Addite Metrology Made Simple

Additel 282

Dual-Channel Reference Thermometer Readout

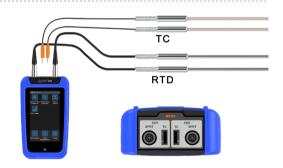
- Reference Level Accuracies
- Dual Measurement Channels
- RTD and TC Inputs
- Smart Style Probe Connections
- Large Smartphone Like Touchscreen
- **Differential Measurement Technology**
- **Bluetooth & USB Communications**
- **Built-in Sensor Library**
- Datalogging
- IP67 Rated
- Rugged Handheld Construction
- Rechargeable Lithium Battery



OVERVIEW

Additel's 282 Reference Thermometer Readout delivers the best possible accuracies and features in the palm of your hand! With accuracy capabilities on par with laboratory grade thermometers, the ADT282 is capable of handling even your most critical measurements. This ultra-high precision readout features dual analog channels designed to facilitate comparison measurements and meet all of your temperature measurement needs. The easy to use touchscreen makes navigating the well-designed menus a time saving and enjoyable experience. The Lemo style smart connectors help to ensure that your probe calibration information is never in question. The ADT282 Reference Thermometer Readout helps makes metrology simple and will quickly become your new go-to when reliable temperature measurements are a must.





*Read up to two channels simultaneously

Main Features

1mk temperature resolution, 0.1mΩ/0.1uV electrical measurement resolution

Reliable temperature metrology requires a stable repeatable measurement device. The ADT282 supports stability and uniformity testing of liquid temperature baths, thermocouple calibration furnaces, and dry well calibrators. The highly accurate dual channels of the ADT282 support deviation and uniformity studies. A very capable standard is required for the measurement resolution of the thermometer readout in these situations. The ADT282's superior measurement performance and dual-channel configuration easily meet these measurement needs.



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Metrology Made Simple

Main Features

Dual Channels

The model ADT282 includes dual inputs which provide support for a multitude of resistive type sensors (RTD's) as well as thermocouples (TC's). Both channels can be displayed simultaneously which allows for comparison measurements and a host of other statistical analysis capabilities. And the Additel 282 allows for easy differential measurement selection for T1-T2.



Reference Measurement Technology



Additel's 282 Reference Thermometer Readout utilizes a ratio measurement technology which provides an unmatched performance in stability and drift. In order to ensure a very small temperature drift coefficient and reliable long-term stability, the ADT282 uses current reversal techniques to cancel EMF effects and a ratio technology to cancel the A/D converter offset. This highly advanced technology has not been available in a handheld device until now!

Smart Style Probe Connections

In order to facilitate quick and reliable probe connections, the ADT282 has been configured with smart connection ports for probes. Both channels atop the reference readout utilize 6 pin Lemo style smart connectors for RTD probes and mini-TC ports for thermocouple probes. The thermocouple connection points utilize an imbedded temperature sensor which allows for both internal and external cold junction compensation. With the smart probe connectors, the ADT282 utilizes a user-selectable probe lock feature to pair the probe with the channel it was calibrated with in a system calibration.



One Touch Control Center



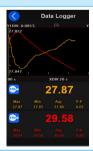
In order to improve the user's experience and speed of use, we have designed a single touch menu option that navigates users to a control center panel. The functions from the control panel include: Date, Battery status, Screen lock, Bluetooth on/off, Speaker on/off, Snapshot, Smart diagnosis center button.

BlueTooth

The ADT282 comes with standard Bluetooth communications capabilities and is supported by Additel's Mobile Link App. This very useful feature will change the way you work as it provides a remote view of the ADT282 display at a distance, up to 20 meters on your personal mobile device.



Datalogging



Temperature sensors and instruments used in the field often require regular calibration. In many cases, the disassembly of equipment can impact productivity. Fixed sensors can be tested in process utilizing the ADT282 datalogging capabilities. In order to accurately monitor temperature changes, this process may take several minutes or even hours to complete. ADT282 has built-in powerful data logging function and supports multi-parameters data recording, trend curve display, partial curve observation, statistical result viewing, data storage capacity up to 8G to help with these applications.

Sensor Library

The ADT282 has an extensive built-in temperature sensor library, including ITS-90, CVD, Standard TC,13 types of industrial RTDs and 15 types of industrial thermocouples, and also supports sensor customization. The user can also edit the probe coefficients according to the ITS-90, CVD formulas and the R0 parameter of the industrial RTDs. The extensive probe library capabilities also support coefficient input methods for standard thermocouple types.





SPECIFICATIONS

General Specifications

Technical Specifications				
Display	5.0 inch 480 x 800 TFT LCD capacitive screen			
Size	16.97" x 4.13" x 2.04" (177 mm x 105 mm x 52 mm)			
Weight	1.5 lbs. (0.65 Kg)			
Power Supply	6600mAh, 23.8Wh lithium battery, charging time 4~6 hours, battery pack can be charged independent. Battery life typically 16 hours			
Specification guaranteed temperature range: (10~30) °C Working Temperature: (-10~50) °C Storage temperature: (-20~70) °C Humidity: 0% ~ 95% RH, non-condensing				
Warm-Up Time	10 minutes			
Ports Protection Voltage 50V max				
CE Certificate TUV IEC61326, IEC61010				
Rohs Compliance	Rohs II Directive 2011/65/EU, EN50581:2012			
IP Protection Level	IP67, 1 meter drop test			
Communication	Isolate USB-TYPEC (slave), Bluetooth BLE			
Input Channels	CH1, CH2 analog channel, 6 pins smart lemo ports for RTD probe; MINI-TC ports for TC probe			
Measurement Display	Single channel, dual channel, differential (e.g T1-T2)			
Measuring Rates	CH1, CH2 analog channels alternately and cyclically measure RTD measuring rate: 1.6S/single channel, 1.6S/dual channel TC measuring rate: 0.8S/single channel, 0.8S/dual channel			
Measurement Units	°C, °F, K			
Statistics	Max, Min, Avg			

Measurement Specifications

Specification			
	RTD Types	ITS-90, CVD, Ohms, Pt100 (385), Pt10 (385), Pt25 (385), Pt50 (385), Pt100 (3916), Pt100 (3926), Pt100 (391), Cu100 (428), Cu50 (428), Cu10 (427), Ni100 (617), Ni100 (618), Ni120 (672), and custom RTD	
	Resistance Accuracy	$0{\sim}400\Omega\text{: }\pm0.5\text{m}\Omega\text{@ }(0{\sim}20\Omega),\pm25\text{ppm}\text{@ }(20{\sim}400\Omega)$	
PRT Measurement	Measurement range	-200°C ~ 850°C	
T TT MODULE	Resolution	±0.1mΩ or 0.001°C	
	Connection Type	4-wire smart connection	
	Excitation Current	1 mA - alternating constant current	
	Temperature Coefficient	±2ppm FS/°C (-10°C~10°C and 30°C~50°C)	
	TC Types	mV, S, R, B, K, N, E, J, T, C, D, G, L, U, LR, A, 10uV/°C, 1mV/°C, Standard TC	
	Electrical Measurement	-10~75mV: 50ppm RDG+2uV	
	TC measurement range	-270°C ∼ 1800°C	
	Resolution	±0.1uV or 0.001°C	
TC Measurement	Connection Type	Mini-TC	
	CJC compensation methods	Internal, external or manual entry	
	Temperature Coefficient	±5ppm FS/°C (-10°C~10°C and 30°C~50°C)	
	Internal CJC Specification	±0.15°C (-10°C~50°C)	



Accuracy Specifications

Accuracy (°C)				
Temperature	ADT282 Readout Only in Temperature	ADT282 Readout with Selected Probes*		
		AM1760	AM1751	AM1730
-200	0.005	0.013	0.017	0.017
0	0.006	0.009	0.011	0.011
100	0.009	0.014	0.016	0.016
232	0.013	0.019	0.021	0.021
420	0.018	0.027	0.029	0.029
660	0.026	0.040	0.043	N/A

^{*}Includes readout accuracy, probe calibration, and probe drift.(K=2)

Thermocouple Measurement

Thermocouple Measurement (Environment Temperature: 20±10°C)				
Туре	Temperature Range (°C)		Accuracy (°C) External CJC compensation (1 year)	Accuracy (°C) Internal CJC compensation (1 year)
		-50~0	0.51	0.53
s	-50 to 1768	0~100	0.37	0.40
		100~1768	0.28	0.32
		-50~0	0.54	0.56
R	-50 to 1768	0~200	0.38	0.41
		200~1768	0.25	0.29
		200~300	1.01	1.02
_	0.1.4000	300~500	0.66	0.68
В	0 to 1820	500~800	0.41	0.44
		800~1820	0.28	0.32
		-250 to -200	0.48	0.50
1 /	070 +- 4070	-200 to -100	0.15	0.21
К	-270 to 1372	-100 to 600	0.08	0.17
		600 to 1372	0.14	0.21
		-250 to -200	0.76	0.77
N	-270 to 1300	-200 to -100	0.22	0.27
		-100 to 1300	0.12	0.19
	-270 to 1000	-250~-200	0.26	0.30
E		-200~-100	0.10	0.18
-		-100~700	0.06	0.16
		700~1000	0.08	0.17
	-210~1200	-210~-100	0.13	0.20
J		-100~700	0.06	0.16
		700~1200	0.10	0.18
		-250~-100	0.36	0.39
т	-270 to 400	-100~0	0.08	0.17
		0~400	0.05	0.16
		0 to 1000	0.16	0.22
С	0 to 2315	1000 to 1800	0.26	0.30
		1800 to 2315	0.42	0.45



SPECIFICATIONS

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ermocouple Measurement (Environment Temperature: 20±10°C)				
Туре	Temperature Range (°C)		Accuracy (°C) 0 ⊂ External CJC compensation (1 year)	Accuracy (°C) Internal CJC compensation (1 year)
		0~100	0.21	0.26
D	0.0045	100~1200	0.16	0.22
U	0~2315	1200~2000	0.27	0.31
		2000~2315	0.42	0.45
		50~100	0.60	0.62
		100~200	0.38	0.41
G	0 to 2315	200~400	0.24	0.28
		400~1500	0.16	0.22
		1500~2315	0.32	0.35
		-200 to -100	0.07	0.17
L	-200 to 900	-100 to 400	0.06	0.16
		400 to 900	0.07	0.17
	-200 to 600	-200 to 0	0.14	0.21
U	-200 10 600	0 to 600	0.05	0.16
LR	-200~800	-200~0	0.09	0.17
	200-000	0~800	0.06	0.16
		0~1200	0.20	0.25
Α	0~2500	1200~2000	0.33	0.36
		2000~2500	0.48	0.50

Notes

- 1. The index is based on the accuracy of the thermocouple electrical measurement, does not include the accuracy of the thermocouple itself and the fixed cold junction compensation at 0 °C.
- 2. Combined accuracy specifications of probe and readout are calculated using the RSS method.
- 3. Additel provides standard S-typeTC probe with MINI-TC connector.

Ordering Information

Model Number

ADT282

Accessories

Accessories (Included)			
Model	Description	QTY	
9813-X	Power Adapter, external power adapter for Additel 282 Thermometer Readout	1 pc	
9704	Chargeable Li-ion battery	1 pc	
	Manual	1 pc	
	ISO 17025 accredited calibration certificate	1 pc	

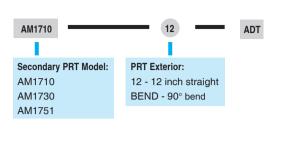
Optional Accessories			
Model	Description		
9052	USB Cable (TYPE - A to C)		
9071	Connector Adapter from smart connector to 4-wire with gold-plated spades for AM17XX PRTs		
9072	Smart connector with clamps		
9080	Cable kits (including TC plug, compensation cable, S,R,B,K,J,T,E,N)		
9918-SC	Soft carrying case, with space for instrument, test leads, and accessories		
9905	Carrying case for handheld calibrators and readouts with space for two PRTs		

*See page #6 for ordering info regarding common probes used with the ADT282.

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Secondary PRT Ordering Information





Secondary PRT Information

Specification	AM1710 Series	AM1730 Series	AM1751 Series	
Temperature Range	-60°C to 160°C	-200°C to 420°C	-200°C to 670°C	
Resistance at 0°C		Nominal 100 Ω		
Temperature Coefficient		0.003925 Ω / Ω / °C		
Accuracy	±0.025°C at -40°C ±0.015°C at 0.01°C ±0.025°C at 160°C	\pm 0.025°C at -196°C \pm 0.015°C at 0.01°C \pm 0.035°C at 420°C	±0.025°C at -196°C ±0.015°C at 0.01°C ±0.035°C at 420°C ±0.05°C at 661°C	
Drift	\pm 0.01°C at TPW after 100 hours at 160°C	\pm 0.01°C at TPW after 100 hours at 420°C	\pm 0.01°C at TPW after 100 hours at 661°C	
Short Term Stability		±0.007°C		
Thermal Shock	\pm 0.005°C after 10 times thermal cycles from minimum to maximum temperatures			
Hysteresis	<=0.005°C			
Self-heating	50 mW/°C			
Response Time	9 seconds for 63% response to step change in water moving at 3 feet per second			
Measurement Current	0.5 mA or 1 mA			
Sensor Length	32 mm			
Sensor Location	5 mm from tip			
Insulation Resistance	>1000 MΩ at room temperature			
Sheath Material	Stainless Steel	Steel Inconei tm		
	AM1710-12-ADT 0.25 in dia X 12 in (6.35 mm X 305 mm)	AM1730-12-ADT 0.25 in dia X 12 in (6.35 mm X 305 mm)	AM1751-12-ADT 0.25 in dia X 12 in (6.35 mm X 305 mm)	
Dimension	AM1710-BEND-ADT 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 7.4 inch (190 mm) from probe end	AM1730-BEND-ADT 0.25 in dia X 12 in (6.35 mm X 305 mm), 90° bend at 9.6 inch (245 mm) from probe end		
External Leads	Teflon tm –insulated copper wire, 4 leads, 2.5 meters			
Handle Dimension	15 mm (OD) x 65 mm (L)			
Handle Temperature Range ^[1]	-50°C to 160°C	-50°C to 180°C		
Optional Calibration	NIST traceable calibration and data available per request			

^[1] Handle temperature outside this range will cause damage to the probe. * PRT Information from www.accumac.com