Технические характеристики на программируемый передатчик температуры Moore Industries SPT

SPT

Site-Programmable, Isolated
Temperature Transmitter

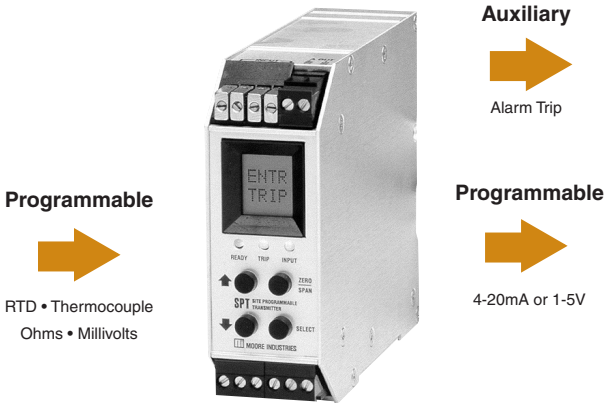
Description

Moore Industries' SPT Site-Programmable Transmitter is an advanced signal conditioner that packs exceptional flexibility, accuracy, and ease-of-use into a compact, universally mountable DIN-style housing.

Accepting T/C, RTD, millivolt, or ohms input in a host of ranges, sensor types, and connection schemes, the SPT provides isolated, process-ready output. Just flick a switch to choose 4-20mA or 1-5V.

Field-selectable input and output, Smart-Ranging, power auto-sensing, and DIN-style packaging that mounts on either G-type or Top Hat rail makes the SPT an ideal "plant standard," and a "universal spare" for all your temperature sensing applications.

Forget Complex, Expensive, and Time-consuming Configurators and Calibrators—SPT setup and calibration is as simple as pushing a button. Its large, LCD screen leads the user through a simple menu system with all programming options spelled out in "plain-English." All settings are stored in the unit's non-volatile memory, protected from power loss or unauthorized changes. Parameters can be viewed at any time without affecting unit operation.



Certifications

Factory Mutual Research Corporation (FMRC)
Non-Incendive – Class I, Division 2, Groups A, B, C, D
Suitable For: Class II, Division 2; Class III, Divisions 1 & 2

Canadian Standards Association (CSA)
General (Ordinary) Location – ***NTRL/C***

CE Conformant – EMC Directive 2004/108/EC EN61326
Low Voltage Directive 2006/95/EC EN61010

Setting a new standard in flexibility *and ease of use, the SPT Site-Programmable Transmitter installs on G-type and Top Hat DIN rails, and programs with the touch of a button.*

Features

- **Fast and Easy to Configure and Calibrate.** No tools, no calibrators, no configurators, no protocols—With the SPT you get the power, accuracy, and flexibility of digital technology without any cumbersome or expensive add-on equipment.
- **Programmable Input, Range, and Configuration.** The SPT accepts input from all common ISA T/C's and 2-, 3-, or 4-wire RTD's, as well as direct input for ohm or millivolt sources. There are menu selections for output based on a single sensor, the average of multiple sensors, and dual sensor differentials.
- **Programmable Output and Display.** Easy-access controls provide a simple means of changing from 4-20mA (source or sink) to 1-5V (consult the factory for other ranges). The intuitive menu display choices for linearized or non-linearized, proportional output, and precise, "real-time" display of input in either °C or °F.
- **Worldwide Power "Auto-Sensing."** The SPT automatically accepts every common ac and dc power input, from 22-300Vdc or 90-260Vac. There are no jumpers or switches to set. Just plug it in and go.

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Specifications

Performance	**Maximum Unit Error:** Output Accuracy + Cold Junction Reference Accuracy + Input Accuracy (See Table 1, "Accuracy") **Output Accuracy:** ±0.03% of output span **Cold Junction Reference Accuracy:** ±0.25°C **Stability:** ±0.1% of calibrated span, max. over six months **Output Response:** 800 milliseconds (msec), max., for output to reach full scale in response to a full scale input step change **Alarm Response:** 700 msec, max., from input change to alarm output for step change on input with trip point at midpoint of step **Ripple:** 15mV*, peak-to-peak max., for voltage output; 10mV*, peak-to-peak, max., when measured across a 250Ω resistor for current ; * Spec'd at frequencies up to 120Hz **Sensor Excitation Current:** .25mA, nominal **Burnout Protection:** User-programmable. Front panel push buttons select upscale or downscale drive **Output Protection:** Transient protection on output
Performance (continued)	**Output Limiting Capability:** 117% of span, max.; 115%, typical **Load Capability:** 1200Ω, max. for current outputs (4-20mA) when configured as internally powered (source mode); 2000Ω max. for current outputs when configured as externally powered (sink mode) **Input Impedance:** 10Ω, min. (T/C and mV inputs) **Load Effect:** ±0.01% of span from 0 to max. load resistance on current output **Line Voltage Effect:** ±0.001% of span for a 1V change in line voltage (ac or dc) **Isolation:** 1000Vrms between case, input, output, and power terminals **NOTE:** High voltage effect of ±0.001% of span/V possible with prolonged exposure to ac voltages above 200Vac **Input Over-Voltage Protection:** ±5.0Vdc
Ambient Conditions Ratings	**RFI/EMI Protection:** 30V/M – ABC ≤ 0.5% error in reading, when tested according to SAMA Standard PMC 33.1 **Noise Rejection:** Common Mode, 120dB@60Hz; Normal Mode, 30dB@60Hz
Ambient Conditions Ratings (continued)	**Operating Temperature Range:** –25°C to +65°C (–13°F to +149°F) **Storage Temperature Range:** –40°C to +80°C (–40°F to +176°F) **Humidity Range:** 0-95%, non-condensing
Effect of Ambient Temperature	**On Maximum Unit Error** (refer to Table 1, "Accuracy"): ±0.005% of span per °C, max., ±15ppm of input signal **On Reference Junction Compensation:** ±0.5% per 50°C change in ambient temperature
Adjustments	Four, front panel push buttons control settings for Zero, Span, Alarm Trip Point, etc. Easy-access, internal settings select current or voltage output and high/low alarm function; Internal jumper and menu password protect parameter settings **Display:** 2X4 character, backlit, alphanumeric LCD **LEDs:** Dual-color TRIP light shows green for non-alarm, red for alarm (dual color); Dual-color INPUT light shows green for input within rated range, red for sensor/wire failure or overrange; READY light indicates normal operation, extinguishes in the event of any internal failure
Weight	383 g (13.5 oz)

Intelligent Site-Programmability — Exceptional Ease of Use

No hand-held configurator or sophisticated bench calibration equipment is needed to get the SPT up and running. Install "generic" SPT's in all types of temperature sensor applications in the plant. The "plain-English" menu system takes the user through setup parameters quickly, making on-site programming practical and cost-effective.

Setup Security. All configuration data is stored safely in non-volatile memory. Easy-access controls and a security password protects setup from inadvertent or unauthorized changes.

Programmable features include:

- **Input.** RTD type and number of wires, ISA T/C type, direct mV, or ohms.
- **Output.** Current or voltage (Set with easy-access internal controls).
- **Reference Junction Compensation.**
- **Differential or Averaging of inputs.**
- **Alarms.** Trip point, deadband, delay, high/low. (-C option required for contact closure output.)
- **Zero and Full Scale.** Smart-Ranging, or bench check with field inputs.

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Ordering Information

Unit	Input	Output	Power	Option	Housing
SPT	**TPRG** Programmable (Temperature). User-set, via integral LCD and menus, for input from RTD, T/C, mV or direct Ω RTD Range: 100 to 1000Ω, –200 to +850°C (–328 to 1562°F) T/C Range: –270 to +1836°C (–454 to +3308°F) Millivolts Range: –10 to 120mV Ohms Range: 0 to 4000Ω Menus provide the following selections*: Pt RTD, with α 3916, 3928, 3926, 3923, 3911, 3902, 3850, or 3750 Ni with α 672; Cu with α 427; 2-, 3-, or 4-wire inputs, multiple sensor averaging and dual sensor differential * Factory Calibration Available ISA T/C Types J, K, E, T, R, S, N, and B	**PRG** Programmable. User-set via easy-access internal controls for either 4-20mA or 1.5V, internally or externally powered (source/sink) (Other ranges available. Consult factory for availability)	**U** Universal Power. Power Auto-sensing automatically switches for safe power input from 22-300Vdc or 90-260Vac Power consumption: 2-3W, nominal	**–C** Contact Closure Relay output SPDT, form C, rated 5A @ 250Vac or 24Vdc, or 0.5A @ 125Vdc, non-inductive. Failsafe/ non-failsafe is field selectable through a switch. (700msec max. response time for step change on input with trip point at midpoint of step).	**DIN** Universal DIN-style housing mounts on both 32 mm, G-type (EN50035) and 35 mm, Top Hat (EN50022) rail

To order, choose: Unit / Input / Output / Power / Option [Housing] from bold face type above
Model Number Example: SPT / TPRG / PRG / U / -C [DIN]

Figure 1. *An Overview of the SPT's Intuitive Configuration/Calibration Menu*

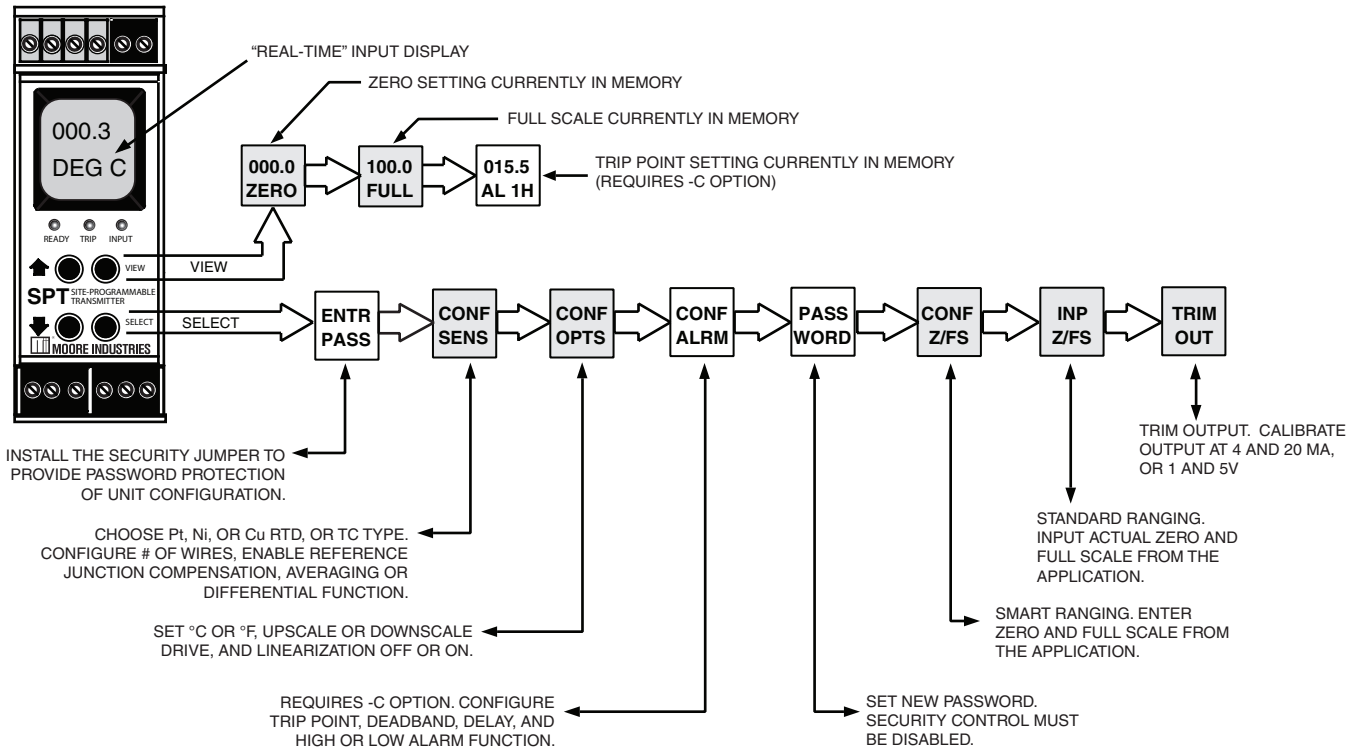

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Table 1. *SPT Input Codes and Accuracy Ratings*

RTD*	α**	Ω	Range	Input Accuracy	Minimum Span***
Pt	3750	1000	–185°C to +540°C (–301°F to +1004°F)	±0.1°C	Single, 100Ω Sensor: 15°C Averaging 100Ω Sensors: 15°C Differential of 100Ω Sensors: 30°C Single, 200Ω Sensor: 10°C Averaging 200Ω Sensors: 10°C Differential of 200Ω Sensors: 20°C Single, 500 or 1000Ω Sensor: 7.5°C Averaging 500 or 1000Ω Sensors: 7.5°C Differential of 500 or 1000Ω Sensors: 15°C
	3850	100, 200, 300, 400, 500, 1000	–200°C to +850°C (–328°F to + 1742°F)	100Ω: ±0.2°C; 200, 300, & 400Ω: ±0.15°C; 500 & 1000Ω: ±0.1°C	
	3902	100, 200, 400, 500, 1000	–100°C to +650°C (–148°F to +1201°F)	100Ω: ±0.2°C; 200 & 400Ω: ±0.15°C; 500 & 1000Ω, ±0.1°C	
	3911	100, 500	–200°C to +630°C (–328°F to +1166°F)	100Ω: ±0.2°C; 500Ω: ±0.1°C	
	3916	100	–200 °C to +510°C (–328°F to +950°F)	±0.2°C	
	3923	98.129	–200°C to +600°C (–328°F to +1112°F)	±0.2°C	
	3926	100, 200, 470, 500	–200°C to +630°C (–328°F to +1166°F)	200 to 470Ω: ±0.15°C; 500Ω: ±0.1°C	
	3928	100	–200°C to +850°C (–328°F to +1742°F)	±0.2°C	
Ni	672	120	–80°C to +320°C (–112°F to +608°F)	±0.14°C	Single Sensor: 10°C Averaging Sensors: 10°C Differential of Multiple Sensors: 20°C
Cu	427	9.035	–50°C to +250°C (–58°F to +482°F)	±1.6°C	Single Sensor: 100°C Averaging Sensors: 100°C Differential of Multiple Sensors: 200°C

Direct Ω*	Range	Input Accuracy	Minimum Span***
Ω	0-4000Ω	±0.4Ω	30Ω

T/C*	Range	Linearization Conformance Range	Input Accuracy	Minimum Span***
J	–210°C to +770°C (–346°F to +1418°F)	–180°C to +760°C (–292°F to +1400°F)	±0.25°C	35°C
K	–270°C to +1390°C (–454°F to +2534°F)	–150°C to +1370°C (–238°F to +2498°F)	±0.3°C	40°C
E	–270°C to +1013°C (–454F to +1855.4°F)	–170°C to +1000°C (–274°F to +1832°F)	±0.25°C	35°C
T	–270°C to +407°C (–454°F to +764.6°F)	–200°C to +400°C (–328°F to +752°F)	±0.25°C	35°C
R	–50°C to +1786°C (–58°F to +3246.8°F)	0°C to +1760°C (–32°F to +3200°F)	±0.5°C	50°C
S	–50°C to +1786°C (–58°F to +3246.8°F)	0°C to +1760°C (–32°F to +3200°F)	±0.5°C	50°C
N	–270°C to +1316°C (–454°F to +2400.8°F)	–130°C to +1300°C (–202°F to +2372°F)	±0.4°C	45°C
B	+200°C to +1836°C (+392°F to +3336.8°F)	+400°C to +1820°C (+752°F to 3308°F)	±0.8°C	75°C

Direct mV*	Range	Input Accuracy	Minimum Span***
mV	–10 to +120mV	±15µV	4mV

* All input types retain site programmability.
** Actual α is 0.003750, 0.003850, 0.003902, etc.
*** Recommended Minimum Span. Tighter spans, while available, may result in output inaccuracies.

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Total Sensor Diagnostics

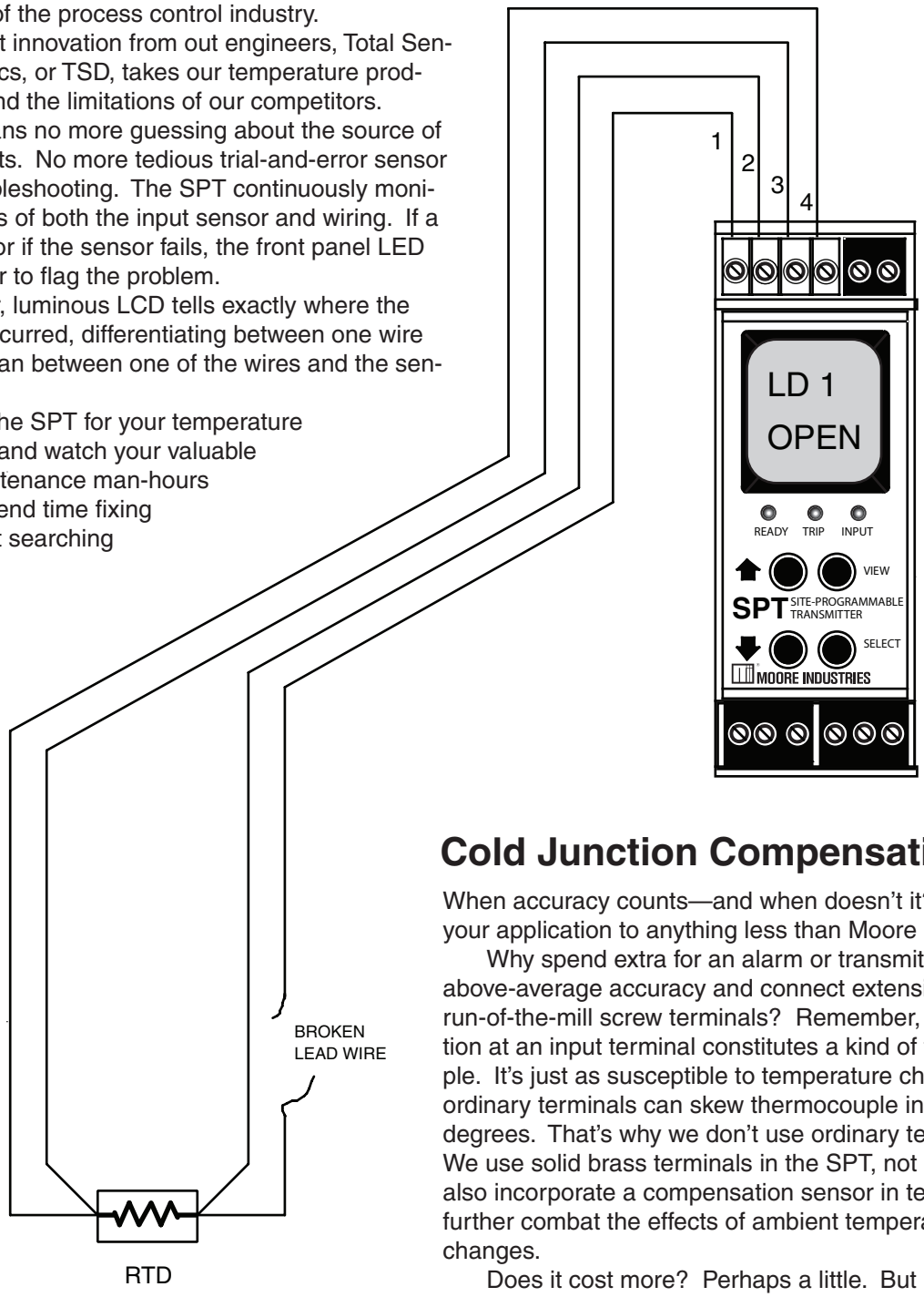
With the SPT, Moore Industries continues to fashion the de facto standard for design improvements in everyday applications of the process control industry.

The latest innovation from out engineers, Total Sensor Diagnostics, or TSD, takes our temperature products far beyond the limitations of our competitors.

TSD means no more guessing about the source of a system faults. No more tedious trial-and-error sensor network troubleshooting. The SPT continuously monitors the status of both the input sensor and wiring. If a wire breaks, or if the sensor fails, the front panel LED changes color to flag the problem.

The clear, luminous LCD tells exactly where the failure has occurred, differentiating between one wire and another, an between one of the wires and the sensor itself.

Choose the SPT for your temperature applications, and watch your valuable monthly maintenance man-hours go down. Spend time fixing problems, not searching for them.



Cold Junction Compensation

When accuracy counts—and when doesn't it?—don't trust your application to anything less than Moore Industries.

Why spend extra for an alarm or transmitter with above-average accuracy and connect extension wires to run-of-the-mill screw terminals? Remember, the connection at an input terminal constitutes a kind of thermocouple. It's just as susceptible to temperature changes, and ordinary terminals can skew thermocouple input by several degrees. That's why we don't use ordinary terminals. We use solid brass terminals in the SPT, not plastic. We also incorporate a compensation sensor in terminal #2 to further combat the effects of ambient temperature changes.

Does it cost more? Perhaps a little. But perhaps accurate control of your process is worth it. The question is not whether you can afford it. The question is, can you afford anything less?

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Figure 2. *SPT Housing Dimensions*

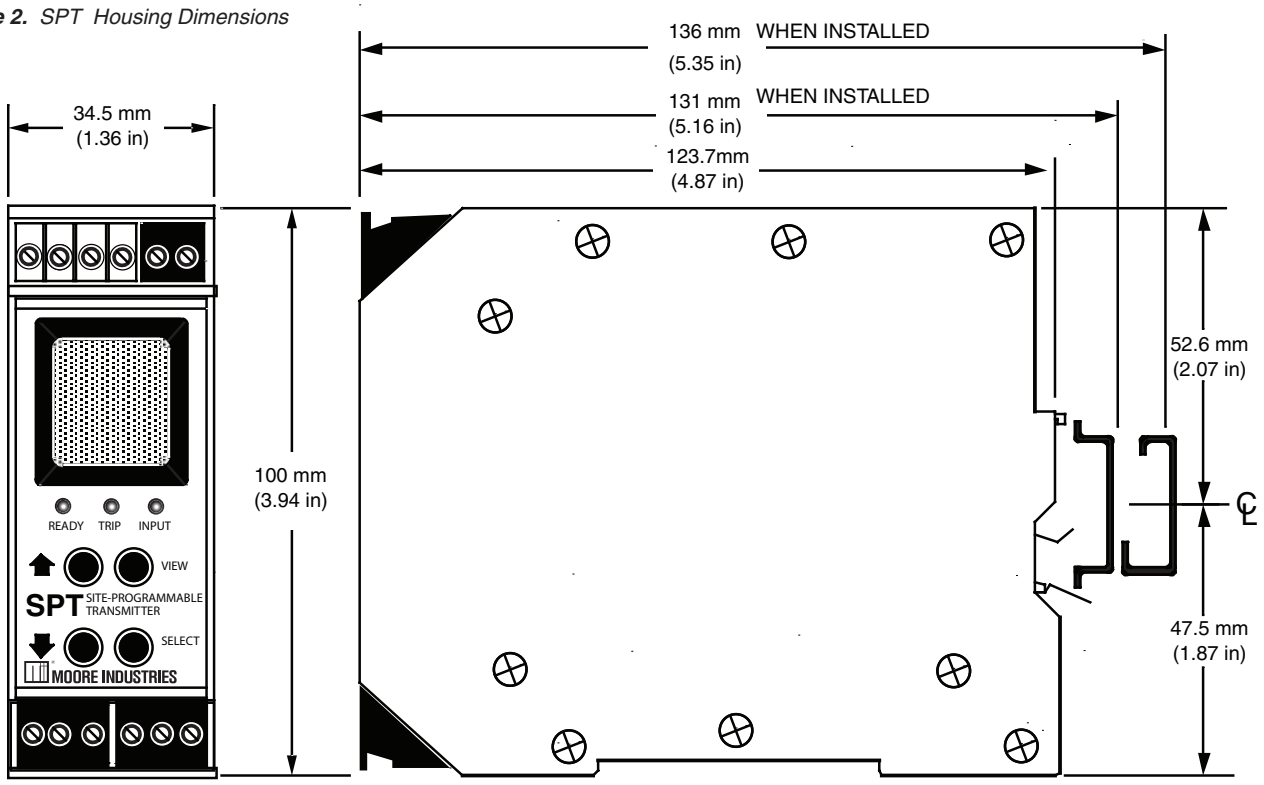
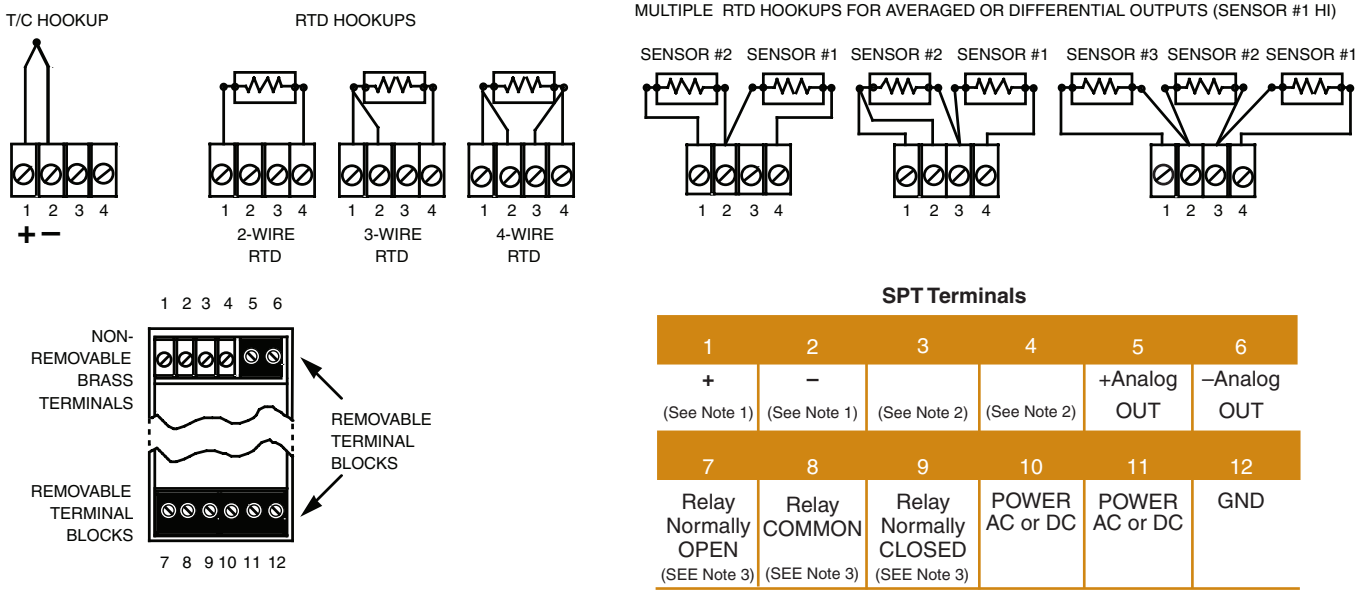


Figure 3. *SPT Single- and Multi-Sensor Hookups*



SPT Terminals

1	2	3	4	5	6
+ (See Note 1)	– (See Note 1)	(See Note 2)	(See Note 2)	+Analog OUT	–Analog OUT
7	**8**	**9**	**10**	**11**	**12**
Relay Normally OPEN (SEE Note 3)	Relay COMMON (SEE Note 3)	Relay Normally CLOSED (SEE Note 3)	POWER AC or DC	POWER AC or DC	GND

Notes: 1. Reference polarity when connecting T/Cs or other mV sources only.
2. Not used with T/C inputs.
3. Requires -C option.

По вопросам продаж и поддержки обращайтесь:

Архангельск (8182)63-90-72
Брянск (4832)59-03-52
Вологда (8172)26-41-59
Иваново (4932)77-34-06
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Пенза (8412)22-31-16
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Ставрополь (8652)20-65-13
Тула (4872)74-02-29
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Ярославль (4852)69-52-93

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