settings: enter the setting interface where the following operations can be performed (as shown in Fig. 2-1):

- WLAN Setting: connect/disconnect the wireless network.
- User Administration: enable the administrator, visitor, and standard user administration modes.
- About this Product: view the product information, check for upgrades, and upgrade this product to the latest version.
- Display: set the screen brightness, language, date, and time.
- Custom Settings: enable the watermark and scale functions, and set the image format.
- Help

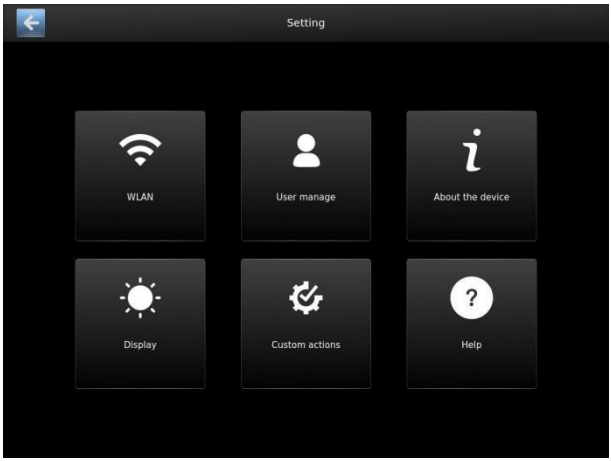

Fig. 2-1

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

⑧ Release/lock: Lock/release the probe.

⑨ Brightness: set the LED brightness of the probe.

⑩ Mirroring:To switch mirror image.

⑪ Color: default, black and white, negative, bright, highlight, and soft.

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

⑬ Annotation: add annotations and preferences.

⑭ Preview: enter the file browsing interface.

⑮ Photo/Video: take photos and videos and save the files automatically.

⑯ Switch: switch photo/video modes.

⑰ Virtual joystick: Drag the blue roller in the middle of the virtual joystick to turn the probe orientation. Click on it to switch between release/lock mode.In the measurement interface, this function serves as an auxiliary point selection tool for moving and determining selected points.

⑱Icon display: The icons in the upper right corner of the screen indicate the current status: USB inserted (not shown if none), image magnification (1~5), LED brightness level (0~9), SOC of batteries, SOC of videoscope, and system time.

4.3 User Management

Enter the user management interface from the setting function on the home interface（as shown in .Fig. 3）. 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.

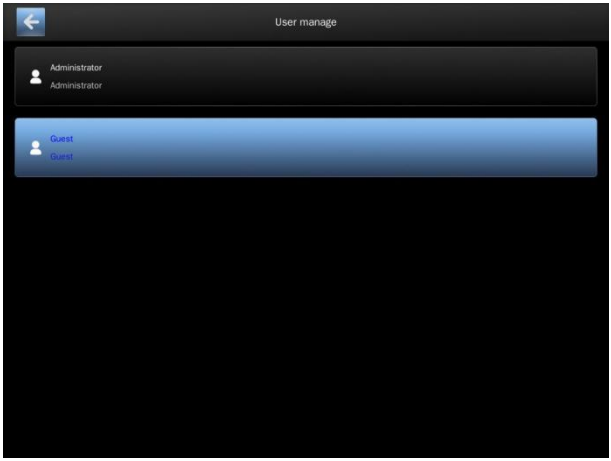

Fig. 3

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.

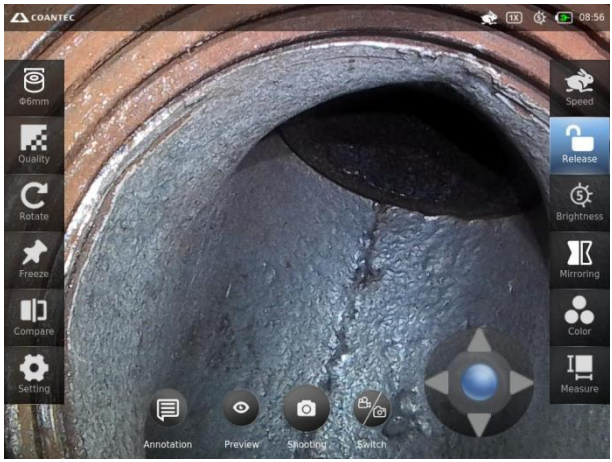

Fig. 4

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.

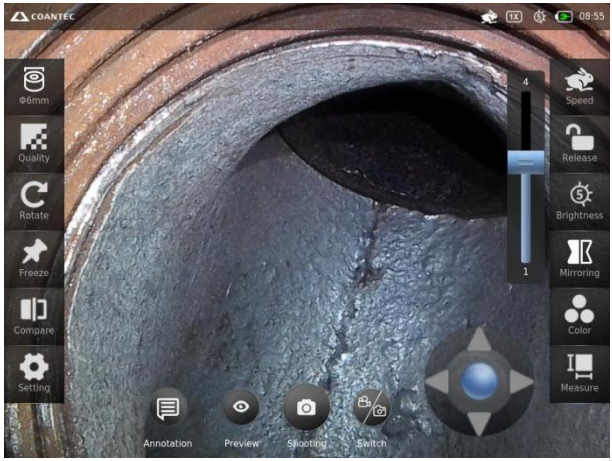

Fig. 5

4.6 Brightness 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) 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.

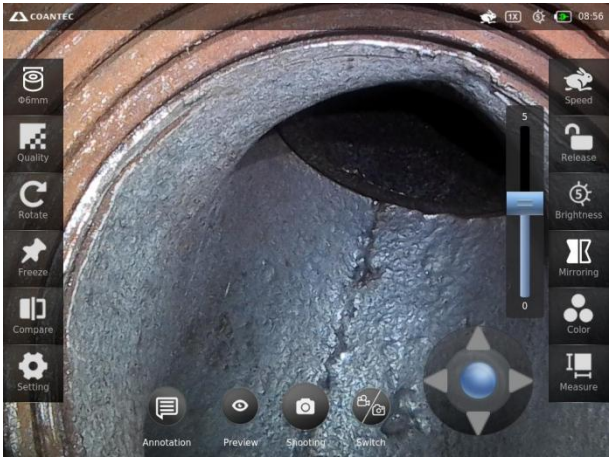

Fig. 6

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:

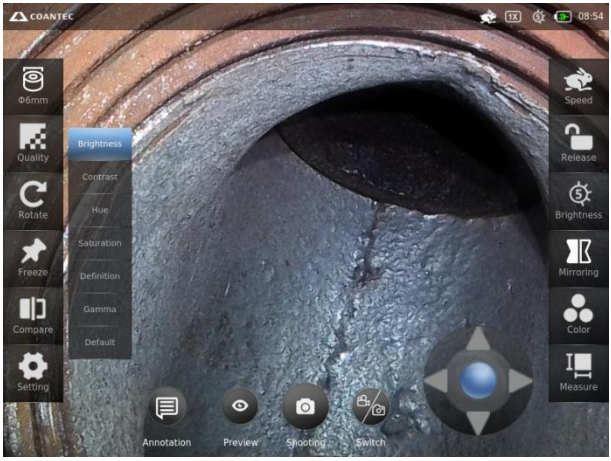

Fig. 7

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.

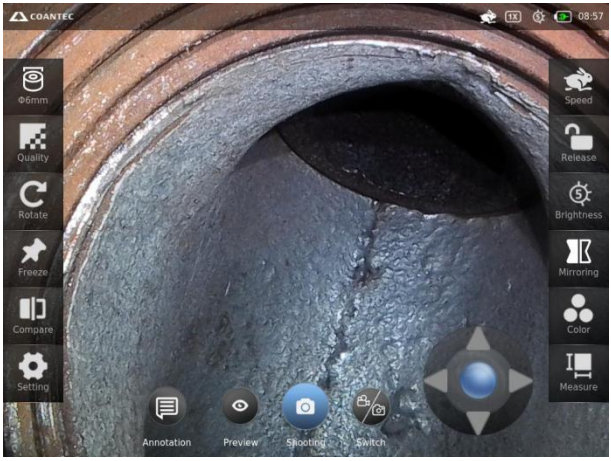

Fig. 8

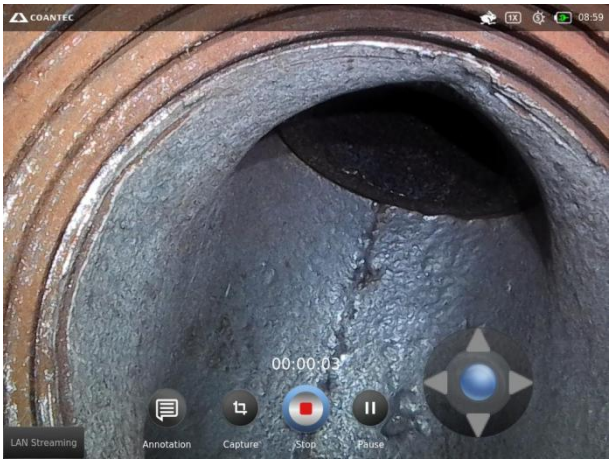

Fig. 8-1

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).

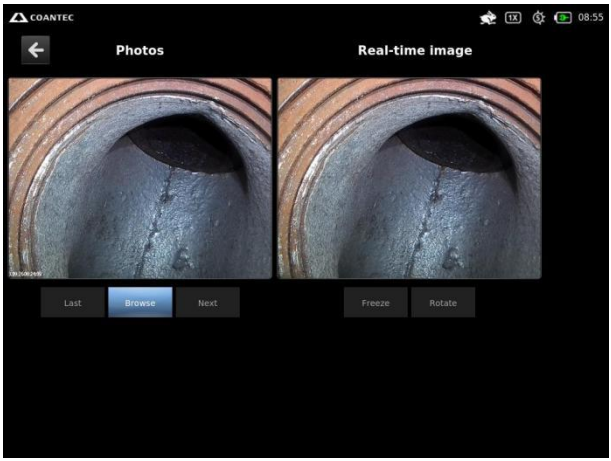

Fig. 9

4.10 File Preview

Press the preview button to enter the playback mode to view pictures,

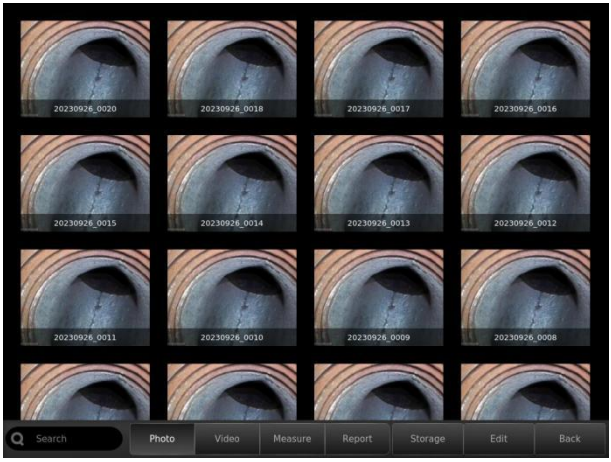

Fig. 10

videos, measurement diagrams, reports (as shown in Fig. 10) and search files.

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.

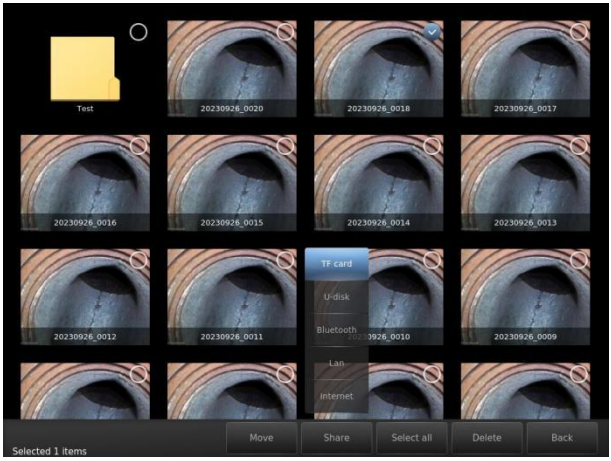

Fig. 11

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. 11-1).

Fig. 11-1

4.11 Picture Editing

Open the picture file, and the user may rename the file, rotate and delete the picture (as shown in Fig. 12).

Graffiti: The graffiti function can be used to mark the pictures (as shown in Fig. 12-1). 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.

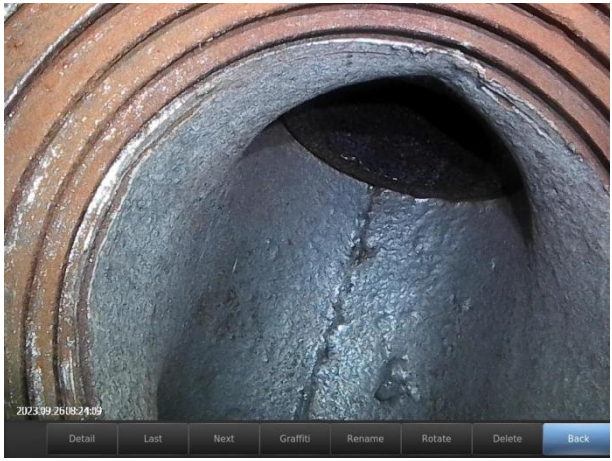

Fig. 12

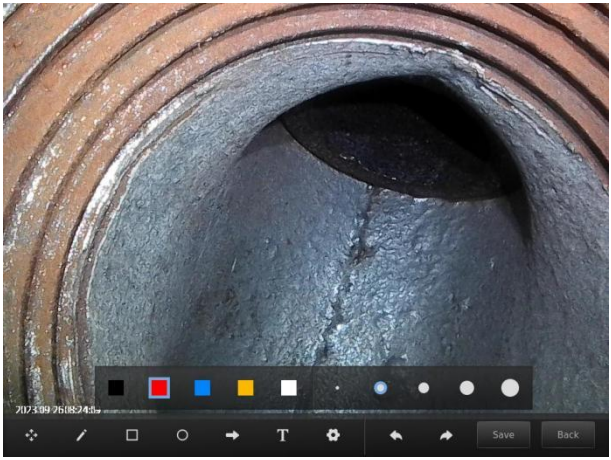

Fig. 12-1

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. 13).

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.

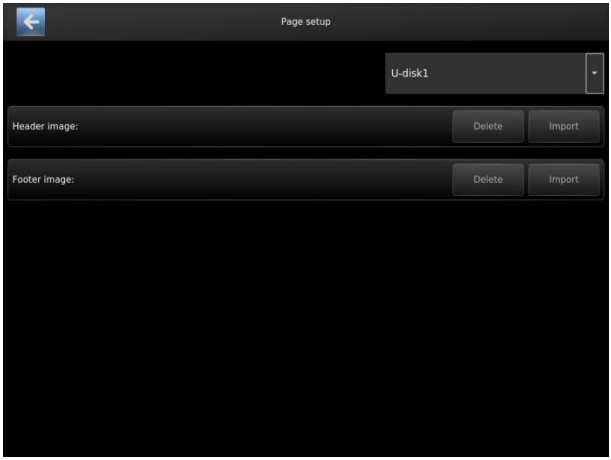

Fig. 13

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. 14).

Fig. 14

5. 3D Measurement

5.1 Measurement Interface

The 3D measurement function is only available for products with a binocular measurement system. Enter the main interface to enable the measurement mode. The functions on the measurement interface are provided below (as shown in Fig. 15):

Fig. 15

The measuring points are indicated by the cross cursors in the left and right figures. The measuring point indicated by the cross cursor in the left display window can be moved, and the measuring point in the right display window can move accordingly.

1-----Left display window, which displays the image taken by the left camera during measurement.

2-----Right display window, which displays the image selected, such as right image, parallax image, and 3D images.

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

4-----The enlarged image of the cross cursor position in the right display window.

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

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

Parallax image: show the matching between the images taken by the left and right cameras at the same position.

3D image: a 3D view showing the height of the surface of the examined object (viewed from different angles by rotation) and the height information of the middle position of the image.

Point cloud: displays the view of the detected object, RGB point cloud image, and point cloud image (which can be observed from different angles by rotation to view the position of the measurement point), and the image can be enlarged or reduced.

Exit-----Exit the current measurement interface

OK----Confirm the measuring point added

Description of parallax image colors:

When the background is black, the parallax image can be in different colors according to the object distance, and it is black if no matching points are found.

6----Optional measurement methods:Length,Vertical,Depth,Multisegment，Area,Missing corner,Sectional,Circle and Gap measurement methods are available.

Back-----Return to the previous step.

Next-----Proceed to the next step

7-----Measuring Point Move. The direction buttons respectively control the measuring point to move vertically and horizontally.Point-press for jog-movement, and press and hold for fast movement.Click the circular button in the middle to confirm the measuring point.

8-----Measurement data display window

Save-----Save the measurement data (viewable in the Preview menu)

Clear-----Clear the information of selected points and data (measurements) in the measurement window

9----Confidence-based point selection. During the point selection, the red, yellow, green and dark green bars shown in the middle of the left and right images indicate the increasing matching degree of the current points selected. The closer to dark green, the better the quality of the selected points and the better the measurement effect. Red indicates that the selected points are poor in quality and new measuring points shall be selected.

10-----Show the current measurement mode and object distance (the distance from the examined object to the lens).

Note: If the left-hand operation mode is enabled in the Custom Settings interface, the layout of these function buttons in the 3D Measurement interface

may vary. In the Operation Instructions, the right-hand operation mode is enabled by default.

5.2 Measurement Procedure

Move the front-end probe, control the LED brightness to make the images taken at the measurement points better in definition and contrast, fix the probe, and press the Measurement button, without moving the probe during measurement and photo taking; in the measurement preview interface, check whether the measuring area is in the middle of the photo taken during measurement and whether the definition and brightness at the measuring points are appropriate. If the photos taken are poor in effect, return to the main interface and repeat the above measurement and photo-taking process.

Measurement methods such as Length,Vertical,Depth,Multisegment， Area,Missing corner,Sectional,Circle and Gap are available. When the measurement mode is enabled, the right image (as shown in Fig. 16), parallax image (as shown in Fig. 16-1) , 3D image (as shown in Fig. 16-2) and Point cloud (as shown in Fig. 16-3) can be selected for comparison, facilitating the accurate selection of measuring points and improving measurement accuracy.

Fig. 16

Fig. 16-1

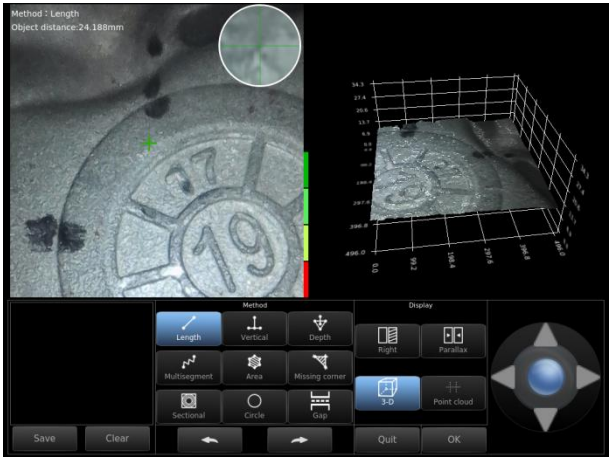

Fig. 16-2

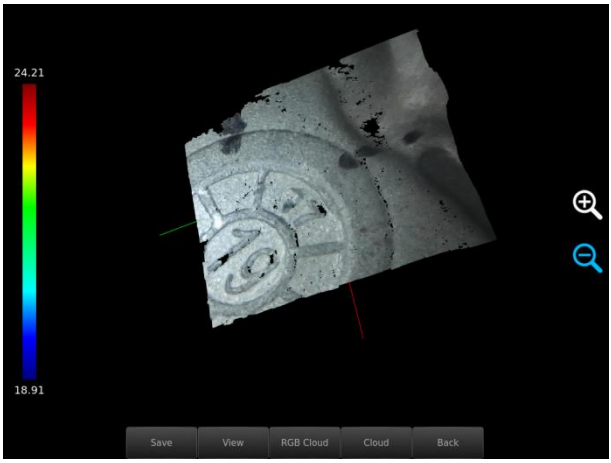

Fig. 16-3

For stereo measurement, a pair of corresponding measuring points (same position) must be determined in the left and right images, which is called matching. The software has an auto-matching function. The better the matching effect, the more accurate the measurement results. After image

processing, if no same shapes are found at the designated points in both images, the correct measuring points may not be obtained. During measurement, pay attention to the points where the cross cursors are located in the left and right small circular window images. Move the cursors until the same shape is shown in the circular window, to confirm that the same point on the object is indicated by the cursors. If the corresponding measuring points are wrong, the measurements may be unbelievable. In this case, it is advisable to change the viewing angle (by moving the end of the insertion tube) or select new measuring points for measurement. The measuring points in images of some surface reflective objects cannot be matched, such as clean stainless steel pipes. In this case, it is advisable to change the viewing angle or apply a layer of non-reflective powder particles on the surface for measurement to obtain more accurate results.

Select the measuring point in the left figure of the measurement interface, which can be dragged and moved in all directions by virtual keys. Observe the color bars for confidence-based point selection in the middle of the left and right figures. If the bar is red, the measuring points selected are poorly matched and cannot be measured. The yellow, green and dark green bars indicate the increasing matching degree of the current measuring points selected, and dark green indicates the best measurement effect.

After confirming that the well-matched measuring points in the photo can be used, select an appropriate measurement method. When the length measurement mode is enabled, 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, observe the enlarged images at the measuring points in the left and right small circular windows, and check whether the corresponding point at the center of the cross cursor in the small window is located at the corresponding position. If the measuring points in the two figures are located at the same point, the points can be used. Press the "OK" to display "Points Selected: 1", i.e., the first measuring point is successfully added to the image. Other measuring points can be selected by moving the cursor. After a new measuring point is added in the same way, "Points selected: 2" will be displayed, and then the distance between the two points will be automatically displayed in the right figure. The specific measurement data can be seen in the measurement data display window.

If "the points are poorly matched" is prompted, the measurement cannot be made, and a new measuring point shall be selected.

Select the well-matched measuring points on the touch screen and press the Measuring Point Move button to move the cursors to the position to be measured. length, Vertical, Depth, Multisegment, area, Missing corner,

Sectional, Circle, and Gap measurement methods are available.

Length:This method is adopted to measure the distance between two points, and two measuring points are required. The length distance is shown in the measurement data display window (as shown in Fig. 16-4).

Fig. 16-4

Vertical:This method is adopted to measure the vertical distance from point to line, and three measuring points are required. The first two points define the line for measurement, and the point added later is the point for measurement. The Vertical distance is shown in the measurement data display window (as shown in Fig. 16-5).

Fig. 16-5

Depth:This method is adopted to measure the vertical distance from a measuring point to a surface, and four measuring points are required. The first three points define a surface for measurement (the system prompts "Select three points to define a measuring surface"), and the fourth point is the point required for measurement. After the surface is defined by the first three points, all green points on the object that are coplanar with this surface appear in the figure. If the area formed with green points is relatively small, new points shall be selected to define a surface to obtain more accurate results. The Depth distance is shown in the measurement data display window (as shown in Fig. 16-6).

Fig. 16-6

Multisegment: This method is adopted to measure the total length of two or more lines, and three measuring points are required to be added in sequence for measurement. The length of Multisegments is shown in the measurement data display window (as shown in Fig. 16-7).

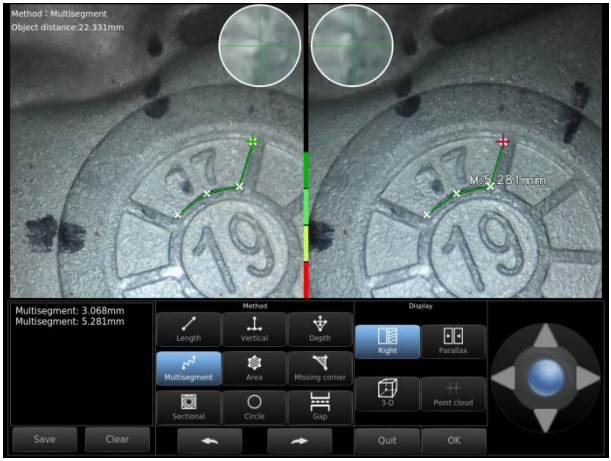

Fig. 16-7

Area: This method is adopted to measure the area and circumference of an area, and three measuring points are required to be added in sequence for measurement. The area and circumference of the area are shown in the measurement data display window (as shown in Fig. 16-8).

Fig. 16-8

Missing corner: The measurement method is mainly adopted to measure the material missed, especially the missed aeroengine blade tips. A base plane is defined by selecting three points in the area without the blade tips, and the area coplanar with this base plane is shown in light green (reference plane, i.e. a collection of points 0.05 mm from the base plane). Select the first measuring point along the defective edge, and select the measuring points one by one so that the connecting line between each two points is as close to the defective edge as possible. Multiple measuring points can be selected. The last

measuring point is located at the outermost edge of the defect to be measured. The measuring points shall be coplanar with the base surface, that is, in the light green area, the closer to the defective edge, the more accurate the measurement data. Finally, select a virtual point (which may be outside the light green area) at the estimated defective tip, where the connecting line L1 between the first measuring point and the virtual point forms an included angle with the connecting line L2 between the last measuring point and the virtual point, move the virtual point so that the two side lines of the included angle coincide with the edges of the existing area, respectively. The included angle, the length of lines L1 and L2, and the area of the tip-missed area are shown in the measurement data window. The virtual point can be adjusted several times to obtain more accurate measurement results. The base plane, measuring point and virtual point selected will affect the measurement accuracy. If the defect measuring point is not coplanar with the base surface, wrong results will also be obtained (as shown in Fig. 16-9).

Note: The measurement results can be displayed by moving the virtual point so that the two side lines of the angle formed by lines L1 and L2 coincide with the two edges of the existing area, respectively. For more accurate results, the first and last measuring points should be located at the extreme edge of each side of the missed tip.

Fig. 16-9

Sectional: This method is mainly adopted to examine and measure the depth of the Sectional formed by any two-point connecting line perpendicular to the flange surface direction of the probe, as well as the vertical depth of pits, crack depth, etc. Select one point on each side above the concave surface to be measured, and the depth image of the Sectional formed by the connecting line between the two points and the corresponding Z value can be displayed (as shown in Fig. 16-10).

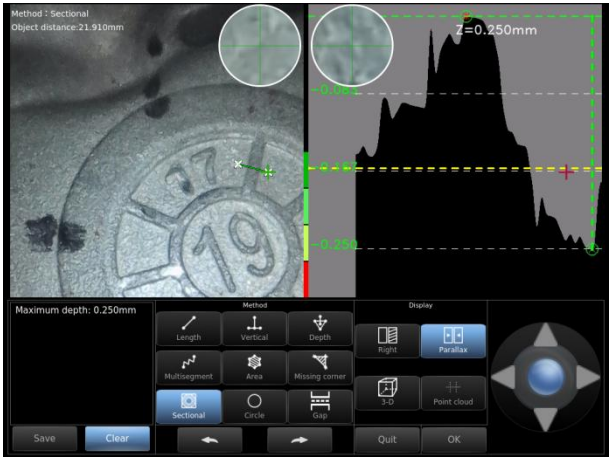

Fig. 16-10

Circle: Select any three points on the circle, and the diameter and area of the circle are calculated by the system and shown in the measurement data display window (as shown in Fig. 16-11).

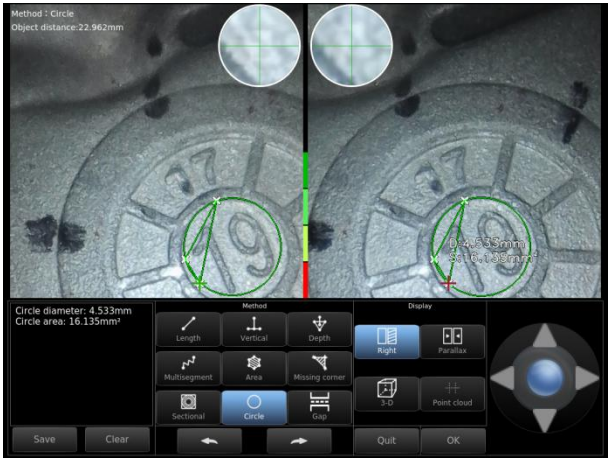

Fig. 16-11

Gap:mainly used to measure the size of the gap between aircraft engine

blades and the casing to determine whether the blades are deformed. Select three points on the casing surface to form a measurement reference plane, and then select a point at the edge of the blade. The system will automatically measure the maximum, minimum, and average values of the clearance (as shown in Fig.16-12).

Fig.16-12

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. 17).

Fig. 17

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. 17-1).

Fig. 17-1

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 charge*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;

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

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