HIGH ACCURACY LAB SIMULATOR

High Accuracy Lab Simulator	Model 5133
50 ppm accuracy	
Simultaneous input and output of V, I, Ω, RTD, and TC	
Programmable through RS-232 and IEEE interfaces	
Menu-driven display for easy use	

Just because you use your multi-function calibrator outside the lab doesn't mean you can't have lab-quality performance. The Model 5133 High Accuracy Process Calibrator, made by AOiP, gives you true benchtop performance in a lightweight, battery-powered package—at a great price.

The 5133 simultaneously measures and sources current, voltage, resistance, five types of RTDs, and 13 types of thermocouples. You get accuracy to 50 ppm, including RTD measurements to ±0.02°C and thermocouple outputs to ±0.1°C.

Operation of the 5133 is easy. The graphical LCD display is menu driven and includes online help. Current values, as well as maximum and minimum values, are shown on-screen for both measuring and sourcing functions.

All the critical tools you need from your calibrator are here, including a step function, ramp function, synthesiser function, scaling, and alarms. Up to five user-definable configuration programs may be stored for easy recall. Memory also holds up to 1,000 measurement values and 100 output simulation values. Because you can measure and source at the same time, the 5133 is perfect for transmitter loop applications.

An optional carrying case is available for in-field use. Or if you want a dedicated lab unit, panel-mount brackets and rack-mount kits are also available. Analog output is included and printer output is available through the RS-232 port.

No other multi-function calibrator combines so well the power you need in the lab with the requirements you have in the field.

Specifications

Operating Conditions	0°C to 50°C, 20% RH to 75% RH
Settling Time	< 25 ms
Temperature Units	°C, °F, K
Measurement Memory	1,000 measurements
Output Memory	100 output values
Display	Graphical backlit LCD
Power	110 to 240 VAC, 50 to 400 Hz; optional battery with internal charger
Communications	RS-232 included; IEEE optional
Dimensions	8.9" W x 3.5" H x 12.2" D (225 x 88 x 310 mm)
Weight	4.5–6.5 lb. (2–3 kg), depending on configuration
Calibration	Certificate included, traceable to BNM (France)

Ordering Information

5133-1	High Accuracy Lab Simulator
5133-2	High Accuracy Lab Simulator, with battery
5133-3	High Accuracy Lab Simulator, with IEEE-488
5133-4	High Accuracy Lab Simulator, with battery and IEEE-488
5314-001	Carrying Case
5314-002	Serial Cable, 9-pin male to 25-pin female
5314-003	Serial Cable, 9-pin male to 9-pin male
5314-004	Serial Cable, 9-pin male to 25-pin male
5314-005	IEEE Cable (2 meters)
5314-006	Mounting Bracket
5314-007	Rack-Mount Kit
5314-008	Software (Win 3.1, 95, 98)

Get the latest product information at www.hartscientific.com

Specifications

	Input				Output	
V	**Range**	**Resolution**	**90-Day Accuracy**	**Input Impedance**	**Range**	**90-Day Accuracy**
	60 mV	0.1 µV	0.005% + 4µV	> 1000 MΩ		
	600 mV	1 µV	0.005% + 4µV	> 1000 MΩ	–100 to 600 mV	0.007% + 4 µV
	6 V	10 µV	0.005% + 20µV	> 1000 MΩ	–1 to 6 V	0.007% + 20 µV
	60 V	100 µV	0.005% + 200µV	> 10 MΩ	–10 to 60 V	0.007% + 200µV
	Max. voltage: 100 V DC or AC peak; Common mode max. voltage: 250 V AC or 350 V peak; Common mode rejection ratio (60 mV range) > 150 dB.				Positive output max. current: 60 mA (except 60 V range: 30 mA); Negative output max. current: –5 mA; Source resistance <0.5 mΩ front panel, < 2 mΩ rear panel; Input protected against a temporary misconnection to –18 V and + 100 V (DC or AC peak).	
I	**Range**	**Resolution**	**90-Day Accuracy**	**Voltage Drop**	**Range**	**90-Day Accuracy**
	60 mA	0.1 µA	0.010 % + 0.4 µA	750 mV	0 to 60 mA	0.010% + 0.5 µA
	In current measurement on 2-wire transmitter, the current loop can be powered by an internal 24 V ±10% source.				Max. output voltage: 30 V; When calibrating a 2-wire transmitter, power may be supplied by an external < 30 V DC source; Source resistance > 100 MΩ; Outputs protected against a temporary misconnection to –20 V and + 100 V.	
Ω	**Range**	**Resolution**	**90-day Accuracy**	**Input Current**		**90-Day Accuracy**
	0 to 600 Ω	1 mΩ	4-wire 0.005% + 4mΩ	1 mA		0.005% + 8 mΩ
			3-wire 0.005% + 20mΩ			
	0 to 6000 Ω	10 mΩ	4-wire 0.005% + 40mΩ	0.1 mA		0.005% + 80 mΩ
			3-wire 0.005% + 70mΩ			
	Measurement with 2-, 3-, or 4-wire resistances; Open circuit max. voltage: 10 V; outputs protected against a temporary misconnection: 100 V DC or AC peak.				Current for the stated accuracy: 0.5 mA to 2.5 mA (600Ω range) and 0.05 mA to 0.25 mA (6000Ω range).	
T/C	**Range**	**Resolution**	**90-Day Accuracy**		**Range**	**90-Day Accuracy**
K	–250 to –200°C –200 to –120°C –120 to 0°C 0 to 1372°C	0.2°C 0.1°C 0.05°C 0.05°C	1°C 0.3°C 0.2°C 0.010% + 0.1°C		–240 to –200°C –200 to 0°C 0 to 1372°C	1°C 0.3°C 0.01% + 0.1°C
T	–250 to –200°C –200 to 0°C 0 to 400°C	0.2°C 0.05°C 0.05°C	1°C 0.3°C 0.1°C		–240 to –200°C –200 to 0°C 0 to 400°C	1°C 0.3°C 0.1°C
J	–210 to –100°C –100 to 1200°C	0.05°C 0.05°C	0.2°C 0.1°C		–210 to –100°C –100 to 1200°C	0.3°C 0.01% + 0.1°C
E	–250 to –200°C –200 to –100°C –100 to 1000°C	0.1°C 0.05°C 0.05°C	0.5°C 0.2°C 0.1°C		–240 to –200°C –200 to –100° –100 to 1000°C	0.5°C 0.2°C 0.1°C
R	–50 to 120°C 120 to 450°C 450 to 1768°C	0.5°C 0.2°C 0.1°C	1°C 0.5°C 0.5°C		–50 to 120°C 120 to 1768°C	1°C 0.5°C
S	–50 to 120°C 120 to 450°C 450 to 1768°C	0.5°C 0.2°C 0.1°C	1°C 0.5°C 0.5°C		–50 to 120°C 120 to 1768°C	1°C 0.5°C
B	400 to 900°C 900 to 1820°C	0.2°C 0.1°C	1°C 0.5°C		400 to 900°C 900 to 1820°C	1°C 0.5°C
U	–200 to 0°C 0 to 600°C	0.05°C 0.05°C	0.3°C 0.2°C		–200 to 0°C 0 to 600°C	0.3°C 0.2°C
L	–200 to –100°C –100 to 900°C	0.05°C 0.05°C	0.2°C 0.1°C		–200 to –100°C –100 to 900°C	0.2°C 0.1°C
C	–20 to 900°C 900 to 2310°C	0.1°C 0.1°C	0.5°C 0.03% + 0.1°C		–20 to 900°C 900 to 2310°C	0.4°C 0.03% + 0.1°C
N	–240 to –190°C –190 to –110°C –110 to 1300°C	0.2°C 0.1°C 0.05°C	1°C 0.5°C 0.2°C		–240 to –100°C –100 to 1300°C	1°C 0.2°C
Platinel	–100 to 1400°C	0.05°C	0.2°C		–100 to 1395°C	0.2°C
Mo	0 to 1375°C	0.05°C	0.1°C		0 to 1375°C	0.2°C
Calibration resolution (all ranges): 0.01°C; Accuracy given with reference junction at 0°C. With internal reference junction compensation: add. 0.2°C						
RTD	**Range**	**Resolution**	**90-Day Accuracy**		**Range**	**90-Day Accuracy**
Pt 100	–220 to 0°C 0 to 630°C 630 to 1200°C	0.01°C 0.005°C 0.01°C	0.02°C 0.01% + 0.02°C 0.1°C		–220 to 0°C 0 to 1200°C	0.04°C 0.01% + 0.04°C
Pt 200	–220 to 0°C 0 to 630°C 630 to 798°C	0.01°C 0.005°C 0.01°C	0.02°C 0.01% + 0.02°C 0.7°C		–220 to 0°C 0 to 590°C	0.03°C 0.01% + 0.03°C
Pt 500	–220 to 0°C 0 to 1200°C	0.01°C 0.01°C	0.04°C 0.01% + 0.04°C		–220 to 0°C 0 to 1200°C	0.05°C 0.01% + 0.05°C
Pt 1000	–220 to 0°C 0 to 630°C 630 to 1200°C	0.01°C 0.005°C 0.01°C	0.03°C 0.01% + 0.03°C 0.15°C		–220 to 0°C 0 to 1200°C	0.04°C 0.01% + 0.04°C
Ni 100	–60 to 180°C	0.05°C	0.1°C		–60 to 180°C	0.3°C
Accuracy given with a 4–wire sensor; Current for the stated accuracy: 0.5 mA and 2.5 mA in Pt 100, Pt 200, and Ni 100 simulation and 1 mA in Pt 500 and Pt 1000 simulation.						