General Warranty

OWON 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 OWON 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, OWON 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 OWON for warranty work may be new or reconditioned like new performance. All replaced parts, modules and products become the property of OWON.

In order to obtain service under this warranty, Customer must notify OWON 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 OWON, and with a copy of customer proof of purchase.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. OWON shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than OWON representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-OWON supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

Please contact the nearest OWON's Sales and Service Offices for services or a complete copy of the warranty statement.

For better after-sales service, please visit www.owon.com.cn and register the purchased product online.

Excepting the after-sales services provided in this summary or the applicable warranty statements, OWON will not offer any guarantee for maintenance definitely declared or hinted, including but not limited to the implied guarantee for marketability and special-purpose acceptability. OWON should not take any responsibilities for any indirect, special or consequent damages.

For more details, please refer to the user manual, it can be downloaded at www.owon.com.cn .

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 two standard AA 1.5 V batteries. 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 600 V, CAT III.

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.

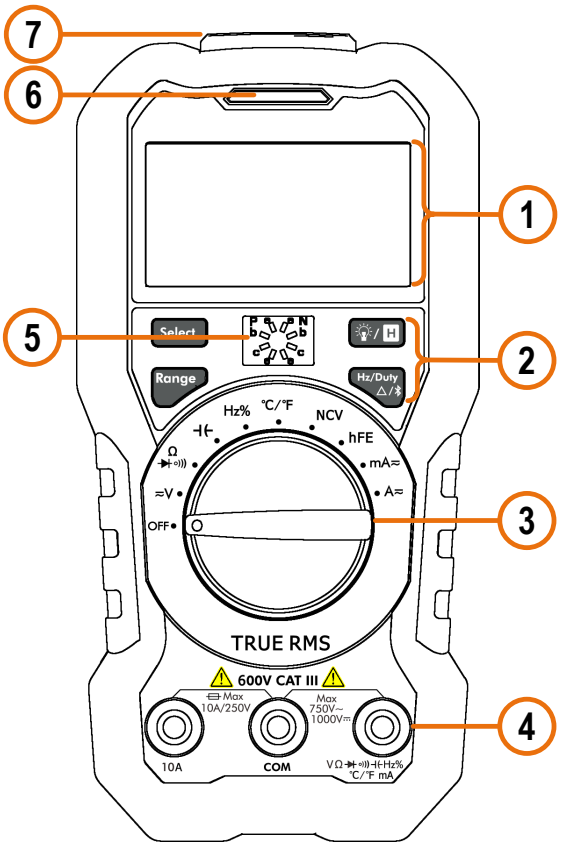
Safety Symbols

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 II	Category II overvoltage protection
	Ground terminal	CAT III	Category III overvoltage protection
	Conforms to European Union directives	CAT IV	Category IV overvoltage protection
	Equipment protected throughout by double insulation or reinforced insulation		

2. Multimeter in Brief

Front panel



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

Figure 2-1 Front panel overview
(OW16B with hFE is shown for example)

Rotary switch

Position	Description
OFF	Power off
≈V	DC or AC voltage measurement
Ω	Resistance measurement
)))	Continuity test
▶|	Diode test
⊣⊢	Capacitance measurement
Hz%	Frequency measurement

℃/℉	Temperature measurement
NCV	Non-contact voltage detect
hFE or μA≈	Transistor measurement or DC or AC current measurement (up to 600 microamperes)
mA≈	DC or AC current measurement (up to 600 milliamperes)
A≈	DC or AC current measurement

Keypad

Key	Description
Select	Select DC or AC
	Select Resistance/Continuity/Diode
Range	Auto/Manual range
/ H	Backlight
	Data Hold
Hz/Duty △/	Select frequency/duty cycle
	Measuring frequency in AC voltage/current mode
	Relative Measurements
	Bluetooth (only for OW16B)

Display screen

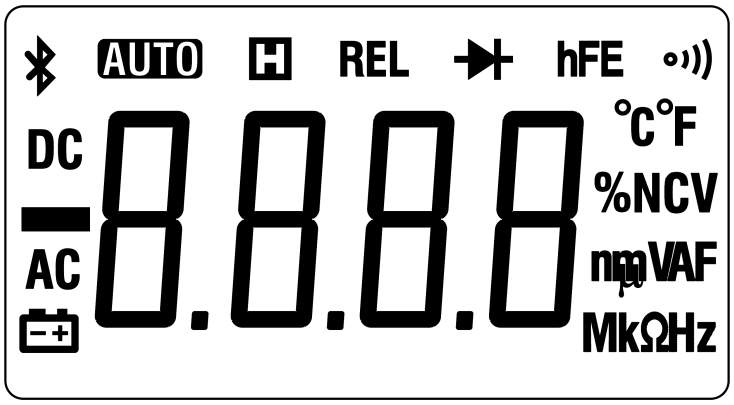


Figure 2-2 Display screen

Symbol	Description
	Bluetooth enabled
AUTO	Auto range
H	Data hold enabled
REL	Relative enabled
	Diode test selected
hFE	Transistor measurement
	Continuity test selected
DC	DC
AC	AC
	Battery is low
-8.8.8.8	Measurement display ("OL" is short for overload, indicates the reading exceeds the display range)
°C°F %NCV	NCV is for Non-contact Voltage Detect
nμmVAF MkΩHz	Measuring units

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	VΩ ⊣▶⊢ ◦))) ⊣⊢ Hz% °C/°F mA	COM	750 VAC/1000 VDC
Ω ⊣▶⊢ ◦)))	VΩ ⊣▶⊢ ◦))) ⊣⊢ Hz% °C/°F mA	COM	250 VAC/300 VDC
⊣⊢			
Hz%			
°C/°F			
mA≈			
A≈	10A	COM	10A/250V, fast-acting fuse

3. Multimeter Features

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 Control

To view the display in low-light conditions, you can activate the LCD backlight by pressing ☼/H for more than 2 seconds. The backlight will last for one minute. To turn off manually, pressing ☼/H for more than 2 seconds.

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, **REL** 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, 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.

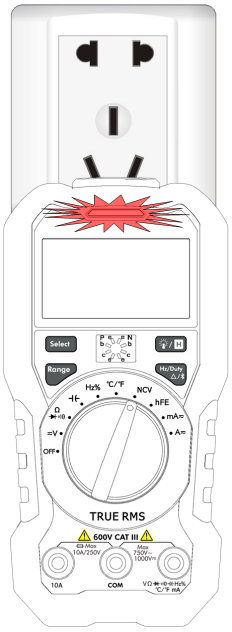
- When the Bluetooth function is idle for 10 minutes, the Bluetooth will be turned off automatically. Before turning off, the buzzer will beep twice.

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 could mistakenly trigger NCV indication.



Beep

(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.

4. Bluetooth Function – Only for OW16B

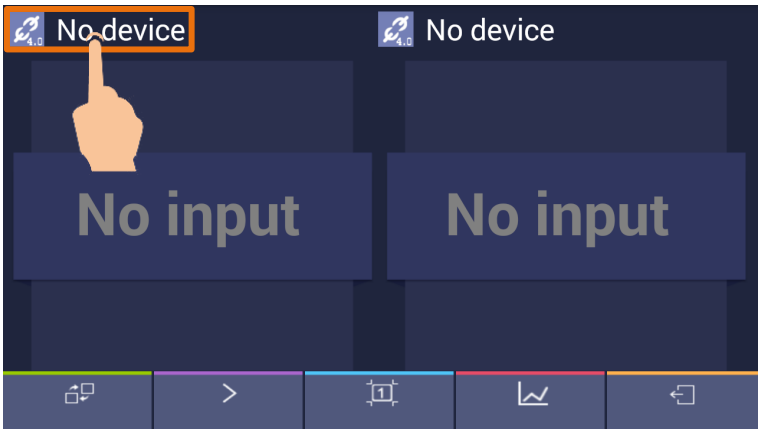
Connect with Android Device

(1) Install the free application software for Android on your Android smart device.

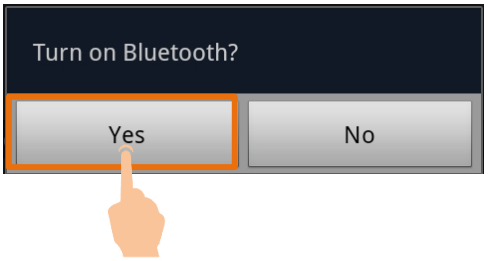
(2) Launch the "Multimeter" application.

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

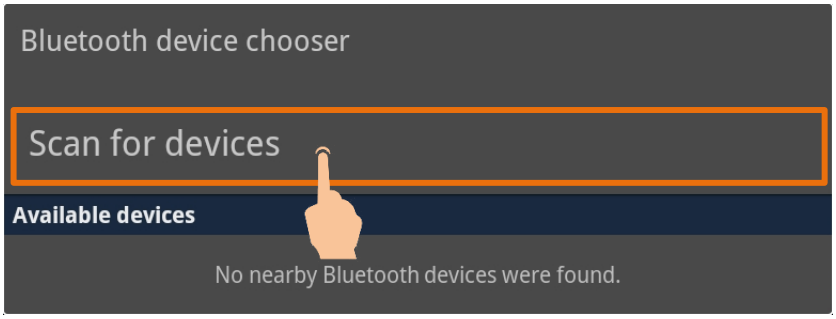
(4) Click the icon on the top left of the screen to launch device connection.



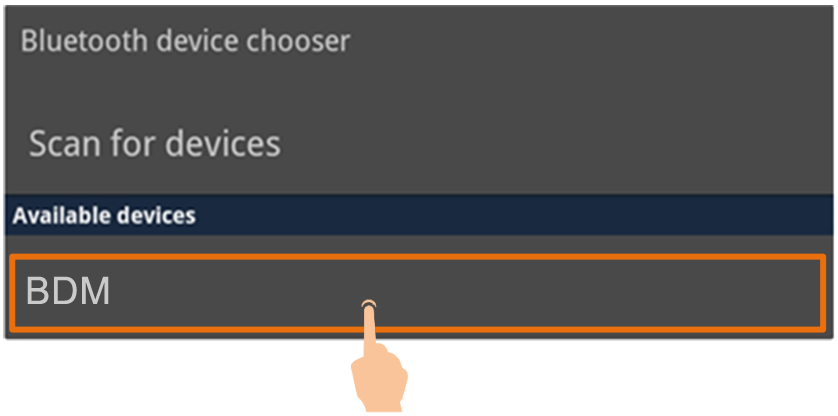
(5) If the Bluetooth function is not activated, a dialog box will ask whether to turn on Bluetooth. Click "Yes".



Click to scan for Bluetooth devices.



(6) Click "BDM" in the device list to pair.

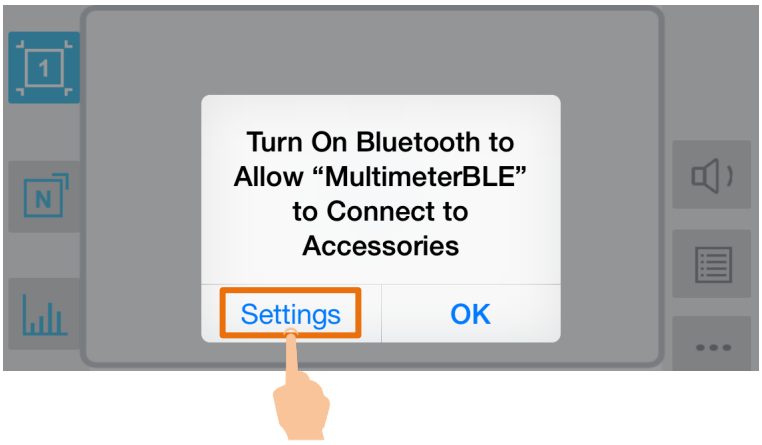


Connect with iOS Device

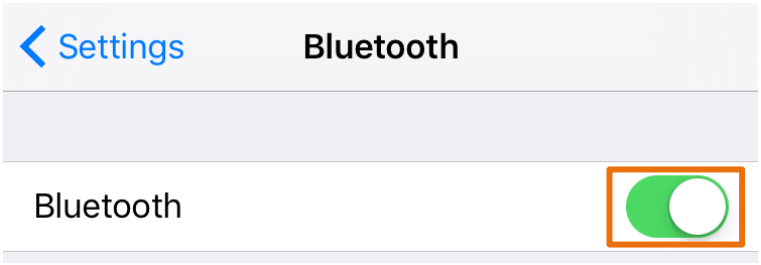
(1) Install the free application software for iOS on your iOS smart device.

(2) Launch the application 

.If the Bluetooth function is not activated, a dialog box will prompt you to turn on Bluetooth. Tap on "Settings".



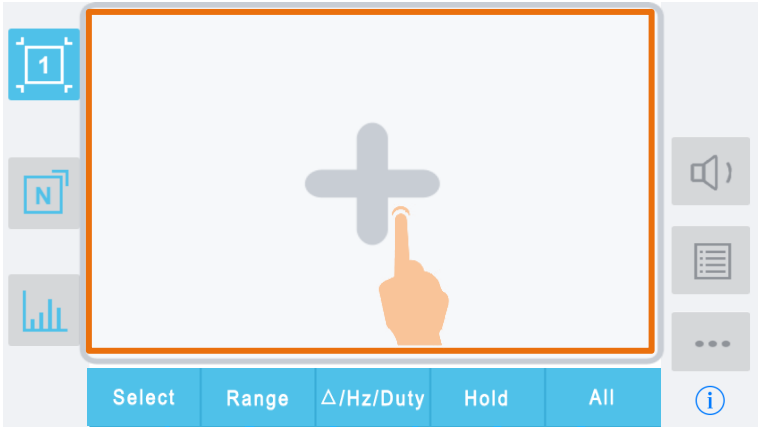
Turn on Bluetooth, and return to the multimeter APP.



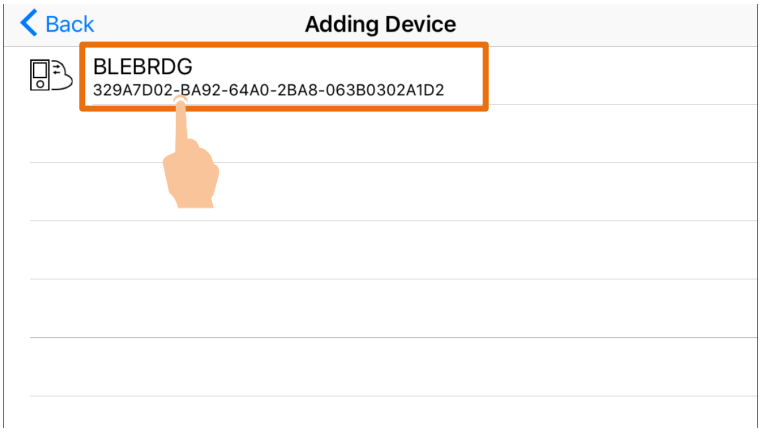
(3) Turn on the multimeter, press and hold 

until  appear on the display.

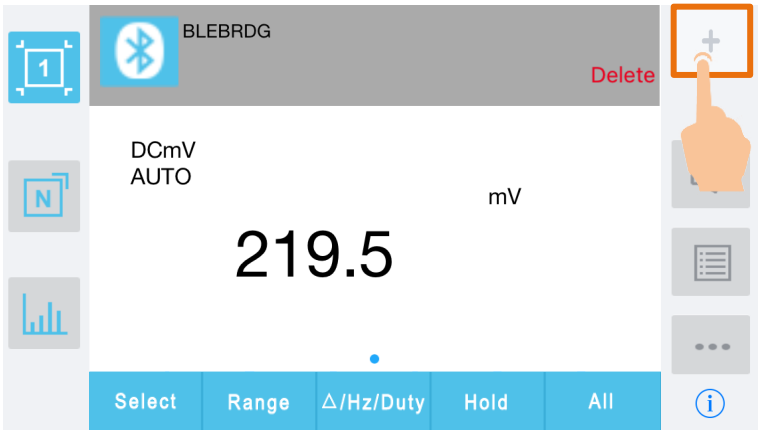
(4) Tap on the center to launch device connection.



(5) Select the desired multimeter in the device list.



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



Connect with Computer

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

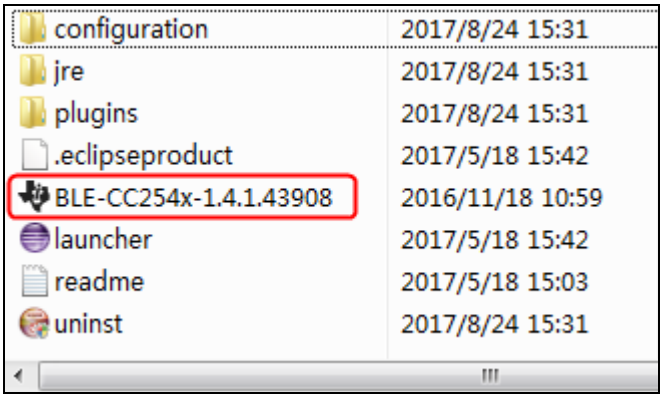
- Use only the Bluetooth USB adapter (optional) supplied with the product.
- The computer must be running the **Windows** operating system (Windows 10, Windows 8, Windows 7, Windows Vista, Windows XP).

Step 1: Install multimeterBLE software

Install the multimeterBLE software on your computer.

Step 2: Install driver of Bluetooth USB adapter

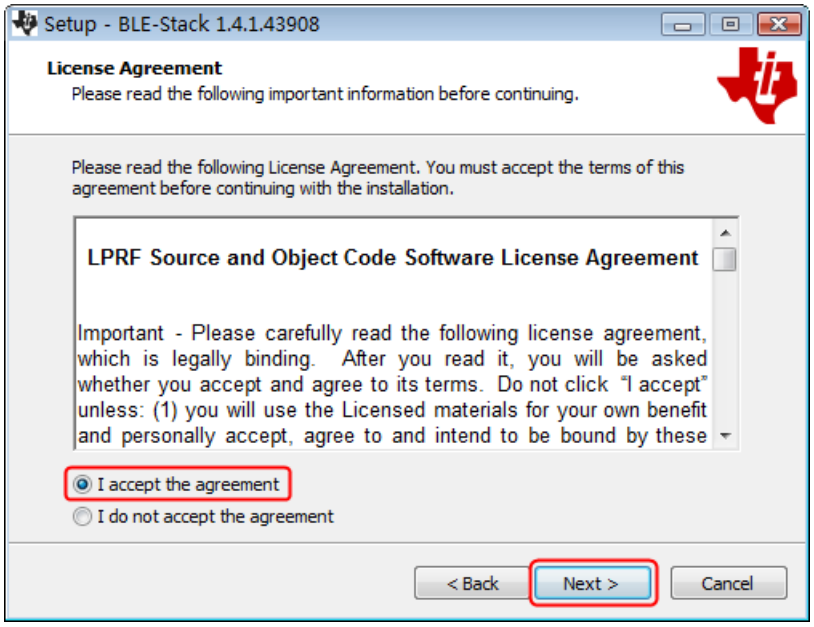
(1) Navigate to the multimeterBLE software installation folder (for example, C:\Program Files\multimeterBLE).
Double-click **BLE-CC254x-1.4.1.43908.exe** in this folder.



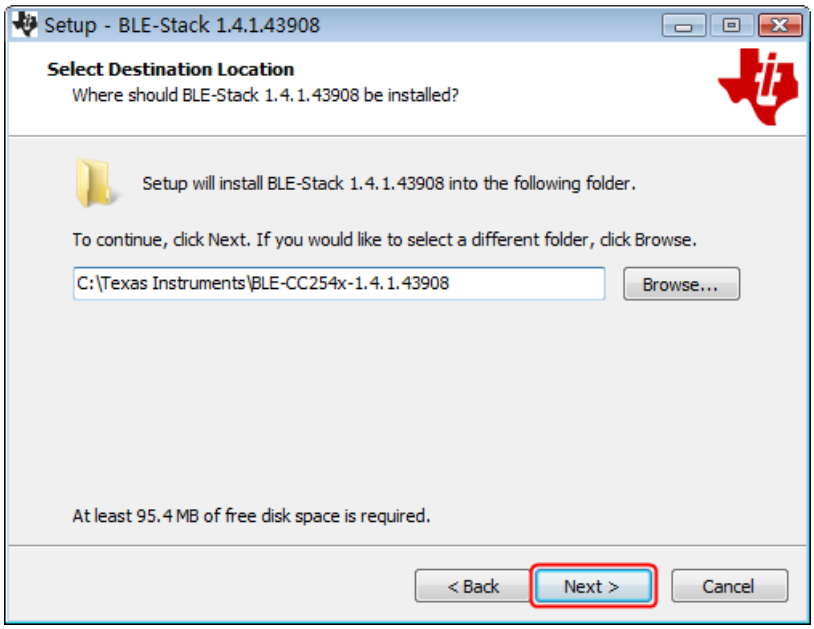
(2) Click "**Next**".



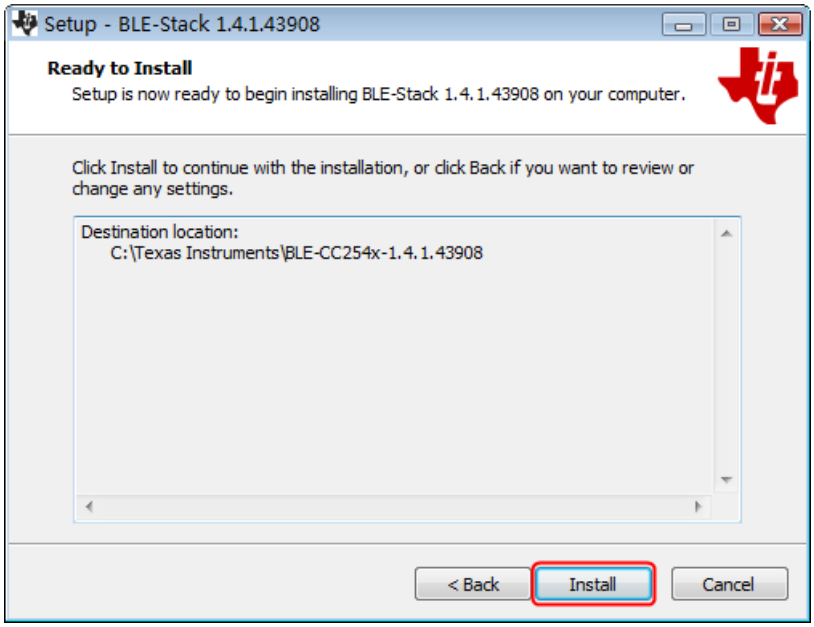
(3) Select "**I accept the agreement**", and then click "**Next**".

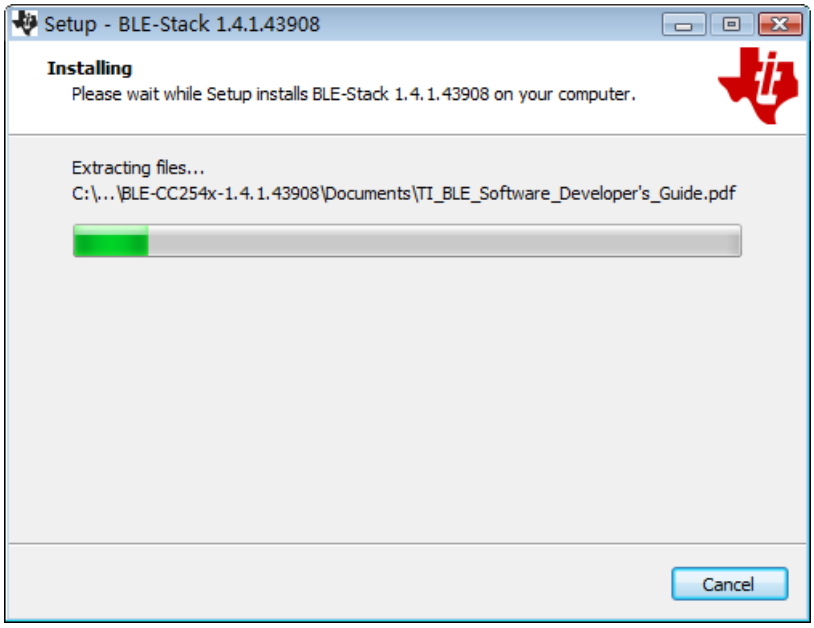


(4) Select the destination folder, and then click "**Next**".



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



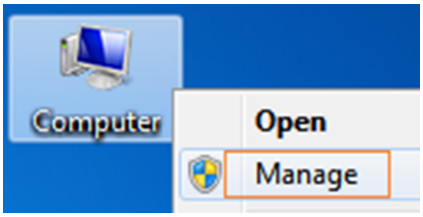


(6) Uncheck "**View the Release Notes**", and click "**Finish**" to exit Setup.



(7) Plug the Bluetooth USB adapter into a USB port on your computer.

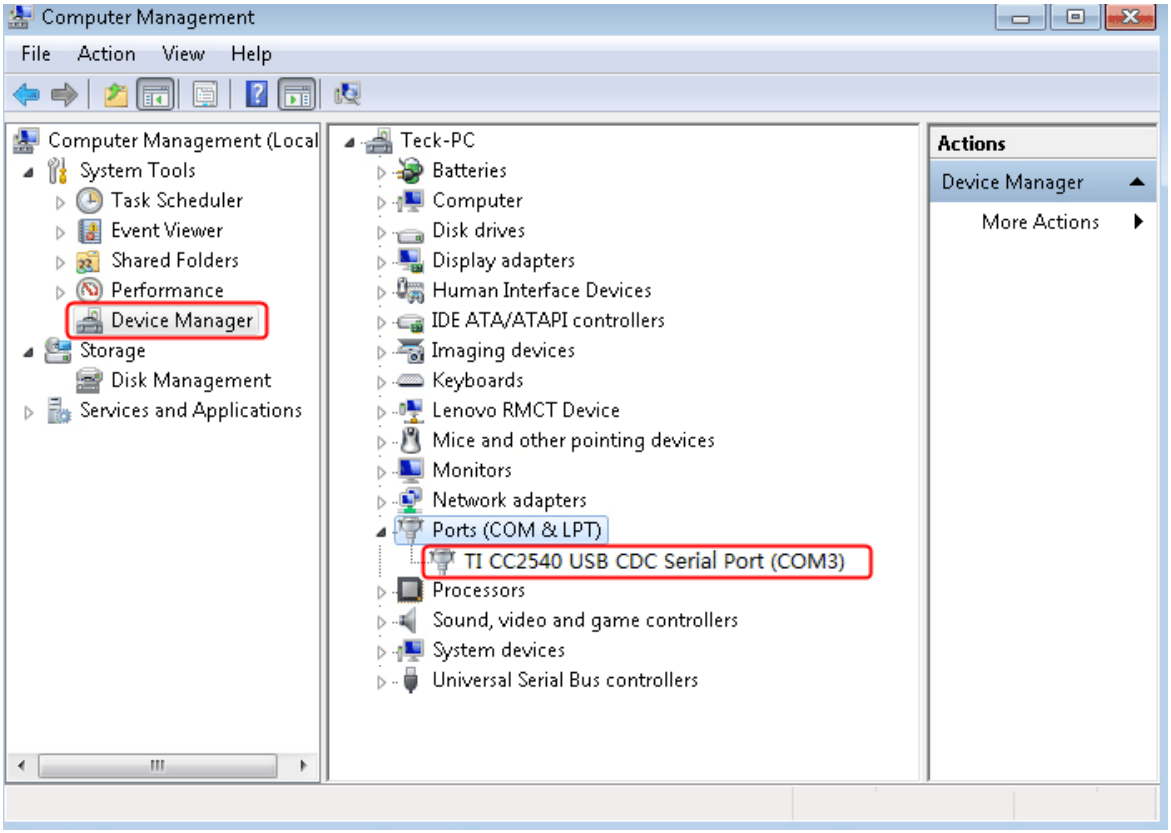
Right click [**Computer**], you can find it on the desktop, or in [**Start**] menu. In the drop down menu, click on [**Manage**], the “Computer Management” window opens.



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

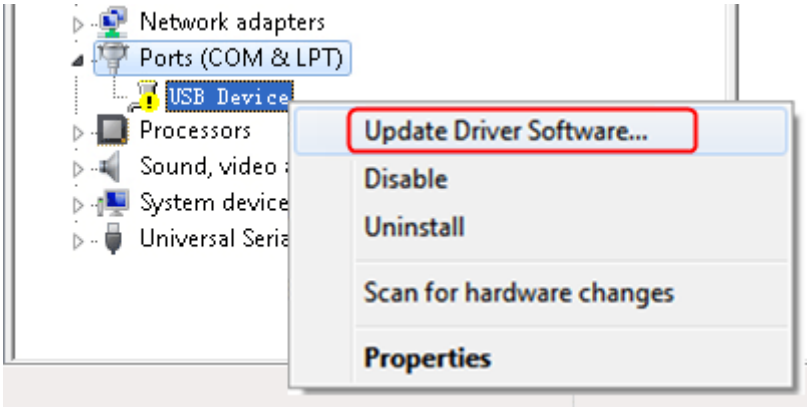
Under ports, if "**TI CC2540 USB CDC Serial Port (COM#)**" is displayed, that means the driver is installed successfully. Remember the “COM #” because you will need to configure the multimeterBLE software.

Note: If an unknown device is displayed, try to install the driver manually following the steps below.

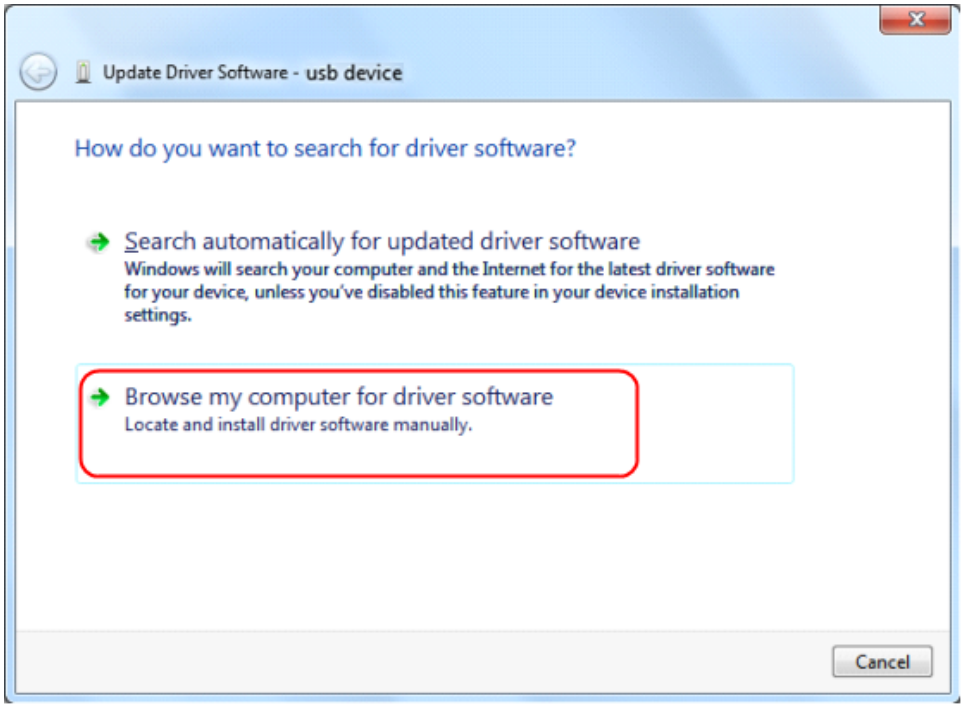


How to install the driver manually

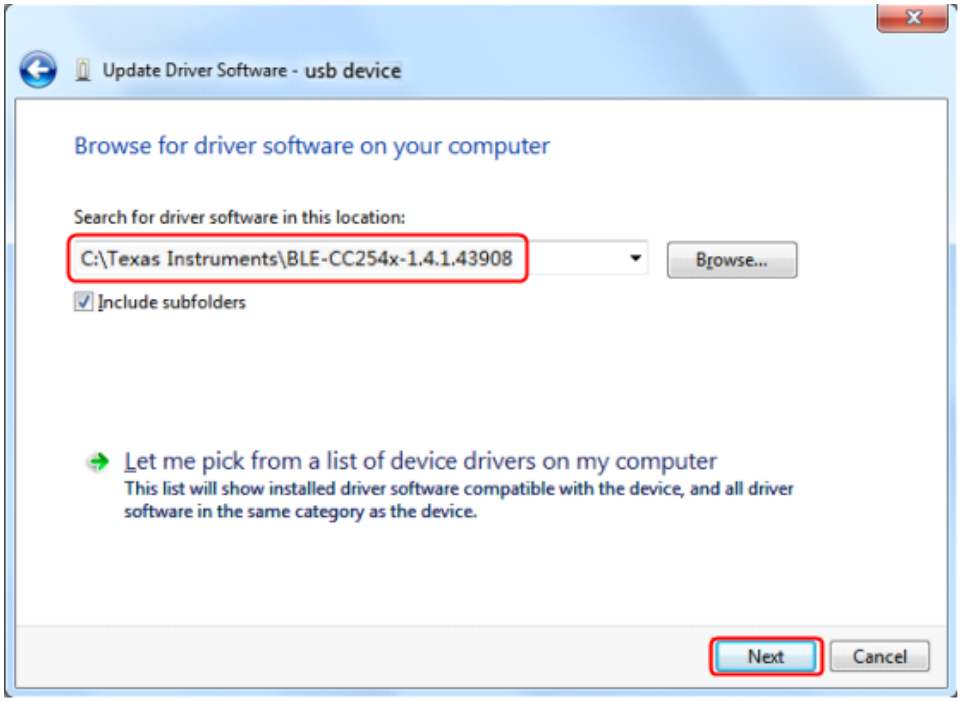
Right click the unknown device icon, in the drop down menu, click "**Update Driver Software...**".



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

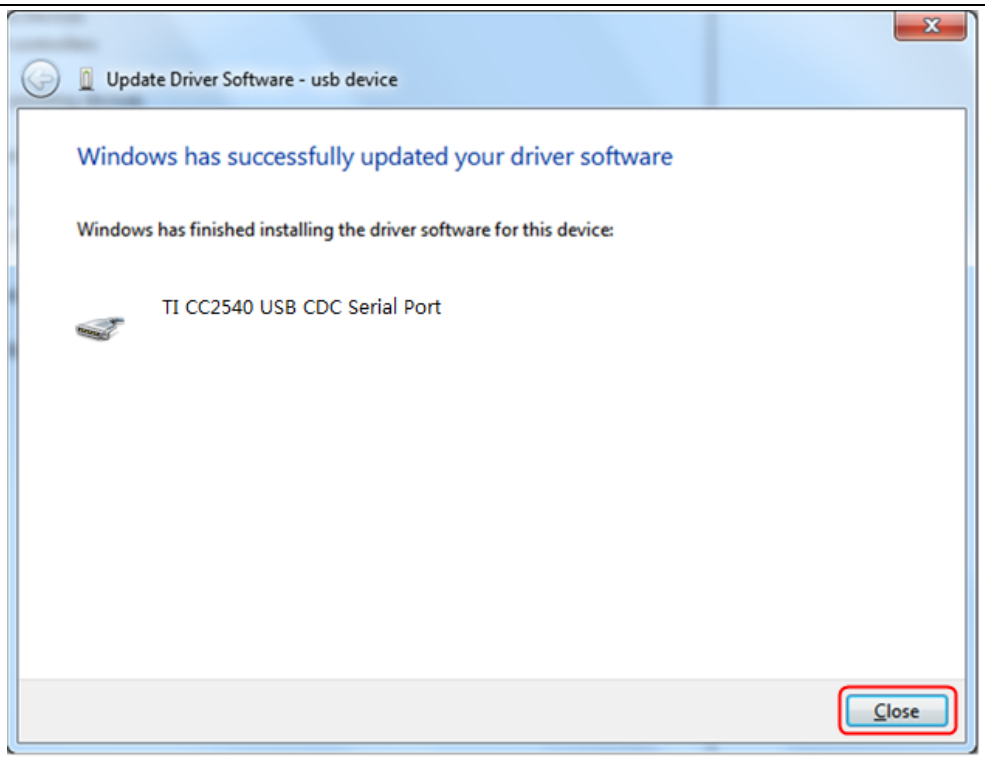


Select a directory path for the driver, and click "**Next**".



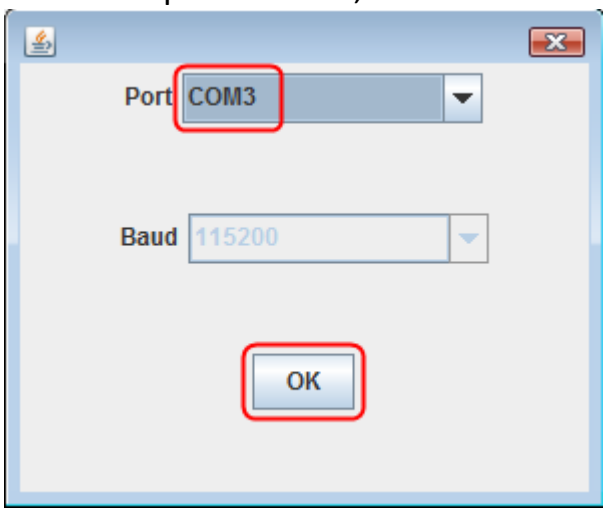
After installing successfully, click "**Close**".

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



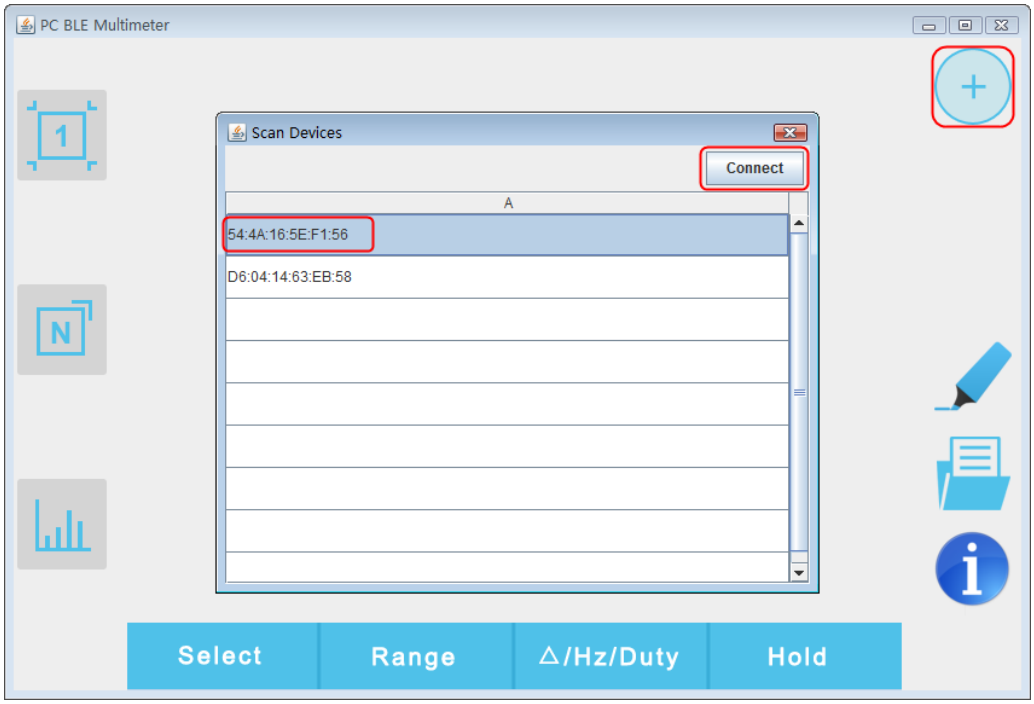
Step 3: Connect to multimeterBLE software

(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".

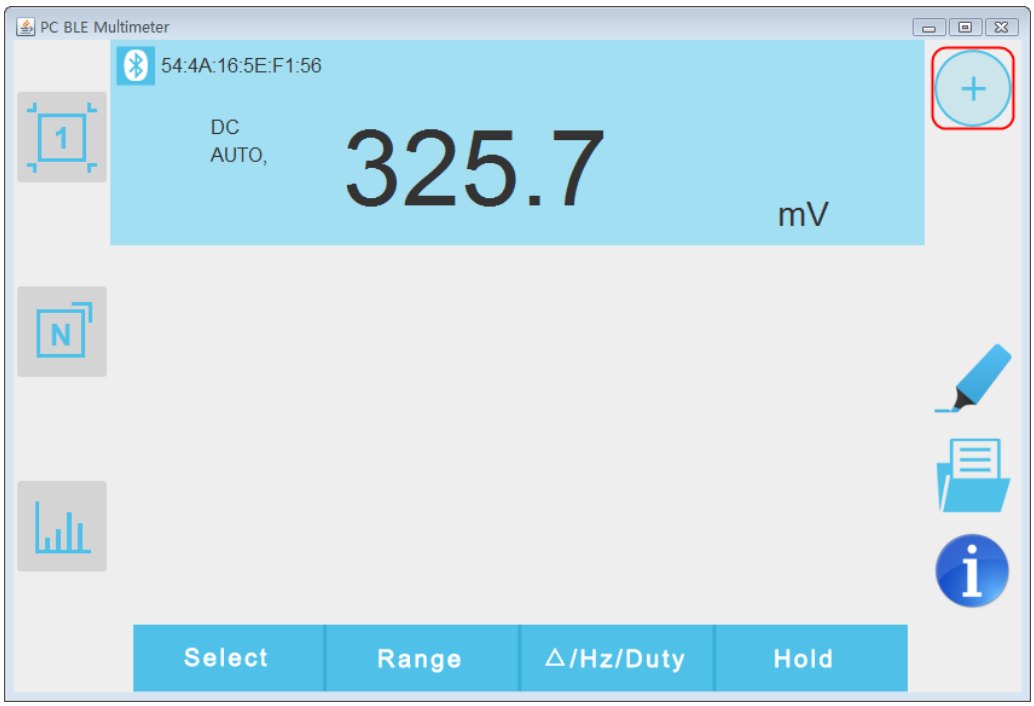


(2) Turn on the multimeter, press and hold Hz/Duty △/ until appear on the display.

(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.



5. Multimeter Offline Record – Only for OW16B

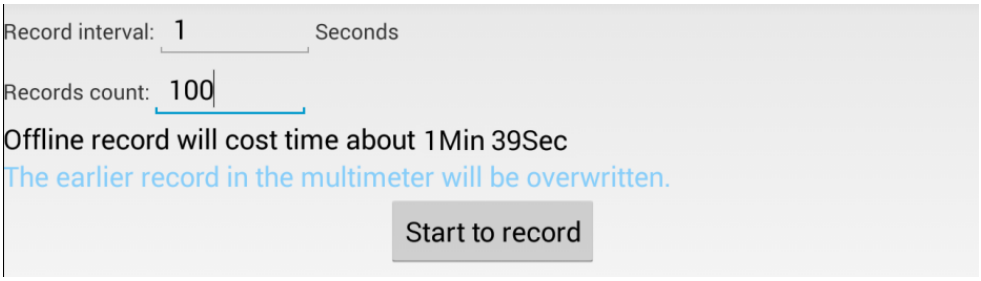
When measuring with OW16B, you can use Android/iOS device APP or PC software to send a command, the multimeter will start recording the measurements. After receiving the command, the connection will be disconnected automatically. The multimeter will record the measuring data in its own memory. After completion of the record, use APP or PC software to reconnect the multimeter, and then you can read the measuring data into the 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.

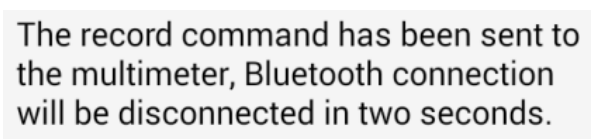
Offline Record for Android Device

(1) Connect the Android device with the multimeter, see "*Connect with Android Device*" on P10.

(2) In APP single view, tap on the icon on the top right, select Record setting from the pop-up menu.



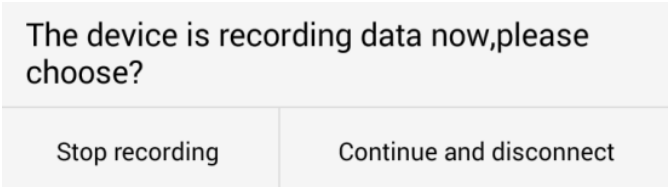
(3) Set "Record interval" and "Records count" (maximum records count is 10,000). Tap on Start to record. The memory in the multimeter can only store the recording data of one time . When start to record, the earlier offline record stored in the multimeter will be overwritten. After starting, the APP interface will display



The Android device will disconnect with the multimeter in two seconds.

After disconnecting, the information "**Bluetooth connection has been 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 Android device and the multimeter, a dialog box will pop up:

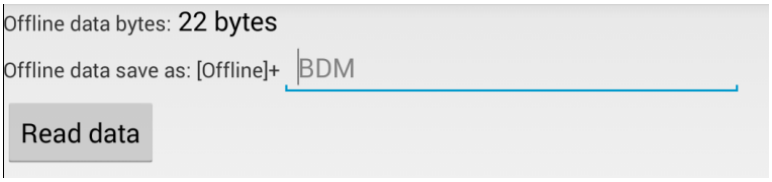


Select Stop recording, the recording process will be interrupted. The Android device will connect with the multimeter to read data.

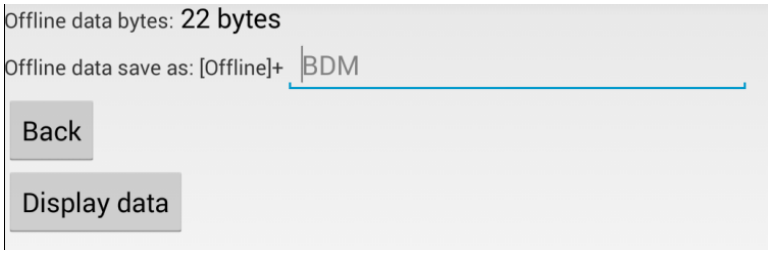
Select Continue and disconnect, the multimeter will continue recording, the connection will be aborted.

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

(5) In APP single view, tap on the icon on the top right, select Record read from the pop-up menu. The file name start with "Offline", the following part can be customized.



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

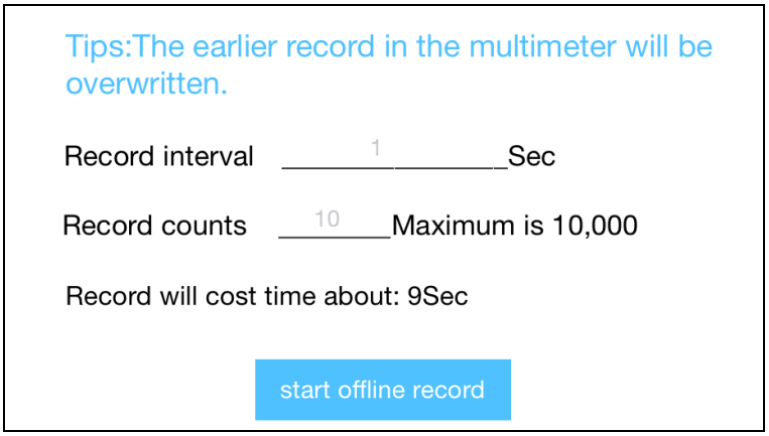


(7) Tap on Display data, the data will be displayed in Data Graph and Table interface.

Offline Record for iOS Device

(1) Connect the iOS device with the multimeter, see "*Connect with iOS Device*" on P11.

(2) In APP device view, tap on the  softkey on the right, select "**Record setting**" from the pop-up menu.

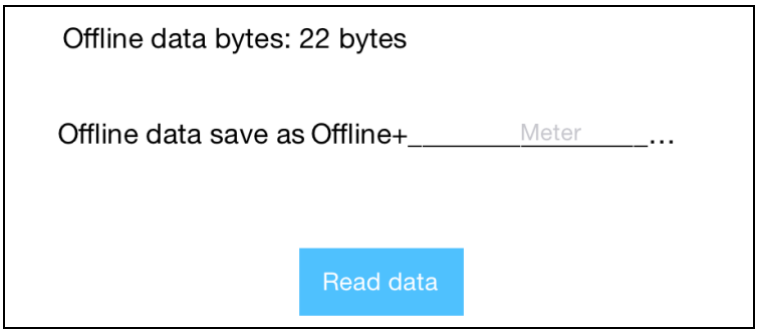


(3) Set "Record interval" and "Records counts" (maximum records count is 10,000). Tap on "**start offline record**". The memory in the multimeter can only store the recording data of one time. When start to record, the earlier offline record stored in the multimeter will be overwritten.

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

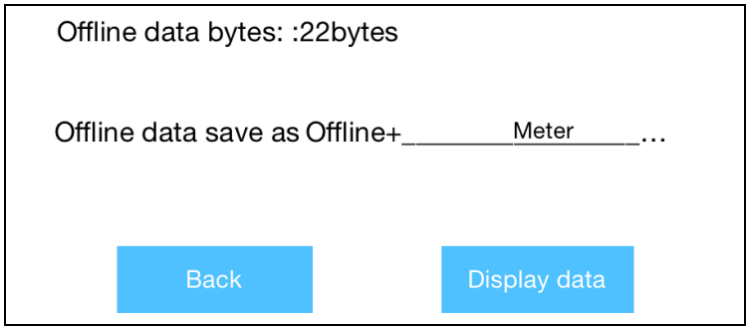
(4) After completion of the record, to read the measuring data, reconnect the iOS device and the multimeter.

(5) In APP device view, tap on the  softkey on the right, select "**Record read**" from the pop-up menu. The file name start with "Offline", the following part can be customized.



(6) Tap on "**Read data**", APP will read the measuring data and save as a CSV file into the iOS device.

After reading, display as below:



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

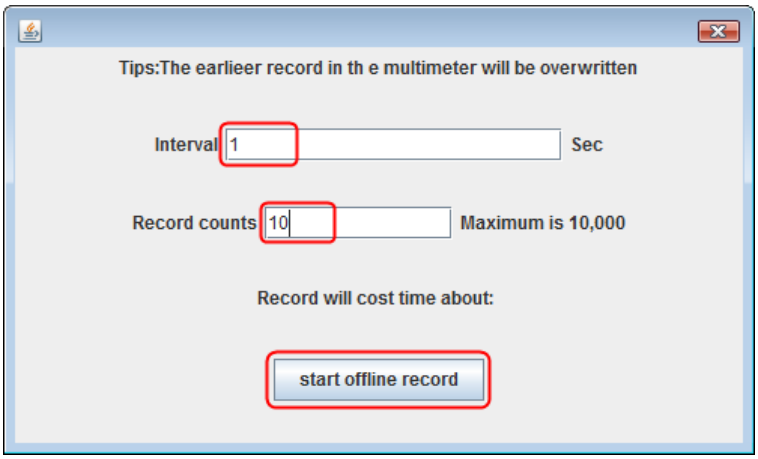
Offline Record for PC Software

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 10, Windows 8, Windows 7, Windows Vista, Windows XP).

(1) Connect the multimeterBLE software with the multimeter, see "*Connect with Computer*" on P13.

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

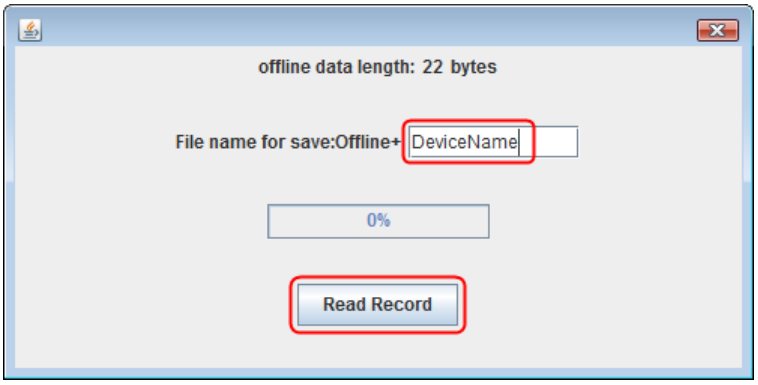


(3) Set "Interval" and "Record counts" (maximum records count is 10,000). Click "**start offline record**". The memory in the multimeter can only store the recording data of one time. When start to record, the earlier offline record stored in the multimeter will be overwritten.

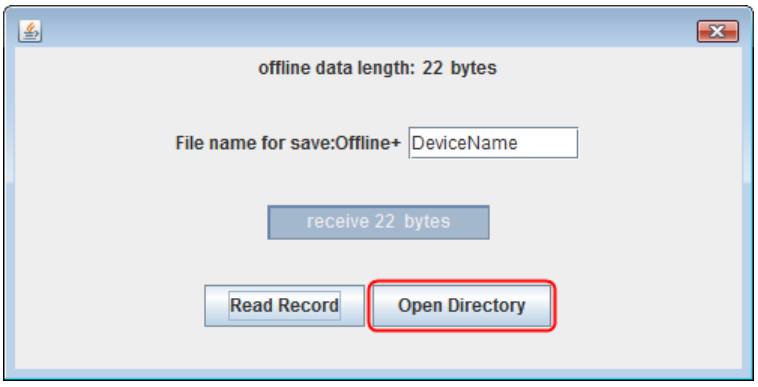
Note: If you want to interrupt the recording process of the multimeter, reconnect the software and the multimeter, select "Stop recording".

(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.

6. Appendix

Appendix A: Enclosure

Standard Accessories:



Test lead



K-type thermocouple



Quick guide



Crocodile clip (only for OW16B)

Options:



Bluetooth USB adapter to PC (only for OW16B)

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.

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