

Technical data

1524 Reference Thermometers

Measure, graph and record three sensor types with one tool

Key Features

- High accuracy
- PRTs: up to $\pm 0.011\text{ }^{\circ}\text{C}$
- Thermocouples: up to $\pm 0.24\text{ }^{\circ}\text{C}$
- Precision thermistors: $\pm 0.002\text{ }^{\circ}\text{C}$
- 1524: Two channels; memory for logging 15,000 measurements; real-time clock for time and date stamps



Finally, a reference thermometer as versatile as you are

The 1524 Reference Thermometers from Fluke Calibration measure, graph, and record PRTs, thermocouples, and thermistors. These thermometer readouts deliver high accuracy, wide measurement range, logging, and trending, all in a handheld tool you can take anywhere.

The 1524 lets you handle field applications, laboratory measurements, and data logging with ease. And with the dual channel measurement capabilities of the model 1524, you can do twice the work in half the time.

Make accurate, consistent measurement...anywhere

You need accuracy for compliance, product yields, energy savings, and consistent results. The 1524 uses current reversal, a technique used in high-end instruments that eliminates thermal EMFs, for precision temperature measurements. Specifications are guaranteed from $-10\text{ }^{\circ}\text{C}$ to $60\text{ }^{\circ}\text{C}$ ambient. Special precision resistors and a highly stable reference voltage source keep 1524 accuracy virtually insensitive to environmental temperature.

Product group:

- Electrical
- RF
- **Temperature**
- Humidity
- Pressure
- Flow
- Software

Like all Fluke handheld tools, the 1524 Reference Thermometers endure rigorous testing in temperature extremes and under harsh conditions of vibration, so you can take it with confidence anywhere you need to go. An optional magnetic hanger allows you to hang the thermometer for easy viewing while freeing your hands to focus on the job.

Monitor trends in the lab or in the field

See trends graphically on the 1524 thermometer's 128x64- backlit LCD display. You can change the graph's resolution at the touch of a button. Now it is easy to see when the temperature is stable (without statistics or long delays) or to monitor processes over time to verify correct operation.

Document on demand up to 25 readings and associated statistics for easy retrieval. Statistics include the average, maximum and minimum values, and the standard deviation. View them through the display or by uploading it to a PC via RS-232 connection and 9940 I/O Toolkit software, included free. To monitor and log more data over time, use a PC and optional LogWare II software.

RS-232-to-USB adapters are available for those who prefer USB connectors. Battery power lasts at least 20 hours on three AA batteries, or use the dc power adapter for extended periods of measurement. Power saving features can be enabled or disabled for longer battery life or greater convenience.

INFO-CON connectors ensure correct temperature conversion

Inside the INFO-CON, a memory chip keeps calibration information for the attached probe. Simply plugging in the probe uploads the information to the readout. The connector transfers this information to the 1524 automatically, ensuring the correct temperature conversion for accurate, hassle-free measurements.

Probes may be locked by password to specific channels and readouts for security or for system calibration traceability. Plug any thermocouple with mini-thermocouple jacks into an optional universal thermocouple adapter for convenient measurement. Each thermocouple adapter or standard connector supports reference junction compensation (RJC) with its own internal precision thermistor.

1524 two-channel thermometer



- 1 RS-232 serial interface connector
- 2 Channel 1 sensor connector (PRT, thermocouple, and thermistor)
- 3 Channel 2 sensor connector (PRT, and thermistor)
- 4 External power adapter connection

The 1524 Reference Thermometer helps you do twice the work in half the time. Two channels, three sensor types and high-speed measurement make you more productive and make model 1524 the one reference thermometer you need to own. It has all the features of the 1523, and it's a data logger too. A real-time clock and memory for 15,000 time and date stamped measurements mean everything you are going to need is in this package. Log up to three times per second, or once every hour or other options in between. Download the data to a PC for analysis when you need it.



Specifications

Input channels	2
Resolution	PRTs and thermistors: 0.001° thermocouples: 0.01°
Logging	25 readings with statistics 15,000 time and date stamped
Sample interval (normal)	1 second (simultaneous measurement)
Typical sample interval (fast mode)*	0.3 seconds
Sensor types	PRTs, RTDs, thermistors, and thermocouples
Statistics	Maximum, minimum, average, standard deviation
Trending	Scale: $\pm 10\text{ }^{\circ}\text{C}$ (18 $^{\circ}\text{F}$), $\pm 1\text{ }^{\circ}\text{C}$ (1.8 $^{\circ}\text{F}$), $\pm 0.1\text{ }^{\circ}\text{C}$ (0.18 $^{\circ}\text{F}$), $\pm 0.01\text{ }^{\circ}\text{C}$ (0.018 $^{\circ}\text{F}$), 10 minutes of real-time data
Power requirements	3 AA alkaline batteries, 12 V dc universal power supply
Size (HxWxD)	96 mm x 200 mm x 47 mm (3.75 in x 7.9 in x 1.86 in)
Weight	0.65 kg (1.4 lb)
Computer interface	RS-232, 9940 I/O ToolKit software included
Safety	EN61010-1:2001, CAN/CSA C22.2 No. 61010.1-04
Environmental conditions for best accuracy: 13 $^{\circ}\text{C}$ to 33 $^{\circ}\text{C}$ (55.4 $^{\circ}\text{F}$ to 91.4 $^{\circ}\text{F}$)	
Millivolt range and accuracy	-10 mV to 75 mV, $\pm (0.005\% + 5\text{ }\mu\text{V})$
Internal reference junction compensation	$\pm 0.2\text{ }^{\circ}\text{C}$ ($\pm 0.36\text{ }^{\circ}\text{F}$)
Resistance range and accuracy	0 Ω to 400 Ω $\pm (0.004\% + 0.002\text{ }\Omega)$ 200 Ω to 50 k Ω $\pm (0.01\% + 0.5\text{ }\Omega)$ 50 k Ω to 500 k Ω $\pm (0.03\%)$
Temperature coefficient, voltage: -10 $^{\circ}\text{C}$ to 13 $^{\circ}\text{C}$, +33 $^{\circ}\text{C}$ to 60 $^{\circ}\text{C}$ (14 $^{\circ}\text{F}$ to 55.4 $^{\circ}\text{F}$, 91.4 $^{\circ}\text{F}$ to 140 $^{\circ}\text{F}$)	$\pm (0.001\text{ }^{\circ}\text{C} + 1\text{ mV}/^{\circ}\text{C})$
Temperature coefficient, resistance: -10 $^{\circ}\text{C}$ to 13 $^{\circ}\text{C}$, +33 $^{\circ}\text{C}$ to 60 $^{\circ}\text{C}$ (14 $^{\circ}\text{F}$ to 55.4 $^{\circ}\text{F}$, 91.4 $^{\circ}\text{F}$ to 140 $^{\circ}\text{F}$)	0.0008 $\text{ }^{\circ}\text{C} + 0.0004\text{ }\Omega$ (0 Ω to 400 Ω) 0.002 $\text{ }^{\circ}\text{C} + 0.1\text{ }\Omega$ (0 Ω to 50 k Ω) 0.06 $\text{ }^{\circ}\text{C} + 0.1\text{ }\Omega$ (50 k Ω to 500 k Ω)
Excitation current, resistance	1 mA (0 Ω to 400 Ω) 10 μA (0 Ω to 50 k Ω) 2 μA (50 k Ω to 500 k Ω)

*See technical manual for sample interval details by sensor type and number of inputs.

Equivalent temperature accuracies for selected sensors derived from primary specifications (Ω , mV)

Temperature, thermocouples

Type	Range	Measure accuracies
K	-200 °C to 0 °C (-328 °F to 32 °F)	± 0.61 °C (± 1.10 °F)
	0 °C to 1370 °C (32 °F to 2498 °F)	± 0.24 °C (± 0.43 °F)
R	-20 °C to 0 °C (4 °F to 32 °F)	± 1.09 °C (± 1.96 °F)
	0 °C to 500 °C (32 °F to 932 °F)	± 0.97 °C (± 1.71 °F)
	500 °C to 1750 °C (932 °F to 3182 °F)	± 0.49 °C (± 0.88 °F)
S	-20 °C to 0 °C (4 °F to 32 °F)	± 1.05 °C (± 1.89 °F)
	0 °C to 500 °C (32 °F to 932 °F)	± 0.95 °C (± 1.71 °F)
	500 °C to 1750 °C (932 °F to 3182 °F)	± 0.56 °C (± 1.01 °F)

Accuracies are based on internal reference junction compensation. Refer to technical manual for greatly improved accuracies using external reference junctions.

Accuracies of selected readout/probe combinations ($\pm$ °C)

Temperature	5615-6	5627A-12	5610-9
-200 °C (-328 °F)	0.025	0.027	n/a
0 °C (32 °F)	0.021	0.049	0.009
100 °C (212 °F)	0.028	0.065	0.009
300 °C (572 °F)	0.043	0.103	n/a
420 °C (788 °F)	n/a	0.130	n/a

Includes readout accuracy, probe calibration, and probe drift

Ordering Information

Models	Description
1524 ¹	Reference Thermometer, Handheld, 2 Channel, Data Logger
1524-P2	1524 Bundled with 5628 ² , Universal TC INFO-CON Connector, TPAK, and Case
1524-P3	1524 Bundled with 5627A ² , Universal TC INFO-CON Connector, TPAK, and Case
1524-P4	1524 Bundled with 5615 ² , Universal TC INFO-CON Connector, TPAK, and Case

¹ Requires an optional probe

² 5628, 5627A, and 5615 PRTs include a 17025 accredited calibration and are RoHS compliant

Calibration options	
1929-2	System Verification, PRT with Readout, Accredited
1929-5	System Verification, Thermistor with Readout, Accredited
1930	System Calibration, PRT with Readout, Accredited
1935	System Calibration, Thermistor with Readout, Accredited

Included accessories

NIST traceable certificate of calibration, users guide, CD-ROM (contains technical manual), 12 V dc universal power supply, RS-232 cable, 9940 I/O ToolKit software

Optional accessories

(compatible with most Fluke probes, a few examples shown below)

Models	Description
5610-9-P	Probe, Precision Thermistor, Stainless Steel, 3.18 mm x 228.6 mm (1/8 in x 9 in), 0 °C to 100 °C (32 °F to 212 °F), NIST traceable calibration included
5615-6-P	Probe, PRT, 100 ohm, 4.76 mm x 152.4 mm (3/16 in x 6 in), -200 °C to 300 °C (-328 °F to 572 °F), 17025 accredited calibration included
5609-9BND-P	Probe, PRT, 25 ohm, 6.35 mm x 305 mm (1/4 in x 12 in), 90° bend at 9 inches, -200 °C to 660 °C (-328 °F to 1220 °F), Requires Calibration (i.e. 1924-4-7)
9935-S	Software, LogWare II, Single User
1523-CASE	1524 Accredited Calibration
TPAK	TPAK, Meter Hanging Kit
2373-LPRT	Adapter, Lemo to Mini Grabbers (4-wire)
2373-LTC	Adapter, Lemo to Universal TC (TC)
2384-P	INFO-CON Connector, PRT (Gray Cap), Spare
2384-T	INFO-CON Connector, TC (Blue Cap), Spare

Recommended accessories



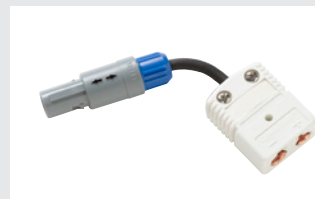
Calibrated Temperature Sensors



TPAK Meter Hanging Kit



Probe and Readout Case



Universal Thermocouple Adapter



Universal RTD Adapter

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