



Thermocouple Data Logger

Spectrum 1700



Palm-sized & Self-Powered Convenience

Spectrum SP-1700 Thermocouple temperature data loggers are accurate and easy to use recorders designed for a broad range of industrial temperature measurement applications.

Compact and efficient alternatives to chart recorders and bulky data acquisition systems, SP-1700 loggers are fully compatible with any type J, K, T, E, R and S thermocouple probe. Equipped with a ten-year lithium battery and an internal non-volatile memory, each logger features multi-year data capacity and full-range cold-junction temperature compensation. Available in both narrow and wide range versions, they provide reliable and high accuracy temperature monitoring from -240°C to 1760°C .

Ease-of-Operation

Simple to set up and use, SP-1700 data loggers require no programming or complicated equations. To operate, simply select a thermocouple type, make your connections to the terminal block, and begin recording. The recorders are completely self-contained and self-powered, eliminating the need for bulky transmitters, signal conditioners or external power sources, making them a convenient choice for remote in-field applications.

- Single & multi-input data logger models record temperature from -240°C to 1760°C
- Use a Palm PDA for convenient data collection
- User-configurable data logger inputs accept type J, K, T, E, R and S thermocouples
- Automatic cold junction temperature compensation for accurate & reliable readings
- Completely self-contained with internal memory and ten-year battery

Applications

- Concrete Curing Process Monitoring
- Process Verification / Troubleshooting
- Cryogenic / IQF freezers
- Oven / High Temperature Process Profiling
- Hazardous Air Pollutant (HAP) ovens
- ISO 9000 Quality / HACCP compliance

Simple yet Powerful Software

Spectrum Software makes it easy to work with your Spectrum 1700 loggers. With just a few keystrokes, you can create outstanding graphic and tabular representations of your data, overlay graphs from different loggers and export files to your favorite programs. For in-field data collection, such as concrete monitoring, use a **Palm PDA** to view **Real-Time Readings** and download multiple loggers.

For more advanced applications, the Spectrum Application Program Interface (API) makes it simple to write custom software to communicate with your data loggers. This allows you to easily merge the Spectrum recording system into your existing operations, procedures and programs.





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SPECIFICATIONS

General

Size

2.8 x 2.1 x 0.7" (71x53x18mm); 60g (2.2 oz)

Operating Range

-40 to 85° C (-40 to 185° F) & 0-95% RH

Interfaces

RS-232 serial port; half-duplex; 19,200 baud.

Mounting

Magnetic strips; velcro optional

PC Software

Designed for use with Veriteq Software (see bottom of pg. 4 for options). Windows operating system required; Win95, 98, ME, 2000, NT 4.0 or XP.

Clock

Accuracy: +/- 1 min./month at 0 to 50° C.

Electromagnetic Interference

Meets FCC Part 15 for digital devices; meets CE requirements for radiated emissions, electrostatic discharge, & radiated susceptibility.



Power Source

Internal lithium battery with life of 10 years at 1 min. sampling rate.

System Operation

SP-1700 Thermocouple data loggers record low-level millivolt thermocouple signals. The system automatically processes these signals and references them to the logger's on-board cold junction temperature sensor to produce accurate temperature readings.

Two types of SP-1700 loggers are available: The narrow range "N" series provides high precision and exceptional low-temperature performance; the wide range "W" series provides a broader temperature measurement range ideal for high temperature applications.

The following two charts detail the input specifications, measurement ranges, and rated accuracies of these two series of units.

Data Logger Inputs

SP-1700 Series	SP-1700 Models	No. of Channels			Thermocouple Channels					1CJT	
		Total	1CJT	Thermocouple	Input Range	Resolution	Accuracy	Compatible Thermocouples	Input Impedance	Range	Accuracy
Narrow Range	SP-1700-21N	2	1	1	-7.2 to 7.8 mV	4µV	+/- 14µV @ 25°C	J, K, T, E, R & S	10M ohms	-40 to 85°C	+/- 0.25°C @ 25°C
	SP-1700-31N	3	1	2							
	SP-1700-51N	5	1	4							
Wide Range	SP-1700-21W	2	1	1	-4.6 to 55.4 mV	16µV	+/- 55µV @ 25°C	J, K, T, E, R & S	10M ohms	-40 to 85°C	+/- 0.25°C @ 25°C
	SP-1700-31W	3	1	2							
	SP-1700-51W	5	1	4							

1. One channel on each model provided for Cold Junction Temperature (CJT) reference using on-board precision thermistor

Temperature Accuracy

Thermocouple Type	K	J	T	E	R	S
Temperature Measurement Range (°C)	-220 to 210	-130 to 160	-240 to 190	-110 to 140	-50 to 790	-50 to 850
	-100 to 1370	-50 to 900	-100 to 350	-50 to 740	-50 to 1760	-50 to 1700
Instrument Temperature Accuracy @mid-range (°C)	0.36	0.28	0.40	0.24	1.4	1.5
	1.3	1.0	1.2	0.70	4.4	5.1
Resolution @mid-range (°C)	0.10	0.08	0.11	0.07	0.40	0.43
	0.37	0.29	0.34	0.20	1.3	1.5

Legend:

SP-1700 Narrow Range Models in unshaded cells

SP-1700 Wide Range Models in shaded cells

1. Instrument accuracy excludes probe errors and probe temperature range limitations.
2. Range & accuracy based on 25°C cold junction reference temperature. Contact Veriteq for accuracy & measurement range data at other CJT reference points.
3. Voltage to temperature conversion based on NIST ITS-90 polynomial coefficients.



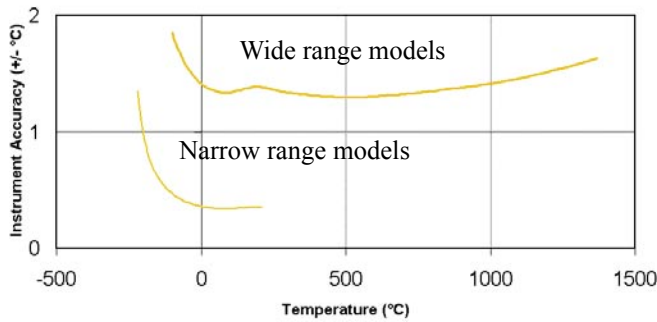
Thermocouple Accuracy Graphs

The following graphs detail the accuracy of the Spectrum 1700 for different thermocouple types over the rated thermocouple measurement range.

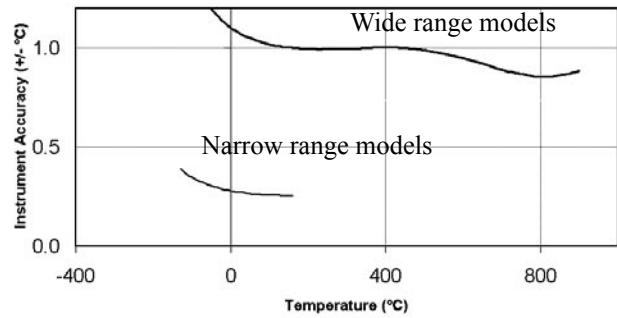
Each graph includes data for SP-1700 Wide range ("W") models (top line in each graph) and Narrow range ("N") models.

Instrument accuracy is based on a 25° C cold junction temperature. Probe errors and probe temperature range limitations are excluded.

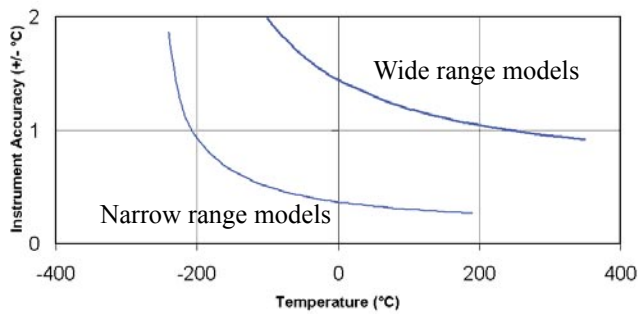
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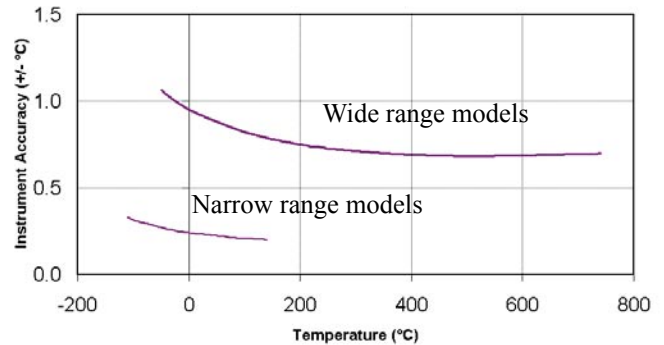
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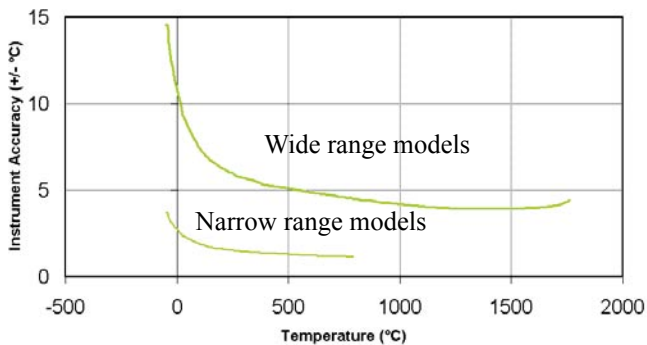
Type T



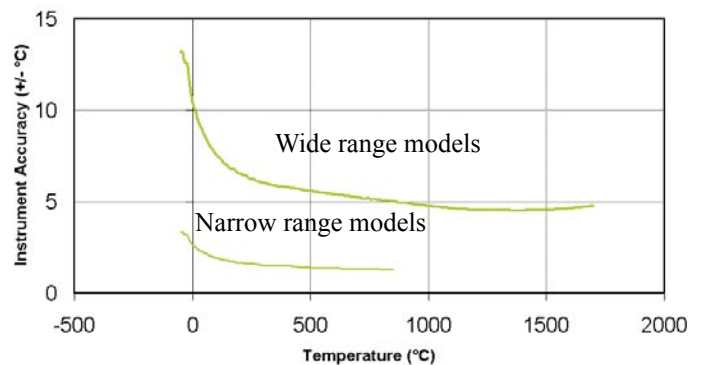
Type E



Type R



Type S

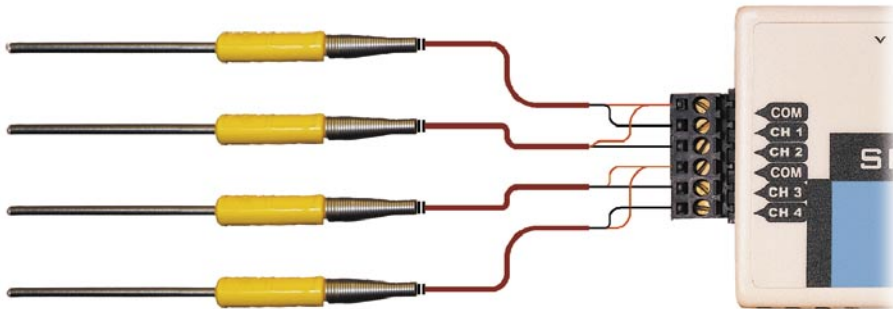




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Connection Diagram



Connect up to four thermocouple probes using the SP-1700-51N or 51W models.

Memory

Memory Type

Non-volatile 105K x 8 EEPROM

Data Sample Capacity

70,000 12-bit samples

Memory Modes

User-selectable: Wrap when memory full, or Stop when memory full.

Memory Protection

Data retention >20 years backup w/o power.

Sampling Rates

User-selectable (in intervals of 10 seconds) from once every 10 seconds to once a day.

Recording span

Recording span depends on sample interval selected & number of channels enabled. Adjacent chart details typical sampling rates & length of time logger will retain data in memory before wrapping around or stopping (see Memory Modes).

Sample Interval	Recording Span			
	2 channels	3 channels	4 channels	5 channels
10 seconds	4.1 days	2.7 days	2.0 days	1.6 days
1 minute	24.3 days	16.2 days	12.1 days	9.7 days
15 minutes	1.0 year	8.1 months	6.1 months	4.9 months
1 hour	4.0 years	2.6 years	2.0 years	1.6 years

Channel count is based on the number of thermocouple inputs enabled plus one channel for cold junction temperature (CJT)

Ordering Guide

MODEL	DESCRIPTION
Narrow Range Thermocouple Loggers (-220 to + 210 °C)	
SP-1700-21N	One Input - One thermocouple input plus cold junction temperature
SP-1700-31N	Two Inputs - Two thermocouple inputs plus cold junction temperature
SP-1700-51N	Four Inputs - Four thermocouple inputs plus cold junction temperature
Wide Range Thermocouple Loggers (-100 to + 1760 °C)	
SP-1700-21W	One Input - One thermocouple input plus cold junction temperature
SP-1700-31W	Two Inputs - Two thermocouple inputs plus cold junction temperature
SP-1700-51W	Four Inputs - Four thermocouple inputs plus cold junction temperature
SOFTWARE (required)	
PC-SFW-IC	Spectrum Software with PC interface cable. (required with initial purchase)
SOFTWARE (optional)	
PLM-SFW-IC	Palm software and cable (specify Palm PDA model #)
PC-SFW-API	Software API for direct logger interface from other Windows programs
EXCELADD-IN	FREE download from website allows users to work within Microsoft Excel

Guarantee / Warranty

30-day return guarantee; 2 year limited warranty.

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VERITEQ
Compact Precision Data Loggers