

# User Guide



## 3 Dimensional Video Microscope

### PCE-MVM 3D

**PCE Deutschland GmbH**

**Please read through the User Manual carefully before use.**

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## Attentions

1. Do not disassemble the equipment without correct guide otherwise faults or errors may happen.
2. High voltage inside, be careful, only a qualified person can open it.
3. The optical lens is preset ready for instant use, disassembly is not recommended.
4. The machine is a sophisticated precise optical instrument, and is damageable, knock and impact is prohibited.
5. Careful operation is required to avoid damage.
6. Do not use the machine under humidity condition.
7. When the top and bottom halogen lamps are working, they may be hot, keep yourself/your skin and inflammable materials away from it to avoid scald or burn or fire.
8. Do not use the machine under oily fuse or dirty conditions.
9. Please pull out the plug when the machine is not in use.
10. Please keep the machine in dry situation when it won't be used within a long time.
11. Please note the parameters of the power supply, do not use other brands' power supply.

To avoid damage during transportation, original package should be used to protect the sophisticated equipment, if lost; quality substitute package is required.

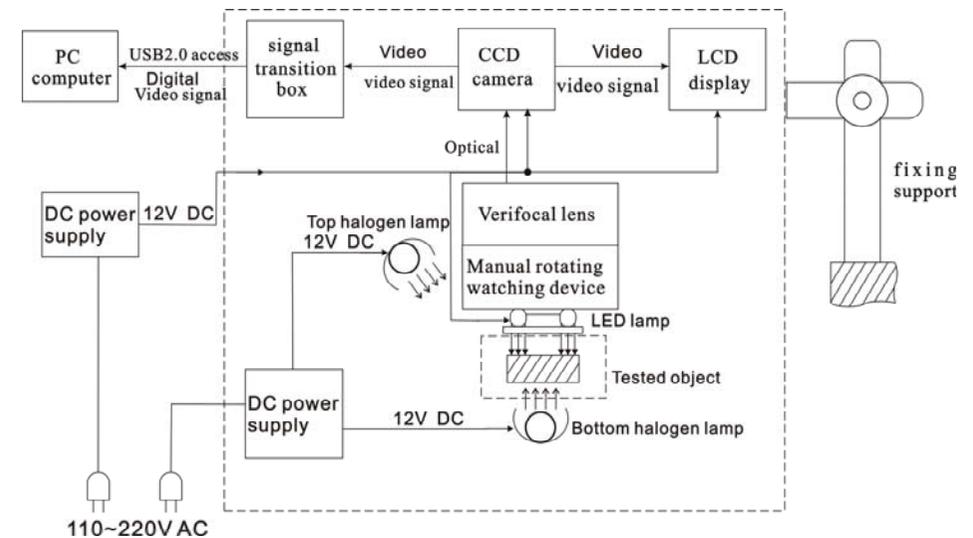
## WARNING

The display is vulnerable and may be damaged forever should its interior parts are changed by any means, to avoid which please let a qualified person to disassemble and fix the machine when faults and dysfunctions happen.

## Introduction

Consisting of motorized rotating watching device, varifocal microscope, CCD camera and LCD; PCE-MVM 3D is a 2/3Dimensional automatic video microscope. Besides, it can be connected to PC via the USB2.0 access, which enables the system more powerful and applicable to wider application range.

## Framework of the microscope system



## Working principles of the video microscope system

A clear picture of tiny object could be seen through the motorized rotating watching device which will reflect the picture to the main optical lens, then, such picture would be grabbed and turned into video signal by the CCD camera, and then, the video signal would turn into a 3D digital picture on the LCD display, meanwhile, the video signal will be transformed in the signal transition box and then sent via the USD2.0 access to the computer for display, picture-grapping, photographing, measuring, saving and printing as

well. The rotating watching device gets a rotating picture of the tested object from an angle of  $45^\circ$ , on the display, the picture will be of 3D effect; Users can get the picture of ideal video effect by turning the zooming ring of the lens section.

### Functions and features

1. Ideal 3D effect pictures for users' comfortable watching without rotating the tested object, eliminating dead watching angle; 2D/normal effect picture/watching is also available.
2. High resolution CCD camera and LCD, provides clear and vivid picture effect.
3. All-in-one integration design, smart size, space saving.
4. Simple and easy to operate, users can get 3D effect picture by just rotating the watching device.
6. With "+" reticle, for measurement and orientation reference.
7. Built-in LED lamp, brightness easy to be adjusted and controlled on the control panel.
8. Double halogen lamp, provide illumination from top & bottom, free lightness adjustment.
9. Rotating watching device with angle of  $45^\circ$  or  $55^\circ$  for choice, observing tiny object from different angles ( $45^\circ$  default)
10. Rotating watching device is controlled by micro motor, turning direction and speed can be adjusted.
11. Optional moving carrier plate, easier to move the tested object.
12. USB2.0 access enables the connection to computer for display, picture-grapping, photographing, measuring, saving and printing etc.

### Application:

Electronics (Micro-electronics), mechanism processing, medicine & biology, metallurgical industry, material analyzing, quality control analysis, jewelry, education and science research, etc.

### Parameters & Specification

1. System magnification: 12X—75X

Remark: System magnification is the ratio of the size of the tested part on the screen to that of the real tested object.

Relevant parameters: magnification of the object lens/CCD ocular, size of CCD lens/display.

2. Reflection angle of the motorized rotating watching device:  $45^\circ$

3. Optical object lens of the microscope system:

Focus of the main optical lens: 0.7X----4.5X

Focus of the CCD ocular: 0.5X

Focus of the entire optical lens: 0.35X----2.25X

Working distance: approx. 30 mm

View range (diameter.) 10X15mm(or 4mmX6mm)

4. CCD camera:

Size of lens: 1/3 inch.

Display chip: Panasonic

Horizontal visual resolution: 700TVL.

Sensitization area: 3.6×2.7 mm

Video output: 1.0Vp-p 75 Ω

Working Voltage: DC 12V

5. LCD display:

Size: 8 inches.

Pixel: 800\*600

Lattice proportion: 0.2535×0.2535 mm

Video input: 1.0Vp-p 75 Ω

Work power: DC 12V (8W)

6. USB2.0 Display card:

Requirements for computer system:

CPU: Pentium III 800MHZ or above

Operating system: Windows 2000 or Windows XP.

Memory: 256MB above.

Hard disk capacity: 500MB above.

USB access: 2.0

Remark: The picture effect will be affected if the PC can not meet the above settings.

7. Electrical index of the built-in LED lamp

Max. Working voltage: DC 12V

Voltage adjustment range: DC 7.5-10.5V

8. Electrical index of the top/bottom halogen lamp

Power: 10W/12V

9. Moving carrier plate (optional)

Moving mode: moving ball navigating rail

Size of the plate: 180X155X26mm

Moving range: X axis: 75mm Y axis: 55mm

Reticle Graduation: 0.1mm

Connecting dia.:  $\Phi 95$

10. Working voltage for the whole machine:

Power supply: 100-240V AC 50/60Hz

Base power supply: 100-240V AC 50/60Hz

11. Physical parameters:

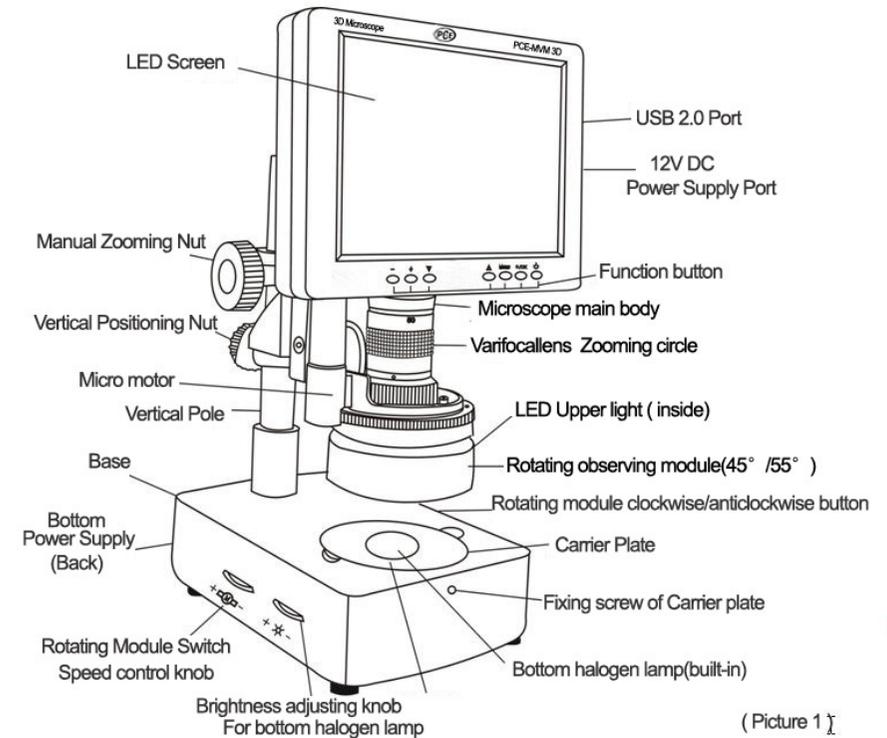
Base size: 255X155X64mm (L x W x H)

Vertical pole height: 250mm

Weight for whole machine: approx. 6kgs

Notes: All the abovementioned parameters are subject to updates without prior notice.

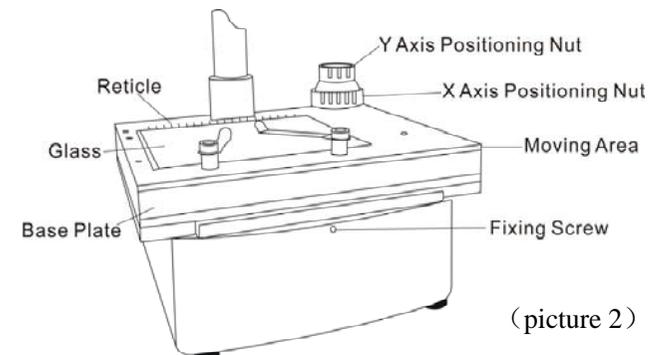
## Instruction of whole machine



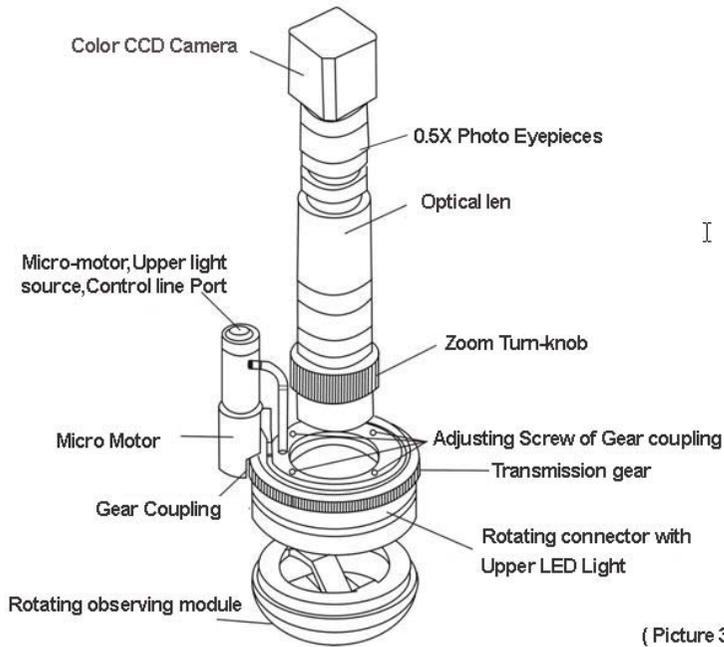
### A. Parts of the whole machine:

### B. Parts:

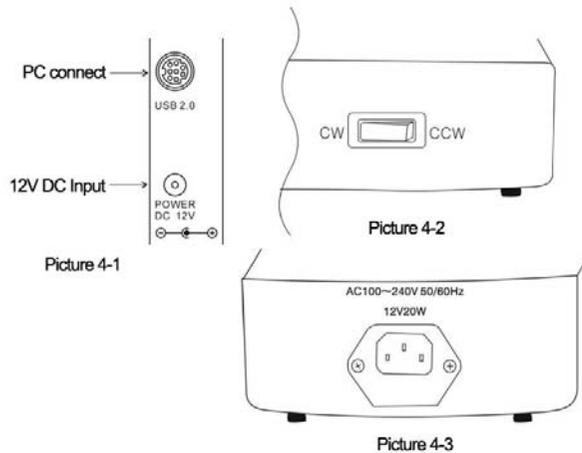
#### B.1. Moving carrier plate (optional)



## B.2. Motorized rotating watching device, main lens, CCD camera



## B.3. PC port、 12V power supply socket



## B.4. Function Buttons:



(picture 5)

- ①: Power on/off button of the LCD display screen
- ②: Power on/off of top halogen lamp/confirming OSD parameters adjustment
- ③: OSD menu; enter into OSD menu, and its items and options.
- ④⑤: Choosing the menu and its item and options.
- ⑥⑦: Adjusting lightness of the top halogen lamp; choosing items and options in the menu.

## Operation and usage

### Installation

- a. set the unit on a smooth and solid working table, place the 3-wire socket in place in the rear side of the unit, then plug into AC power supply outlet.
- b. set the according socket into the “POWER DC 12V” socket and get the unit electrified.

### Turn on/off

- a. press button  to turn on the display
- b. press button  to turn off when the unit is working.

**Attention:** Please pull out the plug cut the power supply when the equipment will not be used for a long time.

### Adjusting

#### 1) Adjust the imaging:

place the tested objects on the carrier palte under the lens, adjust the verifocal to its most magnification, loosen the vertical positioning nut to

adjust the height of microscope and make the distance between the tested object with the surface of lens is around 30mm, and then turn softly the manual zooming nut till get the clearest picture

**Remarks:** the moving carrier plate is recommended to be used to keep the tested object in right center position..Motorized watching device should be not turning when adsjusting,

2) **Adjust the magnification:**

slightly turn zooming circle of the verifocal lens to adjust the magnification.

3) **3D imaging:**

when the suitable magnification is adjusted ready and the clear picture effect shows rotating clockwise or counterclockwise, move the tested object gently, make the rotating picture is in the middle of the screen (moving carrier plate will do more easily). If the picture effect gets worse when rotating, gently turn the zooming circle again to make it better.

**Remarks:** the smaller the magnification is, the wider the view filed of the scope is, on the contrary, bigger view filed for bigger magnification.

4) **Adjusting the motorized watching device:**

The rotating of watching device is controlled by micro-motor.Then rotating direction is controlled by the button on the right side of base.Turn button to “CW” ,it rotates clockwise, Turn button to “CCW”,it rotates anticlockwise;The switch and speed control of watching device is controlled by the button “  ” on the left side of base.

5) **Adjusting the brightness:**

Adjusting brightness of the LED lamp press button “  /OK ” , the correspondent mark appears on the right up corner of the screen , and the lamp is on (direct pressing “+”or “-“ will also turn on the LED lamp). Once the lightness becomes ideal, press button “  /OK ” to

confirm. And press button “  /OK ” again to turn off the LED lamp. Adjusting brightness of the halogen lamps brightness adjusting rings for halogen lamps are in the left side of the base of the unit, turn the corresponding rings to get ideal brightness.

6) **Adjust the parameters of the image & system setting:**

OSD can be adjusted via function buttons. OSD includes “image” and “settings”.” While “image” includes “brightness”, “contrast”, “saturation” and “hue”, users can adjust these parameters at their wills. “Settings” includes “language”, “reticle”, and “reset”.

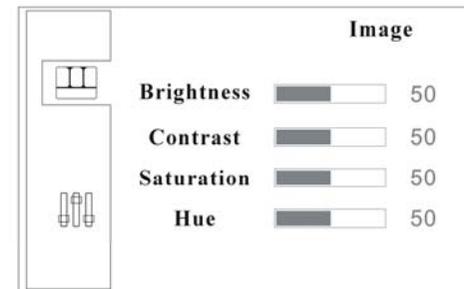
“language”: 9 languages available.

“reticle”: 10mm for a big graduation of reticle while 5mm for a small one. (Notes: the reticle is just for reference only.)

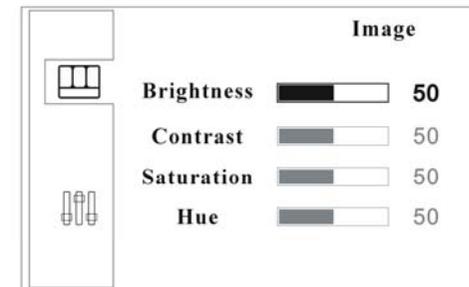
“reset”: recover the factory settings.

**Image adjusting:**

a. press “MENU” to enter into the sub-menu “image”.



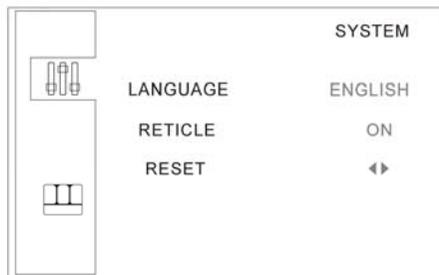
b. press “MENU” again and the option “brightness” is selected and ready for adjustment



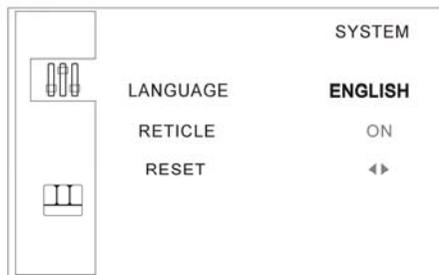
- c. to adjust the brightness, press “+” or “-“, to activate other options, press “▽” or “△” to select.
- d. once the options is selected, press “+” or “-“ to adjust.
- e. when adjustments finish, press button “⚙️/OK” to confirm and exit.

**System “settings”:**

- a. press “MENU” to enter into the sub-menu “image”.
- b. press “▽” or “△” to enter into sub-menu “settings”.



- c. press ”menu”, then option “language” is selected and ready for adjustment.



- d. to change the language, press “+” or “-“.
- e. to select “reticle”, press the button “▽”, then the options “on” “off” are selected, press “+” or “-“ to activate or close “reticle”.
- f. to recover the factory settings, press “▽” or “△” to select the option “reset” thus “◀▶” is ready for choice, then press “+” or “-“ to recover or exit the factory settings.
- g. when adjustments finish, press button “⚙️/OK” to confirm and exit.

**Installation of the USB2.0 access driver and the operation processes:**

For installation steps, please refer to “Installation manual of the USB2.0 access driver”.

**Errors and dysfunctions diagnosis/analysis:**

**1. Vague image:**

Generally results from the improperly adjusted working distance or the lens focus, please re-check and make sure the working distance is approx 30mm as required.

**2. Image is dim, unclear, colorless, red, and with “snow stains”:**

Generally results from weak lightness/brightness, please adjust lightness/brightness properly strong.

**3. Image is too white:**

Generally results from strong lightness/brightness, please adjust lightness/brightness to a properly extent.

**4. Image with white spot:**

Generally results from refraction of the light beam from the tested object, please adjust the light incidence and the lightness/brightness to a properly extent. Normally, scattering light is a better mean of illumination.

**5. Malfunction of rotating watching device**

The rotating watching device is driven by micro-motor. Normally if it is not working that is not rotating. The reason may be mechanical error or electrical failure.

When the watching device is not rotating, please check it carefully and find the reason. Observation: Incline the unit, watch the small gear of micro-motor is turning, if it is turning, mean the gear coupling between small gear and big gear is too loosen. Listening: if you can hear some noise from the inside of micro-motor, it mean the gear coupling between small gear and big gear is too tight. The mechanical part after transportation or long time using, it may cause the gear coupling is too tight or loosen. when it happens, need to loosen the adjusting screws of gear coupling, then switch on motor, let the watching device rotating, then tight the four screws. If it still not works, please check electrical parts.

The motor work at 12V DC, power supply from the bottom base, when motor not working, first check if the power supply to motor is normal or not, then check the power cable and socket. Usually there is little possibility

of motor damage. The bottom light use same power supply as the motor, so can check the bottom light power to check if power supply is normal or not.

#### **6. No image on the video microscope screen:**

This may result from many factors, among which the most common two are display screen dysfunction and signal dysfunction. When this happens, first, check whether the power supply system is properly working or not; open the top cover of the machine, if the indicator of CCD camera is on, it means the power supply system is all right, then the below procedures should be followed:

- (1) Display screen dysfunction: Normally, if the display screen is OK, press button ①, the caught image or the two-second “no signal” indication should be on the screen, otherwise display screen dysfunctions can be deemed affirmative.
- (2) No signal dysfunction: When no signals are sent to the display, the backlight of the display screen will be off even it is power on, so no image appears on the screen. When this happens, please check the pass through which the signals are transmitted. Normally, the ocular microscope is deduced to be ok without outside force, and if the video signal transmitting wire is ok, then CCD camera will be considered to arise.

#### **Attention:**

- ① If any dysfunction happens to CCD camera or display screen, please contact the supplier for repair.
- ② Please take care of the power supply voltage, wire polarity and the video format, if users want to change the CCD camera by themselves.

#### **6. No image on computer screen:**

When the screen of the video microscope goes well, but still no image appears on computer, please check whether the computer works well or whether the system of the machine and the computer is properly connected or not, if affirmative answer comes, then the display card dysfunction is deemed to arise.

**Note: High voltage inside, take care, please make sure the electricity is cut off when checking.**



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