

Digital Multimeter User Manual

■ B35(T)

■ D35(T)

Note: "T" indicates true RMS (optional)

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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 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, 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.

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 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. General Characteristics

Features and benefits:

- ◆ Data transferring via Bluetooth, interacting with mobile device to read measurements, analyze via special chart mode, remote control, voice-out feature; voice warning supported, which enhances measurement safety (B35(T) only);
- ◆ $3\frac{5}{6}$ digit reading, achieving higher measurement accuracy than $3\frac{1}{2}$ or $3\frac{3}{4}$ digit counterparts;
- ◆ Larger display, easier data-reading; analog bar graph is displayed synchronously;
- ◆ Multi-connection (more than one device) supported via mobile APP;
- ◆ Temperature measuring function;
- ◆ Backlit-powered screen, more suitable for dark measurement environment;
- ◆ Smart power-off function, extending battery life;
- ◆ Thin-tipped test lead (optional) to measure the pins of small package device;
- ◆ True RMS value available (only in B35T and D35T).

3. 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 Lilliput responsible for this service or the Lilliput's 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 Lilliput's distributor responsible for this business or the Lilliput's local offices. If there is damage to the instrument caused by the transportation, please keep the package. With the transportation department or the Lilliput's distributor responsible for this business informed about it, a repairing or replacement of the instrument will be arranged by the Lilliput.

Install the Batteries

The multimeter is powered by two 1.5 V AA alkaline batteries.



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 15 minutes. (When the Bluetooth is activated, this function is disabled.)

Pressing any key will turn the multimeter back to operation mode from the sleep mode.

One minute before auto power-off, the buzzer will sound “BeBeBeBeBe” five times to warn. Before it is shut off, the buzzer will sound a long “Beee” then 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.

Backlight Control

- (1) To view the display in low-light conditions, you can activate the LCD backlight by pressing  for more than 2 seconds.

- (2) To turn off the backlight, press  for more than 2 seconds.

The backlight will last for 10 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

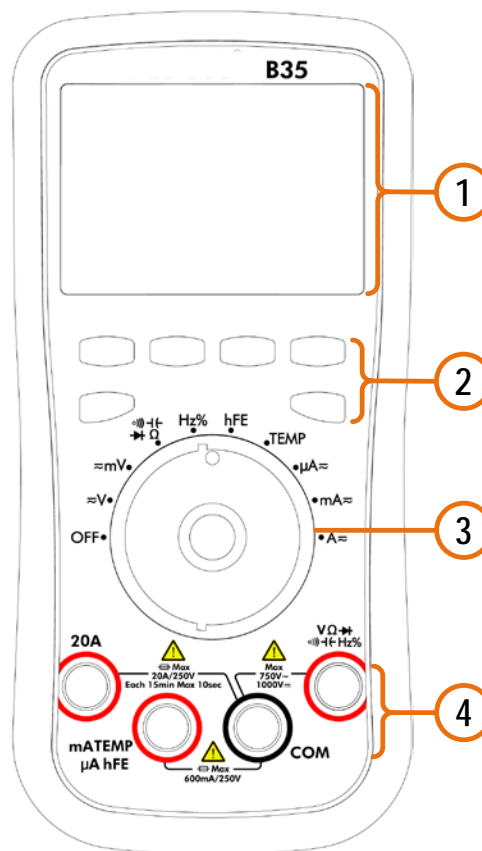





Figure 3-1 Front panel overview (B35)







No.	Description	Details
①	Display screen	Page 10
②	Keypad	Page 9
③	Rotary switch	Page 9
④	Input terminals	Page 12

Rotary switch

Position	Description	Details
OFF	Power off	Page 7
$\approx V$	DC or AC voltage measurement	Page 13
$\approx mV$	DC or AC voltage measurement (up to 600 millivolts)	
	Continuity test	Page 14
	Capacitance measurement	Page 14
	Diode test	Page 14
	Resistance measurement	Page 13
Hz%	Frequency measurement	Page 15
hFE	Transistor measurement	Page 15
TEMP	Temperature measurement	Page 15
$\mu A \approx$	DC or AC current measurement (up to 600 microamperes)	Page 16
$mA \approx$	DC or AC current measurement (up to 600 milliamperes)	
$A \approx$	DC or AC current measurement	

Keypad

Key	Description	Details
	Select function: <ul style="list-style-type: none"> • Select DC or AC • Select °C or °F during temperature measurements • Select Resistance/Diode/Continuity/Capacitance 	Page 8
	Auto/Manual range	

	Select frequency/duty cycle	Page 15
	Capturing Max. and Min. Values	Page 17
	Backlight	Page 7
	Data Hold	Page 17
	Relative Measurements	Page 17
	Bluetooth (B35(T))	Page 19

Display screen

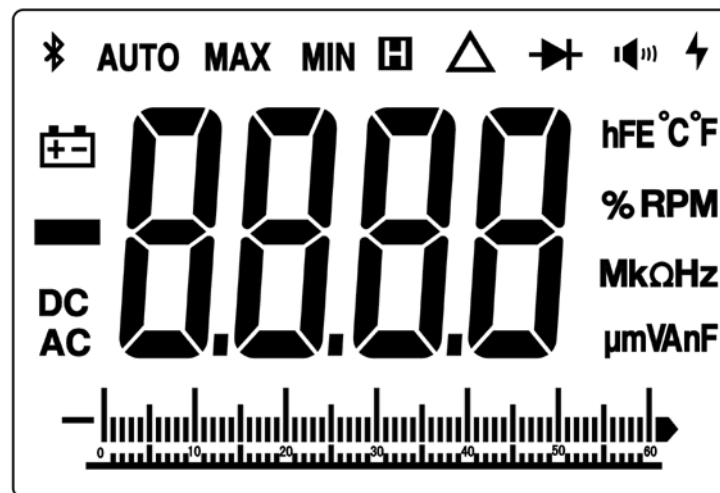







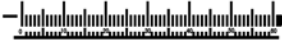


Figure 3-2 Display screen

Symbol	Description	Details
	Bluetooth enabled	Page 19
AUTO	Auto range	Page 8
MAX	Maximum reading	Page 17
MIN	Minimum reading	
	Data hold enabled	Page 17
	Relative enabled	Page 17
	Diode test selected	Page 14

	Continuity test selected	Page 14
	Battery is low	Page 6
DC	DC	Page 13 and Page 16
AC	AC	
	Measurement display ("OL" is short for overload, indicates the reading exceeds the display range)	
hFE °C °F % RPM MkΩHz μmVAnF	Measuring units	Page 11
 Analog bar graph		

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
°C	Degree Celsius	Temperature
°F	Degree Fahrenheit	
V	Voltage	Voltage
A	Ampere	Current
Ω	Ohm	Resistance
Hz	Hertz	Frequency
%	Percent,	Duty cycle
F	Farad	Capacitance
hFE	Current Amplification Factor	Transistor



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

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4. 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.

DC voltage ranges are 60.00 mV, 600.0 mV, 6.000 V, 60.00 V, 600.0 V, 1000 V;
AC voltage ranges are 60.00 mV, 600.0 mV, 6.000 V, 60.00 V, 600.0 V, 750 V.

- (1) Rotate the rotary switch to $\approx V$ or $\approx mV$. 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 $V\Omega\rightarrow$ terminal.
- (3) Probe the test points and read the display. Press Range to enable and cycle through the manual ranges.

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.





Resistance ranges are 600.0 Ω , 6.000 k Ω , 60.00 k Ω , 600.0 k Ω , 6.000 M Ω , and 60.00 M Ω .

- (1) Rotate the rotary switch to $\rightarrow \Omega$.
- (2) Connect the black test lead to the **COM** terminal and the red test lead to the $V\Omega\rightarrow$ terminal.
- (3) Probe the test points and read the display. Press Range to enable and cycle through the manual ranges.

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 . Press  once 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  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".

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 . Press  twice 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  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.




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.



Capacitance ranges are 40.00 nF, 400.0 nF, 4.000 uF, 40.00 uF, 400.0 uF, 4000 uF .


Note: For the 4000 uF range, the measuring duration should be over 30 seconds.

- (1) Rotate the rotary switch to  Ω . Press  three times to enter capacitance measuring mode, the Farad units will be displayed.
- (2) Connect the black test lead to the **COM** terminal and the red test lead to the  Ω terminal.
- (3) Probe the test points and read the display.

Measuring Frequency

Frequency ranges are 9.999 Hz, 99.99 Hz, 999.9 Hz, 9.999 kHz, 99.99 kHz, 999.9 kHz, and 9.999 MHz.

- (1) Rotate the rotary switch to **Hz%**.
- (2) Connect the black test lead to the **COM** terminal and the red test lead to the  Ω terminal.
- (3) Probe the test points and read the display.
- (4) Press  to switch between the frequency and duty cycle measurements.

When measuring AC voltage or AC current, press  to cycle through frequency measuring, duty cycle measuring, and original measuring.

Measuring Transistor



Warning: To avoid electrical shock or damage to the instrument, do not apply more than 250Vdc or 250Vac rms between the **COM** terminal and the **mATEMP** μ A hFE terminal.

- (1) Rotate the rotary switch to **hFE**.
- (2) Connect the “+” plug of the multi-functional test socket to the **mATEMP** μ A hFE terminal and the “**COM**” plug to the **COM** terminal).
- (3) Determine whether the transistor is NPN or PNP type and locate the Emitter, Base and Collector leads. Insert leads of the transistor into the corresponding holes of the multi-functional test socket.
- (4) Read the hFE value.

Measuring Temperature

- (1) Rotate the rotary switch to **TEMP**.

- (2) Connect the **red connection** of the K-type thermocouple to the **mATEMP** **μA hFE** terminal and the **black connection** to the **COM** terminal.
- (3) Probe the test points and read the display. Press **Select** to change the temperature units between **°C** or **°F**.

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.

Current ranges are 600.0 μA, 6000 μA, 60.00 mA, 600.0 mA, 6.000 A, and 20.00 A.

- (1) Turn off the power of the measured circuit. Discharge all high-voltage capacitors.
- (2) Connect the black test lead to the **COM** terminal. For currents below 600 mA, connect the red test lead to the **mATEMP** **μA hFE** terminal; for currents within 600 mA – 20 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.

5. 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.

Note: This function is not available when measuring diodes and transistor.

Capturing Max. and Min. Values

In MAX mode, the measured maximum value will be held; In MIN mode, the measured minimum value will be held.


- (1) Press  to cycle between the MAX mode and MIN mode.
- (2) Press  for more than 2 seconds to exit the mode.

In this mode, the manual range mode will be activated automatically. Analog bar graph is not displayed. Auto power-off function is disabled.

Note: This function is not available when measuring diodes, capacitance, transistor, and frequency.

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.

The measurement value when pressing  is stored as the reference value.

In this mode, $REL\Delta$ (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.) Analog bar graph is not displayed.

Note: This function is not available when measuring diodes, transistor, and frequency.

Buzzer Feature

- Press the function key, the buzzer will sound “Be...” in short.
- One minute before Auto Power-off the buzzer will sound “BeBeBeBeBe” five times to warn. Before it is shut off, the buzzer will sound a long “Beee” then shut off.
- The buzzer will sound “BeBe...” continuously to warn when the measured DC voltage is higher than 1000 V, AC voltage is higher than 750 V, or the measured DC/AC mV mode is higher than 600.0 mV.
- The buzzer will sound long when the short circuit resistance is less than about 30Ω during the continuity test.
- When the Bluetooth function is time out, the buzzer will sound “BeBe” two times.

6. Bluetooth Function – B35(T) only

B35(T) multimeter supports communications with Android based smart device through Bluetooth. You can use the free application software on the Android based smart devices to monitor the measurements, perform remote control, view trending graphs, etc. The recorded data can be saved as CSV file. More than one meters can be connect simultaneously.

Note: Bluetooth connectivity works over a range of about 10 meters. The work range is much longer in open-sided and non-occluded wide range environment, even up to 20 meters. If the Bluetooth function in the multimeter is idle for 10 minutes, the Bluetooth will be turned off automatically. Before turning off, the buzzer will sound “BeBe” two times.

System Requirements of Mobile Devices

- Android devices with Bluetooth connectivity
- Android Versions: 4.0 and above (for the version 4.0 below, some functions are not supported)



Install the application software

Install the free application software (Multimeter.apk), it can be downloaded from here:

- Scan QR Codes below with your Android based smart device to install the app.

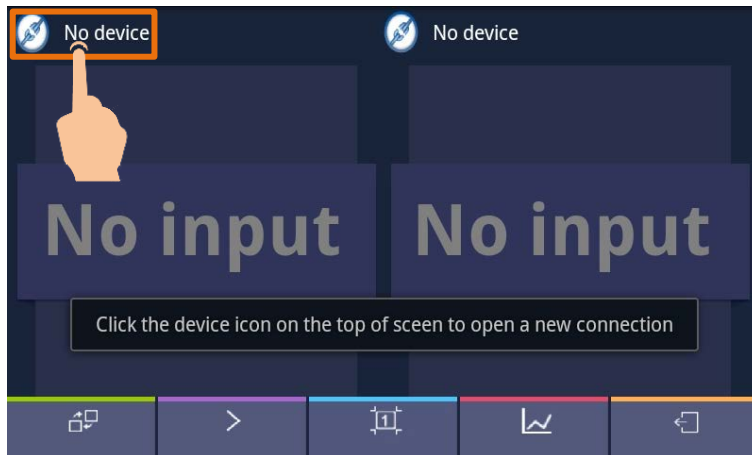


How to Connect

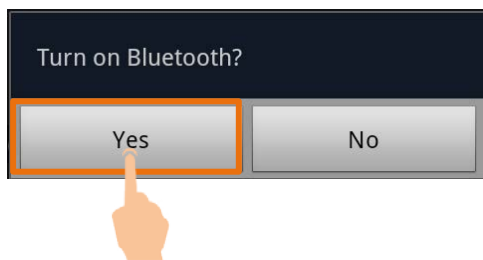
- (1) Turn on the multimeter, press and hold  until  appear on the display.
- (2) In Android based smart device, enter the Bluetooth settings, turn on Bluetooth, and search for devices. Click "OWON BDM*****" in the device list to pair. ("*****" is the serial number in the multimeter.)



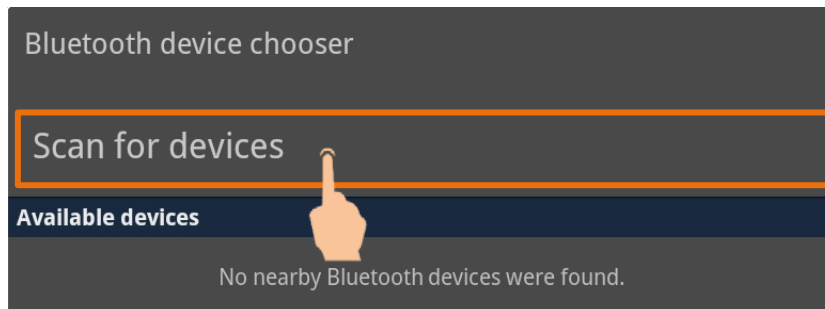
- (3) Launch the application .
- (4) Click the icon on the top left of the screen to launch device connection.



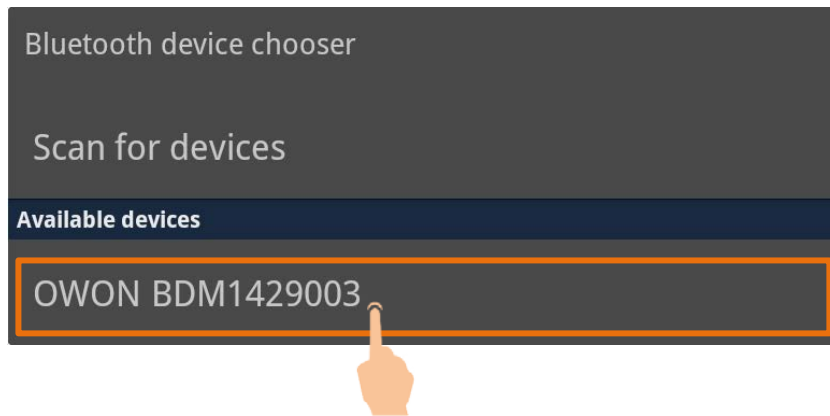
- (5) If the Bluetooth function is activated, skip this step; if not, a dialog box will ask whether to turn on Bluetooth. Click "Yes".



Click to scan for Bluetooth devices.

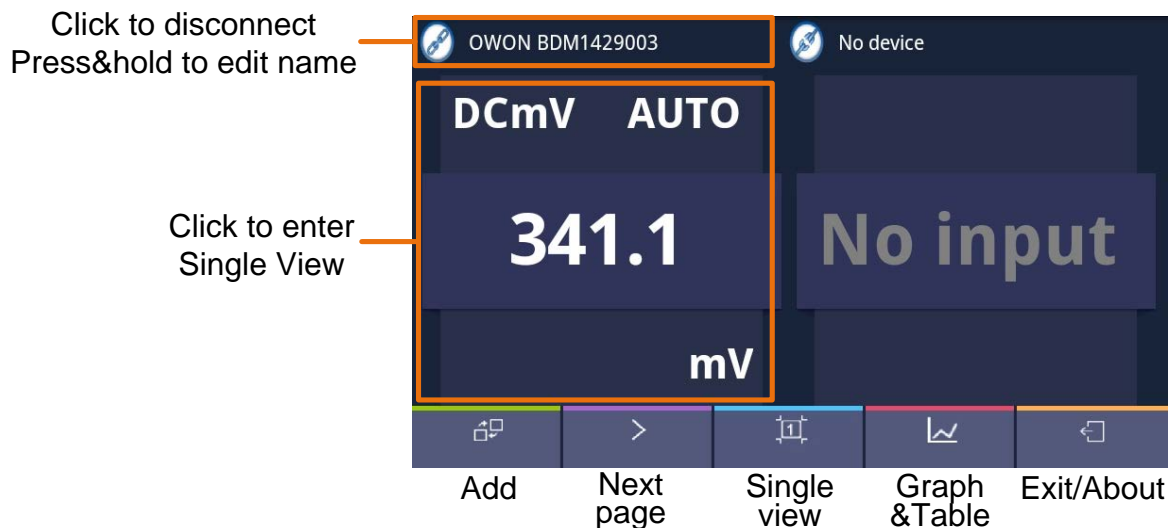


- (6) Click "OWON BDM*****" in the device list to pair. ("*****" is the serial number in the multimeter.)

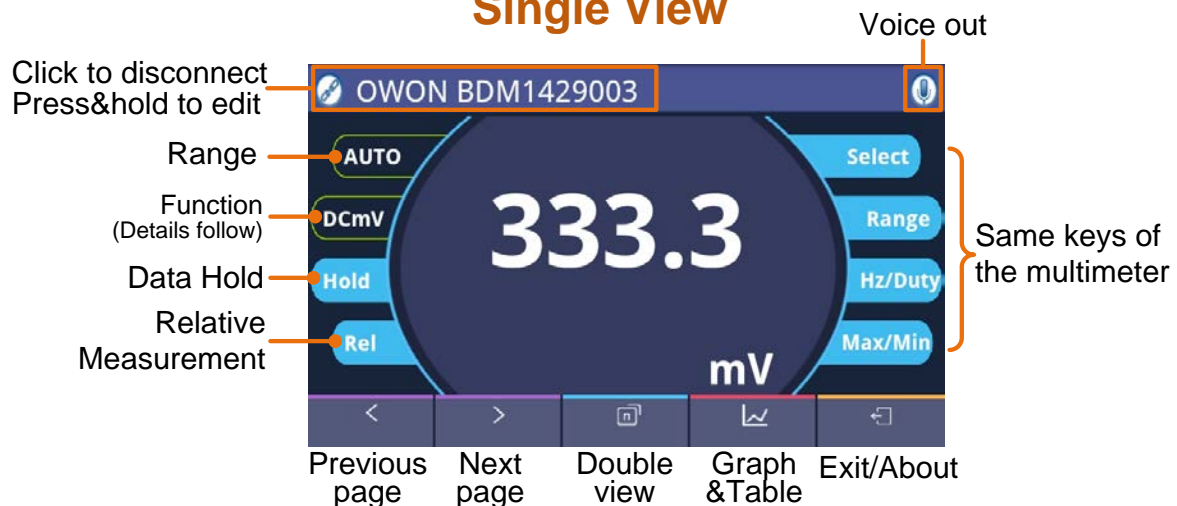


User Interface

Double View



Single View



Function Description Table





Display	Function	Display	Function
DC	Direct Current	CAP	Measuring Capacitance
AC	Alternating Current	Hz	Measuring Frequency
RES	Measuring Resistance	DUT	Measuring Duty Cycle
DIO	Testing Diodes	hFE	Measuring Transistor
BEEP	Testing for Continuity	TEMP	Measuring Temperature

Operations

● Customize the meter name


The device name of meter can be customized. Press and hold the name on the top left of the screen, a dialog box below will pop up. You can input the customized name, 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:** In double view, click  softkey.
- **Select meter:** In single or double view, click  or  softkey.
- **Disconnect meter:** In single or double view, click  or the meter name.
- **Remote Control:** In single view, the control softkeys (blue background softkeys, as Hold, Rel, Select, etc.) can be short or long pressed to perform control, just as press the corresponding keys of multimeter.
- **Voice out function**


Provide an audible out of the readings through the text-to-speech (TTS) engine on

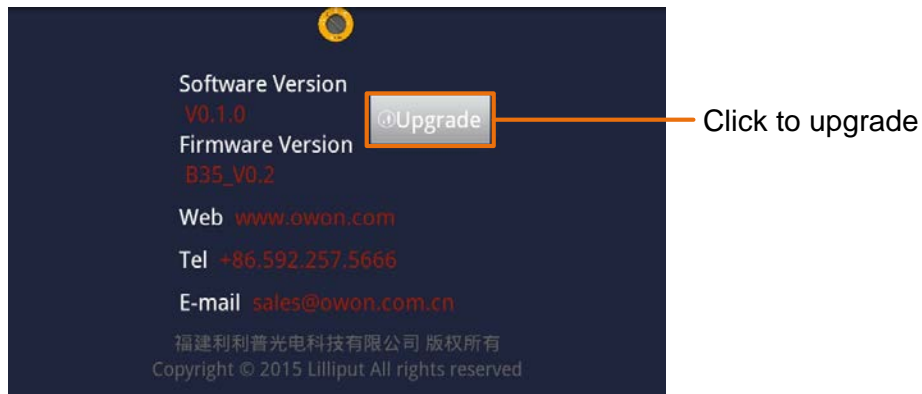
your Android device. Click the  icon on the top right of the screen to turn on



voice out. Click  to turn off. In settings menu on your Android device, you can set the language-specific voice for the spoken text, or speech rate etc.

You may change to different voices by installing different TTS engines.

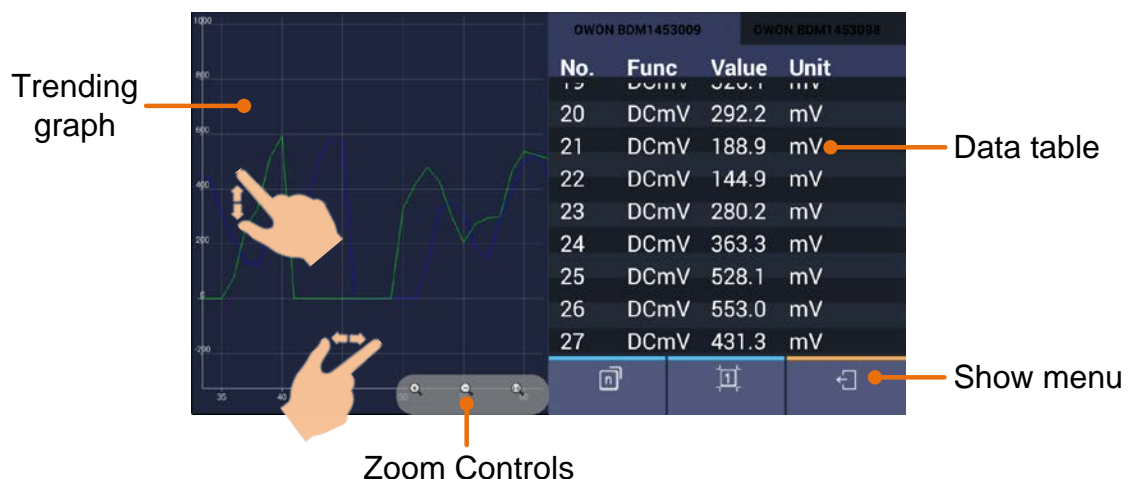
TTS engines can be downloaded by scanning [QR Codes](#)

- **Upgrade Online:** Click  , and click "About", the following interface is shown. Click "Upgrade" as below.



- **Data Graph and Table:** Click  to view data graph and table. Click  to show setting menu.

Data Graph&Table



Setting menu:

Softkey	Description
Open local file	Read the saved file (.CSV)
Save data	Save the displayed data into .CSV file
Share	Share the measurements via the installed sharing apps
Clear data	Clear the data displayed
Setting	Sampling Interval: Set the interval of sampling (unit second). Fill: Check to fill the area as blue below the data line. Enable Period: Log data within the defined period. Record Period: Define the period time if the period is enabled.
Exit	Exit the APP

Note: In trending graph, you can pinch the screen to zoom. The Y axis (value) can be zoomed by gesturing along the up-down direction, and the X axis (time) can be zoomed by gesturing along the left-right direction.

7. Technical Specifications

All these specifications apply to the multimeter unless otherwise explanation.

Note: "T" in the model indicates true RMS (optional).

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

Function		Measurement Range	Resolu- tion	Accuracy
DC Voltage (V)	mV	60.00mV/600.0mV	0.01 mV	±(0.5%+2dig)
	V	60.00mV/600.0mV/6.000V/60.00V	0.1 mV	
		600.0V/1000V	0.1 V	
AC Voltage (V)	mV	60.00mV/600.0mV	0.01 mV	±(0.8%+2dig)
	V	60.00mV/600.0mV/6.000V/60.00V	1 mV	±(0.8%+2dig)
		600.0V/750V	0.1 V	±(1%+3dig)
DC Current (A)	μA	600.0μA	0.1 μA	±(0.8%+2dig)
	mA	600.0μA/6.000mA/60.00mA/ 600.0mA/6.000A	0.01 mA	±(0.8%+2dig)
	A	20.00A ^[1]	1 mA	±(1.2%+3dig)
AC Current (A)	μA	600.0μA	0.1 μA	±(1%+3dig)
	mA	600.0μA/6.000mA/60.00mA/ 600.0mA/6.000A	0.01 mA	±(0.8%+2dig)
	A	20.00A ^[1]	1 mA	±(2%+3dig)
Resistance (Ω)		600.0Ω/6.000kΩ/60.00kΩ/600.0kΩ/ 6.000MΩ/10.00MΩ	0.1 Ω	±(0.8%+2dig)
		60.00MΩ	0.01 MΩ	±(2%+3dig)
Capacitance (F)		40.00nF	0.01 nF	±(2.5%+3dig)
		400.0nF/4.000μF/40.00μF	0.1 nF	±(2.5%+3dig)
		400.0μF/4000μF ^[2]	0.1 μF	±(3%+5dig)
Frequency ^[3] (Hz)		9.999Hz/99.99Hz/999.9Hz/9.999k Hz/99.99kHz/999.9kHz/9.999MHz	1 mHz	±(0.8%+2dig)
Duty Cycle ^[4] (%)		0.1% - 99.9% (Typical: V _{rms} =1 V, f=1 kHz)	0.1%	±(1.2%+3dig)
		0.1% - 99.9%(≥ 1 kHz)		±(2.5%+3dig)
Temperature (°C/°F)		— 50 °C to 400 °C	1 °C	±(2.5%+3dig)
		— 58 °F to 752 °F	1 °F	±(4.5%+5dig)

[1] 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.

[2] When measuring capacitance, for the 4000 uF range, the measuring duration should


7. Technical Specifications

be over 30 seconds.

- [3] 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
4 M – 8 M	≥ 200 mV
8 M – 10 M	≥ 300 mV

- [4] When measuring duty cycle, the typical waveform is Square or Sine.

Display	6000
Frequency Response (Hz)	(40 - 400) Hz
Sample rate for digital data	3 times/second
Sample rate for analog bar graph	30 times/second
Bluetooth	B35(T) ✓
	D35(T) Without
Auto ranging	✓
True RMS	The model with "T" has this function.
Diodes Test	✓
Measuring Transistor	✓
Sleep Mode	✓
Continuity Test	✓
Low battery indication	✓ (The "  " is displayed when the battery is under the proper operation range.)
Data Hold	✓
Relative Measurement	✓
MAX/MIN Value	✓
LCD Backlight	✓
Analog bar graph	61 Segments
Input Protection	✓
Input Impedance	10 MΩ
Battery	3 V (1.5 V × 2) AA alkaline batteries
LCD Size	69 mm * 52 mm
Weight (without package)	0.32 kg
Dimension	85 mm * 185 mm * 30 mm
Working temperature	0°C to 40°C
Storage temperature	−10°C to 60°C
Relative Humidity	≤ 80%
Altitude	Operating: 3,000 m
	Non-operating: 15,000 m

Interval Period of Adjustment:

One year is recommended for the calibration interval period.