Additel 227, 227Ex
Documenting Multifunction Process Calibrator

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- Sourcing, Simulating and Measuring Pressure, Temperature and Electrical Signals
- Built-in Full Hart Communicator (ADT227-HART)
- Built-in Barometer
- Intrinsically Safe Models Available (Ex)
- Large Smartphone Like Touchscreen User Experience
- USB Type-C and Bluetooth Communications
- IP67 Rated
- High Voltage Measurement Capability (300V AC)
- True RMS Voltage Meter Capability
- Dual Channel Pressure Module Ports
- High Static Differential Pressure Measurement 0.002% FS
- ISO 17025-accredited Calibration w/data Included



OVERVIEW

Additel's new Multi-functional Documenting Process Calibrator series takes portability, functionality, and accuracy to a whole new level and packages it with an intuitive and easy to use color touchscreen display. This series includes an advanced documenting pressure calibrator (ADT227) and an advanced documentation process calibrator with a built-in HART communicator (ADT227-HART). Additionally, each calibrator has an ATEX certified intrinsically safe option (ADT227Ex) allowing you to perform calibration in the harshest of environments. We're confident these new tools will not only meet your calibration requirements but will make metrology simple for you!

Features

Easy-to-use Cellphone Like Interface

The ADT227 series brings an all new user interface to the world of process calibrators. With a menu driven interface and a small size/weight, the ADT227 is the industry's smallest advanced multifunctional process calibrator with an intrinsically safe version to boot (ADT227Ex). It adopts advanced human hand engineering design for the most convenient field handheld process calibrator available.

The ADT227 has been developed with a powerful embedded operating system which solves common problems of other designs including slow response, cumbersome key operation, high power consumption and overall slow processing.



Accuracy



Additel's new and improved ADT227 series provides much improved accuracies including an electrical accuracy of 0.005% RD + 0.005% FS, high-static differential pressure mode accuracy to 0.002% FS and across the board improvements in temperature measurement accuracies.

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Features

Thermocouple Measurement Performance

The ADT227 series delivers highly improved thermocouple measurement capabilities by vastly improving the cold junction compensation(CJC) specifications and a much improved stabilization time.



Portable and Robust



The demands of remote calibration work can be challenging. The ADT227series is lightweight and highly portable and utilizes an advanced color LCD screen to help ensure you can easily see, even in the (Ex) intrinsically safe versions.

All models in the ADT227 family have been designed with ruggedness and dependability in mind and meet IP67 standards with a 1-meter drop test, 4G vibration, xenon exposure and 130g steel ball drop testing of the display.

Other environmental conditions have also been considered, such as temperature and humidity. To combat these external elements, Additel has designed a unique internal circuit design and process technology to allow for the utmost confidence in your critical calibration and measurement work.

Intrinsically Safe Option

The Additel 227Ex series calibrators have passed the most stringent testing by certified organizations to acquire intrinsically safe certificates, ATEX, IECEX, CSA and UKCA. The explosion-proof grade (Ex ia IIC T4 Ga), can be widely used in potentially explosive environments, such as oil and gas platforms, oil refineries, chemical and petrochemical plants, pharmaceutical industries, energy and gas processing industries.

Each intrinsically safe calibrator has an advance transflective color LCD display which has enhanced visibility when viewed in direct sunlight. No matter where your work takes you, these calibrators are up to the task.



Voltage Meter (RMS)



The Additel 227 non-Ex version is equipped with “true effective value” RMS measuring function, which can measure the RMS of various waveforms with no need to consider distortion or waveform parameters and other errors caused by various waveforms

Automated Tasks for Paperless Calibration Management

Additel 227 Series Calibrators come with a powerful documenting calibration task application which provides a turnkey solution for automation and paperless calibration management.

Tasks are easily created for temperature, pressure, flow and loop instruments. Up to 10,000 documented tasks for ADT227 and up to 1,000 documented tasks for ADT227Ex can be stored in the extensive on-board memory. Many tasks, when executed, are fully automated in data collection and performance validation, such as pass/fail and hysteresis calculations. All information can be integrated into Additel’s ACal software for additional calibration management.



Full HART Communicaton (For ADT227-HART only)



The built-in full HART communicator will work with most HART transmitters . The ADT227-HART contains an extensive DD library to meet the needs of your smart transmitter. Our DD library is updated on a regular basis and at no additional cost. The ADT227Ex-HART is integrated with the HART communication functions, permitting users to monitor, control, and calibrate HART instrumentations. It's an ideal device for calibrating, maintaining, and troubleshooting HART instrumentations

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Features

Targeted application features



The onboard applications provide a useful selection of features including HART communicator, high static differential pressure mode, pressure leak test, safety valve test, analog transmitter calibration, unit converter, thermal calculator, and snapshots to name a few.

High static differential pressure mode uses two sensors, unique calculation technology to achieve a differential pressure measurement to 0.002% FS at high static pressures. The leak test will automatically calculate the pressure drop to determine a leak condition. The safety valve test is a specialized task which captures the exact pressure release point by taking 10 readings per second during a valve crack test.

You will find this and much more as we continue to develop new apps at Additel.

Data Logger (For ADT227 & ADT227-HART only)

The calibrator can record pressure, temperature and electrical signals readings for a long period. Recorded values can be displayed numerically or graphically to identify trending. ADT227 & ADT227-HART can store up to 500 results. each result can record up to 7 channels with up to 100,0000 readings in each channel. These results can be easily exported to Additel application software. Each log session is easily configured at a set interval and each reading is provided with a date and time stamp.



Connectivity & Battery



Users can remotely connect mobile devices to the ADT227 via Bluetooth and Wi-Fi communication with an unobstructed distance up 20 meters. The included USB type-C comm port and cable provide a hard wired communication option as well as charging for the removeable Li-ion battery, which provides up to 35 hours of run time.

Time Saving Features

In addition to all the great features mentioned above, the ADT227series is loaded with time saving features like our builtin pressure and temperature converter, thermal calculator, wiring diagram guide for assisting with electrical connections, a built-in diagnostic center including intelligent alarm messaging and a real time error report and comprehensive selftesting to help our customers get the very most out of their investment in Additel calibration tools.



SPECIFICATIONS

Electrical Specification

Source Accuracy						
Specifications	ADT227			ADT227Ex		
	Range	Resolution	Accuracy	Range	Resolution	Accuracy
Voltage DC	0 to 15 V	0.1 mV	0.005%RDG+0.005%FS	0 to 10.5 V	0.1 mV	0.01%RDG+0.005%FS
Current DC	0 to 25 mA	0.1 uA	0.01%RDG+0.005%FS	0 to 25 mA	0.1 uA	0.01%RDG+0.005%FS
Resistance	0 to 400 Ω	1 mΩ	0.005%RDG+0.005%FS	0 to 400 Ω	1 mΩ	0.01%RDG+0.005%FS
	0 to 4000 Ω	10 mΩ	0.01%RDG+0.005%FS	0 to 4000 Ω	10 mΩ	0.01%RDG+0.005%FS
Frequency	0.01 to 50000.0 Hz	Auto range, 6-digit	0.002%RDG+2 on last digit	0.01 to 50000.0 Hz	Auto range, 6-digit	0.002%RDG+2 on last digit
Voltage mV (TC)	-10 to 75 mV	0.1 uV	0.0008%RDG + 0.004%FS	-10 to 75 mV	0.1 uV	0.01%RDG + 0.004%FS
Pulse	0 to 9999999	1	N/A	0 to 9999999	1	N/A
	Optional rising edge and falling edge, minimum threshold voltage: 2.5V					
Loop power (max 25mA)	24 V	N/A	±1 V	20 V	N/A	± 10%

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Measurement Accuracy Cont.						
Specifications	**ADT227**			**ADT227Ex**		
	Range	**Resolution**	**Accuracy**	**Range**	**Resolution**	**Accuracy**
Voltage DC	-300 to 300 mV	1 µV	0.005% RDG + 0.005% FS	-300 to 300 mV	1µV	0.01% RDG + 0.005% FS
	-30 to 30 V	0.1 mV	0.005% RDG + 0.005% FS	-30 to 30 V	0.1 mV	0.01% RDG + 0.005% FS
	Temperature Coefficient: ±5 ppm FS/°C (-10°C to 10°C and 30°C to 50°C)					
	Impedance: -300 mV to 300 mV = > 100 MΩ -30 V to 30 V = >1 MΩ					
DC High Voltage	-3 to 3 V	0.1 mV	0.05% RDG + 0.01% FS	N/A		
	-30 to 30 V	1 mV	0.05% RDG + 0.01% FS			
	-300 to 300 V	10 mV	0.05% RDG + 0.01% FS			
	Temperature coefficient: ±0.0025% FS/°C (-10°C to 10°C and 30°C to 50°C)					
	Maximum input voltage = 300 V, IEC61010 300V CATII					
	Commong mode rejection: >100 dB (at 50 or 60 Hz)					
	Impedance: > 4 MΩ, DC coupling					
AC High Voltage	3V (40 to 500 Hz)	0.1 mV	0.5% RDG + 0.05% FS	N/A		
	30V (40 to 500 Hz)	1 mV	0.5% RDG + 0.05% FS			
	300V (40 to 500 Hz)	10 mV	0.5% RDG + 0.05% FS			
	Temperature coefficient: ±（0.025% RD + 0.0025% FS）/°C (-10°C to 10°C and 30°C to 50°C)					
	Maximum input voltage = 300 V, IEC61010 300V CATII					
	9% to 100% of range is suitable for the above accuracy indicators					
	Impedance: >4 MΩ, <100pF, AC coupling					
Current DC	-30 to 30 mA	0.1 µA	0.01% RDG + 0.005% FS	-30 to 30 mA	0.1 µA	0.01% RDG + 0.005% FS
	Temperature Coefficient: ±5ppm FS/°C (-10°C to 10°C and 30°C to 50°C), Impedance: < 40 Ω					
Resistance (4-Wire)	0 to 400 Ω	1 mΩ	0.005% RDG + 0.005% FS	0 to 400 Ω	1 mΩ	0.01% RDG + 0.005% FS
	0 to 4000 Ω	10 mΩ	0.01% RDG + 0.005% FS	0 to 4000 Ω	10 mΩ	0.01% RDG + 0.005% FS
	Temperature coeficient: ±5 ppm FS/°C (-10°C to 10°C and 30°C to 50°C)					
	2-Wire + 50 mΩ, 3-wire+ 10 mΩ					
	Excitation current: 0.25 mA					
Voltage mV (TC)	-10 to 75 mV	0.1 µV	0.008% RDG + 0.004% FS	-10 to 75 mV	0.1 µV	0.01% RDG + 0.004% FS
	Temperature Coefficient: ±5ppm FS/°C (-10°C to 10°C and 30°C to 50°C)					
	Impedance: >100 MΩ					
Frequency	0.01 to 50000 Hz	Auto range, 6-digit	0.002% RDG + 2 on last digit	0.01 to 50000 Hz	Auto range, 6-digit	0.002% RDG + 2 on last digit
	Minimum threshold voltage: 2.5 V					
	Supported units: Hz, kHz, MHz, CPM, CPH, s, ms, µs					
Pulse	0 to 9999999	1	N/A	0 to 9999999	1	N/A
	Optional rising edge and falling edge, minimum threshold voltage: 2.5V					
Switch	Supports dry or wet switches. Voltage range of 3 to 30 V. Response speed < 10 ms					

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Genreal Specification

Specifications	ADT227	ADT227Ex
Operating Temperature	-10°C to 50°C	-10°C to 50°C
Specification guaranteed temperature range	10°C to 30°C	10°C to 30°C
Storage Temperature	-20°C to 70°C	-20°C to 70°C
Humidity	<95%, non-condensing	<95%, non-condensing
Power supply	6600mAh, 23.8Wh lithium battery, charging time 4~6 hours, battery pack can be charged independently	4000mAh 14.4Wh Explosion-proof lithium battery packcharging time 6~8 hours, battery pack can be charged independently
User interface	Icon drive menus	Icon driven menus with navigation buttons
Ports protection voltage	50V max	30V max
Display	5.0 inch 480 x 800 mm TFT LCD capacitive screen	4.4 inch 640 x 480 mm color display capacitive screen
Data logger	500 results, 7 channels x 100,0000 readings	
Maximum altitude	3000 meters	
European Compliance	CE Mark	
Electrical Connection	Ø4mm sockets and flat mini-jack thermocouple socket	
Size	6.97" x 4.13" x 2.04" (177 mm x 105 mm x 52 mm)	
Weight	1.6 lb (0.7 kg)	1.65 lb (0.75Kg)
Battery	Rechargeable Li-ion battery (included)	
Battery Life	Typically 16 hours	Typically 35 hours
Battery Charge	110V/220V external power adapter included. Battery can be charged external to the unit. Typically charge time is 6-8 hours.	
External pressure module	Dual channel serial plug, can connect two digital pressure modules	
Warm-up time	Full specification performance is achieved after a 10 minute warm-up time.	
ROHS compliant	Rohs II Directive 2011/65/EU, EN50581:2012	
Display rate	3 readings per second	
Barometric Accuracy (Built-in barometer)	50Pa	
IP protection level	IP67, 1 meter drop test	
Communication	Isolate USB-TYPEC (slave), Bluetooth BLE	
Calibration	ISO 17025 accredited calibration with data	

Pressure Specification

Pressure Specification (ADT227 & ADT227Ex)
The ADT161 and ADT161Ex series Intelligent Digital Pressure Modules are available for gauge, vacuum and absolute pressure from -15 psi to 60,000 psi (-1 bar to 4200 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 detailed specifications, please refer to the pressure modules datasheet.

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Temperature Specification

Thermocouple Measurement and Source Accuracy

	ADT227				ADT227Ex			
Type	Standard	Temperature Range (℃)		Accuracy (℃) Measure / Source	Standard	Temperature Range (℃)		Accuracy (℃) Measure / Source
S	IEC 584	-50 to 1768	-50~0	0.76	IEC 584	-50 to 1768	-50~100	0.77
			0~100	0.56			100~1000	0.42
			100~1768	0.44			1000~1768	0.47
R	IEC 584	-50 to 1768	-50~0	0.82	IEC 584	-50 to 1768	-50~0	0.82
			0~200	0.57			0~200	0.57
			200~1768	0.38			200~1768	0.42
B	IEC 584	0 to 1820	200~300	1.51	IEC 584	0 to 1820	200~300	1.51
			300~500	1.00			300~500	1.00
			500~800	0.62			500~800	0.62
			800~1820	0.43			800~1820	0.43
K	IEC 584	-270 to 1372	-250 to -200	0.72	IEC 584	-270 to 1372	-250 to -200	0.75
			-200 to -100	0.23			-200 to -100	0.24
			-100 to 600	0.12			-100 to 600	0.13
			600 to 1372	0.22			600 to 1372	0.25
N	IEC 584	-270 to 1300	-250 to -200	1.14	IEC 584	-270 to 1300	-250 to -200	1.17
			-200 to -100	0.33			-200 to -100	0.34
			-100 to 1300	0.19			-100 to 1300	0.22
E	IEC 584	-270 to 1000	-250~-200	0.39	IEC 584	-270 to 1000	-250~-200	0.41
			-200~-100	0.15			-200~-100	0.15
			-100~700	0.09			-100~700	0.10
			700~1000	0.12			700~1000	0.14
J	IEC 584	-210~1200	-210~-100	0.19	IEC 584	-210~1200	-210~-100	0.20
			-100~700	0.10			-100~700	0.11
			700~1200	0.15			700~1200	0.17
T	IEC 584	-270 to 400	-250~-100	0.55	IEC 584	-270 to 400	-250~-100	0.57
			-100~0	0.12			-100~0	0.23
			0~400	0.08			0~400	0.08
C	ASTM E988	0 to 2315	0 to 1000	0.24	ASTM E988	0 to 2315	0 to 1000	0.26
			1000 to 1800	0.40			1000 to 1800	0.45
			1800 to 2315	0.65			1800 to 2315	0.73
D	ASTM E988	0~2315	0~100	0.31	ASTM E988	0~2315	0~100	0.31
			100~1200	0.25			100~1200	0.27
			1200~2000	0.42			1200~2000	0.47
			2000~2315	0.65			2000~2315	0.74
G	ASTM E1751	0 to 2315	50~100	0.90	ASTM E1751	0 to 2315	50~100	0.90
			100~200	0.57			100~200	0.57
			200~400	0.35			200~400	0.36
			400~1500	0.25			400~1500	0.27
			1500~2315	0.49			1500~2315	0.55
L	DIN43710	-200 to 900	-200 to -100	0.11	DIN43710	-200 to 900	-200 to -100	0.12
			-100 to 400	0.08			-100 to 400	0.09
			400 to 900	0.10			400 to 900	0.12
U	DIN43710	-200 to 600	-200 to 0	0.21	DIN43710	-200 to 600	-200 to 0	0.21
			0 to 600	0.08			0 to 600	0.09

Note: Internal CJC is ±0.15°C (-10°C to 50°C ambient temperature)
Accuracy with external cold junction only, for internal cold junction add 0.15 ℃ (k=2)

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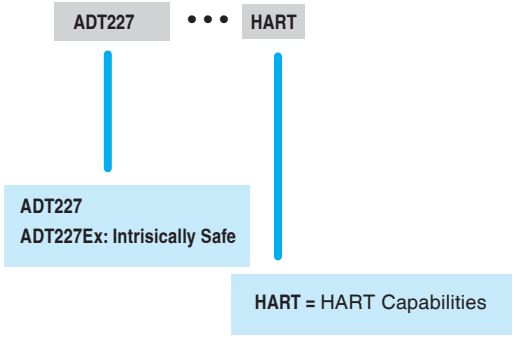
RTD Measurement and Source Accuracy				
Measure and Simulate	**Temperature Range (°C)**		**Accuracy (°C)**	
			ADT227	**ADT227Ex**
PT10(385)	-200 to 850	-200~200	0.57	0.59
		200~600	0.67	0.72
		600~850	0.75	0.82
PT25(385)	-200 to 850	-200~200	0.24	0.27
		200~600	0.30	0.35
		600~850	0.34	0.41
PT50(3916)	-200 to 850	-200~200	0.13	0.16
		200~600	0.17	0.22
		600~850	0.20	0.27
PT100(385) PT100(391) PT100(3916) PT100(3926)	-200 to 850	-200~200	0.08	0.10
		200~600	0.11	0.16
		600~850	0.14	0.20
PT200(385)	-200 to 850	-200~200	0.32	0.08
		200~300	0.34	0.34
		300~600	0.41	0.41
		600~850	0.48	0.48
PT400(385)	-200 to 850	-200~0	0.15	0.04
		0~200	0.18	0.18
		200~600	0.25	0.25
		600~850	0.30	0.30
PT500(385)	-200 to 850	-200~200	0.16	0.16
		200~600	0.22	0.22
		600~850	0.27	0.27
PT1000(385)	-200 to 850	-200~200	0.10	0.10
		200~600	0.16	0.16
		600~850	0.20	0.20
Cu10(427)	-200~260	-200~260	0.54	0.56
Cu50(428)	--200~260	-200~260	0.11	0.13
Cu100(428)	-200~260	-200~260	0.07	0.08
Ni100(617) Ni100(618)	-60~180	-60~0	0.05	0.06
		0~180	0.05	0.05
Ni120(672)	--80~260	-80~260	0.04	0.05
Ni1000	-50~150	-50~150	0.07	0.07

*Note: Ambient temperature of 20°C±10°C.
4-wire accuracy. For 2-wire add 50 mΩ, for 3-wire add 10 mΩ

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ORDERING INFORMATION

Model Number



Accessories (included)		
Model number	**Description**	**QTY**
9811-X	110V/220V external power adapter	1 pc
9704	Chargeable Li-ion battery	1 pc
9023	Test leads	1 set (6 pcs)
9027	Right angle test leads kit	1 set (2 pcs)
9060	Pressure module connection cable	1 pc
9040	Hanging strap with magnet	1 pc
	Manual	1 pc
	ISO 17025 accredited calibration certificate	1 pc

Optional Accessories	
Model number	**Description**
ADT161 - XXX	Digital Pressure Modules
ADT161Ex - XXX	Intrinsically Safe Digital Pressure Modules
9060	Pressure module connection cable
9081	U type TC MINI-TC cable
9052	USB Cable (TYPE - A to C)
9080	Cable kit (including TC plug, compensation cable, S,R,B,K,J,T,E,N)
9704	Spare chargeable Li-ion battery for multifunction calibrator
9811-X	110 V/220 V external power adapter
9906A	Hard carrying case for handheld instrument with accessories
9918-SC	Soft carrying case, with space for handheld instrument, test leads, and accessories
9530-BASIC	Additel/Acal Automated calibration software with asset management

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