

Multifunction Process Calibrators Selection Guide

Models	Additel 220 Multifunction Loop Calibrator	Additel 221A Multifunction Temperature Calibrator	Additel 222A Multifunction Process Calibrator	Additel 223A Documenting Process Calibrator
Measure				
Voltage(mV)	±300 mV	±75 mV	±75 mV	±75 mV
Voltage(V)	±60 V	±30 V	±30 V	±30 V
Current (mA)	±30 mA	±30 mA	±30 mA	±30 mA
Resistance(ohm)	0 to 2,000 ohm	0 to 4,000 ohm	0 to 4,000 ohm	0 to 4,000 ohm
Frequency(Hz)		1 to 50,000 Hz	1 to 50,000 Hz	1 to 50,000 Hz
Pulse		0 to 999,999	0 to 999,999	0 to 999,999
Limit Switch	3 to 24V	3 to 24V	3 to 24V	3 to 24V
Pressure			● ^[1]	● ^[1]
Source / Simulate				
Voltage(mV)	-10 to 200 mV	-10 to 75 mV	-10 to 75 mV	-10 to 75 mV
Voltage(V)	0 to 12 V	0 to 12 V	0 to 12 V	0 to 12 V
Current (mA)	0 to 22 mA	0 to 22 mA	0 to 22 mA	0 to 22 mA
Resistance(ohm)		1 to 4,000 ohm	1 to 4,000 ohm	1 to 4,000 ohm
Frequency(Hz)		0 to 50,000 Hz	0 to 50,000 Hz	0 to 50,000 Hz
Pulse		0 to 999,999	0 to 999,999	0 to 999,999
DC 24 V	●	●	●	●
Record				
Scaling	●	●	●	●
Min/Max/Avg/Tare	●			
Hold	●			
As found/ As left	●	●	●	●
Data Logging	●	●	●	●
Upload data to PC		●	●	●
Features				
24V loop supply	●	●	●	●
Ramp/ Step	●	●	●	●
Simulate Transmitter		●	●	●
RTD		11 types ^[2]	11 types ^[2]	11 types ^[2]
Thermocouple		13 types ^[3]	13 types ^[3]	13 types ^[3]
HART communication	● ^[4]			●
Documenting		●	●	●
Warranty	3 years	3 years	3 years	3 years
NIST traceable calibration	●	●	●	●
See Page	P31	P33	P36	P39

[1] Additel 160 External Pressure Module required

[2] RTD Includes Pt10(385), Pt100(385), Pt100(3916), Pt100(3926), Pt500(385), Pt1000(385), Cu10(427), Cu50(428), Cu100(428), Ni100(617), Ni120(672), Ni1000 and customized

[3] Thermocouple Includes S, R, B, K, N, E, J, T, C, D, G, L, U

[4] Built-in 250Ω resistor for HART communications.

Additel 220

Multifunction Loop Calibrator

- Measure and source loop current, mV, and V
- Measure and source simultaneously
- Loop Continuity Test capability
- 24V loop supply with simultaneous current measurement
- 3 years warranty



OVERVIEW

The 220 is a highly integrated loop calibrator featuring several patented technologies, the calibrator is an ultra-compact, rugged, and best of all, easy to use hand-held device that will source, simulate and measure loop current, mV/V, Loop Continuity Test, and also perform switch testing. Its smart phone-like menu and interface makes it simple and easy to use. The 220 is ideal for calibrating, maintaining, and troubleshooting various loop devices in the field.

FEATURES

- **Measuring and sourcing loop current, mV and V**
Measures loop current up to 30mA with 0.1 μ A resolution
Measures voltage signals up to 60 V, and mV signals up to 300 mV
Sources/sink loop current, mV and V
24V loop power supply with simultaneous current measurement
Simultaneous dual reading capability
Capture switch
- **Data statistics and analysis**
Display max, min, peak-to-peak, average, and percentage simultaneously
Convert data to a real physical value through re-scaling function
- **Data logging**
High-capacity storage with up to twenty thousand records
On-line view, index, analyze, auto-curve, and list the data
- **Various sources and converting mode**
Support linear, flow, valve, and 25% stepping source
Auto-source of ramping and stepping
Gauge span examination
- **"As Cal" on-site calibration tools**
Four on-site calibration tools preset: loop indicator, sensor/transmitter, signal isolator/converter, and limit alarm/switch
- **Support 2W transmitter connection**
- **Multi lingual interface**
English, Simplified Chinese
- **Convenient tools**
Calculator, thermocouple converter, HOLD screen lock
- **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
- **Snapshot**
Save and manage up to 100 snapshots
- **Display**
3.5 inch TFT color screen
4, 5, or 6 digits adjustable display
- **Rugged**
Rugged design for harsh environments.
Passed a 1-meter drop test
Three years warranty for the 220, and one year for the battery pack
- **Misuse protection and Electrical isolation**
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.
Measuring, sourcing and loop power circuits are electrically isolated each other.
- **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**
- **Firmware upgrade**
Support firmware upgrade when available
- **Warranty: 3 years**

Additel 220

Multifunction Loop Calibrator

APPLICATIONS

The 220 loop calibrator is a process tool for measuring, sourcing and simulating mA, mV and V, captures switch values and provides 24V loop power. It is a high performance solution for calibration, repair and maintenance of various loops devices, Loop Continuity Test, and switch capture.

SPECIFICATIONS

Electrical Specifications

Measurement Accuracy			
	Range	Resolution	Accuracy
Voltage DC	-300.000 to 300.000 mV	1µV	0.01%RD+0.005%FS
	-60.0000 to 60.0000 V	0.1mV	0.01%RD+0.005%FS
Current DC	-30.0000 to 30.0000 mA	0.1µA	0.01%RD+0.005%FS
Loop Continuity	0 to 2000.0 ohm	0.1 Ω	0.02%RD+0.2 Ω
Switch Test	For the contact with potential, the voltage within the range 3V to 24V.		

Source Accuracy			
	Range	Resolution	Accuracy
Voltage DC	-10.00 to 200.00 mV	0.01mV	0.02%RD+0.005%FS
	0 to 12.000 V	1mV	0.02%RD+0.005%FS
Current DC	0 to 22.000 mA	1µA	0.02%RD+0.005%FS
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	4mm 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)

ORDERING INFORMATION

- Model Number
ADT220

Accessories (included)	
110V/220V external power adapter	1 pc
Chargeable Li-ion battery	1 pc
Test leads	2 sets(4 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
9050	USB to RS232 (DB-9 Male) Adapter
9712	Spare chargeable Li-ion battery for multifunction calibrator
9816	110V/220V external power adapter for multifunction calibrator
9906	Carrying case for multifunction calibrator



Additel 221A Multifunction Temperature Calibrator

- Sourcing, simulating and measuring temperature and electrical signals
- Smartphone-like menu and interface make the operation simple and simple
- 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 (0.7kg)



OVERVIEW

A highly integrated Multifunction Temperature Calibrator featuring several patented technologies, the 221A is an ultra-compact, rugged, and easy to use hand-held device for sourcing, simulating and measuring temperature, and electrical signals. Its smartphone-like menu and interface make the operation simple. The 221A is ideal for calibrating, maintaining, and troubleshooting process instrumentation. Automation and documentation capabilities make the 221A 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
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 ADT221A 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.
- **Built-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 ADT221A, 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.
- **NIST Traceable Calibration with data**
- **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.
- **Warranty: 3 years**

Additel 221A

Multifunction Temperature Calibrator

APPLICATIONS

The ADT221A multifunction temperature calibrator is a process tool for measuring, sourcing and simulating mA, mV, V, RTDs, thermocouples, ohms, frequency, and pulses, captures switch values and provides 24 V loop power.

- **Electrical**
 - Resistance measurement / simulation
 - Frequency measurement / generation
 - Switch sensing
 - **Temperature**
 - RTD measurement /simulation
- Voltage measurement / generation
Pulse counting/generation
- Current measurement /generation
24 VDC loop supply
- 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
	Three-wire	0 to 400.000 Ω	1mΩ
	Four-wire	0 to 400.000 Ω	1mΩ
	Two-wire	0 to 4000.00 Ω	10mΩ
	Three-wire	0 to 4000.00 Ω	10mΩ
	Four-wire	0 to 4000.00 Ω	10mΩ
Frequency	1 to 50000.0 Hz	0.1Hz	0.005%RD+0.002%FS
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+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

Mechanical Specifications	
Display	3.5 inch TFT color screen
Electrical Connection	4mm 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)

Measurement 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
			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
J	IEC 584	-270 to 1200	700 to 1000	0.2	0.4
			-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
G	ASTM E1751	0 to 2315	2000 to 2320	0.9	1.3
			0 to 200	2.4	2.4
			200 to 400	0.5	0.5
L	DIN43710	-200 to 900	400 to 1400	0.4	0.5
			1400 to 2315	0.7	1.0
			-200 to -100	0.2	0.3
U	DIN43710	-200 to 600	-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

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	-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
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)	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)	GOST6651-94	-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

Accessories (included)	
110V/220V external power adapter	1 pc
Chargeable Li-ion battery	1 pc
Test leads	2 sets(4 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
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



Additel 222A Multifunction Process Calibrator

- Sourcing, simulating and measuring pressure, temperature and electrical signals
- Smartphone-like menu and interface make the operation simple
- 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)



OVERVIEW

A highly integrated multifunction calibrator featuring several patented technologies, the 222A 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. The 222A is ideal for calibrating, maintaining, and troubleshooting process instrumentation. Automation and documentation capabilities make the 222A a turnkey solution.

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 Additel 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 the Additel 222A 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.
- **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 ADT222A, 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 222A 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

Pressure

- Gauge pressure measurement
- Absolute pressure measurement

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
	Three-wire	0 to 400.000 Ω	1mΩ
	Four-wire	0 to 400.000 Ω	1mΩ
	Two-wire	0 to 4000.00 Ω	10mΩ
	Three-wire	0 to 4000.00 Ω	10mΩ
	Four-wire	0 to 4000.00 Ω	10mΩ
Frequency	1 to 50000.0 Hz	0.1Hz	0.005%RD+0.002%FS
Pulse	0 to 999999	1	N/A
Limit Switch	For the contact with potential, the voltage within the range 3V to 24V.		

Source Accuracy			
	Range	Resolution	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

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 adaptor (included)

Safety Specifications	
The 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
J	IEC 584	-270 to 1200	700 to 1000	0.2	0.4
			-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

Additel 222A

Multifunction Process Calibrator

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	-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
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)	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)	GOST6651-94	-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
Additel 222A

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 could be downloaded for free at www.additel.com

Optional Accessories	
Model number	Description
ADT160	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



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 160 series Intelligent Digital Pressure Modules from -15 psi to 1,000 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.

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+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
	Three-wire	0 to 400.000 Ω	1mΩ
	Four-wire	0 to 400.000 Ω	1mΩ
	Two-wire	0 to 4000.00 Ω	10mΩ
	Three-wire	0 to 4000.00 Ω	10mΩ
	Four-wire	0 to 4000.00 Ω	10mΩ
Frequency	1 to 50000.0 Hz	0.1Hz	0.005%RD+0.002%FS
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+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
Mechanical Specifications	
Display	3.5 inch TFT color screen
Electrical Connection	4mm 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 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	0.6	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

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	-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
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)	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)	GOST6651-94	-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 could be downloaded for free at www.additel.com

Optional Accessories	
Model number	Description
ADT160	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