Additel 286
Multifunction Reference Thermometer Readout



- Measure and calibrate SPRTs, RTDs, thermistors and thermocouples
- 1 PPM resistance ratio accuracy (channel 1)
- 8 1/2-digit DC multimeter
- Measure up to 82 channels
- Sample rates up to 10 channels per second
- Bluetooth, WIFI, USB& Ethernet (RJ-45) capable
- Auto temperature control of Additel and other manufacture's heat sources
- Built-in automatic temperature control, data collection, and coefficient generation
- Support for creating custom control of heat sources with RS-232
- Auto - zero power feature (self heating compensation)
- 10.1 in. touch screen display
- Supports fully automated temperature calibrations with data collection and report generation (no software required)

OVERVIEW

The Additel 286 Multifunction Reference Thermometer Readout is an industry first! We have combined the capabilities of a high-end reference thermometer with a highly capable data acquisition system and 8.5 digit multimeter. The ADT286 is capable of scanning and recording up to 82 channels at 10 channels per second. Users can easily configure the ADT286 to perform field calibrations and uniformity studies as well as use the unit in the lab as a precision thermometer and 8.5 digit multimeter. Get more for less with this newest game changer from Additel!

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Rev # 20200424

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ADT 286 Multifunction Reference Thermometer Readout Scanner Modules

If you're in need of a precision reference thermometer for your laboratory, then look no further than the Additel 286. The base unit comes with two precision readout channels that can be used to measure your SPRT. Need to calibrate RTDs, PRTs, thermistors or thermocouples? Add a scanner module and you now have the ability to measure 10 RTDs, PRTs, or thermistors and 20 thermocouples. Expand up to 82 channels with our unique easy to use scanner modules. Each 20 channel module is outfitted with our proprietary universal terminals with an industries best cold junction capability second to none. Utilize the module docked atop the ADT286, or connect remotely with cables to suit nearly any unique setup/configuration. Additel also has a process module specifically designed to measure process instrumentation like transmitters and switches. This scanner will also supply loop power for the transmitters.

Designed to make your job easier, the ADT286 has a large sensor library supporting 15 TC types, both standard and special limits, 18 different thermal resistors, CVD, ITS-90, and a large variety of standard curves for RTDs and thermistors. The ADT286 is loaded with special applications such as probe calibration, SPRT calibration, chamber mapping and more. And we continue to add applications on a regular basis!



Automatic Temperature Control and Probe Calibration

The Additel 286 Multifunction Reference Thermometer Readout has preinstalled drivers to control Additel and other manufacturer's heat sources. Simply connect to one or more heat sources via a communication cable, Ethernet or wireless and now it will automatically control to the set point and desired stability. If your heat source is not on the list, you can easily add the driver yourself so you can run automated calibrations with any heat source.

Now combine the heat source control feature with our probe calibration application and you have a very powerful automatic calibration solution. The probe calibration app allows you to automatically setup and run calibration routines with multiple set points and multiple heat sources, collect data, and develop calibration coefficients — all with one device and without the need of software! Simply place a batch of sensors of any mix and type into your heat source, connect it to the ADT286, run the probe calibration app and come back to a completed test. All that is left to do is generate and export all the calibration data. There's no need to work with complicated software for communication, set up or coefficient generation. There is no reason to have a calibration technician manually monitor the process and record the data. This Multifunction Reference Thermometer Readout will do all the work for you.

ADT280-RS Resistance Standards

Available in 25 & 100 Ohm values, users can enjoy improved resistance ratio performance by easily plugging one of our reference resisters into channel 2 on the new ADT286. Perfect for calibrating your SPRT's and high end PRT's. Each ADT280-RS resistor comes with adaptive binding posts to help facilitate utilization of the resistor in other applications as needed.



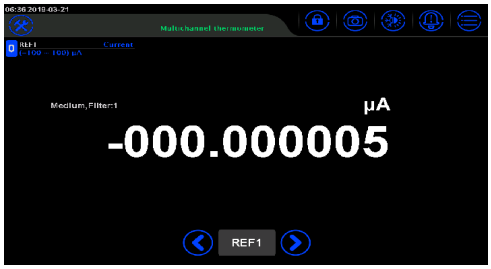
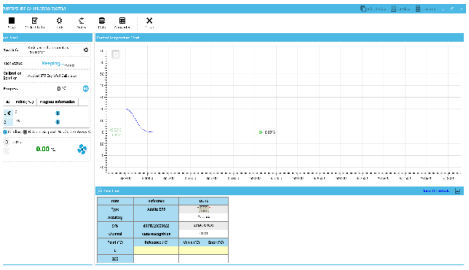
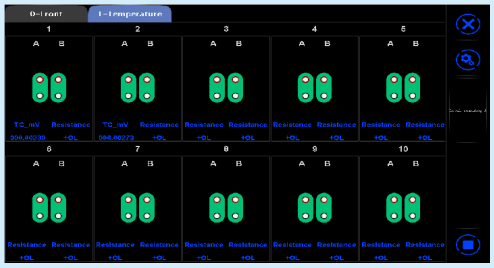
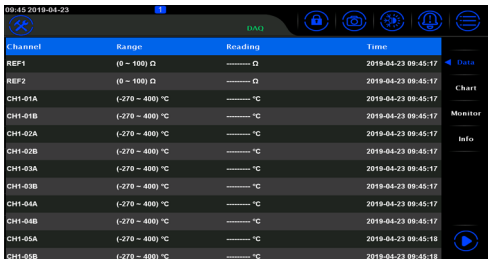
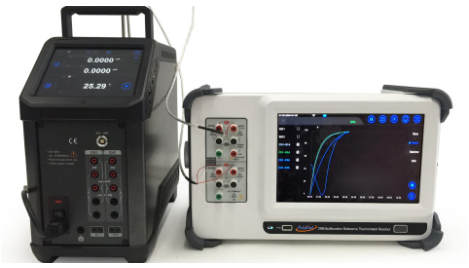
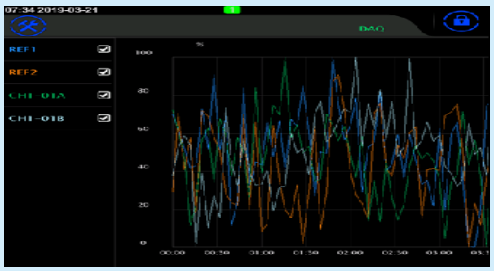
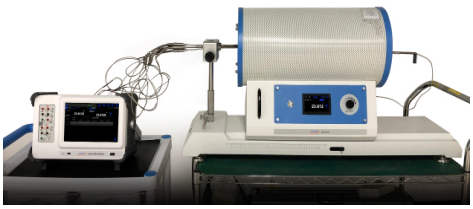
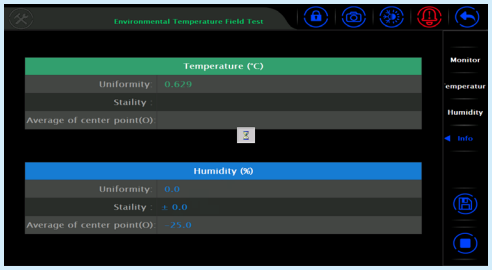


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FEATURES

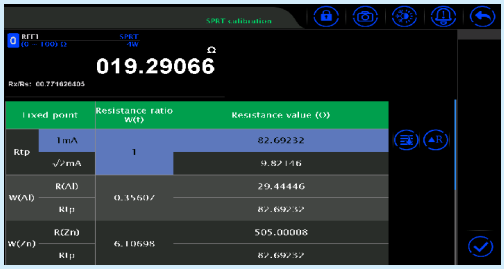
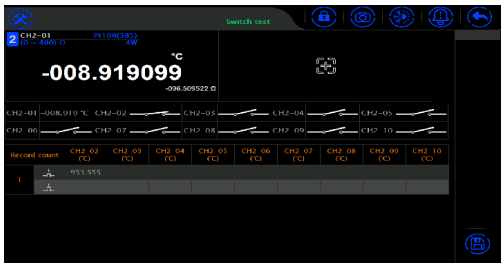
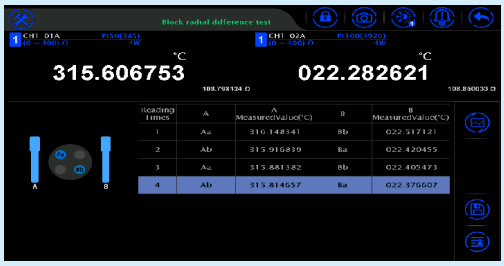
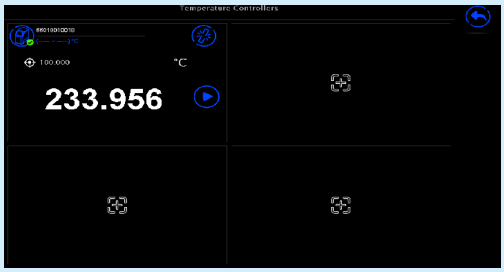
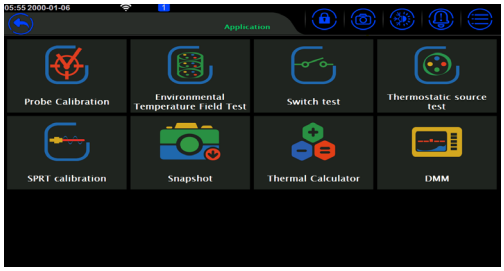
Specification	Display	Application
Multi-Channel		
Smart Connection		
DAQ Mode		
Temperature Mapping Mode		
Probe Calibration		
Environmental Temperature Field Test		

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APPLICATIONS

Specification	Display	Application
SPRT Mode		
Switch Testing		
Thermostatic Source Test		
DMM		
Heat Source Control		
Snapshot		

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SPECIFICATIONS

General Specifications

Specification	Description
Voltage	100V Setting 90V to 110V 120V Setting 108V to 132V 220V Setting 198V to 242V 240V Setting 216V to 264V
Frequency	47Hz to 440Hz.Automatically sensed at power-on
Power Consumption	40VA peak (30Watt average)
Temperature	Operating : 0°C to 50°C Full accuracy :18°C to 28°C Storage : -20°C to 70°C
Warm-up	60 mins for full uncertainty specifications
Relative Humidity (non-condensing)	Operating : 0°C to 28°C < 90% 28°C to 40°C < 75% 40°C to 50°C < 50% Storage : -20°C to 70°C < 95%
Altitude	Operating : 2000 m Storage : 12000 m
Vibration and Shock	Complies with MIL-28800F Class 3
Input Protection	50V all functions, ranges and terminals
Communication	USB-A , USB-B , RJ45 , WiFi , Bluetooth
Memory	10G - All data stored with time stamps
Localization	English , Chinese
Display	10.1 in (256 mm) TFT color display
Size (H x W x D)	9.8 in (250 mm) x 16.5 in (420 mm) x 7.9 in (200 mm)
Weight	18.5 lb (8.39 kg)
Other Conformities	CE

Measurement Specifications

Specification Conditions: 60 mins Warm-Up Time / Environment Temperature (18 - 28) °C.
The following specifications apply for front panel, after at least 60 minutes warm-up.
24-hour specifications are relative to calibration standards and assume a controlled electromagnetic environment per EN 61326.

Resistance Ratio Accuracy (Rx/Rs) using External Rs

Range	Reference Resistance	Ratio (Rx/Rs)	1 Year (23 ± 5) °C ppm of Reading
100 Ω	25 Ω	2.00-4.00	1.5
		1.10-2.00	0.85
		0.90-1.10	0.6
		0.50-0.90	1.5
		0.25-0.50	2.5
400 Ω	100 Ω	2.00-4.00	2
		1.10-2.00	0.81
		0.90-1.10	0.26
		0.50-0.90	0.95
		0.25-0.50	1.2



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SPRT/PRT Measurement Accuracy using External Rs

SPRT/PRT Type	External Reference Resistance	Temperature (°C)	Resistance Ratio (Rx/Rs)	1 Year(23 ± 5) °C ppm of reading	Equivalent to Temperature (mK)
PT25	25 Ω	-189.3442	0.22	2.5	0.13
		-38.8344	0.84	1.5	0.32
		0.01	1	0.6	0.15
		231.928	1.89	0.85	0.44
		419.527	2.57	1.5	1.11
		660.323	3.37	1.5	1.58
PT100	100 Ω	-189.3442	0.22	1.2	0.07
		-38.8344	0.84	0.95	0.20
		0.01	1	0.26	0.07
		231.928	1.89	0.81	0.42
		419.527	2.57	2	1.47
		660.323	3.37	2	2.11

[1] The PT25 indicator is based on a nominal resistance of 25 Ω for Rx.
[2] The PT100 indicator is based on a nominal resistance of 100 Ω for Rx.
[3] The uncertainty of external Rs is not included. The user may choose the ADT280-RS-25/100 standard resistor as external Rs, which has an accuracy of 5 ppm at (23±2) °C.

Resistance Accuracy using Internal Rs

Measurement Range	Scanning Speed	Resolution	24 Hour (23 ±1) °C	90 Days (23 ± 5) °C	1 year (23 ± 5) °C	Excitation Currert	Temperature Coefficient
(0~100) Ω	Slow Speed	0.01 mΩ	3 ppm or 0.2 mΩ	12 ppm or 0.35 mΩ	15 ppm or 0.35 mΩ	±1 mA/±12 V	3 ppm + 0.01 mΩ
	Medium Speed	0.01 mΩ	3 ppm or 0.55 mΩ	12 ppm or 0.7 mΩ	15 ppm or 0.7 mΩ		
	Fast Speed	0.1 mΩ	3.6 ppm or 1.7 mΩ	12.6 ppm or 1.85 mΩ	15.6 ppm or 1.85 mΩ		
(0~400) Ω	Slow Speed	0.01 mΩ	3 ppm or 0.3 mΩ	12 ppm or 0.4 mΩ	15 ppm or 0.4 mΩ	±1 mA/±12 V	3 ppm + 0.02 mΩ
	Medium Speed	0.01 mΩ	3 ppm or 0.7 mΩ	12 ppm or 0.8 mΩ	15 ppm or 0.8 mΩ		
	Fast Speed	0.1 mΩ	3.6 ppm or 1.9 mΩ	12.6 ppm or 2 mΩ	15.6 ppm or 2 mΩ		
(0~4000) Ω	Slow Speed	0.1 mΩ	3 ppm or 4 mΩ	12 ppm or 5 mΩ	15 ppm or 5 mΩ	±0.1 mA/±12 V	3 ppm + 0.2 mΩ
	Medium Speed	0.1 mΩ	3 ppm or 8 mΩ	12 ppm or 9 mΩ	15 ppm or 9 mΩ		
	Fast Speed	1 mΩ	3.6 ppm or 20 mΩ	12.6 ppm or 21 mΩ	15.6 ppm or 21 mΩ		

[1] Accuracy Index: ± (ppm of reading or xxmΩ , whichever is greater).
[2] Temperature coefficient index: exceeds (18-28) °C range, increase per degree (ppm reading +xxmΩ).
[3] Specifications are for 4-wire function. For 3-wire, add 0.005 Ω for internal resistance mismatch. For 2-wire, add 0.005 Ω for internal resistance
[4] Automatic current reversal.

PRT Measurement Accuracy using Internal Rs

Scanning Speed	Temperature	24 Hour / °C (23 ±1) °C	90 Days / °C (23 ± 5) °C	1 year / °C (23 ± 5) °C	Temperature Coefficient °C/°C
Slow Speed	-200 °C	0.0005	0.0008	0.0008	0.0002
	0 °C	0.0008	0.0031	0.0038	0.0008
	300 °C	0.0018	0.0089	0.0089	0.0018
	600 °C	0.0029	0.0146	0.0146	0.0030
Medium Speed	-200 °C	0.0013	0.0016	0.0016	0.0002
	0 °C	0.0014	0.0031	0.0038	0.0008
	300 °C	0.0020	0.0089	0.0089	0.0018
	600 °C	0.0029	0.0146	0.0146	0.0030
Fast Speed	-200 °C	0.0039	0.0043	0.0043	0.0006
	0 °C	0.0044	0.0047	0.0047	0.0013
	300 °C	0.0053	0.0093	0.0093	0.0024
	600 °C	0.0059	0.0152	0.0152	0.0036

[1] The indicator is based on the electrical accuracy of the 4-wire PT100 PRT and does not include the accuracy of the PRT itself.
[2] Temperature maximum Resolution is 0.0001 °C.

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Thermocouple Voltage Accuracy

Test Range	*Scanning Speed*	*Resolution*	*24 hours (23 ±1) °C*	*90 days (23 ±5) °C*	*1 year (23 ±5) °C*	*Input Resistance*	*Temperature Coefficient*
(-100-100) mV	Slow Speed	0.01 μV	5 ppm + 2 ppm	10 ppm + 4 ppm	14 ppm + 4 ppm	10 MΩ or >10 GΩ	1 ppm + 0.1 μV
	Medium Speed	0.01 μV	5 ppm + 6 ppm	10 ppm + 8 ppm	14 ppm + 8 ppm		
	Fast Speed	0.1 μV	5 ppm + 22 ppm	10 ppm + 24 ppm	14 ppm + 24 ppm		

[1] Accuracy Index: ± (ppm of reading + ppm of FS).
[2] Temperature coefficient index: Exceed the range of (18-28) °C, increase (ppm of reading + xxμV)/ °C.

Thermocouple Cold Junction Accuracy

CJC Accuracy	±0.1 °C , 1 year, 23 °C ± 5°C
Environmental Coefficient	Beyond (18 ~ 28) °C, add 0.02 °C / °C
Other	Each signal scanner has 10 cold Junction temperature sensors

Thermocouple Temperature Accuracy

Type	Temperature	*24 Hour/°C (23 ±1) °C*			*90 days/°C (23 ± 5) °C*			*1 year /°C (23 ±5) °C*		
		Fast Speed	Medium Speed	Slow Speed	Fast Speed	Medium Speed	Slow Speed	Fast Speed	Medium Speed	Slow Speed
E	-200	0.089	0.038	0.022	0.099	0.047	0.031	0.100	0.049	0.033
	-100	0.049	0.021	0.012	0.054	0.026	0.017	0.055	0.026	0.017
	-40	0.041	0.017	0.009	0.045	0.021	0.013	0.045	0.021	0.014
	0	0.038	0.015	0.009	0.041	0.019	0.012	0.041	0.019	0.012
	155	0.031	0.013	0.008	0.035	0.017	0.011	0.036	0.017	0.012
	350	0.029	0.013	0.008	0.033	0.017	0.012	0.035	0.018	0.013
	660	0.031	0.014	0.009	0.036	0.020	0.015	0.039	0.022	0.017
	1000	0.034	0.017	0.012	0.042	0.025	0.019	0.046	0.029	0.024
J	-200	0.102	0.043	0.025	0.113	0.054	0.036	0.115	0.055	0.037
	-100	0.054	0.022	0.013	0.060	0.028	0.018	0.060	0.028	0.019
	-40	0.047	0.019	0.011	0.051	0.024	0.015	0.051	0.024	0.015
	0	0.044	0.018	0.010	0.048	0.022	0.014	0.048	0.022	0.014
	155	0.041	0.017	0.010	0.045	0.021	0.014	0.046	0.022	0.015
	350	0.042	0.018	0.011	0.047	0.023	0.016	0.048	0.025	0.018
	660	0.039	0.018	0.011	0.046	0.024	0.018	0.048	0.027	0.020
	1200	0.044	0.022	0.015	0.054	0.031	0.024	0.059	0.036	0.029
K	-200	0.146	0.061	0.035	0.161	0.076	0.050	0.163	0.077	0.051
	-100	0.073	0.030	0.017	0.080	0.037	0.024	0.080	0.038	0.025
	-40	0.060	0.025	0.014	0.066	0.030	0.020	0.066	0.031	0.020
	0	0.056	0.023	0.013	0.061	0.028	0.018	0.061	0.028	0.018
	155	0.056	0.023	0.013	0.061	0.029	0.019	0.062	0.030	0.020
	350	0.054	0.023	0.014	0.061	0.030	0.020	0.062	0.031	0.021
	660	0.055	0.025	0.015	0.063	0.033	0.023	0.066	0.035	0.026
	1372	0.073	0.035	0.023	0.087	0.049	0.037	0.093	0.055	0.043

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Thermocouple Temperature Accuracy

Type	Temperature	*24 Hour*/ °C *(23 ±1)* °C			*90 days*/ °C *(23 ± 5)* °C			*1 year* / °C *(23 ±5)* °C		
		Fast Speed	Medium Speed	Slow Speed	Fast Speed	Medium Speed	Slow Speed	Fast Speed	Medium Speed	Slow Speed
T	-200	0.142	0.059	0.034	0.156	0.073	0.048	0.157	0.075	0.049
	-100	0.078	0.032	0.018	0.086	0.040	0.026	0.086	0.040	0.026
	-40	0.063	0.026	0.015	0.069	0.032	0.020	0.069	0.032	0.021
	0	0.057	0.023	0.013	0.062	0.028	0.018	0.062	0.028	0.018
	155	0.044	0.019	0.011	0.049	0.023	0.015	0.049	0.024	0.016
	350	0.038	0.016	0.010	0.043	0.021	0.015	0.044	0.022	0.016
	400	0.037	0.016	0.010	0.042	0.021	0.015	0.044	0.023	0.016
R	-40	0.543	0.222	0.124	0.593	0.272	0.173	0.593	0.272	0.173
	0	0.416	0.170	0.095	0.454	0.208	0.132	0.454	0.208	0.132
	155	0.266	0.109	0.061	0.290	0.134	0.086	0.291	0.134	0.086
	350	0.220	0.091	0.051	0.241	0.112	0.072	0.242	0.113	0.073
	660	0.192	0.080	0.046	0.212	0.100	0.066	0.214	0.102	0.068
	1768	0.188	0.082	0.049	0.213	0.107	0.074	0.219	0.114	0.081
S	-40	0.515	0.211	0.117	0.562	0.258	0.164	0.562	0.258	0.164
	0	0.407	0.167	0.093	0.444	0.204	0.130	0.444	0.204	0.130
	155	0.275	0.113	0.063	0.300	0.138	0.089	0.301	0.139	0.089
	350	0.236	0.098	0.055	0.259	0.120	0.078	0.260	0.122	0.079
	660	0.214	0.089	0.051	0.236	0.111	0.073	0.239	0.114	0.075
	1768	0.222	0.096	0.057	0.250	0.124	0.086	0.257	0.132	0.093
B	250	0.872	0.357	0.199	0.952	0.437	0.278	0.952	0.437	0.279
	350	0.619	0.254	0.141	0.676	0.311	0.198	0.676	0.311	0.199
	660	0.342	0.141	0.079	0.374	0.173	0.111	0.375	0.175	0.113
	1820	0.199	0.085	0.050	0.222	0.108	0.073	0.227	0.113	0.078
N	-200	0.224	0.093	0.052	0.246	0.115	0.075	0.247	0.116	0.076
	-100	0.106	0.044	0.024	0.116	0.054	0.035	0.116	0.054	0.035
	-40	0.089	0.036	0.020	0.097	0.045	0.029	0.097	0.045	0.029
	0	0.084	0.035	0.019	0.092	0.042	0.027	0.092	0.042	0.027
	155	0.070	0.029	0.017	0.077	0.036	0.024	0.078	0.037	0.024
	350	0.062	0.026	0.015	0.069	0.033	0.022	0.070	0.035	0.024
	660	0.059	0.026	0.016	0.067	0.034	0.024	0.069	0.036	0.026
	800	0.060	0.027	0.016	0.068	0.035	0.025	0.071	0.038	0.028
	1000	0.062	0.028	0.018	0.072	0.038	0.028	0.075	0.042	0.031
	1200	0.065	0.030	0.019	0.076	0.041	0.031	0.081	0.046	0.035
	1300	0.068	0.032	0.020	0.080	0.044	0.033	0.085	0.049	0.038
L	-200	0.069	0.029	0.017	0.076	0.036	0.024	0.077	0.037	0.025
	-100	0.053	0.022	0.013	0.059	0.028	0.018	0.059	0.028	0.018
	-40	0.045	0.019	0.010	0.049	0.023	0.015	0.050	0.023	0.015
	0	0.043	0.018	0.010	0.047	0.021	0.014	0.047	0.021	0.014
	155	0.040	0.017	0.010	0.044	0.021	0.014	0.045	0.022	0.015
	350	0.041	0.018	0.011	0.046	0.023	0.016	0.047	0.024	0.017
	660	0.039	0.018	0.011	0.046	0.024	0.018	0.048	0.027	0.020
	900	0.035	0.017	0.011	0.042	0.023	0.017	0.045	0.026	0.021
U	-80	0.072	0.030	0.017	0.079	0.037	0.024	0.079	0.037	0.024
	-40	0.062	0.026	0.014	0.068	0.031	0.020	0.068	0.032	0.020
	0	0.056	0.023	0.013	0.061	0.028	0.018	0.061	0.028	0.018
	155	0.045	0.019	0.011	0.049	0.023	0.015	0.050	0.024	0.016
	350	0.037	0.016	0.010	0.042	0.021	0.014	0.043	0.022	0.016
	600	0.034	0.015	0.010	0.039	0.021	0.015	0.041	0.023	0.017

[1] The index is based on the accuracy of the thermocouple electrical measurement of temperature scanner module, does not include the accuracy of the thermocouple itself and the fixed cold junction compensation at 0 °C.
[2] The highest temperature resolution is 0.0001 °C.

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Thermistor Accuracy

Measurement Range	Scanning Speed	Resolution	24 Hour (23 ±1) °C	90 Days (23 ± 5) °C	1 year (23 ± 5) °C	Excitation Currert	Temperature Coefficient
(0~12) kΩ	Slow Speed	1 mΩ	10 ppm or 60 mΩ	30 ppm or 80 mΩ	40 ppm or 80 mΩ	10 µA	5 ppm + 10 mΩ
	Medium Speed	1 mΩ	10 ppm or 110 mΩ	30 ppm or 130 mΩ	40 ppm or 130 mΩ		
	Fast Speed	10 mΩ	10 ppm or 210 mΩ	30 ppm or 230 mΩ	40 ppm or 230 mΩ		
(10~120) kΩ	Slow Speed	10 mΩ	10 ppm	30 ppm	40 ppm	10 µA	5 ppm + 20 mΩ
	Medium Speed	10 mΩ	10 ppm + 80 mΩ	30 ppm + 80 mΩ	40 ppm + 80 mΩ		
	Fast Speed	100 mΩ	10.6 ppm + 200 mΩ	30.6 ppm + 200 mΩ	40.6 ppm + 200 mΩ		
(100~1000) kΩ	Slow Speed	0.1 Ω	50 ppm	80 ppm	100 ppm	1 µA	5 ppm + 1 Ω
	Medium Speed	0.1 Ω	50 ppm + 1 Ω	80 ppm + 1 Ω	100 ppm + 1 Ω		
	Fast Speed	1 Ω	51 ppm + 2 Ω	81 ppm + 2 Ω	101 ppm + 2 Ω		

[1] Accuracy Index: ± (ppm of reading or xxmΩ , whichever is greater).
[2] Temperature coefficient index: exceeds (18-28) °C range, increase (ppm reading +xxmΩ) / °C.
[3] Specifications are for 4-wire function.

Thermistor Temperature Accuracy

Type	Scanning Speed	Temperature	24 Hour / °C (23 ±1) °C	90 Days / °C (23 ± 5) °C	1 year / °C (23 ± 5) °C
10 kΩ	Slow Speed	-40 °C	0.0007	0.0011	0.0014
		0 °C	0.0002	0.0006	0.0008
		50 °C	0.0004	0.0008	0.0011
		100 °C	0.0030	0.0039	0.0039
		150 °C	0.0130	0.0174	0.0174
	Medium Speed	-40 °C	0.0007	0.0011	0.0014
		0 °C	0.0002	0.0006	0.0008
		50 °C	0.0008	0.0010	0.0011
		100 °C	0.0054	0.0064	0.0064
		150 °C	0.0239	0.0282	0.0282
	Fast Speed	-40 °C	0.0007	0.0011	0.0014
		0 °C	0.0002	0.0006	0.0008
		50 °C	0.0016	0.0016	0.0016
		100 °C	0.0104	0.0104	0.0104
		150 °C	0.0456	0.0456	0.0456

[1] The indicator is based on the electrical accuracy of the 4-wire thermistor and does not include the accuracy of the thermistor itself.
[2] Temperature maximum Resolution is 0.0001 °C.

DC Voltage Accuracy

Test Range	Scanning Speed	Resolution	24 hours (23 ±1) °C	90 days (23 ±5) °C	1 year (23 ±5) °C	Input Resistance	Temperature Coefficient
(-100-100) mV	Slow Speed	0.01 µV	5 ppm + 2 ppm	10 ppm + 4 ppm	14 ppm + 4 ppm	>10 GΩ or 10 MΩ	1 ppm + 0.1 µV
	Medium Speed	0.01 µV	5 ppm + 6 ppm	10 ppm + 8 ppm	14 ppm + 8 ppm		
	Fast Speed	0.1 µV	5 ppm + 22 ppm	10 ppm + 24 ppm	14 ppm + 24 ppm		
(-1-1) V	Slow Speed	0.1 µV	2 ppm + 0.3 ppm	8 ppm + 0.6 ppm	14 ppm + 0.6 ppm	>10 GΩ or 10 MΩ	1 ppm + 0.2 µV
	Medium Speed	0.1 µV	2 ppm + 1.3 ppm	8 ppm + 1.6 ppm	14 ppm + 1.6 ppm		
	Fast Speed	1 µV	2.6 ppm + 3.3 ppm	8.6 ppm + 3.6 ppm	14.6 ppm + 3.6 ppm		
(-10-10) V	Slow Speed	1 µV	2 ppm + 0.05 ppm	8 ppm + 0.08 ppm	14 ppm + 0.08 ppm	>10 GΩ or 10 MΩ	1 ppm + 0.3 µV
	Medium Speed	1 µV	2 ppm + 0.35 ppm	8 ppm + 0.38 ppm	14 ppm + 0.38 ppm		
	Fast Speed	10 µV	2.6 ppm + 1.05 ppm	8.6 ppm + 1.08 ppm	14.6 ppm + 1.08 ppm		
(-50-50) V	Slow Speed	10 µV	8 ppm + 1 ppm	32 ppm + 1 ppm	38 ppm + 1 ppm	10 MΩ	5 ppm + 5 µV
	Medium Speed	10 µV	8 ppm + 2 ppm	32 ppm + 2 ppm	38 ppm + 2 ppm		
	Fast Speed	100 µV	8.6 ppm + 7 ppm	32.6 ppm + 7 ppm	38.6 ppm + 7 ppm		

[1] Accuracy Index: ± (ppm of reading + ppm of FS).
[2] Temperature Coefficient index: Exceed the range of (18-28) °C, increase (ppm reading + xxµV)/ °C.
[3] Any range, the maximum input voltage is 50 V.

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DC Current Accuracy

Test Range	Scanning Speed	Resolution	24 hours (23 ±1) °C	90 days (23 ±5) °C	1 year (23 ±5) °C	Burden Voltage	Temperature Coefficient
(-100-100) µA	Slow Speed	0.01 nA	15 ppm + 3 ppm	50 ppm + 6 ppm	60 ppm + 6 ppm	<1 mV	8 ppm + 0.1 nA
	Medium Speed	0.01 nA	15 ppm + 7 ppm	50 ppm + 10 ppm	60 ppm + 10 ppm		
	Fast Speed	0.1 nA	15 ppm + 23 ppm	50 ppm +26 ppm	60 ppm + 26 ppm		
(-1-1) mA	Slow Speed	0.1 nA	15 ppm + 0.6 ppm	50 ppm +1 ppm	60 ppm + 1 ppm	<1 mV	8 ppm + 0.5 nA
	Medium Speed	0.1 nA	15 ppm + 1.6 ppm	50 ppm + 2 ppm	60 ppm + 2 ppm		
	Fast Speed	1 nA	15.6 ppm + 3.6ppm	50.6 ppm + 4 ppm	60.6 ppm + 4 ppm		
(-10-10) mA	Slow Speed	1 nA	30 ppm + 3 ppm	75 ppm + 6 ppm	80 ppm + 6 ppm	<1 mV	8 ppm + 10 nA
	Medium Speed	1 nA	30 ppm + 7 ppm	75 ppm + 10 ppm	80 ppm + 10 ppm		
	Fast Speed	10 nA	30 ppm + 23 ppm	75 ppm + 26 ppm	80 ppm + 26 ppm		
(-100-100) mA	Slow Speed	10 nA	40 ppm + 0.6 ppm	75 ppm + 1 ppm	80 ppm + 1 ppm	<1 mV	8 ppm + 50 nA
	Medium Speed	10 nA	40 ppm + 1.6 ppm	75 ppm + 2 ppm	80 ppm + 2 ppm		
	Fast Speed	100 nA	40.6 ppm + 3.6 ppm	75.6 ppm + 4 ppm	80.6 ppm + 4 ppm		

[1] Accuracy Index: ± (ppm of reading + ppm of FS).
[2] Temperature Coefficient index:Exceed the range of range of (18-28) °C, increase (ppm reading+ xxnA)/ °C.
[3] Input Protection 0.3A/600V Resettable PTC.

DC Resisstance Accuracy

Test Range	Scanning Speed	Resolution	24 hours (23 ±1) °C	90 days (23 ±5) °C	1 year (23 ±5) °C	Excitation Current	Temperature Coefficient
(0-100) Ω	Slow Speed	0.01 mΩ	3 ppm + 1 ppm	13 ppm + 1.5 ppm	16 ppm + 1.5 ppm	1 mA	3 ppm + 0.01 mΩ
	Medium Speed	0.01 mΩ	3 ppm + 5 ppm	13 ppm + 5.5 ppm	16 ppm + 5.5 ppm		
	Fast Speed	0.1 mΩ	3 ppm + 21 ppm	13 ppm + 21.5 ppm	16 ppm + 21.5 ppm		
(0-1) kΩ	Slow Speed	0.1 mΩ	3 ppm + 0.2 ppm	12 ppm + 0.3 ppm	15 ppm + 0.3 ppm	1 mA	3 ppm + 0.02 mΩ
	Medium Speed	0.1 mΩ	3 ppm + 1.2 ppm	12 ppm + 1.3 ppm	15 ppm + 1.3 ppm		
	Fast Speed	1 mΩ	3.6 ppm + 3.2 ppm	12.6 ppm + 3.3 ppm	15.6 ppm + 3.3 ppm		
(0-10) kΩ	Slow Speed	1 mΩ	3 ppm + 0.3 ppm	12 ppm + 0.4 ppm	15 ppm + 0.4 ppm	0.1 mA	3 ppm + 0.2 mΩ
	Medium Speed	1 mΩ	3 ppm + 1.3 ppm	12.6 ppm + 1.3 ppm	15 ppm + 1.3 ppm		
	Fast Speed	10 mΩ	3.6 ppm + 3.3 ppm	12.6 ppm + 3.4 ppm	15.6 ppm + 3.4 ppm		
(0-100) kΩ	Slow Speed	10 mΩ	3 ppm + 0.2 ppm	12 ppm + 0.3 ppm	15 ppm + 0.3 ppm	0.1 mA	3 ppm + 20 mΩ
	Medium Speed	10 mΩ	3 ppm + 0.5 ppm	12 ppm + 0.6 ppm	15 ppm + 0.6 ppm		
	Fast Speed	100 mΩ	3.6 ppm + 1.3 ppm	12.6 ppm + 1.3 ppm	30.6 ppm + 1.3 ppm		
(0-1) MΩ	Slow Speed	0.1 Ω	10 ppm + 0.6 ppm	30 ppm + 1 ppm	40 ppm + 1 ppm	10 µA	5 ppm + 0.2 Ω
	Medium Speed	0.1 Ω	10 ppm + 1.2 ppm	30 ppm + 0.6 ppm	40 ppm + 0.6 ppm		
	Fast Speed	1 Ω	10 ppm + 2.6 ppm	30 ppm + 3 ppm	40 ppm + 3 ppm		
(0-10) MΩ	Slow Speed	1 Ω	50 ppm + 0.4 ppm	80 ppm + 1 ppm	100 ppm + 1 ppm	1 µA	10 ppm + 1 Ω
	Medium Speed	1 Ω	50 ppm + 1.4 ppm	80 ppm + 2 ppm	100 ppm + 2 ppm		
	Fast Speed	10 Ω	50 ppm + 4.4 ppm	80 ppm + 5 ppm	100 ppm + 5 ppm		
(0-100) MΩ	Slow Speed	10 Ω	150 ppm + 1 ppm	400 ppm + 4 ppm	500 ppm + 4 ppm	0.1 µA	50 ppm + 50 Ω
	Medium Speed	10 Ω	150 ppm + 6 ppm	400 ppm + 9 ppm	500 ppm + 9 ppm		
	Fast Speed	100 Ω	150 ppm + 11 ppm	400 ppm + 14 ppm	500 ppm + 14 ppm		

[1] Accuracy Index: ± (ppm of reading + ppm of FS).
[2] Temperature Coefficient index:Exceed the range of range of (18-28) °C, increase (ppm reading+ xx Ω)/ °C.
[3] The above is a 4-wire measurement index.
[4] When the range is less than or equal to 10 kΩ, the default is automatic current reversal.
[5] Max Lead Resistance(4-wire ohms): 10 Ω per lead for 100 Ω & 1 kΩ ranges; 100 Ω per lead for 10 kΩ &100 kΩ ranges; 1 kΩ per lead on all other ranges.

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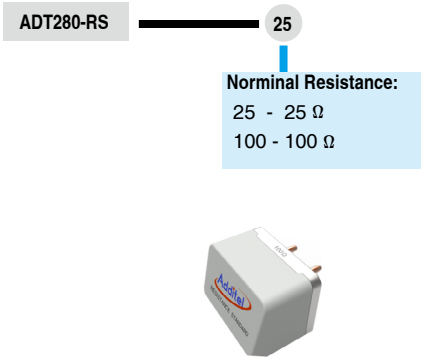
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Ordering Information

Model Number		
Model	**Description**	**Picture**
ADT286-110V ADT286-220V	Multifunction Reference Thermometer Readout base unit only	
ADT286-TS-PKG-110V ADT286-TS-PKG-220V	Multifunction Reference Thermometer Readout base unit with (1) Temperature Scanner Module (9051 cable not included)	
ADT286-PS-PKG-110V ADT286-PS-PKG-220V	Multifunction Reference Thermometer Readout base unit with (1) Process Scanner Module (9051 cable not included)	

Standard Reference Resistor Ordering Information



ADT280-RS-X

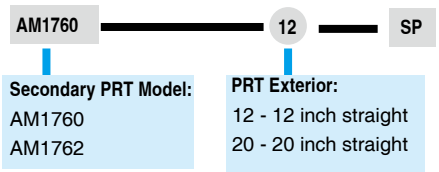
Accessories

Accessories (Included)		
Standard Accessories	**Quantity**	**Picture**
Shorting Block (1210103531)	1 pc.	
USB Cable (UK-415) (1210200243)	1 pc.	
Test leads	4 sets (8 pcs)	
9026 2-Wire Test Leads (Only w/ ADT286-TS-PKG & ADT286-PS-PKG)	20 pcs	
Fuse (50T-0315H)	2 pcs	
Calibration Certificate	1 pc.	
CD Manual	1 pc.	

Optional Accessories		
Model	**Optional Accessories**	**Picture**
9026	2-wire test leads(20-Pack)	
9051-10	Dsub Comm Cable=10 ft	
9051-33	Dsub Comm Cable=33 ft	
9050 USB to RS232 (DB9/M) Adapter	1 pc.	
9916-286	Carrying Case for ADT286,(2) scanner modules and reference probe w/wheels	
ADT286-DOCK	Remote Module Docking Station w/AC Adapter	
ADT286-TS	ADT286 Temperature Scanner Module	
ADT286-PS	ADT286 Process Scanner Module	
ADT280-RS-25	25 Ω Standard Reference Resistor	
ADT280-RS-100	100 Ω Standard Reference Resistor	

Resistance Standards		
Specification	**ADT280-RS-25**	**ADT280-RS-100**
Nominal Resistance	25 Ω	100 Ω
Stability	5 ppm/year	5 ppm/year
Operating Temperature	23 °C±2 °C	23 °C±2 °C
Temperature Coefficient	0.5 ppm/°C	0.5 ppm/°C
Size	57 mm x 57 mm x 45 mm	57 mm x 57 mm x 45 mm
Weight	0.35 lb (160 g)	0.35 lb (160 g)
Excitation Current	1 mA	1 mA

Secondary Standard PRT Ordering Information





AM17XX-X-SP

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Secondary Standard PRT Information

Specification	*AM1760 Series*	*AM1762 Series*
Temperature Range	-200 °C to 670 °C	-200 °C to 670 °C
Resistance at 0°C	Nominal 100 Ω	Nominal 25 Ω
Temperature Coefficient	0.003925 Ω / Ω / °C	
Accuracy	±0.007 °C at -196 °C ±0.006 °C at 0.01 °C ±0.015 °C at 420 °C ±0.025 °C at 660 °C	±0.007 °C at -196 °C ±0.006 °C at 0.01 °C ±0.015 °C at 420 °C ±0.025 °C at 660 °C
Drift	±0.004 °C at TPW after 100 hours at 661 °C	
Short Term Stability	±0.002 °C	
Thermal Shock	±0.002 °C after 10 times thermal cycles from minimum to maximum temperatures	
Hysteresis	N/A	
Self-heating	0.0015 °C at 1 mA current	
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	42 mm	
Sensor Location	5 mm from tip	
Insulation Resistance	>1000 MΩ at room temperature	
Sheath Material	Inconel™	
Dimension	**AM1760-12-SP** 0.25 in dia X 12 in (6.35 mm X 305 mm) **AM1760-20-SP** 0.25 in dia X 20 in (6.35 mm X 500 mm)	**AM1762-12-SP** 0.25 in dia X 12 in (6.35 mm X 305 mm) **AM1762-20-SP** 0.25 in dia X 20 in (6.35 mm X 500 mm)
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
Calibration	NIST traceable calibration w/ data included	

[1] Handle temperatures outside the usable will cause damage to the probe.
* PRT Information from www.accumac.com.

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