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**5319-AF290  
AUTO FOCUS DIGITAL MICROSCOPE  
(WITH DISPLAY)  
OPERATION MANUAL**



### Attention

- ◆ The camera use only DC12V power supply. Before connecting power supply, please connect mouse to the camera.
- ◆ Under AF mode, the program will automatically adjust the focus to provide a clear image; Switching to "Click F" mode, it will lock the focus after the system performed auto focus on the required image; Even if the image is blurry, with focus being locked, it will not trigger auto focus again; When "MF" (Manual Focus) is set, the MF can be adjusted.
- ◆ If auto focus cannot operate under special circumstances (e.g. Smooth reflect surface). Move the focus frame to objects with details, change to "Click F" mode to perform one-off auto focus operation, or switch to "MF" mode for manual focus operation.
- ◆ To avoid danger or damage incurred to the lens, do not touch the lens or sensor directly with your fingers.
- ◆ To avoid failure or electric shock hazard and so on, do not disassemble or modify the internal structure of the device.
- ◆ Do not plug in or unplug the anything port when hands are wet.
- ◆ If the lens or sensor is dirty or damp, you should better use dry and non-linen fabric or professional lens tissue to wipe them. To avoid scratches on the surface, do not touch the lens with your fingers. Wipe the lens or sensor lightly.
- ◆ The products are not specifically designed for an outdoor use. Do not expose it to outdoor environment without any protection. Excessive temperature and humidity will damage the lens. Please avoid using the product under the following environment: high temperature or high humidity environment, places with direct sunlight, dirt or vibration and places near heat source.
- ◆ Please use and store in the following environment:  
Operating temperature :0°C~ 40°C  
Storage temperature: -20°C~ 60°C  
Operating Humidity: 30~80%RH  
Storage Humidity: 10~60%RH
- ◆ The cleanliness of the device lens will directly affect clarity degree of contents from the computer screen during preview. Problems like various circles or spots on the screen may mostly be incurred by dirt on the lens. When cleaning, please use professional lens tissue or other professional detergent to clear the dirt on the lens.

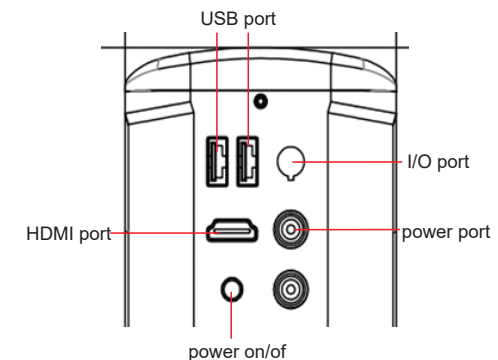
### Structure

#### 1 Name:



1. Camera and lens(1/2.8" CMOS sensor)
2. Stand;
3. Mouse;
4. LED light: Adopts many fill lamps, display a circle with even and abundant light.
5. 21.5LCD;
6. Base;

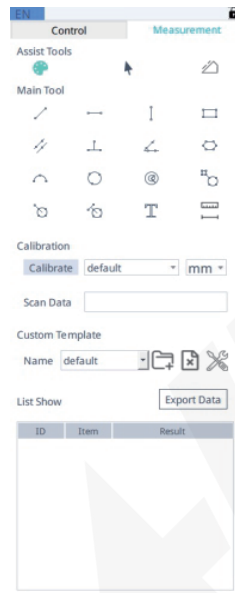
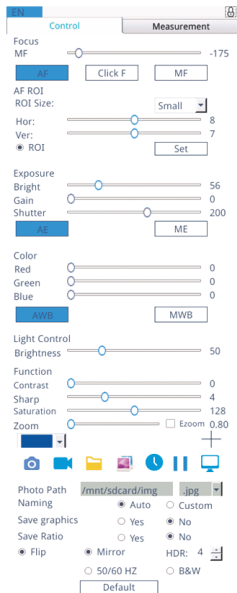
#### 2 Camera:



1 Introduction to Software Functions:

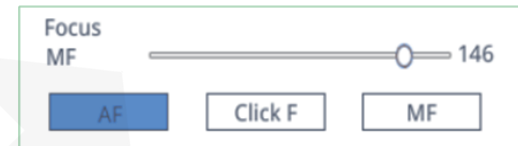
- ◆ Real time magnification displayed in the upper right corner of the display screen;
- ◆ Mouse click zoom/ Zoom out icon to change magnification;
- ◆ Digital keyboard connection with USB interface to control software functions.

2 Menu interface:



- ◆ Click the lock icon in the upper right corner of the menu to switch the menu display status.

- ◆ The language mode can be selected by clicking the upper left corner of the menu with the mouse. Simplified Chinese, English, Traditional, and Japanese.
- ◆ Focus mode: AF \ Click F \ MF



- ◆ Click "AF" mode, the program judges that the image is blurred and refocuses automatically. Click the "Click F" mode to achieve one-time auto focus with a mouse click. Different focal planes need to click again to focus. Click the "MF" mode and pull the focus progress bar to adjust the focus value. In manual mode, place the mouse on the focus progress bar and scroll the mouse wheel to adjust the focus position.
- ◆ AF ROI: After checking the "ROI", the "ROI Size" can choose the size of the focus frame. Pull the progress bar to adjust the horizontal or vertical position of the focus frame. Focus frame: In the auto focus mode, check the "focus frame", the image display area displays the focus frame, you can click the screen to achieve auto focus. After changing the area size or focus position, click "Set" to be effective.



- ◆ Exposure: Auto \ Manual



- When the "Auto" exposure is checked, the "Brightness" progress bar can be pulled to adjust the brightness. When the "Manual" exposure is checked, the "Gain" progress bar can be pulled to adjust the gain. You can pull the "Shutter" progress bar to adjust the shutter. Reset the default auto exposure.

◆ White Balance: Auto \ Manual

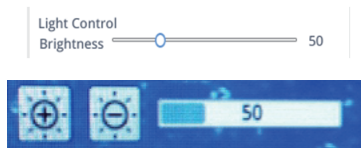
AWB: Realize automatic white balance under different color temperature conditions.

MBW: Pull the "red, green and blue" progress bar to adjust the color value of "red, green and blue".



◆ Light Control: adjust the brightness of the fill light, range 1-200, the default value is 50.

Or adjust the +,-control in the lower right corner of the screen.



◆ Function: Contrast\Sharp\Saturation\Ezoom

Contrast: 0-15 value can be adjusted.The default value is 0;

Sharpness: 0-15 adjustable.The default value is 4;

Saturation: 0-254 value can be adjusted.The default value is 128;

Zoom: click "Ezoom" to zoom in electronically

Or adjust the +,-control in the lower right corner of the screen.



+ : image zoom in - : image zoom out The left side is the optical magnification (0.80-4.76), and the right side is the electronic magnification (1.0-6.0).

◆ Crosshair Tool: Click on the cross line tool , select "cross line", the number of horizontal and vertical lines will be displayed. After the setting is completed, select "Display" and the set crosshairs will be displayed in the image display area. Select "Delete" to not display the crosshairs.



Display crosshairs: In the measurement mode, press and hold the left button to drag the crosshairs.

In the measurement mode, double-click a single cross line to set its color and position, and it can be centered and deleted.

Click the cross line tool and select "cross line the cross line will be displayed in the image area.

Click the cross line tool and select "Hide", and all cross lines or cross tick marks will be hidden in the image area.

Click the Set Cross Line Color Tool and drop down to set the cross line color. After the color is set, draw the crosshair again to take effect, and the color of the crosshair drawn before will not change.

◆ Photograph Operation:First confirm whether the U disk is inserted successfully.

Click the "Capture" icon, it will prompt "input file name", input the file name and click "OK". The icon will be displayed in the center of the screen, and the icon will disappear after about 3 seconds, and the picture will be automatically saved to the fixed path of the U disk.

The photo save path is the fixed path of the camera. Save it in the /mnt/sdcard/img folder of the U disk.

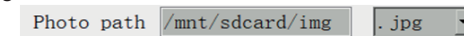


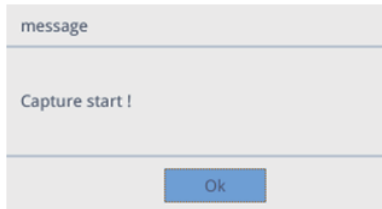
Photo Format:Click the photo format drop-down to select the photo format, there are two formats to choose from. jpg or .bmp.



Naming of Photo:Select "Auto" to name according to time.

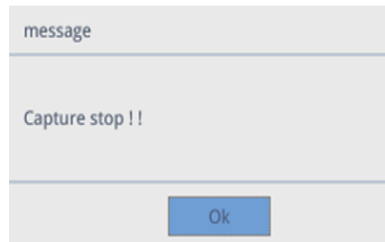
Select "Custom", you need to enter a name to save.





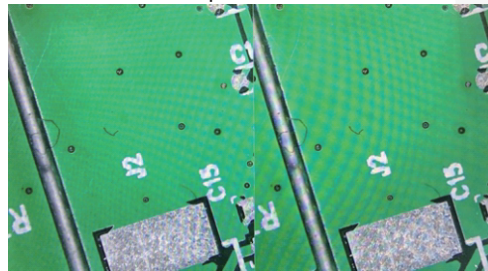
- ◆ Recording: Click the "Video" icon . The interface prompts "Capture start!", click "OK" to start recording.



During recording, a flashing icon  is displayed in the lower right corner of the screen, indicating that the recording is in progress. Click the "Recording"  icon again, the interface will prompt "Capture stop!", click "OK" to stop recording.




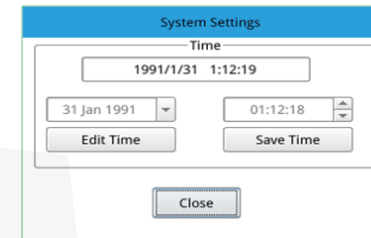
- ◆ Open Picture: Click the "open picture" icon , the interface pops up to select the picture interface. Select the picture you want to open, and pop up the open picture interface.
- ◆ Compare Pictures: Click the "Compare Pictures" icon , and an interface for selecting pictures will pop up. Select the picture to be compared, and the interface for comparing pictures will pop up. The left side of the screen is the real-time video interface, and the right side is the selected picture.






Real-time Picture Compare Picture Comparative images

Note: Comparing pictures, only pictures in bmp format are supported.

- ◆ System Settings  
Click the "time setting" icon , and the time setting interface will pop up.



After clicking "Edit Time", you can click the date drop-down box to set the date. Select the hour, minute, and second that you want to modify, and set the time. After each time setting, you need to click "Save Time" to save successfully. Click the "Close" icon to close the time setting interface.

- ◆ Freeze: Click the "Freeze"  icon to freeze the current image interface. The image window will remain static, which is convenient for observing the measured object. After freezing, the icon becomes frozen . Click the  icon to return to the real-time display interface.
- ◆ Save Graphics: When 'Yes' is checked, the upper-level measurement line will be saved in the photographed picture, and 'No' will not be saved.



- ◆ Save Ratio: When 'Yes' is checked, the magnification information will be saved in the photo, while 'No' will not be saved.



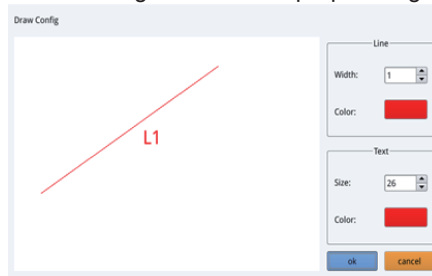
- ◆ Other settings:
  - Check inverted: the vertical direction of the video on the screen is opposite to the actual one.
  - Check Flip, the horizontal direction of the video on the screen is opposite to the actual one.
  - Wide dynamic: 0-10 adjustable. The default value is 4.
  - Anti-screen Flicker: Achieve the anti-screen flicker effect after checking.
  - Black and White Mode: Check the black and white mode, the default is color mode.
  - Default: Click "Default" to restore various parameters to factory settings.

## Detailed Measurement Interface

### Assist Tools

#### ◆ Color Settings:

Click the "color setting" icon . Pop-up setting interface.



#### ◆ Measurement Mode:

After operating the measurement, the measurement mode tool will automatically become selected, and the program will automatically enter the measurement mode. The focus mode and focus area can no longer be operated. You must click the measurement mode tool again with the left mouse button to operate the focus mode and focus area.

#### ◆ FBL:

The sensor in the camera moves up and down the whole distance is 16mm, click "FBL", the sensor will move to the middle position.

#### ◆ Edge Detection:

Click the "Edge Detection" icon and the icon will turn blue when selected. When measuring pictures, it will realize automatic edge finding.

#### ◆ Custom Template:

After drawing the primitives in the image area, click the "New" icon, and the "Warning" window pops up on the interface. Click "OK" to create a new template.

After entering the name in the name window, click the "Save" icon to save the template.

Click the "delete" icon to delete the template;

Click the "Edit" icon to modify the template.

Click the "Save" icon again to save the modified template. If you click the "Return" icon, the modified template will not be saved.

#### ◆ Measurement Operation:

In order to reduce the side volume error, please make the camera par-focus before measuring operation (please refer to Parfocal method). The camera has a calibration-free function, and there is no need to re-calibrate when the magnification changes. However, if the camera has been automatically focused, it needs to be re-calibrated and measured.

#### ◆ Calibration:

Click the calibration tool drop-down icon. There are linear calibration, H-type calibration or circle calibration optional.

Drag the marking line to align with the marking line of the calibration ruler. Then enter the lens magnification value, the actual length between the scales, and select the unit to complete the calibration.

Delete calibration: Click the drop-down calibration list. Select the calibration group to be deleted and click the delete icon to delete the calibration group.

No need to re-calibrate function: the current magnification will be saved during calibration, and the calibration value will change when the magnification changes.

#### ◆ Measuring:

1. The measurement tool includes various stitch measurements. You can choose the appropriate calibration and unit according to the specific application.

2. Then choose the appropriate tool to measure. When measuring, you only need to click the anchor point of the measurement with the mouse. After you click and release the mouse, the measurement data is displayed in the measurement data list area.

3. After the measurement is completed, you can export the data in the measurement data list. Click "Export Data", the data will be automatically saved in the .csv file in the U disk, and the user can enter the file name.

#### ◆ Select Measurement Data:

1. Left-click the data in the measurement data list, and the selected data will be displayed in gray shading. The color of the selected graph in the image display area becomes the inverse of the set color.

2. Double-click the data in the measurement data list with the left mouse button. The selected element data will pop up a dialog box, you can modify the line color, line width and lock the selected element. The locked primitives can no longer be operated.


#### ◆ Graphics Settings:

Double-click the image element in the image area, a dialog box will pop up. You can modify the line color and line width and lock the selected primitives. The locked primitives can no longer be operated.



- ◆ Detailed Data: Double-click the "List Show" icon with the left mouse button, and a detailed data dialog box will pop up. You can view the detailed data of all current measurements.

	name	distance	perimeter	area	angle	radius	width	height	radius
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									

- ◆ Mark Tool: Click the "Text"  icon and draw the position to be marked in the image area. Then enter the annotation content in the pop-up window and press "OK" to complete the annotation.

Please enter the comment content:

Ok Cancel

- ◆ Digital Keyboard Installation: Connect the digital keyboard to the camera's USB port, the indicator light on the digital keyboard will light up, and the keyboard is connected successfully.



- ◆ Take picture: press "Enter" to take photos with one key and the pictures will be automatically saved to the fixed path of the U disk.
- Video: the motor starts recording, click again to end recording.
- Freeze: The current image interface can be frozen and the image window remains static. press "000" again to restore the real-time display interface.
- Manual focus-: reduce manual focus value
- Manual focus+: increase manual focus value
- Zoom+: increase the magnification
- Zoom-: reduce the magnification
- AF/MF: switch to auto focus or manual focus
- FBL: center the camera motor
- Mirror: image horizontal flipover
- Flip: image vertical flipover
- Focus: achieve one-key focus
- Zoom 1、2、3、4、: Long press to save the current zoom value. Press once quickly to return to the previously saved zoom state. 4 groups of zoom values can be saved.
- Brightness+: increase the brightness of the light
- Brightness-: reduce the brightness of the light
- ◆ Parfocal method:
  1. Install an auto focus camera and output images normally. Then open the camera menu and click on the FBL menu item;
  2. Set the optical magnification of the camera to the maximum;
  3. Adjust the focus handwheel to make the image clear, then fix the focus handwheel to lock the working distance;
  4. Gradually reduce the optical magnification of the camera to the minimum value. If the image is clear all the way, the camera is in focus; otherwise, please repeat steps 1-4.