Additel 223A
Documenting Process Calibrator

- Sourcing, simulating and measuring pressure, temperature and electrical signals
- Smartphone-like menu and interface make the operation simple
- HART Communication capability
- The internal cold junction compensation sensor can be re-calibrated at ice point by user
- Ultra-compact, 3.9" x 7.6" x 2.0", and 1.6 lb (0.7 kg)



OVERVIEW

A highly integrated multifunction calibrator featuring several patented technologies. The 223A is an ultra-compact, rugged, and easy to use hand-held device for sourcing, simulating and measuring pressure, temperature, and electrical signals. Its smartphone-like menu and interface make the operation simple. With HART communication capability, the 223A is ideal for calibrating, maintaining, and troubleshooting HART instrumentation. Automation and documentation capabilities make the 223A a turnkey solution.

FEATURES

- **Sourcing, simulating and measuring temperature and electrical signals**
  Sources and measures mV, mA, ohms, RTDs, thermocouples, frequency, and pulses
  Simulates and measures 13 thermocouples and 11 RTDs to calibrate transmitters
  Measures and sources pressure using Additel 160A series Intelligent Digital Pressure Modules from -15 psi to 10,000 psi (-1 bar to 700 bar)
  24V loop power supply
  Simultaneous dual reading capability
  Automatic switch test
  Supports square root transmitter
  Pulse frequency output for the calibration of flow totalizer
- **Easy to use**
  Smartphone-like menu and interface make the operation simpler and easier
  Ultra-compact, size 3.9" x 7.6" x 2.0" (100mm x 192mm x 52mm), and weight 1.6 lb (0.7 kg)
  One hand operation
- **Calibrated cold junction compensation (Patented)**
  Cold junction equivalent block in the calibrator
  A calibrated PRT element with flexible leads is installed in the equivalent block for thermocouple cold junction compensation
  This PRT element can be pulled out from the calibrator and re-calibrated and corrected at ice point by users
- **Built-in temperature readout**
  CVD coefficients of a calibrated PRT can be input into the calibrator for accurate temperature measurement.
- **Multi lingual interface**
  English, German, French, Italian, Spanish, Portuguese, Simplified Chinese
  (Traditional Chinese, Japanese and Russian are available per request)
- **Documenting and automated procedure capability**
  Manage the information of the device under test.
  Set up automated calibration procedures, and 223A performs the test, calculates the errors, displays and/or stores the results in the memory, and highlights the out-of-tolerance points.
  As-found and As-left functions allow recording and documenting results for quality control.
  Download tasks and upload the results.
  Snapshots allow you to capture and save work.
- **HART Communication capability**
  Support HART® instrumentation
- **Build-in unit conversion tool**
  Build-in converters for pressure units, temperature units, temperature vs. resistance (RTDs), and temperature vs millivolt (thermocouples)
- **Display**
  3.5 inch TFT color screen
- **Rugged**
  Rugged design for harsh environments.
  Passed a 1-meter drop test.
  Three years warranty for the 223A, and one year for the battery pack
- **Misuse protection**
  Up to 30V voltage on any two sockets and up to 1A current on current sockets will not damage the calibrator. The calibrator will return to normal condition as soon as the voltage or current is removed.
- **Rechargeable battery**
  Rechargeable Li-ion battery for 15 hours uninterrupted use.
  Battery life will be reduced when 24V is applied.
  The rechargeable battery is replaceable.

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APPLICATIONS

The 223A multifunction calibrator is a process tool for measuring, sourcing and simulating mA, mV, V, RTDs, thermocouples, ohms, frequency, pulses and pressure, captures switch values and provides 24 V loop power.

- **Electrical**
  - Resistance measurement / simulation
  - Voltage measurement / generation
  - Current measurement /generation
  - Frequency measurement / generation
  - Pulse counting/generation
  - 24 VDC loop supply
  - Switch sensing
- **Temperature**
  - RTD measurement /simulation
  - TC measurement /simulation
- **NIST Traceable Calibration with data**
- **Warranty:** 3 years

SPECIFICATIONS

Electrical Specifications

Measurement Accuracy				
		Range	Resolution	Accuracy
Voltage DC		±75.0000 mV	0.1µV	0.01%RD + 3.75 µV
		±30.0000 V	0.1 mV	0.01%RD + 1.5 mV
Current DC		± 30.0000 mA	0.1µA	0.01%RD + 1.5 µA
Resistance	Two-wire	0 to 400.000 Ω	1mΩ	0.02%RD + 0.02 Ω
	Three-wire	0 to 400.000 Ω	1mΩ	0.02%RD + 0.02 Ω
	Four-wire	0 to 400.000 Ω	1mΩ	0.01%RD + 0.02 Ω
	Two-wire	0 to 4000.00 Ω	10mΩ	0.02%RD + 0.2 Ω
	Three-wire	0 to 4000.00 Ω	10mΩ	0.02%RD + 0.2 Ω
	Four-wire	0 to 4000.00 Ω	10mΩ	0.01%RD + 0.2 Ω
Frequency		1 to 50000.0 Hz	0.1Hz	0.005%RD + 1 Hz
Pulse		0 to 999999	1	N/A
Limit Switch		For the contact with potential, the voltage within the range 3V to 24V.		

Source Accuracy			
Voltage DC	-10.000 to 75.000mV	1µV	0.02%RD + 4.25 µV
	0 to 12.0000 V	0.1mV	0.02%RD + 0.6 mV
Current DC	0 to 22.000 mA	1µA	0.02%RD + 1.1 µA
Resistance	1 to 400.00 Ω	10mΩ	0.02%RD + 0.02 Ω
	1 to 4000.0 Ω	100mΩ	0.03%RD + 0.4 Ω
Frequency	0 to 50000.0 Hz	0.1Hz	0.005%RD + 1 Hz
Pulse	0 to 999999	1	N/A
DC24V	N/A	N/A	0.5V

General Specifications

Environmental Specifications	
Operating Temperature	-10°C to 50°C
Storage Temperature	-20°C to 60°C
Humidity	<90%, non-condensing

Safety Specifications	
European Compliance	CE Mark

Mechanical Specifications	
Display	3.5 inch TFT color screen
Electrical Connection	Ø4mm sockets and flat mini-jack thermocouple socket
RS232 Interface	Standard RS232-DB9 socket
Size	3.9" x 7.6" x 2.0" (100mm x 192mm x 52mm)
Weight	1.6 lb (0.7 kg)
Power Supply	Polymer Li-ion rechargeable battery,or 10V DC adaptor
Battery	Rechargeable Li-ion battery (included)
Battery Life	15 hours uninterrupted use Battery life will be reduced when 24V is applied
Battery Charge	110V/220V external power adapter (included)

Pressure Specification

The 160A series Intelligent Digital Pressure Modules are available for gauge, vacuum and absolute pressure from -15 psi to 10,000 psi (-1 bar to 700 bar). Accuracy from 0.02% FS includes operation over 14°F to 122°F (-10°C to 50°C), one year stability and calibration uncertainty. For detail specification refer to pressure modules datasheet.

Temperature Specification

Thermocouple Measurement and Source Accuracy					
Measure and Simulate	Standard	Temperature Range (°C)		Accuracy (°C)	
				Measure	Source
S	IEC 584	-50 to 1768	-50 to400	1.0	1.1
			400 to 1000	0.6	0.6
			1000 to1768	0.7	0.8
R	IEC 584	-50 to 1768	-50 to 200	1.4	1.4
			200 to 500	0.6	0.6
			500 to 1768	0.6	0.7
B	IEC 584	0 to 1820	50 to 450	3.8	3.8
			450 to 800	0.9	0.9
			800 to 1820	0.6	0.7
K	IEC 584	-270 to 1372	-250 to -200	1.0	1.1
			-200 to -100	0.4	0.5
			-100 to 600	0.3	0.3
			600 to 1372	0.4	0.5
N	IEC 584	-270 to 1300	-250 to -200	1.5	1.6
			-200 to -100	0.5	0.6
			-100 to 1300	0.4	0.5
E	IEC 584	-270 to 1000	-250 to -200	0.6	0.7
			-200 to -100	0.3	0.3
			-100 to 0	0.2	0.2
			0 to 700	0.2	0.3
			700 to 1000	0.2	0.4
J	IEC 584	-270 to 1200	-210 to -100	0.3	0.3
			-100 to 1200	0.3	0.4
T	IEC 584	-270 to 400	-250 to -200	0.8	0.9
			-200 to 0	0.4	0.4
			0 to 400	0.2	0.2
C	ASTM E988	0 to 2315	0 to 1000	0.5	0.5
			1000 to 1800	0.7	0.9
			1800 to 2315	1.0	1.4
D	ASTM E988	0 to 2320	0 to 100	0.5	0.5
			100 to 1100	0.4	0.5
			1100 to 2000	0.6	0.9
			2000 to 2320	0.9	1.3
G	ASTM E1751	0 to 2315	0 to 200	2.4	2.4
			200 to 400	0.5	0.5
			400 to 1400	0.4	0.5
			1400 to 2315	0.7	1.0
L	DIN43710	-200 to 900	-200 to -100	0.2	0.3
			-100 to 400	0.2	0.2
			400 to 900	0.2	0.3
U	DIN43710	-200 to 600	-200 to 0	0.4	0.4
			0 to 600	0.2	0.3

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Measurement Accuracy						
Measure and Simulate	Standard	Temperature Range (°C)		Accuracy (°C)		
				Measure (2W/3W)	Measure (4W)	Source
Pt10(385)	IEC 751	-200 to 850	-100 to 200	0.65	0.60	0.65
			200 to 600	0.82	0.72	0.82
			600 to 850	0.96	0.82	0.96
Pt100(385)	IEC 751	-200 to 850	-100 to 200	0.15	0.1	0.15
			200 to 600	0.26	0.16	0.26
			600 to 850	0.34	0.20	0.34
Pt100(3916)	JIS 1604	-200 to 850	-100 to 200	0.15	0.1	0.15
			200 to 600	0.26	0.16	0.26
			600 to 850	0.33	0.20	0.33
Pt100(3926)	Minco Application Aid #18	-200 to 850	-100 to 200	0.15	0.1	0.15
			200 to 600	0.26	0.16	0.26
			600 to 850	0.33	0.20	0.33
Pt500(385)	IEC 751	-200 to 850	-100 to 200	0.20	0.16	0.36
			200 to 600	0.32	0.22	0.54
			600 to 850	0.40	0.27	0.67
Pt1000(385)	IEC 751	-200 to 850	-100 to 200	0.1	0.05	0.25
			200 to 600	0.2	0.10	0.42
			600 to 850	0.27	0.14	0.54
Cu10(427)	Minco Application Aid #18	-100 to 260	-100 to 260	0.61	0.56	0.61
Cu50(428)	GOST 6651-94	-50 to 150	-50 to 150	0.17	0.13	0.17
Cu100(428)	GOST 6651-94	-50 to 150	-50 to 150	0.12	0.09	0.12
Ni120(672)	Edison curve #7	-100 to 260	-100 to 260	0.07	0.05	0.07
Ni100(618)	DIN 43760	-100 to 260	-100 to 260	0.08	0.06	0.08

ORDERING INFORMATION

- **Model Number**
  ADT223A

Accessories (included)	
110V/220V external power adapter	1 pc
Chargeable Li-ion battery	1 pc
Test leads	3 sets(6 pcs)
Short circuit cable	1 sets(2 pcs)
9060 Pressure module connection cable	1 pc
Manual	1 pc
NIST traceable calibration certificate	1 pc

* Additel/Land software can be downloaded for free at www.additel.com

Optional Accessories	
Model number	Description
ADT160A	Intelligent Digital Pressure Modules
9060	Pressure module connection cable
9050	USB to RS232 (DB-9 Male) Adapter
9080	Cable kit (including TC plug, compensation cable, S,R,B,K,J,T,E,N)
9712	Spare chargeable Li-ion battery for multifunction calibrator
9816	110V/220V external power adapter for ADT22X and ADT672 calibrator
9906	Carrying case for multifunction calibrator
9510	Additel/Cal Task management software for multifunction calibrator

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