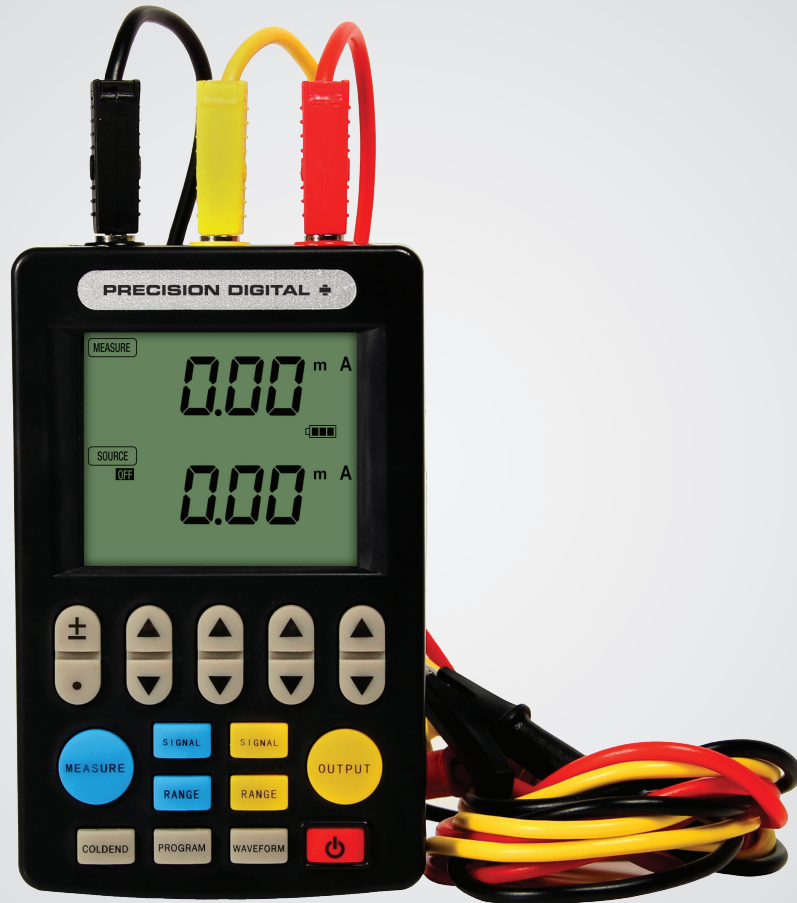# PD9501
Multi-Function Calibrator

FEATURES

- **Measure and Source T/Cs, RTDs, Ohms, Current, Voltage**
- **Compact & Lightweight**
- **Battery or USB Powered**
- **Descriptive LCD Display**
- **24 V Power to Drive the Transmitter**
- **Auto Stepping & Auto Ramping**
- **Selective Auto Off Mode**
- **LCD includes an LED backlight**

PD9501 Multi-Function Calibrator

OVERVIEW

This PD9501 Multi-Function Calibrator has a variety of signal measurement and output functions, including voltage, current, thermocouple, and RTD.

Main Function

Voltage Signal: 0-30 V, 0-25 mV, 0-100 mV output and measurement.

Current Signal: Active and passive 0-25 mA, 4-20 mA output and measurement.

Thermocouple: K, E, J, T, R, B, S, N output and measurement. *Note: Output Range Starts from 0°C*

RTD: PT100 output and measurement.

Ohms: Output and measurement

The PD9501 includes a convenient storage case.

Accuracy Specifications

INPUT	SIGNAL	RANGE	ACCURACY	RESOLUTION	NOTE
DC Voltage	20 mV	0.00-24.00 mV	±0.2%	0.01 mV	
	100 mV	0.0-100.0 mV	±0.2%	0.1 mV	
	V	**Output:** 0.00-15.00 V	±0.2%	0.01 V	**Output:** Maximum current 30 mA **Measurement:** Input Impedance 1.2 M Ω
		Measure: 0.00-30.00 V	±0.2%	0.01 V	
DC Current	mA	0.00-24.00 mA	±0.2%	0.01 V	**Output:** Maximum load 750 Ω **Measurement:** Input Impedance 100 Ω
	4-20 mA	4/8/12/16/20 mA	±0.2%	0.01 mA	
Passive Current	mA	0.00-24.00 mA	±0.2%	0.1 V	**Output:** External power 16-30 V
Power Output	24 V LOOP	24V/16 V	±10%		**Drive Current:** 24 mA
Thermocouple	K	-270 to 1372°C	±1%	1°C	The output or measurement can not be less than the Cold Junction Temperature. **Output:** Range Starts from 0°C
	E	-270 to 1000°C	±1%	1°C	
	J	-210 to 1200°C	±1%	1°C	
	T	-270 to 400°C	±1%	1°C	
	R	-50 to 1768°C	±1%	1°C	
	B	0 to 1820°C	±1%	1°C	
	S	-50 to 1768°C	±1%	1°C	
	N	-270 to1300°C	±1%	1°C	
Ohms	Ω	**Output:** 15.0-400.0 **Measure:** 0.0-400.0	±0.2%	0.1 Ω	**Excitation Current:** Min of 0.5 mA, Max of 3 mA
RTD	PT100	-199.0 to 650.0°C	±0.2%	0.1°C	
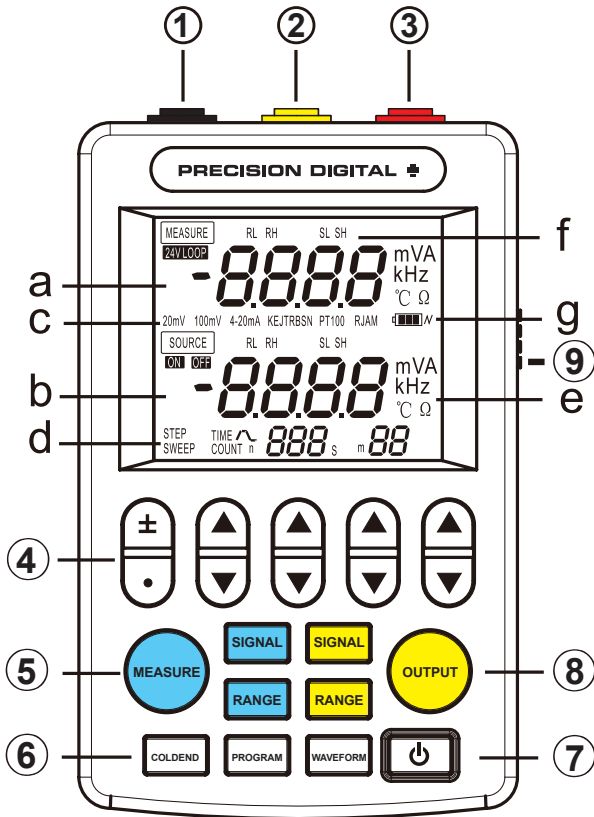
FUNCTIONS

Terminal Blocks

① Common (**Black**)

② Output Terminal (**Yellow**)

③ Measurement Terminals (**Red**)

Buttons

④ Numeric Modifier Keys

   ▲▼   Increase or decrease values

   ⊡   Toggle numeric decimal points

   ±   Toggle value plus or minus

⑤ Measurement Function Keys (**Blue**)
   [Signal]: toggle signal type
   [Range]: toggle measurement range
   [Measure]: open/exit measurement function

⑥ Cold Junction and Programming Function Keys
   [Cold End]: display/modify cold end
   [Program]: turn on the programming function
   [Waveform]: change programmable output waveform

⑦ **[Power]:** turn power on/off

⑧ Output Function Keys (**Yellow**)
   [Signal]: toggle output signal type
   [Range]: toggle output range
   [Output]: open/turn off signal output

⑨ Dip Switch (Factory defaults to OFF-Down)

   1. **Auto Power Off:** 10 minutes without key operation, automatic shutdown.
   2. **Manual Cold End:** Manually set the cold end value when measuring thermocouples.
   3. **Passive Output:** outputs a passive current signal for analog transmitters.
   4. **Low Load Mode:** When the passive current is input, calibrator supplies 16 V to the transmitter to reduce power consumption and prolong the use time.

LCD Display

a: Measurement: 4 digits with unit
b: Output signal value: 4 digits with unit
c: Signal and cold end mode: 20 mV/100 mV/ 4-20 mA/K/E/J/T/R/B/S/N
   RJA: automatic cold junction compensation
   M: manual set cold junction compensation
d: Programming function: n/m to split the output, Output value = (Main Set Value)*(n/m)
   Sweep: Linear output, Linear output signal
   Step: Stepping output
   Time: Output time for each step, 0-999s can be set.
   Count: Output cycles, 0-999 times can be set, 0 is infinite
e: Unit: mA/mV/°C
f: Range and change function:
   RL: Show the lower range limit
   RH: Show the high range limit
   SL: Show the minimum signal
   SH: Show the maximum signal
g: Battery: Icon flashes when charging. Icon will stop flashing when fully charged.

SIGNAL OUTPUT

The calibrator can output voltage, active current, passive current, thermocouple, and RTD signals.

Voltage, Active Current Output

① Connect the black wire to the common terminal, connect the yellow wire to the output terminal

② Press **[Signal]** to toggle the signal type

③ Press ▲▼ to adjust the output value

④ Press **[Output]**, the "source" will change from OFF to ON and start the output function.

4-20 mA Output

① Choose 4-20 mA for signal type

② Press the opposite **[Signal]**. You can choose 4→8→12→16→20 or press ▲▼ to adjust

③ Press **[Output]** to open the output function
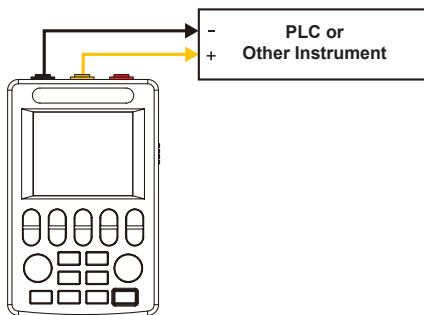
Figure 1: Output Active Current/Voltage to the meter or PLC

RTD and Thermocouple Output

Note: On thermocouple, the output temperature is minus the voltage value corresponding to the cold junction temperature.

① Press **[Signal]** to select signal type. Choose from K/E/J/T/R/B/S/N/RTD/Ω

② Press ▲▼ to set output value of temperature

③ Press **[Output]** to open the function

Passive Current Output

Active with DIP Switch setting

Passive current output can be used as a 2-wire transmitter simulator for loop testing.

① Choose 4-20 mA for signal type

② Press the opposite **[Signal]**. You can choose 4→8→12→16→20 or press the ▲▼ to adjust

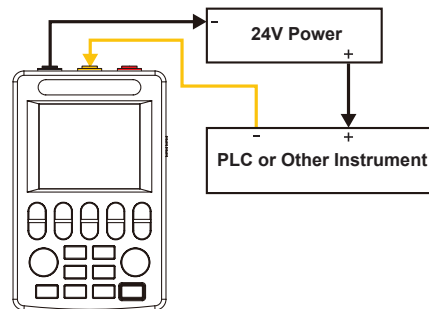③ Press **[Output]** to open the output function

Figure 2: 2-wire Transmitter Simulator

Voltage, Current Signal Output or Measurement by Display Range (Eliminates range conversions)

① Signal type must be voltage or current

② Press **[Range]** to select display range limit: RL, RH, SL, SH

③ When "RL" is selected press ▲▼ to set value

④ Setup the RL, RH, SL, SH in turn

....

OUTPUT

⑤ Press **[Range]** to exit the rage setup. Press ⊙ to toggle between signal output or range output (no units are displayed on output)

⑥ Press the ▲▼ to change the output value

⑦ Press **[Range]** to open the function

....

MEASURE

⑤ Press **[Range]** to exit the rage setup. Press ⊙ to toggle between signal value or range output (no units are displayed on output)

⑥ It shows the measurement or conversion value according to range

SIGNAL MEASUREMENT

The calibrator can measure voltage, active current, passive current, thermocouple signal, and RTD.

When measure function is not in use press **[Measure]** to turn off the measure mode to conserve battery power.

Voltage, Active Current Measurement

① Connect the black wire to the common terminal, connect the red wire to the measure terminal

② Press **[Measure]** to open measure function
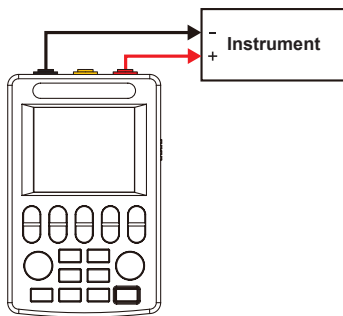
③ Press **[Signal]** to toggle signal type

④ Shows value in the LCD screen

Figure 3: Measurement voltage, active current

Passive Current Measurement

① Wiring as the 2-wire or 3-wire system

② Press Blue **[Signal]** to set signal type to 24 V loop

③ Generator outputs 24 V (or 16 V when via DIP switch to low power mode

④ Shows value in the LCD screen
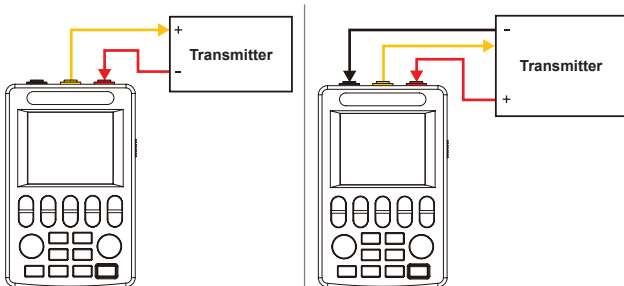
Figure 4:	**Figure 5:**
Measure 2-wire transmitter	**Measure 3-wire transmitter**

RTD and Thermocouple Measurement

① Connect the black wire to the common terminal, connect the red wire to the measuring terminal

② Press blue **[Measure]** to set signal type to K/E/J/T/R/B/S/N/RTD/Ω

③ Value is displayed on the LCD screen

To view or adjust cold junction temperature for thermocouple:

① Press **[Cold End]** to display cold end temperature

② If the LCD displays **"RJA"** the cold end is collected by the internal sensor and cannot be modified.

③ Select the **"M"** on the LCD to manually set the cold end value.

PROGRAMMABLE OUTPUT

Scaled Output Function (n/m)

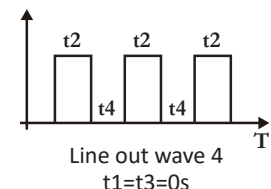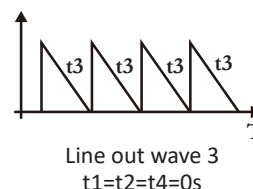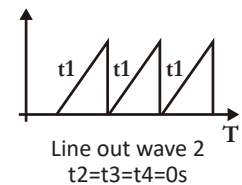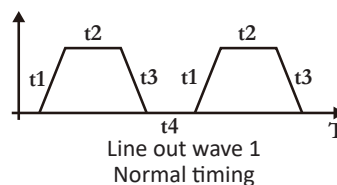The voltage, current, and thermocouple signals can be scaled by n/m.

Output value = (Main Set Value) × (n/m)

① Press △▽ to change the main setpoint

② Press **[Program]** to open split output mode to display n/m menu

③ Set (**m**) from 1 to 20

④ Set (**n**) from 0 to 20

⑤ Press yellow **[Output]** to open/exit the output

⑥ Press **[Program]** to exit the split output function

Linear Output Function

The signal value can be output linearly according to the time set by the user.

① Press △▽ to set value for the main set point

② Press **[Waveform]** to display "sweep". This enables linear output function.

③ Press **[Program]** to set output time for rise time, hold time [top], fall time, hold time [low].
Press △▽ to set time between 0-999s.

④ Press **[Program]** again to set number of linear outputs from 0-999.

⑤ Press yellow **[Output]** to open/exit the output

⑥ Press **[Program]** to exit the linear output function

Line out wave 1 Normal timing	Line out wave 2 t2=t3=t4=0s
Line out wave 3 t1=t2=t4=0s	Line out wave 4 t1=t3=0s

Automatic Step Output Function

The signal value can be stepped out according to the user-defined value.

① Press ▲▼ to set value for the main setpoint

② Press **[Waveform]** to display "step". This enables step output function.

③ Press **[Program]** to set "time". Press ▲▼ to set time between 0-999s.

④ Press **[Program]** again to set N/m for step output

⑤ Press yellow **[Output]** to open/exit the output

⑥ Press **[Program]** to exit the step output function

Step out wave
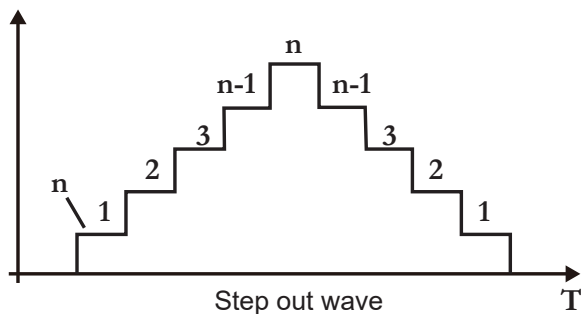
SPECIFICATIONS

Operating Temperature: 15 to 130°F (-10 to 55°C)
Storage Temperature: 5 to 158°F (-20 to 70°C)
Relative Humidity: 20 to 80%
External Dimensions: 4.5" x 2.5" x 10.2"
(115 mm x 70 mm x 26 mm)
Weight: 10.6 oz (300 g)
Power: Internal rechargeable Lithium Ion battery (non-replaceable) or external USB power
Power Dissipation: 300 mA, 7-10 hours
Reverse Connection and Overcurrent Protection: 30 V
Cables Provided: Three signal cables and one USB cable

ORDERING INFORMATION

Model	Description
PD9501	Multi-Function Calibrator

Your Local Distributor is:

Disclaimer

⚠ WARNING
Cancer and Reproductive Harm - **www.P65Warnings.ca.gov**