

ADT 223A

Documenting Process Calibrator



OVERVIEW

A highly integrated multifunction calibrator featuring several patented technologies, the ADT223A is an ultra-compact, rugged, and ease-to-use hand-held device for sourcing, simulating and measuring pressure, temperature, and electrical signals. Its smartphone-like menu and interface make the operation simpler and easier. With HART communication capability, the ADT223A is ideal for calibrating, maintaining, and troubleshooting HART instrumentation. Automation and documentation capabilities make the ADT 223A a turnkey solution.



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

FEATURES

- **Sourcing, simulating and measuring pressure, temperature and electrical signals**
 - ✓ Sources and measures mV, mA, ohms, RTDs, thermocouples, frequency, and pulses
 - ✓ Simulates and measures 13 thermocouples, 11 RTDs, and pressure to calibrate transmitters
 - ✓ Measures and sources pressure using ADT 160 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 ADT 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 year warranty for the ADT 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.
- **NIST Traceable Calibration with data**
- **Warranty:**

3 years

APPLICATIONS

The ADT223A 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

SPECIFICATIONS

Electrical Specifications

Measurement Accuracy				
		Range	Resolution	Accuracy
Voltage DC		±75.0000 mV	0.1μV	0.01%RD+0.005%FS
		±30.0000 V	0.1 mV	0.01%RD+0.005%FS
Current DC		± 30.0000 mA	0.1μA	0.01%RD+0.005%FS
Resistance	Two-wire	0 to 400.000 Ω	1mΩ	0.02%RD+0.005%FS
	Three-wire	0 to 400.000 Ω	1mΩ	0.02%RD+0.005%FS
	Four-wire	0 to 400.000 Ω	1mΩ	0.01%RD+0.005%FS
	Two-wire	0 to 4000.00 Ω	10mΩ	0.02%RD+0.005%FS
	Three-wire	0 to 4000.00 Ω	10mΩ	0.02%RD+0.005%FS
	Four-wire	0 to 4000.00 Ω	10mΩ	0.01%RD+0.005%FS
Frequency	1 to 50000.0 Hz		0.1Hz	0.005%RD+0.002%FS
Pulse	0 to 999999		1	N/A
Limit Switch	If the switch has detective voltage, its range is +3V to +24V			
Source Accuracy				
Voltage DC	-10.000 to 75.000mV		1μV	0.02%RD+0.005%FS
	0 to 12.0000 V		0.1mV	0.02%RD+0.005%FS
Current DC	0 to 22.000 mA		1μA	0.02%RD+0.005%FS
Resistance	1 to 400.00 Ω		10mΩ	0.02%RD+0.005%FS
	1 to 4000.0 Ω		100mΩ	0.03%RD+0.01%FS
Frequency	0 to 50000.0 Hz		0.1Hz	0.005%RD+0.002%FS
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
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Mechanical Specifications

Display	3.5 inch TFT color screen
Electrical Connection	φ4mm sockets and flat mini-jack thermocouple socket
Pressure connection	Pressure module connector
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

ADT 160 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 0.025% 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 to 400	1.0	1.1
			400 to 1000	0.6	0.6
			1000 to 1768	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	0.7	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 E230	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 E230	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

SPECIFICATIONS

RTD Measurement and Source 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)	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	0.33	0.20	0.33
Pt200(385)	IEC 751	-200 to 850	-100 to 200	0.37	0.32	0.69
			200 to 600	0.51	0.41	0.92
			600 to 850	0.61	0.48	1.08
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)	IEC 751	-100 to 260	-100 to 260	0.61	0.56	0.61
Cu50(385)	IEC 751	-50 to 150	-50 to 150	0.17	0.13	0.17
Cu100(385)	IEC 751	-50 to 150	-50 to 150	0.12	0.09	0.12
Ni120(672)	DIN 43760	-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

ADT 223A

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)	
Manual	1 pc	
NIST traceable calibration certificate	1 pc	

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

Optional Accessories		
Model number	Description	Picture
ADT 160	Intelligent Digital Pressure Modules	
9060	Pressure module connection cable	
9050	USB to RS232 (DB-9 Male) Adapter	
9080	Cold Junction compensation kits (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 multifunction calibrator	
9906	Carrying case for multifunction calibrator	
9510	Additel/Cal Task management software for multifunction calibrator	