

# User Manual

Inspection Camera PCE-VMM 100



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski, русский, 中文) can be found by using our product search on: [www.pce-instruments.com](http://www.pce-instruments.com)

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## Contents

<b>1</b>	<b>Safety notes .....</b>	<b>1</b>
<b>2</b>	<b>Technical specifications .....</b>	<b>2</b>
<b>3</b>	<b>Delivery contents .....</b>	<b>2</b>
<b>4</b>	<b>Device description .....</b>	<b>3</b>
<b>5</b>	<b>Start-up .....</b>	<b>6</b>
<b>6</b>	<b>Control menu description .....</b>	<b>7</b>
<b>7</b>	<b>Operation .....</b>	<b>10</b>
<b>8</b>	<b>Troubleshooting .....</b>	<b>11</b>
<b>9</b>	<b>Cleaning .....</b>	<b>11</b>
<b>10</b>	<b>Contact .....</b>	<b>12</b>
<b>11</b>	<b>Disposal .....</b>	<b>12</b>

## 1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, ...) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the meter to corrosive media.
- Do not operate the microscope in environments with a lot of dust.
- Do not expose the device to shocks, strong vibrations or strong magnetic fields.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The device must only be used with accessories from PCE Instruments or equivalent.
- If the wrong mains adaptor is used, fire or electric shocks can occur.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- Install the video microscope on a solid and flat surface. Do not place it on a surface that deforms easily to prevent the microscope from falling over as the lamp can get hot and cause a fire when in contact with certain materials.
- When the microscope gets hot or if smoke or odour occurs, unplug it immediately to avoid fire or getting burnt. Contact PCE Instruments for advice.
- Keep the power cord away from the microscope's light source to avoid melting of the cable insulation which can cause electric shock.
- Make sure the earth terminal of the microscope is firmly connected.
- Do not touch the lens with sharp objects.
- When not in use, remove the power supply from the microscope itself as well as from all of its parts.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.



## 2 Technical specifications

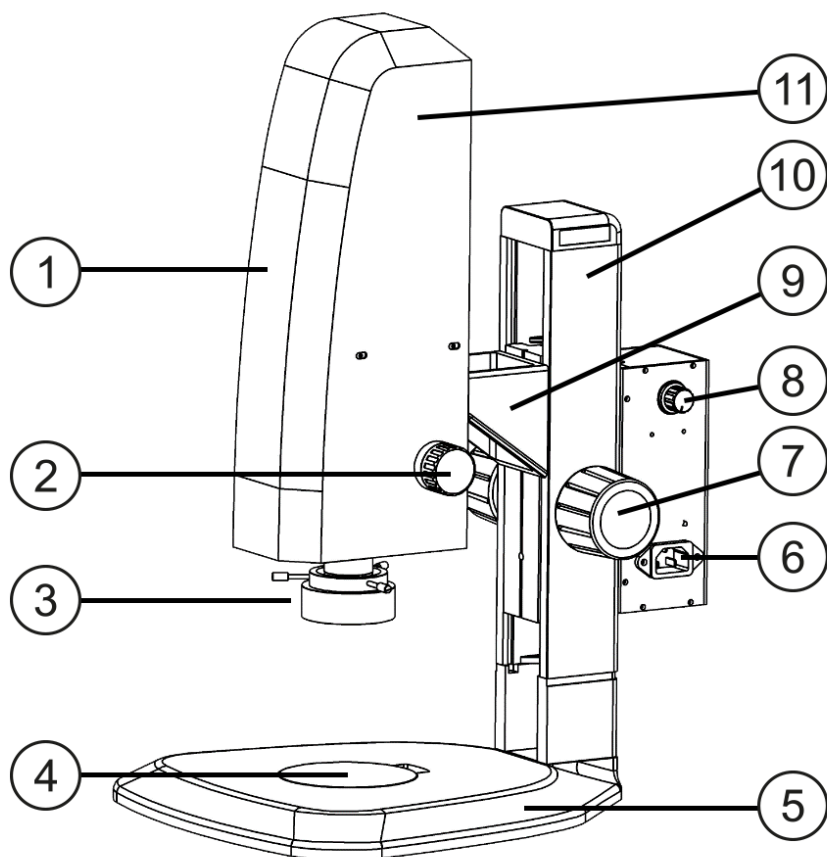
Digital zoom	1x ... 50x
Optical lens	0.7x ... 4.5x horizontal zoom lens
	Zoom ratio: 6.5:1
	0.5x C-mount camera adapter
Camera parameters	Resolution: 1920 x 1080 pixels
	Frame rate: 60 fps
Camera functions	Autofocus, image and video recording
	HDMI output
	White balance, brightness control, digital noise reduction
Microscope stand	Z-axis travel: 100 mm / coarse lifting via focusing knob
Power supply	AC 90 ... 240 V, 50 ... 60 Hz
Dimensions	375 x 285 x 500 mm
Weight	6.5 kg

## 3 Delivery contents

- 1 x microscope PCE-VMM 100
- 1 x power cord
- 1 x HDMI cable
- 1 x USB mouse
- 1 x LCD screen
- 1 x user manual

## 4 Device description

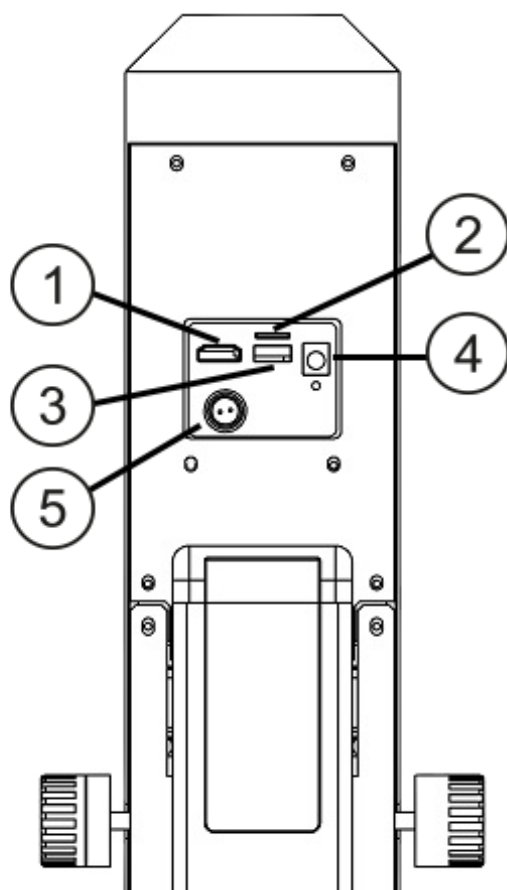
### Front view



- 1 Microscope camera
- 2 Magnification
- 3 Light source
- 4 Specimen stage
- 5 Base
- 6 AC outlet

- 7 Coarse drive
- 8 Light adjustment knob
- 9 Bracket
- 10 Microscope stand
- 11 Housing

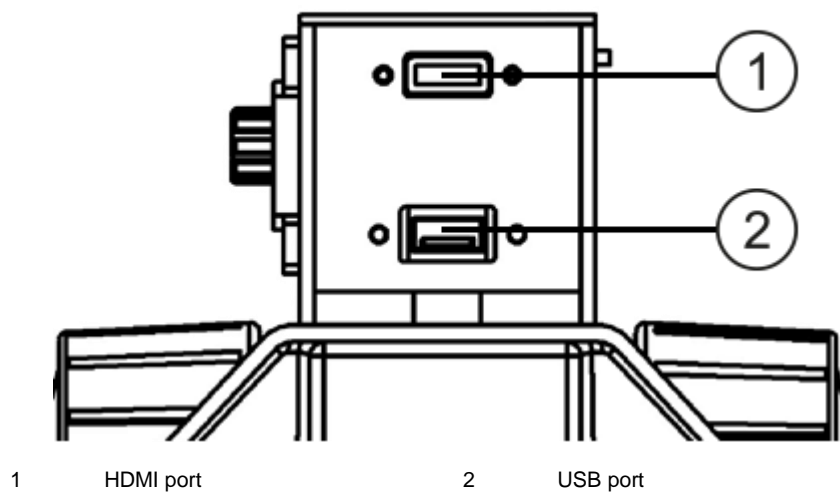
# Rear view



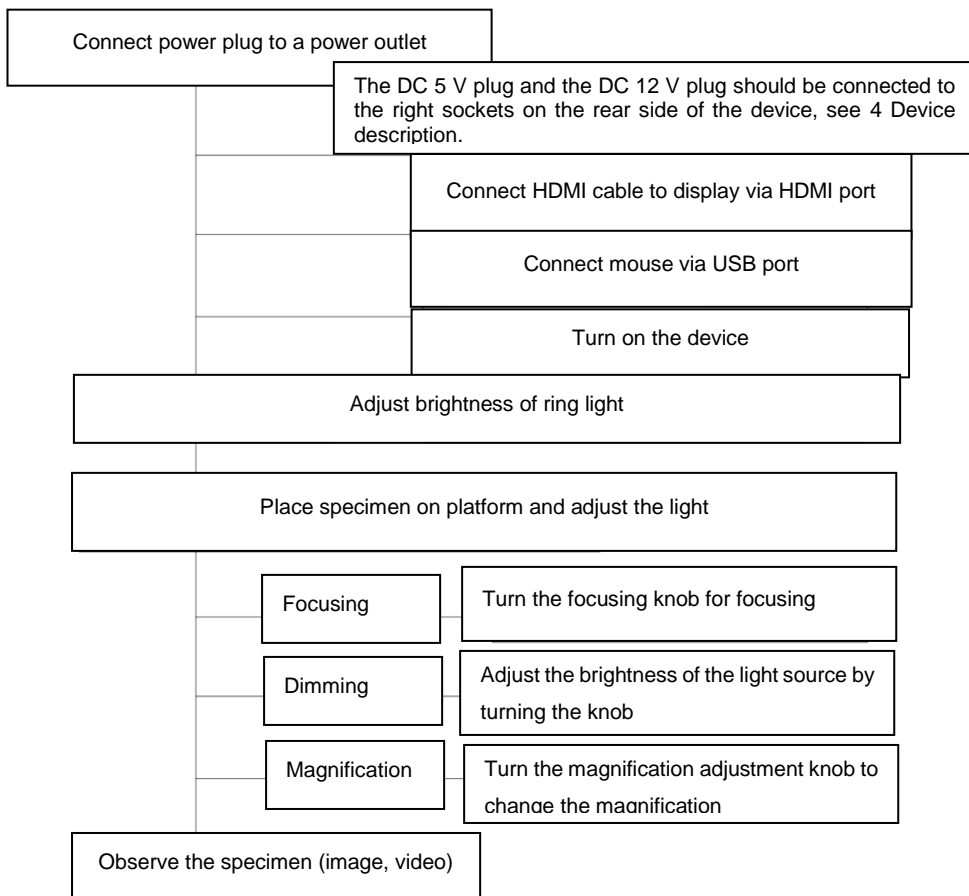
- 1 HDMI port
- 2 Memory card slot
- 3 USB port

- 4 DC 5 V
- 5 DC 12 V

# Bottom view

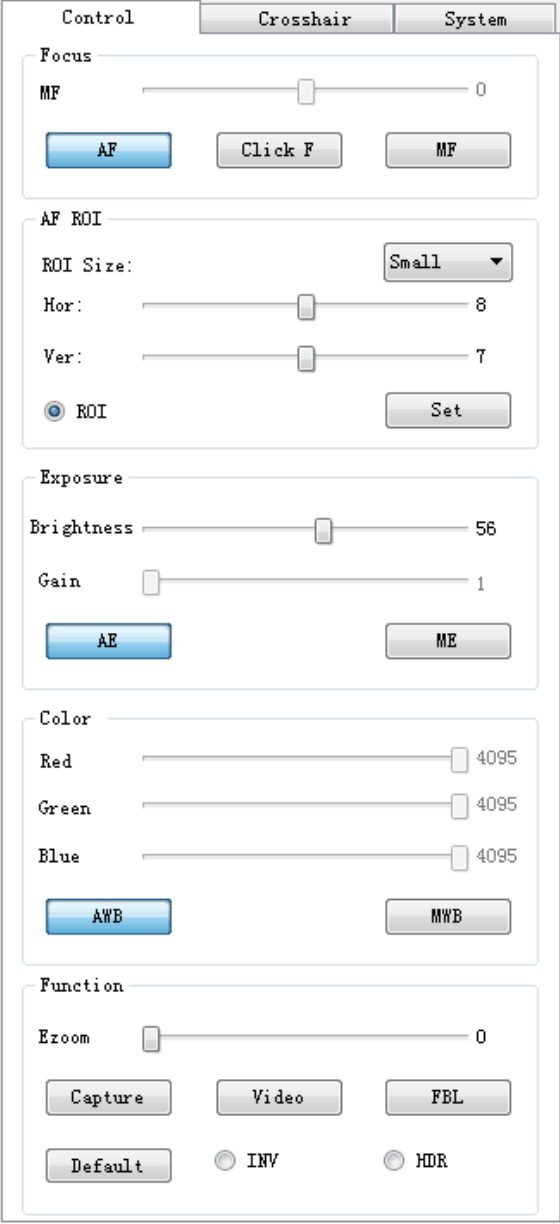
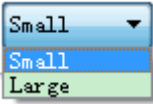


## 5 Start-up





## 6 Control menu description

	<p><b>Focus</b>  <b>AF:</b> Autofocus  <b>Click F:</b> One-click focus  <b>MF:</b> Manual focus; adjustment of focusing motor</p> <hr/> <p><b>AF ROI</b>  <b>ROI:</b> Display focus frame  <b>ROI Size:</b> Select the focus frame size</p>  <p><b>Hor/Ver:</b> Set the focus frame position (horizontal / vertical)  <b>Set:</b> Save settings</p> <hr/> <p><b>Exposure</b>  <b>AE:</b> Automatic exposure; adjustment of brightness  <b>ME:</b> Manual exposure; adjustment of gain</p> <hr/> <p><b>Color</b>  <b>AWB:</b> Automatic white balance  <b>MWB:</b> Manual white balance; adjustment of RGB color value</p> <hr/> <p><b>Function</b>  <b>Flip:</b> Image mirroring along horizontal centre line  <b>Mirror:</b> Image mirroring along vertical centre line  <b>HDR:</b> Setting dynamic range  <b>Ezoom:</b> Set digital magnification  <b>Capture:</b> Image  <b>Video:</b> Video  <b>FBL:</b> Flange back length  <b>Default:</b> Default</p>
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Control Crosshair System

**Group 1**

Hor1:  

540

Ver1:  

960

**Group 2**

Hor2:  

1

Ver2:  

1

**Group 3**

Hor3:  

1

Ver3:  

1

**Group 4**

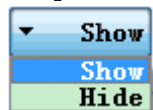
Hor4:  

1

Ver4:  

1

The crosshairs are divided into four groups, each group having two lines (Hor/Ver).



The lines can be displayed or hidden.

Set the line position by moving the slide bar.



Click on one of the color patches to change the color. There are nine colors to choose from.

**Default:** Default


**Center:** Only the "Group 1" lines are displayed in the center

**Save:** Save settings

Control	Crosshair	System
<div>Time</div> <div>2017/4/24 10:39:23</div> <div><div>24 Apr 2017 ▼</div><div>10:39:20 ▲▼</div><div>Edit Time</div><div>Save Time</div></div> <div>Information</div> <div>Version: V 2.2.0</div>		

Click "Edit Time" to select the date on the left-hand side and the time on the right-hand side. Then confirm by clicking "Save Time".

## 7 Operation

1. In "AF" mode, the program will automatically re-focus whenever the image is fuzzy. In "Click F" mode, the AF ROI range is focused and the focus will be locked, which means that if you change the sample, the system will not re-focus unless you click on "Click F" again. In "MF" mode, you can manually adjust the motor position within a range of -200 ... 200, by moving the slide bar.
2. In some special scenarios (such as smooth surface), auto focus may not work properly. In this case, focus the edge of the object by using the "Click F" function in order to lock the focus. If this is not sufficient, enter "MF" to manually re-focus the sample.
3. By using the "AE" function, you can adjust the brightness (0 ... 100, default value: 56). By using the "ME" function, you can adjust the gain (0 ... 50, default value: 1).
4. To ensure correct white balance, target a pure white object with the camera (such as the white standard that comes with the microscope) and set the exposure mode to "AE". With the "MWB" function, you can adjust the RGB color value (0 ... 4095) manually.
5. Via the "AWB" function, you can start automatic white balance.
6. When you click on "Capture", the  icon will appear in the middle of the display, which means that the image is automatically saved to the microSD card as a jpg file.
7. When you click on "Video", a text box will appear. Click on "OK" (Capture start) to start recording. Click on "Video" and then on "OK" again (Capture stop) to stop recording and automatically save the video to the microSD card in H.264 format.
8. After completing the capture / recording operation, wait for some time before you remove the microSD card.
9. When the image / video is saved, the folder is named by date and the file is named by time.
10. When the lens sharpness needs to be corrected, the FBL function can be used. The focus will then have to be adjusted manually.

## 8 Troubleshooting

No.	Problem	Cause	Solution
1	<ul style="list-style-type: none"> <li>- Poor visibility</li> <li>- Image not clear</li> </ul>	<ul style="list-style-type: none"> <li>- Dirt on lens</li> <li>- Focus not correct</li> </ul>	<ul style="list-style-type: none"> <li>- Clean lens (see 9 Cleaning)</li> <li>- Adjust focus</li> </ul>
2	Power light does not light	Power supply connection is bad	Check the power connections
3	No image on the monitor	VGA cable not or not properly connected	Check the VGA cable connection
5	Stiff focus adjustment	Focusing knob locked too tightly	Loosen focusing knob slightly

In case of any other problem, please contact PCE Instruments.

## 9 Cleaning

- When cleaning lens, gently wipe with a microfibre cloth. When removing fingerprints, use rubbing alcohol to wipe the surface.
- Do not use any solvents to clean the microscope, except for the lens. To clean the non-glass parts, use a soft cloth without lint, moistened with a small amount of neutral detergent.



## 10 Contact

If you have any questions, suggestions or technical problems, please do not hesitate to contact us. You will find the relevant contact information at the end of this user manual.

## 11 Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.



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