

Additel 221A, 222A & 223A Multifunction Documenting Process Calibrators

- Sourcing, simulating and measuring pressure, temperature and electrical signals
- Smartphone-like menu and interface for simple operation
- HART Communication capability (223A)
- The internal cold junction compensation sensor can be re-calibrated at the ice point
- Ultra-compact, 3.9" x 7.6" x 2.0", and 1.6 lb (0.7 kg)



Metrology Made Simple



OVERVIEW

This series of highly integrated multifunction calibrators feature several patented technologies. These are an ultra-compact, rugged, and easy to use hand-held device for sourcing, simulating and measuring pressure, temperature, and electrical signals. Their smartphone-like menu and interface make the operation simple. Automation and documentation capabilities make these calibrators a turnkey solution.

Additel 221A

The Additel 221A is very unique to the multifunction temperature calibrator market. Not only does it provide you with the ability to source, simulate and measure temperature and electrical functions but it also incorporates full documenting capability and many other solutions other competitors do not provide. As a standalone device, you can create tasks, run tests and store the results. With the use of Additel/Land Software or Additel/Cal software, all saved tasks and data can be downloaded and managed. With its unique internal cold junction compensation sensor, cold junction compensation is very simple and easy.

Additel 222A

The Additel 222A Multifunction Process Calibrator takes all the functionality of the 221A and adds the ability to measure and source pressure using the ADT160A Intelligent Pressure Modules. With calibration characteristics programmed directly into the ADT160A pressure modules, you can simply connect them to the 222A and it will automatically recognize and display the module as the source or measure pressure. For ultimate convenience, the 222A allows for modules to be "hot swapped" with a simple connection at the top of the module.

Additel 223A

The 223A has all the capability of the 221A and 222A and HART Communication in one small, easy-to-use package. The 223A has a full HART library that allows for the reading of HART-smart devices and also the capability to write to devices. Combined with full task automation and documentation, the 223A is an ideal tool to accomplish many of your important calibration tasks.

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 handed operation
- **Calibrated cold junction compensation (Patented)**
Cold junction equalizing block in the calibrator
A calibrated PRT element with flexible leads is installed in the equalizing block for thermocouple cold junction compensation
This PRT element can be pulled out from the calibrator and re-calibrated and corrected at the ice point
- **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 data.
- **ISO 17025 accredited calibration with data**



Metrology Made Simple

- **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)
- **Build-in unit conversion tool**
Build-in converters for pressure units, temperature units, temperature vs. resistance (RTDs), and temperature vs millivolt (thermocouples)
- **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 400.000Ω	1 mΩ	0.02%RD + 0.02Ω
	Three-wire 0 to 400.000Ω	1 mΩ	0.02%RD + 0.02Ω
	Four-wire 0 to 400.000Ω	1 mΩ	0.01%RD + 0.02Ω
	Two-wire 0 to 4000.00Ω	10 mΩ	0.02%RD + 0.2Ω
	Three-wire 0 to 4000.00Ω	10 mΩ	0.02%RD + 0.2Ω
	Four-wire 0 to 4000.00Ω	10 mΩ	0.01%RD + 0.2Ω
Frequency	1 to 50000.0 Hz	0.1 Hz	0.005%RD + 1 Hz
Pulse	0 to 999999	1	N/A
Limit Switch	For the contact with potential, the voltage within the range 3 V to 24 V.		

Source Accuracy			
	Range	Resolution	Accuracy
Voltage DC	-10.000 to 75.000 mV	1 µV	0.02%RD + 4.25 µV
	0 to 12.0000 V	0.1 mV	0.02%RD + 0.6 mV
Current DC	0 to 22.000 mA	1 µA	0.02%RD + 1.1 µA
Resistance	1 to 400.00 Ω	10 mΩ	0.02%RD + 0.02Ω
	1 to 4000.0 Ω	100 mΩ	0.03%RD + 0.4Ω
Frequency	0 to 50000.0 Hz	0.1 Hz	0.005%RD + 1 Hz
Pulse	0 to 999999	1	N/A
DC24V (MAX 50mA)	24 V	N/A	0.5 V

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" (100 mm x 192 mm x 52 mm)
Weight	1.6 lb (0.7 kg)
Power Supply	Polymer Li-ion rechargeable battery, or 10 V DC adapter
Battery	Rechargeable Li-ion battery (included)
Battery Life	15 hours uninterrupted use Battery life will be reduced when 24 V is applied
Battery Charge	110 V/220 V external power adapter (included)

Pressure Specification(222A & 223A)	
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.	

- **HART Communication capability (223A)**
Support HART® instrumentation
- **Display**
3.5 inch TFT color screen
- **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 24 V is applied.
The rechargeable battery is replaceable.

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	0.6	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
N	IEC 584	-270 to 1300	600 to 1372	0.4	0.5
			-250 to -200	1.5	1.6
			-200 to -100	0.5	0.6
E	IEC 584	-270 to 1000	-100 to 1300	0.4	0.5
			-250 to -200	0.6	0.7
			-200 to -100	0.3	0.3
J	IEC 584	-270 to 1200	-100 to 0	0.2	0.2
			0 to 700	0.2	0.3
			700 to 1000	0.2	0.4
T	IEC 584	-270 to 400	-210 to -100	0.3	0.3
			-100 to 1200	0.3	0.4
			-250 to -200	0.8	0.9
C	ASTM E988	0 to 2315	-200 to 0	0.4	0.4
			0 to 400	0.2	0.2
			0 to 1000	0.5	0.5
D	ASTM E988	0 to 2320	1000 to 1800	0.7	0.9
			1800 to 2315	1.0	1.4
			0 to 100	0.5	0.5
G	ASTM E1751	0 to 2315	100 to 1100	0.4	0.5
			1100 to 2000	0.6	0.9
			2000 to 2320	0.9	1.3
L	DIN43710	-200 to 900	0 to 200	2.4	2.4
			200 to 400	0.5	0.5
			400 to 1400	0.4	0.5
U	DIN43710	-200 to 600	1400 to 2315	0.7	1.0
			-200 to -100	0.2	0.3
			-100 to 400	0.2	0.2
			400 to 900	0.2	0.3
			-200 to 0	0.4	0.4
			0 to 600	0.2	0.3

*Accuracy with external cold junction; for internal cold junction add 0.1°C (k=2)

SPECIFICATIONS



Measurement Accuracy						
Measure and Simulate	Standard	Temperature Range (°C)		Accuracy (°C)		
				Measure (2W/3W)	Measure (4W)	Source
Pt10(385)	IEC 751	-200 to 850	-200 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	-200 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	-200 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	-200 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	-200 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	-200 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

ADT221A

ADT222A

ADT223A

Accessories (Included)		
9816-X	110V/220V external power adapter	1 pc
9712	Chargeable Li-ion battery	1 pc
9022	Test leads	3 sets(6 pcs)
9020	Short circuit cable	1 sets(2 pcs)
9060	Pressure module connection cable (only for 222A & 223A)	1 pc
	Manual	1 pc
	ISO 17025 accredited calibration certificate	1 pc

Optional Accessories	
Model number	Description
ADT160A (only for 222A & 223A)	Intelligent Digital Pressure Modules, see page 27
9060 (only for 222A & 223A)	Pressure module connection cable
9050	USB to RS232 (DB-9 Male) Adapter
9050-EXT	RS 232 (DB9/M) extension cable, 9 feet
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	110 V/220 V external power adapter for ADT22X and ADT672 calibrator
9906	Carrying case for multifunction calibrator
9510	Additel/Cal Task management software for multifunction calibrator

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