



**Contents** [ [hide](#) ]

- [1 PCE Instruments PCE-DM 3 Digital Multimeter](#)
- [2 Specifications](#)
- [3 Introduction](#)
- [4 Safety Instructions](#)
- [5 Instrument Description](#)
- [6 Operation Instructions](#)
- [7 Technical Indicators](#)
- [8 Instrument Maintenance](#)
- [9 FAQs](#)
- [10 Documents / Resources](#)
  - [10.1 References](#)



## PCE Instruments PCE-DM 3 Digital Multimeter



## Specifications

- **Product Name:** PCE-DM 3 Digital Multimeter
- **Type:** Handheld large-screen digital display smart multimeter
- **Advantages:** Fast measurement data, large-screen LCD dual display, overload protection, battery undervoltage indication
- **Usage:** Suitable for professionals, factories, schools, hobbyists, and families
- **Overvoltage Standard:** CAT III 1000V

## Notice to user

- Please read this instruction manual and operation instructions carefully, Follow the instructions in the manual, In order to make the detector function fully.
- Please keep this manual.
- Don't use this equipment in a flammable and explosive environment.
- Replaced used batteries and discarded instruments cannot be disposed of with household waste . Please handle according to relevant national or local laws.
- When there are any quality problems with the instrument or questions about using the instrument. You can contact PCEInstruments' online customer service.

## Introduction

This product is a handheld, large-screen digital display smart multimeter. It has the

advantages of fast measurement data, a large-screen LCD dual display, lighting, and easy reading by users. It has functions such as overload protection and battery undervoltage indication. Whether it is used by professionals, factories, schools, hobbyists, or families, it is a rational choice for the multi-function instrument. It belongs to secondary pollution, and the overvoltage standard is CAT III 1000V.

## **Safety Instructions**

When using this instrument, the user must follow all standard safety procedures regarding:

1. Safety regulations to prevent electric shock
2. To ensure your safety, please use the test pen provided with the meter. To ensure your personal safety, use the test pens provided with the meter. Before use, check and make sure they are in good condition.

## **Safety Precautions**

- Use the meter near the equipment with large electromagnetic interference, and the reading of the meter will be unstable, and it may even produce larger errors.
- Do not use when the appearance of the meter or test leads is damaged.
- If the instrument is not used correctly, the safety function provided by the instrument may be invalid.
- Extreme care must be taken when working around exposed conductors or buses.
- It is forbidden to use this instrument near explosive gas, steam, or dust.
- The correct input terminal, function, and range must be used for measurement. The input value must not exceed the input limit value specified in each range to prevent damage to the instrument.
- When the meter is connected to the line under test, do not touch the unused input terminals.
- When the measured voltage exceeds the rms value of 60V DC or 30V AC, be careful to prevent electric shock.
- When measuring with a test pen, place your finger behind the protective ring of the test pen.
- Before changing the range, make sure that the test pen has left the circuit under test.

- For all DC functions, to avoid the risk of electric shock due to possible incorrect readings, please use the AC function first to confirm whether there is any AC voltage. Then, select a DC voltage range that is equal to or greater than the AC voltage.
- Before performing resistance measurement or continuity test, the power supply of the circuit under test must be cut off, and all high-voltage capacitors in the circuit under test must be discharged.
- Do not measure resistance or conduct continuity tests on live circuits.
- Do not put it in an explosive and flammable place when not in use.
- When repairing TV sets or measuring power conversion circuits, be careful of high-amplitude voltage pulses in the circuit under test to avoid damage to the meter.
- This product uses 3.7V/1000mA lithium battery for power supply, and the battery must be correctly installed in the battery box of the instrument.
- When the battery undervoltage symbol appears, please charge it in time. A low battery can cause the meter to read incorrectly, which could result in an electric shock or personal injury.
- In the measurement category, the voltage measurement should not exceed 1000V.
- The case of the instrument (or part of the case | Do not use the instrument when it is removed.

## **Safety Maintenance Habits**

- When opening the case of the instrument or removing the battery cover, the test pen should be pulled out first.
- When repairing the instrument, be sure to use the designated replacement parts.
- Before turning on the instrument, you must disconnect all related power sources, and you must also ensure that you do not have static electricity to prevent damage to the components of the instrument.
- The calibration and maintenance of the instrument can only be returned to the factory for maintenance.
- When opening the case of the meter, it must be noted that some capacitors in the meter still hold dangerous voltages even after the meter is powered off.
- If any abnormality is observed in the instrument, the instrument should be stopped immediately and sent for repair. And make sure that it cannot be used until it passes the inspection.

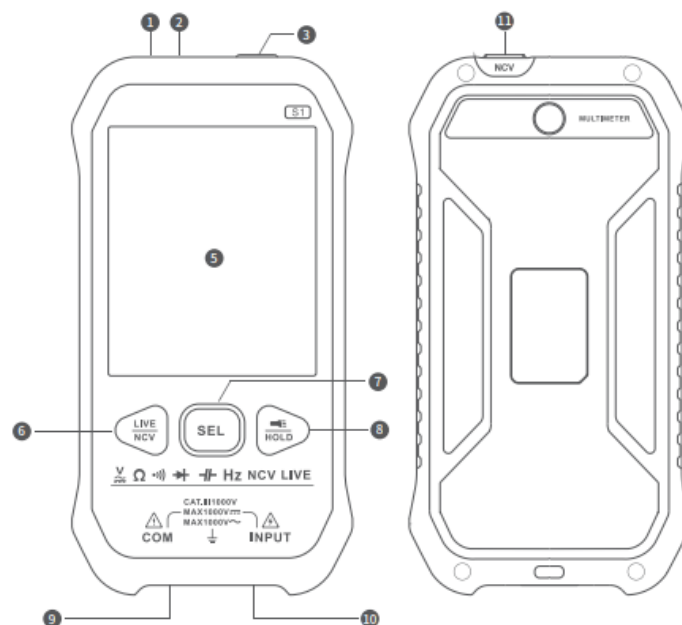
- When not in use for a long time, and avoid storing in places with high temperature and high humidity.

## Input protection measures

- When performing voltage measurement, the maximum input voltage that can be withstood is a DC voltage of 1000V or an AC Voltage of 1000V.
- Can withstand no more than 250V AC voltage or equivalent effective value voltage.

## Instrument Description



1.



Charging port (5V-1A)

2. Charging indicator (red light for charging, green light for full)
3. On/Off Button
4. flashlight
5. LCD Monitor
6. NCV and LIVE buttons
7. SEL button
8. Data hold and flashlight button
9. black test pen input
10. red test pen input
11. NCV sensing area






## Button description

Button	Function Description
	power button
SEL	Function switch button
 HOLD	Data hold button and flashlight
LIVE NCV	NCV function and Firewire function buttons

## Operation Instructions

### Regular operation

Reading Hold Mode keeps the current reading on the display. The reading hold mode can be exited by changing the measurement function gear or pressing the key again. To enter and exit reading hold mode:

1. Short press the  key, the reading will be held and the symbol will be displayed on the LCD HOLD display at the same time.
2. Short-press the “ ” key again to restore the meter to the normal measurement state
3. Long-press press  key to turn on the flashlight, and then long-press it to turn off the flashlight.
3. Press the “ ” key to perform NCV measurement. Press the “ ” key again to enter the live wire (LIVE) measurement.

### Automatic measurement

In automatic mode, AC and DC voltage, resistance, and continuity can be automatically measured.

1. After powering on, it will automatically switch to “AUTO” automatic measurement mode.
2. Connect the black test lead and the red test lead to the COM input jack and the INPUT input jack, respectively.
3. Use the test pen to measure the voltage value, resistance value, and short-circuit point of the circuit to be tested at both ends. (parallel to the circuit under test)
4. At this time, the liquid crystal display will display the corresponding measured voltage value and resistance value at the same time. When measuring DC voltage, the display will show the voltage polarity connected to the red test lead at the same time. If the

measured resistance value is less than 50, the buzzer will issue an alarm sound.





## Note

- Do not measure any voltage higher than 1000V DC/1000V AC to prevent electric shock or damage to the instrument.
- Do not apply more than 1000V DC voltage/1000V AC voltage between the common terminal and the ground to avoid electric shock or damage to the instrument.

**Notice:** When the measured DC voltage is less than 0.75V and the AC voltage is less than 0.75V, the displayed resistance value may appear, because the minimum measurement voltage value of this product is 0.75V, and the minimum AC voltage is 0.75V.

1. When measuring low resistance, in order to measure accurately, please first short-circuit the two test leads to read the short-circuit resistance value of the test leads, and subtract the resistance value after measuring the measured resistance.
2. In the 10M range, it will take a few seconds for the reading to stabilize. This is normal for high resistance measurements.
3. When the meter is open-circuit or the resistance value of the measured object is too large, the display will display “OL”, indicating that the measured value exceeds the range.

## NCV test

Press the key  <sup>LIVE</sup><sub>NCV</sub>, place the top of the meter close to the conductor, if the meter detects AC voltage, the meter will The signal strength o, when the sensed voltage is low, the screen signal will display low: , medium: , high: , and at the same time the buzzer emits alarm sounds of different frequencies.

## Notice

- Even without an indication, voltage may still be present. Do not rely on non-contact voltage detectors to determine whether there is voltage on the line. Probing operations may vary by socket design, insulation thickness and type, etc., influenced by factors.
- When the input terminal of the meter enters the voltage, the buzzer will also sound

due to the existence of the induced voltage. sound.

- Interference sources in the external environment (such as flashlights, etc.) may falsely trigger the non-contact voltage detection.

### **Firewire test**

Press  $\frac{\text{LIVE}}{\text{NCV}}$  press the button twice, the screen displays LIVE, insert the red test pen into the INPUT end, and the red pen into the power socket, the meter displays LIVE, which is the live wire.

### **Diode measurement**

1. After powering on, it will automatically switch to the “AUTO” automatic measurement mode, and then press the SEL key to switch to the diode measurement mode.
2. Connect the black test lead and the red test lead to the COM input jack and the INPUT input jack, respectively.
3. Connect the black test lead and the red test lead to both ends of the object to be tested.
4. If the measured object is a diode, the red and black test leads should be placed on the positive and negative ends of the diode, respectively, and the meter will display the positive bias value of the tested diode. If the polarity of the test leads is reversed or the test points are connected, and the polarity of the tubes is reversed, the meter will display “OL”. In the circuit, a normal diode should produce a forward voltage drop of 0.5V to 0.8V, but the reading of the reverse bias voltage will depend on the change in the resistance value of the other channels between the two test leads.

### **Capacitance measurement**

1. After power on, it will automatically switch to the “AUTO” automatic measurement mode, and then press the SEL button to switch to the capacitance measurement mode.
2. Connect the black test lead and the red test lead to the COM input jack and the INPUT input jack, respectively.
3. Use a test pen to measure the capacitance value of the capacitor to be measured at both ends and read the measured value from the LCD.




## Note

- When measuring large capacitances, it will take some time for the reading to stabilize.
- When measuring polarized capacitors, pay attention to the corresponding polarity to avoid damage to the meter.

## Frequency measurement

1. After power on, it will automatically switch to the “AUTO” automatic measurement mode, and then press the SEL key to switch to the frequency Hz measurement mode.
2. Connect the black test lead and the red test lead to the COM input jack and the INPUT input jack, respectively.
3. Use both ends of the test pen to read the measured value of the LCD.

## Temperature measurement

1. After power on, it will automatically switch to the “AUTO” automatic measurement mode, and then press the SEL key to switch  the measurement mode.
2. Connect the black input terminal of the thermocouple and the red test lead to the COM input jack and the INPUT input jack respectively. Fahrenheit is displayed along with the temperature value.
3. The LCD reads the measured value.


If there is an inductive impedance in the line, there will be fluctuations affecting the test value, or the test data will be inaccurate. It is necessary to disconnect the test, and the correct test data will be obtained.

## Technical Indicators

### Comprehensive indicators

- 1000V CAT. III pollution degree: 2
- Altitude < 2000 m
- Working environment temperature and humidity: 0-40 °C (<80% RH, not considered when <10 °C).
- Storage environment temperature and humidity: -10-60 °C (<70% RH, remove the

battery).

- Temperature coefficient: 0.1 accuracy/°C (<18°C or >28°C).
- Maximum allowable voltage between measuring terminal and earth: 1000V DC or 1000V AC RMS
- Conversion rate: about 3 times / second
- Display: LCD display with a maximum of 9999 counts, which is automatically displayed according to the measurement function unit symbol.
- Overrange indication: LCD will display “OL”
- Battery low voltage indication: When the battery voltage is lower than the normal working voltage, “ ” will be displayed.
- Indication of input polarity: “-” is displayed automatically.
- Power supply: rechargeable lithium battery (3.7V/1000mA) Note: The device is not available in the power-on state, and the display “—”, at this time, unplug the charger and automatically switch to the normal measurement mode.
- Dimensions: 143 mm\*75 mm\*19 mmWeight: about 130g (including battery)

## Accuracy index

- **Accuracy:** soil (reading + word), the warranty period is one year from the date of delivery.
- **Baseline conditions:** ambient temperature 18°C to 28°C, relative humidity not greater than 80%.

## DC voltage

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Range (excluding maximum value)	Resolution	Accuracy
0-10V	0.001V	± (0.8% reading + 3 digits)
10-100V	0.01V	± (0.8% reading + 3 digits)
100-1000V	0.1V	± (0.8% reading + 3 digits)
1000V	1V	± (1.2% reading + 3 digits)

Maximum input voltage: 1000V DC RMS

- Minimum measurement voltage: 0.75VDC
- Press the SEL button to switch the auto range mode in the smart mode

## AC voltage

- 

Range (excluding maximum value)	Resolution	Accuracy
0-10V	0.001V	$\pm$ (0.8% reading + 3 digits)
10-100V	0.01V	$\pm$ (0.8% reading + 3 digits)
100-1000V	0.1V	$\pm$ (0.8% reading + 3 digits)
1000V	1V	$\pm$ (1.2% reading + 3 digits)

Maximum input voltage: 1000V DC RMS

- Minimum measurement voltage: 0.75VDC
- Frequency response: 50Hz-1KHzZ true RMS
- Press the SEL button to switch the auto range mode in the smart mode

## Resistance

- 

Range (excluding maximum value)	Resolution	Accuracy
0-1000 $\Omega$	0.1 $\Omega$	$\pm$ (0.8% reading + 3 digits)
1k-100k $\Omega$	0.01k $\Omega$	$\pm$ (0.8% reading + 3 digits)
100k-1000k $\Omega$	0.1k $\Omega$	$\pm$ (0.8% reading + 3 digits)
1M-100M $\Omega$	0.01M $\Omega$	$\pm$ (1.2% reading + 3 digits)

Overload protection: 250V DC/AC

## Beep on and off

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Function	Range	Resolution	Test Conditions	
•)))	100 $\Omega$	0.1 $\Omega$	Resistance not greater than 50 $\Omega$ Built-in buzzer sounds continuously	Open circuit voltage About 0.4V

Overload protection: 250V DC/AC

## Temperature measurement

Range	Resolution	Accuracy
-20°C-0°C	1°C	± (5.0% reading + 4 digits)
1°C-400°C	1°C	± (1.0% reading + 3 digits)
401°C-1000°C	1°C	± (2.0% reading + 5 digits)
-4°F-32°F	1°F	± (5.0% reading + 8 digits)
33.8°F-752°F	1°F	± (1.0% reading + 6 digits)
753.8°F-1832°F	1°F	± (2.0% reading + 10 digits)

## Capacitance

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Range (excluding maximum value)	Resolution	Accuracy
0-10nF	0.001nF	± (4.5% reading + 5digits)
10-100nF	0.01nF	
100-1000nF	0.1nF	
1μ-10μF	0.001μF	
10μ-100μF	0.01μF	
100μ-1000μF	0.1μF	
1m-10mF	0.001mF	

Overload protection: 250V DC/AC

## Frequency

- 

Range (excluding maximum value)	Resolution	Accuracy
0-10Hz	0.001Hz	± (0.1% reading + 3digits)
10-100Hz	0.01Hz	
100-1000Hz	0.1Hz	
1k-10kHz	0.001kHz	
10k-100kHz	0.01kHz	
100k-1000kHz	0.1kHz	
1000kHz	1kHz	


Input Sensitivity: 1.5V RMS

- Overload Protection: 250V DC or AC Peak(no more than 10 seconds) frequency

measurement

## Diodes

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Function	Resolution	Test Conditions
	0.001V	Forward DC current: about 1mA Open circuit voltage: about 3.2V monitor display diode Approximate value of forward voltage drop

Overload protection: 250V DC/AC

## Instrument Maintenance

- Regularly clean the meter case with a damp cloth and a small amount of detergent; do not use abrasives or chemical solvents.
- Dirty or wet input jacks may affect readings.
- To clean input jacks:
  1. Turn off the meter and unplug all test leads from the input jacks.
  2. Remove all dirt from the jack.
  3. Use a new cotton ball dipped in detergent or lubricant to clean each socket, the lubricant can prevent and moisture related jack contamination.

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## FAQs


### Q: What should I do if the multimeter shows an overload warning?

A: If the multimeter displays an overload warning, stop measurements immediately to prevent damage to the instrument. Check the input voltage and switch to a higher range if needed.

**Q: How can I ensure accurate measurements with the multimeter?**

A: To ensure accurate measurements, always calibrate the multimeter before first use and regularly thereafter. Avoid exposing the multimeter to extreme temperatures or humidity.

## Documents / Resources

	<a href="#">PCE Instruments PCE-DM 3 Digital Multimeter [pdf]</a> Instruction Manual PCE-DM 3, PCE-DM 3 Digital Multimeter, PCE-DM 3, Digital Multimeter, Multimeter
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## References

- [User Manual](#)

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