



ADT875 Series Dry Well Calibrator



Additel 875 Series Dry Well Calibrator

—————User's Manual

Latest version at www.additel.com

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Additel Corporation

STATEMENT

This user's manual provides operating and safety instructions for the ADT875 Series Dry Well Calibrator. To ensure correct operation and safety, please follow the instructions in this manual. Additel Corporation reserves the right to change the contents and other information contained in this manual without notice. For the most up-to-date manual, please visit www.additel.com.

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Welcome

The Additel 875 Series Dry Well Calibrators combine excellent performance in stability, radial and axial uniformity, loading with speed, ruggedness and portability. The Process Calibrator option adds the capabilities of a three-channel thermometer readout and a documenting process calibrator. This option includes the ability to measure a reference PRT and two devices under test channels, which can measure, mA, voltage, switch, RTD or thermocouple. When utilizing a reference PRT, the user can control the dry well set point using the external reference PRT for improved performance and periodic self calibration.

How to Contact

A Shelby Jones Company

Phone: +1-610-446-6600

Fax: +1-610-449.7010

E-mail: info@instrumentation.com or

Website: www.instrumentation.com

Safety Information

WARNINGS - identify action or condition that may be hazards to the user.

CAUTIONS - identify action or condition that may damage the calibrator or the equipment under test.

WARNINGS:


To prevent personal injury, please follow this user manual.

To prevent possible electrical shock, fire, or personal injury, please:

1. General:

- ◆ Check product exterior before use
- ◆ Read and follow all instructions carefully
- ◆ Dry well calibrator should be used by trained person only
- ◆ Before initial use, or after storage in humid environments, or anytime the dry well calibrator has not been used for more than 10 days, the dry well calibrator needs to be started with "Dry-out" function over 2 hours first to meet all safety requirements and specifications, see section 5.3
- ◆ Do NOT use the product if it is damaged or operates incorrectly
- ◆ Do NOT use in flammable, high humidity, or dusty environments
- ◆ Turn off the power switch before unplugging the power cord

2. High Temperature:

- ◆ Dry well calibrator has a high temperature warning symbol  , this symbol indicates when the block temperature is over 50°C
- ◆ Do NOT touch or move the probe or insert when the high temperature warning symbol is on
- ◆ Verify the status of the high temperature indicator prior to each use to avoid potential harm when handling the unit, probes and inserts
- ◆ Keep fingers, hands and other body parts clear of the heat shield at all times
- ◆ Do NOT touch any part of the dry well other than the touch screen, electrical measurement board and power switch, when the high temperature indicator is Active.

3. Electrical:

- ◆ Double check power connection, fuse model and installation before each use
- ◆ Do NOT open the dry well exterior. High voltage is present when the unit is plugged in
- ◆ Do NOT apply more than 30V AC or DC to any of the process calibrator inputs (ADT875PC only)
- ◆ Do NOT use any test leads other than those provided with the dry well calibrator (ADT875PC only)
- ◆ Disconnect all test leads before switching to other electrical measurement functions (ADT875PC only)

CAUTIONS:

To prevent instrument damage, please follow this user manual.

To prevent possible electrical shock, fire, or instrument damage, please:

- ◆ Do NOT shake, drop, or bump the calibrator while in use
- ◆ Do NOT use any power cord other than the one provided with the dry well calibrator
- ◆ Do NOT unplug the power cord while in use
- ◆ Do NOT clean the dry well with liquid, please contact Additel for cleaning process
- ◆ Do NOT drop anything into the dry well slowly and careful place inserts and probes into the dry well calibrator. To avoid damaging the unit, it is best to use the insert removal tool when both inserting and removing inserts.

1. Introduction

1.1 Model Information

Table 1 Model Information

Specification	ADT875PC			ADT875		
	-155	-350	-660	-155	-350	-660
Temperature Range	(-40~155) °C	(33~350) °C	(33~660) °C	(-40~155) °C	(33~350) °C	(33~660) °C
mA/mV/V/Ω Measurement	•	•	•			
DC 24V Output	•	•	•			
HART Communication	•	•	•			
Switch Test	•	•	•			
External PRT (Temperature Control)	•	•	•			
Task Function	•	•	•			
Database	•	•	•			
Self Calibration	Auto & Manual Mode	Auto & Manual Mode	Auto & Manual Mode	Manual Mode	Manual Mode	Manual Mode
Application	•	•	•	•	•	•
Intelligent Diagnosis	•	•	•	•	•	•
Remote Control	•	•	•	•	•	•
Weight	9.9 kg (21.8 lbs)	8.6 kg (17.2 lbs)		9.8 kg (19.6 lbs)	8.5 kg (17.0 lbs)	

1.2 Basic Structure

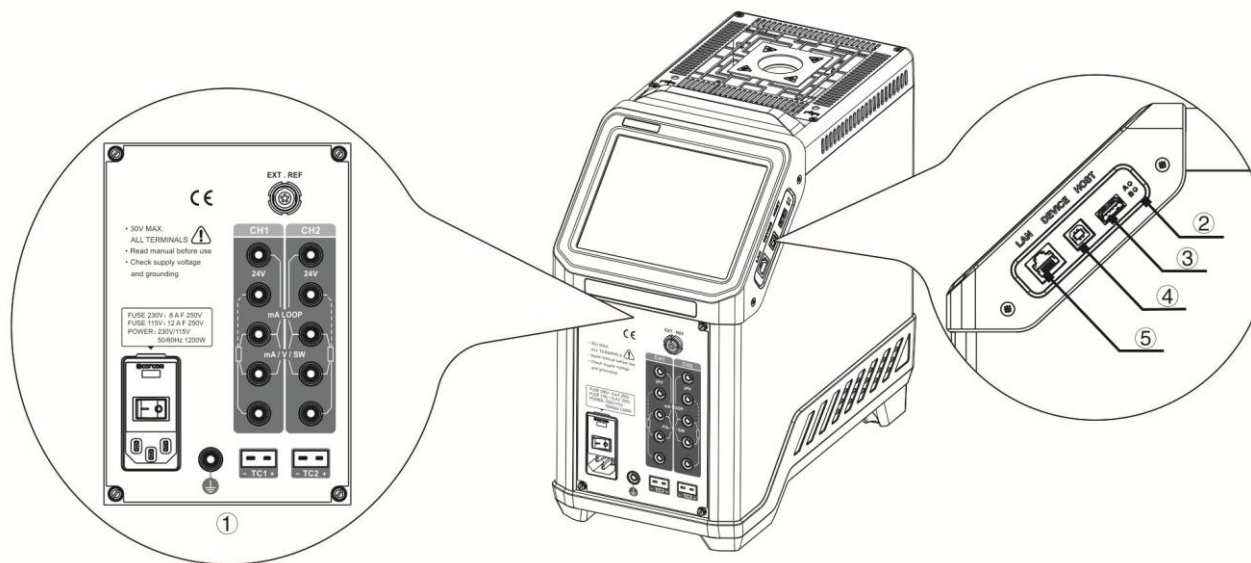


Figure 1 Basic Structure

Table 2 Basic Structure

No.	Description
1	Electrical Measurement Panel
2	Factory Restore Button
3	USB Port (Host)
4	USB Port (Device)
5	Network Cable Port

1.3 Features

- ◆ Three models ranging from -40°C to 660°C
- ◆ Portable, rugged, and quick to temperature
- ◆ Metrology-level performance in stability, uniformity, accuracy and loading effect
- ◆ Dual-zone control
- ◆ Process calibrator option provides a multi-channel readout for use with a reference thermometer, RTDs and TCs, as well as task documentation, switch testing and HART communication
- ◆ Color touch screen display
- ◆ Choose your own range option
- ◆ Set point control by reference PRT
- ◆ Self-calibration feature

1.4 Environmental Conditions

- ◆ Working Temperature: (0~50) °C / (32~122) °F (Accuracy guarantee: 8°C~38°C / 46°F~100°F)
- ◆ Storage Temperature: (-20~60) °C / (-4~140) °F
- ◆ Humidity: 0 ~ 90% (0°C ~ 50°C or 32°F ~ 122°F), RH (non-condensing)
- ◆ Atmosphere Pressure: Less than 3,000 m (9,800 ft)
- ◆ Protect Level: IP20

1.5 Technical Specifications

1. General:

Table 3 General Specifications

Specification	ADT875PC / ADT875		
	875-155	875-350	875-660
Dimensions	320 x 170 x 330 mm (12.6 x 6.7 x 13.0 in)		
Power Supply	(90-242)VAC, (45-65)Hz, 580W	(90-242)VAC, (45-65)Hz, 1200W	
Fuse	230V: 4A F 250V 115V: 8A F 250V	230V: 8A F 250V 115V: 16A F 250V	
Display	6.5 in (165 mm) color touch screen		
Communication	USB A, USB B, RJ45, Wi-Fi, Bluetooth		
Localization	English, Chinese, Japanese, Russian, German, French, Italian, and Spanish		
Temperature Unit	°C, °F, K		
Temperature Resolution	0.01°C / 0.01°F/ 0.01 K		
Compliance	CE		

2. Dry Well:

Table 4 Dry Well Specifications

Specification	ADT875PC / ADT875		
	-155	-350	-660
Temperature Range at 23°C	-40°C to 155°C	33°C to 350°C	33°C to 660°C
Display Accuracy	±0.18°C at Full Range	±0.2°C at Full Range	±0.3°C at 33°C
			±0.3°C at 420°C
			±0.5°C at 660°C
Stability (30 min)	±0.01°C at Full Range	±0.02°C at Full Range	±0.02°C at 33°C
			±0.03°C at 50°C
			±0.04°C at 420°C
			±0.04°C at 660°C
Axial Uniformity at 60 mm (2.4 in)	±0.07°C at Full Range	±0.04°C at 33°C	±0.05°C at 33°C
		±0.1°C at 200°C	±0.3°C at 420°C
		±0.2°C at 350°C	±0.5°C at 660°C
Radial Uniformity	±0.01°C at Full Range	±0.01°C at 33°C	±0.02°C at 33°C
		±0.015°C at 200°C	±0.05°C at 420°C
		±0.02°C at 350°C	±0.1°C at 660°C
Loading Effect	±0.1°C (Display Sensor)	±0.15°C (Display Sensor)	±0.15°C (Display Sensor)
	±0.02°C (External Sensor)	±0.015°C (External Sensor)	±0.025°C (External Sensor)
Hysteresis (Display Sensor)	0.025°C	0.03°C	0.1°C
Immersion Depth	150 mm (5.9 in)		

Insert OD	25.8 mm (1.02 in)	24.8 mm (0.98 in)	
Heating Time	13 min: -40°C to 155°C	5 min: 33°C to 350°C	15 min: 33°C to 660°C
	5 min: -40°C to 23°C		
	8 min: 23°C to 155°C		
Cooling Time	28 min: 155°C to -40°C	15 min: 350°C to 100°C	23 min: 660°C to 100°C
	8 min: 155°C to 23°C	10 min: 100°C to 50°C	12 min: 100°C to 50°C
	20 min: 23°C to -40°C	10 min: 50°C to 33°C	12 min: 50°C to 33°C
Typical Time to Stability	10 min		

3. Electrical Measurement (Only for ADT875PC)

Table 5 Electrical Measurement Specifications

Specification	Description
Readout Accuracy for 100 ohm PRT (Probe Accuracy Not Included)	±0.009°C at -40°C
	±0.010°C at 0°C
	±0.012°C at 50°C
	±0.017°C at 155°C
	±0.019°C at 200°C
	±0.026°C at 350°C
	±0.030°C at 420°C
	±0.042°C at 660°C
Readout Resolution	1 mΩ
Reference Resistance Range	0 Ω to 400 Ω
Reference Resistance Accuracy	0 Ω to 50 Ω: 0.002 Ω
	50 Ω to 400 Ω: 0.004% RD
Reference Characterizations	ITS-90, CVD, IEC-751, Resistance
Reference Measurement Capability	4-wire PRT
Reference Probe Connection	6-pin lemo smart connector
RTD Channels	2
RTD Measurement Accuracy (excl sensor)	0 Ω to 25 Ω: 0.002 Ω
	25 Ω to 400 Ω: 0.008% RD
	400 Ω to 4K Ω: 0.004% RD

RTD Measurement Resolution	0 Ω to 400 Ω : 1 m Ω
	400 Ω to 4K Ω : 0.01 Ω
RTD Measurement Resistance Range	0 Ω to 4K Ω
RTD Characterizations	PT10, PT25, PT50, PT100, PT200, PT500, PT1000, CU10, CU50, CU100, NI100, NI120
RTD Connection	Four 4 mm input jacks
RTD Channels	2 channels. Both accept 2, 3, or 4-wire RTDs
TC Channel	2
TC Measurement Channels	Mini TC terminals: Accepting S, R, K, B, N, E, J, T, C, D, G, L, and U
TC Measurement Accuracy (excl sensor)	Type K: $\pm 0.13^{\circ}\text{C}$ at 0°C $\pm 0.15^{\circ}\text{C}$ at 155°C $\pm 0.18^{\circ}\text{C}$ at 350°C $\pm 0.24^{\circ}\text{C}$ at 660°C
TC Range	-100 mV to 100 mV
TC Resolution	0.001 mV, Input Impedance <1 M Ω
TC Voltage Accuracy	0.02% RD + 5 μV
Internal CJC Accuracy	$\pm 0.35^{\circ}\text{C}$ (ambient from 0°C to 50°C)
Current Range	-30 mA to 30 mA
Current Accuracy	0.02% RD + 2 μA
Current Resolution	0.001 mA, Input Impedance: < 10 Ω
Voltage Range	-30 V to 30 V

Voltage Accuracy	$\pm 0.02\%$ RD + 2 mV
Voltage Resolution	0.001 V; Input impedance: < 1M Ω
Switch Test	Mechanical or Electrical
DC 24V Output	24 V ± 1 V, MAX60 mA
Hart Communication	Optional (ADT875PC Model)
Documentation	Up to 1,000 tasks capable of storing up to 10 results. Each task contains as found and as left data. The snap shot feature allows for screen captures. Also records auto step and ramp functions.
Temperature Coefficient 0°C to 8°C and 38°C to 50°C	ADT875(PC)-155: ± 0.005 °C/°C
	ADT875(PC)-350/660: ± 0.01 °C/°C
	Ref Readout: ± 1 ppm FS/°C
	RTD Readouts: ± 2 ppm FS/°C
	TC Readouts: ± 5 ppm FS/°C
	Current: ± 10 ppm FS/°C
	Voltage: ± 10 ppm FS/°C

4. Compliance and Mechanical Testing

Table 6 Compliance and Mechanical Testing Specifications

Subject	Specification	Description	
EMC-Directive	Electrostatic Discharge Immunity	4KV for contact 8KV for air	
	Radiated Radio-frequency Electromagnetic Field Immunity	10V/m (80MHZ~1GHZ) 3V/m (1.4GHZ~2GHZ) 1V/m (2GHZ~2.7GHZ)	
	Immunity to Radio-frequency Induced Conducted Disturbance	3V/m (150kHz~50MHZ)	
	Voltage Dip	0% for 1 cycle 40% for 10 cycles, and 70% for 25 cycles	
	Short Interruption	0% for 250 cycles	
	Pulse Group	1KV (Measuring & Communication Cable)	5ns, 5kHz
		2KV (Power Cord)	50ns, 5kHz
	Surge	1KV (Line-to-line) / 2KV (Line-to-ground)	
	Radio-frequency Radiated Electromagnetic Disturbance Limit	Class B	
	Radio-frequency Induced Conducted Disturbance Limit	Class B	
LVD-Directive	Insulation Voltage	1KV: 875 and 875PC - 350 & 660 2KV: 875 and 875PC - 155	
	Insulation Resistance	> 1GΩ when tested at 1KV	
Mechanical Testing	Vibration Test	2g (10 ~ 500HZ) , 30 minutes for 2 sides	
	Impact Test	4g, 3 times	
	Drop Test	500mm	

5. TC Measurement Specification and Calculation (Only for ADT875PC)

Table 7 TC Measurement Specification and Calculation

TC Type	Temperature (°C)	Error (°C)*	TC Type	Temperature (°C)	Error (°C)*	TC Type	Temperature (°C)	Error (°C)
B	250	±2	J	-40	±0.1	R	-40	±1.23
	350	±1.44		0	±0.1		0	±0.95
	660	±0.84		155	±0.12		155	±0.63
C	0	±0.38		350	±0.16		350	±0.56
	155	±0.34		660	±0.21		660	±0.54
	350	±0.33	K	-40	±0.13	S	-40	±1.16
660	±0.38	0		±0.13	0		±0.93	
D	0	±0.52		155	±0.16		155	±0.65
	155	±0.37		350	±0.19		350	±0.6
	350	±0.33		660	±0.25		660	±0.6
	660	±0.36	L	-40	±0.1	T	-40	±0.14
E	-40	±0.09		0	±0.1		0	±0.13
	0	±0.09		155	±0.12		155	±0.13
	155	±0.1		350	±0.16		350	±0.15
	350	±0.13		660	±0.21		400	±0.15
	660	±0.19	N	-40	±0.2	U	-40	±0.14
G	0	±3.85		0	±0.2		0	±0.13
	155	±0.71		155	±0.19		155	±0.13
	350	±0.43		350	±0.2		350	±0.14
	660	±0.36		660	±0.24		600	±0.17

* Excluding cold junction compensation errors.

1.6 Standard Equipment







Table 8 Standard Equipment

Model	Quantity	ADT875PC		ADT875	
		ADT-155	ADT-350 ADT-660	ADT-155	ADT-350 ADT-660
Dry well	1 pc.	•	•	•	•
ADT110-875-L-INSERT-X (Selected Model)	1 pc.	•		•	
ADT110-875-H-INSERT-X (Selected Model)	1 pc.		•		•
Insulation Plug (Selected Model)	1 pc.	•		•	
Silica Gel Plug	1 pc.	•		•	
Thermal Shield	1 pc.		•		•
Insert Removal Tool	1 pc.	•	•	•	•
Test Leads	2 set (6 pcs.)	•	•		
USB Cable	1 pc.	•	•	•	•
CD Manual	1 pc.	•	•	•	•
Certificate of Calibration	1 pc.	•	•	•	•

2. Operation




2.1 Main Screen



The main operation interface includes two screens, the upper DUT measurement channel and the lower temperature output channel.


① Status Bar: Includes date and time, cloud storage status , 24V power status , intelligence diagnose center , screenshot , electrical measurement channel switch , and system menu icon .

Note: All icons (except date and time) on the status bar can be selected via the touch screen to manage and select options.

② DUT measurement window (only for ADT875PC): Includes external measurement readings and sensor type (RTD or TC measurement), automatic cold junction temperature (only for TC measurement), current or resistance measurements, real-time data of electrical measurement and data analysis

③ Temperature output window: Includes target temperature set point   **0.00**, real-time temperature data and temperature control play/pause button .

◆ The external PRT sensor can be used as a temperature control sensor: The external sensor window will automatically be displayed when the external PRT sensor is connected, click on the   **0.00** icon in the window to set the target temperature.

④ Screen lock: Press  on the top right corner of the screen and select "Screen Lock" to lock the touch display.


◆ Unlock: Press  on the top right corner of the screen to unlock the touch display.



Figure 2 Main Screen

2.2 System Temperature Unit Setup

System temperature display units can be changed through the system menu or main screen

◆ Once the system display temperature units are changed, all related parameters in the system will be changed, except existed sensors and DUTs information

1. System Menu:


Press  on the top right corner of the screen → "Personalization" → "Temperature Unit" → Select temperature unit

2. Main Screen:

Press the temperature unit on the temperature display screen - Select desired temperature unit

2.3 Temperature Output

1. Temperature output settings

Press the  icon on the left of the temperature display screen to enter the setting menu. This menu includes control parameters and reference parameters:

(1)Control Settings:

Table 9 Control Settings



Subject	Valid Value	Comment
Fluctuation	Dependant on the system temperature units selected	One of the conditions for temperature control and stability. The condition is met when temperature varies within this range.
Stabilization Time	1~120	One of the conditions for temperature control stability. The condition is met when the stabilized time of temperature control exceeds the set value. Unit: min
Deviation	Dependant on the system temperature units selected	One of the conditions for temperature control stability. The condition is met when the difference between the measured temperature and the target value is within this range.
Temperature Control Rate	Max value depends on system temperature units selected	Choose max or customize the temperature Scan rate. Customized rate is indicated on the process bar.
Set Point Limits	On/Off	Limit the range of temperature control
Set Point Range (on)	Depends on dry well model	The temperature will not exceed the upper and lower limits after setting.

(2)Standard Parameter:

Table 10 Standard Parameter

Subject	Valid Value	Comment
Internal Sensor		
Resolution	1, 0.1, 0.01	Temperature display resolution
Sensor Signal	Read only	Measured temperature of internal sensor
External Sensor (Only for ADT875PC)		
Resolution	1, 0.1, 0.01, 0.001	Temperature display resolution
Sensor Signal	Read only	Measured temperature of external sensor
Sensor Information	Read only	Information of external sensor

2. Target Temperature Input:

Press the Target Temperature icon  , or real-time temperature data area, then input the target temperature value through the numeric keyboard. The target set point should be set within the temperature range above the screen, which is restricted by different model numbers and customized set points. Press Enter or press  to confirm. Temperature control of the dry well calibrator will start automatically.

3. Start/Pause Temperature Control:

Temperature control can be initiated or paused by pressing START  or PAUSE  on the right of the dry-well temperature display screen.

4. Temperature Control Stabilization

Temperature control will stabilize when the conditions of fluctuation degree, stabilization time and target deviation are met. The display value will turn green accompanied by a beep when the unit is stable.

2.4 DUT Measurement (Only for ADT875PC)

2.4.1 DUT Settings







Press  (when CH1 and CH2 are always measuring the same measurement type) /  (when CH1 and CH2 are measuring different measurement types from each other) on the left of the DUT measurement channel screen to enter DUT settings, which includes channel settings, sensor testing and electrical signal.

Table 11 DUT Settings

Subject	Valid Value	Comment
Channel Setting		
CH1 & CH2 Connection	Connected  / Disconnected 	Selecting whether the two-channel measurement types are the same: Connected = Same; Disconnected = Different
CH1 & CH2 Measurement subject (when CH1 and CH2 are connected)	RTD, TC, current, voltage, switch test, HART (transmitter), N/A	Selecting a subject of DUT channel measurement
CH1 (CH2) Measurement subject (when CH1 and CH2 are disconnected)		
Sensor Testing		
Resolution	1, 0.1, 0.01	Temperature display resolution
Fluctuation	≥0.005	One of the conditions for temperature control and stability. The condition is met when temperature varies within this range. Unit: °C
Stabilization Time	1~60	One of the conditions to for temperature control and stabilization. The condition is met when the stabilized time exceeds the set point. Unit: min
Electrical Signal		
mA & V Resolution	1, 0.1, 0.01, 0.001, 0.0001	Display resolution of current and voltage measurements

Press  on the lower right to confirm.

◆ Press  on the DUT measurement screen and select "Close" to close any or both of the electrical measurement channels.

2.4.2 Thermal Resistance (RTD) & NTC Measurement

1. Connection

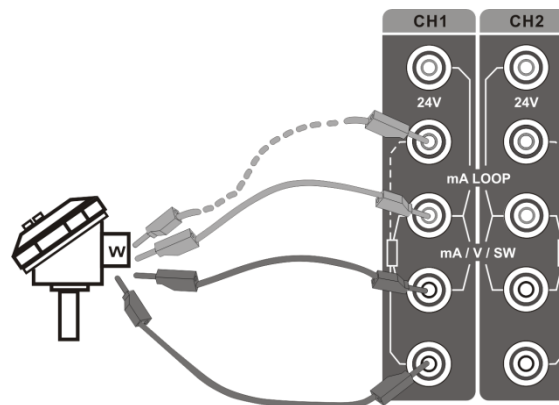


Figure 3 RTD Connection

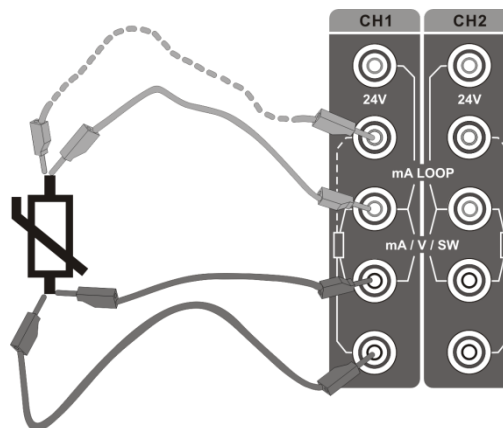




Figure 4 NTC Connection

2. Measurement Settings

Press  (when CH1 and CH2 are always measuring the same measurement type)/  (when CH1 and CH2 are measuring different measurement types from each other) on the left of DUT measurement channel screen to enter the DUT setting screen. Select CH1 or CH2 or CH1&CH2 to enter the channel setting screen. Press “Subject” and select RTD (thermal resistance), and the unit will return to the channel setting screen.


2.1 Sensor Type

Press “Sensor Type” to enter the sensor selection screen.

2.1.1 Default Sensor

The default sensor can be selected from the sensor library.

2.1.2 Custom Sensor


Press  on the right side of the screen to add a new sensor, please see section 3.2 Sensor Library for how to add a custom sensor.


2.2 Wire Type Selection

Table 12 RTD Wire Selection

Subject	Valid Value	Comment
Wire	2, 3, 4	RTD Wire selection

3. Starting a Measurement

Press  on the lower right of the screen after selecting the sensor and wire type, the system will then return to the DUT setting screen.

Press , again and the system will return to the main screen.

The DUT channel will show “-----” with an audible beep if there is an error in the RTD connection.

Please see section 2.3 for more info regarding the calibrator temperature output.

2.4.3 Thermal Couple (TC) Measurement

1. Connection

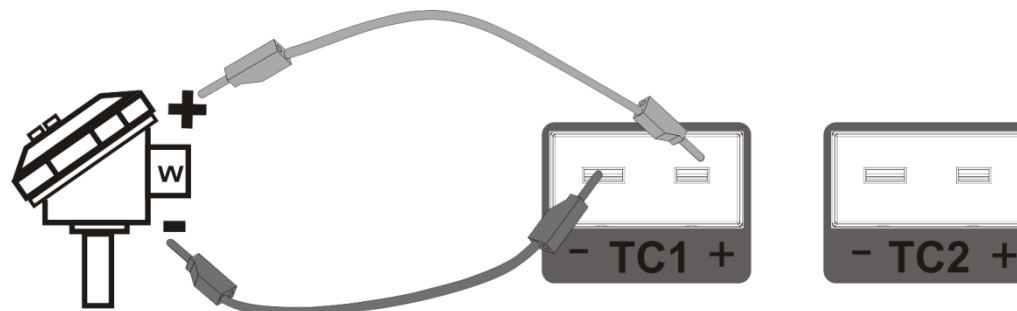


Figure 5 TC Connection

2. Measurement Settings

Press CH (when CH1 and CH2 are always measuring the same measurement type)/ CH (when CH1 and CH2 are measuring different measurement types from each other) on the left of DUT measurement channel screen to enter the DUT setting screen. Select CH1 or CH2 or CH1&CH2 to enter the channel setting screen. Press “Subject” and select TC (thermal couple), and the unit will return to the channel setting screen.

2.1 Thermal Couple (TC) Type

Press sensor type to enter the sensor selection screen:

2.1.1 Default Sensor

System default sensors are as follows:


mV, S, R, B, K, N, E, J, T, C, D, G, L, U, LR, A, $10\mu\text{V}/^\circ\text{C}$, $1\text{mV}/^\circ\text{C}$


2.1.2 Cold Junction Type

Table 13 Cold Junction Type

Subject	Valid Value	Comment
Cold Junction Type	Automatic / Fixed	<p>“Automatic” means the calibrator is the using internal sensor as the cold junction reference.</p> <p>“Fixed” means the calibrator is using user entered custom values as the cold junction reference.</p> <p>Note: There is no need to choose the cold junction type when mV is selected as the sensor type.</p>
Fixed value (when selecting “Fixed”)	Numeric Content	Set customer value for the cold junction compensation value

3. Starting a Measurement

Press  on the lower right of the screen after the sensor and cold junction type is selected. The unit will return to the DUT setting screen.

Press , again and the unit will jump back to the main screen.

The DUT channel will show “-----” with an audible beep if there is an error in the TC connection.

Please see section 2.3 for more information regarding the temperature output.

2.3.4 Current (mA) Measurement

1. Connection

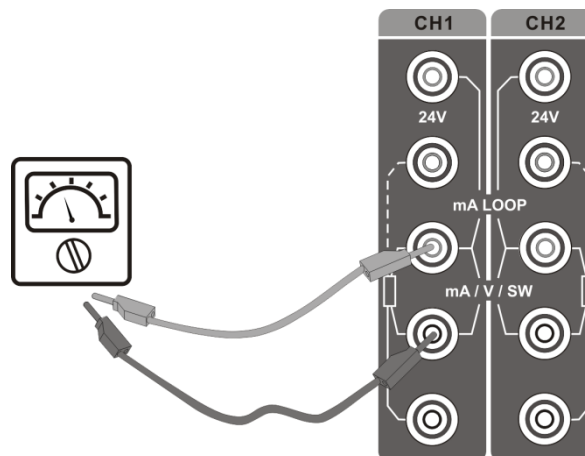


Figure 6 Current Measurement Connection

2. Measurement Settings

Press (when CH1 and CH2 are always measuring the same measurement type)/ (when CH1 and CH2 are measuring different measurement types from each other) on the left of DUT measurement channel screen to enter the DUT setting screen. Select CH1 or CH2 or CH1&CH2 to enter the channel setting screen. Press “Subject” and select mA measurement, and the unit will return to the channel setting screen.

3. Starting a Measurement

Press on the lower right screen, the unit will return to DUT setting screen.

Press again and, the unit will return to the main screen.

Please see section 2.3 for more information regarding the temperature output.

2.3.5 Voltage (V) Measurement

1. Connection

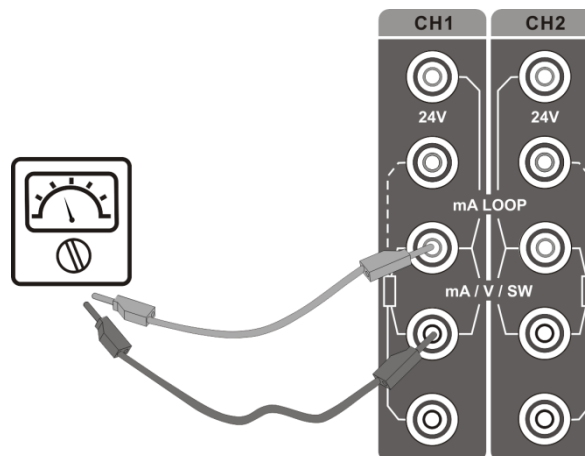


Figure 7 Voltage Measurement Connection


2. Measurement Settings


Press $\text{CH} \text{ } \text{V}$ (when CH1 and CH2 are always measuring the same measurement type)/ $\text{CH} \text{ } \text{G}$ (when CH1 and CH2 are measuring different measurement types from each other) on the left of DUT measurement channel screen to enter the DUT setting screen. Select CH1 or CH2 or CH1&CH2 to enter the channel setting screen. Press “Subject” and select voltage (V) measurement, and the unit will return to the channel setting screen.

Table 14 Voltage Selection

Subject	Valid Value	Comment
Range	12V, 30V	Select a voltage measurement range scale

3. Starting a Measurement

Press  on the lower right of the screen, the system will return to the DUT setting screen.

Press  again and the unit will return to the main screen.

Please see section 2.3 for more information regarding the temperature output.

2.3.6 Switch Test

1. Connection

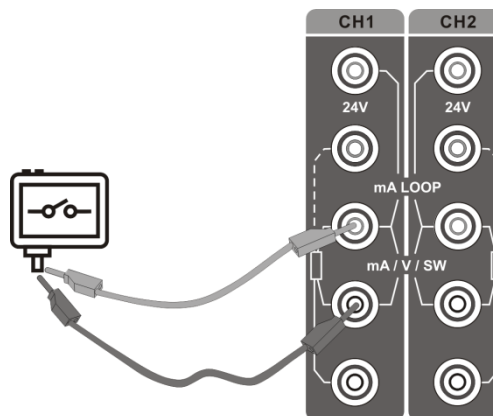


Figure 8 Switch Test Connection


2. Measurement Settings


Press CH (when CH1 and CH2 are always measuring the same measurement type)/ CH (when CH1 and CH2 are measuring different measurement types from each other) on the left of DUT measurement channel screen to enter the DUT setting screen. Select CH1 or CH2 or CH1&CH2 to enter the channel setting screen. Press “Subject” and select Switch, and the unit will return to the channel setting screen.

Table 15 Switch Type Selection

Subject	Valid Value	Comment
Switch Type	Dry contact, Wet contact, PNP, NPN	Temperature switch type

3. Starting a Measurement

Press  on the lower right of the screen and the unit will return to DUT setting screen.

Press  again and the unit will return to the main screen.

Please see section 2.3 for more information regarding the temperature output.

2.3.7 Transmitter Measurement (including HART transmitter)

1. Connection

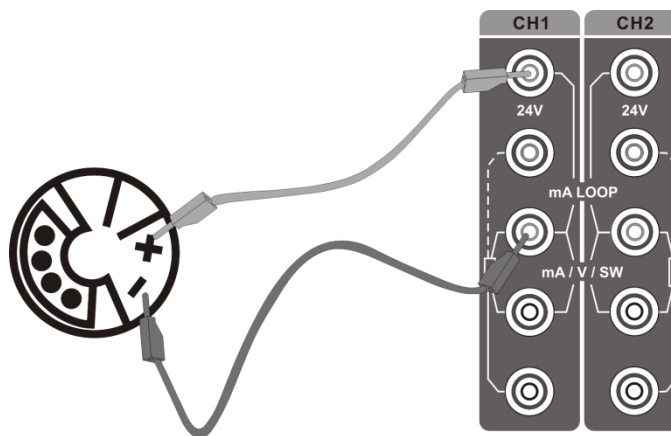


Figure 9 Transmitter Connection

◆ Only CH1 is available for HART transmitter

2. Transmitter Settings

Press (when CH1 and CH2 are always measuring the same measurement type)/ (when CH1 and CH2 are measuring different measurement types from each other) on the left of DUT measurement channel screen to enter the DUT setting screen. Select CH1 or CH2 or CH1&CH2 to enter the channel setting screen. Press “Subject” and select HART, and the unit will return to the channel setting screen.


Press and the unit will return to the main screen.

Please see section 2.3 for more information regarding the temperature output.



2.1 Poll

Press in the submenu on the upper right of DUT measurement channel screen .

Press to search the unit for a list of transmitters automatically. If additional searches are needed press on the right of the screen.

Press the name of the target transmitter when searching is completed, then press  on the lower right of the screen. The unit will return to the main screen and read the measured data of the transmitter.

2.2 Setting (some functions are HART only)

Press  on the upper right of DUT measurement channel screen, and select  to enter the transmitter setting screen.

1. Device Information:

Table 16 Transmitter Information

Subject	Valid Value	Comment
Manufacturer	Read only	Manufacturer of the transmitter
Device Type	Read only	Type of the transmitter
S/N	Read only	Serial number of the transmitter
Label	Alphanumeric content (8 max length)	Custom label of the transmitter
Date	2000/1/1~2099/12/31	Date setting
Write-protect	Read only	Protection type
Information	Alphanumeric content (20 max length)	Custom information
Description	Alphanumeric content (20 max length)	Custom description
Final Assembly Number	Support numeric input, no more than 20 characters	The final assembly number of the transmitter
Leading Character Number	5~20	The leading character number of the transmitter
General Version	Read only	General version of the transmitter
Software Version	Read only	Software version of the transmitter
Hardware Version	Read only	Hardware version of the transmitter
Device Version	Read only	Device version of the transmitter

2. Sensor:


Check the information on sensor, upper-lower limits, and the minimum range.

3. Device Output:

Table 17 Transmitter Output Information

Subject	Valid Value	Comment
Master Variable/Range Units	°C, °F, °R, K	Measurement unit of the transmitter
Lower Limit of PV Range	Support numeric input, lower limit expanding 10%	Lower limit of the master variable
Upper limit of PV Range	Support numeric input, upper limit expanding 10%	Upper limit of the master variable
Transform Function	Linear, Root	Transform function of the transmitter
Alarm State	Read only	Alarm state of the transmitter
Damping	Support numeric input, ≥ 0	Damping time
Poll Address	0~15	Poll address of the transmitter
Burst Mode	Disable, Enable	Burst mode state
Burst Command	1, 2, 3	Burst command depends on different transmitters

2.3 Diagnose/Test

Press the icon on the right of DUT measurement channel screen, select  “Diagnose/Test” to enter the transmitter setting screen.

1. Current Loop Test

Customers can compare and calibrate the current output signal of the transmitter and the current measurement signal of the Calibrator through a current loop test.

◆ This function will be enabled only when the poll address of the transmitter is 0.

- 1) Intercept the current measurement signal through the numeric keyboard or press the button “obtain”, and apply by pressing Enter or pressing the confirm button.
- 2) A few seconds later, the calibrator will send output current value of the transmitter and current measurement value of the calibrator. Adjustment should be made if the difference is out of tolerance.

2. D/A Adjustment

Customers can adjust the current output of the transmitter at zero and full scale through D/A adjustment.

◆ This function will be enabled only when the poll address of the transmitter is 0.

① D/A Zero

1) Intercept the current measurement signal (4mA as the typical value) through the numeric keyboard or press the button “obtain”, and apply by pressing Enter or pressing the confirm button.

2) A few seconds later, the calibrator will send instruction to the transmitter to adjust the current output at zero.

② D/A Gain

1) Intercept the current measurement signal (20mA as the typical value) through the numeric keyboard or press the button “obtain”, and apply by pressing Enter or pressing the confirm button.

2) A few seconds later, the calibrator will send instruction to the transmitter to adjust the current output at full scale.

2.4 Process

Press ●●● on the right of DUT measurement channel screen and select “Process Quantity” to enter the transmitter setting screen, which allows the customers to select the process variable of the transmitter:


Table 18 HART Device Variable

Subject	Comment
Process Variable	The unit of the master variable depends on the setting of the transmitter. Please refer to transmitter output setting for details.
Output Current	Output current of the transmitter, unit: mA
Percentage	The percentage of temperature readout in the temperature range of the transmitter
Loop Current	Loop current of the transmitter, unit: mA

3. Starting a Measurement

Please refer to section 2.3 for operation on calibrator temperature output.

3. System Setup

To enter the system setup menu, please select "Setup" under Main Menu .

- ◆ Any changes made in the Setup will become the default values after the calibrator is rebooted.
- ◆ Necessary information has to be completed, otherwise system will prohibit the next step with notification.

3.1 Communication

3.1.1 Ethernet

Connect the dry well to a computer through the Network port.

Table 19 Ethernet Address Acquisition Setting

Subject	Valid Value	Comment
Address Acquisition	DHCP / Static	Ethernet address acquisition mode


- ◆ All information in Table 18 is required and entered manually when static address acquisition mode is selected:

Table 20 Ethernet Settings

Subject	Valid Value	Comment
IP Address	0.0.0.0 ~ 255.255.255.255	Dry well IP address
Subnet Mask	0.0.0.0 ~ 255.255.255.255	Dry well subnet mask
Gateway	0.0.0.0 ~ 255.255.255.255	Dry well gateway

Port number and MAC address information are read only.

- ◆ All information in Table 18 above is filled in automatically when DHCP address acquisition mode is selected.

Press  on the bottom left corner of screen to confirm.

3.1.2 Wi-Fi

Connect the dry well to a computer through Wi-Fi.

Table 21 Wi-Fi Settings

Subject	Valid Value	Comment
WLAN	On / Off	Enable or disable Wi-Fi communication function
SSID	Depends on network environment (only available when WLAN is on)	Select Wi-Fi router
Advanced	DHCP / Static	Network address acquisition mode


◆ All information in Table 20 is required and entered manually when static address acquisition mode is selected:

Table 22 Wi-Fi Address Settings

Subject	Valid Value	Comment
IP Address	0.0.0.0 ~ 255.255.255.255	Dry well IP address
Subnet Mask	0.0.0.0 ~ 255.255.255.255	Dry well subnet mask
Gateway	0.0.0.0 ~ 255.255.255.255	Dry well gateway

Port number and MAC address information are read only.

◆ All information in Table 20 above is filled in automatically when DHCP address acquisition mode is selected.


Wi-Fi settings are applied immediately, press  on the top left corner for previous menu.

3.1.3 Bluetooth®

Connect dry well with computer through Bluetooth®.

Table 23 Bluetooth Settings

Subject	Valid Value	Comment
BT Name	Alphanumeric content (14 max length)	Dry well Bluetooth name
Radio Mode	On / Off	Enable or disable Bluetooth function
MAC	Read only (only available when WLAN is on)	Dry well MAC address
Available Devices	Depends on Bluetooth environment	Select Bluetooth device to connect


Bluetooth settings are applied immediately, press  on the top left corner for previous menu.

3.1.4 Cloud Service

Upload data onto cloud server for remote control

Table 24 Cloud Service Settings

Subject	Valid Value	Comment
Enable	On / Off	Enable or disable cloud service function
Account	Alphanumeric content (16 max length)	Cloud server account
Interval	1~100	Interval time between each reading, unit: sec

◆ Symbol  on the title bar of main screen indicates that the cloud service is enabled.

3.2 Sensor Library (Only for ADT875PC)

Sensor information can be stored in the sensor library for future use. 5 type of sensors are available: Intelligent Sensor, ITS-90, CVD, RTD, and NTC. Press sensor type to enter sub-menu, then press sensor name to enter sensor information page.

3.2.1 General Management

1. Display Settings:


Press  on the bottom right corner of the screen to set the sensor list display contents:







Table 25 Sensor Display Settings

Subject	Valid Value	Comment
Sensor Display Setting	Scientific / Decimal	Select parameter display mode: Scientific: 1.1×10^{-2} Decimal: 0.011
RTD	Model & Name / Serial Number	Select display contents
ITS-90		
CVD		
NTC		
Intelligent Sensor		

2. Sub-menu:

Management function Icons in the sub-menu are listed below:




Table 26 General Management Icons in Sensor Library

Icon	Comment	Intelligent Sensor	ITS-90	CVD	RTD	NTC
	Add a new sensor	•	•	•	•	•
	Add a new sensor based on selected sensor as template	•	•	•		
	Export selected sensor data into connected PRT sensor	•	•	•		
	Delete sensors: 1. Press sensors to select, then press  to delete 2. Press  to delete all sensors	•	•	•	•	•

3. Sensor information:

Management function Icons in the sensor information page are listed below:

Table 27 Management Icons in Sensor Information Page

Icon	Comment	Intelligent Sensor	ITS-90	CVD	RTD	NTC
	Edit selected sensor	•	•	•	•	•
	Delete selected sensor	•	•	•	•	•
	Export selected sensor data into connected PRT sensor	•	•	•		

3.2.2 Smart Sensor

Table 28 Smart Sensor Information

Subject	Valid Value	Comment
Model / Name	Alphanumeric content (14 max length)	Sensor type and name
Serial Number	Alphanumeric content (14 max length)	Sensor serial number
Sensor Type	ITS-90 / CVD	Sensor type, different type applies different calculation parameters and equations. See tables below.
Temperature Range	Depends on system temperature units	Temperature range, unit: mirrors system units
Calibration Date	2000/1/1~2099/12/31	Calibration date
Next Calibration Date	2000/1/1~2099/12/31	Calibration due date
Note	Alphanumeric content (14 max length)	Note

1. Select ITS-90 sensor type:

Table 29 ITS-90 Information

ITS-90		
Subject	Valid Value	Comment
Negative temperature parameters coefficients	A4, b4: (-200~0) °C	Negative temperature parameters selection
	A5, b5: (-40~0) °C	
	N/A	
Positive temperature parameter coefficients	A6, b6, c6, d, W660.323: (0~960) °C	Positive temperature parameter selection
	A7, b7, c7: (0~660) °C	
	A8, b8: (0~420) °C	
	A9, b9: (0~232) °C	
	A10: (0~157) °C	
A11: (0~30) °C		
Rtp (Ω)	Numeric content	Parameters for the sensor calculation equation, please refer to the sensor calibration certificate.
a4		
b4		
a6		
b6		
c6		
d		
W (660.323°C)		

2. Select CVD sensor type:

Table 30 CVD Information

CVD		
Subject	Valid Value	Comment
R0 (Ω)	Numeric content	Parameters for the sensor calculation equation, please refer to the sensor calibration certificate.
a	Numeric content	
b		
c		

3.2.3 ITS-90

See table 27 & 28 for ITS-90 information.

3.2.4 CVD

See table 27 & 29 for CVD information.

3.2.5 RTD

Table 31 RTD Information

Subject	Valid Value	Comment
Model / Name	Alphanumeric content (14 max length)	RTD type and name
Serial Number	Alphanumeric content (14 max length)	RTD serial number
Temperature Range	Depends on system temperature units	Temperature range, unit: mirrors system units
R0 (Ω)	Numeric content	Resistance value at 0°C
Calibration Date	2000/1/1~2099/12/31	Calibration date
Next Calibration Date	2000/1/1~2099/12/31	Calibration due date
Note	Alphanumeric content (14 max length)	Note

3.2.6 NTC

Table 32 NTC Information

Subject	Valid Value	Comment
Model Name	Alphanumeric content (14 max length)	NTC type and name
Serial Number	Alphanumeric content (14 max length)	NTC serial number
Temperature Range	Depends on system temperature unit	Temperature range, unit: mirrors system units
NTC Type	NTC / Steinhart-Hart	Sensor type, different types apply different calculation parameters and equations. See tables below.
Calibration Date	2000/1/1~2099/12/31	Calibration date
Next Calibration Date	2000/1/1~2099/12/31	Calibration due date
Note	Alphanumeric content (14 max length)	Note

1. Select NTC sensor type:

Table 33 NTC Information

Subject	Valid Value	Comment
Rtn	Numeric content	Parameters for the sensor calculation equation, please refer to the sensor calibration certificate.
Tn		
β		

2. Select Hart sensor type:

Table 34 Hart Information

Subject	Valid Value	Comment
a	Numeric content	Parameters for the sensor calculation equation, please refer to the sensor calibration certificate.
b		
c		

3.3 Power Grid Settings (Only for ADT875PC/875 - 350 & 660)

Two types of power supply voltages are available: 220V & 110V

- ◆ Please check and select the correct voltage
- ◆ Please check fuse value when voltage settings are changed
- ◆ The dry well will detect the power supply voltage each time of use, an error notification will be displayed if the voltage selection is different from the supply voltage
- ◆ A password is necessary when switching to another voltage, see section 3.4 Password Protection for more information. The default password is:123456

3.4 Password Protection

Table 35 Password Protection

Subject	Valid Value	Comment
Edit Password	Numeric content (20 max length)	Password setup, default password is: 123456
Task (Only for ADT875PC)	Enable / Disable	Enable or disable Password Protection. Enable: Password is necessary when deleting task data
Sensor Library (Only for ADT875PC)	Enable / Disable	Enable or disable Password Protection. Enable: Password is necessary when deleting sensor library data

- ◆ Password applies on: Tasks (when enabled), Sensors (when enabled), Calibration, Power Grid Settings, System Calibration, Factory Reset, and Updates.

3.5 Service

3.5.1 Calibration

Password applies when entering calibration menu, default password: 123456




◆ Please refer to section 3.4 Password Protection to change the password

3.5.1.1 Electrical Calibration

1. General Information

Display Icons on the right side of each calibration menu are listed below:

Table 36 General Display Icons in Electrical Calibration

Icon	Comment	Ext.REF	CH1 & CH2				
			±30 mV Measurement	TC (±75 mV) Measurement	±12 V & ±30 V Measurement	400Ω (4W) & 4000Ω (4W) Measurement	Cold Junction Calibration
	Cancel the calibration, no data will be saved.	•	•	•	•	•	•
	Restore the factory data	•	•	•	•	•	•
	Cancel the zeroing		•	•	•		

2. Ext.REF

To calibrate the resistance measurement of Ext.REF connector, please prepare standard resistance source.

- ◆ The number of set points cannot be changed, but set point values can be changed by pressing and inputting new values
- ◆ The last calibration date is shown below the set point table

Connection diagram:

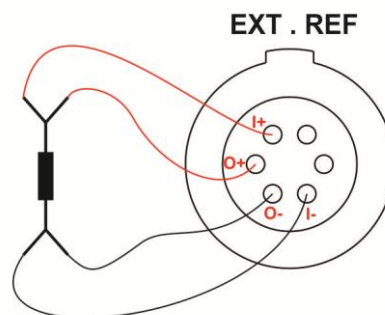






Figure 10 External Reference Connection

Calibration Instructions:

- 1 Press  to start the calibration process. All reference data will need to be input manually.
- 2 Press  to record data and move to the next set point, or press  to delete current data and move to the previous set point.
- 3 Press  to save the calibration result after all set points are done.

3. CH 1 & CH2

1 ± 30 mA Measurement

To calibrate the current measurement for CH1 and CH2:

- ◆ The number of set points cannot be changed, but set point values can be changed by pressing and inputting the new values.

How to Connect:

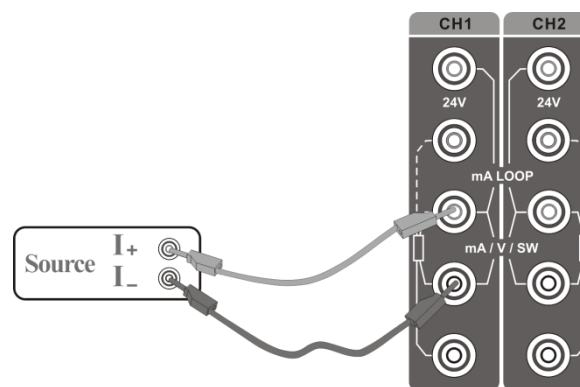


Figure 11 ± 30 mA Measurement Calibration Connection

Calibration Instructions:

- 1 Press to start calibration process
- 2 Output the current from your standard which corresponds to the calibration set point value
- 3 When the Measured Value is stable, press to record data and move to the next calibration point, or press to return to the previous point to retake the data
- 4 Once the calibration has finished, press to save the data

2 TC, (-75~75)mV

To calibrate the TC measurement for CH1 and CH2:

- ◆ The set point values of TC, (-75~75)mV cannot be changed
- ◆ Press set point value on the left side of table to enter set point edit interface in which data is entered

How to Connect:

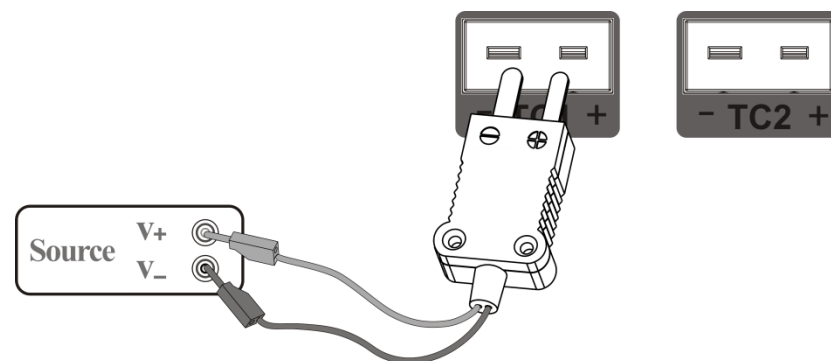


Figure 12 TC, (-75~75)mV Calibration Connection

Calibration Instructions:

- 1 Press (▶) to start calibration process
- 2 Output voltage from the standard to dry well corresponding to the calibration set point
- 3 When Measured Value is stable, press (▶) to record data and move to the next calibration point, or press (◀) to return to the previous point to retake the data
- 4 Once calibration has finished press (💾) to save the data

3 (-12~12)V & (-30~30)V

◆The number of set points (-12~12)V & (-30~30) cannot be changed

◆Press the set point value on the left side of table to enter set point edit interface in which data is entered

How to Connect:

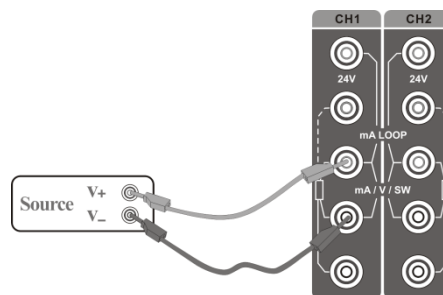


Figure 13 (-12~12)V & (-30~30)V Measurement Calibration Connection

Calibration Instructions:

1 Press to start calibration process

2 Output voltage from the standard to the dry well corresponding to the calibration set point

3 When the Measured Value is stable, press to record data and move to the next calibration point, or press to return to the previous point to retake the data

4 Once calibration has finished press to save the data





4 400Ω (4W) & 4000Ω (4W)

- ◆ The set point number for 400Ω (4W) & 4000Ω (4W) cannot be changed
- ◆ Press the set point value on the left side of table to enter set point edit interface in which data can be entered
- ◆ The latest calibration date is shown under the table

How to Connect:

- ◆ Correct electrical connection: please see Figure 3 RTD Connection

How to Execute:

- 1 Press  to start calibration process
- 2 Output resistance from the standard to dry well corresponding to calibration set point
- 3 When the Measured Value is stable, press  to record the data and move to the next calibration point, or press  to return to the previous point to retake the data
- 4 Once calibration has finished, press  to save the data

5 Cold Junction Calibration

◆ Please select cold junction sensor type. Available type are: S, R, B, K, N, E, J, T, C, D, G, L, U, LR, A, $10\mu\text{V}/^\circ\text{C}$, $1\text{mV}/^\circ\text{C}$

How to Connect:

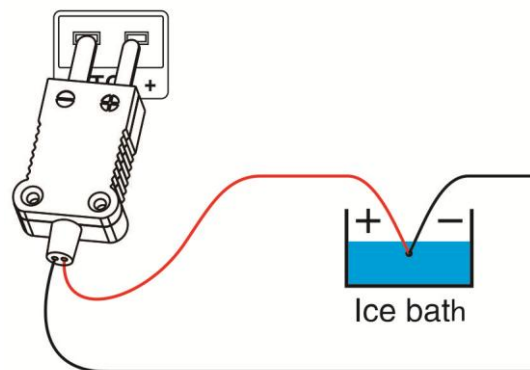



Figure 14 Cold Junction Calibration Connection

Calibration Instructions:

- 1 The cold junction temperature is adjusted by clicking the set point value and changing it.
- 2 Press  to save the cold junction calibration result

3.5.1.2 Calibration History

Calibration history consist of three parts: Manufacturer Calibration Data, User Calibration Data, and Period Calibration Data

Table 37 Calibration History

Subject	Data Source	Review	Operated by	Delete	Comment
Manufacturer Calibration Data	Factory data				Factory data
Self Calibration Data	Latest user calibration data	•	• (User)	•	Self calibration operated by user
Recalibration Data	All recalibration data is shown, one history will be added after each recalibration	•	• (Third Party Organization or User)	•	Calibration operated by third party organization or user

Note: If old recalibration data is applied, the recalibrations after this date will turn gray and be automatically deleted on the next recalibration.


◆ **Invalid data can be re-activate before it is deleted**

Each calibration history including axial homogeneity calibration and self calibration data:

◆ For axial homogeneity calibration operation, please refer to section 3.5.1.3 Axial Homogeneity Calibration

◆ For self calibration operation, please refer to section 3.5.1.4 Self Calibration

How to use:

1. Select a data to enter data information interface
2. Double check the axial homogeneity calibration and self calibration data first, then press  to apply



3.5.1.3 Axial Homogeneity Calibration

To calibrate dry well axial uniformity, the latest axial homogeneity calibration data will be listed

How to connect:

Please follow the instruction displayed on screen for correct connection

How to use:

1. Press  to start a new manual axial homogeneity calibration
2. Select “Period” or “User” as calibration data storage method
 - ◆ Period: Periodic calibration operated by third party organization
 - ◆ User: Regular calibration operated by user
3. Read the instructions displayed on the screen
4. Input reference values at 0 mm and 60 mm
 - ◆ All reference values should be read on the main screen, reference value readings are not available in this interface under manual mode
5. Click humidity value to input the current humidity data
6. Press  to save and apply the calibration data



3.5.1.4 Self Calibration

To calibrate dry well display sensor.

How to connect:

Please follow the instruction displayed on screen for correct connection

How to use:

1. Press  or  to start a new calibration

◆ Automatic calibration  is only for ADT875PC models

◆ Click to change the set point if necessary before execution

2. Select “Period” or “User” as a calibration data storage method

◆ Period: Periodic calibration operated by third party organization


◆ User: Regular calibration operated by user

3.1 Manual Mode:

1. Input reference value at different set point temperatures manually

◆ All reference values should be read on the main screen, reference value readings are not available in this interface under the manual mode


◆ Set point value cannot be changed under this interface

2. Press  to save and apply the calibration data

3.2 Automatic Mode (only for ADT875PC):

1. Connect reference following the instructions displayed




2. Press  to execute automatic calibration

3. Press  to save and apply the calibration data

3.5.1.5 Dry Well Calibration (Only for ADT875PC)

Dry well calibration data including axial homogeneity calibration and self calibration data

How to use:

1. Connect reference following the instruction displayed on the screen
2. Press  to start a new calibration
 - ◆ Click to change the set point if necessary before execution
3. Select “Period” or “User” as calibration data storage method
 - ◆ Period: Periodic calibration operated by third party organization
 - ◆ User: Regular calibration operated by user
4. Move the reference for axial homogeneity calibration when indicated
5. Press  to advance to the next point when current set point calibration is done
6. Press  to save and apply the calibration data


3.5.2 Restore

Resets all data to factory data

- ◆ Default password: 123456
- ◆ Password is editable, please refer to section 3.4 Password Protection
- ◆ Restore operation will not apply dry well factory data, please refer to section 3.5.1.2 Calibration History for factory data applying
- ◆ User data (including task data, sensor library, etc.) will not be deleted when restore is selected

3.5.3 Updates

To update dry well firmware:

- 1). Copy the update file into an USB root directory
 - 2). Insert USB into dry well USB port
 - 3). Select Updates by USB on calibrator
 - 4). Press  to start update process
 - 5). Wait for the update to complete in which a notification will be given
- ◆ Password: 123456
 - ◆ To change the password, please refer to section 3.4 Password Protection
 - ◆ The USB has to be in FAT16 or FAT32 type

3.6 Personalization

3.6.1 Temperature Unit

Three units are available: °C, °F, and K

◆ Once this unit is changed, all related temperature units for other menus will be changed automatically, except for the sensor library and task function

3.6.2 Date and Time

Table 38 Date and Time Settings

Subject	Valid Value	Comment
Time	00:00 ~ 23:59	Time
Date	2000-1-1 ~ 2099-12-31	Date
Date Format	YYYY-MMDD /MM-DD-YYYY / DD-MM-YYYY	Date format
Date Separator	-, /, .	Date format separator

3.6.3 Language

Dry well is equipped with a multi-language user interface. Use this menu to change from the offered languages.

3.6.4 Sound

Table 39 Sound Settings

Subject	Valid Value	Comment
Touch Beep	On / Off	Enable or disable touch beep
Prompt Beep	On / Off	Enable or disable prompt beep
Over range beep	On / Off	Enable or disable over range beep
Volume	0~100	Adjust beep volume, unit: %

3.6.5 Brightness

Press the bar to adjust screen brightness

3.6.7 Screen Saver

Dry well will turn off the screen for power saving if it is not used over set time.

- ◆ To activate, please touch the screen
- ◆ Available selections: 1 min, 5 min, 10 min, 30 min, 60 min, or Never

3.6.8 Display

Switch to **Light Theme** or **Dark Theme**.

3.7 Product Information

Dry well information is read only:

1. General Information: Including model, serial number and range information
 2. Version Information: Including main host, system version, control board, electric board, Wi-Fi, and Bluetooth information
- ◆The firmware version number normally means the main board version number, please provide the to the customer service if necessary.

4 Task (Only for ADT875PC)

4.1 Device Center

All DUTs can be managed in Device Center.

4.1.1 DUT Management








1. Click “Added DUT” to view the DUT information.
2. Click  on the right to add a DUT. Please refer to Chapter 4.1.2 to 4.1.9 on how to add a DUT.
3. Click  to delete an added task. Tasks to be deleted can be selected according to users’ needs and click  to delete. Or click  to delete all the test tasks.
4. Click  to search added DUTs. The search conditions are as follows:

Table 40 DUT search conditions in Device Center menu

Subject	Valid Value	Comment
Type	Thermal resistance, thermocouple, NTC, temperature transmitter, temperature switch, liquid in glass thermometer, temperature controller, bimetallic thermometer, pressure thermometer, thermostat transmitter, surface thermometer , digital thermometer, all	Select the type of DUT. All as default.
Name	Alphanumeric content (16 max length)	Input the name of DUT
S/N	Alphanumeric content (16 max length)	Input the Serial Number of DUT
Performance	Yes / No / All	Whether the DUT has performed any tasks on the dry well calibration depends on if there is test data.
Creation Time	Starting time: 2000-1-1 ~ 2099-12-31	Searching the time range when the DUT is created. For example: DUT created between Jan 1, 2018 to Dec 31, 2018.
	Finishing time: 2000-1-1 ~ 2099-12-31	

Click  on the lower right to apply search conditions. DUTs conforming to the conditions will appear in the list.

◆ Click  to delete all the input search conditions.

4.1.2 RTD




◆ Click  to select the task information of an existing sensor as a template


Table 41 RTD Task Information


Subject	Valid Value	Comment
Name	Alphanumeric content (16 max length)	Name of DUT
S/N	Alphanumeric content (16 max length)	Serial number of DUT
Location	Alphanumeric content (16 max length)	DUT location or area
Comment	Alphanumeric content (16 max length)	Information about the DUT
Company	Alphanumeric content (16 max length)	DUT owner
Range	Depends on the unit of temperature	Click temperature units to switch.
Accuracy	The dry well calibrator provides some common errors of thermal resistance. Click  to enter a custom page.	The accuracy of the DUT Please refer to Chapter 4.1.10 for accuracy settings.
Wire	Two-wire / three-wire / four-wire	Select the wire type
Type of thermal resistance	Pt series, Cu series, Ni series, and CVD	The type of thermal resistance under test
R0	Numeric content	The R0 value of the thermal resistance at zero.

Click  on the lower right to save.

4.1.3 TC

Table 42 TC Task Information

Subject	Valid Value	Comment
Name	Alphanumeric content (16 max length)	Name of DUT
S/N	Alphanumeric content (16 max length)	Serial number of DUT
Location	Alphanumeric content (16 max length)	DUT location or area
Comment	Alphanumeric content (16 max length)	Information about the DUT
Company	Alphanumeric content (16 max length)	DUT owner
Range	Depends on the unit of temperature	Click temperature units to switch.
Accuracy	The dry well calibrator provides some common permissible errors of thermal resistance. Click  to enter custom page.	The accuracy of the DUT Please refer to Chapter 4.1.10 for accuracy settings.
Type of thermal couple	A, B, C, D, E, F, J, K, L, LR, N, R, S, T, U	The type of thermal couple under test
Type of cold junction compensation	automatic / fixed	Select the type of cold junction compensation. The compensation value has to be input manually when selecting fixed mode.


Click  on the lower right to save.

4.1.4 NTC

◆ Click  to select the task information of an existing sensor as a template

Table 43 NTC Task Information


Subject	Valid Value	Comment
Name	Alphanumeric content (16 max length)	Name of DUT
S/N	Alphanumeric content (16 max length)	Serial number of DUT
Location	Alphanumeric content (16 max length)	DUT location
Comment	Alphanumeric content (16 max length)	Comment information of DUT
Company	Alphanumeric content (16 max length)	DUT owner
Range	Depends on the unit of temperature	Click temperature units to switch.
Permissible Error	Depends on the needs of the users. Please refer to Chapter 4.1.10 for accuracy settings.	The accuracy of the DUT Please refer to Chapter 4.1.10 for accuracy settings.
Wire	Two-wire / three-wire / four-wire	Select the wire type
Rtn	Numeric content	The Rtn value of NTC under test
Tn	Numeric content	The Tn value of NTC under test
β	Numeric content	The β value of NTC under test

Click  on the lower right to save.

4.1.5 Temperature Transmitter

Table 44 Temperature Transmitter Task Information


Subject	Valid Value	Comment
Name	Alphanumeric content (16 max length)	Name of DUT
S/N	Alphanumeric content (16 max length)	Serial Number of DUT
Location	Alphanumeric content (16 max length)	DUT location
Comment	Alphanumeric content (16 max length)	Comment information of DUT
Company	Alphanumeric content (16 max length)	DUT owner
Input	Depends on the unit of temperature	Click temperature units to switch.
Output	Analog signals: 1. mA: 4~20, 0~10, 0~20 2. V: 0~5, 0~10, 4~20 3. Customize: -30~30(Click electrical signals to switch between mA and V.)	Output signal settings of the temperature transmitter under test
	HART Transmitter: Major variable, percentage, Output current, loop current	
Accuracy	0.1%, 0.2%, 0.5%, 1%, 1.5%, 2%, 2.5%, custom	Users can set special accuracy by selecting custom options. Unit: %.

Click  on the lower right to save

4.1.6 Temperature Switch

Table 45 Switch Task Information


Subject	Valid Value	Comment
Name	Alphanumeric content (16 max length)	Name of DUT
S/N	Alphanumeric content (16 max length)	Serial Number of DUT
Location	Alphanumeric content (16 max length)	DUT location
Comment	Alphanumeric content (16 max length)	Comment information of DUT
Company	Alphanumeric content (16 max length)	DUT owner
Range	Depends on the unit of temperature	Click temperature units to switch.
Set point	Depends on the range of the switch	The anticipated temperature the switch will change states
The range of set point	Depends on the range of the switch	The open and close or set and reset temperatures of the switch
Type of switch	normally open / normally closed	Type of switch
Set point error	Depends on the range of the switch	Accuracy of the DUT
Type of switch	Dry contact, wet contact, NPN switch, PNP switch	Type of switch
Dead band	Depends on the range of the switch	The band of temperature when the switch will set and then reset.

Click  on the lower right to save

4.1.7 Liquid-In-Glass and Surface Thermometers

Table 46 Liquid-In-Glass Thermometer and Surface Thermometer Task Information


Subject	Valid Value	Comment
Name	Alphanumeric content (16 max length)	Name of DUT
S/N	Alphanumeric content (16 max length)	Serial Number of DUT
Location	Alphanumeric content (16 max length)	DUT location
Comment	Alphanumeric content (16 max length)	Comment information of DUT
Company	Alphanumeric content (16 max length)	DUT owner
Range	Depends on the unit of temperature	Click temperature units to switch.
Accuracy	Depends on the needs of the users. Please refer to Chapter 4.1.10 for accuracy settings.	The accuracy of the DUT Please refer to Chapter 4.1.10 for accuracy settings.
Scale Value	Depends on the range of the thermometer	The temperature difference represented by each scale of the DUT (for liquid-in-glass thermometers)

Click  on the lower right to save

4.1.8 Temperature Controller, Bimetallic Thermometer, and Thermostat Transmitter

Table 47 Temperature Controller, Bimetallic Thermometer, and Thermostat Transmitter Task Information


Subject	Valid Value	Comment
Name	Alphanumeric content (16 max length)	Name of DUT
S/N	Alphanumeric content (16 max length)	Serial Number of DUT
Location	Alphanumeric content (16 max length)	DUT location
Comment	Alphanumeric content (16 max length)	Comment information of DUT
Company	Alphanumeric content (16 max length)	DUT owner
Range	Depends on the unit of temperature	Click temperature units to switch.
Accuracy	1%, 1.5%, 2%, 2.5%, 4%, custom	Users can set a custom accuracy. The unit should be %.
Scale Value	Depends on the range of the thermometer	The display resolution of the DUT
Number of electric contacts	0, 1, 2	Number of electric contacts of the DUT. An electric contact value should be set if it is not zero. The upper and lower limits, valid value and unit depend on the range.

Click  on the lower right to save

4.1.9 Digital Thermometer

Table 48 Digital Thermometer Task Information

Subject	Valid Value	Comment
Name	Alphanumeric content (16 max length)	Name of DUT
S/N	Alphanumeric content (16 max length)	Serial Number of DUT
Location	Alphanumeric content (16 max length)	DUT location
Comment	Alphanumeric content (16 max length)	Comment information of DUT
Company	Alphanumeric content (16 max length)	DUT owner
Input	Depends on the unit of temperature	Click temperature units to switch.
Accuracy	1%, 1.5%, 2%, 2.5%, 4%, custom	Users can set a custom accuracy. Unit: %
Scale value	Depends on DUT	The temperature difference represented by each scale of the DUT
Number of electric contacts	0, 1, 2	Number of electric contacts of the DUT. An electric contact value should be set if it is not zero. The upper and lower limits, valid value and unit depend on the range.
Enable analog output	open / close	Select if the digital thermometer has an analog output. Output signal should be set if this function is enabled.
Output (only when analog output is enabled)	-30~30	The output signal range of the DUT. The unit depends on the measurement of current or voltage (Click the unit of electric signal to switch between mA and V).
Analog output accuracy (only when analog output is enabled)	1%, 1.5%, 2%, 2.5%, 4%, custom	Users can set a custom accuracy by custom options. Unit: %

Click  on the lower right to save

4.1.10 Accuracy Setting of DUT

Apart from standard accuracy settings, the dry well calibrator also supports three sub selections.

◆ In the setting interface, every highlighted value can be revised.

4.1.10.1 Accuracy Setting

The dry well calibrator provides two types of accuracy setting:

1. Fixed Accuracy

Fixed accuracy setting can be applied to such DUTs liquid-in-glass thermometers.

For example: **(0 ~ 100)% ± (0.2 °C)**

How to set a fixed accuracy:

Click fixed accuracy value (the highlighted value, as 0.2 in the example above), and enter the selection page. The default accuracies are: 0.1, 0.15, 0.3, 0.5, 1, 2.5 and custom.

◆ Custom values can be selected. The unit depends on the DUT's unit setting.

2. Fixed Accuracy + % of Reading Accuracy

Fixed and % of reading accuracy setting can be applied to such DUTs as resistance, thermocouple, NTC and surface thermometers.

For example: **(0 ~ 100)% ± (0.1 °C + 0.002 * |t|)**

How to set fixed and % of reading accuracy:

1. Fixed accuracy setting: Click fixed accuracy value (the highlighted value, as 0.1 in the example above), and enter the selection page. The default accuracies are: 0.1, 0.15, 0.3, 0.5, 1, 2.5 and custom.



2. % of Reading accuracy setting: Click % of reading accuracy value (the highlighted value, as in 0.002 in the example above), and enter the selection page. The default accuracies are: 0.001, 0.002, 0.004, 0.005, 0.008, 0.01 and custom.

◆ Custom values can be selected. The unit depends on the DUT's unit setting.

4.1.10.2 Subsection Setting

The dry well calibrator allows users to list the accuracy in different subsections, and set the accuracies respectively in order to meet different demands.

How to set subsection accuracies:

1. Click  /  to add or reduce the number of sections. Or click the number on the right to input the sections through the keyboard.
 2. Please refer to 4.1.10.1 to set the accuracy for every subsection.
- ◆ The dry well calibrator supports as many as three subsections of accuracy.




4.2 Test Center



All the tasks can be managed in test center.

4.2.1 Test Task Management

1 Click “Add Task” to view the task information.

◆ On task information screen, the user can:

- 1) Click  to enter the task screen. The dry well calibrator will perform the task again according to the previous device and task. Please refer to Chapter 4.3 to perform task actions.
- 2) Click  to use the current test settings as a template
 - ◆ The new task of the DUT cannot be revised. Please refer to the following instructions for task configuration.
- 3) On the task settings information screen, the contents with the icon  can be revised. Please refer to Chapter 4.2.2 for task settings operation.

2. Click  to add new task. Click  in the center of the screen and select a DUT from device center. The basic information of the selected DUT will be shown, and a task setting menu will be listed according to the type of the DUT.

3. Click  to delete the added tasks. Click  to delete a single task, or click  to delete multiple tasks.




4. Click  to search the tasks. The search conditions are as follows:

Table 49 Search Settings in the Test Center

Subject	Valid Value	Comment
Name of task	Alphanumeric content (16 max length)	Input the name of the task
Name of device	Alphanumeric content (16 max length)	Input the name of the DUT
S/N	Alphanumeric content (16 max length)	Input the serial number of the DUT
Performance	Yes / No / All	Yes means the task has test data associated with it.
Creation Time	Starting time: 2000-1-1 ~ 2099-12-31	The time range when the DUT was created.
	Finishing time: 2000-1-1 ~ 2099-12-31	
Update Time	Starting time: 2000-1-1 ~ 2099-12-31	Search the time range of the latest task update.
	Finishing time: 2000-1-1 ~ 2099-12-31	

Click  to apply the search conditions. The results conforming to the conditions will appear in the list.

◆ Click  to delete all the input search conditions.

4.2.2 Task Settings

Task settings include basic information setting, control setting, device setting, set point list, and indication error, etc.

4.2.2.1 Dual-Channel Test

The DUT types which support dual-channel tests are as follows:

Table 50 Dual-Channel Test Compatibility Information

Type of DUT	Available for Dual Channel Test
Thermal resistance	•
Thermocouple	•
NTC	•
Temperature transmitter	
Temperature switch	
Glass liquid thermometer	•
Temperature controller	
Bimetallic thermometer	
Pressure thermometer	
Thermostat transmitter	
Surface thermometer	•
Digital thermometer	

As for DUTs supporting dual channel test, click  to add a second DUT when one is already selected.

4.2.2.2 Basic Information Settings

The DUTs which support setting basic information are as follows:


Table 51 Basic Information Setting Compatibility in the Task Menu

Type of DUT	Basic information		Operation settings				
	Name	Comment	Cycle times	Trip	Dwell time	Reading times	Reading intervals
Thermal resistance	•	•	•	•	•	•	•
Thermocouple	•	•	•	•	•	•	•
NTC	•	•	•	•	•	•	•
Temperature transmitter	•	•	•	•	•	•	•
Temperature switch	•	•	•				
Liquid-in-glass thermometer	•	•	•	•	•	•	•
Temperature controller	•	•	•	•	•	•	•
Bimetallic thermometer	•	•	•	•	•	•	•
Pressure thermometer	•	•	•	•	•	•	•
Thermostat transmitter	•	•	•	•	•	•	•
Surface thermometer	•	•	•	•	•	•	•
Digital thermometer	•	•	•	•	•	•	•

The basic information setting include the following:

Table 52 Basic Information Setting in the Task Menu

Subject	Valid Value	Comment
Basic Information Settings		
Name	Alphanumeric content (16 max length)	Name of the task
Comment	Alphanumeric content (16 max length)	Comment for the task
Operation Settings		
Cycle times	1 / 2 / 3	The number of times a test repeats
Trip	One way / round trip	The operation mode of the task
Dwell time	1~60	The time that the test point is stable before each reading. Unit: min
Reading times	1~6	The number of readings the dry well calibrator measures after the dwell time.
Reading intervals	0~3600	The intervals between every reading. Unit: sec

Click  to apply the changes.

4.2.2.3 Control Settings

The DUTs supported control settings are as follows:

Temperature control settings which determine temperature stability are as follows:

Table 53 Temperature Control Settings in the Task Menu

Subject	Valid Value	Comment
Select REF	INT / EXT	Select Internal (INT) or external (EXT) sensor as the reference standard
Fluctuation degree	0.04~10	The allowed range of temperature fluctuation
Stability time	1~60	The time in which stability is determined. Unit: minute
Target deviation	0~20	The allowed difference between the reading of the standard temperature and the target temperature

- ◆ The temperature is considered stable when fluctuation degree, stability time and target deviation are within the allowed range.

4.2.2.4 Device Settings

The DUTs supported device settings are as follows:

Table 54 Device Settings Compatibility in the Task Menu

Type of DUT	Device 1 & Device 2	Fluctuation Degree	Stable Time	Temperature Control Rate	Channel 1 & Channel 2
Thermal resistance	•	•	•		•
Thermocouple	•	•	•		•
NTC	•	•	•		•
Temperature transmitter	•	•	•		•
Temperature switch	•			•	•
Glass liquid thermometer	•	•	•		
Temperature controller	•	•	•		
Bimetallic thermometer	•	•	•		
Pressure thermometer	•	•	•		
Thermostat transmitter	•	•	•		
Surface thermometer	•	•	•		
Digital thermometer	•	•	•		

Device setting selections includes:

Table 55 Device Settings Compatibility Instruction

Subject	Valid Value	Comment
Device1 & Device2	Depends on the selected DUT. Refer to Chapter 4.1 for details.	Editable information about the DUT.
Fluctuation degree	0.04~10	The fluctuation degree particularly for a DUT can be set here.
Stability time	1~60	The stability time particularly for a DUT can be set here. Unit: minute
Temperature control rate	0~30	Temperature control rate of the dry well calibrator, unit: temperature unit/minute Temperature control rate is only applied within the set point range of the temperature switch. Please refer to Chapter 3.1.6 for details.
Channel 1 & Channel 2	CH 1 (/CH 2)	Set the corresponding DUTs for Channel 1 and Channel 2, which depends on whether the DUT supports dual channel test and the connection.

4.2.2.5 Set Point List

All types of DUTs support the set point list function.

- ◆ The dry well calibrator supports 1 to 17 set point settings. The set points can be added or reduced through ^ and v button on the right, or click the numbers of the set points and input the number through the keyboard.
- ◆ The set points are one-way. For example: If round trip is selected in the basic task setting, and the set points are 3 (0, 50, 100), then the actual set points run in the task will be 6(0, 50, 100,100, 50, 0).

4.2.2.6 Indication Error

Indication error function only relates to liquid-in-glass thermometers, bimetallic thermometers, temperature controllers, and pressure thermometers. When indication error test is checked, the settings are as follows:

4.2.2.7 Electric Contact Test

Electric contact test function only supports such DUTs as bimetallic thermometer with more than zero electric contacts, and temperature controller. When electric contact test is checked, the settings are as follows:

Table 56 Electric Contact Test Settings

Subject	Valid Value	Comment
Temperature control rate	Up to the temperature unit	Set the temperature control rate of the electric contact
The first electric contact value	CH 1 / CH 2	Select the channel for the first electric contact
The second electric contact value (only for the device with two electric contacts)	CH 1 / CH 2	Select the channel for the second electric contact


◆ Either one or both of electric contacts and indication errors should be selected. Indication error is checked as default.

4.3 Task Performance

4.3.1 DUT and Test Setting Selection

Task performance is able to start when DUT and task configuration are complete.

◆ **How to operate:**

- ① Selected the added task setting, enter the task setting screen. Task settings can be changed here.
 - ② After task setting, click  to enter task performance screen. Please refer to Chapter 4.3.2 for details.
- ◆ All the setting changes will be effective and replace the previous changes after clicking CONFIRM button.

4.3.2 Task Performance

A wire connection diagram will show on the task performance screen to suggest the correct way to make the connection.

◆ **Only CH1 supports HART transmitters**

Note: Please check the wire connection of the DUT carefully. The wrong connection may damage the dry well calibrator or the DUT.

4.3.2.1 Typical Task Screen

The typical task screen of the dry well calibrator is shown in the picture below (except temperature switch):

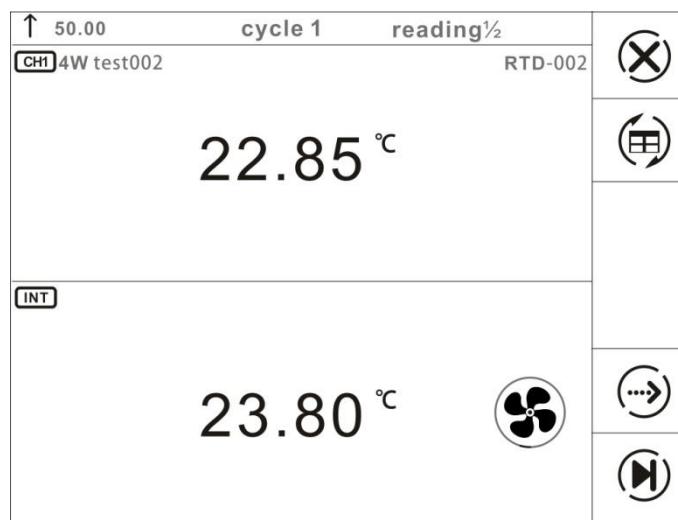


Figure 15 Typical Task Interface










1. The lower part shows the dry well temperature, and the upper part shows the return value of the DUT.

- ◆ DUTs such as thermal resistance, and thermocouple, etc., the reading is automatically collected and cannot be revised by the users.
- ◆ DUTs such as liquid-in-glass thermometer, and bimetallic thermometer which the dry well calibrator cannot collect the reading automatically, the user can click on the return value and input the reading through the keyboard after the temperature is stable in required dwell time.

2. The bar on top of the screen shows the current temperature set point and cycle times.

3. The standard buttons are on the right of the screen:

Table 57 Button Instruction on Typical Task Interface




Icon	Manual Mode 	Automatic Mode 	Comment
	•	•	Exit the task and the current data acquired will be cleared.
	•	•	Switch the display mode between regular mode and table mode. The DUT readings can be revised in the two modes. In temperature switch test, click  to switch display mode. The regular mode shows a temperature/time diagram.
	•		Switch to the previous set point The data of this set point will be cleared and the temperature control will automatically switch to the previous set point.
	•	•	Switch to the next set point The standard value and the DUT readings will be saved and the dry well will control to the next set point.
	•		Skip the current set point The value of this set point will be skipped and will not be shown in the final report.
		•	Pause or continue with the current task
↑ 50.00 cycle 1	•	•	Shows the current cycle times and the numbers of set points in current cycle This example means the dry well is ascending to 50 degrees as the set point under the first cycle

4.3.2.2 Thermal resistance, thermocouple, NTC, and temperature transmitter



◆ Only CH1 supports HART transmitters

The dry well calibrator provides manual and automatic performance modes for the DUTs above.

1. Manual Performance



- 1) Click  on the lower right to start performance. The temperature will be automatically controlled to the first set point.
- 2) The temperature output value will become green when the temperature is stable, with dwell time is shown after the dry well is stable.
- 3) The dwell time will become green when it meets the requirement.
- 4) Click  to record the data and proceed to the next set point.
- 5) When all the set points are tested, click  to enter task report screen. The test data will be saved here. Please refer to Chapter 4.4 for details.

2. Automatic Performance

- 1) Click  on lower right to start the task. The dry well calibrator will start controlling automatically.
- 2) When all the set points are tested, click  to enter task report screen. The user can redo the test or save the data of this test. Please refer to Chapter 4.4 for details.

4.3.2.3 Temperature Switch



The dry well calibrator only provides automatic performance mode for temperature switch.

- 1) Click  on lower right to start the test. The dry well calibrator will start controlling automatically.
- 2) When all the set points are tested, click  to enter task report screen. The user can redo the test or save the data of this test. Please refer to Chapter 4.4 for details.



4.3.2.4 Liquid-in-Glass Thermometer, Temperature Controller, Bimetallic Thermometer, Pressure Thermometer, Thermostat Transmitter, Surface Thermometer, and Digital Thermometer

The dry well calibrator only provides manual performance modes for the DUTs above.

1. Manual Mode:

- 1) Click  in the lower right to start the test. The dry well will automatically control to the first set point.
- 2) The temperature output value will become green when the temperature is stable, with the dwell time shown.
- 3) The dwell time will become green when it meets the requirement.
- 4) Click the DUT's value on the screen, and input the current reading through the key board. Click Enter key to apply the value, and the dry well will proceed to the next set point.
- 5) When all the set points are complete, click  to enter task report screen. The user can redo the test or save the data of this test. Please refer to Chapter4.4 for details

2. Automatic Mode:

- 1) Click  in the lower right to start the test. The dry well calibrator will control automatically to the first set point.
- 2) When the temperature reaches the set point, the system will automatically take the standard value and the DUT's reading. The user can click and revise the DUT's reading manually if desired.
 - ◆When the temperature reaches the set point, the user should revise the DUT's reading within the dwell time.
 - ◆When the dwell time meets the requirement, the dry well will move to the next set point. The DUT's previous reading cannot be edited at this point.
- 3) When all the set points are tested, click  to enter task report screen. The user can redo the test or save the data of this test. Please refer to Chapter4.4 for details




4.4 End of Task

4.4.1 Task Report

The user can view all the data in the task report screen.

- ◆ As for a dual channel task, click the DUT names on the top of the screen to view reports for different DUTs.

Table 58 Icon Meanings

Icon	Comment
	Exit the task. All the data of the current task will be cleared.
	The current task will restart again. All the data of the current task will be cleared.
	Save the data of this test. Please refer to Chapter 4.4.2 for details.

4.4.2 Task Data Saving

When the task is completed, the dry well will proceed to a screen where the test results can be saved.


How to setup:

Table 59 Task Saving Settings

Subject	Valid Value	Comment
Operator	Alphanumeric content (16 max length)	Input the information of the operator
Time	2000-1-1 ~ 2099-12-31	Input the time of the task performance
Environmental Temperature	Up to the temperature unit	Input the environmental temperature
Environmental Humidity	0~100	Input the environmental humidity, Unit: %RH

How to use:


When the settings are saved, the user can choose to save the task data as “as found” or “as left”, or “both”, and click the CONFIRM button on the lower right to save.

◆ Press  to cancel and go back to the task report screen.


4.5 Data Center

4.5.1 Data Viewing



Click the test data existing in the data center to view the test information and test data.

◆ On data information screen, press  to redo the task. The user cannot change device or the test in this process.


4.5.2 Data Deletion

Press  to enter data deletion screen and delete the existing task data.

How to use:

1. Click the task data to be deleted (multiple can be selected)
 2. Press  to delete the selected data.
- ◆ Press  to delete all the data.

4.5.3 Data Search

Click  to search the task data.

How to Use

1. The user can select 4 Subjects from the list below:

Table 60 Task Data Searching Subject Selection

No.	Subject Name
1	Device name
2	S/N
3	Type of the device
4	Name of the test
5	Operator
6	Type of the result
7	Pass
8	Time of the performance


2. Click  to apply the settings.

3. Click the highlighted part of the search list subjects to select the keywords.

◆ Keyword selection is not case sensitive and supports partial keyword searching. Please refer to Example 1.

◆ Cancel the keyword selection by deleting all the keywords. Please refer to Example 2.

Example 1: Name of device → click “All” → input “lg” → click  → all the devices with “lg” in the name will be listed.

Example 2: Name of device → click “lg” → Delete All → click  → cancel the search with the key word “lg”.

5. Application

5.1 Temperature Converter

How to setup:

1.TC:

Table 61 Temperature Converter for TC

Subject	Valid Value	Comment
Sensor Type	S, R, B, K, N, E, J, T, C, D, G, L, U, LR, A, 10 μ V/ $^{\circ}$ C, 1mV/ $^{\circ}$ C	Select TC type
Electric Signal	Depends on sensor type	Electrical signal output from TC, unit: mV Please input Ext CJC Value for correct calculation result
Celsius	Depends on sensor type	Celsius degree, unit: $^{\circ}$ C
Kelvin	Depends on sensor type	Kelvin degree, unit: K
Fahrenheit	Depends on sensor type	Fahrenheit degree, unit: $^{\circ}$ F
Ext CJC Value	-10~50	Fixed cold junction value, used for electrical signal calculation, unit: $^{\circ}$ C

For example, type K TC:

1. Input 20 $^{\circ}$ C, corresponding 68 $^{\circ}$ F and 293.15K will be calculated by the dry well.
2. Once the Electric Signal needs to be calculated the Ext CJC Value shall be inputted as the compensated Electric Signal.

2. RTD

Table 62 Temperature Converter for RTD

Subject	Valid Value	Comment
Sensor Type	All available RTD, ITS-90, CVD and NTC from sensor library	Select RTD type
Electric Signal	Depends on sensor type	Electrical signal output from RTD, unit: Ω
Celsius	Depends on sensor type	Celsius degree, unit: $^{\circ}\text{C}$
Kelvin	Depends on sensor type	Kelvin degree, unit: K
Fahrenheit	Depends on sensor type	Fahrenheit degree, unit: $^{\circ}\text{F}$

How to use:

Press the known subject and input the corresponding value, other subject values will be calculated by the dry well.

5.2 Temperature Control Data Logging

How to setup:

1. General settings:

Table 63 Temperature Control Data Logging General Settings

Subject	Valid Value	Comment
Start Temperature	Current Temperature / Custom Temperature (value depends on temperature unit)	Data logging function will start after the dry well reaches the start temperature
End Temperature	Depends on dry well model	Data logging function will end after the dry well reaches the end temperature
Control Settings	Refer to Control Settings table below	Control settings
Interval	1~60	Data logging interval, unit: sec
Dwell Time	1~60	Dwell time after the dry well reaches the target temperature in the stability test, unit: min
Stability Test	Enable / Disable	Enable or disable stability test Dry well will start stability test only when it reaches the target temperature and meets the dwell time requirement
Stability Test Time (only available when stability test is on)	1~60	Logging time after the dwell time is reached during the stability test, unit: min
CH 1 & CH 2	Refer to UUT Settings table below	Channel settings

2. Control Settings:

Table 64 Data Logging Control Settings



Subject	Valid Value	Comment
Control Program		
Stability Tolerance	0.04~10	Temperature stability after set point is reached
Stabilization Time	1~120	Dwell time after dry well reach the stability criteria is meet , unit: min
Set Point Tolerance	0~20	The difference between display temperature and set point
Control Rate	Max, 0~100 °C/min	The target slew rate at which the dry well increases or decreases temperature
Set Point Limit	Enable / Disable	Enable or disable set point limit
Restriction Range (only available when Set Point Limit is enable)	Depends range of dry well	Set restriction range for set point Dry well will only apply custom control rate within this restriction range
Control Reference		
Control Resolution	1, 0.1, 0.01	Set temperature control resolution, which changes the sensor signal resolution as well (see below)
Sensor Signal	Read only	Sensor display value, resolution depends on control resolution (see above)

3. UUT settings:

Table 65 Data Logging UUT Settings

Subject	Valid Value	Comment
General settings		
CH 1 & CH 2 Connection	Connected / Disconnected	Selecting whether the two-channel measurement type is the same: Connected-CH 1 & CH 2 are the same measurement type Disconnected-CH 1 & CH2 are different from each other
CH 1 / CH 2 (Measurement Subject)	RTD, TC, mA, V, Off	Set channel measurement type. Please select voltage range when testing RTD or TC
Stability Tolerance	≥0.005	Set temperature stability tolerance, unit: °C
Channel settings (Only available when measuring current or voltage)		
Measure Range	-30~30	Set measurement range, unit depends on current or voltage (press electrical unit to switch between current and voltage measurement)
Scale Range	Depends on dry well model	Set scale range

How to use:

- 1) Press  on the lower-right to start data logging. The dry well will start temperature control and data logging automatically. It may take a few minutes of preparation before control is initiated.
 - ◆ During data logging, press  on the lower right to stop data logging process and the logged data will not be saved.
- 2) Once temperature control data logging is finished, a result interface will be shown where data can be saved.

How to review:

- To review saved temperature control data, press  on the right side to review saved data logging files
- ◆ To delete files, press  to delete a file or press  to delete multiple files.

5.3 Dehumidification



◆ After a extended time of inactivity, the dry well may need to be dehumidified. The dehumidification process is a 2 hour automated process to remove moisture that may have built up in the dry well and could cause damage.

How to setup:

Table 66 Dehumidification Settings

Subject	Valid Value	Comment
Dehumidification Temperature	Depends on system temperature unit	Set dehumidification temperature
Dwell Time	≥10	Set dehumidification time

How to use:

- 1) To start dehumidification process, press  on the lower right corner
- 2) To terminate dehumidification process, press  and wait for process to end.



5.4 Line Voltage Test (Only for ADT875PC/875 - 350 & 660)

How to setup:


In the setting interface:




1. Supply Power: Input actual power supply voltage, valid value: (90~254) V
2. Frequency: Input actual power supply frequency, valid value: (45~65) Hz

How to use:

1. Press  on the bottom right corner to start line voltage test.
 - ◆ During the test, supply power voltage will be recorded based on time line, the default test time is 5 min.
 - ◆ During the test, press  to stop and dry well will proceed to the report interface and all collected test results can be saved or abandoned

How to review:

To review saved data, press  at setting interface, all saved data will be displayed

- ◆ Press  to export all saved data to a USB drive
- ◆ To delete files, press  to delete a single file or press  to delete multiple files

5.5 Step Test



How to setup:

Table 67 Step Test Settings


Subject	Valid Value	Comment
Range	Depends on dry well model	Set step test range
Stroke	One way / (N points)	Select step test stroke
	Round trip 1 ^ (2N-1 points)	
	Round trip 2 ^ (21 points max)	
Dwell Time	1 ~ 240	Dwell time for stabilization before each reading, unit: min
Repeat	1 / 2 / 3	Number of test cycles
Set Points	Refer to section 4.2.2.5 set point settings	Set the value and quantity of set points
CH 1 & CH 2	Refer to section 2.4 DUT information	Set DUT settings
Control Settings	Refer to section 2.3 Control Settings	Set dry well temperature control settings

How to save a configuration:

Twenty step test configurations can be save with a unique name and test date

- 1) To enter setup saving interface, press  in step test settings interface
- 2) To save a new setup select one from the list, then press 

How to run a saved configuration:

To run a saved configuration, press  on the right side then select desired configuration.

How to use:









- 1) Press  to enter step test operation
- 2) Icon introduction:

Table 68 Step Test Icons Instruction



Icon	Comment
	Start step test
	Switch to previous or next set point
	Cancel current step test and re-start the step test from the first set point of the first cycle All data within this test will be deleted
	Switch display mode between chart and table
 100.00 cycle 2	Display current cycle and set point number This icon shown on the left means the dry well is reaching to ascending 100 degree set point under the second cycle
	Stop the current step test and enter report interface, all data of current test can be saved

3) Regular operation:

Press  to start the test, dry well will control to the first set point

◆ **How to review:**

To review saved data, press  on the right side.

◆ To delete saved data, press  to delete a single file or press  to delete multiple files




5.6 Switch Test

How to setup:


Table 69 Switch Test Settings



Subject	Valid Value	Comment
CH 1 & CH 2	On: Dry contact, Wet contact, NPN switch, PNP switch	Enable or disable channel, and select DUT type
	Off	
Temperature Range	Depends on dry well model	Set switch test starting and ending temperatures Dry well will only capture the switch activity within this temperature range
Control Rate	Max, 0~100 °C/min	Temperature control speed Dry well will only apply this control rate when actual temperature is within the temperature range set above
Stroke	One way / / Round trip Λ	Select switch test stroke method
Repeat	1, 2, 3	Set switch test cycle times

How to use:

- 1) Press  on the bottom right corner to enter switch test interface
- 2) Current temperature value and switch status will be displayed on the screen
- ◆ Press  to switch display mode between chart and table
 1. Chart: Display switch test process under current cycle
 2. Table: List all data under each cycle
- 3) Press  to stop switch test

How to review data:

At switch set up interface, press  to enter switch test data table, all saved data will be displayed

◆ To delete saved data, press  to delete a single record or press  to delete multiple records


5.7 Snapshot

How to setup:


Table 70 Snapshot Settings

Subject	Valid Value	Comment
Snapshot	On / Off	Enable or disable snapshot function
Storage Path	Local / USB	Select snapshot storage path
Storage Amount (only available when using local storage path)	Read only	Display the current quantity of snapshots can be stored in local storage
File Prefix	Alphanumeric content (16 max length)	Edit prefix of snapshot name
File Name	Time / No.	Select snapshot automatic naming method
Start No. (only available when choosing No. as file name)	1~1000	Select starting number for the next snapshot name If selected number is occupied, dry well will use the closest available number following selected number

How to use:


To execute a snapshot, press  on the top of screen


How to review:


Press  to review saved snapshot, swipe the screen to view others

◆ Only the snapshots under selected saving path can be viewed. Please change the saving path to view more snapshot under different saving path.

1. Local path:


Current snapshot name will display after press 

◆ Press  on the right side to transfer all snapshots into a USB drive

◆ Press  on the right side to delete all local path snapshots

2. USB drive:

◆ Please check USB connection first

Current snapshot name will display after press 



A Shelby Jones Company

8800 West Chester Pike

Upper Darby, PA 19082, USA

Phone: 610-446-6600

Email: info@instrumentation.com

website: www.instrumentation.com