Tweener Thermometer Readouts



- Two Tweeners to choose from—reading PRTs or thermistors
- Battery packs available
- Best price/performance package

One of Hart's best-selling products is the Tweener thermometer, and there's a reason. No other company, not one, has a thermometer that comes close to the performance and features of the Tweener for anywhere near its price.

1502A Tweener PRT Readout

The 1502A Tweener features accuracy up to ±0.006 °C (the 1504 is even more accurate, up to ±0.002 °C). In addition, it reads 100-ohm, 25-ohm, and 10-ohm probes, has a resolution of 0.001 °C across its entire range, and is the smallest unit in its class. It also has an optional battery pack for completely portable operation.

Each Tweener is programmable to match a probe's constants for maximum linearity and accuracy. All probe constants and coefficients are programmed through simple, front-panel keystrokes. Temperature is displayed in °C, °F, K, or resistance in ohms.

The 1502A accurately measures the resistance of the probe and then converts the resistance to a temperature value using its built-in algorithms.

For convenience, the 1502A reads the common industrial grade IEC-751 or "385" ALPHA RTD without any programming. Enter the actual R0 and ALPHA of the individual probe for increased accuracy. For maximum accuracy, use the ITS-90 formulas. The Tweener accepts the subranges 4 and 6 through 11.

ITS-90 formulas reside in the Tweener's firmware. If your probe has been calibrated for any of the above subranges of the ITS-90, you simply enter the coefficients directly into your Tweener.

Each thermometer comes complete with an RS-232 interface for automation of temperature data collection, calibrations, or process control functions. An IEEE-488 interface is available as an option.

The 1502A is calibrated digitally using the front-panel buttons. You never have to open the box to calibrate it. This calibration protocol further reduces the cost of the 1502A. It goes where you go and works the way you want it to.

1504 Tweener Thermistor Readout

If you need more accuracy in a limited temperature range, the Model 1504 Tweener gives it to you as a thermistor readout. Thermistors are less fragile than PRTs and less likely to be impacted by mechanical shock. Thermistors are more sensitive to temperature, have faster response times, and come in many shapes for different applications.

Typical accuracy of a 1504 is ±0.002 °C with a resolution of 0.0001 °C.

Software

With our 9934 Log*Ware,* both Tweener models may be used for real-time data acquisition. Collect data and analyze it graphically or statistically. Additionally, Tweeners may be used as reference thermometers with our MET/TEMP II software.

Battery option

If you want freedom from AC power in the field or on the plant floor, order Model 2502 and we'll install a DC power board in your Tweener. Then you can connect your own 12-volt DC power or order Hart's 9313 Battery Pack. Our battery gives you three to eight hours between charges. It includes a charger and a nylon pouch with a belt clip.

Calibration choices

Each Tweener and its accompanying probe (sold separately) have their own individual calibration reports. Overall system error can be calculated from the individual errors, rendering the added cost of system data unnecessary. However, for those requiring it, system data is available at two or more temperatures of your choice.



The thermistor version of the "Tweener" gives you more variety in sensor configurations and even higher accuracy over a limited temperature range.

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Tweener Thermometer Readouts

FLUKE®
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Specifications	1502A	1504
Temperature Range†	–200 °C to 962 °C (–328 °F to 1764 °F)	Any thermistor range
Resistance Range	0Ω to 400Ω, auto-ranging	0Ω to 1 MΩ, auto-ranging
Probe	Nominal R_{TPW}: 10Ω to 100Ω RTD, PRT, or SPRT	Thermistors
Characterizations	ITS-90 subranges 4, 6, 7, 8, 9, 10, and 11 IPTS-68: R_0, α, δ, a_4, and c_4 Callendar-Van Dusen: R_0, α, δ, and β	Steinhart-Hart thermistor polynomial Callendar-Van Dusen: R_0, α, δ, and β
Resistance Accuracy (ppm of reading)	0Ω to 20Ω: 0.0005Ω 20Ω to 400Ω: 25 ppm	0Ω to 5 KΩ: 0.5Ω 5 KΩ to 200 KΩ: 100 ppm 200 KΩ to 1 MΩ: 300 ppm
Temperature Accuracy†	±0.004 °C at –100 °C ±0.006 °C at 0 °C ±0.009 °C at 100 °C ±0.012 °C at 200 °C ±0.018 °C at 400 °C ±0.024 °C at 600 °C	±0.002 °C at 0 °C ±0.002 °C at 25 °C ±0.004 °C at 50 °C ±0.010 °C at 75 °C ±0.020 °C at 100 °C (Using 10 KΩ thermistor sensor, α=0.04. Does not include probe uncertainty or characterization errors.)
Operating Temperature Range	16 °C to 30 °C	13 °C to 33 °C
Resistance Resolution	0Ω to 20Ω: 0.0001Ω 20Ω to 400Ω: 0.001Ω	0Ω to 10 KΩ: 0.01Ω 10 KΩ to 100 KΩ: 0.1Ω 100 KΩ to 1 MΩ: 1Ω
Temperature Resolution	0.001 °C	0.0001 °C
Excitation Current	0.5 and 1 mA, user selectable, 2 Hz	2 and 10 µA, automatically selected
Measurement Period	1 second	
Digital Filter	Exponential, 0 to 60 seconds time constant (user selectable)	
Probe Connection	4-wire with shield, 5-pin DIN connector	
Communications	RS-232 serial standard IEEE-488 (GPIB) optional	
Display	8-digit, 7-segment, yellow-green LED; 0.5-inch-high characters	
Power	115 VAC (±10 %), 50/60 Hz, 1 A, nominal 230 VAC (±10 %), 50/60 Hz, 1 A, nominal, specify	
Size (HxWxD)	61 x 143 x 181mm (2.4 x 5.6 x 7.1 in)	
Weight	1.0 kg (2.2 lb.)	
Calibration	Accredited NIST-traceable calibration provided	

†Temperature ranges and accuracy may be limited by the sensor you use.

Ordering Information

1502A	Tweener PRT Readout
1504	Tweener Thermistor Readout
2502	DC Power Option
2505	Spare Connector
2506	IEEE Option
2507	Mini-Printer
2508	Serial Cable Kit
9934-S	Log*Ware,* Single Channel, Single User
9934-M	Log*Ware,* Single Channel, Multi User
9313	Battery Pack
9301	Carrying Case, fits Tweener and 12 in probe
1935	System Cal Report, Thermistors
1930	System Cal Report, PRT

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