Industrial Videoscope

Operation Instructions

COANTEC X3 Series

Be sure to read the Operation Instructions carefully before use

Copyright Notice

Notice:

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Contents

I. User Notices

1.1 Purpose and Application Scope

By passing through a narrow space, this product can effectively check parts or the interior of equipment that are hardly observed by human eyes. With this product, the user can check the state inside and surface defects of objects in real time through the display, and take photos and videos to obtain complete and reliable on-site examination data. This product is suitable for aerospace, automobile manufacturing, precision casting, railway and ship, petrochemical power, special equipment, and other fields.

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 this product by yourself, and the Company will not assume any responsibility for injury or losses caused to the user thereby. This product can only be repaired by the Company and its authorized dealers.

1.3 Safety Precautions

When using this product, the following instructions shall be followed to

avoid accidental injury or equipment damage due to improper operations:

① Do not use this product for non-industrial use, such as observation in humans or animals.

② Do not use this product under live working conditions to avoid electric shock.

③ Do not touch the probe directly after use to avoid burns.

④ Do not look directly at the bright light at the front end of the probe at close range to avoid affecting eyesight.

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

⑥ The stained lens will cause blurred images, so the lens shall be wiped clean with a lint-free wiper dipped in a small amount of alcohol.

⑦ During use, the probe shall be prevented from directly contacting corrosive liquids or various oils as far as possible.

⑧ Clean this product in time after use.

⑨ Make sure that the insertion tube is straightened before turning on this product. Do not make turns when the insertion tube is curled up. During operation, the joystick shall be operated slowly to control the probe orientation. Bending the probe to the maximum extent for a long time will affect its service life.

⑩ In case of any anomalies in this product, stop operating immediately and

reset the probe to the middle position, pull back the insertion tube carefully, turn off this product, and contact the manufacturer or dealer in time.

⑪ Hot swapping is not allowed for the videoscope, the insertion tube and the handle to avoid affecting the service life of this product.

II. Product Introduction

Coantec X3 series products refer to the high-performance and multi-purpose industrial videoscope independently developed by Coantec. With an HD industrial camera and a 5.5" HD touch screen, the videoscope can effectively render true colors and clearer examination images. The optional HFR image sensor can provide smooth video images without smearing or frame jamming. The whole product is a handheld device with an integrated design, and its mechanically controlled probe can steer flexibly in 360°. The quick-opening structure for insertion tube replacement makes it easier and faster to replace the insertion tube. Lighting sources such as white light, infrared light, and ultraviolet light are optional, with expandable storage space and long endurance. It is suitable for examination in aviation, aerospace, automobile, railway, ship, energy, petrochemical, electric power, military industry, special survey, and other fields.

III. Operation Procedures

① Unpacking: open the product box, and take out the videoscope and the insertion tube. Hold the probe properly during unpacking to avoid collision. Install the insertion tube to the videoscope according to the Instructions. The installation method is detailed in the "Installation of Insertion Tube" of the "Replacement of Insertion Tube". If the system prompts "Failed to turn on the camera, please check the camera", the insertion tube may be in poor contact with the videoscope and shall be installed again.

② Preparation for startup: Check whether all parts of the videoscope are in good condition, confirm that the batteries are properly loaded, and long press the ON/OFF button to turn on the videoscope.

③ Real-time observation: Extend the insertion tube into a device or component, and control the orientation of the probe at the front end of the tube by operating the joystick.

④ Brightness adjustment: Adjust the brightness of the light source to render appropriate brightness and the clearest images.

⑤ Examination: Adjust the observation angle, movement mode, and speed of the probe as required, and check and take photos and videos of the target in real time.

⑥ Tube retraction: Operate the joystick to adjust the insertion tube to be roughly straight and flat, and pull back the tube slowly.

⑦ Product storage: Turn off the power switch, put the product into the product box, put away the insertion tube, close the upper cover, and lock the catch.

IV. Operation Instructions

4.1 Buttons and Interfaces

Function diagram of operation buttons and interfaces of X3 series industrial videoscope (as shown in Fig. 1)

Fig. 1

① Menu/Back ② Photo/Video Switch ③ Image Freezing ④ Image Up-scaling

⑤ LED brightness + (short press)/Standby White LED ON/OFF (press and hold)

⑥ LED brightness - (short press)/Standby IR LED ON/OFF (press and hold)

⑦ Photo/Video ⑧ HDMI ⑨ Charging port ⑩ USB 2.0 port ⑪ USB2.0 port

⑫ Joystick ⑬ ON/OFF ⑭ IR LED ⑮ White LED ⑯ Display Removal ⑰ Tube locking ring

4.2 Operation Interface

Press and hold the ON/OFF button for about 3s to turn on the videoscope, and the ON interface pops up after the system startup. After the program is loaded, the main interface of the system for real-time examination pops up (as shown in Fig. 2), and the end of the insertion tube stretches into the target to be examined for examination. Short press the Menu button on the front panel of the videoscope or double tap the blank area on the touch screen to enable/hide the menu functions.

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:

- 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

⑦ Speed: not available for this model.

⑧ Release/lock: not available for this model.

⑨ Brightness: set the LED brightness of the probe.

⑩ Scenario: enable the metal and non-metal modes based on the material.

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

⑫ Measurement: only for products with binocular measurement function.

⑬ Annotation: add annotations and preferences.

⑬ Preview: enter the file browsing interface.

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

⑮ Switch: switch photo/video modes.

Icon 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 Function Settings

Enter the main interface to set functions, such as WLAN Setting, User Administration, About this Product, Display, Custom Settings, and Help (as shown in Fig. 3).

Fig.3

- **WLAN Setting**

Enter the WLAN Setting interface to enable the wireless network function, search for and connect with the WLAN available, and enter the correct password for networking.

- **User Administration**

Enter the User Administration (as shown in Fig. 3-1) interface to set the modes of administrator, visitor, and standard user (added by the administrator). The user administration mode is enabled mainly to grant different administration authorities. Log in as an administrator (the initial password is "123456") to create a standard user, delete a user, and change the password. Information such as images taken and reports generated in different user administration modes can only be viewed and processed in the current mode. The system is in visitor mode by default, and no login is required.

Fig. 3-1

- **About this Product**

View the product information to check for upgrades, and upgrade this product to the latest version.

- **Display**

Set the display brightness level (manually 10-100), language (simplified Chinese, English, French, German, Portugal, Spanish, Italy, Netherlands, Poland, Korean, Traditional Chinese, and Japanese), and date and time (Sync to Web or manually), as shown in Fig. 3-2.

Fig. 3-2

- **Custom Settings**

Set the watermark (time and position), scale (hide, cross scale, circular scale, and reference line), and image format (JPG, and BMP), as shown in Fig. 3-3.

Fig. 3-3

- **Help**

The Operation Instructions are available therein.

4.4 Motion Control

In the real-time inspection mode, the motion direction and angle of the probe can be controlled by operating the joystick. When the joystick is operated to move back to the middle position, the probe is roughly straight and flat. The probe release/locking and speed adjustment functions are disabled, (as shown in Fig. 4).

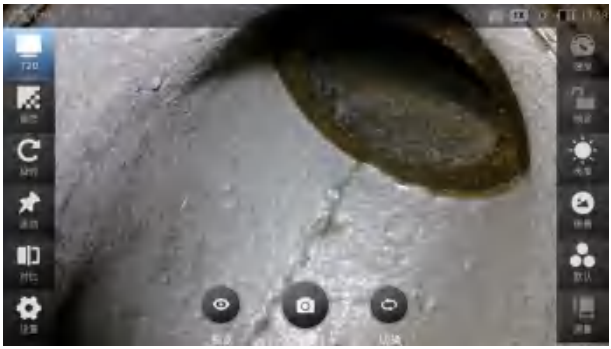

Fig. 4

4.5 Brightness Control

In the real-time examination mode, the LED brightness of the front-end probe is controlled by the brightness +/- button (as shown in Fig. 5). The brightness levels 0 to 9 are available. At Level 0, the LED is off, and the brightness is the highest at Level 9. After startup, the brightness at Level 5 is set by default. The current brightness level is displayed in the upper right corner of the screen.

The brightness can also be adjusted step by step by pressing the brightness increase/decrease button on the front panel of the videoscope.

Fig. 5

4.6 Color Conditioning

Enter the main interface to enable the image color conditioning function to set the image to default, black and white, negative, bright, highlight, and soft modes as required (as shown in Fig. 6).

Fig. 6

4.7 Image Quality Control

Enter the main interface to enable the image color control function, allowing the user to adjust the following parameters of the image or restore defaults (as shown in Fig. 7) according to the actual situation. The adjustable range values are as follows:

Fig. 7

4.8 Image Scaling

In the real-time examination mode, the image can be scaled up by 1-5 times by the Image Up-scaling button on the front panel of the videoscope, or the examination image can be scaled down/up in multi-touch mode by two fingers. The current magnification is displayed in the upper right corner of the screen.

4.9 Photo/Video

Photo: The photo mode is enabled by default during real-time examination. Tap the touch screen or press the photo/video button on the back of the videoscope handle to directly take and save photos automatically (as shown in Fig. 8).

Video: The photo mode is switched to the video mode by the Photo/Video Switch button on the touch screen or handle, tap the touch screen or press the Photo/Video button on the back of the videoscope handle to enable the Video mode, and press this button again to disable the Video mode and save video files. The current duration will be displayed during taking video. During taking video, the functions such as LAN Push, annotation adding, pause and screenshot can be enabled (as shown in Fig. 8-1).

Fig. 8

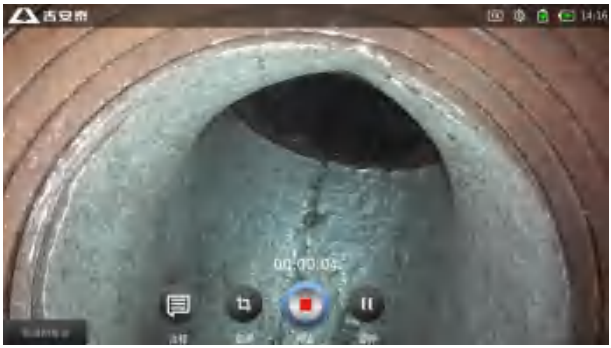

Fig. 8-1

4.10 Image Comparison

Enter the main interface to enable the image comparison function to compare the real-time image with the images in the gallery. The user may browse and select an image, or select the previous or next image. The real-time screen can be frozen and rotated (as shown in Fig. 9).

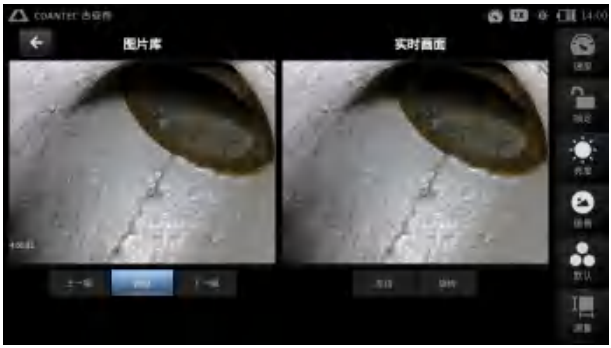

Fig. 9

4.11 File Preview

Press the Preview button to enable the playback mode to search for files and view images, videos, and reports respectively (as shown in Fig. 10).

The file can be searched by inputting certain characters of the file name in the Files Search box in Simplified Chinese, English, French, German, Portugal, Spain, Italy, Netherlands, Poland, Korean, Traditional Chinese, Japanese, and other languages, and also by inputting numbers, capital and lower-case letters, symbols, etc.

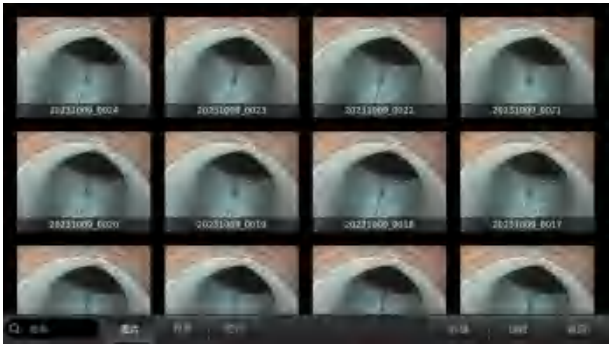

Fig. 10

Save: select the file save path, create/rename folders (in more than ten languages such as Chinese and English), select the folder save path, and set the current path as the default save path (as shown in Fig. 10-1).

Fig. 10-1

Edit: Select files (multiple choices), move, share, select all/clear all, and delete (as shown in Fig. 10-2).

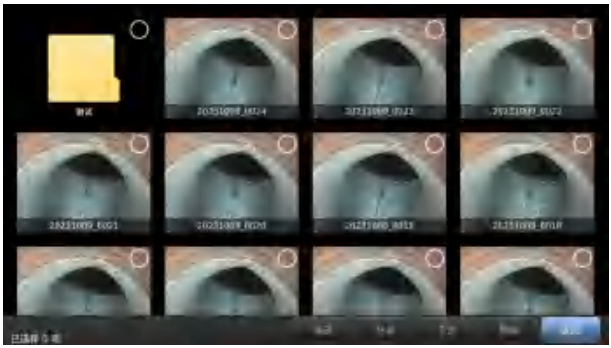

Fig. 10-2

Move: Select a file, and cut and paste it to a designated folder (as shown in Fig. 10-3).

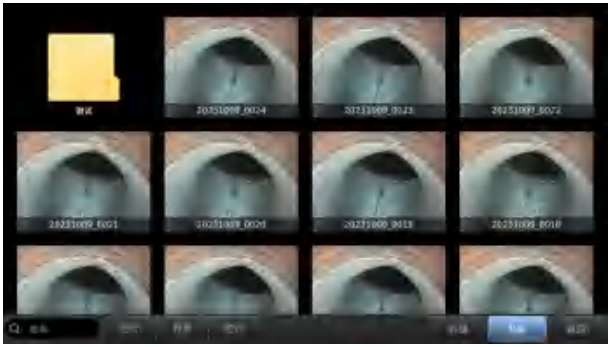

Fig. 10-3

Share: Multiple files can be shared through the TF card and USB, while a single file can be shared through the TF card, USB, Bluetooth, LAN, and the Internet (as shown in Fig. 10-4).

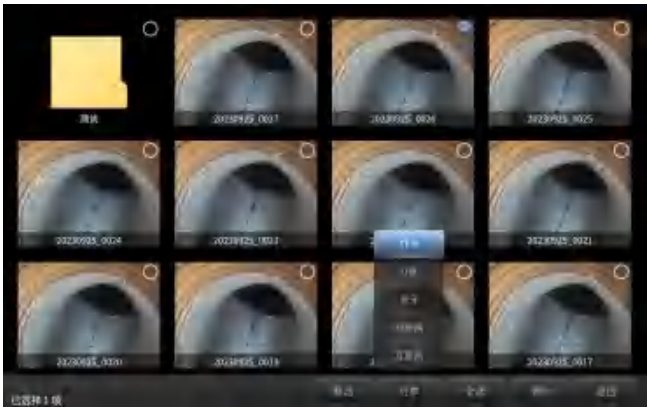

Fig. 10-4

TF card: Share files in the videoscope through the TF card. The file

sharing is disabled without a built-in TF card.

USB: Share files in the videoscope through the USB. The file sharing is disabled without a USB inserted.

Bluetooth: Enable the Bluetooth function of the receiving device (mobile phone), and select a device to be paired with the videoscope from the list of devices in the system, allowing for file transmission through Bluetooth.

LAN: Connect the videoscope with WLAN, with the receiving device (mobile phone) also connected with the same LAN. The system displays the QR code shared through the LAN, and files can be received by scanning this QR code with a mobile browser (as shown in Fig. 10-5).

Fig. 10-5

Internet: Connect the videoscope with WLAN, with the receiving device

(mobile phone) connected with other WLANs or mobile data networks. The system displays the QR code shared through the Internet, and files can be received by scanning this QR code with a mobile browser (as shown in Fig. 10-6).

Fig. 10-6

Note: After this product is connected to a mobile phone or other receiving devices through Bluetooth, LAN, or the Internet, images or videos can be shared through Bluetooth, LAN, and the Internet.

Video files: open the video file to play, pause the video, and move the progress bar to adjust the playback progress, or delete the video.

4.12 Image Editing

Open the image, view the image details and the previous and next images, doodle, rename, rotate and delete files (as shown in Fig. 11).

Details: indicate file name, type, size, creation time, etc.

Doodle: The doodle function can be used to mark images (as shown in Fig. 11-1). The main functions include image up-scaling/moving, brush, rectangle, oval, arrow, text, brush color and thickness setting, undoing the previous step, back to the previous step, save, and return.

Image up-scaling/moving: scale the image up and down by two-finger pinching, and move and view the enlarged part of the image.

Rename: The user can rename the image file in more than 10 languages such as English and simplified Chinese.

Rotate: rotate the image clockwise by 90° each time.

Delete: directly delete the image.

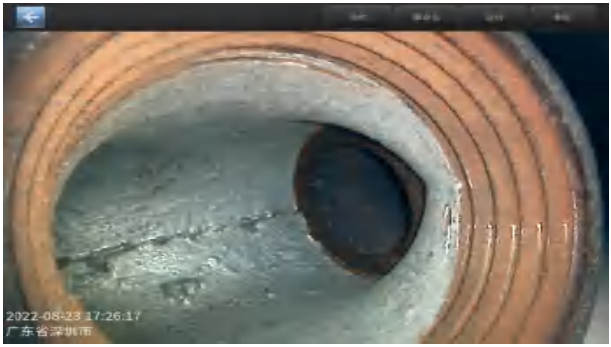

Fig. 11

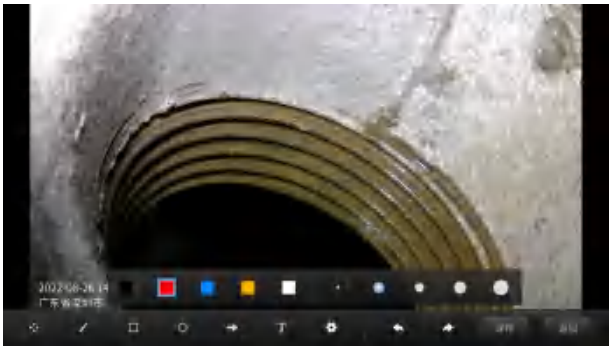

Fig. 11-1

4.13 Report Generation

Enter the main interface to enable the File Preview function and open the report options, to set the page, and create and edit reports (as shown in Fig. 12).

Page setting: The header and footer images are imported through an

external USB (as shown in Fig. 12-1).

Report creation: edit the title, format, size, and examination items, and select an examination image (multiple images) to create a report.

Report editing: move the report to another folder, view the report details, share the report through the USB, Bluetooth (it is necessary to enable the Bluetooth function of the receiving device in advance for device pairing), LAN, the Internet, select all/clear all, delete files, etc. The specific operation method can be found in 4.10 File Management Instructions.

Fig. 12

Fig. 12-1

4.14 Video Push

Enter the main interface to enable the Video mode for LAN Push. The Push function is to transmit the examination image to the receiving device (mobile phone) in real time through the LAN so that the real-time examination images can be viewed remotely. It is suitable for experts or multi-person diagnosis to achieve efficient collaboration.

LAN Push: Connect the videoscope and the mobile phone with the same LAN. Enable the LAN Push function, open the push QR code, and scan the QR code with a mobile phone (as shown in Fig. 13) so that the real-time examination images can be viewed synchronously on the mobile phone.

Note: The LAN Push QR code is generated is generated in real time and can be photographed and sent to the mobile phone that receives the video push, and the video pushed can be played remotely by the image recognition function of the mobile phone. Images can be saved on the mobile phone by screenshot or screen recording. To disable the Video Pus function, select "Stop Publish" on the videoscope.

Fig. 13

V. 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):

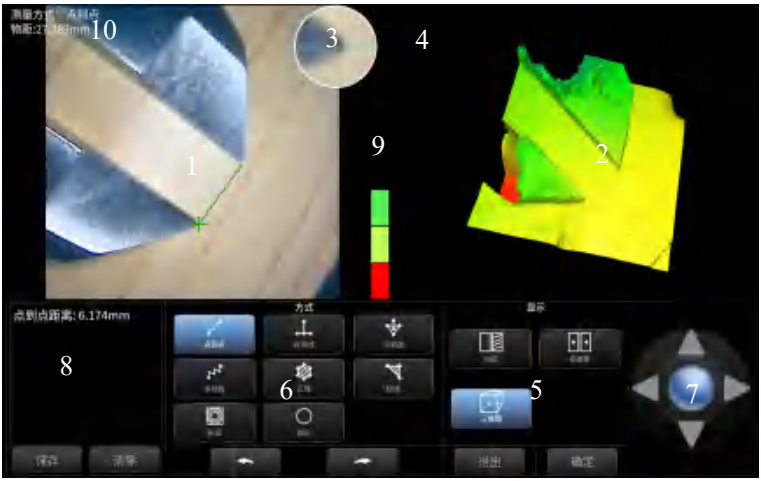

Fig. 15

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, disparity 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.

Disparity 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.

Exit-----Exit the current measurement interface

OK----Confirm the measuring point added

Description of disparity image colors:

When the background is black, the disparity 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: point-to-point, point-to-line, point-to-surface, polyline, area, defect area, and circle measurement methods are available.

Back-----Return to the previous step

Next-----Proceed to the next step

7-----Measuring Point Move. The direction keys respectively control the measuring point to move vertically and horizontally, with OK in the middle, point-press for micro-movement, and press and hold for fast movement.

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. In 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 point-to-point, point-to-line, point-to-plane, polyline, area, and perimeter are available. When the point-to-point measurement mode is enabled, the right image (as shown in Fig. 16), disparity image (as shown in Fig. 16-1) and 3D image (as shown in Fig. 16-2) can be selected for comparison, facilitating the accurate selection of measuring points and improving measurement accuracy.

Fig. 16

Fig. 16-1

Fig. 16-2

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 point-to-point 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. Point-to-point, point-to-line, point-to-surface, polyline, area, tip missed, profile, circle, and other measurement methods are available.

Point-to-point: This method is adopted to measure the distance between two points, and two measuring points are required. The point-to-point distance is shown in the measurement data display window (as shown in Fig. 16-3).

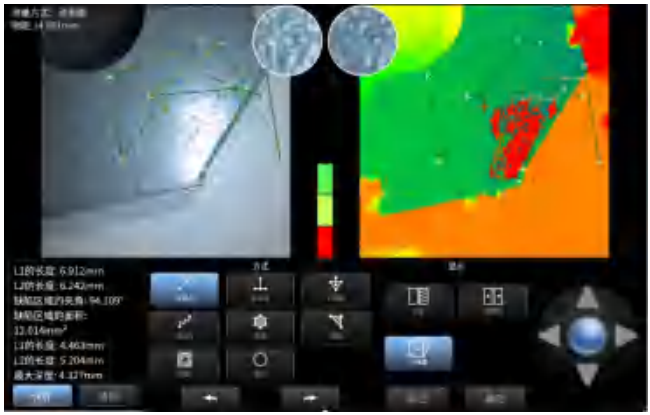

Fig. 16-3

Point-to-line: 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 point-to-line distance is shown in the measurement data display window (as shown in Fig. 16-4).

Point-to-surface: 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 point-to-surface distance is shown in the measurement data display window (as shown in Fig. 16-5).

Fig. 16-4

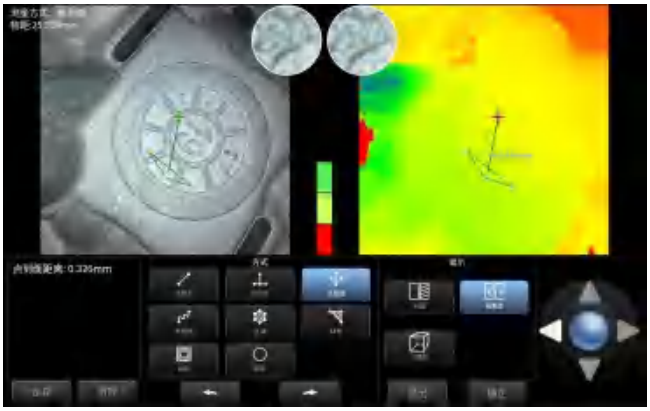

Fig. 16-5

Polyline: 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 distance to polylines is shown in the measurement data display window (as shown in Fig. 16-6).

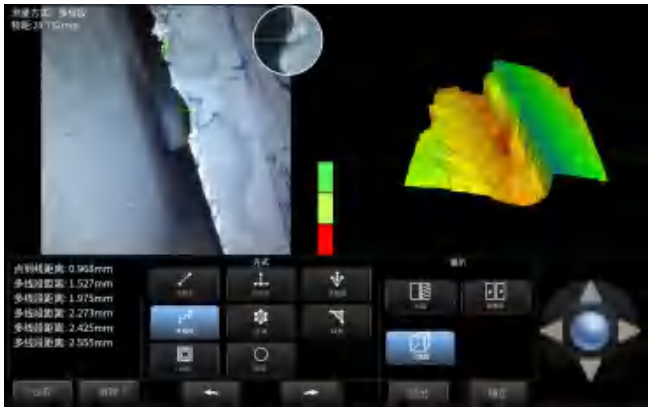

Fig. 16-6

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. 16-7).

Fig. 16-7

Tip missed: The blade angle 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. 16-8).

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.

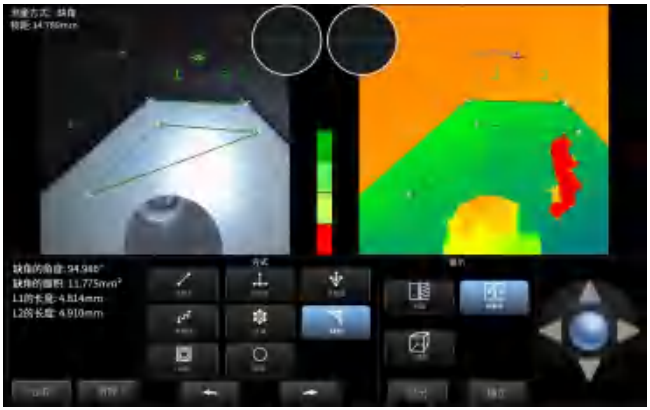

Fig. 16-8

Profile: This method is mainly adopted to examine and measure the depth of the profile 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 profile formed by the connecting line between the two points and the corresponding Z value can be displayed (as shown in Fig. 16-9).

Fig. 16-9

Circle: Select any three points on the circle that are not on the same straight line, 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. 16-10).

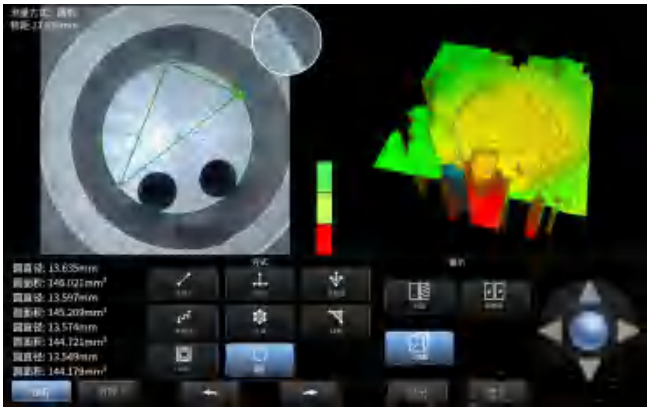

Fig. 16-10

VI. File Read-out

Share the images or video files saved in this product to a USB flash disk, and directly pull the USB out and insert it into the computer to read the images and files.

VII. Video Output

The examination videos and images can be viewed in real time by connecting an external display to this product through the HDMI cable and setting the HDMI signal input on the external display (as shown in Fig. 14).

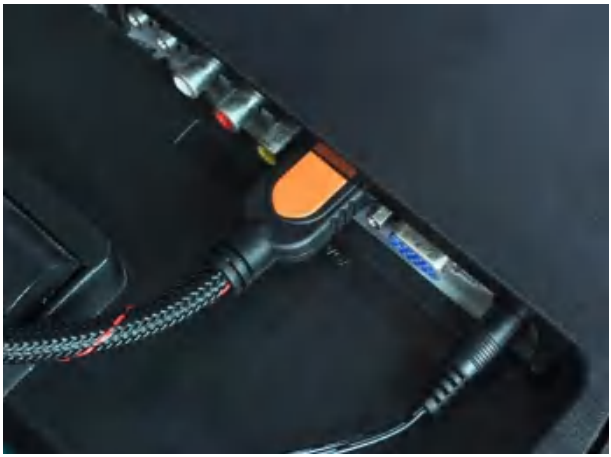

Fig. 14

VIII. Power Off

Operate the joystick to adjust the probe to be straight and flat, and pull back the insertion tube slowly. Press and hold the ON/OFF button to display the OFF interface, and turn off this product after the system parameters and files are saved.

IX. Charging

The current SOC is displayed in the upper right corner of the display screen. When the low SOC is prompted, charge this product or replace the batteries as soon as possible. When the batteries are about to run out, a low SOC is warned, and this product is automatically turned off. This product can be charged only by the dedicated charger through the Type C port above the videoscope. During charging, the red light in the upper left corner of the display screen is on, and the green light is on after full charging.

X. Removal and Installation of Battery

After the videoscope is powered off, push down the back cover of the battery holder, and remove the batteries. After the batteries are loaded, the

battery cover can be closed directly after alignment. The batteries shall be installed in the correct direction, with the anode and cathode in the right direction.

XI. Removal and Installation of Display

Removal: press and hold the button on the back of the videoscope to release the internal connecting buckle, and take out the display directly from the top (as shown in Fig. 15). The display has built-in batteries. Press and hold the red button on the upper left to turn the display on, to directly view, edit, and share images and video files.

Installation: The installation is completed by aiming the back of the display at the joint, and pushing the display directly from top to bottom until a "click" sound is heard (as shown in Fig. 15-1). The displays of different sizes can be replaced as required.

Fig. 15

Fig. 15-1

XII. Removal and Installation of Insertion Tube

Removal: Turn the locking ring at the rear end of the insertion tube anticlockwise (in the Unlock direction), and after loosening the insertion tube, push the locking ring out from the front to directly take the insertion tube out.

Installation: Loosen the locking ring, install the insertion tube at the back of the videoscope, and turn the insertion tube locking ring clockwise (in the Lock direction) until a "click" sound is heard (as shown in Fig. 16). The insertion tubes of different sizes can be replaced as required.

Fig. 16

XIII. Removal and Installation of Base

After installing the insertion tube, install the base from one side and tighten the lock nut clockwise. When replacing the insertion tube, loosen the lock nut of the base before removing the base.

XIV. Basic Configuration

Videoscope *1, dedicated product box *1, 32G USB *1, HDMI connecting cable *1, dedicated charger *1, Operation Instructions *1, product certificate *1, and warranty card *1

XV. Maintenance

① After use, put the videoscope in this product box, close the upper cover and lock the buckle, and place the box horizontally in a cool, dry, clean and stable place at normal room temperature;

② Do not store this product in high temperature, high humidity, strong light, strong vibration, high dust, pollution, or corrosive environment;

③ Avoid collision with other objects or rough treatment during storage;

④ When the low SOC is prompted during use, the batteries shall be fully charged in time before use, to avoid the situation that the batteries cannot be recharged after over-discharging;

⑤ This product left unused for a long time shall be stored after being fully charged, and attention shall be paid to recharging the batteries every three months.

XVI. Common Faults

Faults	Possible cause	Solutions
No response after power-on	The batteries run out or are not loaded	Recharge or replace the batteries with new ones
Automatic power-off	Low battery	Recharge or replace the batteries with new ones
The system stops on the startup screen	System startup failure or low battery	Remove and reload the batteries, restart the videoscope, and charge the batteries
No images can be recorded or searched	Insufficient capacity of videoscope or USB	Delete useless files in the videoscope or replace the USB

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