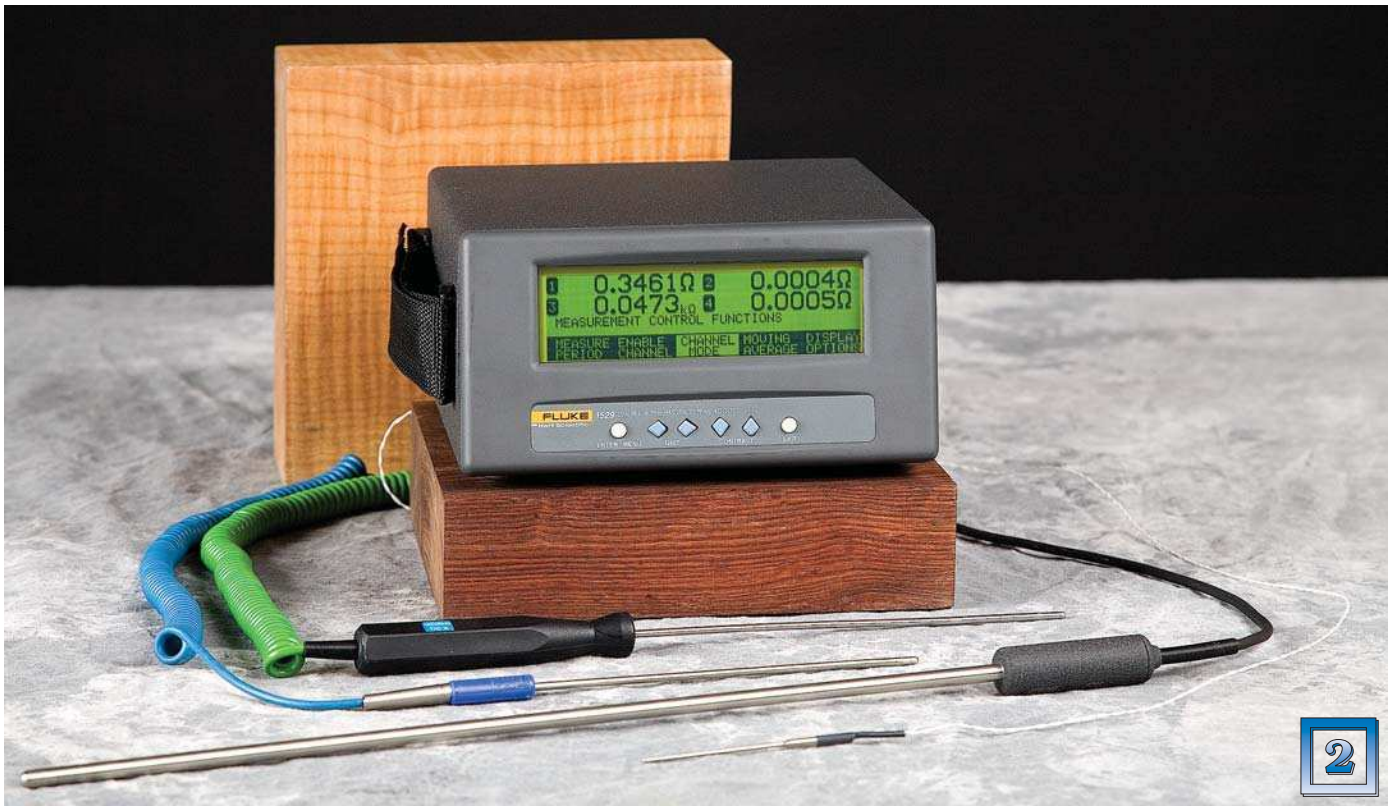
Chub-E4 Thermometer Readout



- Four channels for PRTs, thermistors, and thermocouples
- Displays eight user-selected data fields from any channel
- Logs up to 8,000 readings with date and time stamps
- Battery provides eight hours of continuous operation

So you need multiple channels, battery power, outstanding accuracy, and the ability to read many different sensor types—but you don't need all the power of a 1 ppm Super-Thermometer. We have the answer for you.

Hart's 1529 Chub-E4 Thermometer gives you four channels, three major sensor types, lab-quality accuracy, and a ton of great features, all at a price you'll love.

Inputs

The Chub-E4 has four inputs for reading four different sensors simultaneously, and we'll configure those inputs in any of three different ways according to your preference. Choose four channels of thermocouple inputs, four channels of PRT/thermistor inputs, or two channels of each. With this thermometer, reading thermocouples, PRTs, and thermistors accurately from the same device is no problem.

100-ohm, 25-ohm, or 10-ohm PRTs and RTDs are read using ITS-90, IEC-751 (DIN), or Callendar-Van Dusen conversion methods. Typical accuracies include ±0.004 °C at −100 °C and ±0.009 °C at 100 °C. Thermistor readings are converted using the Steinhart-Hart polynomial or standard YSI-400 curve and are as accurate as ±0.0025 °C at 25 °C with resolution of 0.0001 °.

Thermocouple inputs read all the common thermocouple types, including B, E, J, K, N, R, S, T, and Au-Pt, and allow you to choose between internal and external reference junction compensation. Typical accuracy for a type J thermocouple at 600 °C is ±0.35 °C using internal reference junction compensation and not including the thermocouple. (Support for C and U type thermocouples is available. Download the application note *Using Hart Readouts with Tungsten-Rhenium and other Thermocouples* from www.hartscientific.com.)

PRTs and thermistors connect easily to the 1529 using Hart's patented mini DWF connectors, which accept bare wire, spade lug, or mini banana plug terminations. Thermocouples connect using standard or miniature terminations. Measurements are taken each second and can be taken simultaneously or sequentially. A special high-speed mode allows measurements on one channel to be taken at the rate of 10 per second.

Display

If you think three sensor types and four inputs sounds versatile, wait until you see the display panel on the Chub-E4. Displaying measurements in °C, °F, K, ohms, or millivolts and choosing temperature resolution from 0.01 to 0.0001 are just the beginning.

You can also select any eight items from our long list of displayable data fields to view on-screen. Choose statistical functions such as averages, standard deviations, and spreads; choose probe information such as probe type and serial number; choose T1–T2 functions using inputs from any two channels; or choose utility functions such as the date, time, and battery power level. You can even save up to 10 screen configurations for easy recall.

The push of a single front-panel button also brings up a simple menu system to easily guide you through all the internal setup and memory options of the 1529. Probe coefficients, sample intervals, communication settings, password

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settings, and a host of other functions are all easily accessible.

Communications

The memory and communications capabilities of the Chub-E4 make it perfect for benchtop thermometry, on-site measurements, lab calibration work, and remote data logging. Optional software packages from Hart make this one of the most powerful thermometers on the market.

With battery power and memory to store up to 8,000 measurements (including date and time stamps) at user-selected intervals, the 1529 has plenty of data logging capability. Store 100 individual measurements or any number of automatic log sessions (up to 8,000 readings), each tagged with an identifying session label. Fourteen different logging intervals may be selected, from 0.1 second to 60 minutes.

With Hart's 9935 Log*Ware* II (page 87), data may be quickly downloaded to your PC for complete graphical and statistical analysis. Separate log sessions may even be automatically downloaded to separate files based on session labels. With this software, the 1529 can even be used for real-time data logging. Log four channels at once directly to your PC with virtually no limit to the number of data points you take. You can analyze data, set alarm events, and even set delayed start and stop times.

With MET/TEMP II software, the Chub-E4 may be integrated into a completely automated calibration system. Use one input for your reference thermometer and calibrate up to three other thermometers automatically (see page 83). An RS-232 port is standard on every unit. An IEEE-488 port is optional.

More great features

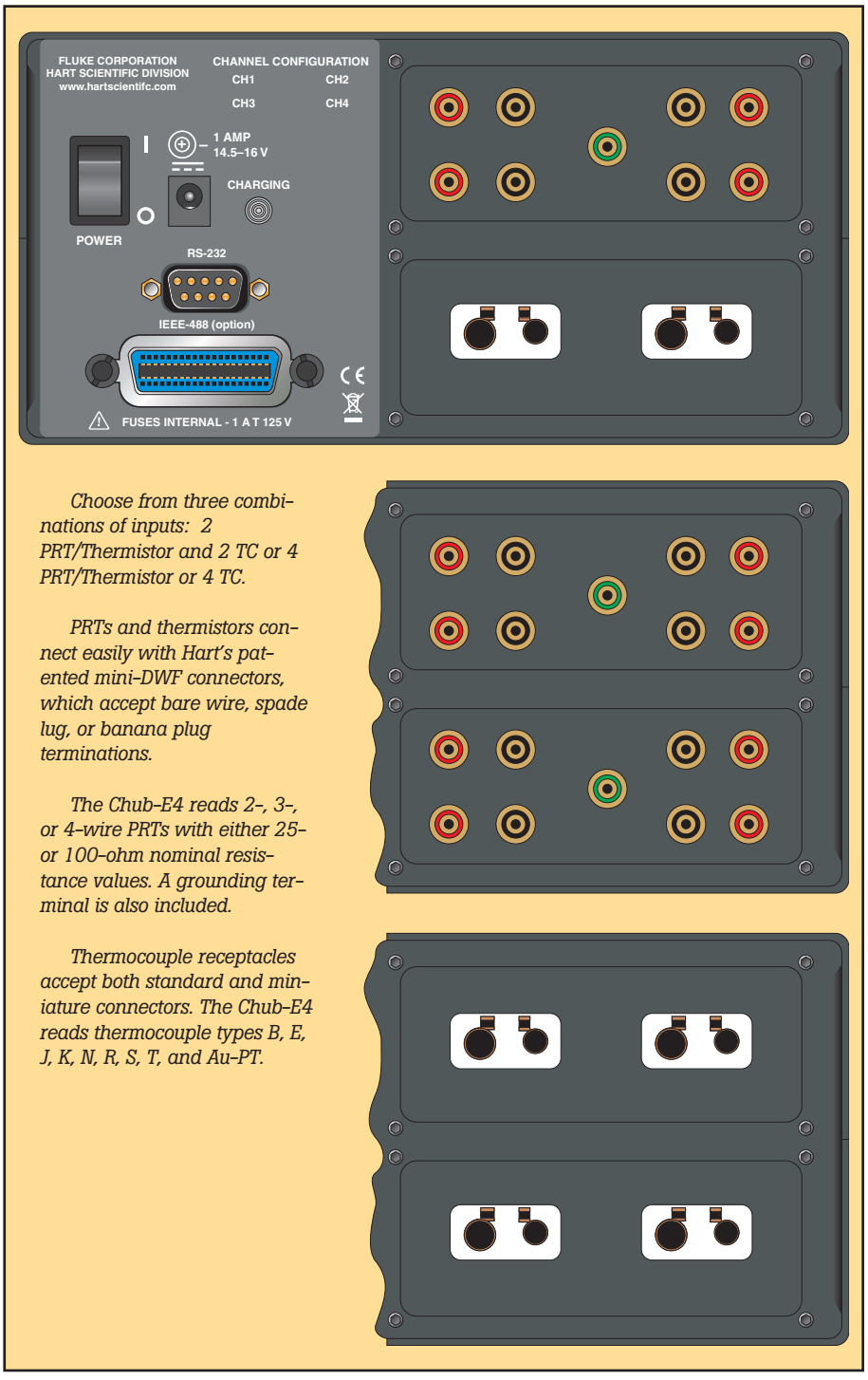
Did we forget some aspect of versatility on this thermometer? No!

The 1529 runs on AC power from 100 to 240 volts, DC power from 12 to 16 volts, or off its internal nickel-metal-hydride battery for eight hours between charging. The standard battery charges in less than three hours and lasts through 500 charge/recharge cycles.

If you want to rack-mount your Chub-E4, we've even got a rack-mount kit for you. This unit fits on your benchtop, in your instrument rack, and even in your hand.

Of course, all the reference thermometers you might need for your 1529 are available from Hart, including secondary standard PRTs, standard thermistors, and noble-metal thermocouples. Carrying cases and even a serial printer for direct printer output are also available.

We've said it before and we'll keep saying it: Hart Scientific simply makes the best thermometer readouts in the world. No one else gives you a comparable combination of accuracy, versatility, productivity-enhancing features, and price. No one. Get a Chub-E4 and just enjoy everything it'll do for you. You'll love it.



Choose from three combinations of inputs: 2 PRT/Thermistor and 2 TC or 4 PRT/Thermistor or 4 TC.

PRTs and thermistors connect easily with Hart's patented mini-DWF connectors, which accept bare wire, spade lug, or banana plug terminations.

The Chub-E4 reads 2-, 3-, or 4-wire PRTs with either 25- or 100-ohm nominal resistance values. A grounding terminal is also included.

Thermocouple receptacles accept both standard and miniature connectors. The Chub-E4 reads thermocouple types B, E, J, K, N, R, S, T, and Au-PT.

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Specifications	PRT / RTD	Thermistor	Thermocouple
Inputs	2 channels PRT/thermistor and 2 channels TC, or 4 channels PRT/thermistor, or 4 channels TC, specify when ordering; PRT/thermistor channels accept 2, 3, or 4 wires; TC inputs accept B, E, J, K, N, R, S, T, and Au-Pt TC types. (Support for C and U type thermocouples is available. Download the application note *Using Hart Readouts with Tungsten-Rhenium and other Thermocouples* from www.hartscientific.com.)		
Temperature Range	–189 °C to 960 °C	–50 °C to 150 °C	–270 °C to 1800 °C
Measurement Range	0 to 400 Ω	0 to 500 KΩ	–10 to 100 mV
Characterizations	ITS-90, IEC-751 (DIN "385"), Callendar-Van Dusen	Steinhart-Hart, YSI-400	NIST Monograph 175, 3-point deviation function applied to NIST 175, 6th-order polynomial
Temperature Accuracy (meter only)	±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	±0.0025 °C at 0 °C ±0.0025 °C at 25 °C ±0.004 °C at 50 °C ±0.010 °C at 75 °C ±0.025 °C at 100 °C	Ext. RJC / Int. RJC B at 1000 °C ±0.6 °C / ±0.6 °C E at 600 °C ±0.07 °C / ±0.25 °C J at 600 °C ±0.1 °C / ±0.35 °C K at 600 °C ±0.15 °C / ±0.4 °C N at 600 °C ±0.15 °C / ±0.3 °C R at 1000 °C ±0.4 °C / ±0.5 °C S at 1000 °C ±0.5 °C / ±0.6 °C T at 200 °C ±0.1 °C / ±0.3 °C
Temperature Resolution	0.001 °	0.0001 °	0.01 to 0.001 °
Resistance/Voltage Accuracy	0Ω to 20Ω: ±0.0005Ω 20Ω to 400Ω: ±25 ppm of rdg.	0Ω to 5 KΩ: ±0.5Ω 5 KΩ to 200 KΩ: ±100 ppm of rdg. 200 KΩ to 500 KΩ ±300 ppm of rdg.	–10 to 50 mV: ±0.005 mV 50 to 100 mV: ±100 ppm of rdg. (Internal RJC: ±0.25 °C)
Operating Range	16 °C to 30 °C		
Measurement Interval	0.1 second to 1 hour; inputs may be read sequentially or simultaneously at 1 second or greater interval		
Excitation Current	1 mA, reversing	2 and 10 µA, automatically selected	n/a
Display	33 x 127 mm (1.3 x 5 in) backlit LCD graphical display		
Display Units	°C, °F, K, Ω, KΩ, mV		
Data Logging	Up to 8,000 time- and date-stamped measurements can be logged		
Logging Intervals	0.1, 0.2, 0.5, 1, 2, 5, 10, 30, or 60 seconds; 2, 5, 10, 30, or 60 minutes		
Averaging	Moving average of most recent 2 to 10 readings, user selectable		
Probe Connection	Patented DWF Connectors accept mini spade lug, bare-wire, or mini banana plug terminations		Universal receptacle accepts miniature and standard TC connectors
Communications	RS-232 included, IEEE-488 (GPIB) optional		
AC Power	100–240 VAC, 50–60 Hz, 0.4 A		
DC Power	12–16 VDC, 0.5 A (battery charges during operation from 14.5 to 16V DC, 1.0A)		
Battery	NiMH, 8 hours of operation typical without backlight, 3 hours to charge, 500 cycles		
Size (HxWxD)	102 x 191 x 208 mm (4.0 x 7.5 x 8.2 in)		
Weight	2 kg (4.5 lb.)		
Probes from Hart	See pages 60 to 80		
Calibration	Accredited NIST-traceable resistance calibration and NIST-traceable voltage calibration provided		

Ordering Information

1529	Chub-E4 Thermometer, 2 TC and 2 PRT/Thermistor inputs
1529-R	Chub-E4 Thermometer, 4 PRT/Thermistor inputs
1529-T	Chub-E4 Thermometer, 4 TC inputs
2506-1529	IEEE Option
9322	Rugged Carrying Case, holds 1529 and four probes up to 12" long
9323	Soft Carrying Case
2513-1529	Rack-Mount Kit
9935-S	Log*Ware* II, Multi Channel, Single User
9935-M	Log*Ware* II, Multi Channel, Multi User
2375	Thermal Serial Printer, with paper, AC adapter, cable, battery pack
2362	Spare AC Adapter, 15 V