English

User Manual

PCE-CTI 10 Clamp Meter

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Last change: 27 May 2024
v1.0

Contents

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 device to shocks or strong vibrations.
- 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 appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- 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.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- 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.

2 Specifications

DC voltage		
Measurement range	**Resolution**	**Accuracy**
±600.0 mV	0.1 mV	±(0.8% + 8 digits) of Rd
±6.000 V	0.001 V	±(0.5% + 5 digits) of Rd
±60.00 V	0.01 V	±(0.5% + 5 digits) of Rd
± 600.0 V	0.1 V	±(0.8% + 5 digits) of Rd
±1500 V	1 V	±(0.8% + 5 digits) of Rd
Input impedance: >10 MΩ; overvoltage protection: 1500 VDC / 1000 VAC rms		
Alternating voltage		
Measurement range	**Resolution**	**Accuracy**
0.000 ... 6.000 V	0.001 V	50 ... 60 Hz: ±(1.2 % + 5 digits) of Rd 61 ... 1 kHz: ±(2.5 % + 5 digits) of Rd
0.00 ... 60.00 V	0.01 V	
0.0 ... 600.0 V	0.1 V	
0 ... 1500 V	1 V	
The accuracy refers to 10 ... 100 % of the respective measurement range and one sine wave Input impedance: >9 MΩ; overvoltage protection: 1000 V DC/AC RMS The accuracy of the "PEAK" function is: ±10 % of Rd The response time of the "PEAK" function is: 1 ms		
AC voltage with low input impedance (LowZ)		
Measurement range	**Resolution**	**Accuracy**
0.000 ... 6.000 V	0.001 V	±(3.0 % + 40 digits) v. Rd
0.00 ... 60.00 V	0.01 V	
0.0 ... 300.0 V	0.1 V	
Input impedance: 300 kΩ; overvoltage protection: 1000 VDC / VAC RMS The accuracy refers to 10 ... 100 % of the respective measurement range and one sine wave		
DC and AC voltage (50 ... 1 kHz)		
Measurement range	**Resolution**	**Accuracy**
0.000 ... 6.000 V	0.001 V	±(2.5 % of Rd + 40 digits)
0.00 ... 60.00 V	0.01 V	
0.0 ... 600.0 V	0.1 V	
0 ... 1000 V	1 V	
Input impedance: 300 kΩ; overvoltage protection: 1000 VDC / VAC RMS		
Non-contact voltage verification (NCV)		
Detection range	100 ... 1000 AC/DC	
DC and AC voltage with low input impedance (LowZ)		
Measurement range	**Resolution**	**Accuracy**
0.000 ... 6.000 V	0.001 V	±(3.5 % of Rd + 40 digits)
0.00 ... 60.00 V	0.01 V	
0.0 ... 300.0 V	0.1 V	
Input impedance: 300 kΩ; overvoltage protection: 1000 VDC / VAC RMS		
Direct current		
Measurement range	**Resolution**	**Accuracy**
±60.00 A	0.01 A	±(3.0 % of Rd + 8 digits)
±600.0 A	0.1 A	
±1000 A	1 A	
Overload protection: 1000 A AC/DC		
Alternating current (50 ... 60 Hz)		
Measurement range	**Resolution**	**Accuracy**
0.00 ... 60.00 A	0.01 A	±(2.5 % of Rd + 5 digits)

0.0 ... 600.0 A	0.1 A	
0 ... 1000 A	1 A	
Overload protection: 1000 A AC/DC The accuracy refers to 10 ... 100 % of the respective measurement range and one sine wave The inrush current measurement serves only as a reference		
AC current measurement with flexible current clamp (50 ... 400 Hz)		
Measurement range	**Resolution**	**Accuracy**
0.00 ... 30.00 A	0.01 A	±(3.0 % of of Rd + 5 digits)
0.0 ... 300.0 A	0.1 A	
0 ... 3000 A	1 A	
Overload protection: 1000 A AC/DC The accuracy refers to 10 ... 100 % of the respective measurement range and one sine wave		
Resistance and continuity measurement		
Measurement range	**Resolution**	**Accuracy**
0.0 ... 600.0 Ω	0.1 Ω	±(1.0 % of Rd + 10 digits)
0.000 ... 6.000 kΩ	0.001 kΩ	±(0.8 % of Rd + 5 digits)
0.00 ... 60.00 kΩ	0.01 kΩ	±(0.8 % of Rd + 5 digits)
0.0 ... 600.0 kΩ	0.1 kΩ	±(0.8 % of Rd + 5 digits)
0.000 ... 6.000 MΩ	0.001 MΩ	±(0.8 % of Rd + 5 digits)
0.00 ... 60.00 MΩ	0.01 MΩ	±(2.5 % of Rd + 10 digits)
Continuity test signal tone at: <50 Ω Overvoltage protection: 1000 V AC/DC		
Frequency measurement		
Measurement range	**Resolution**	**Accuracy**
0.00 ... 60.00 Hz	0.01 Hz	±(0.2 % of Rd + 5 digits)
0.0 ... 600.0 Hz	0.1 Hz	
0.000 ... 6.000 kHz	0.001 kHz	
0.00 ... 60.00 kHz	0.01 kHz	
0.0 ... 600.0 kHz	0.1 kHz	
0.000 ... 6.000 MHz	0.001 MHz	
Overvoltage protection: 1000 V AC/DC Sensitivity: >2 Vrms with a duty cycle between 20 ... 80 % and a frequency of <100 kHz >5 Vrms with a duty cycle between 20 ... 80 % and a frequency of >100 kHz		
Duty cycle		
Measurement range	**Resolution**	**Accuracy**
10.0 ... 90.0 %	0.1 %	±(1.2 % of Rd + 8 digits)
Frequency range: 40 ... 10 kHz; pulse amplitude ±5 V with a duration of 100 µs ... 100 mS		
Capacity		
Measurement range	**Resolution**	**Accuracy**
0.00 ... 60.00 nF	0.01 nF	±(3.0 % of Rd + 20 digits)
0.0 ... 600.0 nF	0.1 nF	±(3.0 % of Rd + 8 digits)
0.000 ... 6,000 µF	0.001 µF	±(3.0 % of Rd + 8 digits)
0.00 ... 60.00 µF	0.01 µF	±(3.0 % of Rd + 8 digits)
0.0 ... 600.0 nF	0.1 nF	±(3.0 % of Rd + 8 digits)
0 ... 6000 µF	1 µF	±(3.5 % of Rd + 20 digits)
0.00 ... 60.00 mF	0.01 mF	for reference only
0.0 ... 600.0 mF	0.1 mF	for reference only
Diode test		
Test current	<1.5 mA	
Maximum voltage	3.3 VDC	

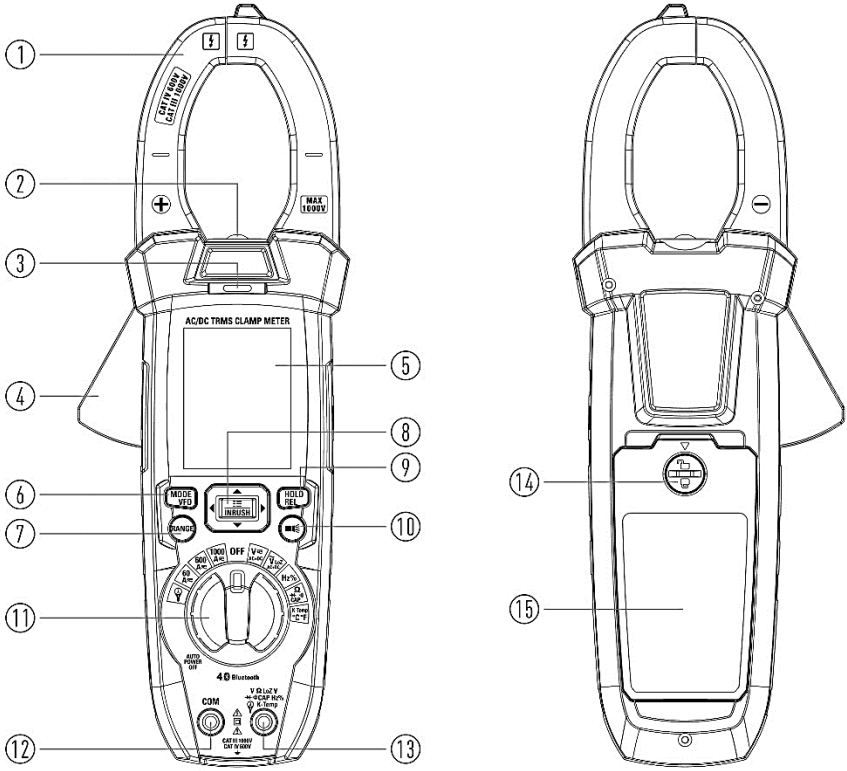
Further specifications	
Memory space	16 groups with a total memory capacity of 100,000 measured values
Clamp diameter horizontal	38 mm / 1.49"
Clamp diameter vertical	63 mm / 2.48"
Clamp aperture	45 mm / 1.77"
Protection class	IP65
Interface	Bluetooth 4.0
Degree of pollution	2
Insulation categories	CAT IV 600 V, CAT III 1000 V, CAT II 1500 V
Maximum working height	2000 m / 6562 ft
Power supply battery	7.4 V, 1200 mAh Li-ion battery
Power supply charger	Primary: 100 ... 240 V AC, 50 ... 60 Hz Secondary: 12 V DC, 2 A
Charger plug connection	Europe, USA, England, China
Battery status display	available
Automatic power-off	off, 15, 30 or 60 minutes
Display	2.36 " TFT
Display frequency	3 Hz
Reference conditions	18 ... 28 °C, 64 ... 82 °F; <80 % RH, non-condensing
Operating conditions	5 ... 40 °C, 41 ... 104 °F; <80 % RH, non-condensing
Storage conditions	-20 ... 60 °C, -4 ... 140 °F; <80 % RH, non-condensing
Dimensions	275 x 100 x 45 mm / 10.8 x 3.9 x 1.7"
Weight	481 g / 16.9 oz

3 Delivery scope

1 x clamp meter PCE-CTI 10
1 x K-type thermocouple with adaptor
1 x pair of test leads
1 x carrying case
1 x battery charging station
1 x rechargeable battery
1 x user manual

4 Device description

No.	Description
1	Current clamp
2	Torch
3	NCV indicator. As soon as this lamp lights up, a voltage has been detected.
4	Lever for opening the current clamp
5	Display
6	"MODE / VFD" key
7	"RANGE" key
8	"INRUSH / Menu" key
9	"HOLD / REL" key
10	Light key
11	Rotary selector switch
12	Connection for test leads (-)
13	Connection for test leads (+)
14	Lock of the battery cover
15	Battery cover



4.1 Key description

The meter has 9 keys which can change their function depending on the set position of the rotary selector switch.

4.1.1 Real keys

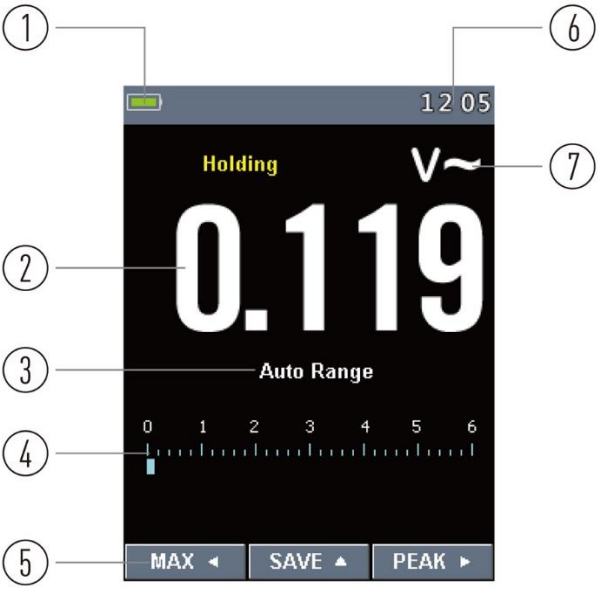
Button	Description
HOLD / REL	- Freezes the display in order to subsequently save the displayed measured value - Sets the measured value in relation
MODE / VFD	- Switching between the individual functions
RANGE	- Manual switching of the measurement range
	- Switching the torch on and off
INRUSH / Menu	- Starting inrush current measurement - Open menu

4.1.2 Virtual keys

The virtual keys are shown on the display. These are actuated by the real arrow keys. The virtual keys change their functions depending on the setting.

4.2 Display description

No.	Description
1	Battery status display
2	Measured value
3	Automatic or manual selection of the measurement range
4	Bar chart in relation to the set measurement range
5	Virtual key
6	System time
7	Unit of meaurement



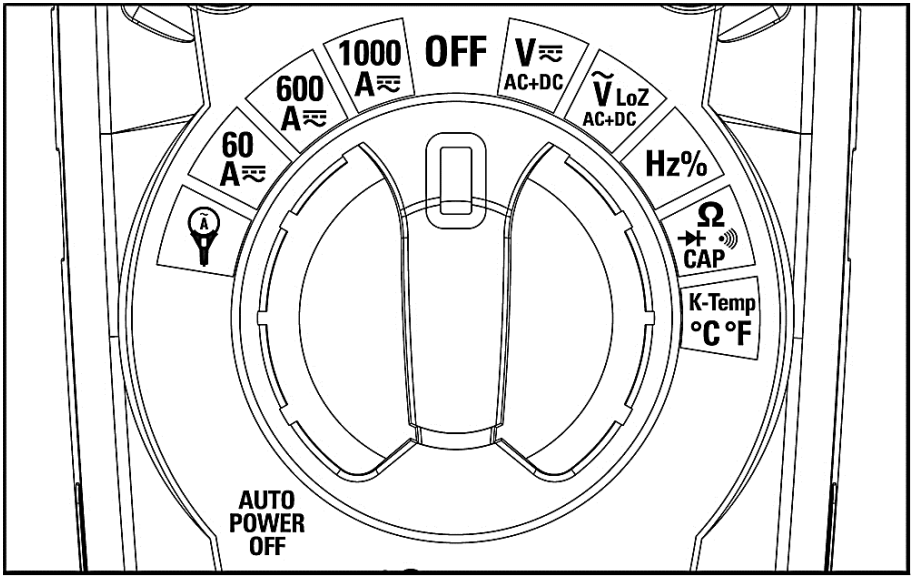
4.2.1 Display symbols

Symbols	Function	Symbols	Function
	Voltage above 30 V AC or DC		Alternating voltage or current
	Warning		Direct voltage or current
	Measurement via the current clamp		Alternating voltage or current with direct voltage or direct current component
	Measurement via the existing current clamp		Continuity test
	Measured value in relation		Diode test
VFD	Function: measurement on a frequency inverter	Ω	Unit symbol for ohm
	Function: inrush current measurement	LoZ	Measurement with low impedance
	Time of the high edge		

4.3 Rotary selector switch

To operate the meter, select the desired function using the rotary selector switch. The meter will switch on immediately. To switch off the meter, set the rotary selector switch to "OFF".

Function	Description
V≂ AC+DC	Direct and / or alternating voltage measurement
V~ LoZ	Direct and / or alternating voltage measurement with low input resistance
Hz%	Frequency measurement and duty cycle measurement
Ω ⊣ •)) CAP	Resistance measurement, diode test, continuity measurement, capacitance measurement
K-Temp °C°F	Temperature measurement
60A	Alternating or direct current measurement up to 60 A
600A	Alternating or direct current measurement up to 600 A
1000A	Alternating or direct current measurement up to 1000 A
	Alternating current measurement with external current clamp up to 3000 A



5 Making a measurement

To carry out a measurement, the meter must be set appropriately for the measurement task before the test leads are connected. Voltage and current peaks can damage the meter. Ensure that the contacts are correctly connected for each measurement. Failure to do so may result in incorrect measurements.

5.1 Voltage measurement

To carry out a voltage measurement, first set the rotary selector switch to V≂ AC+DC. Now connect the test leads to the device. Use the "MODE VFD" key to switch between the direct voltage, alternating voltage, direct and alternating voltage and frequency measurement functions.

5.1.1 Measurements with low impedance

To make a voltage measurement with a low impedance, turn the rotary selector switch to V~LoZ. The "MODE VFD" key can be used to select between the direct voltage, alternating voltage and direct and alternating voltage functions.

5.2 Frequency measurement and duty cycle measurement

For a frequency measurement, turn the rotary selector switch to Hz%. The "MODE VFD" key can now be used to select between frequency measurement and duty cycle.

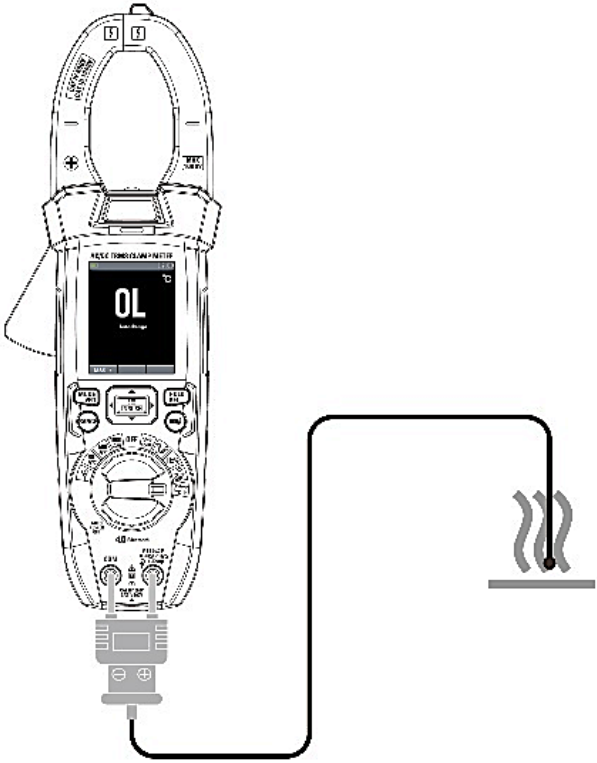
5.3 Resistance, capacitance measurement, diode test and continuity test

To make a resistance or capacitance measurement, a diode test or continuity test, set the rotary selector switch to Ω →+ •)) CAP. The "MODE VFD" key can be used to select between the individual functions.

Note: Make sure that capacitors are discharged before a capacitance measurement. They could be fully charged after a measurement. They must be discharged after a measurement as there is a risk of electric shock.

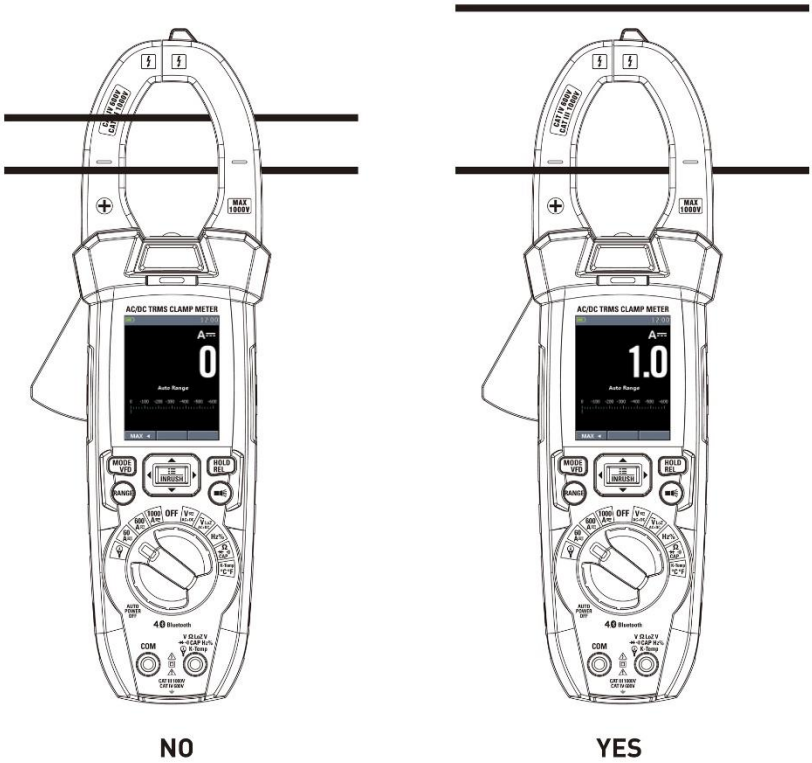
5.4 Temperature measurement

To carry out a temperature measurement, set the rotary selector switch to K-Temp °C°F. Connect the temperature adaptor for thermocouples to the device. Then connect a suitable thermocouple to the adaptor. The measurement is carried out immediately. Use the "MODE VFD" key to select between °C and °F.



5.5 Current measurement

To carry out a current measurement with the current clamp, set the rotary selector switch to one of the current measurement end values. A maximum of 60, 600 and 1000 A are available. The "MODE" key can be used to select between direct and alternating current. Use the "REL" key to set the current in relation to another current. Then place the current clamp around the supply cable to be measured. Make sure that there is only one cable in the clamp.



5.6 Inrush current measurement

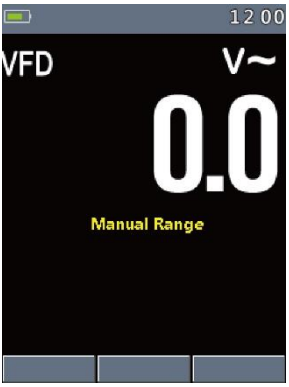
The inrush current measurement is only possible when measuring the current with the fixed current clamp and with an alternating current. To carry out this measurement, press and hold the "INRUSH/Menu" key for at least two seconds. You can then switch on the device under test. The measurement starts immediately and the inrush current is shown on the display.

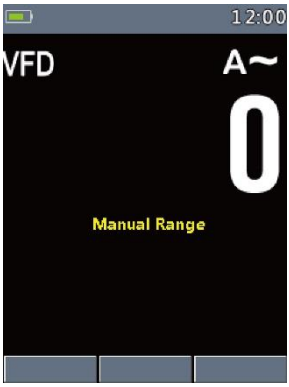
5.7 Current measurement with external current clamp

To carry out a measurement with an external current clamp, set the rotary selector switch to . Then connect the external current clamp to the device and compare the set measurement range to the setting on the current clamp. To set the measurement range of the device, press the "Range" key repeatedly.

5.8 Frequency inverter

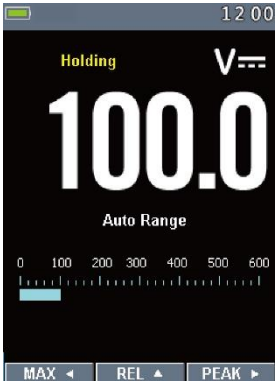
To carry out measurements on a frequency inverter, the function must first be activated by pressing and holding the "VFD" key. You can then carry out measurements on a frequency converter. This function is available for alternating current and voltage.
To exit this mode, press and hold the key again.





5.9 Freeze measured value

To freeze the measured value, briefly press the "HOLD/REL" key once. Press the key again to resume normal measurement. If the value is frozen, the displayed image can be saved using the virtual "Save" key. The screenshots can be recalled and deleted in the "Memory" menu item.



5.10 Highest and lowest measured value

To display the highest and lowest measured values, press the virtual "MAX" key. The highest and lowest measured values are now shown on the display next to the current measured value. To return to the normal view, press the key again.

5.11 Set measured value in relation

To display the measured value in relation, press and hold the "HOLD / REL" key. The current measured value, the measured value set in relation and the base measured value are now shown on the display. To return to the normal view, press the key again.

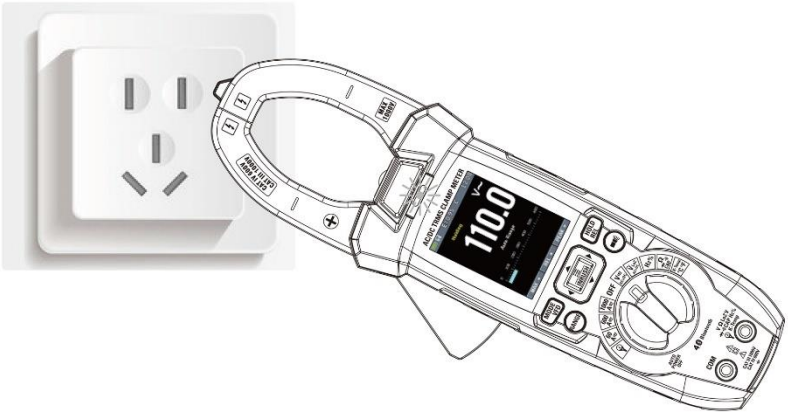
5.12 Peak values

To display the peak value, press the virtual "PEAK" key. The highest and lowest peak values are displayed next to the normal measurement. To reset the display, exit the mode and open it again.

5.13 Non-contact voltage verification (NCV)

To carry out a non-contact voltage check, the device only needs to be switched on. This function is always active. For the test, the tip of the current clamp must be held against the cable, fuse, socket, etc. to be tested. The control LED then signals the presence of a voltage between 100 ... 1000 V.

Note: Insulation, shielding and distances influence the display. Before a measurement, this function should be checked with a known voltage, for example on a supply line. The meter has a sensitive sensor system. External voltage can cause the control LED to light up.



6 Menu

To open the menu to make settings, press the menu key. The arrow keys can be used to select between the individual functions and parameters can be changed. Use the menu key and the right arrow key to open the menu level and apply settings. Press the left arrow key to go back one level.

Menu	Function
Recording	Data recording
Language	Set language
Setup	Further settings
Time/Date	Date and time
Memory	Retrieving screenshots of the "Hold" function
Information	Device information
Factory Set	Reset meter

6.1 Data logger

To start the data logger, go to the "Recording" menu.

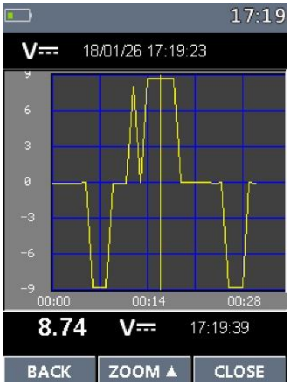
Menu	Function
Start Recording	Recording is started
Recall	Retrieve measured values
Sample Interval	Setting the memory interval
Duration	Storage duration
Memory	Display of the memory space
Delete all Recordings	Delete all measurement data

6.1.1 Start data recording

To start data recording, select "Start Recording" in the "Recording" menu. Recording starts immediately. The appropriate settings for recording should be made in advance.

6.1.2 Retrieve recorded data

To retrieve the saved data, go to "Recall" in the "Recording" menu. The last value is displayed there. Press "Close" to return to the menu. Via "Trend", you can see a graphical history of the last recordings. Use the arrow keys to move to each individual point. Zoom can be used to zoom closer into the graph. If you press the zoom key repeatedly, you will return to the overall view.

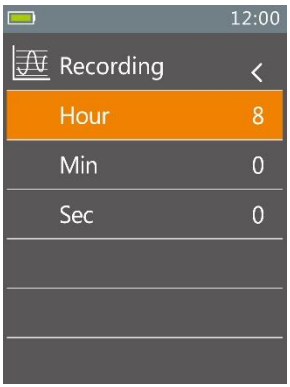


6.1.3 Set storage interval

To set the storage interval, go to "Sample Interval" in the "Recording" menu item. Here, you can set the storage interval in minutes and seconds.

6.1.4 Setting the data logger duration

To set the data logger duration, go to "Duration" in the "Recording" menu item. Here, you can specifically set the duration of the recording.



6.1.5 View memory space

To find out how much memory space is still available, go to "Memory" in the "Recording" menu item. There you can see how much memory space is already in use.

6.1.6 Clear memory

To clear the entire memory, select "Delete all Recordings" in the "Recording" menu item. You will be asked whether you really want to clear the memory. Confirm this if you do.

6.2 Set language

To set the language, go to the "Language" menu. Here you can choose between the specified system languages.

6.3 Settings

To make settings, go to the "Setup" menu.

Menu	Function
Key Sound	Key sound
Bluetooth	Switching Bluetooth on and off
Brightness	Setting the display brightness
Auto Power Off	Setting the automatic power-off time

6.4 Set system time and date

The system time can be set in the "Time/Date" menu item.

6.5 Device information

The current hardware version and firmware version are displayed in the "Information" menu item.

6.6 Call up screenshots

To retrieve the screenshots of the "Hold" function, go to "Memory" in the settings. The screenshots can be called up and deleted from there.
Note: Up to 16 screenshots can be saved.

6.7 Restore factory settings

To reset the meter, select "Factory Set" in the menu. You will then be asked whether you really want to reset the meter. Confirm this if you do.

7 Bluetooth connection

To establish a Bluetooth connection, first download the free "MeterBox Pro" app from the App Store or Play Store. Activate the Bluetooth connection of the clamp meter and your mobile device. Then open the app and connect to the meter via the app.

Note: The connection must not be established via the Bluetooth setting on your mobile end device.

Android

iOS

8 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.

9 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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