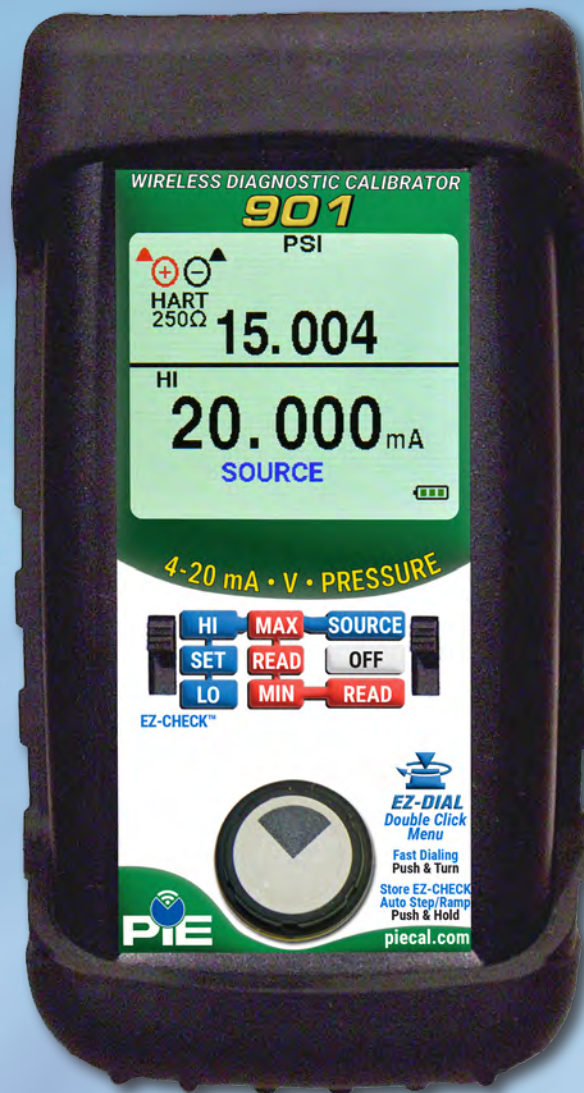


PIE CALIBRATORS

Calibrate *and* Troubleshoot Control
Loops and Process Instruments

NEW

Wireless Diagnostic
mA, V & Pressure
Calibrator with Larger
Color Display



NEW

Wireless Diagnostic
Pressure Module

Single Function &
Multifunction Calibrators
Compact, light, and easy to use

PIE Calibrators

Single function & Multifunction Process Calibrators

Handheld • Accurate • Easy to use • Reliable

Advanced Features • Value Added Troubleshooting tools

Technician Friendly Calibrators

Become a troubleshooting technician

Stop wasting time swapping out instruments to locate loop problems. PIE calibrators have value added automatic troubleshooting functions to locate problems caused by corrosion or moisture in conduits, excessive loop loads, broken RTD wires, high resistance thermocouple sensors, pressure modules with damaged sensors, and flaky loop power supplies. No other brand of calibrator has these patented features!

PIE helps you simplify your job with calibrators that are technician friendly. They are compact, easy to learn, simple to setup with industry leading accuracy. PIE technician friendly calibrators are all about ease of use. The unique and intuitive EZ-DIAL Double Click Menu makes them simpler to setup than larger calibrators with complicated button filled panels and confusing menus. When you need a multifunction calibrator designed for use in a calibrator bench or test stand look to the PIE Models 820PM or 830PM. Use PIE right out of the box instead of wasting time learning to use more complex calibrators.

Technician suggested evolutionary designs

PIE Calibrators include features requested by I & E technicians. PIE's engineers have been designing calibrators since the 1980s and for PIE since 2001. Improvements over other brands include simple "Double Click Menu", rubber boot with tilt stand, backlit displays with larger digits, rugged switches and battery compartments for fast battery changes. All PIE calibrators include a Certificate of Calibration Card (see page 22) at no extra charge. From simple thermocouple and RTD sources to Diagnostic Multifunction Calibrators PIE has what you are looking for at a price to fit your budget.

American by design

PIE Calibrators are designed and assembled in Webster, New York with parts sourced from around the world. Many of our employees have years of experience producing multiple brands of calibrators. PIE's patented troubleshooting tools are based on decades of talking to instrument technicians at process plants around the world. We back all our calibrators with a Three Year Warranty and guarantee that they will work with the instruments & control systems in your plant or we will buy them back.



Replace your Altek* Calibrator

Did you know that Altek* Calibrator designs are over 25 years old? The first Altek Calibrator was built in 1979 and the last came off the assembly line in 2016. They are no longer being manufactured and support is extremely limited. PIE Calibrators are entirely new designs that are more rugged, have longer battery life and are just as easy to use as the Altek you have used for years. Trade in your old Altek to get a discount on your new PIE Calibrator.

PIE Calibrators are designed and built by members of the same team that designed and built the calibrators that were manufactured by Fluke* under the Altek* label.

Find your Altek Calibrator Replacement on Page 21

* PIE Calibrators are not manufactured or distributed by Fluke Corp. or Altek Industries Inc, manufacturers of Altek Calibrators

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Prevent Small Problems from Becoming **Major** Plant Failures

PIE diagnostic calibrators offer powerful troubleshooting tools that provide visibility to the health of your loop that is not possible with any calibrator brand on the market. LoopScope Ground Leak Detection allows technicians to find and fix undetected problems before they cause quality issues or become catastrophic failures - ending in poor product, injury, loss of life, or equipment damage. Common loop problems caused by moisture, corrosion, and contamination left unchecked can lead to dangerous conditions that are easily avoided with the innovation technology in the PIE diagnostic calibrators.

Even the most common small errors caused by loop wiring issues can lead to inferior product, lost production time, and risk to personnel which all impact the bottom line. Intrinsically safe loops are protected by barriers only against extreme over voltage and over current conditions but allowing small but significant ground faults to go undetected. PIE's unique and powerful LoopScope Ground Leak Detection technology quickly and easily finds a fault that would otherwise go undetected. These undetected faults could lead to potentially disastrous outcomes.

Have you ever replaced a "faulty" transmitter only to find the problem was somewhere else in the loop? And did you end up throwing the transmitter away after you fixed the other problem "just in case" the transmitter was faulty? If you find a loop where the transmitter is calibrated correctly but all the readings elsewhere in the loop have a fixed offset this is due to a Zero Shift. This Zero Shift is typically caused by some of the current in the loop bypassing the transmitter. If you have some loops that are erratic after it rains there may be moisture present in a junction box or where insulation has broken down.

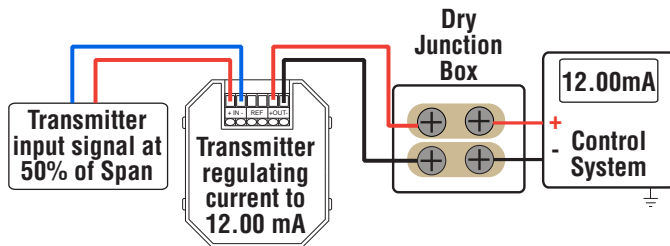
Only a PIE Calibrator with patented LoopScope can find all these hidden problems. Turn on LoopScope and use the PIE diagnostic calibrator to power up the loop. Any current that isn't controlled by the transmitter or other current control element will be clearly indicated as leakage on the PIE calibrator display.

LoopScope Ground Leak Detection allows technicians to troubleshoot loop problems with ease and confidence - minimizing risk and maximizing process uptime.

Hidden Problem Found with LoopScope Ground Leak Detection

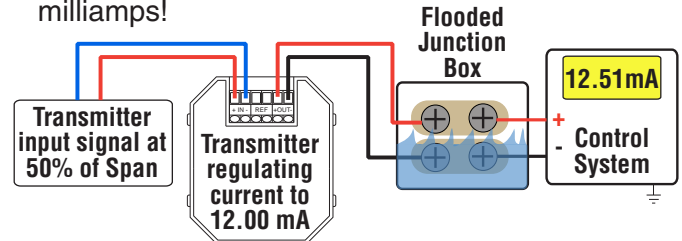
Safe loop

Sealed junction box is dry and the control system is operating within parameters.



Dangerous loop

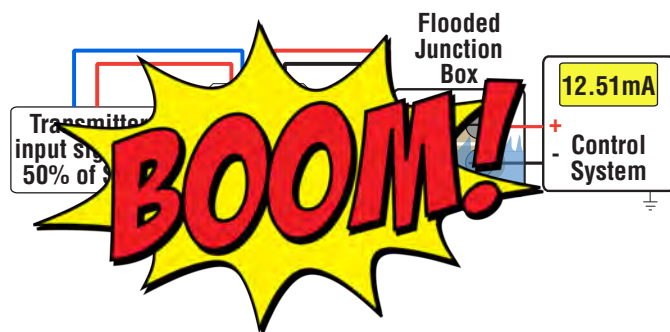
Sealed junction box is wet* and the control system is operating with a fixed offset of 0.51 milliamps!



* The value of the current leak increases when the water in the junction box is contaminated with rust, salt or process chemicals.

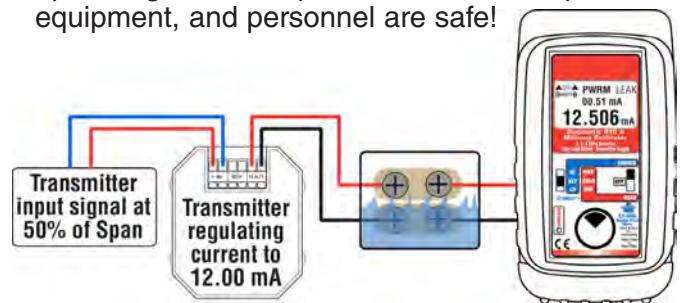
Dangerous loop left undetected

The flooded junction box goes undetected and the control system potentially goes further out of control until...



OR Disaster averted with PIE LoopScope

Hidden problem is detected by the PIE diagnostic calibrator. The flooded sealed junction box is emptied and the control system is once again operating within parameters. The product, equipment, and personnel are safe!



Carry Less and Do More with PIE Multifunction Process Calibrators

Milliamp • Voltage • Thermocouple • pH
RTD • Frequency • Continuity Tester • Pressure



Deluxe 'Hands Free' carrying case (020-0211) with zippered pocket for the manual, test leads & spare batteries.

The PIE 820, 820-ELITE and 830 are smaller and easier to use than other multifunction calibrators. Multiple single function calibrators with advanced features are squeezed into a single, surprisingly small, pocket sized package. Choose the 820PM or 830PM for use in a test bench.

The PIE 820 is a basic multifunction calibrator with a single display. The 820-ELITE has higher accuracy, sources pH, includes PIE's patented 'Leak Detection' for finding problems in 4-20 mA loops, and measures pressure. The 830 combines high accuracy, a dual display for standalone transmitter calibration along with several functions making it the most advanced troubleshooting tool for the instrument technician. The PIE Multifunction Calibrators improve upon other brands by including a rubber boot, a backlit display with larger digits, higher accuracy and more ranges for greater flexibility.

It's the best value of multifunction calibrator combining ease of use, accuracy, signal compatibility and compact size to make calibration easy as pie!

Magnetic Hanging Strap
(Optional 020-0236)

More than a Simple Boot

- **Rubber boot adds more than just protection**
The PIE Rubber boot makes it easier to hold in your hand or when wearing gloves and provides protection against accidental falls or when banging around in your toolbox. A swing out stand is handy when you are working on a bench.
- **Boot included with many models and optional for others**
Included with PIE 830, 820, 820-ELITE, 850, 334, 334Plus, 235, 322-I, 422, 422Plus, 211, 311, 311Plus, 525B, 525Plus and 901.
Optional for PIE 510B, 511B, 520B & 521B.
- **Add a magnetic hanging strap**
The PIE Magnetic Hanging Strap (optional) allows any PIE Calibrator to be suspended from a panel or rack. Quick releases on the strap are designed to let you hang the calibrator from a pipe or conduit.



PIE Calibrators

Easier to Carry

Easier to Use

Advantages of the PIE 830 over the competition

Greater accuracy and more RTD & thermocouple types with wider ranges

Diagnostic features unique to PIE for fast troubleshooting of loops and connections

Compatible with more instruments

Wider frequency ranges with greater resolution

Easier to use with Simple “Double Click” menu. One handed operation to switch output between zero and span.

Configurable automatic stepping

Safer to use in the field with Deluxe “Hands Free” carrying case

Check out the advanced features of the PIE 830 on pages 8 & 9 to see what you can do only with a PIE Calibrator!

Actual Size



PIE is Smaller & half the weight

Calibrate Your Process Controls With The PIE 820, 820PM & 820-ELITE

• Technician friendly operation

The unique and intuitive EZ-DIAL Double Click Menu makes it easier to setup than other multifunction calibrators. Uses the same menus as the single function Evolution Calibrators.

• Use it as a milliamp and voltage calibrator

820/820PM Source 820-ELITE Source

0 to 24.00 mA 0.000 to 24.000 mA
0 to 10.25 V dc 0.000 to 10.250 V dc
-10.00 to 80.00 mV -20.000 to 99.999 mV & -500.00 to 999.99 mV

820/820PM Read 820-ELITE Read

0.00 to 24.00 mA 0.000 to 24.000 mA
0.00 to 10.25 V dc 0.000 to 10.250 V dc
0.0 to 60.0 V dc 0.00 to 60.00 V dc
-10.00 to 80.00 mV ± 99.999 mV & ± 999.99 mV

Simulate 2-Wire Transmitters

Power up transmitters & loops with the built-in 24V power supply

Simplify HART hookups with built-in 250 Ohm resistor

• Calibrate directly in temperature with 0.1°C/°F resolution

The PIE 820, 820PM & 820-ELITE work with the instruments you use.

Types J, K, T, E, R, S, B, N, G, C, D, L (J DIN), U (T DIN) and P (Platinel II)

Pt 100 Ohm (3850, 3902, 3916, 3926) & 1000 Ohm (3850)

Copper 10 & 50 Ohm, Nickel 110 and 120 Ohm

• Checkout flow and vibration systems

Source & read frequency from 0 to 2000 CPM (Counts-Per-Minute),

0.00 to 999.99 Hz, 0.0 to 9999.9 Hz and 0.000 to 20.000 kHz

• Checkout resistance instruments - Source and read resistance

820/820PM	820-ELITE
0.0 to 401.0 Ohms	0.00 to 401.00 Ohms
0 to 4010 Ohms	0.0 to 4010.0 Ohms

• Troubleshoot loop & wiring problems

'Beep' out connections with the built-in continuity checker.

• Repeatability you can count on

Accuracy at	820/820PM	820-ELITE
4 mA	± 0.01 mA	± 0.004 mA
5 V	± 0.003 V	± 0.002 V
10 kHz	± 0.006 kHz	± 0.004 kHz
Type T 400.0°C/742.0°F	± 0.4 °C/0.7°F	± 0.2 °C/0.4°F
Pt 100Ω 0.0°C/32.0°F	± 0.5 °C/0.9°F	± 0.2 °C/0.4°F

• Guaranteed Compatible with all Instrumentation

Works with Rosemount & Honeywell Smart Transmitters, PLCs, DCSs, Multi-Channel Recorders and other pulsed excitation devices

• Detect 'hidden' loop problems (820-ELITE Only)

Quickly diagnose troublesome ground faults & current leakage with patented Loop Diagnostic technology (page 3). *Undetectable with other instruments!*

• Source pH probes into transmitters & analyzers (820-ELITE Only)

Source from 0.000 to 14.000 pH @ 25°C (77°F) corresponding to -414.12 to 414.12 mV to verify the pH system is operating properly.

• Measure pressure with optional pressure modules (820-ELITE Only)

Measure pressure in up to 32 engineering units with one of 32 pressure modules for gauge, differential non-isolated, differential isolated, compound or absolute pressure. Optional pressure modules for the 820-ELITE & 830 are listed on page 16.

• Easy to read - Turn on the backlight & easily see the display in dark areas of the plant.

• Quickly set any three outputs plus automatic stepping & ramping

Easily set any value quickly with the adjustable "DIAL" plus store any three output settings for instant recall with the EZ-CHECK™ switch. Choose 2, 3, 5 or 11 steps to automatically change the output in 100%, 50%, 25% or 10% of span. Select RAMP to smoothly move the output between Zero and Span from 5, 6, 7, 8, 9, 10, 15, 20, 25, 30 and 60 seconds.

• Measure temperature sensors, frequency pickups, loop currents and voltage levels

Check the values of your process sensors. Instantly recall MAX and MIN values to see process variability.

• Ready to go right out of the box

The PIE 820 & 820-ELITE come with a rubber boot with tilt stand, deluxe hands free carrying case (020-0211), four test leads with spade lugs for RTD and ohms, two test leads with alligator clips for milliamp, volt, frequency & continuity, and a free NIST Certificate of Calibration Card. The 820PM comes mounted on an aluminum panel with screws, AC Adapter, and Calibration Card listed above.

• Optional Accessories

Wire & Mini T/C Plug: J, T, E, K (020-0202); B, R/S, K (020-0203); Individual Wire & Mini T/C Plug (020-0210-*) *Choose Type J, K, T, E, R/S, N or B;
NiMh Batteries & Charger 120 VAC/12V DC (020-0103); Magnetic Hanging Strap (020-0236); Calibration report with test data



Panel mount versions of the PIE 820 & 830

Add a multifunction calibrator to your calibration or control panel



Models 820PM & 830PM

When you need a multifunction calibrator designed for use in a calibrator bench or test stand look to the PIE Models 820PM or 830PM.

Each has the same specifications, easy-to-use interface, and connections of their portable counterparts with larger displays for easy reading.

Comes with 8¾" x 4¾" aluminum mounting plate, cutout dimensions, screws, and AC adapter.



Back side of panel

Diagnostic Process Calibrator

PIE 830 & 830PM - More tools in a Smaller Calibrator

Carry eight single function calibrators

plus an isolated milliamp calibrator with loop supply
plus a loop troubleshooter in the palm of your hand!

Milliamp • Voltage • Frequency • pH
Ohms • Thermocouples • RTDs • Pressure
Loop Diagnostics • Transmitter Supply
Emulate an Isolated Transmitter with
TransmitterReplace

First calibrator with FIVE troubleshooting tools

- 1 Detect 'hidden' loop problems**
Quickly diagnose troublesome ground faults & current leakage with patented **Loop Diagnostic** technology (see page 3). These problems are undetectable with other instruments!
- 2 Check all loop parameters at once with the LoopScope™**
LoopScope simultaneously displays & updates the loop current, voltage, and resistance to show you the changing conditions as the process is running. Finds problems with power supplies & loops with too many loads. Patented by PIE!
- 3 Automatically detect 2, 3 or 4 wire RTDs with RTD ConnectSense**
Trouble shoot sensor connections and find broken wires with patented technology. LCD indicates which of the four wires are connected to an RTD sensor.
- 4 Swap out faulty transmitters to diagnose control issues** Easily setup the 830 with TransmitterReplace as a universal isolated transmitter for temperature, frequency, millivolt or pressure. If the loop is back under control you know the transmitter was faulty. Turn on the LoopScope to simultaneously see the loop current, power supply voltage and loop loads for troubleshooting.
- 5 Troubleshoot wiring problems without a multimeter**
Built in continuity checker with 'beeper' quickly finds broken wires or shorts in instrumentation wiring. Also handy for checking operation of relays and controller outputs.

The PIE Model 830/830PM (and the 10-50 mA Model 850 on page 13) is more than a multifunction calibrator. It is also a **loop detective** that is able to diagnose common problems that other test equipment just can't find. Have a flooded junction box or unknown ground faults? Our Loop Diagnostic technology will detect it. Or use the LoopScope to see at a glance all the parameters - milliamps, voltage and resistance - in the loop. Choose the 830PM Panel Mount calibrator when you need a multifunction calibrator designed for use in a calibrator bench or test stand (see photo on page 7).

Stop wasting time and throwing away perfectly good transmitters only to find the problem is somewhere else in the loop. Setup the PIE Model 830 with TransmitterReplace as an isolated universal transmitter and turn on LoopScope. The display will tell you EXACTLY the sensor input, the current output, and if there is any uncontrolled current in the loop due to a ground fault, corrosion bridge or moisture. If the control system sees no problem when the 830 is acting as a transmitter THEN you can replace the faulty transmitter. With RTDs the 830/830PM automatically detects which of the 2, 3 or 4 wires are connected and unbroken, quickly alerting you to a sensor problem. Diagnostic features are covered by US Patent #7,248,058.

Become a troubleshooting technician with Patented Diagnostic Technology - Available only with PIE Calibrators!



PIE 830 & 830PM - More tools in a Smaller Calibrator

- **Use it as a milliamp and voltage calibrator**

Source 0 to 24.000 mA, 0 to 10.25 V dc and -10.00 to 80.00 mV, Read to 24.00 mA, 60.00 V dc and -10.00 to 80.00 mV
Simulate 2-Wire Transmitters, Power up transmitters & loops with the built-in 24 V power supply
Simplify HART hookups with built-in 250 Ohm resistor

- **Calibrate directly in temperature with 0.1°C/°F resolution**

The PIECAL 830/830PM works with the instruments you use. Types J, K, T, E, R, S, B, N, G, C, D, L (J DIN), U (T DIN) and P (Platinel II)
Pt 100 Ohm (3850, 3902, 3916, 3926) & 1000 Ohm (3850), Copper 10 & 50 Ohm, Nickel 100 and 120 Ohm

- **Checkout flow and vibration systems**

Source & read frequency from 0 to 2000 CPM (Counts-Per-Minute), 0.00 to 999.99 Hz, 0.0 to 9999.9 Hz and 0.000 to 20.000 kHz

- **Checkout resistance instruments**

Source and read resistance from 0.00 to 401.00 and 0.0 to 4010.0 ohms Guaranteed compatible with all instruments including Rosemount & Honeywell Smart Transmitters, PLCs, DCSs, Multi-Channel Recorders and other pulsed excitation devices

- **Repeatability you can count on**

Accurate to ± 0.008 mA, ± 0.003 V, ± 0.006 kHz, $\pm 0.3^\circ\text{C}/0.5^\circ\text{F}$

- **Quickly set any three outputs plus automatic stepping & ramping**

Easily set any value quickly with the adjustable EZ-DIAL plus store any three output settings for instant recall with the EZ-CHECK™ switch. Choose 2, 3, 5 or 11 steps to automatically change the output in 100%, 50%, 25% or 10% of span. Select RAMP to smoothly move the output between Zero and Span from 5, 6, 7, 8, 9, 10, 15, 20, 25, 30 and 60 seconds.

- **Measure temperature sensors, frequency pickups, loop currents and voltage levels**

Check the values of your process sensors. Instantly recall MAX and MIN values to see process variability.

- **Ready to go right out of the box**

The 830 comes with a rubber boot with tilt stand, deluxe hands free carrying case (020-0211), four test leads with spade lugs for RTD and ohms, two test leads with alligator clips for milliamp, volt, frequency & continuity and a free NIST Certificate of Calibration card. The 830PM (photo page 4) comes mounted on an aluminum panel with screws, AC Adapter, and the same Calibration card listed above.

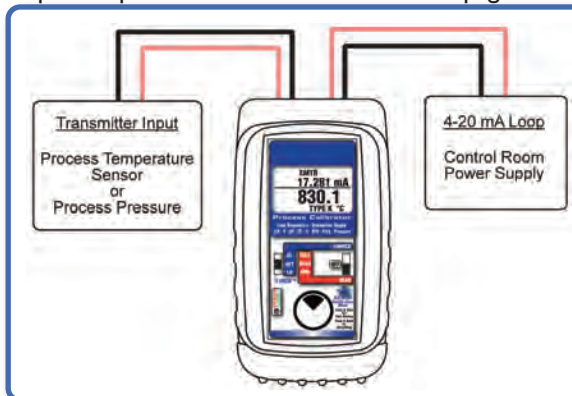
- **Optional Accessories**

Wire & Mini T/C Plug: J, T, E, K (020-0202); B, R/S, K (020-0203); Individual Wire & Mini T/C Plug (020-0210-*) *Choose Type J, K, T, E, R/S, N or B; Magnetic Hanging Strap (020-0236); NiMh Batteries & Charger 120 VAC/12V DC (020-0103); calibration report with test data.

Optional pressure modules are listed on page 19.



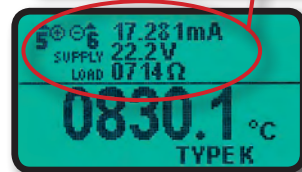
Upgraded Hands Free carrying case (020-0233) with pockets for the PIE 830/820-ELITE, the Pressure Module & a zippered pocket for the manual, test leads, hoses & pressure fittings. Included when the 830, 820-ELITE, or 850 & a pressure module are ordered together.



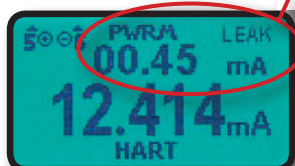
Use the PIE 830 as a Universal Isolated Transmitter

Swap out a faulty transmitter to diagnose control issues with PIE TransmitterReplace. If replacing the transmitter fixes the problem leave the 830 in place while you go to the shop to obtain and configure a replacement. Turn on LoopScope while running as a transmitter and see the status of the loop. Use the LoopScope to simultaneously display current, power supply voltage and loop resistance (load) in live loops.

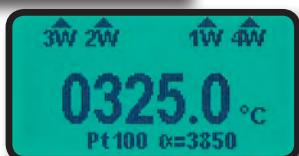
With LoopScope running the 830 simultaneously displays the sensor input along with the loop current, power supply voltage and loop load in ohms.



830 detects uncontrolled current in the loop due to a flooded junction box.



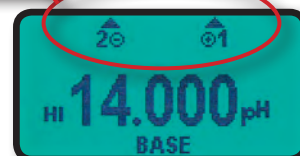
Detect hidden loop problems caused by ground faults & current leakages.



Automatically sense 2, 3 or 4 wires with RTD ConnectSense.



Continuity tester with beeper to find broken wires & shorts.



Sources pH - 830 has a pH range as well as wider millivolt ranges

Milliamp Loop Calibrators

PIE Model 334 - Just Like an Old Friend

• Source milliamps

Calibrate recorders, digital indicators, stroke valves or any instruments that get their input from a 4 to 20 mA loop. Easily set any value quickly to within 0.01 mA & 0.1% with the adjustable digital potentiometer "DIAL" or use preset **4.00 mA (0.0%)** and **20.00 mA (100.0%)** EZ-CHECK™ settings. Simultaneously displays mA & %!

• Calibrate with Confidence - Accurate to $\pm 0.025\%$ of Span at 4.00 & 20.00 EZ-CHECK outputs

• Power up all the devices in your loop

Drive up to 1200 Ohm loads in a fully loaded loop even when the batteries get low. Many competitive calibrators drive less than 1000 ohm loads and their output voltage drops as the batteries drain.

• Calibrate using loop power

Check loop wiring and receivers by using the PIECAL 334 in place of a 2 Wire transmitter. Uses any loop power from 2 to 100 V DC.

• Read loop current

Check controller outputs or measure the milliamp signal anywhere in the loop. The PIECAL 334 measures 0.00 to 52.00 mA (-25.0 to 300.0%) signals with greater accuracy than a typical multimeter.

• Keep the loop running while replacing a sensor or transmitter

Use the PIECAL Model 334 as a manual loading station. Set it up to simulate a 2-Wire transmitter and adjust the dial to simulate the running process.

• Power & measure 2 wire transmitters

The PIECAL 334 can simultaneously output 24V DC to power any and all devices in a process loop using the internal batteries and internal switching power supply, while measuring the output of a 2 Wire Transmitter and any other loop devices.

• Read DC volts

The PIECAL 334 can measure from -99.99 to +99.99 VDC with 0.01 Volt resolution. Use it to check loop power supplies, I/V converters, 1 to 5 Volt signals, and other voltages making it unnecessary to carry a multimeter.

• Easy-to Read Backlit Display - Use in the Plant, Field or Shop

Includes Rubber Boot, Attached Test Leads & free NIST Certificate of Calibration. Low profile switches resist accidental damage.

• Simple Battery Changes

Some competitive calibrators use from one to three expensive 9V batteries requiring you to take the calibrator out of the enclosure just to replace the batteries. The PIECAL Model 334 has a separate compartment for no-tool battery changes with four inexpensive "AA" batteries. Plus the PIECAL Model 334 has much longer battery life.

• Optional Accessories

AC Adaptor 120 V (020-0101); 240 V (020-0100); NiMh Batteries & Charger 120 VAC/12V DC (020-0103)

Deluxe Hands Free Carrying Case (020-0211); Magnetic Hanging Strap (020-0236); Calibration report with test data



Locate hidden loop problems with LoopScope on the PIE 334Plus!

• Calibrate Milliamp Instruments

Source & Read 0.000 to 24.000 mA & -25.00 to 125.00% of 4-20 mA with five digit display
Read -99.99 to 99.99 V; Simulate 2-Wire Transmitters, Power & Read Transmitters
Menu selectable 250 Ohm resistor for HART compatibility

• Calibrate with Lab Accuracy -

PIE 334Plus accurate to $\pm(0.05\%$ of Span) - within 0.01 mA

• Locate 'Hidden' Loop Current Leakages

Automatic indication of Loop Current & Leakage Current (US Patent #7,248,058). Measure ground current leakage from faulty wiring, flooded conduit and corrosion bridges to help you decide if there is a wiring problem (see page 3).

• Faster Calibrations - Three output EZ-CHECK switch. 2 speed EZ-DIAL; Stepping & Ramping

• Easy-to-Read Backlit Display - Includes Boot, Attached Test Leads & free NIST Certificate of Calibration Card

• Optional Accessories - AC Adaptor 120 V (020-0101); Calibration report with test data;

NiMh Batteries & Charger 120 VAC/12V DC (020-0103); Magnetic Hanging Strap (020-0236); Deluxe Hands Free Carrying Case (020-0211)



Diagnostic Milliamp, Voltage & Pressure Calibrator

PIE Model 901 - Super simple color menus!

- **Compact, Accurate & Easy to use**

With the PIE 901 you can check, calibrate and measure all your current, voltage and pressure instruments in a 4 to 20 milliamp DC loop. It can be used at any access point in your loop. Source & Read to 24.000 mA, Simulate a 2 Wire Transmitter or use the PIE 901 to simultaneously provide loop power to your 2 Wire Transmitter and measure its output. Source up to 24.000 V DC to calibrate voltage inputs. Measure from -60.000 to +60.00 V DC to check loop power supplies & batteries without carrying a separate multimeter. Rugged design with bright, color display for use in the shop, field, or on the bench. Rechargeable "AA" batteries and AC adapter included for charging or for bench use.

- **Troubleshoot Loop Problems**

Quickly diagnose ground fault and current leakage with the patented loop diagnostic technology (US Patent# 7,248,058 - See page 3).

- **Calibrate I/P, P/I & other Pressure Instruments**

Compact design for easy carrying & connection directly to hand pump or process. Use a cable for long term pressure tests on the bench or with PIE wireless pressure modules.

- **Calibrate Milliamp & Voltage Receivers**

Calibrate recorders, digital indicators, stroke valves or any instruments that get their input from a 4 to 20 mA loop or voltage devices. Easily set any value quickly to within 0.001 mA or 0.001 V with the adjustable digital potentiometer "DIAL" or use preset LO 4.000 mA (0.00%) and HI 20.000 mA (100.00%) EZ-CHECK™ settings. Store any three mA or V output values for instant recall.

- **Calibrate quickly with automatic output stepping**

Press & hold the dial to automatically step from 4 to 20 in 2, 3 or 5 steps or choose a continuous ramp.

- **Measure Milliamp Control Signals**

Check controller outputs or measure the milliamp signal anywhere in the loop. Measure 0.000 to 24.000 mA (-25.00 to 125.00%) signals with greater accuracy than a typical multimeter.

- **Calibrate 2 Wire Transmitters with Built-In power supply**

The PIE 901 can simultaneously output 24V DC to power any and all devices in a process loop using the internal batteries and internal switching power supply, while measuring the output of a 2 Wire Transmitter and any other loop devices. Powers HART™ transmitters with built-in 250 ohm resistor simplifying hookups with HART communicators.

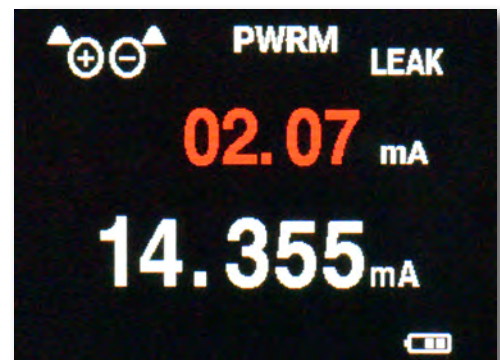
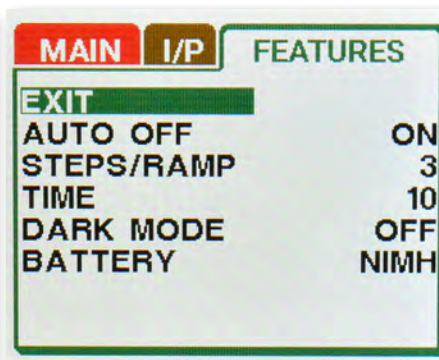
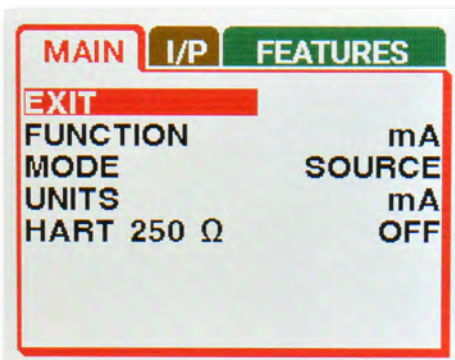
- **Includes**

Rubber Boot, Four "AA" NiMH batteries, Test Leads, Certificate of Calibration, AC Adaptor (9V USB-C), Hands Free Carrying Case

- **Optional Accessories**

Magnetic Hanging Strap (020-0236); Calibration report with test data

Milliamp Loop Diagnostics



Quickly and easily configure the 901 with simple color menus.
Color coded tabs makes setup easier.

Read the display in bright sunshine
with Dark Mode

Voltage Calibrator

Verify all your DC voltage instruments with the Model 235

- **Source three ranges of mV & V dc plus percent of 1 to 5 volts**
With the 235 you can check, calibrate and measure all your voltage, millivolt and pH signal instruments in your plant. Source -500.00 to 999.00 mV, 1.000 to 5.000 V, 0.0 to 100.0% of 1 to 5 V; 0.000 to 20.000 V.
- **Power your loops with over 1,000 Ohm loads**
The 20.000 V range has an extended span of up to 24.000 Volts giving you a portable source for powering your loops.
- **Read DC volts**
The 235 can measure from -500.00 to +999.00 mV, 0.000 to 5.100 V, 0.0 to 100.0 % of 1 to 5 V; 0 to 20.000 V and 0.00 to 60.00 V DC. Use it to check loop power supplies, I/V converters, 1 to 5 Volt signals, and other voltages.
- **Save time calibrating recorders and monitors in 4 to 20 mA loops**
Other brands of calibrators require that you break the loop to calibrate voltage inputs. With the PIE 235 you simply clip the test leads across the voltage inputs in a live 4 to 20 mA loop **without disconnecting any wires**.
- **Simulate pH probes into transmitters & analyzers**
Use the pH simulator to verify proper operation of pH devices before you place a probe into a calibrated buffer.
- **Faster Calibrations** - Three output EZ-CHECK switch. 2 speed EZ-DIAL; Stepping & Ramping
- **Calibrate with Lab Accuracy** -
Accurate to $\pm(0.025\% \text{ of Reading} + 4 \text{ lsd})$ - within 0.01 mA
- **Calibrate with Confidence**
Accurate to $\pm 0.02\%$ of Reading + 0.01% Full Scale. Out of range or over current is indicated by an audible alarm, flashing display and the OVERLOAD LED will light.
- **Includes everything you need**
Rubber Boot with Stand, Deluxe Hands Free Carrying Case (020-0211), Test Leads (020-0207)
- **Optional Accessories**
NiMH Batteries & Charger 120 VAC/12V DC (020-0103); Magnetic Hanging Strap (020-0236); Calibration report with test data



Frequency/Totalizer Calibrator

Model 541 & 541-BNC Frequency Calibrators

- **Calibrate Flow Meters and Frequency Instruments**
Generate Sine Waves, Zero based & Zero crossing Square Waves with amplitude from 100 mV to 12V p-to-p
 - **Read with Built-in Frequency counter** - Measures waveforms from 0.1V-120V peak-to-peak
 - **Compatible with Process Signal Ranges & Accurate to $\pm 0.005\%$ of Range**
0.001 kHz to 20.000 kHz; 0.1 Hz to 2000.0 Hz; 0.01 Hz to 200.00 Hz
0.1 CPM (Counts-per-minute) to 2000.0 CPM; 1 CPH (Counts-per-hour) to 20000 CPH
 - **Calibrate Totalizers** - Totalize Inputs/Outputs from 1 to 99999 counts in 0.1 to 100.0 minutes
 - **Includes:** Attached Leads, Carrying Case & free NIST Certificate of Calibration, (top mounted BNC connector 541-BNC only)
 - **Optional Accessories** - Magnetic Hanging Strap (020-0236); Calibration report with test data
- The PIE Model 541 is designed for calibration & testing turbine meters, counters, vibration systems, tachometers, vortex shedders, integrators, and any other frequency devices in the shop or field. Save hours of time compared to other calibration methods. When calibrating a totalizer it eliminates the need of a stop watch. Set the number of pulses & number of minutes required and it automatically stops when the number of pulses has been sent to the totalizer! The Model 541 has a handy LED indicator showing gate time for easy trigger level adjustment. The LED pulses with the frequency output for calibration of optical pickups.



10 to 50 Milliamp Multifunction Diagnostic Calibrator

Multifunction Calibrator for all your power plant instruments - PIE Model 850

• Technician friendly operation

The unique and intuitive EZ-DIAL Double Click Menu makes it easier to setup than other multifunction calibrators. Uses the same menus as the single function Evolution Calibrators.

• Use it as a milliamp and voltage calibrator

Source 0.000 to 24.000 mA & 0.000 to 52.000 mA
0.000 to 24.000 V dc, -500.00 to 999.99 mV & -20.000 to 99.999 mV
Read 0.000 to 24.000 mA & 0.000 to 52.000 mA
0.000 to 10.250 & 0.00 to 60.00 V dc, ± 99.999 mV & ± 999.99 mV

Simulate 2-Wire Transmitters

Power up transmitters & loops with built-in supplies of 24V for 20 mA & 40V for 50 mA loops

Simplify 4 to 20 mA HART hookups with built-in 250 Ohm resistor

• Calibrate directly in temperature with 0.1°C/°F resolution

The PIE 850 works with the instruments you use.

Types J, K, T, E, R, S, B, N, G, C, D, L (J DIN), U (T DIN) and P (Platinel II)

Pt 100 Ohm (3850, 3902, 3916, 3926) & 1000 Ohm (3850)

Copper 10 & 50 Ohm, Nickel 110 and 120 Ohm

• Checkout flow and vibration systems

Source & read frequency from 0 to 2000 CPM (Counts-Per-Minute),

0.00 to 999.99 Hz, 0.0 to 9999.9 Hz and 0.000 to 20.000 kHz

• Checkout resistance instruments - Source and read resistance

0.00 to 401.00 Ohms & 0.0 to 4010.0 Ohms

• Troubleshoot loop & wiring problems

'Beep' out connections with the built-in continuity checker.

• Repeatability you can count on

Accuracy at

4 mA	± 0.007 mA
50 mA	± 0.013 mA
5 V	± 0.002 V
10 kHz	± 0.004 kHz
Type T 400.0°C/742.0°F	$\pm 0.2^\circ\text{C}/0.4^\circ\text{F}$
Pt 100Ω 0.0°C/32.0°F	$\pm 0.3^\circ\text{C}/0.6^\circ\text{F}$

• Guaranteed Compatible with all Instrumentation

Works with Rosemount & Honeywell Smart Transmitters, PLCs, DCSs, Multi-Channel Recorders and other pulsed excitation devices

• Detect 'hidden' loop problems with LoopScope

Quickly diagnose troublesome ground faults & current leakage with patented LoopScope Diagnostic technology (see page 3). *Undetectable with other instruments!*

• Source pH probes into transmitters & analyzers

Source from 0.000 to 14.000 pH @ 25°C (77°F) corresponding to -414.12 to 414.12 mV to verify the pH system is operating properly.

• Measure pressure with optional pressure modules

Measure pressure in up to 32 engineering units with one of 32 pressure modules for gauge, differential non-isolated, differential isolated, compound or absolute pressure. Optional pressure modules are listed on page 16.

• Easy to read - Turn on the backlight & easily see the display in dark areas of the plant.

• Quickly set any three outputs plus automatic stepping & ramping

Easily set any value quickly with the adjustable "DIAL" plus store any three output settings for instant recall with the EZ-CHECK™ switch. Choose 2, 3, 5 or 11 steps to automatically change the output in 100%, 50%, 25% or 10% of span. Select RAMP to smoothly move the output between Zero and Span from 5, 6, 7, 8, 9, 10, 15, 20, 25, 30 and 60 seconds.

• Measure temperature sensors, frequency pickups, loop currents and voltage levels

Check the values of your process sensors. Instantly recall MAX and MIN values to see process variability.

• Ready to go right out of the box

The PIE 850 come with 4 high power "AA" lithium batteries, a rubber boot with tilt stand, deluxe hands free carrying case (020-0211), four test leads with spade lugs for RTD and ohms, two test leads with alligator clips for milliamp, volt, frequency & continuity, and a free NIST Traceable Calibration Report with test data.

• Optional Accessories

Wire & Mini T/C Plug: J, T, E, K (020-0202); B, R/S, K (020-0203); Individual Wire & Mini T/C Plug (020-0210-*) *Choose Type J, K, T, E, R/S, N or B; Magnetic Hanging Strap (020-0236);



Lab Accurate Thermocouple, RTD and mA Calibrators

PIE Plus Line of Diagnostic Thermocouple, RTD, & Milliamp Calibrators

Three Models:

Model 311Plus for RTD and Milliamp

Model 422Plus for Thermocouple and Milliamp

Model 525Plus with combined Thermocouple, RTD, and Milliamp



Features of the three PIE Plus Series Calibrators

- **Protect instruments & technicians from potentially dangerous catastrophic failures due to hidden loop problems with LoopScope**
Quickly diagnose ground fault and current leakage often caused by water in conduits and junction boxes with patented loop diagnostic technology US Patent# 7,248,058 (see page 3).

All have a Full Function Milliamp Calibrator

Perfect for standalone calibration of two-wire temperature transmitters using the built-in 24V loop power supply.

- **Faster Calibrations** - Instantly select 3 outputs with EZ-CHECK switch; 2 speed EZ-DIAL; Auto Stepping.
- **Easy-to-Read Display** - Turn on the backlight to read in dark areas of the plant

Both the 422Plus & 311Plus display the output current value & temperature while powering a 2 wire transmitter

Model 422Plus Thermocouple & Milliamp Calibrator

- **Source and Read Fourteen T/C Types plus mV**
J, K, T, E, R, S, B, N, G, C, D, L (J DIN), U (T DIN) & P (Platinel); -13.000 to 80.000 mV
- **Calibrate with Confidence** - Resolution of 0.1° F & C; Accurate to 0.2°
Includes Hands Free Carrying Case (020-0211); mV Test Leads (020-0207) & free NIST Calibration Card



Model 311 Plus RTD & Milliamp Calibrator

- **Source and Read Multiple RTD Curves plus Ohms**
Platinum 10, 50, 100, 200, 500 & 1000 Ohm (alpha = 3850), Platinum 100 Ohm (alpha = 3902, 3916, 3926), Copper 10 & 50 Ohm, and Nickel 120 Ohm.
Calibrate from 0.000 to 400.000 & 0.00 to 4000.00 Ohms.
- **Automatically Detect 2, 3 & 4 Wire Connections with RTD ConnectSense**
Troubleshoot sensor connections & find broken wires with patented technology
Includes Hands Free Carrying Case (020-0211); RTD Wire Kit (020-0206); mV Test Leads (020-0207) & free NIST Calibration Card

Model 525Plus Thermocouple, RTD & Milliamp Calibrator

Combines all the functions of the of the 422Plus & 311Plus show above as well as these Advanced Features

Only calibrator that combines ALL the functions of a diagnostic milliamp calibrator with the accuracy of laboratory Thermocouple & RTD calibrators. Perfect for standalone calibration of two-wire temperature transmitters using the built-in 24V loop power supply.

- **Compatible with ALL process instruments**
No competitor's calibrator is compatible with as many process instruments! Connect directly to the RTD inputs of smart transmitters, PLCs, DCS and multichannel recorders and verify their outputs or displays. Works with Rosemount & Honeywell Smart Transmitters, PLCs, DCSs, Multi-Channel Recorders and other pulsed excitation devices
- **Calibrate with Precision** - High resolution to 0.1° and 0.01° F & °C; Accurate to 0.2°
- **Troubleshoot thermocouples with TC FaultSense before sensor burnout**
Detect high resistance thermocouples before they burnout. TC FaultSense simultaneously indicates the resistance of the thermocouple sensor & cables along with the measured temperature! Easily decide which probes need replacement - **Only with PIE Calibrators!**
Includes Hands Free Carrying Case (020-0211); RTD Wire Kit (020-0206); mV Test Leads (020-0207) & free NIST Calibration Card

Optional Accessories

Wire & Mini T/C Plug: J, T, E, K (020-0202); B, R/S, K (020-0203);
Individual Wire & Mini T/C Plug (020-0210-*) *Choose Type J, K, T, E, R/S, N or B; Magnetic Hanging Strap (020-0236)
NiMh Batteries & Charger 120 VAC/12V DC (020-0103); Calibration report with test data



TC & RTD Calibrator

Automated Thermocouple & RTD Calibrator - Model 525B

- **Calibration Lab Accurate & Stable**

The internal cold junction thermistor is accurate to $\pm 0.05^{\circ}\text{C}$ and is traceable to NIST. More accurate than other handheld or benchtop calibrators.
Exceeds the requirement of AMS 2750 as a Field Test Instrument.

- **Automatically Detect 2, 3 & 4 Wire Connections with RTD ConnectSense**

Troubleshoot sensor connections & find broken wires with patented technology
Works with Rosemount & Honeywell Smart Transmitters, PLCs, DCSs, & Multi-Channel Recorders

- **Source & Read Multiple Thermocouple Types plus mV**

Resolution to 0.1° and 0.01° F & $^{\circ}\text{C}$

J, K, T, E, R, S, B, N, G, C, D, L (J-DIN), U (T-DIN) and P (Platinel II)
-13.0000 to 80.0000 mV

- **Source and Read Multiple RTD Curves to 0.1° and 0.01° F & $^{\circ}\text{C}$ plus Ohms**

Platinum 10, 50, 100, 200, 500 & 1000 Ohm ($\alpha = 3850$), Platinum 100 Ohm ($\alpha = 3902, 3916, 3926$), Copper 10 & 50 Ohm, and Nickel 120 Ohm. Or calibrate from 0.000 to 400.000 and 0.00 to 4000.00 Ohms.

- **Faster Calibrations**

Select 3 outputs with EZ-CHECK switch
2 speed EZ-DIAL
User configurable Auto Stepping

- **Includes**

Hands Free Carrying Case (020-0211)
RTD Wire Kit (020-0206)
mV Test Leads (020-0207)
Free NIST Calibration Card

- **Optional Accessories**

Wire & Mini T/C Plug: J, T, E, K (020-0202); B, R/S, K (020-0203)
Individual Wire & Mini T/C Plug (020-0210-*) *Choose Type J, K, T, E, R/S, N or B
Magnetic Hanging Strap (020-0236)
Calibration report with test data

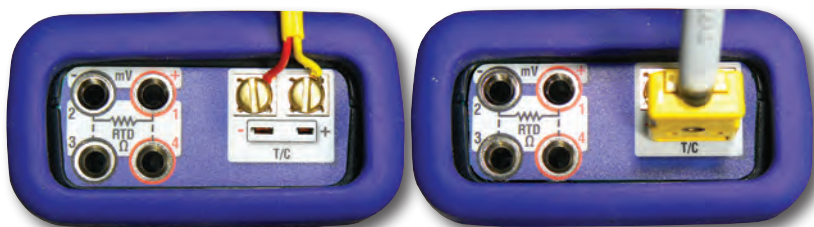


Thermocouple Connections

Simulating or reading thermocouples requires the use of thermocouple or extension grade thermocouple wire.

Plug thermocouple wires into the miniature thermocouple jack or place bare thermocouple wires onto the brass block under the screws.

The PIE 525B has two banana jacks (1+ & 2-) mounted in the top end of the housing. These are not temperature compensated and are to be used only for millivolt signals.



RTD Connections

Simulating or reading RTDs uses copper wire.

Plug 2, 3 or 4 wires into the corresponding jacks on the calibrator. For RTD source the PIE 525B simulates the (+) RTD from jacks 1 & 4 and the (-) RTD from jacks 2 & 3.

When reading an RTD sensor the PIE 525B uses patented circuitry to automatically detects if 2, 3 or 4 wires are connected. This is helpful to troubleshoot sensor connections.



TC & RTD Calibrators

PIE 322-I & 422 Automated T/C Calibrators

- **PIE 422 - Source and Read Fourteen T/C Types plus mV**
J, K, T, E, R, S, B, N, G, C, D, L (J DIN), U (T DIN) & P (Platinel); -13.000 to 80.000 mV
- **PIE 322-I - Source and Read Four T/C Types plus mV**
J, K, T, & E; -13.000 to 80.000 mV
- **Calibrate with Confidence** - Resolution of 0.1° F & C; Accurate to 0.2°
- **Easily Change T/C Types & Scale** - Double click to select T/C type & °F & C
- **Easy-to-Read Display** - Turn on the backlight to read in dark areas of the plant
- **Use in the Plant, Field or Shop** - Low profile switches resist accidental damage. Includes Rubber Boot, Deluxe Hands Free Carrying Case (020-0211), mV Test Leads (020-0207) & free NIST Certificate of Calibration Card.
- **Two ways to connect** - Miniature thermocouple jack or place wires under the screws.
- **Verify Cold Junction Temperature & Output (422 Only)**
Secondary display of compensated millivolt setting and cold junction temperature
- **Included with 322 & 422**
Rubber Boot
mV Wire Kit (020-0207)
Deluxe Hands Free Carrying Case (020-0211)
Free NIST Certificate of Calibration Card
- **Optional Accessories for 322 & 422**
Wire & Mini T/C Plug: J, T, E, K (020-0202); B, R/S, K (020-0203);
Individual Wire & Mini T/C Plug (020-0210-*) *Choose Type J, K, T, E, R/S, N or B
NiMh Batteries & Charger 120 VAC/12V DC (020-0103)
Magnetic Hanging Strap (020-0236)
Calibration report with test data



PIE 211 & 311 Automated RTD Calibrators

- **Calibrate with Ease** - Resolution to 0.1° F & C; Accurate to 0.2°
- **Source and Read Multiple RTD Curves plus Ohms**
Platinum 100 Ω: a=1.3850, 1.3902, 1.3916, 1.3926; Platinum 1000 Ω: a=1.3850, 1.3750
Copper 10 & 50 Ω; Nickel 120 Ω; 0.00 to 4001.0 Ω (PIE 211 limited to 2001.0 Ω)
- **Automatically Detect 2, 3 & 4 Wire Connections with RTD ConnectSense**
Troubleshoot sensor connections & find broken wires with patented technology
- **Guaranteed Compatible with all Instrumentation**
Works with Rosemount & Honeywell Smart Transmitters, PLCs, DCSs, Multi-Channel Recorders and other pulsed excitation devices
- **Easily Change RTD Types & Scale** - Double click to select RTD Type & °F & °C
- **Verify RTD Temperature & Output (311 Only)** - Secondary display of Ohms
- **Use in the Plant, Field or Shop**
- **Included with 211 & 311**
Rubber Boot
RTD Wire Kit (020-0208)
Deluxe Hands Free Carrying Case (020-0211)
Free NIST Certificate of Calibration Card
- **Optional Accessories for 211 & 311**
NiMh Batteries & Charger 120 VAC/12V DC (020-0103)
Magnetic Hanging Strap (020-0236)
Calibration report with test data



Thermocouple Sources and RTD Simulators

Thermocouple Source PIE 521B

- **Source Multiple Thermocouple Types plus mV**
J, K, T, E, R, S, N, B, G, C, D, L, U and P; -13.000 to 80.000 mV
- **Calibrate with Confidence**
Resolution of 0.1° F & C; Accurate to 0.4°; Backlit display
Included with PIE 520B & 521B: mV Test Leads & free NIST Certificate of Calibration Card.
- **Faster Calibrations**
Instantly select three outputs with EZ-CHECK switch
Easily find trip points with two speed EZ-DIAL
- **Included with 520B & 521B**
mV Test Leads (020-0207) & free NIST Certificate of Calibration Card.
- **Optional Accessories for 520B & 521B**
Rubber Boot (020-0209), Deluxe Hands Free Carrying Case (020-0211), NiMH Batteries & Charger 120 VAC/12V DC (020-0103), Calibration report with test data
Wire & Mini T/C Plug - Types J,T,E,K (020-0202), Types B,R/S,K (020-0203), Individual Wire & Mini T/C Plug (020-0210-*) *Choose Type J,K,T,E,R,S,N or B



PIE 520B

- **Source Only - Single Thermocouple Type plus mV**
Choose from Types J, K, T, E, R, S, N, B, G, C, D, L, U or P
(Optional boot shown)

RTD Simulator PIE 511B

- **Simulate Multiple RTD Curves plus Ohms**
Pt 100 Ω : $\alpha=1.385, 1.3902, 1.3926, 1.3916$; 1000 Ω : $\alpha=1.385, 1.375$
Copper 10 & 50 Ω ; Nickel 110 & 120 Ω ;
0.00 to 410.00 & 410.1 to 4001.0 Ohms
- **Calibrate with Confidence**
Resolution of 0.1° F & C; Accurate to 0.3°; Backlit display
- **Faster Calibrations**
Instantly select three outputs with EZ-CHECK switch
Easily find trip points with two speed EZ-DIAL knob
- **Included with 510B & 511B**
RTD Wire Kit (020-0208) & free NIST Certificate of Calibration Card.
- **Optional Accessories for 510B & 511B**
Rubber Boot (020-0209); Deluxe Hands Free Carrying Case (020-0211); NiMH Batteries & Charger 120 VAC/12V DC (020-0103); Calibration report with test data



PIE 510B

- **Simulate Only - Single RTD Curves plus Ohms**
Choose any single RTD type from list:
510B-Pt-100-1 $\alpha=1.3850^*$
510B-Pt-100-2 $\alpha=1.3902$
510B-Pt-100-3 $\alpha=1.3916$
510B-Pt-100-4 $\alpha=1.3926$
510B-Pt-1000-5 $\alpha=1.3850$
510B-Pt-1000-6 $\alpha=1.375$
510B-Cu-10; 510B-Cu-50
510B-Ni-120; 510B-Ni-110
* Default Model - most common worldwide
(Optional boot shown)

Thermocouple & RTD Wire Kits

Each thermocouple wire is stripped at one end with Mini T/C Plug on the other end.
RTD wires have banana plugs on one end and spade lugs on the other end.



Types J, T, E, K (020-0202)



Types B, R/S, N (020-0203)



Individual Wire & Mini T/C Plug
(020-0210-*)
*Choose Type J, K, T, E, R/S, N or B



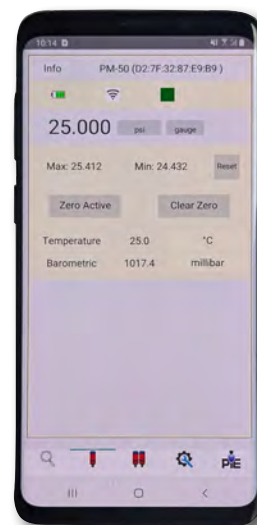
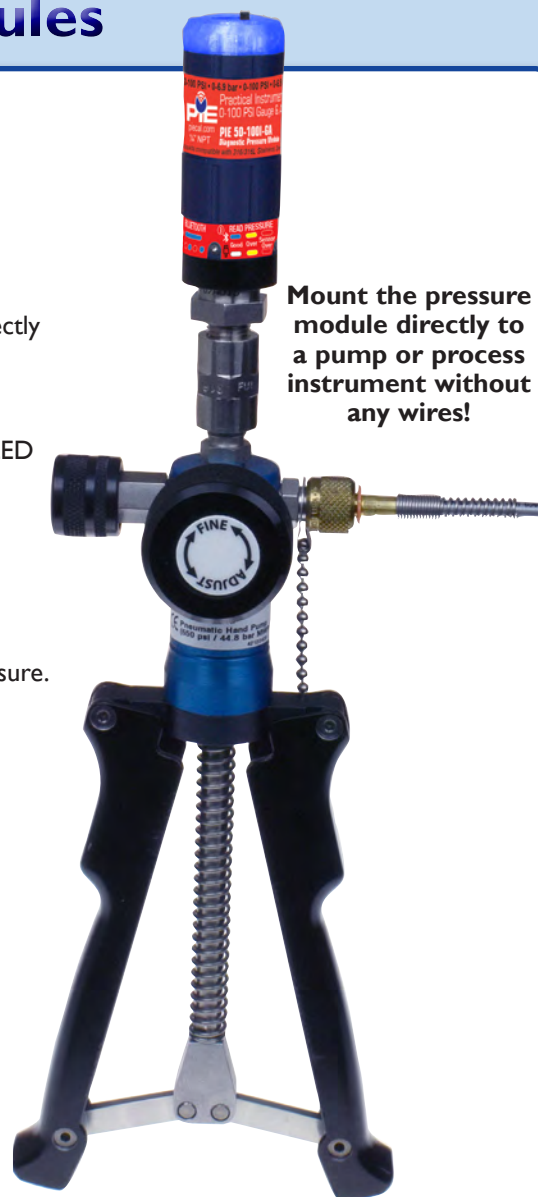
RTD Wire Kit (020-0206)
Included with all calibrators
with RTD ranges

Wireless Diagnostic Pressure Modules

PIE PM50 Series Pressure Modules

- **Connect with or without wires for simplified calibrations**
Bluetooth compatible pressure module
Connect without wires to PIE 900 series calibrators or to Android & iPhones with PIE Pressure App
Use adapter cable to connect to PIE 820-ELITE, 830, or 850 Calibrators
- **Convenient**
Compact, robust design makes them easy to carry into the plant or field. Connects directly to hand pump, or to instrument ports with no hose or wire needed.
- **Smart**
Patented self diagnostics (Patent 11,815,364) make it easy to confirm that the pressure module is functional and ready to use. Easy to identify 'healthy' or 'calibration needed' LED indicators quickly notify the user of a potential problem.
- **Accurate**
Accuracy of $\pm 0.035\%$ of Span with the main sensor
Atmospheric pressure accurate to ± 1 milliBar (0.00145 psi)
- **Adaptable pressure readings**
Measure gauge pressure or absolute pressures with a single module. External sensor connects to your pressure devices while an internal sensor measures atmospheric pressure. Both pressures are automatically compared to display absolute pressure.
- **32 Engineering Units:**
PSI • inches, feet, mm, cm and meter of H₂O @ 4°C, 20°C & 60°F inches, meter, cm and mm of Hg @ 0°C; • torr • kg/cm² • kg/m²
Pa • hPa • kPa • MPa • Bar • mBar • ATM • oz/in² • lb/ft²

PM50 Series	Isolated for fluids & gases compatible with 316/316L stainless steel	
PM50-30i-GA	0.000 to 30.000 psi	0.00000 to 2.10000 Bar
PM50-100i-GA	0.000 to 100.000 psi	0.0000 to 6.8948 Bar
PM50-300i-GA	0.000 to 300.000 psi	0.0000 to 20.6843 Bar
PM50-500i-GA	0.000 to 500.000 psi	0.0000 to 34.4738 Bar
PM50-1500i-GA	0.000 to 1500.0 psi	0.000 to 103.421 Bar



Wireless connection to PIE 900 Series Calibrator or to the PIE Pressure App on Android or iPhone.

Pressure Modules

- **Easily measure pressure with a plug in pressure module**

Purchase any of the pressure modules from the table below along with one of the three hand pumps and tubing kits for a complete pressure calibration system. All pressure modules are compatible with the PIE Models 820-ELITE, 830, 830PM, 850, and 901.

- **Media Compatibility**

Non-isolated DN sensors: clean, dry, non-corrosive, non-condensing gases only

Isolated DI sensors: any media compatible with 316L SS & Viton®

Isolated GI, CI & AI sensors: any media compatible with 316L SS

- **Accuracy**

±0.025% of full scale including all effects of linearity, repeatability and hysteresis from -20° to +50°C (-4° to +122°F)

*The DN0010 sensor accuracy is ±0.050% of full scale

- **32 Engineering Units:**

PSI • inches, feet, mm, cm and meter of H₂O @ 4°C, 20°C & 60°F

inches, meter, cm and mm of Hg @ 0°C

torr • kg/cm² • kg/m² • Pa • hPa • kPa • MPa • Bar • mBar • ATM • oz/in² • lb/ft²

Sensor Code	Application	Ranges Available
DNxxxx	Differential, Non-isolated	0 to 0010*, 0028, 0200, 0415, 2000" H ₂ O
DIxxxx	Differential, Isolated	0 to 0001, 0005, 0015, 0030, 0100, 0300, 0500 PSID
GIxxxx	Gauge, Isolated	0 to 0015, 0030, 0050, 0100, 0300, 0500, 1000, 3000 PSIG
CIxxxx	Compound, Isolated	-14.7 to +0015, 0030, 0050, 0100, 0300, 0500, 1000, 3000 PSIG
AIxxxx	Absolute, Isolated	0 to 0017, 0038, 0100, 1000 PSIA

Ordering Examples: **GI0300** is a Gauge, Isolated 0 to 300 PSI; **DN0415** is a Differential, Non-isolated 0 to 415 inches of water



PIE 830 with GI0100 Pressure Module,
Pressure/Vacuum Pump & Hose

Hand Pumps, Tubing & Fitting Kits

- **Generate pressure with a full set of hand pumps**

Choose from a selection of hand pumps, tubing & fittings made in the USA by Ralston Instruments. All pumps have two pressure ports - one port & hose go to the PIE pressure module and the other to the pressure input of your instrument. Each pump comes with the Quick-Test hose (020-0229).

Pneumatic Scissor Hand Pump

020-0237

0 to 650 psi



Hydraulic Scissor Hand Pump

020-0238

0 to 5,000 psi



Pneumatic Pressure/Vacuum Pump

020-0226

0 to 125 psi & 0 to 23 inches vacuum



Quick-test™ Hoses - 020-0229

Microbore hoses provide a very quick, low volume, high pressure (up to 6900 psi) way of connecting any pressure instrumentation to the hand pump and pressure module.



Pressure Fitting Kit - 020-0228

Adapts from Quick-test™ hose to 1/4" male & female NPT, 1/8" male & female NPT and 1/4" tube fitting.



Pressure Fitting - 020-0227

Adapts from Quick-test™ hose with cap to 1/8" male NPT for mounting on pressure module or pressure instrument.

PIE Pressure kits include the pump, two hoses and a basic fitting to get you started when you buy a PIE pressure module.

PKIT3 020-0232: includes 020-0226 Pressure/Vacuum Pump, two 020-0229 Hoses & 020-0227 fitting

PKIT4 020-0239: includes 020-0237 Pneumatic Scissor Pump, two 020-0229 Hoses & 020-0227 fitting

PKIT5 020-0240: includes 020-0238 Hydraulic Scissor Pump, two 020-0229 Hoses & 020-0227 fitting

Replace Your Altek* Calibrator

Did you know that Altek* Calibrator designs are over 25 years old? The first Altek Calibrator was built in Rochester, NY in 1979 and the last came off the assembly line in Everett, WA in 2016. They are no longer being manufactured and support is limited - *even the website is gone*. PIE Calibrators are entirely new designs that are more rugged, protected by rubber boots, have longer battery life and are just as easy to use as the Altek you have used for years. Use the table below to find the PIE replacement for your favorite discontinued calibrator. *Trade in your old Altek to get a discount on your new PIE Calibrator!*

PIE Calibrators are designed and built by members of the same team in Rochester, NY that designed and built the calibrators that were manufactured by Altek and Fluke* under the Altek label.

Discontinued Altek Calibrators



Find the recommended replacement for your discontinued Altek* Calibrators

Altek* Model	PIE Model	Type
46, 131, 134, 134-2, 234, 334, 334A	334, 334Plus	Milliamp Loop
434, 434-KP	901	Milliamp/Volt (High Accuracy)
135, 235	235	Voltage
22	520B, 521B	Thermocouple (Source Only)
222, 222A, 322-1	322-1	Thermocouple (4 Type)
422	422	Thermocouple (14 Type)
11	510B, 511B	RTD (Source Only)
111, 211	211	RTD (9 Types)
311, 311A, 311A-KP	311	RTD (High Accuracy)
40A, 241, 941, 942	541	Frequency
820	820	Multifunction (Single Display)
830, 830-KP	830	Multifunction (Dual Display)

PIE Calibrators are not manufactured or distributed by Fluke Corp. or Altek Industries Inc, manufacturers of Altek Calibrators



PIE Calibrators are smaller, & more accurate

Calibration Certificates

PIE Calibrators come calibrated

PIE Calibrators are designed, assembled, and calibrated in the USA. Your new calibrator comes standard with a Certificate of Calibration Card and a Three Year Warranty.

You may optionally purchase a Certificate of Calibration with Test Data. Note: The test data must be requested when the calibrator is ordered.

We recommend annual recalibration of our products. Contact PIE or your local distributor for factory recalibration. Calibration procedures are posted on our website.

Practical Instrument Electronics
34 May Street Suite 3, 14 • Webster NY 14580 USA
Tel (585) 872-9350 • Fax (585) 872-2638 • www.piecal.com

CERTIFICATE OF CALIBRATION

This is to certify that your instrument has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology within the limits of the NIST Calibration Services. Actual records pertaining to these standards are on file and are available for examination.

Certified by: Practical Instrument Electronics
Recommended Recalibration: Annually

Model Number 820 Serial No. 123456
Calibration Date 6/24/2021 Calibration By K. Keick
In Service Date _____ Calibration Due _____

Standard Certificate of Calibration Card included free with each calibrator purchased.

Optional Certificate of Calibration with Test Data.

The Test Data must be requested at the time the calibrator is ordered.

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Certificate of Calibration

This is to certify that your instrument has been calibrated using standards whose accuracies are traceable to NIST (National Institute of Standards and Technology) within the limits of the NIST Calibration Services. Actual records pertaining to these standards are on file and are available for examination.

Certified by: Practical Instrument Electronics
Recommended Calibration Interval: 1 Year

Model Number 820 Serial Number 123456 Calibrated By Ken Keick
Calibration Date 6/24/2021 In Service Date _____ Calibration Due 6/24/2022

Function Parameter	Limit	As Received	Adjusted
Source mA (Limits in column of full range)			
4.00	±0.01 mA	4.0000	
12.00	±0.01 mA	12.000	
20.00	±0.01 mA	20.000	
24.00	±0.01 mA	24.000	
0.0% (4.00mA)	±0.01mA	4.0000	
100.0% (20.00mA)	±0.01mA	20.000	
2-Wire Sim (Limits in column of full range)			
4.00 mA	±0.01 mA	4.000	
12.00 mA	±0.01 mA	12.000	
20.00 mA	±0.01 mA	20.000	
Read mA (Limits in column of full range)			
4.00 mA	±0.01 mA	4.000	
12.00 mA	±0.01 mA	12.000	
20.00 mA	±0.01 mA	20.000	
Power Xmt (Limits in column of full range)			
4.00 mA	±0.01 mA	4.000	
12.00 mA	±0.01 mA	12.000	
20.00 mA	±0.01 mA	20.000	
Read mV (Limits in column of full range)			
-10.00	±0.02 mV	-10.000	
0.00	±0.02 mV	0.000	
80.00	±0.02 mV	80.000	
Read 10V (Limits in column of full range)			
0.00	±0.01 V	0.000	
5.00	±0.01 V	5.000	
10.00	±0.01 V	10.000	
Read 50V (Limits in column of full range)			
0.0	±0.1 V	0.0	
30.0	±0.1 V	30.0	
50.0	±0.1 V	50.0	
Source mV (Limits in column of full range)			
-10.00 mV	±0.02 mV	-10.000	
0.00 mV	±0.02 mV	0.000	
80.00 mV	±0.02 mV	80.000	

Function Parameter	Limit	As Received	Adjusted
Source V (Limits in column of full range)			
0.00	±0.01 V	0.000	
5.00	±0.01 V	5.000	
10.00	±0.01 V	10.000	
Source 4000 (4-wire @ 1mA) (Limits in column of full range)			
5.0	±0.2 Ω	5.000	
100.0	±0.2 Ω	100.00	
400.0	±0.2 Ω	400.00	
Source 40000 (4-wire @ 100µA) (Limits in column of full range)			
5	±0.2 Ω	5.000	
2000	±0.2 Ω	2000.00	
4000	±0.2 Ω	4000.00	
Read 4000 (4-wire @ 100µA) (Limits in column of full range)			
10.0 (4-wire)	±0.2 Ω	10.00	
100.0 (4-wire)	±0.2 Ω	100.00	
400.0 (4-wire)	±0.2 Ω	400.00	
100.0 (3-wire)	±0.2 Ω	100.00	
100.0 (2-wire)	±0.2 Ω	100.00	
Read 40000 (4-wire @ 100µA) (Limits in column of full range)			
100 (4-wire)	±1 Ω	100.00	
2000 (4-wire)	±1 Ω	2000.00	
4000 (4-wire)	±1 Ω	4000.00	

Asset	Serial Number	Last Calibrated	Calibration Due
820-1	123456	6/24/2021	6/24/2022
820-2	123457	6/24/2021	6/24/2022
820-3	123458	6/24/2021	6/24/2022
820-4	123459	6/24/2021	6/24/2022

PN-005-0115 Rev-G

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Certificate of Calibration

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Certified by: Practical Instrument Electronics
Recommended Calibration Interval: 1 Year

Model Number 820 Serial Number 123456 Calibrated By Ken Keick
Calibration Date 6/24/2021 In Service Date _____ Calibration Due 6/24/2022

Function Parameter	Limit	As Received	Adjusted
Source kHz (Limits in column of full range)			
1.000	±0.005 kHz	1.0000	
10.000	±0.005 kHz	10.0000	
20.000	±0.005 kHz	20.0000	
Read kHz (Limits in column of full range)			
1.000	±0.005 kHz	1.0000	
10.000	±0.005 kHz	10.0000	
20.000	±0.005 kHz	20.0000	
Cold Junctions (Limits in column of full range)			
0.000	±0.005 °C	0.0000	
10.000	±0.005 °C	10.0000	
20.000	±0.005 °C	20.0000	

Function Parameter	Limit	As Received	Adjusted
Source V (Limits in column of full range)			
0.00	±0.01 V	0.000	
5.00	±0.01 V	5.000	
10.00	±0.01 V	10.000	
Source 4000 (4-wire @ 1mA) (Limits in column of full range)			
5.0	±0.2 Ω	5.000	
100.0	±0.2 Ω	100.00	
400.0	±0.2 Ω	400.00	
Source 40000 (4-wire @ 100µA) (Limits in column of full range)			
5	±0.2 Ω	5.000	
2000	±0.2 Ω	2000.00	
4000	±0.2 Ω	4000.00	
Read 4000 (4-wire @ 100µA) (Limits in column of full range)			
10.0 (4-wire)	±0.2 Ω	10.00	
100.0 (4-wire)	±0.2 Ω	100.00	
400.0 (4-wire)	±0.2 Ω	400.00	
100.0 (3-wire)	±0.2 Ω	100.00	
100.0 (2-wire)	±0.2 Ω	100.00	
Read 40000 (4-wire @ 100µA) (Limits in column of full range)			
100 (4-wire)	±1 Ω	100.00	
2000 (4-wire)	±1 Ω	2000.00	
4000 (4-wire)	±1 Ω	4000.00	

Asset	Serial Number	Last Calibrated	Calibration Due
820-1	123456	6/24/2021	6/24/2022
820-2	123457	6/24/2021	6/24/2022
820-3	123458	6/24/2021	6/24/2022
820-4	123459	6/24/2021	6/24/2022

PN-005-0115 Rev-G

Warranties

Standard Three Year Warranty

Three years of protection from any defects in materials or workmanship - included with every calibrator. If your calibrator should fail, and is physically undamaged, we will repair it free of charge under our Standard Warranty.

Repair/Replacement Three Year Warranty (-RW)

Available for a small additional charge at time of purchase. Three years of protection from any defects in materials or workmanship PLUS Three years of protection from physical damage. If you use calibrators frequently and under extreme conditions, the Repair/Replacement Warranty is the best choice. This warranty provides for the repair or replacement of the covered calibrator during the first three years no matter what happens to the calibrator! If the calibrator is dropped, run over, or is abused until it ceases to function, we will repair or replace it no charge. *No questions asked.*

Recalibration and Repair

Recalibration

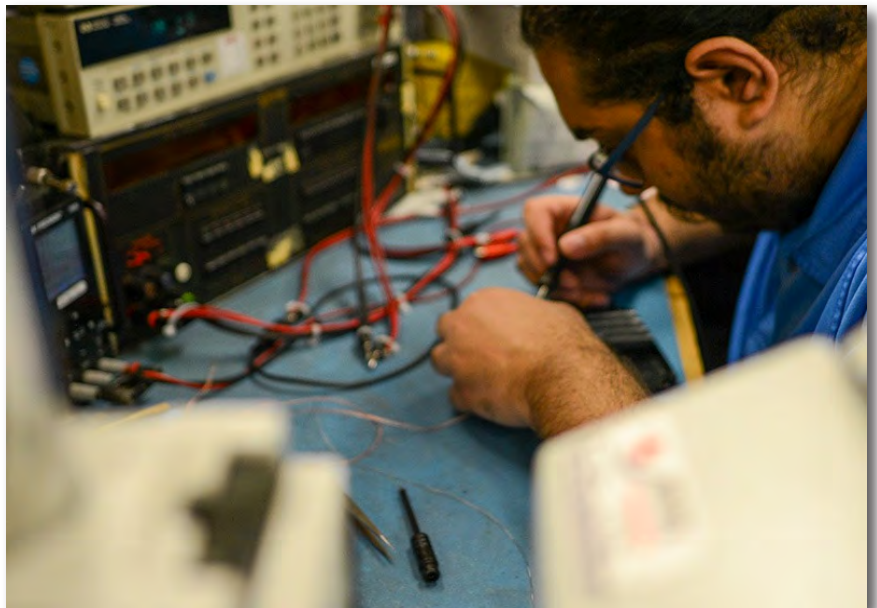
We recommend and perform annual recalibration of our products. Contact PIE for a fast turnaround factory recalibration.

Calibration may also be performed by your company's calibration laboratory or any of your qualified calibration vendors.

Repair

We service all PIE calibrators *including discontinued models* (unless parts are no longer available and our safety stock has been depleted).

- **NIST traceable calibration certificate**
Included FREE
- **Fast turnaround**
2-3 week turnaround or better on calibrations (please call for lead time on repairs)
- **Low \$50 evaluation fee**
Charged only if unit is sent back without being repaired or recalibrated
- **Test data as found/as left**
Included FREE



If you have a lab with the equipment to perform calibrations, our field calibration procedures may be downloaded from piecal.com.

PIE Calibrators are easy to buy

Looking to purchase a PIE Calibrator?

You may buy a calibrator from your local distributor, a national distributor or directly from PIE. Your local distributor may provide you with local support including demonstrating the calibrator at your location, delivery services and training. National distributors may provide you with fast delivery options and may have special pricing setup with your company.

Calibrators ordered directly from piecal.com must be paid for in advance using PayPal. UPS ground is included at no extra charge and expedited shipping is available. Standard delivery from PIE is 1 to 2 weeks. International shipping will be by UPS with the cost calculated by PayPal.



CALIBRATORS



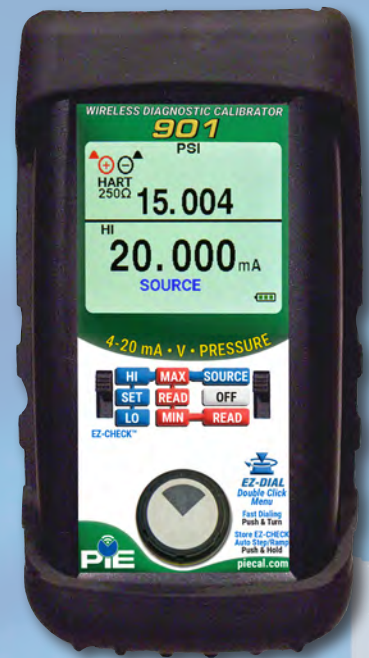
Multifunction



Frequency



Thermocouple
& RTD



Milliamp
& Voltage



Panel Mount

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