



Practical Instrument Electronics

Model 531 4-20 Milliamp Loop Calibrator Datasheet

Features

4 to 20 mA Loop Functions

Source and Read 0.00-24.00 mA

Simulate 2-Wire Transmitters 0.00-24.00mA

Power 2-Wire Transmitters and Read 0.00-24.00 mA

Display current in mA or -25.0-125.0 % of 4-20 mA

Full 4 Digit Display

True $\pm 0.05\%$ of reading accuracy

Bar graph for quick reference of input and output levels

High contrast graphic display viewable in all lighting conditions and angles

EZ-Dial Knob

Easily adjust output by 00.01 mA (0.1 %) or

0.1 mA (1.0 %)

EZ-Check Switch

3-position tactile switch for true one-handed calibrations

Slide switch for stepping through calibration points

Uses a standard AA Alkaline Battery

Superior battery life up to 40 hours under typical continuous usage

Easy access to battery compartment

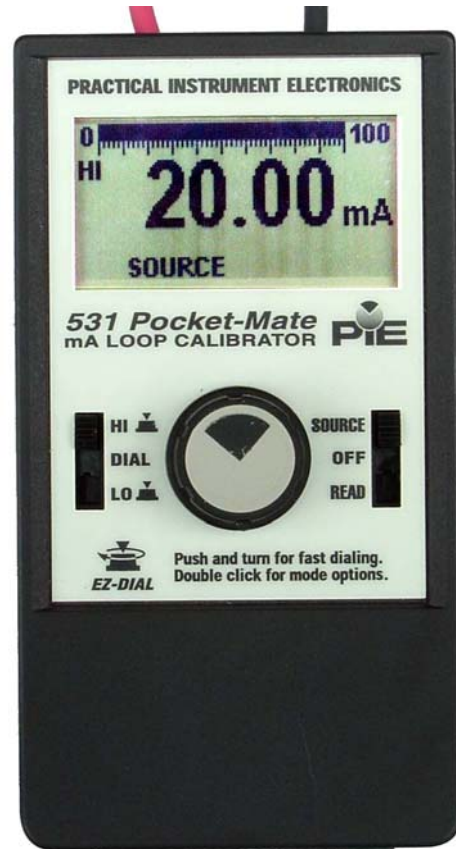
60 VAC Tolerant

Fuse-less protection from accidental misuse

Lightweight and rugged with a solid feel

HART® protocol compatibility mode

HART® protocol compatibility option built-in using a jumper



Description

The Practical Instrument Electronics Model 531 is the result of 30+ years of experience manufacturing and designing calibrators for the process control industry. Almost all of the Fortune 500 manufacturers use calibrators designed by our engineers. The Model 531 calibrator incorporates all of this knowledge and experience and combines it into one small but powerful product. It has simple, easy to use controls featuring a large high contrast display with easy visibility without the need for contrast adjustments. The Model 531 is designed to be a tool with all the practical functions required to get the job done easily without the confusing extras or reading through a complicated manual. The Model 531 can source and read current in the process loop and simulate, power and measure 2-wire transmitters. It fits in your pocket or you can clip in on your belt.



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Specifications

General Specifications:

(Unless otherwise indicated all specifications are rated from a nominal 23 °C, 70 % RH for 1 year from calibration)

Operating Temperature Range	-20 to 60 °C (-5 to 140 °F)
Storage Temperature Range	-30 to 60 °C (-22 to 140 °F)
Relative Humidity Range	10 % ≤RH ≤90 % (0 to 35 °C), Non-condensing 10 % ≤RH ≤ 70 % (35 to 60 °C), Non-condensing
Size	4.75 X 2.50 X .75 inches (120.65 x 63.5 x 19.05mm)
Weight	7.5 oz (212.6 grams)
Battery	2 AAV Alkaline
Miscellaneous	Low battery indication with nominal 1 hour of operation left Over-voltage protection to 120 Vrms (rated for 30 seconds) Bar graph display with 1% resolution of 4-20 mA signal scale High contrast graphic liquid crystal display with 0.45" (11.4 mm) high digits

Common Specifications for all current modes

Ranges	0.00 to 24.00 mA, -25.0 to 125.0% of 4-20 mA
Accuracy	≤ ± (0.05 % of Reading + 0.01 mA)
Temperature effect	≤ ± 50 ppm/°C of Range
Resolution(s)	00.01 mA and 0.1 %

Source/Power and Measure 2-Wire Transmitter Specifications:

Loop compliance voltage	≥ 15 Volts or ≥ 24 Volts
Loop drive capability	1200 Ω at 20 mA for entire battery life @24 Volts 600 Ω at 20 mA for entire battery life @15 Volts
Miscellaneous	Open loop or out of compliance conditions are indicated by flashing the bar graph Battery life in: 24Volts - Source mode ≥ 10 hrs at 12mA typical (HART® disabled) Power measure ≥ 10 hrs at 12mA typical 15 Volts - Source mode ≥ 18 hrs at 12mA typical (HART® disabled) Power measure ≥ 18 hrs at 12mA typical

Read mA Specifications:

Voltage burden	≤ 1V at 20 mA
Overload/Current limit protection	25 mA nominal
Battery life	Typical ≥ 40 Hours



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2-Wire Transmitter Simulation Specifications:

Voltage burden	$\leq 1V$ at 20 mA
Overload/Current limit protection	25 mA nominal
Loop voltage limits	2-42 VDC
Miscellaneous	Open loop or out of compliance conditions are indicated by flashing the bar graph Battery life ≥ 40 hour typical

Available Options:

Option:	Part Number:
Carrying Case	020-0200

Other Products Available:

RTD Source (Single Type/ 1° resolution)	Model 510
RTD Source (7 Types, $\Omega/0.1^\circ$ resolution) Pt100: $\alpha=1.3850, 1.3902, 1.3916, 1.3926$ Cu10: $\alpha=1.427$ Ni110: $\alpha=1.530$ Ni120: $\alpha=1.672$	Model 511
RTD Calibrator (Source/Read 7 Types, $\Omega /0.1^\circ$ resolution)	Model 512
RTD Calibrator (Source/Read 8 Types, $\Omega /0.1^\circ$ resolution) With Auto Stepping	Model 512S
T/C Source (Single Type/ 1° resolution)	Model 520
T/C Source (8 Types, mV/ 0.1° resolution) B, E, J, K, N, R, S, T, mV	Model 521
T/C Calibrator (Source/Read 8 Types, mV/ 0.1° resolution) B, E, J, K, N, R, S, T, mV	Model 522
Dual RTD - T/C Source and Read With Auto Stepping	Model 525
4-20 Milliamp Loop Calibrator	Model 530
4-20 Milliamp Loop Calibrator with Loop Diagnostic	Model 532
4-20/10-50 Dual Range Loop Calibrator	Model 535
Frequency Read & Source w/totalizer	Model 541



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Warranty

Our equipment is guaranteed against defective material and workmanship (excluding batteries) for a period of three years from the date of shipment. Claims under guarantee can be made by returning the equipment prepaid to our factory. The equipment will be repaired, replaced or adjusted at our option. The liability of Practical Instrument Electronics (PIE) is restricted to that given under our guarantee. No responsibility is accepted for damage, loss or other expense incurred through sale or use of our equipment. Under no condition shall Practical Instrument Electronics, Inc. be liable for any special, incidental or consequential damage.