

Chub-E4 Standards Thermometer



Feature Summary

- 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

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		
Temperature Range	-189 to 960°C	-50 to 150°C	-270 to 1800°C
Measurement Range	0 to 400 Ω	0 to 500 K Ω	-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)	$\pm 0.004^{\circ}\text{C}$ at -100°C $\pm 0.006^{\circ}\text{C}$ at 0°C $\pm 0.009^{\circ}\text{C}$ at 100°C $\pm 0.012^{\circ}\text{C}$ at 200°C $\pm 0.018^{\circ}\text{C}$ at 400°C $\pm 0.024^{\circ}\text{C}$ at 600°C	$\pm 0.0025^{\circ}\text{C}$ at 0°C $\pm 0.0025^{\circ}\text{C}$ at 25°C $\pm 0.004^{\circ}\text{C}$ at 50°C $\pm 0.010^{\circ}\text{C}$ at 75°C $\pm 0.025^{\circ}\text{C}$ at 100°C	<div>Ext. RJC Int. RJC</div> <div>B at</div> 1000°C $\pm 0.6^{\circ}\text{C}$ $\pm 0.6^{\circ}\text{C}$ <div>E at</div> 600°C $\pm 0.07^{\circ}\text{C}$ $\pm 0.25^{\circ}\text{C}$ <div>J at</div> 600°C $\pm 0.1^{\circ}\text{C}$ $\pm 0.35^{\circ}\text{C}$ <div>K at</div> 600°C $\pm 0.15^{\circ}\text{C}$ $\pm 0.4^{\circ}\text{C}$ <div>N at</div> 600°C $\pm 0.15^{\circ}\text{C}$ $\pm 0.3^{\circ}\text{C}$ <div>R at</div> 1000°C $\pm 0.4^{\circ}\text{C}$ $\pm 0.5^{\circ}\text{C}$ <div>S at</div> 1000°C $\pm 0.5^{\circ}\text{C}$ $\pm 0.6^{\circ}\text{C}$ <div>T at</div> 200°C $\pm 0.1^{\circ}\text{C}$ $\pm 0.3^{\circ}\text{C}$
Temperature Resolution	0.001°	0.0001°	0.01 to 0.001°
Resistance / Voltage Accuracy	0 to $20\ \Omega$: $\pm 0.0005\ \Omega$ 20 to $400\ \Omega$: ± 25 ppm of rdg.	0 to $5\ \text{K}\Omega$: $\pm 0.5\ \Omega$ 5 to $200\ \text{K}\Omega$: ± 100 ppm of rdg. 200 to $500\ \text{K}\Omega$: ± 300 ppm of rdg.	-10 to $50\ \text{mV}$: $\pm 0.005\ \text{mV}$ 50 to $100\ \text{mV}$: ± 100 ppm of rdg. (Internal RJC: $\pm 0.25^{\circ}\text{C}$)
Operating Range	16 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	$1\ \text{mA}$	2 and $10\ \mu\text{A}$, automatically selected	n/a

Display	1.3" x 5" backlit LCD graphical display	
Display Units	°C, °F, K, Ω , $K\Omega$, 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 spade lug, bare-wire, or banana plug terminations	Universal receptacle accepts miniature and standard connectors
Communications	RS-232 and IR ports included, IEEE-488 (GPIB) optional	
AC Power	100 to 240V AC, 50-60 Hz, 0.4A	
DC Power	12 to 16V DC, 0.5A (battery charges during operation from 14.5 to 16V DC, 1.0A)	
Battery	NiMH, 8 hours operation typical without backlight, 3 hours to charge, 500 cycles	
Size	4.0" H x 7.5" W x 8.2" D (102 x 191 x 208 mm)	
Weight	4.5 lbs. (2 kg)	
Probes from Hart	Contact Hart for a wide variety of precision PRTs, thermistors, and thermocouples	
Calibration	NIST-traceable resistance certificate and NIST-traceable voltage certificate provided	

So you need multiple channels, battery power, outstanding accuracy, and the ability to read PRTs, thermistors, and thermocouples. Well, here's your answer.

Hart's new Model 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. 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 or 25-ohm PRTs (with two, three, or four wires) are read using ITS-90, IEC-751 (DIN), or Callendar-Van Dusen conversion methods. Typical accuracies include $\pm 0.006^{\circ}\text{C}$ at temperatures below 0°C and $\pm 0.009^{\circ}\text{C}$ at 100°C . Thermistor readings are converted using the Steinhart-Hart polynomial or standard YSI-400 curve and are as accurate as $\pm 0.0025^{\circ}\text{C}$ at 25°C with four-digit resolution.

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 using internal reference junction compensation at 600°C is $\pm 0.35^{\circ}\text{C}$, not including the thermocouple.

PRTs and thermistors connect easily to the 1529 using Hart's patented mini-DWF connectors, which accept bare-wire, spade lug, or miniature banana plug terminations. Thermocouples connect using standard or miniature terminations. Measurements are made each second and can be taken simultaneously or sequentially. A special high-speed mode allows measurements 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 $^{\circ}\text{C}$, $^{\circ}\text{F}$, K, ohms, or millivolts and choosing temperature resolution from 1 to 0.0001 are just the beginning.

You can also select any eight 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 logging status. You can even save a number of screen configurations for easy recall.

The push of a front-panel button also brings up a simple menu system to easily guide you through the set-up and memory options of the 1529. Probe coefficients, sample intervals, communication settings, password 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), the 1529 has plenty of data logging capability. Store 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 Model 9935 LogWare II, data may be quickly downloaded to your PC for complete graphical and statistical analysis. Separate log sessions may 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 Calibrate-it 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. An RS-232 port is standard on every unit and an IEEE-488 port is optional.

More Great Features

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 up to 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, or in your hand.

Of course all the reference probes 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 makes the best thermometer readouts in the world. No one else gives you a comparable combination of accuracy, versatility, productivity enhancing features, and price.

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