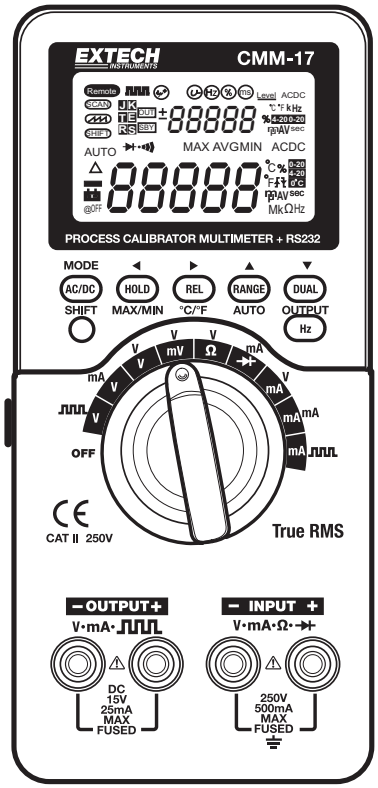
Quick Start
CMM-17 Process Calibrator Multimeter

- **Constant Voltage**
- **mA Source**
- **Square Wave**
- **Auto Scan/Ramp**
- **Dual Display Multimeter**
- **Rechargeable Batteries**



This guide provides an overview of the meter. For more detailed information, refer to the CMM-17 User's Guide provided with the meter.

Introduction

This process calibrator/meter is a hand-held, battery-operated instrument for testing and troubleshooting power electronic systems. This device can be used not only for instrument system maintenance, but also for maintaining, servicing industrial meters, testing electronic circuits and electronic equipments. The meter can also be used to measure or calibrate sensors or transmitters in automotive or automatic control system.

The meter generates a high precision constant voltage, constant current and square wave output and includes a full feature, high accuracy multimeter. The precision source and the measurement functions can perform simultaneously.

Main Features:

- Generates and Measures Signal simultaneously
- 1,200Ω drive capability with special yellow lead for 20mA simulation
- High precision Constant voltage, Constant Current and Square wave outputs
- Intelligent Output and Standby control
- Built-in Ni-MH rechargeable battery
- Smart Charger design without battery removal
- Brightness EL backlight
- Coarse or Fine output adjust
- The % scale readout for 4-20mA or 0-20mA
- Adjustable steps and time interval for Auto Scan
- Adjustable resolutions and start for linear Ramp output
- 1ms Peak hold to capture inrush voltage and current easily
- Temperature test with the option of 0°C compensation
- Frequency, Duty cycle and Pulse width measurements
- Dynamic Recording for MIN/MAX/AVG
- Data Hold with Manual or Auto Trigger and Relative modes
- Diode and Audible Continuity test
- Bi-directional optical computer interface with SCPI commands
- Safe, precise and fast closed-case calibration
- 50,000 count precision True-RMS digital multi-meter and designed to meet IEC-1010 CAT. II 250V standards

SAFETY INFORMATION

A **WARNING** identifies conditions and actions that may cause hazard(s) to the user;
A **CAUTION** identifies conditions and actions that may damage this Device.

Table-1 International Electrical Symbols

	AC - Alternating Current
	DC - Direct Current
	AC and DC - Alternating and Direct Current
	Ground
	Double Insulation
	See Explanation In The Manual

To avoid electric shock, injury, or damage to this instrument:

- Read this operation manual completely before using this device and follow all safety instructions.
- This device is for indoor use, altitude up to 2,000m.
- Avoid working alone.
- Use the device only as specified in this manual; otherwise, the protection provided by the meter may be impaired.
- Never measure Voltage when the current measurement is selected.
- Do not use this device if it looks damaged.
- Inspect the leads for damaged insulation or exposed metal. Replace damaged leads.
- Disconnect the power and discharge all high-voltage capacitors before testing in the resistance, continuity, and diode function.
- Use caution when working above 70V DC or 33V RMS and 46.7V peak, these voltages may cause a shock hazard.
- Always keep your hands behind the protective guard of the probe when measuring.
- Select the proper function and disconnect the test leads from test points before changing functions.
- Do not mix with different types of batteries. Always use specified battery.
- The meter is safety-certified in compliance with EN61010 (IEC 1010-1, IEC 1010-2-031) Installation Category II 250V Pollution Degree 2.

Setup and Output a process calibration signal

⚠ WARNING
Read "SAFETY INFORMATION" before using this

1. Set the side switch on the left side to the **M/S** position
2. Turn the function switch to select combined function for the output function required (⎍⎍⎍, mA, or V) and related input function will be used simultaneously.
3. Press the **"SHIFT"** button to shift the buttons for output setting.
4. Use the **arrow** buttons (◀ / ▶ for digit selection, ▲ / ▼ for value) to set the output value.
5. Connect the **OUTPUT** terminals to the device to be tested.
6. Press the **OUTPUT** button. The process signal will become active.
7. Press the **OUTPUT** button to return the output to the standby mode.

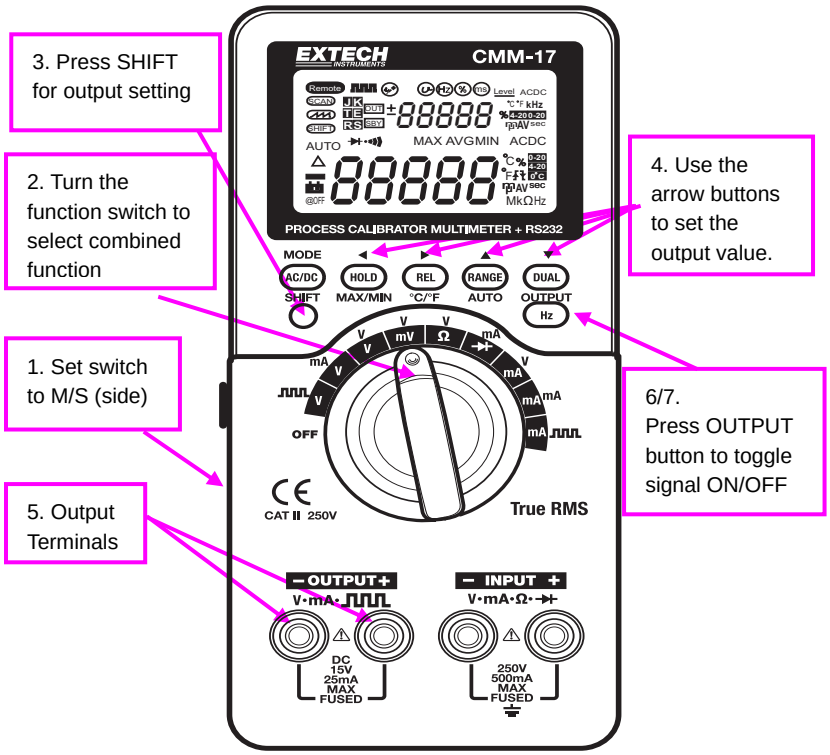


Figure-1 Quick Output Operation

INPUT- ACV and Frequency Measurements

1. Set the side switch on the left side to the **M** or **M/S** position
2. Turn the rotary switch to select combined function for "**V**" and the output function (⎍⎍, mA or V) as desired.
3. Press the **"AC/DC"** button momentarily to select AC voltage measurement.
4. Press the "**Dual**" button momentarily to set frequency measuring on secondary display.
5. Connect the **INPUT** terminals by test leads to the source to be tested.

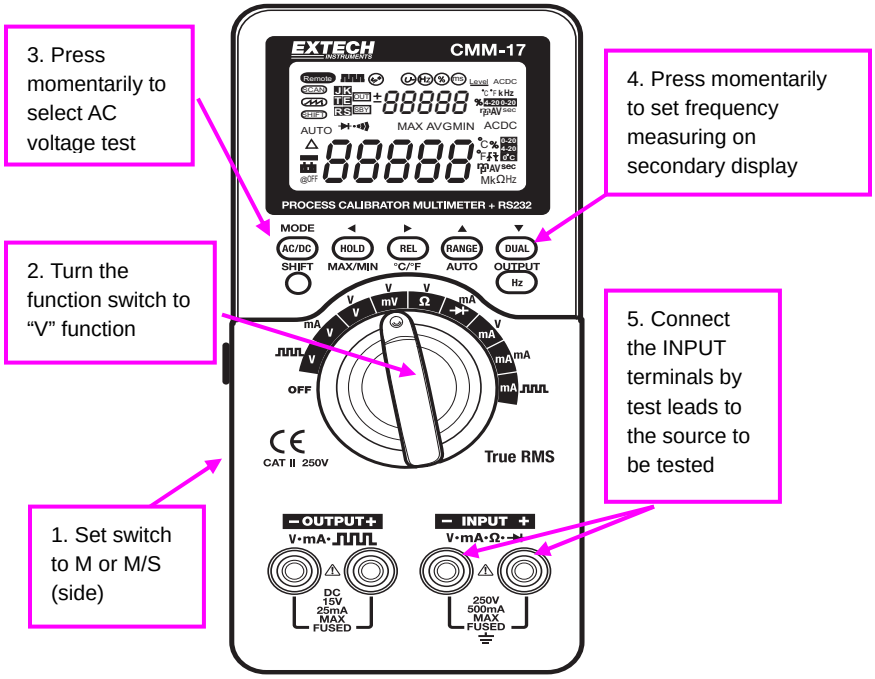


Figure-2 ACV/ Hz Measurement

■ *Display Illustration*

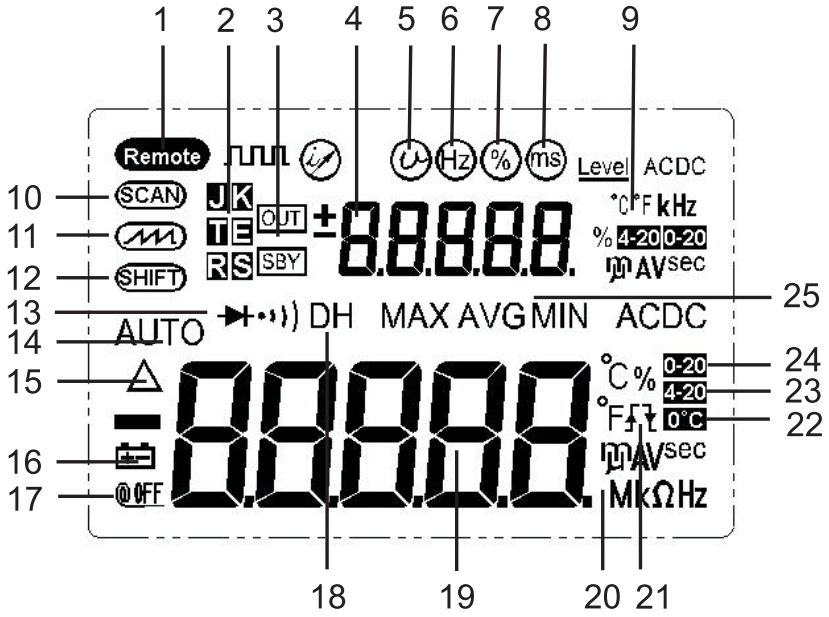


Figure-3 LCD Display

1. Remote control
2. Thermocouple type
3. Output enable/disable
4. Secondary display for output and input
5. Constant voltage output
6. Square wave output for Hz
7. Square wave output for %
8. Square wave output for mS
9. Output/input units
10. Scan output
11. Ramp output
12. Shift button operation
13. Diode/audible continuity
14. Auto range
15. Relative mode
16. Low battery
17. Auto power off icon
18. Data Hold (manual trigger)
19. Primary display for input
20. Input units
21. Positive/negative trigger slope for % and mS tests
22. Without ambient temperature compensation
23. % 4-20/4-20mA
24. % 0-20/0-20mA
25. Dynamic recording

■ *Pushbutton Operation*

The operation of the push-buttons is shown below. When a button is pressed, a related symbol will be lit, and the beeper will sound. Turning the rotary switch to another position will reset current operation of the push buttons.

INPUT BUTTONS

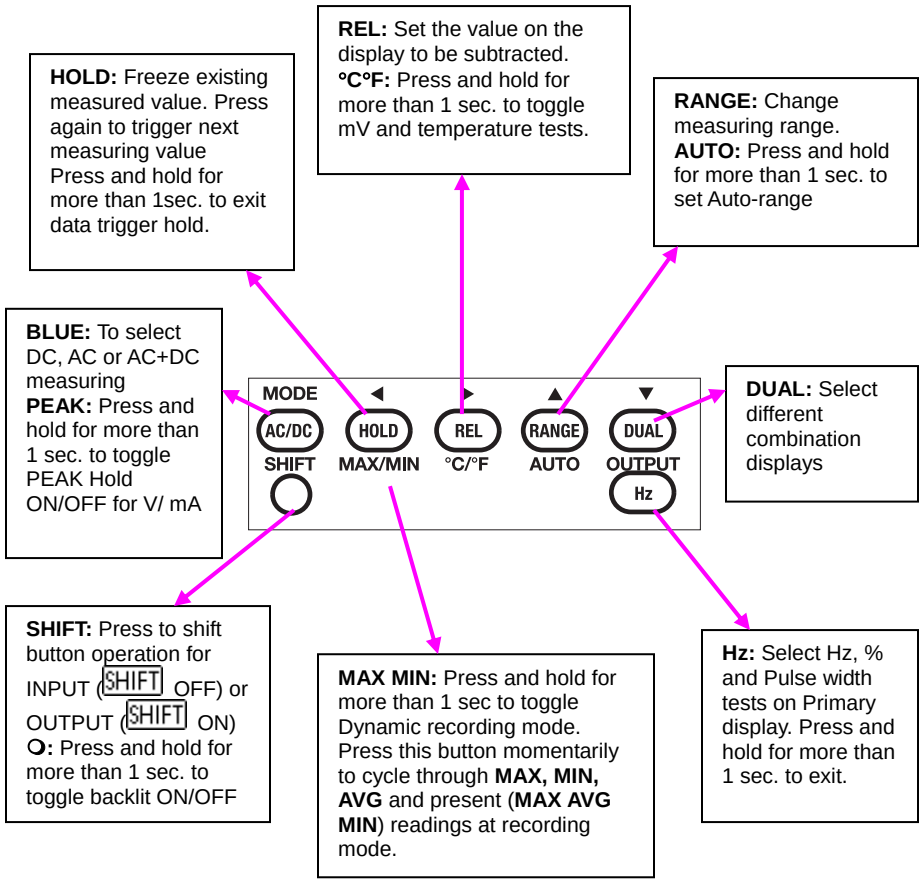


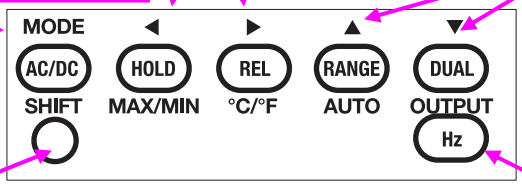
Figure-4 Input Buttons

OUTPUT BUTTONS

◄ (LEFT)/ ► (RIGHT):
Select which Digits or polarity to be adjusted
For voltage and current output, press this button momentarily to select which Digits or polarity to be adjusted. The selected position will flash on the secondary display.
± ⟷ D5 ⟷ D4 ⟷ D3 ⟷ D2 ⟷ D1 ⟷ ±

MODE:
Select output modes for CV (CC), SCAN and RAMP.
Select Hz, %, pulse width and Level adjustments for Square wave output.

▲ (UP)/ ▼(DOWN):
Adjust digit or polarity
Press momentarily to increase/ decrease 1 count for present digit or toggle the polarity of output state.



SHIFT: Press to shift button operation for INPUT (SHIFT OFF) or OUTPUT (SHIFT ON)
❍: Press and hold for more than 1 sec. to toggle backlit ON/OFF

OUTPUT: Press momentarily to toggle the output state **ON** and **OFF**. The OUT means this signal has been sent out, and SBY means the signal has been disabled output.

Figure-5 Output Buttons

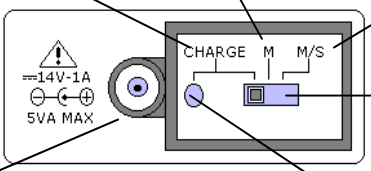
■ ***Slide Switch***

Turn the slide switch to the position accordingly:

Charge: Charge batteries by using the standard DC adapter

M: Provide power for Meter (INPUT) only.

M/S: Provide power for Measuring and Source function.



Slide Switch

External DC adaptor jack:
Plug in the external DC adapter to charge the batteries or to power the device.

Charging indication
Green: Fully charged
Red: Under charged

Figure-6 Slide Switch

■ *Rotary Switch*

Set the slide switch to the M or M/S position. Turn the meter ON and select the combined function you desire by turning the rotary switch.

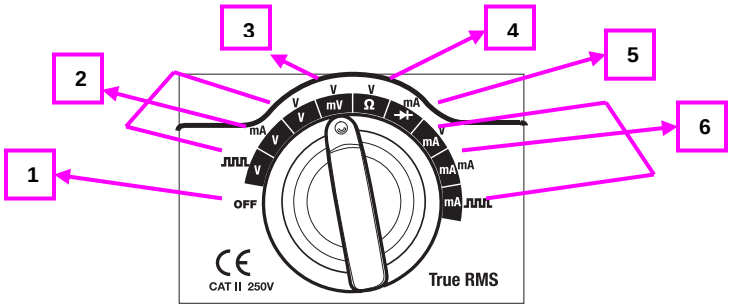


Figure-7 Rotary Switch for selecting combined function

FUNC.	INPUT (White color)	OUTPUT (Yellow Color)
1	Power Off	
2	DC, AC or DC+AC Voltage measurements.	Square wave output
		Constant current: ± 25 mA
		Constant voltage: ± 1.5V, ± 15V
3	DC, AC or DC+AC mV measurements.	Constant voltage: ± 1.5V, ± 15V
4	Resistance/ Continuity measurements	Constant voltage: ± 1.5V, ± 15V
5	Diode/ Audible Continuity.	Constant current: ± 25 mA
6	DC, AC or DC+AC mA measurements: 50mA and 500 mA	Constant voltage: ± 1.5V, ± 15V
		Constant current: ± 25 mA
		Square wave output

■ *Output and Input Terminals*

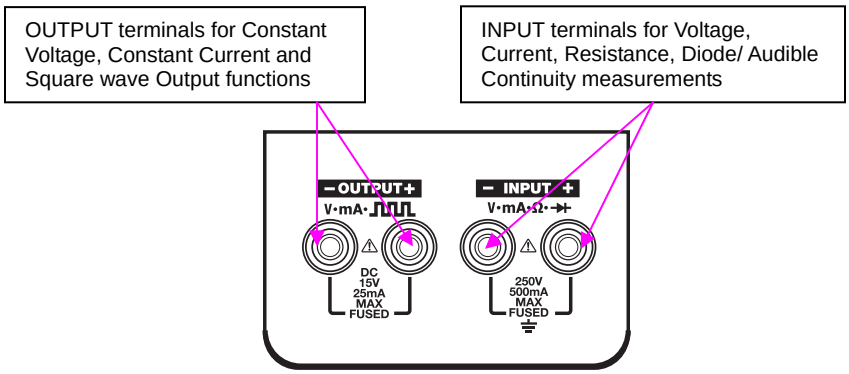


Figure-8 Output/Input Terminals

HOW TO ENTER SETUP MODE

Press and hold the **MODE** button while turning the rotary switch to any ON position. The meter will enter setup mode, these parameters will be saved in non-volatile memory even when the meter is turned off.

Changing the parameters in setup mode:

1. Press "◀ **(LEFT)**" or "▶ **(RIGHT)**" button to select which menu item to be set.
2. Press "▲ **(UP) or** ▼**(DOWN)**" button to change the parameter.
3. Push "**OUTPUT**" button momentarily to save your setting.
4. Push "**SHIFT**" button momentarily to exit setup mode.

The following table describes the setup menu items, the factory settings and user selectable parameters.

Table-2 Descriptions for Setup Menu Items

Menu item	Factory Setting	Selectable Parameters
Baud Rate	9600	2400, 4800, 9600 and 19200
Parity	None	Odd, even or none
Data bit	8	8 bits or 7 bits (Stop bit is always 1 bit)
ECHO	OFF	ON or OFF
Printer-Only	OFF	ON or OFF
Percentage scale	4-20mA	4-20mA and 0-20mA for % scale readout
Frequency	0.5Hz	Set minimum measuring frequency, 0.5, 1 or 2 Hz.
Beeper	4800	The driving frequency can be set for 4800,2400,1200 or 600 Hz. "OFF" disables the beeper
Temperature	°C/°F	Four combinations can be set: 1. °C only 2. °C and °F 3. °F only 4. °F and °C
Refresh Hold	OFF	OFF means Data Hold, set 100~1000 variation counts to enable refresh hold.
Auto power off	15	0~99 minutes, "0" disables auto power off.
Backlight	30	0~99 seconds, "0" disables turning off the backlight automatically.

Notes: Push the "**SHIFT**" button for more than one second to enable temperature option. The "SHIFT" symbol will appear on the display.