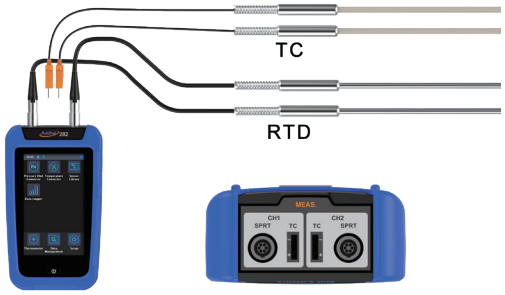
Additel
Metrology Made Simple

Additel 282
Dual-Channel Reference Thermometer Readout

- Accuracy to 0.006 °C at 0 °C
- 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.

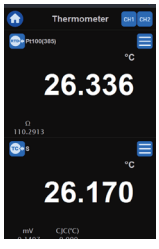


*Read up to two channels simultaneously

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.



Phone: 714-998-6899 Email: sales@additel.com
Rev # 20260130

Corporate Headquarters
2900 Saturn Street #B
Brea, CA 92821, USA

Salt Lake City Office
1364 West State Rd. Suite 101
Pleasant Grove, UT 84062, USA

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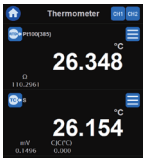
Main Features

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.

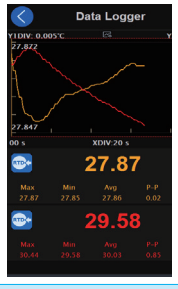
One Touch Control Center

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.

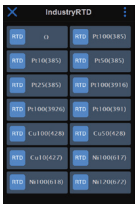
Datalogging



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.



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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
Environment	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
Warranty	1 Year

Measurement Specifications

Specification		
PRT Measurement	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	0~400Ω: ±0.5mΩ@(0~20Ω),±25ppm RD@(20Ω~400Ω)
	Measurement range	-200°C ~ 850°C
	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 Measurement	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 RD+2uV)
	TC measurement range	-270°C ~ 1800°C
	Resolution	±0.1uV or 0.001°C
	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)

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Accuracy Specifications

Accuracy (°C)										
T, °C	Rx,Ω	ADT282 readout only (C)	Readout with selected Probe Accuracy (°C)*							
			AM1760	AM1751	AM1730	AM1640	AM1660	AM1710	AM1612-2	AM1612-1
-200	18	0.005	0.013	0.021	0.021	0.053	0.053	n/a	0.072	n/a
-40	84	0.005	0.013	0.018	0.018	0.042	0.042	0.018	0.051	0.051
0	100	0.006	0.009	0.014	0.014	0.036	0.036	0.014	0.051	0.051
100	140	0.009	[1]	[1]	[1]	[1]	[1]	0.019	0.051	0.051
160	163	0.011	[1]	[1]	[1]	[1]	[1]	0.023	0.052	0.052
232	190	0.013	0.019	0.024	0.024	0.059	0.059	n/a	n/a	n/a
420	257	0.018	0.027	0.033	0.033	0.077	0.077	n/a	n/a	n/a
660	338	0.026	0.040	0.046	n/a	n/a	0.109	n/a	n/a	n/a

Note: [1] - These are non-standard calibration points, some probes are not calibrated at 100°C and/or 160°C.
*Includes readout accuracy, probe calibration, and probe drift.(K=2)

Thermocouple Measurement

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

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Thermocouple Measurement (Environment Temperature: 20±10°C)				
Type	Temperature Range (°C)		Accuracy (°C) External CJC compensation (1 year)	Accuracy (°C) Internal CJC compensation (1 year)
D	0~2315	0~100	0.21	0.26
		100~1200	0.16	0.22
		1200~2000	0.27	0.31
		2000~2315	0.42	0.45
G	0 to 2315	50~100	0.60	0.62
		100~200	0.38	0.41
		200~400	0.24	0.28
		400~1500	0.16	0.22
		1500~2315	0.32	0.35
L	-200 to 900	-200 to -100	0.07	0.17
		-100 to 400	0.06	0.16
		400 to 900	0.07	0.17
U	-200 to 600	-200 to 0	0.14	0.21
		0 to 600	0.05	0.16
LR	-200~800	-200~0	0.09	0.17
		0~800	0.06	0.16
A	0~2500	0~1200	0.20	0.25
		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	
9052	USB Cable type A to type C	1 pc	
9704	Chargeable Li-ion battery	1 pc	
	ISO 17025 accredited calibration certificate	1 pc	

Optional Accessories		
Model	Description	
9070	Smart connector for reference PRT used with ADT875, ADT878, and ADT282	
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,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	
9079-X	Thermocouple connection wire, mini male to alligator clips (X = type K, N, J, T, E)	

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

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Secondary PRT Ordering Information

AM1710 — 12 — ADT

Secondary PRT Model:
AM1710
AM1730
AM1751

PRT Exterior:
12 - 12 inch straight
BEND - 90° bend

AM17XX-12-ADT

AM17XX-BEND-ADT

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℃	Nominal 100Ω		
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	±0.025°C at -196°C ±0.015°C at 0.01°C ±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	±0.01°C at TPW after 100 hours at 160°C	±0.01°C at TPW after 100 hours at 420°C	±0.01°C at TPW after 100 hours at 661°C
Short Term Stability	±0.007°C		
Thermal Shock	±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	Inconel™	
Dimension	**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)
	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	**AM1751-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™ –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

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