OW18 Series Digital Multimeters

User Manual

- OW18A
- OW18B
- OW18D
- OW18E

For product support, visit:www.owon.com.hk/download

※：The illustrations, interface, icons and characters in the user manual may be slightly different from the actual product. Please refer to the actual product.

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Our company warrants that the product will be free from defects in materials and workmanship for a period of 1 year from the date of purchase of the product by the original purchaser from the our company. This warranty only applies to the original purchaser and is not transferable to the third party, and does not apply to fuses, disposable batteries or to any product which has been misused, altered, neglected or damaged by accident or abnormal conditions of operation or handling.

If the product proves defective during the warranty period, our company either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by our company for warranty work may be new or reconditioned like new performance. All replaced parts, modules and products become the property of our company.

In order to obtain service under this warranty, customer must notify our company of the defect before the expiration of the warranty period. Customer shall be responsible for packaging and shipping the defective product to the service center designated by our company, and with a copy of customer proof of purchase.

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1. Safety Information

Safety Considerations

Before any operations, please read the following safety precautions to avoid any possible bodily injury and prevent damage to this product or any other products connected. To avoid any contingent danger, use this product only as specified.

- Limit operation to the specified measurement category, voltage, or amperage ratings.
- **Do not use the multimeter if it is damaged.** Before you use the multimeter, inspect the case. Look for cracks or missing plastic. Pay particular attention to the insulation surrounding the connectors.
- **Do not use the test leads provided for other products.** Use only the certified test leads specified for this product.
- Inspect the test leads for damaged insulation or exposed metal.
- Before use, verify the multimeter's operation by measuring a known voltage.
- Only the qualified technicians can implement the maintenance.
- **Always use the specified battery type.** The power for the multimeter is supplied with a battery. Observe the correct polarity markings before you insert the batteries to ensure proper insertion of the batteries in the multimeter.
- **Check all Terminal Ratings.** To avoid fire or shock hazard, check all ratings and markers of this product. Refer to the user's manual for more information about ratings before connecting to the multimeter.
- Do not operate the multimeter with the cover or portions of the cover removed or loosened.
- **Use Proper Fuse.** Use only the specified type and rating fuse for the multimeter.
- **Do not operate if in any doubt.** If you suspect damage occurs to the multimeter, have it inspected by qualified service personnel before further operations.
- **To avoid electric shock, do not operate this product in wet or damp conditions.**
- **Do not operate in an explosive atmosphere.**
- **Keep product surfaces clean and dry.**
- Do not apply more than the rated voltage (as marked on the multimeter) between terminals, or between terminal and earth ground.
- When measuring current, turn off the circuit power before connecting the multimeter in the circuit. Remember to place the multimeter in series with the circuit.

- When servicing the multimeter, use only the specified replacement parts.
- Use caution when working above 60 V DC, 30 V AC RMS, or 42.4 V peak. Such voltages pose a shock hazard.
- When using the test leads, keep your fingers behind the finger guards on the test leads.
- Remove the test leads from the multimeter before you open the battery cover.
- To avoid false readings, which may lead to possible electric shock or personal injury, replace the battery as soon as the low battery indicator appears and flashes.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.
- **Use the proper terminals, function, and range for your measurements.** When the range of the value to be measured is unknown, set the rotary switch position as the highest range, or choose the auto ranging mode. To avoid damages to the multimeter, do not exceed the maximum limits of the input values shown in the technical specification tables.
- Connect the common test lead before you connect the live test lead. When you disconnect the leads, disconnect the live test lead first.
- Before changing functions, disconnect the test leads from the circuit under test.

Measurement Category

The multimeter has a safety rating of 1000 V, CAT III and 600 V, CAT IV.

Measurement category definition

Measurement CAT I applies to measurements performed on circuits not directly connected to the AC mains. Examples are measurements on circuits not derived from the AC mains and specially protected (internal) mains- derived circuits.

Measurement CAT II applies to protect against transients from energy-consuming equipment supplied from the fixed installation, such as TVs, PCs, portable tools, and other household circuits.

Measurement CAT III applies to protect against transients in equipment in fixed equipment installations, such as distribution panels, feeders and short branch circuits, and lighting systems in large buildings.

Measurement CAT IV applies to measurements performed at the source of the low- voltage installation. Examples are electricity meters and measurements on primary over current protection devices and ripple control units.

Safety Terms and Symbols

Safety Terms

Terms in this Manual. The following terms may appear in this manual:

Warning: Warning indicates the conditions or practices that could result in personal injury or death.

Caution: Caution indicates the conditions or practices that could result in damage to this product or other property.

Terms on the Product. The following terms may appear on this product:

Danger: It indicates an injury or hazard may immediately happen.

Warning: It indicates an injury or hazard may be accessible potentially.

Caution: It indicates a potential damage to the instrument or other property might occur.

Safety Symbols

Symbols on the Product. The following symbol may appear on the product:

	Direct current (DC)		Fuse
	Alternating current (AC)		Caution, risk of danger (refer to this manual for specific Warning or Caution information)
	Both direct and alternating current	CAT I	Category I overvoltage protection
	Ground terminal	CAT II	Category II overvoltage protection
CE	Conforms to European Union directives	CAT III	Category III overvoltage protection
	Equipment protected throughout by double insulation or reinforced insulation	CAT IV	Category IV overvoltage protection

2. Quick Start

General Inspection

After you get a new multimeter, make a check on the instrument according to the following steps:

1. **Check whether there is any damage caused by transportation.**

   If it is found that the packaging carton or the foamed plastic protection cushion has suffered serious damage, do not throw it away first till the complete device and its accessories succeed in the electrical and mechanical property tests.

2. **Check the Accessories**

   The supplied accessories have been already described in the *Appendix A: Enclosure* of this Manual. You can check whether there is any loss of accessories with reference to this description. If it is found that there is any accessory lost or damaged, please get in touch with the distributor of our responsible for this service or the our local offices.

3. **Check the Complete Instrument**

   If it is found that there is damage to the appearance of the instrument, or the instrument can not work normally, or fails in the performance test, please get in touch with the our distributor responsible for this business or the our local offices. If there is damage to the instrument caused by the transportation, please keep the package. With the transportation department or the our distributor responsible for this business informed about it, a repairing or replacement of the instrument will be arranged by us.

Install the Batteries

The multimeter is powered by a 9V (6F22) battery.

Warning: To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the low battery indicator appears.

Before replacing the battery, turn off the meter, disconnect test leads and any connectors from any circuit under test, remove test leads from the input terminals. Use only the specified battery type.

Use the following procedure to install the batteries.

(1) Ensure that the rotary switch is at the OFF position. Remove test leads and any connectors from the input terminals.

(2) Lift the tilt stand and loosen the screws with a suitable Phillips screwdriver and remove the battery cover.

(3) Observe the battery polarity indicated inside the battery compartment, Insert the batteries.

(4) Place the battery cover back in its original position and tighten the screws.

Caution: To avoid instruments being damage from battery leakage, always remove the batteries and store them separately if the multimeter is not going to be used for a long period.

Adjusting the Tilt Stand

Pull the tilt stand outward to its maximum reach (about 85° to the meter body).

Power On

(1) To power ON the multimeter, turn the rotary switch to any other position except **OFF**.

(2) To power OFF the multimeter, turn the rotary switch to the **OFF** position.

Sleep Mode

The multimeter automatically enters the sleep mode if the rotary switch is not moved or a key is not pressed for 30 minutes. (When the Bluetooth is activated, this function is disabled.)

Pressing Select or turn the rotary switch will turn the multimeter back to operation mode from the sleep mode.

One minute before Auto Power-off, the buzzer will beep five times to warn. Before shutoff, the buzzer will emit a long beep, and then the multimeter will shut off.

Note: In sleep mode, the multimeter will still consume a little power. If the multimeter is not going to be used for a long period, the power should be turned off.

LCD Backlight and Flashlight

To implement the test among darkness, you can activate the LCD backlight and flashlight by pressing H for more than 2 seconds. The backlight and flashlight will last for one minute. To turn off manually, pressing H for more than 2 seconds.

Selecting the Range

- Auto ranging is set as default when the meter is powered on, AUTO is displayed.
- When auto ranging is enabled, press Range to enter the manual range mode.
- In manual range, each additional press of Range sets the multimeter to the next higher range, unless it is already in the highest range, at which point the range switches to the lowest range.
- When manual range is enabled, press Range for more than 2 seconds to enter the auto ranging mode.

Note: Manual range is not available when measuring capacitance.

Multimeter in Brief

Front panel

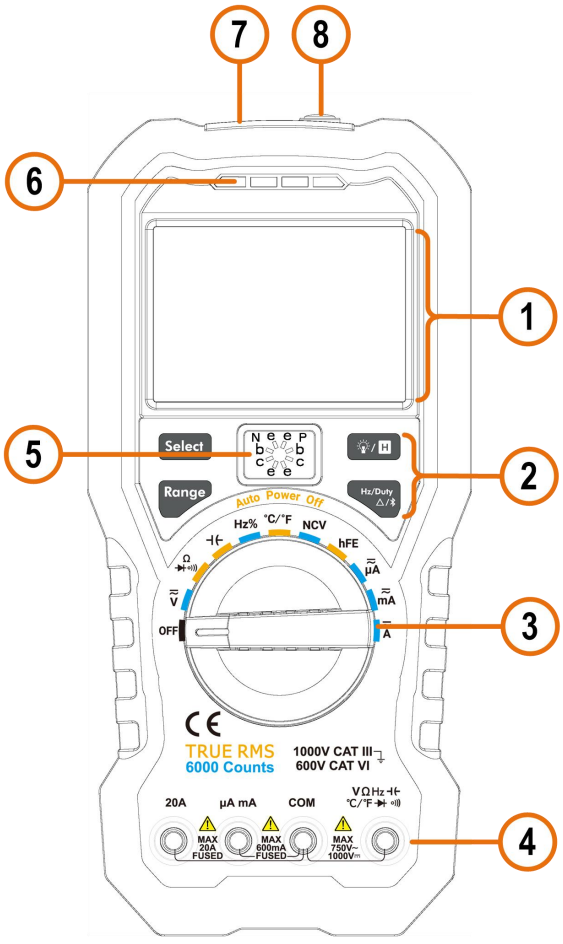


Figure 2- 1 Front panel overview (OW18B is shown for example)

No.	Description	Details
①	Display screen	Page 9
②	Keypad	Page 9
③	Rotary switch	Page 8
④	Input terminals	Page 11
⑤	Transistor test holes (only for specific models)	Page 15
⑥	LED indicator	
⑦	Non-contact voltage detector (NCV)	Page 14
⑧	Flashlight	Page 6

Rotary switch

Position	Description	Details
OFF	Power off	Page 6
V≂	DC or AC voltage measurement	Page 12
mV≂ *	DC or AC voltage measurement (For OW18A/OW18B: up to 600 millivolts For OW18D/OW18E: up to 200 millivolts)	
Ω	Resistance measurement	Page 12
⊣◦)))	Continuity test	Page 13
	Diode test	Page 13
⊣⊢	Capacitance measurement	Page 13
Hz%	Frequency measurement	Page 14
℃/℉	Temperature measurement	Page 14
NCV	Non-contact voltage detect	Page 14
hFE *	Transistor measurement	Page 15
μA≂	DC or AC current measurement (For OW18A/OW18B: up to 6000 microamperes; For OW18D/OW18E: up to2000 microamperes)	Page 15

mA	DC or AC current measurement (For OW18A/OW18B: up to 600 milliamperes; For OW18D/OW18E: up to200 milliamperes.
A	DC or AC current measurement

* The model with hFE function does not have the mV position.

Keypad

Key	Description	Details
Select	Select DC or AC	
	Select Resistance/Continuity /Diode	
Range	Auto/Manual range	Page 7
/ H	Backlight & Flashlight	Page 6
	Data Hold	Page 17
Hz/Duty △/	Select frequency/duty cycle	Page 14
	Measuring frequency in AC voltage/current mode	
	Relative Measurements	Page 17
	Bluetooth (only for OW18B/OW18E)	Page 18

Display screen

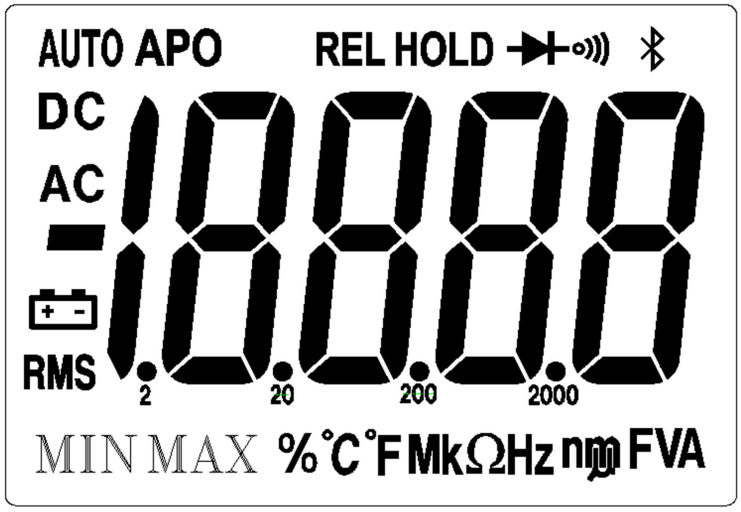


Figure 2-2 Display screen（For OW18D/E）

Symbol	Description	Details

AUTO	Auto range	Page 7
APO	Sleep mode	Page 7
REL	Relative enabled	Page 17
HOLD	Data hold enabled	Page 17
	Diode test selected	Page 13
	Continuity test selected	Page 13
	Bluetooth enabled	Page 18
DC	DC	Page 12 and Page 14
AC	AC	
1.8.8.8.8	Measurement display ("OL" is short for overload, indicates the reading exceeds the display range)	
	Battery is low	Page 5
RMS	True RMS	
%°C°FMkΩHznmμVAF	Measuring units	Page 10

Measurement units

Sign	Description	
M	Mega	1E+06 (1000000)
k	kilo	1E+03 (1000)
m	milli	1E–03 (0.001)
μ	micro	1E–06 (0.000001)
n	nano	1E–09 (0.000000001)

Sign	Description	Measurement type
℃	Degree Celsius	Temperature
℉	Degree Fahrenheit	
V	Voltage	Voltage
A	Ampere	Current

Ω	Ohm	Resistance
Hz	Hertz	Frequency
%	Percent,	Duty cycle
F	Farad	Capacitance

Input terminals

The terminal connections for the different measurement functions of the multimeter are described in the table below.

Warning: Before starting any measurement, observe the rotary switch position of the multimeter, and then connect the test leads to the correct terminals.

Caution: To avoid damaging the multimeter, do not exceed the rated input limit.

Rotary switch position	Input terminals		Overload protection	
V (mV)	VΩHz ⊣⊢ °C/°F →| ◦)))	COM	750 VAC/1000 VDC	
Ω →| ◦)))	VΩHz ⊣⊢ °C/°F →| ◦)))	COM	250 VAC/300 VDC	
⊣⊢				
Hz%				
°C/°F				
μA	μA mA	COM	Model with hFE	OW18A/OW18B: 400mA/250V; OW18D/OW18E: 200mA/250V. resettable fuse
mA			Model without hFE	OW18A/OW18B: 1A/1000V; OW18D/OW18E: 0.5A/1000V fast-acting fuse
A	20A	COM	Model with hFE	20A/250V, fast-acting fuse
			Model without hFE	15A/1000V, fast-acting fuse

3. Making Measurements

Measuring AC or DC Voltage

Warning: Do not measure any voltage of over 1000 Vdc or 750 Vac rms to avoid instrument damage or electric shock.
Do not apply more than 1000 Vdc or 750 Vac rms between the common terminal and the earth ground to avoid instrument damage or electric shock.

This multimeter displays DC voltage values as well as their polarity. Negative DC voltages will display a negative sign on the left of the display.

(1) Rotate the rotary switch to V or mV (mV is only for specific models). Default is DC measurement mode, DC will be displayed. Press Select to switch into AC measurement mode, AC will be displayed.
(2) Connect the black test lead to the COM terminal and the red test lead to the VΩHz terminal.
(3) Probe the test points and read the display. Press Range to enable and cycle through the manual ranges.

Note: When measuring AC voltage, press Hz/Duty to cycle through frequency measuring, duty cycle measuring, and original measuring.

Measuring Resistance

Caution: To avoid possible damage to your multimeter or to the equipment under test, disconnect the circuit power and discharge all high-voltage capacitors before measuring resistance.

(1) Rotate the rotary switch to Ω.
(2) Connect the black test lead to the COM terminal and the red test lead to the VΩHz terminal.
(3) Probe the test points and read the display. Press Range to enable and cycle through the manual ranges.

Testing for Continuity

Caution: To avoid possible damage to your multimeter or to the equipment under test, disconnect the circuit power and discharge all high-voltage capacitors before testing for continuity.

(1) Rotate the rotary switch to Ω. Press Select once to enter continuity testing mode,))) will be displayed.
(2) Connect the black test lead to the COM terminal and the red test lead to the VΩHz⊣⊢ °C/°F terminal.
(3) Probe the test points to measure the resistance in the circuit. If the reading is below 30 Ω, the multimeter will beep continuously.

Testing Diodes

Caution: To avoid possible damage to your multimeter or to the equipment under test, disconnect the circuit power and discharge all high-voltage capacitors before testing diodes.

(1) Rotate the rotary switch to Ω. Press Select twice to enter diode testing mode, → will be displayed.
(2) Connect the black test lead to the COM terminal and the red test lead to the VΩHz⊣⊢ °C/°F terminal.
(3) Connect the red test lead to the positive terminal (anode) of the diode and the black test lead to the negative terminal (cathode). The cathode of a diode is indicated with a band.
(4) Read the diode forward bias. If the test lead connection is reversed, the multimeter will display "OL".

Measuring Capacitance

Caution: To avoid possible damage to the multimeter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the DC voltage function to confirm that the capacitor is fully discharged.

(1) Rotate the rotary switch to ⊣⊢.
(2) Connect the black test lead to the COM terminal and the red test lead to the VΩHz⊣⊢ °C/°F terminal.

(3) Probe the test points and read the display.

Measuring Frequency

(1) Rotate the rotary switch to Hz%.

(2) Connect the black test lead to the COM terminal and the red test lead to the VΩHz ⊣⊢ ℃/℉ ⊳|– ◦))) terminal.

(3) Probe the test points and read the display.

(4) Press Hz/Duty △/ᛒ to switch between the frequency and duty cycle measurements.

Note: When measuring AC voltage or AC current, press Hz/Duty △/ᛒ to cycle through frequency measuring, duty cycle measuring, and original measuring.

To measure the frequency of signal with large amplitude, it is recommended to press Hz/Duty △/ᛒ to measure the frequency in AC voltage measurement mode.

Measuring Temperature

(1) Rotate the rotary switch to ℃/℉.

(2) Connect the **red connection** of the K-type thermocouple to the VΩHz ⊣⊢ ℃/℉ ⊳|– ◦))) terminal and the **black connection** to the COM terminal.

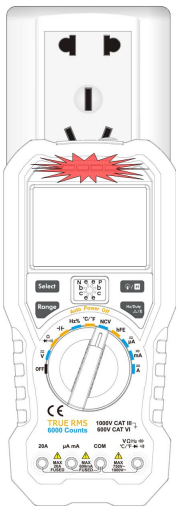
(3) Probe the test points and read the display.

Non-Contact Voltage Detect (NCV)

To detect the presence of AC voltage, place the top of the meter close to a voltage source. When voltage is detected, the LED above the display will glow, and the meter will beep.

⚠ **Warning**:

- Always test the NCV function on a known live circuit before use.
- Do not attempt to use the meter as an AC Voltage Detector if the battery is weak or bad.
- Even without indication, voltage may still be present. Do not rely on NCV detection to check the shielded wire. Detection could be impaired by socket design, insulation thickness, or other factors.
- External interference such as static electricity sources



Beep

could mistakenly trigger NCV indication.

(1) Rotate the rotary switch to **NCV**.
(2) Test the NCV function on a known live circuit before use.
(3) Place the top of the meter very close to the voltage source as shown in the figure.
(4) If voltage is detected, the LED above the display will flash, and the meter will beep.

Measuring Transistor — Only for specific models

(1) Rotate the rotary switch to **hFE**.
(2) Verify the type of the transistor is NPN or PNP, and locate the Emitter, Base and Collector leads. Insert leads of the transistor into the corresponding test holes on the panel.
(3) Read the hFE value.

Measuring DC or AC Current

⚠ Warning: Never attempt an in-circuit current measurement where the open-circuit potential to earth is greater than 250 V. Doing so will cause damage to the multimeter and possible electric shock or personal injury.

⚠ **Caution:** To avoid possible damage to the multimeter or to the equipment under test, check the multimeter's fuse before measuring current. Use the proper terminals, function, and range for your measurement. Never place the test leads in parallel with any circuit or component when the leads are plugged into the current terminals.

(1) Turn off the power of the measured circuit. Discharge all high- voltage capacitors.
(2) For OW18A/OW18B，connect the black test lead to the **COM** terminal. For currents below 600 mA, connect the red test lead to the **µA mA** terminal; for currents within 600 mA – 10 A, connect the red test lead to the **20A** terminal.
For OW18D/OW18E，connect the black test lead to the **COM** terminal. For currents below 200 mA, connect the red test lead to the **µA mA** terminal; for currents within 200 mA – 10 A, connect the red test lead to the **20A** terminal.
(3) Rotate the rotary switch to the appropriate position according to the measurement range, **µA**, **mA**, or **A**.
(4) Disconnect the circuit path to be tested. Connect the black test lead to one side of the circuit (with a lower voltage); connect the red test lead to the other side (with a higher voltage). Reversing the leads will produce a negative reading, but will not damage the multimeter.
(5) Select DC or AC measurement mode. Default is DC measurement mode, **DC** will be displayed. Press **Select** to switch into AC measurement mode, **AC** will be displayed.
(6) Turn on the power of the measured circuit, and read the display. Press **Range**

to enable and cycle through the manual ranges. If "OL" is displayed, it indicates the input exceeds the selected range and the rotary switch should be set to the position with higher range.

(7) Turn off the power of the measured circuit and discharge all high-voltage capacitors. Remove the test leads and restore the circuit to the original condition.

Note: When measuring AC current, press 

to cycle through frequency measuring, duty cycle measuring, and original measuring.

4. Multimeter Features

Data Hold Mode

(1) Press  to freeze the display during measurement,  will be shown on the display.
(2) Press  again to exit this mode.

Making Relative Measurements

When making relative measurements, reading is the difference between a stored reference value and the input signal.

(1) Press  to enter the relative mode,  will be shown on the display. The measurement value when pressing  is stored as the reference value.
In this mode, REL△ (current reading) = input value - reference value.

(2) Press it again to exit the mode.

In relative measurement, the manual range mode will be activated automatically. (The relative measurement should be carried out under a certain range, that is, this function is only available under the manual range mode.)

Note: This function is not available when measuring AC voltage/current, transistor (only for specific models), and frequency.

Buzzer Feature

- Press the function key, the buzzer emits a short beep.
- One minute before Auto Power-off, the buzzer will beep five times to warn. Before shutoff, the buzzer will emit a long beep, and then the multimeter will shut off.
- The buzzer beeps continuously to warn once the measured DC voltage exceeds 1000 V, or the measured AC voltage exceeds 750 V.
- The buzzer emits a long beep when the short circuit resistance is less than about 50Ω during the continuity test.
- When the Bluetooth function is idle for 10 minutes, the Bluetooth will be turned off automatically. Before turning off, the buzzer will beep twice.

5. To Connect with Mobile Device – Only for OW18B/OW18E

OW18B/OW18E supports communications with smart device through Bluetooth. You can use the free application software on the smart devices to monitor the measurements, perform remote control, view trending graphs, etc. The recorded data can be saved as CSV file. The maximum number of record that can be stored depends on the free storage space in your smart device. More than one meters can be connected simultaneously.

Note: Bluetooth connectivity works over a range of about 7 to 8 meters. The work range is much longer in open-sided and non-occluded wide range environment, even up to 20 meters. When the Bluetooth function is idle for 10 minutes, the Bluetooth will be turned off automatically. Before turning off, the buzzer will beep twice.

Mobile App

How to Connect with Mobile Device

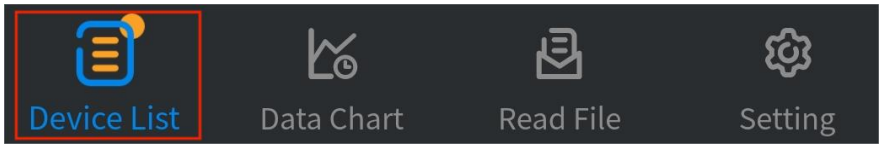
(1) On the mobile device, scan the QR code below and follow the instructions to install the free multimeter app.

(2) Open the installed application on your mobile device.

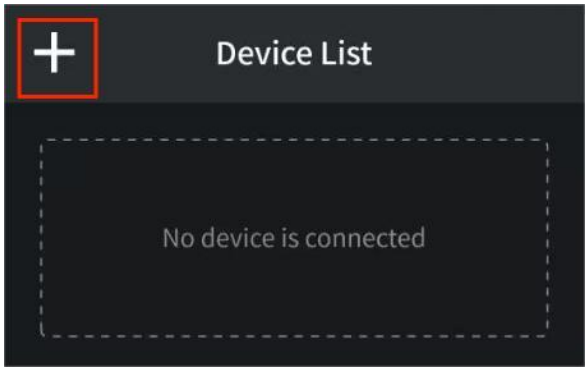
(3) Turn on the multimeter, press and hold 

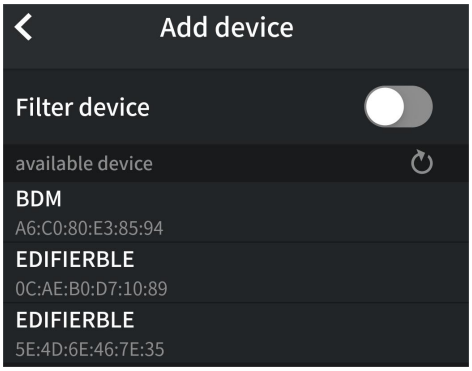
until  appear on the display.

(4) Click on **"Device List"** in the bottom navigation bar.

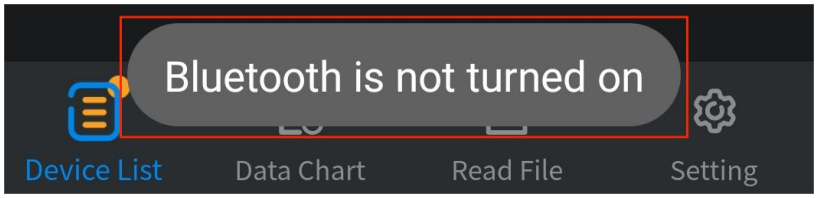


(5) Click the **"+"** icon in the upper left corner to begin searching for devices and list out the multimeters found.

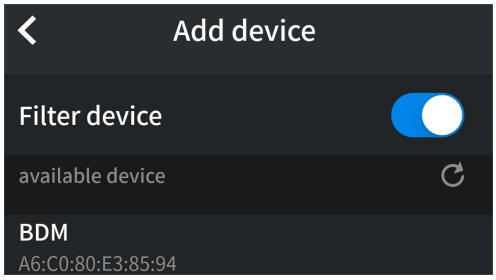




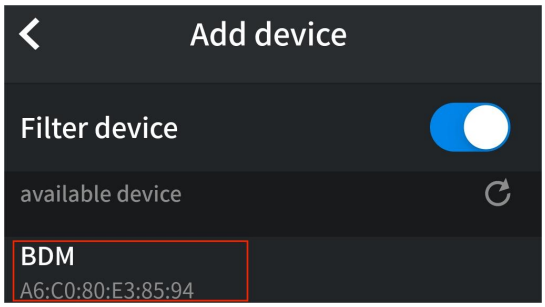
(6) If the Bluetooth of the mobile device is not enabled, a prompt box will pop up at the bottom, indicating **"Bluetooth is not turned on"**. You need to manually open the Bluetooth of the mobile device before connection can be made.

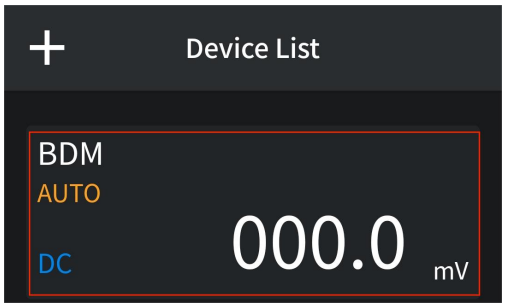


(7) Active **"Filter device"** to hide incompatible multimeters.

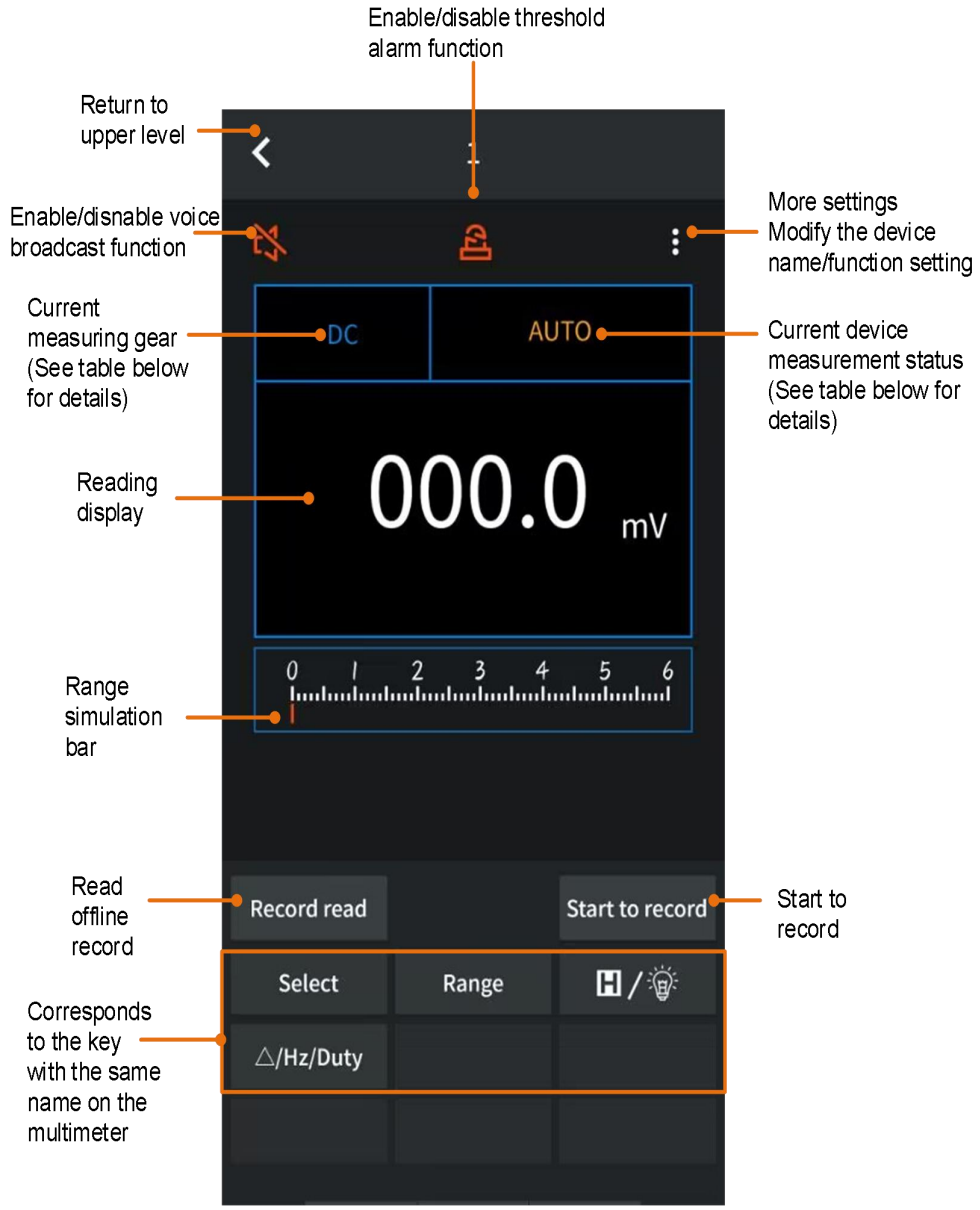


(8) After **"BDM"** appears in the list of available devices, click and select to connect it to the mobile device.





User Interface in Mobile App



Measuring gear comparison table:

Display	Function	Display	Function
DC	DC voltage/current measurement	CAP	Capacitance measurement
AC	AC voltage/current measurement	Hz	Frequency measurement
RES	Resistance measurement	DUTY	Duty cycle measurement
CONT	On-off test	TEMP	Temperature measurement
DIODE	Diode measurement	POWER	Power measurement

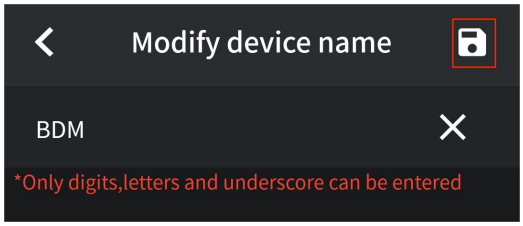
Measurement status comparison table:

Display	Function	Display	Function
HOLD	Holds or locks the current value	REL	Relative value
AUTO	Automatic measuring range	Bat	Low battery
MAX	Maximum holding	MIN	Minimum holding
RMR	Current value (only B41 model)		

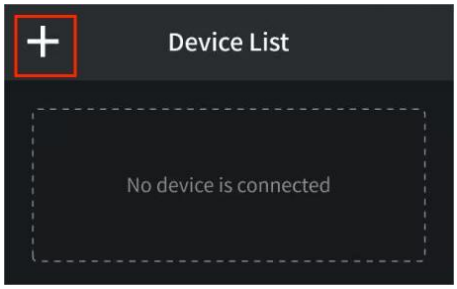
Operations in Mobile App

- **Customize the meter name**

  The device name of meter can be customized.Click the main interface of the device to enter the control screen interface,click on the top right corner " ⋮ ",enter the more settings interface,and then click the **"Modify device name"** , you can enter the rename device interface.You can input the customized name, click " 💾 " to finish the setting, this name will be memorized in the device. If this meter is connected to the same device next time, the customized name will be shown. If this meter is connected to another device, the name is still the default one or the customized name to the connected device.



- **Add meter**:Click the **"+"** icon in the upper left corner to begin searching for devices and list out the multimeters found.

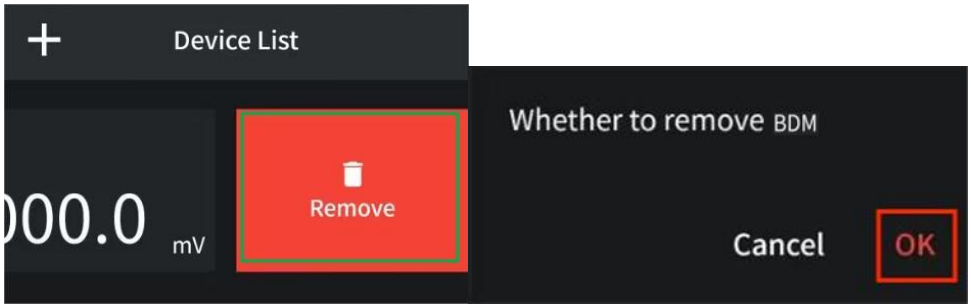


- **Select meter**:Under the Data Chart interface,click the drop-down box to select the multimeter for reading.



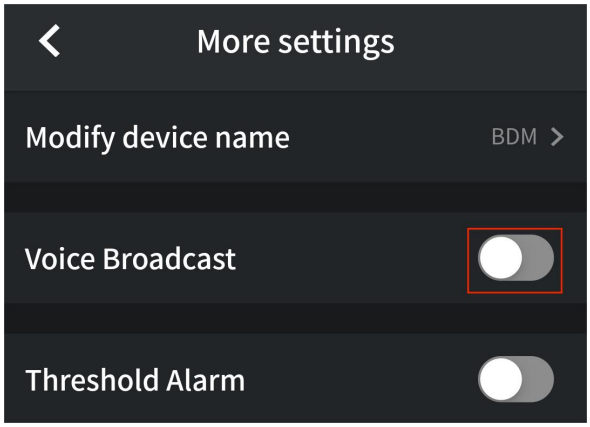
- **Disconnect meter**: In the list of devices, select the multimeter you want to disconnect, and swipe left after touching your finger. Click the **"Remove"**

button that slides out.Click on **"OK"** in the pop-up prompt to disconnect the multimeter.

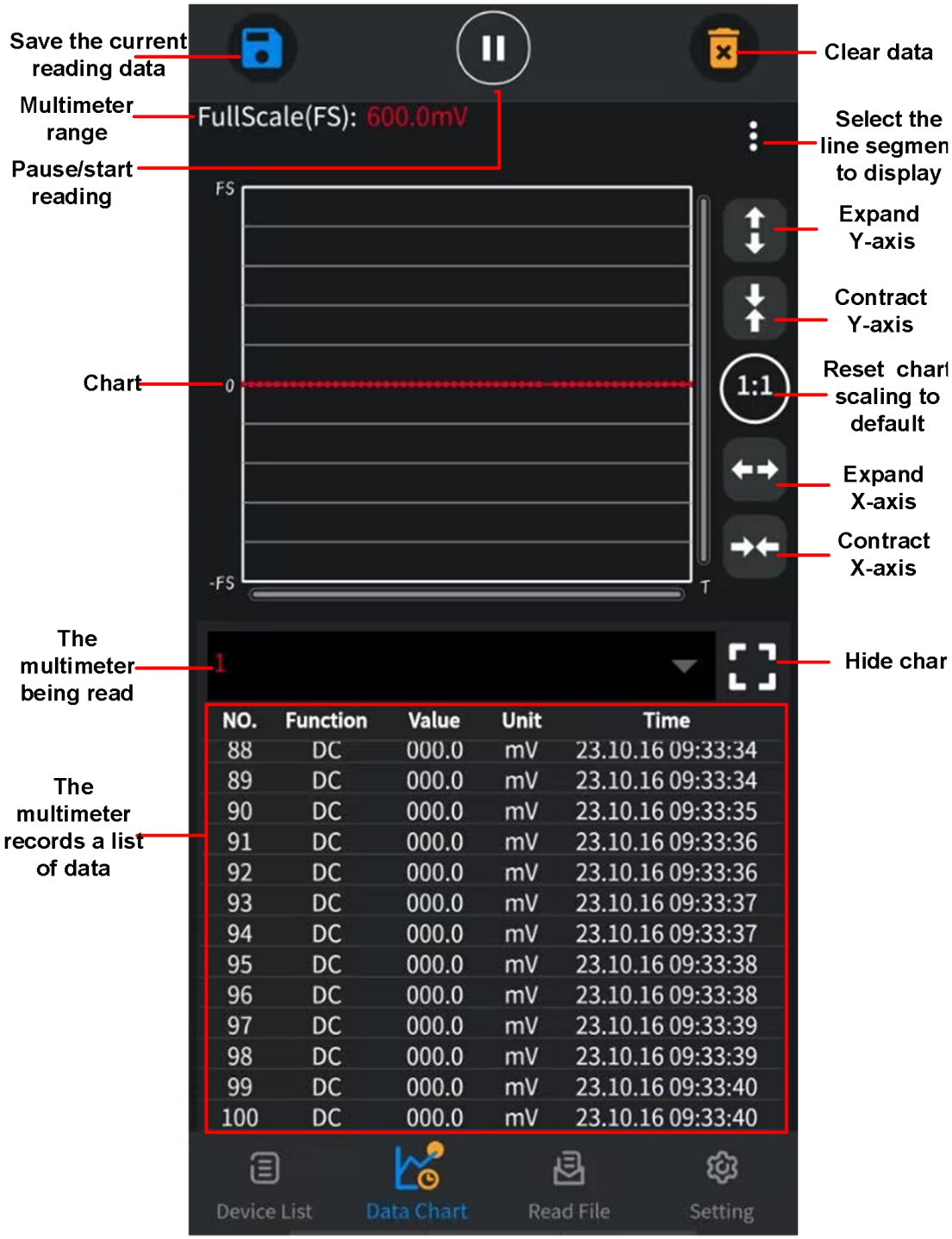


- **Remote Control**: In single view, the control softkeys just as press the corresponding keys of multimeter.
- **Voice out function**

  Click the shortcut key at the top of the control interface to turn on or off the voice broadcast .Click on the upper right corner of the control interface "⋮", to enter more settings, click on **"Voice Broadcast"** switch ,turn on or off the function.



- **Data Graph and Table**: Click **“Data Chart ”** to enter the chart interface.



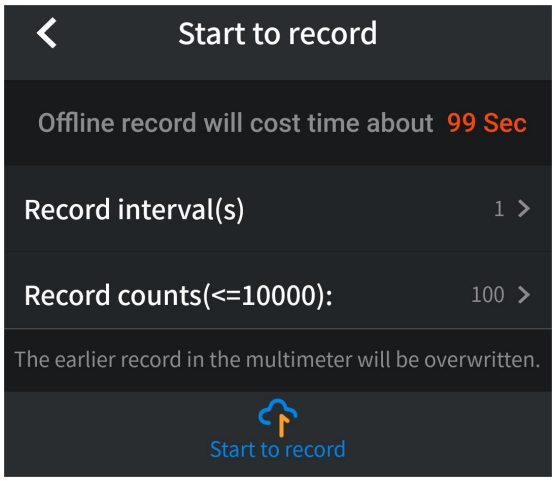
Multimeter Offline Record

When measuring with OW18B/OW18E, you can use mobile device APP to send a command, the multimeter will start recording the measurements. After receiving the command, the connection will be disconnected automatically. The multimeter will record the measuring data in its own memory. After completion of the record, use APP to reconnect the multimeter, and then you can read the measuring data into the Mobile device as a CSV file. You can use this function to record for a long time without staff on duty, while reducing Bluetooth consumption to conserve the battery power of the multimeter.

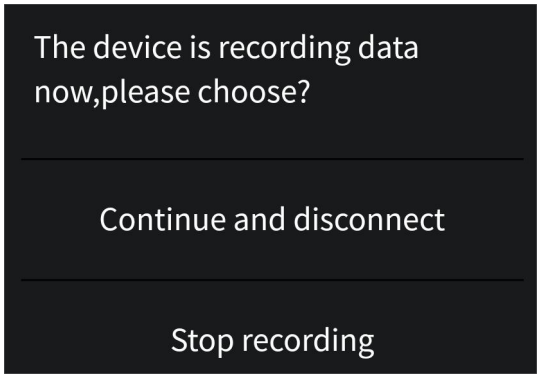
Note: When the low battery indicator appears on the meter screen, the offline record function may not work correctly. Please check the batteries of the meter to ensure them in a good state.

(1) Connect the Mobile device with the multimeter, see "*How to Connect with Mobile Device*" on P18.

(2) In APP view, tap on the "Start to record" icon on the lower right, enter the read record interface.On the interface click on "Start to record".



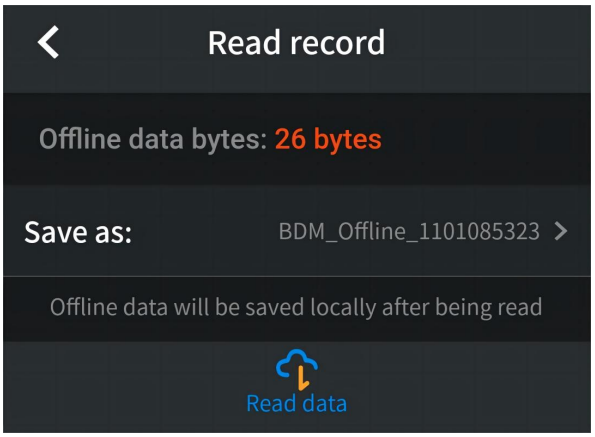
(3) Set "Record interval" and "Records count" (maximum records count is 10,000). Tap on Start to record. The memory in the multimeter can only store the recording data of one time . When start to record, the earlier offline record stored in the multimeter will be overwritten.
The mobile device will disconnect with the multimeter in two seconds. After disconnecting, the information "**BDM disconnected.**" will be shown on APP. The multimeter will record the current measurements and store in the memory.
Note: If the multimeter is in the process of recording data and not finished yet, connect the Mobile device and the multimeter, a dialog box will pop up:



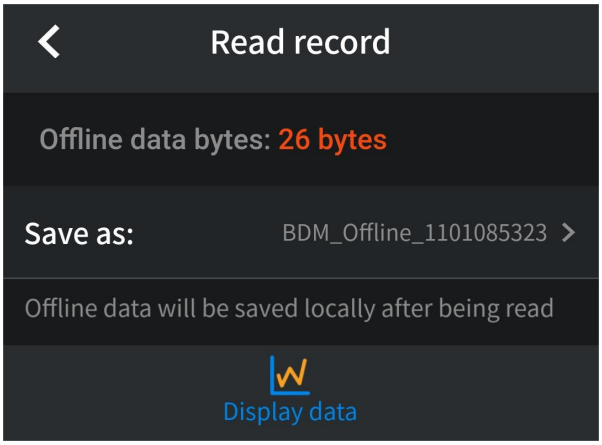
Select Stop recording, the recording process will be interrupted. The Mobile device will connect with the multimeter to read data.
Select Continue and disconnect, the multimeter will continue recording, the connection will be aborted.

(4) After completion of the record, to read the measuring data, reconnect the mobile device and the multimeter.

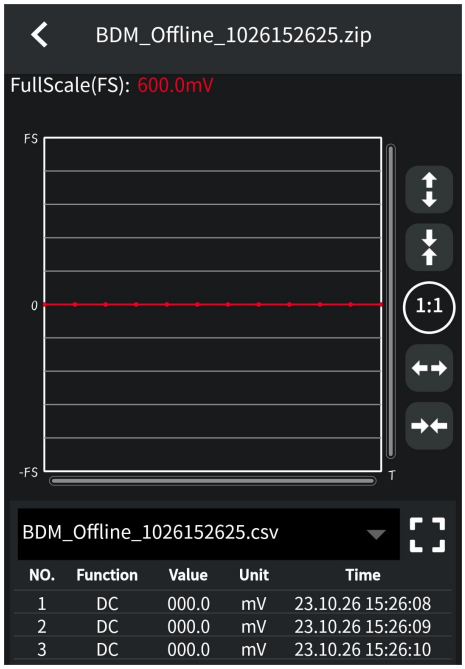
(5) In APP view, tap on the Record read icon on the lower left, enter the read record interface,under the interface click on the “ Read data ”,can start to read data.



(6) Tap on Record read, APP will read the measuring data and save as a CSV file into the Mobile device. After reading, display as below:



(7) Tap on Display data, the data will be displayed in Data Graph and Table interface.


BDM_Offline_1026152625.zip
FullScale(FS): 600.0mV
FS
0
-FS
T
1:1
BDM_Offline_1026152625.csv
NO. Function Value Unit Time
1 DC 000.0 mV 23.10.26 15:26:08
2 DC 000.0 mV 23.10.26 15:26:09
3 DC 000.0 mV 23.10.26 15:26:10

6. To Connect with Computer – Only for OW18B/OW18E

To connect the multimeter to a computer, a **Bluetooth USB adapter** should be plugged into the USB port of computer.

- Use only the Bluetooth USB adapter (optional) supplied with the product.
- The computer must be running the **Windows** operating system (Windows 11,Windows 10, Windows 8, Windows 7).

OW18B/OW18E supports communications with a computer through Bluetooth. This multimeter supports two kinds of APP connection： iMeter connection and multimeterBLE connection.You can use the free multimeterBLE software on computer to monitor the measurements, perform remote control, view trending graphs, etc. The recorded data can be saved as CSV file. The maximum number of record that can be stored depends on the free storage space in your smart device. Up to three multimeters can be connected simultaneously.

Note: Bluetooth connectivity works over a range of about 7 to 8 meters. The work range is much longer in open-sided and non-occluded wide range environment, even up to 20 meters. When the Bluetooth function is idle for 10 minutes, the Bluetooth will be turned off automatically. Before turning off, the buzzer will beep twice.

iMeter Connection

For detailed documentation of the iMeter connection, please go directly to our website.(This connection mode applies to Windows 10 and later operating systems.)

multimeterBLE Connection

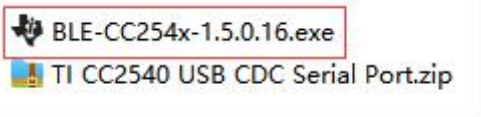
How to Connect with Computer

Step 1: Download the driver

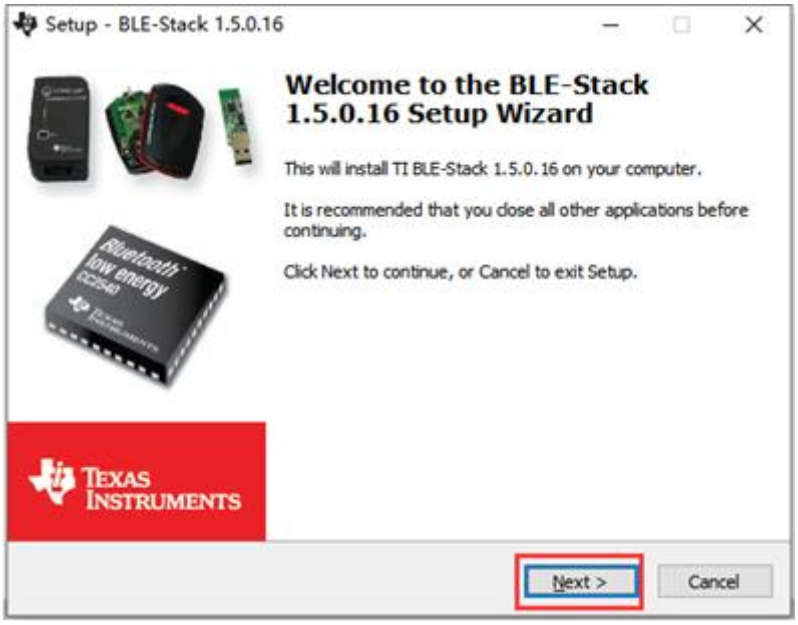
(1) Please go to the official website to download the main program pcMultimeter_Vxxx and the driver Multimeter_bluetooth and decompress
(2) Plug the Bluetooth adapter into the USB port of the computer

Step 2: Install driver of Bluetooth USB adapter

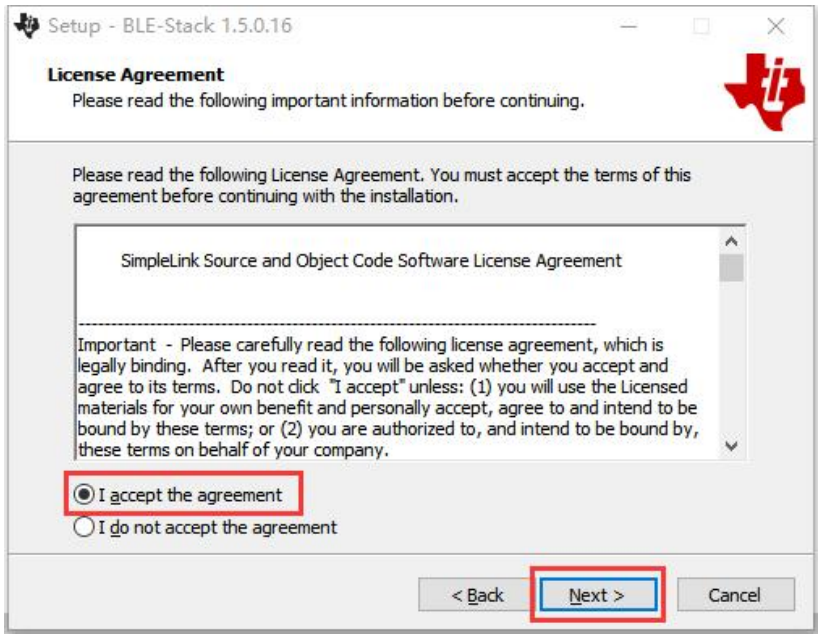
(1) Navigate to the multimeterBLE software installation folder (for example, C:\Program Files\multimeterBLE).
Double-click **BLE-CC254x-1.5.0.16.exe** in this folder.



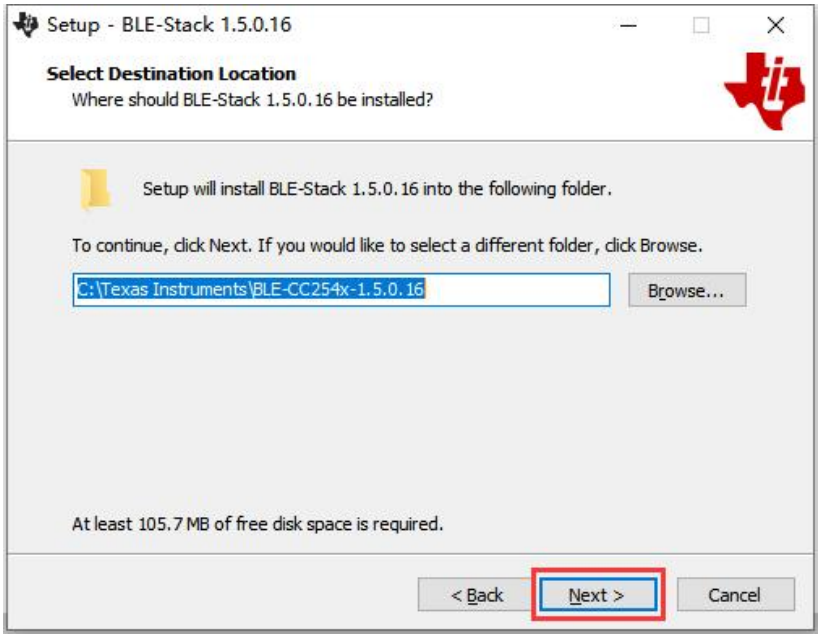
(2) Click "**Next**".



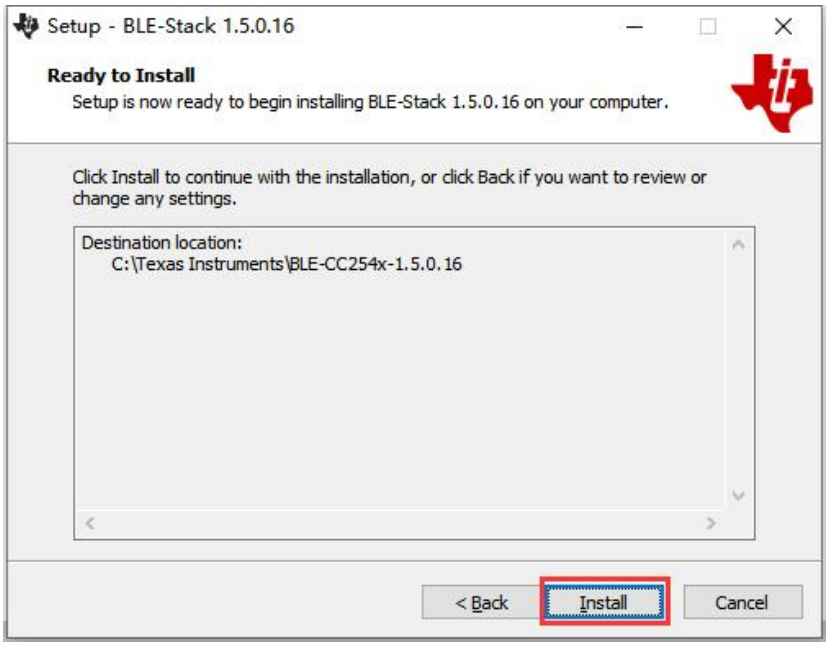
(3) Select "**I accept the agreement**", and then click "**Next**".

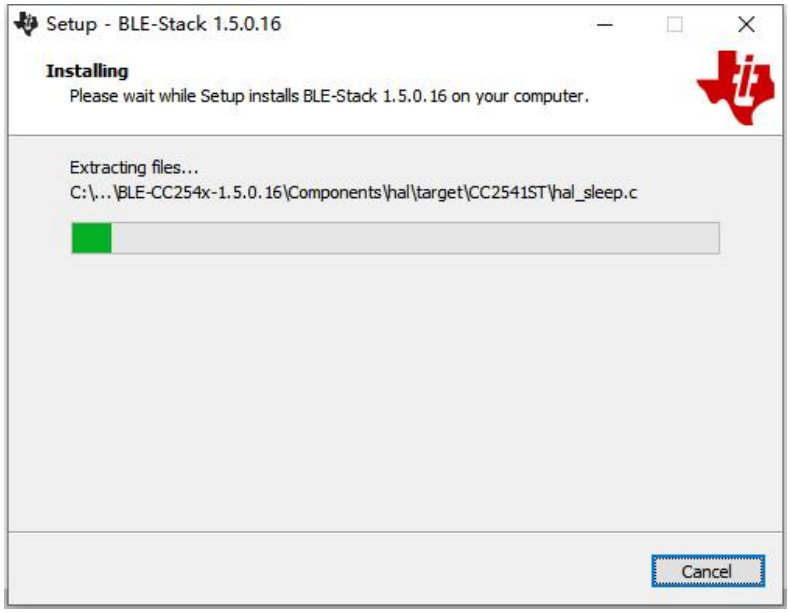


(4) Select the destination folder, and then click "**Next**".

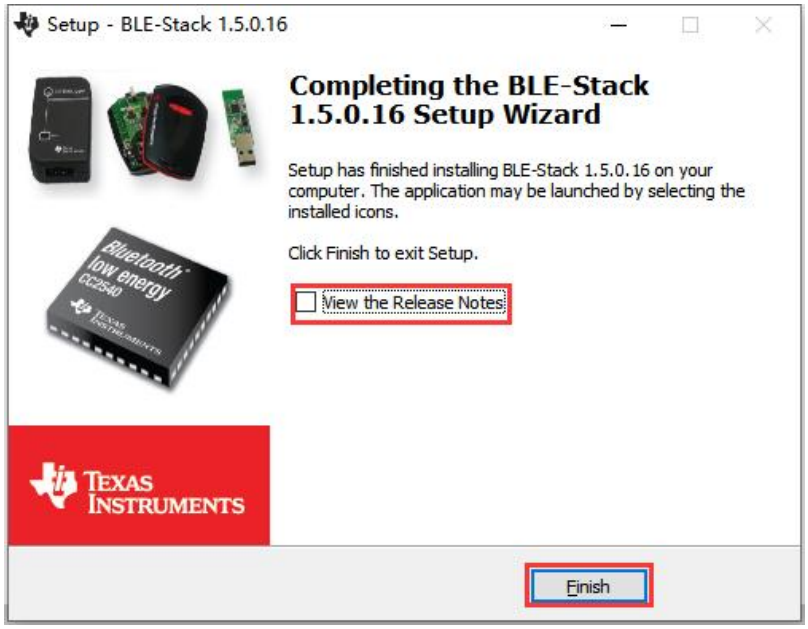


(5) Click "**Install**".



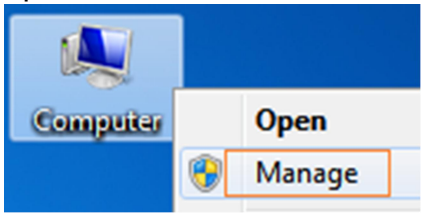


(6) Uncheck "**View the Release Notes**", and click "**Finish**" to exit Setup.



Note: The driver cannot be automatically installed on Windows 7 64-bit operating system. If you need to manually install the driver, perform Step (7).

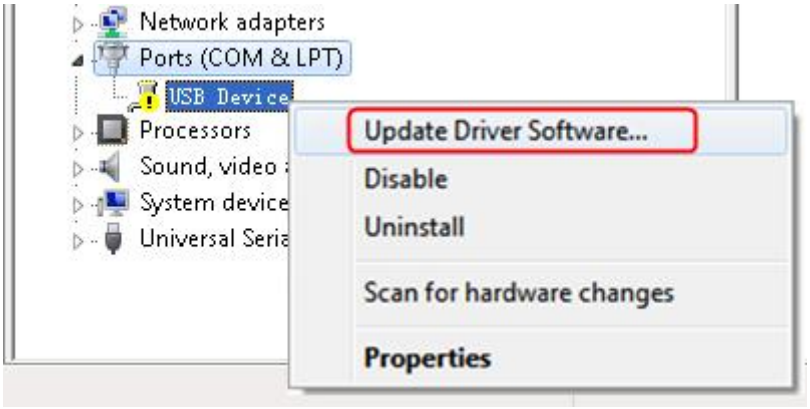
(7) Plug the Bluetooth USB adapter into a USB port on your computer.
Right click [**Computer**], you can find it on the desktop, or in [**Start**] menu. In the drop down menu, click on [**Manage**], the “Computer Management” window opens.



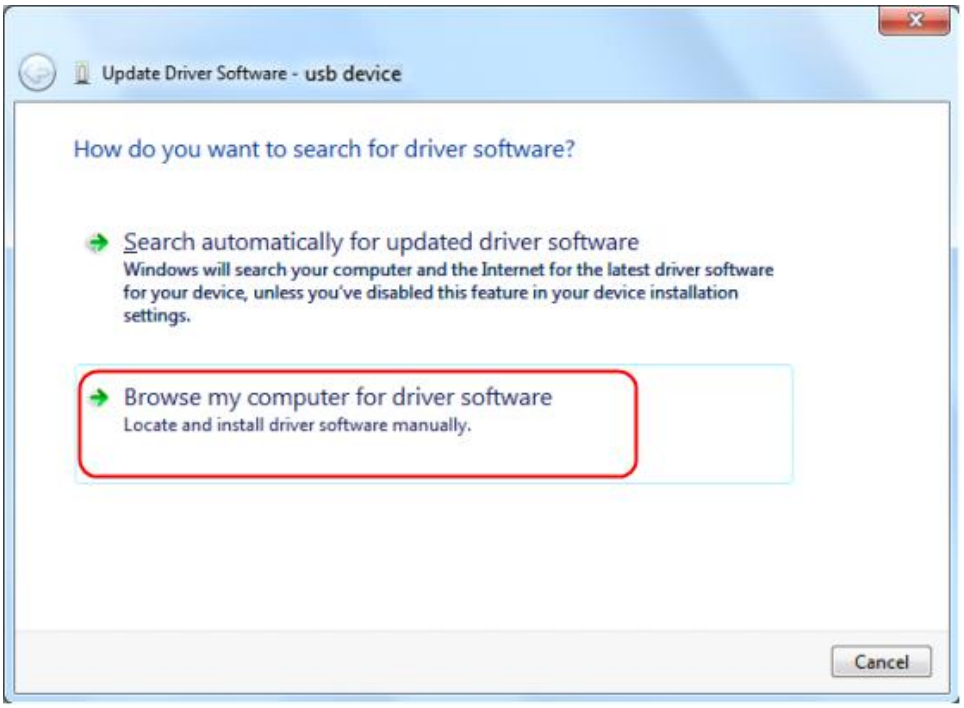
Click on “**Device Manager**” on the left hand side. On the right hand side, double click on “**Ports (COM & LPT)**”.

Under ports, if "**TI CC2540 USB CDC Serial Port (COM#)**" is displayed, that means the driver is installed successfully. Remember the “COM #” because you will need to configure the multimeterBLE software.

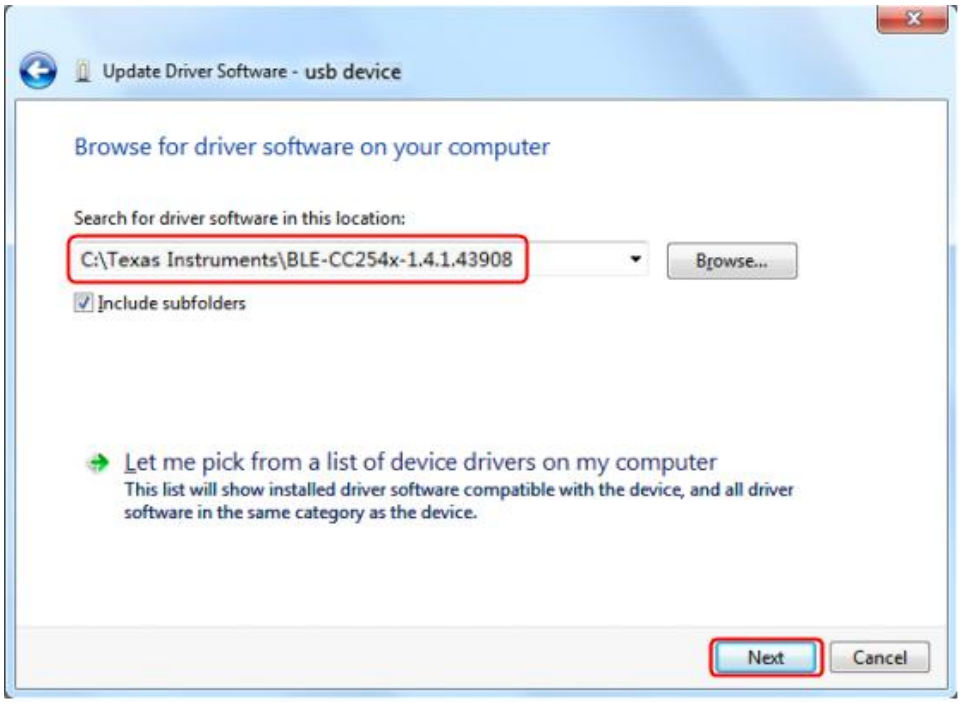
Right click the unknown device icon, in the drop down menu, click "**Update Driver Software...**".



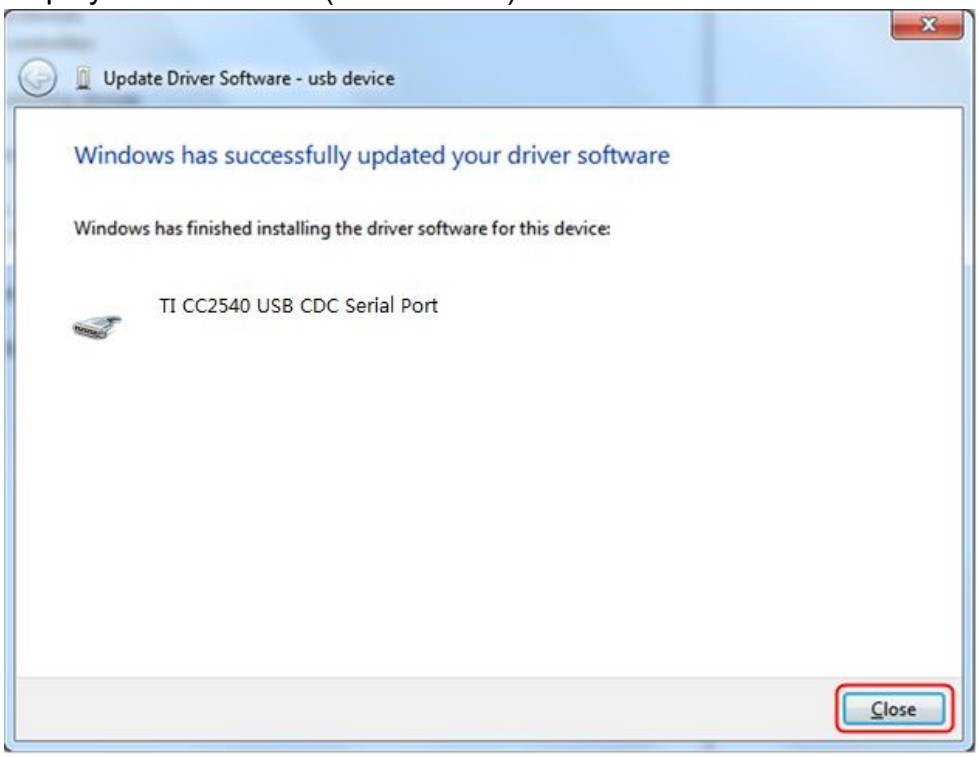
Select "**Browse my computer for driver software**".



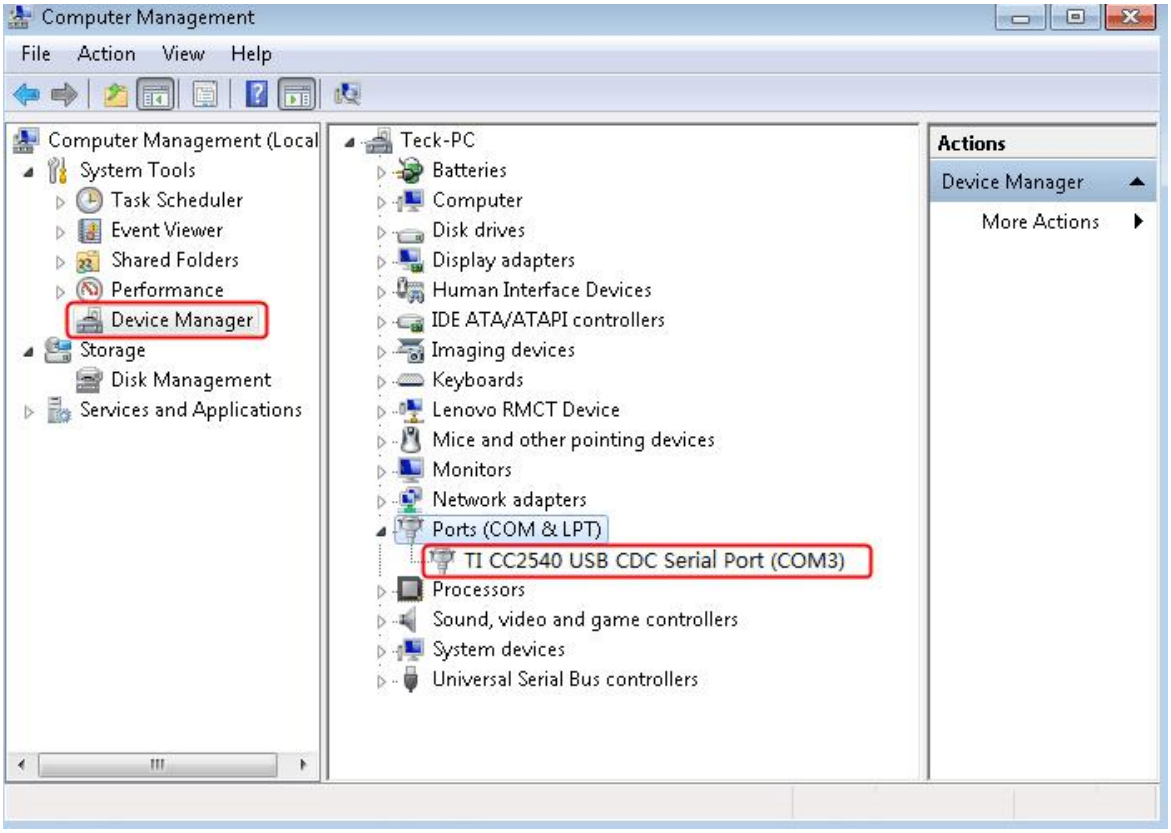
Select a directory path for the driver, and click "**Next**".



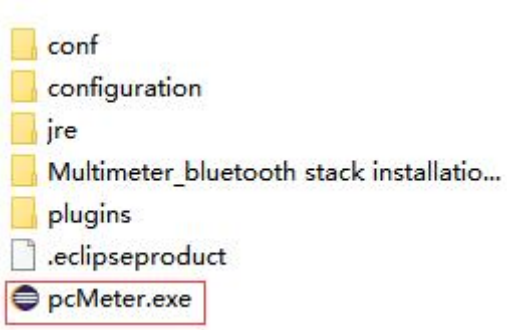
After installing successfully, click "**Close**".
In Device Manager, check if "**TI CC2540 USB CDC Serial Port (COM#)**" is displayed under Ports (COM & LPT).



After the installation is complete, the correct driver name is displayed.

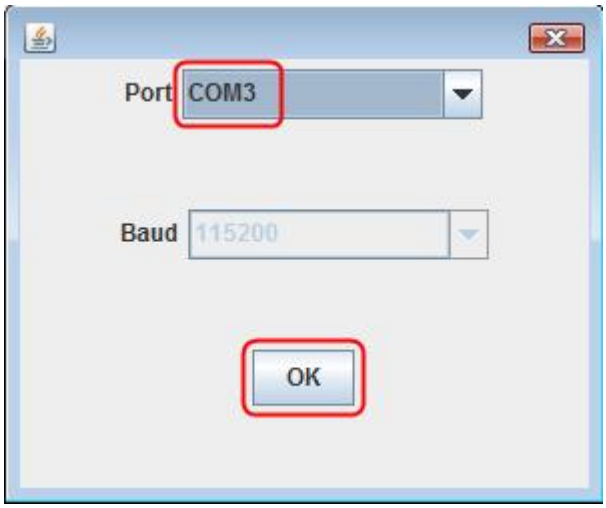


Open the ” pcMultimeter_Vxxx “folder and click Run the ” exe” file as shown below:



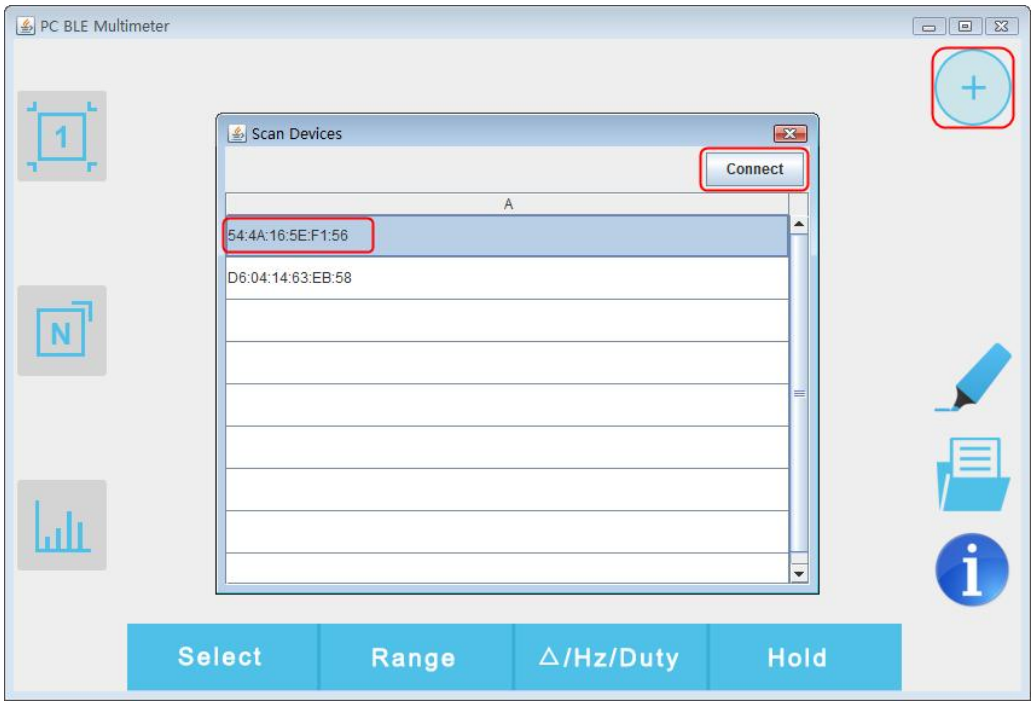
Step 3: Connect to multimeterBLE software

(1) After installing the Bluetooth USB adapter driver successfully, run the multimeterBLE software, the configure dialog box appears.
Make sure that the Bluetooth USB adapter is plugged into the computer.
To find the “Port” (COM #), you will need to look for it under "Ports (COM & LPT)" in Device Manager window.
Select the port number, and click "OK".

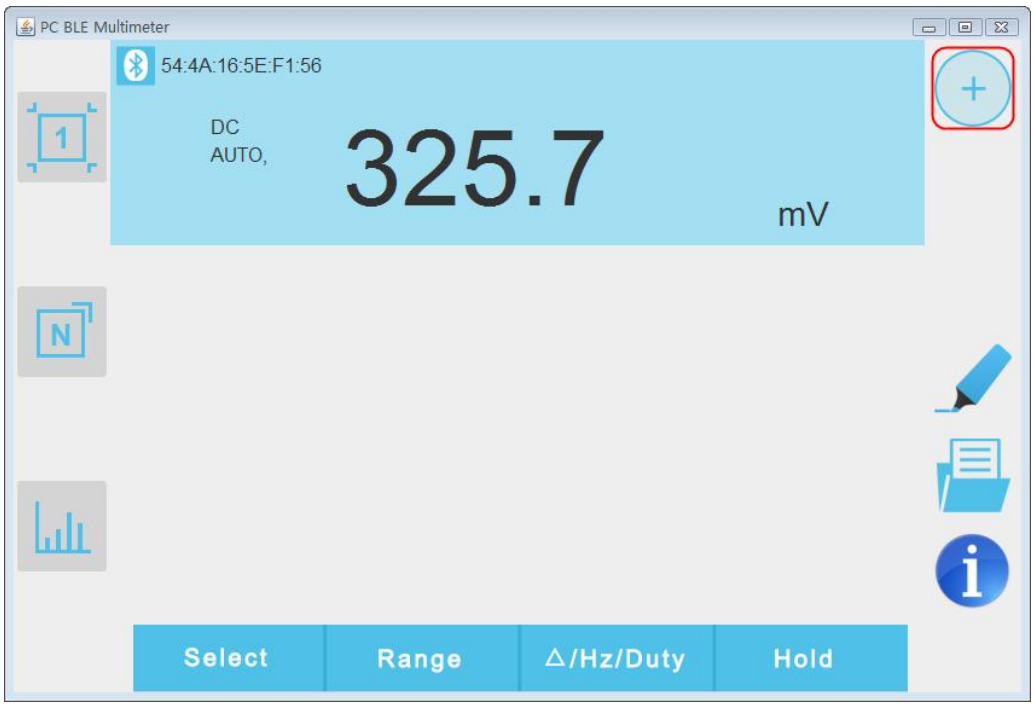


(2) Turn on the multimeter, press and hold Hz/Duty △/ until appear on the display.

(3) Click + softkey on the right, a Scan Devices dialog box appears. A progress bar shows the progress of scanning multimeters. It will take a few seconds. When the scan is finished, select the desired multimeter in the device list. Click the "**Connect**" button.

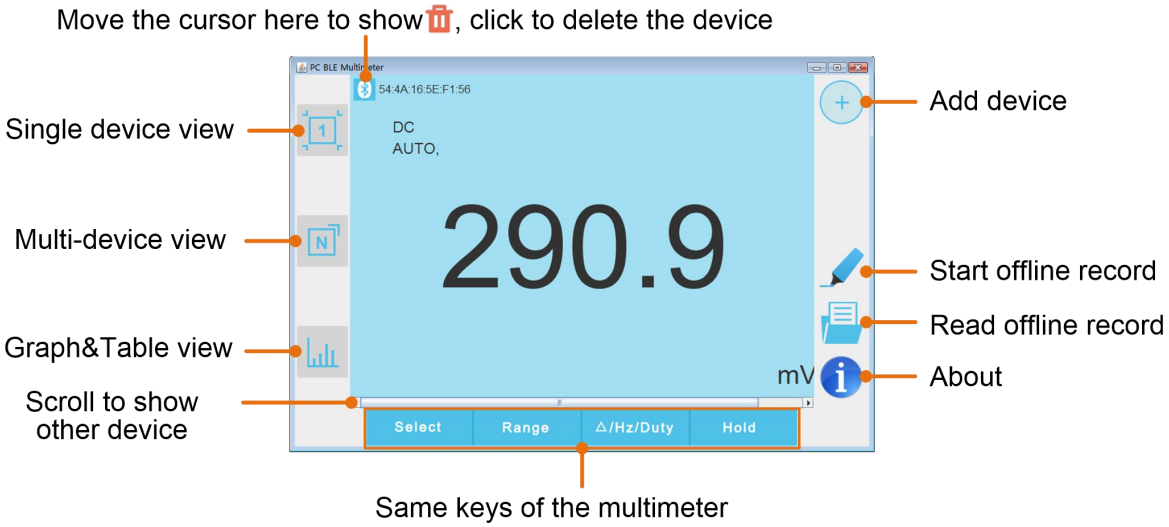


(4) The measurements will be shown if the connection is successful. You can tap on the + softkey on the right to add another multimeter.

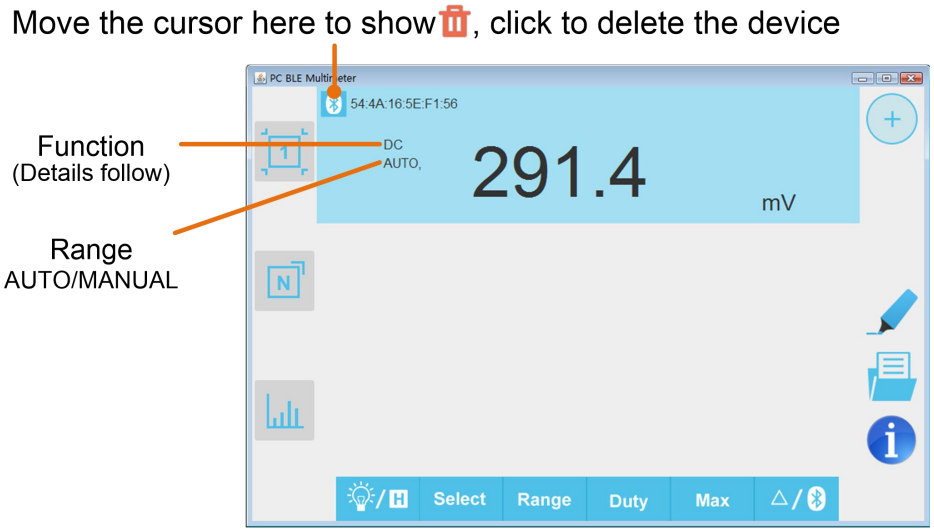


User Interface in MultimeterBLE Software

Single Device View



Multi-device View

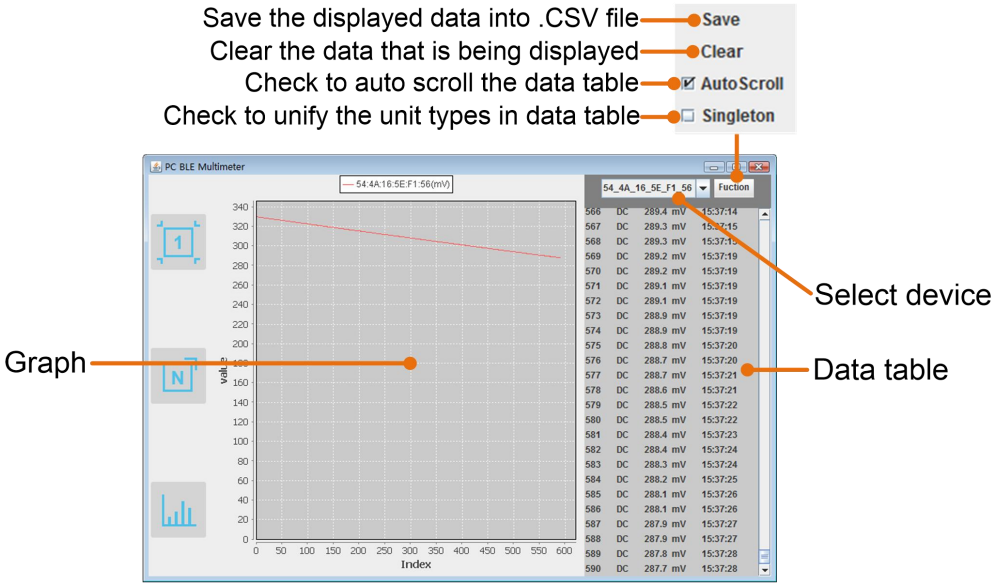


Function Description Table

Display	Function
DC	Direct Current
AC	Alternating Current
RES	Measuring Resistance
DIO	Testing Diodes
BEEP	Testing for Continuity

Display	Function
CAP	Measuring Capacitance
Hz	Measuring Frequency
DUT	Measuring Duty Cycle
TEMP	Measuring Temperature
NCV	Non-contact Voltage Detect

Graph&Table View



Operations in MultimeterBLE Software

- **Add meter**: In single or multi-device view, click  softkey on the right.
- **Select meter**: In single device view, scroll left or right to switch the meter view. In multi-device view, click a device item to select it, the background is turned to blue.
- **Disconnect meter**: In single or multi-device view, move the cursor over the  icon, it will change to , click it.
- **Remote Control**: In single or multi-device view, the control softkeys



can be short or long pressed to perform control, just as press the corresponding keys of the multimeter.

- **Unify the unit types**: In Graph&Table view, sometimes the unit type will be changed while recording, for example, V is changed to mV. To unify the unite types, click "**Function**" on the top right, in the drop down menu, check "**Singleton**".

Multimeter Offline Record (PC Software)

When measuring with OW18B/OW18E, you can use PC software to send a command, the multimeter will start recording the measurements. After receiving the command, the connection will be disconnected automatically. The multimeter will record the measuring data in its own memory. After completion of the record, use PC software to reconnect the multimeter, and then you can read the measuring data into the Mobile device as a CSV file. You can use this function to

record for a long time without staff on duty, while reducing Bluetooth consumption to conserve the battery power of the multimeter.

Note: When the low battery indicator appears on the meter screen, the offline record function may not work correctly. Please check the batteries of the meter to ensure them in a good state.

There are two APP modes for offline recording on the PC side of this multimeter:iMeter offline recording and multimeterBLE offline recording.

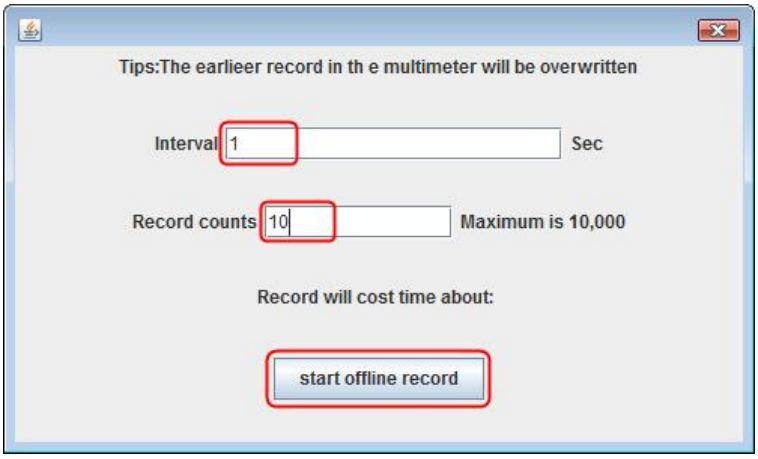
iMeter offline recording

For detailed documentation of the iMeter connection, please go directly to our website.(This connection mode applies to Windows 10 and later operating systems.)

multimeterBLE offline recording

(1) Connect the multimeterBLE software with the multimeter, see "*How to Connect with Computer*" on P27.

(2) On software interface, click the softkey on the right, a dialog will show.



(3) Set "Interval" and "Record counts" (maximum records count is 10,000). Click "**start offline record**". The memory in the multimeter can only store the recording data of one time. When start to record, the earlier offline record stored in the multimeter will be overwritten.

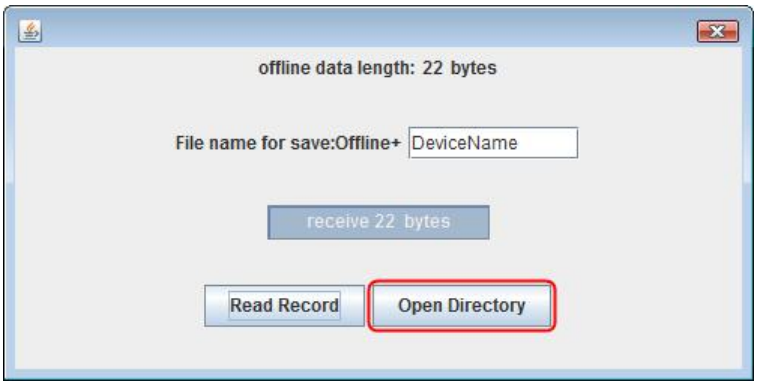
Note: If you want to interrupt the recording process of the multimeter, reconnect the software and the multimeter, select "Stop recording".

(4) After completion of the record, to read the measuring data, reconnect the software and the multimeter.

(5) On software interface, click softkey on the right, a dialog will show. The file name start with "Offline", the following part can be customized.



(6) Click "**Read Record**", the software will read the measuring data and save as a CSV file into computer. After reading, the dialog is as below:



(7) Click "**Open Directory**" to open the directory where the CSV files are saved.

7. Technical Specifications

All these specifications apply to the multimeter unless otherwise explanation.

Standard conditions: The environment temperature is 18℃ to 28℃, the relative humidity is less than 80%.

Note: When measuring AC voltage/current or capacitance, accuracy guarantee range is 5% to 100% of the range.

OW18D/OW18E multimeter

Function		Measurement Range	Resolution	Function	
DC Voltage (V)	mV[1]	20.000mV	0.001mV	±(0.05%+10dig)	
		200.00mV	0.01mV		
	V	2.0000V	0.1mV	±(0.1%+2dig)	
		20.000V	1 mV		
		200.00V	10mV		
		1000.0V	0.1V	±(0.15%+5dig)	
AC Voltage (V)	mV[1]	20.000mV	0.001mV	VRMS Freq range：40Hz-1000Hz	±(0.5%+10dig)
		200.00mV	0.01mV		
	V	2.0000V	0.1mV		
		20.000V	1mV		
		200.00V	10mV		
		750.0V	0.1V		±(0.8%+10dig)
DC Current (A)	μA	200.00μA	0.01μA	±(0.5%+10dig)	
	mA	2.0000mA	0.1μA		
		20.000mA	1μA		
		200.00mA	10μA		
	A	20.000A [2]	1mA	±(2.0%+10dig)	
AC Current (A)	μA	200.00μA	0.01μA	VRMS Freq range：40Hz-1000Hz	±(0.8%+10dig)
	mA	2.0000mA	0.1μA		
		20.000mA	1μA		
		200.00mA	10μA		
	A	20.000A [2]	1mA		±(2.5%+10dig)
Resistance (Ω)		200.00Ω	0.01Ω	±(0.5%+10dig)	
		2.0000kΩ	0.1Ω	±(0.3%+3dig)	

	20.000kΩ	1Ω	±(0.3%+1dig)
	200.00kΩ	10Ω	
	2.0000MΩ	100Ω	
	20.000MΩ	1kΩ	±(0.5%+1dig)
	200.00MΩ	10kΩ	±(5.0%+10dig)
Capacitance (F)	2.0000nF	0.1pF	±(3.0%+10dig)
	20.000nF	1pF	
	200.00nF	10pF	
	2.0000μF	100pF	
	20.000μF	1nF	
	200.00μF	10nF	
	2.0000mF	100nF	
	20.000mF [3]	1μF	
Frequency [4] (Hz)	200.00Hz	0.01Hz	±(0.1%+4dig)
	2.0000kHz	0.1Hz	
	20.000kHz	1Hz	
	200.00kHz	10Hz	
	2.0000MHz	0.1kHz	
	20.000MHz	1kHz	
Duty Cycle [5] (%)	0.1% - 99.9% (Typical：Vrms=1 V, f=1 kHz)	0.1%	±(1.2%+3dig)
	0.1% - 99.9%(≥1 kHz)		±(2.5%+3dig)
Temperature (°C/°F)	－50 ℃ to 400 ℃	0.1 ℃	±(1.0%+3℃)
	－58 ℉ to 752 ℉	0.1 ℉	±(1.2%+6℉)

[1] The rotary switch position $\tilde{\tilde{\text{mV}}}$ is only for specific models.

[2] When measuring current, for 10 A to 15 A, the measuring duration should not be over 2 minutes within 10 minutes, and in this 10 minutes, no other current should flow through except within the measuring duration; for 15 A to 20 A, the measuring duration should not be over 10 seconds within 15 minutes, and in this 15 minutes, no other current should flow through except within the measuring duration.

[3] When measuring capacitance, for the 20.00mF range, the measuring duration should be over 30 seconds.

[4] When measuring frequency, the typical waveform is Square or Sine. The signal meets the following conditions.

Frequency	Amplitude (rms)
1 Hz – 4 MHz	≥ 100 mV

[5] When measuring duty cycle, the typical waveform is Square.

Note: when measuring resistance and capacitance, the influence of the resistance reactance of the pen itself on the measured value should be considered.

OW18A/OW18B multimeter

Function		Measurement Range	Resolu-tion	Function
DC Voltage (V)	mV [1]	60.00mV/600.0mV	0.01mV	±(0.5%+2dig)
	V	600.0mV/6.000V/60.00V/600.0V	0.1mV	
	V	1000V	1V	±(0.8%+2dig)
AC Voltage (V)	mV [1]	600.0mV	0.01mV	±(0.8%+3dig)
	V	600.0mV	0.1 mV	±(2%+5dig)
	V	6.000V/60.00V/600.0V	1mV	±(0.8%+3dig)
	V	750V	1V	±(1%+3dig)
DC Current (A)	μA	600.0μA/6000μA	0.1μA	±(0.8%+2dig)
	mA	60.00mA/600.0mA	0.01mA	±(0.8%+2dig)
	A	20.00A [2]	0.01A	±(1.2%+3dig)
AC Current (A)	μA	600.0μA/6000μA	0.1μA	±(1%+3dig)
	mA	60.00mA/600.0mA	0.01mA	±(1%+3dig)
	A	20.00A [2]	0.01A	±(1.5%+3dig)
Resistance (Ω)		600.0Ω/6.000kΩ/60.00kΩ/ 600.0kΩ/6.000MΩ	0.1Ω	±(0.8%+2dig)
		60.00MΩ	0.01 MΩ	±(2%+3dig)
Capacitance (F)		60.00nF/600.0nF/6.000μF/ 60.00μF	0.01nF	±(3%+3dig)
		600.0μF/6.000mF/60.00mF [3]	0.1μF	±(3%+5dig)
Frequency [4] (Hz)		9.999Hz/99.99Hz/999.9Hz/ 9.999kHz/99.99kHz/999.9kHz/ 9.999MHz	0.001Hz	±(0.8%+2dig)
Duty Cycle [5] (%)		0.1% - 99.9% (Typical: Vrms=1 V, f=1 kHz)	0.1%	±(1.2%+3dig)
		0.1% - 99.9%(≥1 kHz)		±(2.5%+3dig)
Temperature (°C/°F)		－50 ℃ to 400 ℃	1 ℃	±(2.5%+3dig)
		－58 ℉ to 752 ℉	1 ℉	±(4.5%+5dig)

[1] The rotary switch position $\tilde{\tilde{mV}}$ is only for specific models.

[2] When measuring current, for 10 A to 15 A, the measuring duration should not be over 2 minutes within 10 minutes, and in this 10 minutes, no other current should flow through except within the measuring duration; for 15 A to 20 A, the measuring duration should not be over 10 seconds within 15 minutes, and in this 15 minutes, no other current should flow through except within the measuring duration.

[3] When measuring capacitance, for the 60.00mF range, the measuring duration

should be over 30 seconds.

[4] When measuring frequency, the typical waveform is Square or Sine. The signal meets the following conditions.

Frequency	Amplitude (rms)
1 Hz – 5 MHz	≥ 700 mV

[5] When measuring duty cycle, the typical waveform is Square.

Note: when measuring resistance and capacitance, the influence of the resistance reactance of the pen itself on the measured value should be considered.

Characteristics	**Instruction**	
Display	OW18A,OW18B	5999
	OW18D,OW18E	19999
Frequency Response (Hz)	(40 - 1000) Hz	
Sample rate for digital data	3 times/second	
Bluetooth	OW18D. OW18A	Without
	OW18E. OW18B	√
Auto ranging	√	
True RMS	√	
Diodes Test	√	
Sleep Mode	√	
Continuity Test	√	
NCV function	√	
Flashlight	√	
Low battery indication	√(The "" is displayed when the battery is under the proper operation range.)	
Data Hold	√	
Relative Measurement	√	
LCD Backlight	√	
Input Protection	√	
Input Impedance	≥ 10 MΩ	
Battery	9V battery (6F22)	
LCD Size	69 mm * 52 mm	
Weight (without package)	0.32 kg	
Dimension	190 mm * 90 mm * 56 mm	
Working temperature	0℃ to 40℃	
Storage temperature	－10℃ to 60℃	
Relative Humidity	≤ 80%	
Altitude	Operating: 3,000 meters Non-operating: 15,000 meters	

Interval Period of Adjustment:

One year is recommended for the calibration interval period.

8. Appendix

Appendix A: Enclosure

Standard Accessories:



Multimeter Leads



K-type thermocouple



Quick guide



9V battery (6F22)



Bolt driver



Alligator Clips (only for OW18B/OW18E)

Options:



Bluetooth USB adapter to PC (only for OW18B/OW18E)

Appendix B: General Care and Cleaning

Warning: To avoid electrical shock or damage to the multimeter, ensure that the insides of the casing stay dry at all times.

Cleaning

To clean the instrument exterior, perform the following steps:

Wipe the dust from the instrument surface with a soft cloth. Do not make any scuffing on the screen when clean the LCD. Clean the instrument with a wet soft cloth not dripping water. It is recommended to scrub with soft detergent or fresh water. To avoid damage to the instrument, do not use any corrosive chemical

cleaning agent.

Dirt or moisture in the terminals can distort readings. Follow the steps below to clean your multimeter.

1. Turn the multimeter off and remove the test leads.
2. Turn the multimeter over and shake out the dirt in the terminals.
3. Wipe the contacts in each terminal with a clean swab dipped in alcohol.