

## 601 Series Borescope

# Operation Manual



Note: Please read the manual before use the equipment.

**601** Series borescope is developed after years of careful study and absorption of advanced technology at home and abroad, independent innovation, research and development. It is portable and ease use, 360° arbitrarily oriented,integrated design, lightweight and portable. 3.5 inch TFT LCD screen, high definition image sensor technology, HD image, with the function of taking video and photographs, probe and protective device corrosion, wear resistance, waterproof and dust proof meets IP67 requirements.

## Copyright Declaration

This specification applies to **601** series products. Copyright owns to our company, and all rights reserved. Without agree, anyone is not allowed to copy, reproduce or translate this specification. The offender will be investigated legal liability.

### Warning:

Due to the continuous updating of product technology, rapid market changes, the editing time is limited. We do not guarantee that there is no error in this manual, so this manual is only for user' s reference, does not provide any form of guarantee. We reserve the right to revise and change the content. For the manual amendment, we have no responsibility and obligation to inform any company or individuals.

## 1, Users Instruction

### 1.1 Use and application

This product is only applied in the real-time detection and analysis for industrial equipment and automobile production and maintenance.

### 1.2 Maintenance and modification

This product has not any spare parts which can be repair by users. Any disassemble, refit or maintenance is not allowed, if damage and losses caused by this, We do not assume any responsibility. The product maintenance is only afforded by our company and the authorized dealers and distributors.

### 1.3 Attentions

- When using this product, please observe the following:
- Prohibit the use of this instrument to observe the body or the animal's body;
- Do not use or store the product on explosive, strong electromagnetic field or with combustible gas, otherwise it may cause fire or explosion;
- Do not use the product to check objects with current carrying, so as to avoid the occurrence of electric shock;
- During the use process, please do not touch the end of the lens, in particular, pay special attention to the use in the high temperature environment, the end of the lens may cause burns;
- Do not watch the LED light source at the end of the lens straightly, avoiding the effect of strong light on the visual acuity;
- Never excessive bending, stretching, twisting, rolling cable, otherwise it may cause cable disconnect, a fire or electric shock accident;
- Long term use of this product will cause the lens to produce stains, resulting in blurred images and the impact of data collection, please use alcohol or acetone to clean the objective lens;
- If there is abnormal in the angle adjustment operation, stop the current operation, and turn off. Then contact the supplier;
- Keep the insert tube away from any liquid, except water, salty water or oil;
- When finish using, please clean the front section of the instrument in time, to prevent corrosion.

## 2, Product brief introduction

### 2.1 Parameters

Replaceable Insert Tube	Users can easily replace the spare insert tube.	
Probe Length	15mm	
Camera Diameter(mm)	Φ6mm	
Camera Material	Titanium alloy	
Camera Pixel	450,000	
Depth of Field	Standard: 10mm ~ 100mm	
Angle of Field	120°	
Image Magnification	4X	
Light Control	7 levels	
Bright/Chroma/ Contrast Ratio Adjustment	0–16 levels	
White Balance	Auto white balance	
Bending Control	360° manual all-way articulation	
Bending Angle	≥160°	
Effective Working Length	1.0m/1.5m	
Insert Tube	Quadruple tungsten-braided tubes	
Protecting Device of Durability	Buffer protection device between the host and wear-resistant tube	
Language	Chinese, English, Russian, Japanese, etc.	
Display	Highlight 3.5 inches TFT LCD	
Display Resolution	640*480	
Image/Video Format	JPEG/AVI	
Image Resolution	640*480	
Host Structure	Handheld Design	
Memory	Standard SD card:8G, Maximum: 32G	
Data I/O port	Micro-USB port、 Video output port	
Probe articulation control	The speed of the probe articulation is controlled by rocker. Release the rocker to complete positioning.	
Waterproof	Camera/Object glass/Tubes:IP67	
Host Working Time	≥4 hours	
Weight	≤0.45kg ( with batteries )	
Power Supply	Rechargeable lithium battery ( dismantlable)	
Battery Capacity	4.2V 2200mAh	
Power Consumption	3W	
Charging Parameters	DC5V, Maximum current:1A	
Warranty Period	Free charge for one year, life-long maintenance.	

## 2.2 Operation Environment (temperature / humidity)

Host System Working Temperature: -10°C~50°C, when 0°C below, the display needs preheating.	
Camera Working Temperature: -20°C~100°C, when °C below, please reduce oriented operation.	
Store Temperature	-20°C~60°C
Relative Humidity	Maximum: 90%, non-condensing

## 3, Operations








- 3.1 Take out the instrument: loosen instrument box lock, while taking out the instrument host, set aside and pay close attention to the probe; avoid colliding the probe and scratching probe lens.
- 3.2 Boot preparation: check whether the insert tube is fully inserted and the screws are fixed well as well as insert SD card.
- 3.3 Insert the endoscope: put the endoscope insert tube gently into the detected device.
- 3.4 Adjust brightness: adjust the brightness of the light source, in order to obtain the appropriate illumination, so that the image can achieve the best effect.
- 3.5 Bending operation: according to the testing need, operate the rocker to control probe bending, in order to observe. The bending motion of the front probe is controlled by rotating the rocker.
  - 1) During the operation, if the rocker suddenly meets larger resistance, or there is any abnormality, please immediately stop using. After adjust the rocker to the middle position, please remove the insert tube carefully from the testing equipment;
  - 2) Please slowly operate the rocker.
- 3.6 Exit: confirm the bending of the insert tube is in a roughly flat position (rocker in the middle position), and then slowly exit.
- 3.7 Use finished: turn off the power switch, put the instrument into the portable box, and put the tube into the tube well.

## 4, Operation guide

### 4.1 Working modes


**601** borescope system mainly has 3 working modes, they are: "real time detection mode", "playback mode", and "system settings mode". When turning on, it enters to the "real time detection mode".

Details of the various modes and the key functions, please refer to the table 1. "button function list".


Button	Name	Real time detection mode	Play back mode	Video play	System setting	Time setting
	On/Off	real time detection/ Image freezing	—	—	—	—
	Upward	—	Upward	—	Upward	Upward
	Return/Playback	photo/ video playback	return	exit	return	exit
	Menu/Ok	enter into menu	—	—	ok	ok
	Downward/ Switch for photo and video	switch for photo and video	downward	—	downward	downward
	LED brightness control	Adjust brightness				
	rocker	control the direction of the probe: up/down/left/right				

( Table1. button function list )


● Real time detection mode:

Under this mode, users can see real-time image taken by the probe; control the probe movement and speed by rocker, lock the position as well as adjust the LED light. Press  button to select photo or video mode.

● Playback mode:

Press  “playback” to view images of JPG files and playback recorded video of AVI files. When in video mode, press this button, the system will enter the video playback mode.

● System setting mode:

In “real time detection mode”, press  will enter system setting mode and set the parameter of the image and system.

## 5, Connect with PC and read the data of TF card

### **Method 1: Read the data directly By PC**

5.1 Take out the TF card and insert into the PC port.

5.2 Click "my computer" to find the removable disk, the file is stored in the removable disk  
G:DCIM1003AABB (AABB is date)

### **Method 2: Connect with PC by USB line.**

5.3 If it is the first time to connect Mechanic Eyes with PC by USB, you need to wait a little longer. Because it needs to be automatically installed with USB drivers. When the two are connected successfully, Mechanic Eyes will enter the PC read mode. Then you can read the data in TF card like Method 1.


5.4 When the machine is in USB mode, please do not pull out the TF card. Otherwise, it will lead to an exception error.

## 6, USB connection

The USB port is used for recharging or connecting with PC. When it is connected with PC, the machine screen will display "memory", "camera" and "charging" three options for users to choose:

1. Select "memory", the PC only has card reader (TF card) function.
2. Select "camera", it means to insert a camera into PC, the Mechanic Eye display interface will be transferred to the PC end, through QQ video and other video features to achieve remote observation of the Internet.
3. Select "charging" it will enter charge mode.

## 7, System Setting

In the "real-time detection mode", press  will enter "system setting mode."

### 7.1 Playback

In system settings menu, you can select the playback of photos or video playback.

### 7.2 Language setting

8 Languages: simplified Chinese, traditional Chinese, English, Russian, French, German, Spanish and Japanese.

### 7.3 Date/Time

Users can set the system display time.

### 7.4 Standby time setting

Users can set the standby time, in order to reduce power consumption.

### 7.5 Auto power off

User can set the auto power off time.



### 7.6 Continuous shooting

According to different needs, users can set single shooting, continuous shot or triple shot mode.

### 7.7 Recording time

Users can set the recording time.

### 7.8 Format

When entering into the format interface, if you press "Yes", all the data in the TF card will be deleted, please be careful to operate.

### 7.9 TV mode

TV mode setting.

### 7.10 Image rotation

Image rotation of 180° setting.

### 7.11 Color adjustment

After entering the color setting interface, the brightness, chroma and contrast can be adjusted.

### 7.12 Factory default setting

Press the button, it will clear the user settings, and restore to the factory default settings.

### 7.13 Version

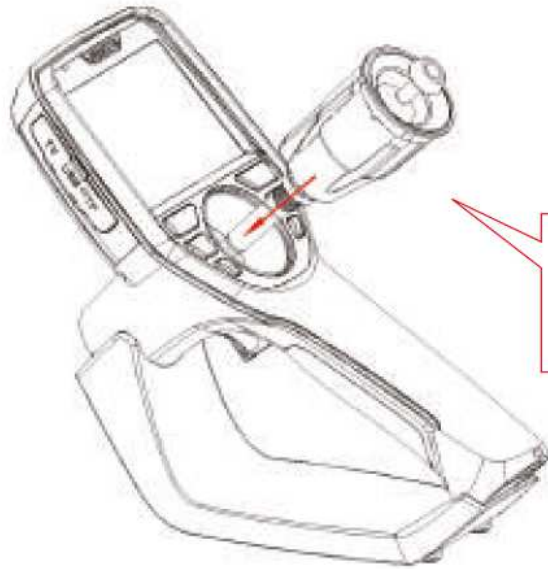
It shows the current system version in the version setting.

## 8, Power off

During normal operation, keep pressing On/Off button for 1 to 2 seconds, it will shut off. It needs to store some system parameters and the image data, which will take a few seconds to finish the power off operation.

## 9, Replace the insert tube

Part 1: Insert tube replacement (inserting).

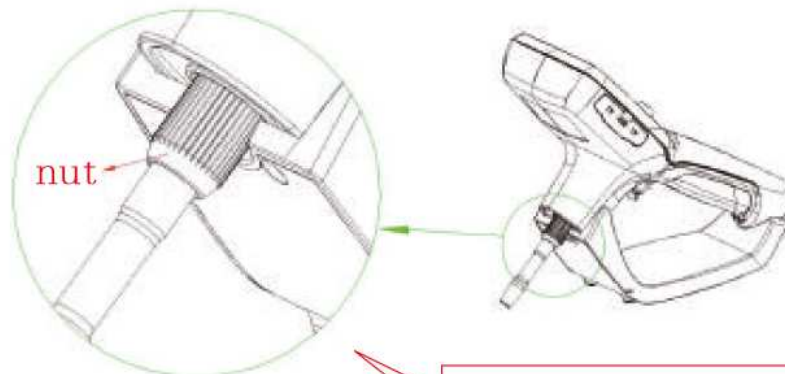


Step 1: Insert the tube from the upper end of the host.

Details:

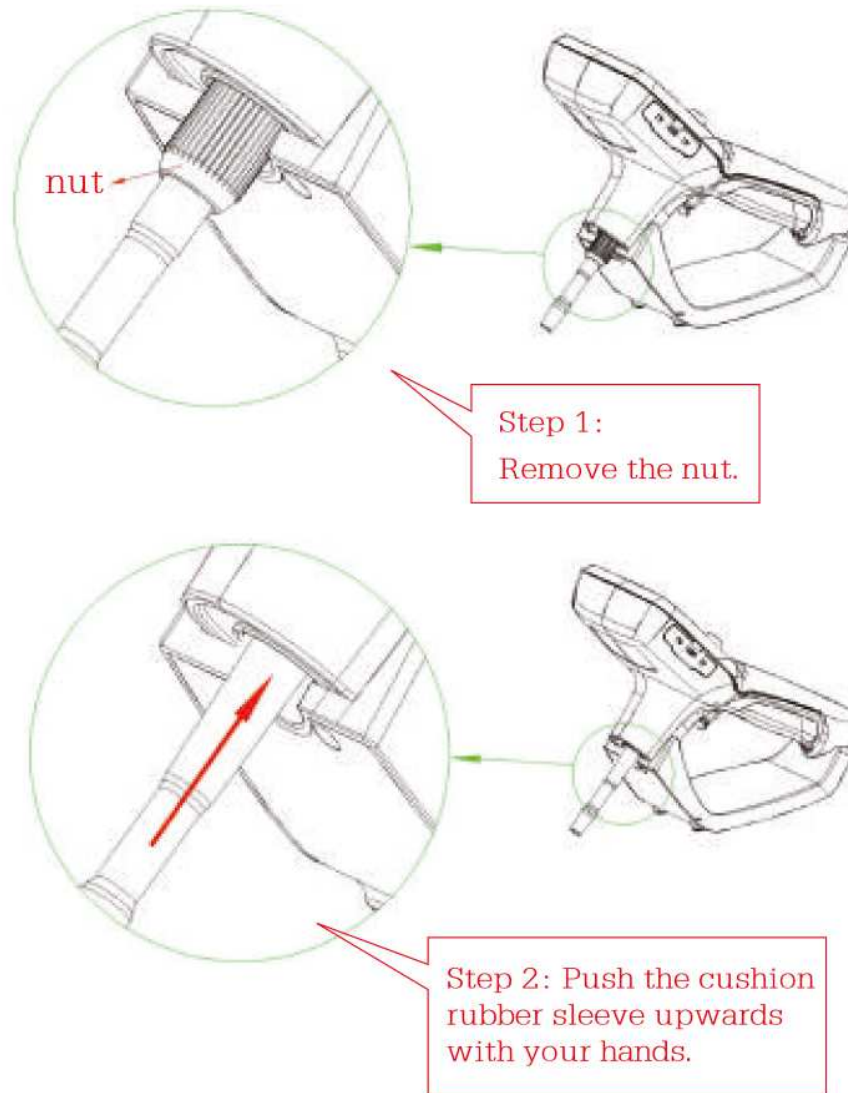


Step 2: Match two semicircles. The two semicircles are actually the same color, in order to better distinguish and understand, we mark two different colors here).



Step3: After insertion, lock the nut tightly to complete the installation.

Part 2: Insert tube replacement (extracting).



**Standard Configuration:**

instrument Case, 601 borescope, battery, card reader, 8G SD card, adaptor, USB line, manual, certificate and warranty card.

**Optional:**

Detachable magnetic base, battery, insert tube and shoulder belt of instrument case.

## 10, Instrument storage

- Please keep the instrument at regular room temperature, keep it clean, dry and stable;
- It is prohibited to store the instrument in high temperature, high humidity, strong light, strong shock, high dust, pollution or corrosive environment;
- Do not collide the instrument with other objects during storage.
- When the product is not in use for a long time, please take out the battery and regularly check the operation of the instrument.

## 11, Solutions to common problems

Problem	Reason	Solution
Boot without reaction	no battery or power shortage	charge or install battery
Auto shutdown	battery power shortage	charge or change battery
Boot screen freezing	system boot failure or battery power shortage	remove the battery to re install and restart or charge
The image cannot be recorded or found	the capacity of TF card is not enough	replace TF card or delete useless files