

Bluetooth® Data Recorder

TR45A User's Manual

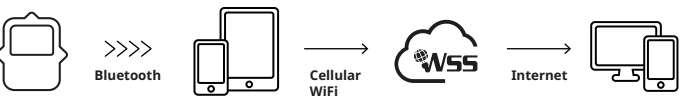
Package Contents

Before use, please confirm that all of the contents are included.



Introduction

The TR4A series enables data collection and management using dedicated mobile device applications. By using our free cloud service, you can access collected data using a web browser and analyze with the T&D Graph Windows application.



The following applications are supported:

T&D Thermo
Mobile app for device configuration, data collection and graphing, data upload to the cloud, and report creation.
* Refer to the **HELP** for operational details.
<https://manual.tandd.com/thermo/>

TR4 Report
TR4 Report is a mobile application that collects recorded data and generates a report for a specified period.
* Refer to the **HELP** for operational details.
<https://manual.tandd.com/tr4report/>

Device Preparation

TR45A is a data logger designed to measure and record different items depending on the input module (Sold Separately) to be connected: temperature (Thermocouple, Pt), analog signal (4-20mA, DC voltage), and pulse.

Battery Installation & Input Module Connection

The logger starts recording automatically upon battery installation and input module recognition.

Measurement Item	Input Module (Type)
Temperature (Type K, J, T, S, R)	Thermocouple Module (TCM-3010)
Temperature (Pt100, Pt1000)	PT Module (PTM-3010)
Voltage	Voltage Module (VIM-3010)
4-20mA	4-20mA (AIM-3010)
Pulse	Pulse Input Cable (PIC-3150)

*Before using the pulse input cable, it is necessary to set the measurement item to "pulse type" in the application.
*Sensor not provided / Pt sensor available as option

The LCD Display



REC	Recording Status	ON: Recording in progress OFF: Recording stopped BLINKING: Waiting for programmed start
ONETIME	Recording Mode	ON (One Time): Upon reaching logging capacity, recording automatically stops. OFF (Endless): Upon reaching the logging capacity, the oldest data is overwritten and recording continues.
	Battery Warning Mark	When this appears, replace the battery as soon as possible. A low battery may cause communication errors. * If the battery is left unchanged until the LCD display goes blank, all recorded data in the logger will be lost.
COM	Communication Status	Blinks while communicating with the application.

Display Examples

Display varies depending upon the input module connected.



Temperature (Thermocouple, Pt100 / Pt1000)

Sensor type will be displayed below the measurement. (Unit: °F / °C)

K J T S: Thermocouple Type, **Pt:** Pt100, **PtK:** Pt1000

Default setting is Type K and Pt.

* The sensor type setting can be changed in the application.



Voltage

The measurement range, recording method, and preheat settings can be made in the application.

Measurement Range: V Range 0 to 22V, mV Range 0 to 999.9mV

Default setting is V Range.

* Due to the wide measurement range, the device has been set by default to adjust the decimal point automatically to display the measurement in V.



4-20mA

The recording method ("Average Value" or "Instantaneous Value") can be selected in the application. (Unit: mA)

Pulse

There are two display methods as follows. The display method can be changed in the application. (Unit: P)



Pulse Rate (Max: 61439)

The most recent pulse count for the recording interval period will be displayed.

The display will be refreshed every one-sixtieth of the recording interval (at minimum of every one second).

* 45,000 pulse count will be displayed as [45.00P] with K (x1000) below the measurement value (in units of 10 pulses).



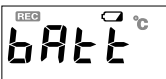
Total Pulse Count (0 to 9999)

Indicates the cumulative number of pulses since recording start.

The display will be refreshed every one second.

* Upon exceeding 9999, the count will start over again from 0.

Messages



Low Battery

This appears if, after the battery warning mark is displayed, no action is taken and the battery level becomes lower. (The measurement and the [bAtt] sign will alternately appear in the LCD.)

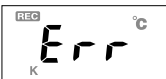
* Bluetooth communication is now stopped.

* If the battery is left unchanged until the LCD display goes blank, all recorded data in the logger will be lost.



Input Module Unrecognized or Unconnected

If the display does not change after reconnecting the input module, it may be damaged.



Sensor Error

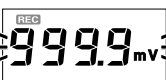
Indicates that the sensor is not connected or the wire is broken.

* If nothing appears on display after reconnecting the sensor to the device, there is a possibility that the sensor or the device has been damaged.



Measurement Range Exceeded

This will appear if a measurement exceeds the measurement range.



Display Range Exceeded

When measuring voltage in mV range, the measurement in the LCD display will flash if it exceeds the display range of the device.



Logging Capacity FULL

Indicates that the logging capacity has been reached and recording has been stopped.

(When recording mode is One Time)

Estimated Time until Logging Capacity (16,000 readings) is Reached

Rec Interval	1 sec.	30 sec.	1 min.	10 min.	60 min.
Time Period	About 4 hours	About 5 days	About 11 days	About 111 days	About 1 year and 10 months

Refer to the **HELP** for operational details.
<https://manual.tandd.com/tr4a/>



T&D Thermo (Basic Operations)

1 Download the App

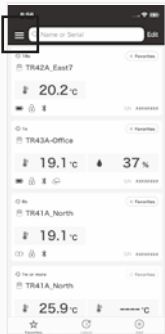
- 1.1 "T&D Thermo" is available for free download from the App Store or Google Play Store.

2 Set up a T&D WebStorage Service Account

- 2.1 **If you don't use the WebStorage: Go to Step 3.1**
In order to send data to the WebStorage, it is necessary to add an account to the App.
- 2.2 **If you don't have a WebStorage account:**
Tap ① [Menu Button] on the upper left corner of the app home screen → ② [Account Management] → ③ [Selected Account] → ④ [Get a User ID] to create a new account. Go back to the home screen and tap ① [Menu Button] → ② [Account Management] → ③ [Selected Account] → ⑤ [Apply] after entering the account information you created.
- 2.3 **If you already have a WebStorage account:**
Tap ① [Menu Button] on the upper left corner of the app home screen → ② [Account Management] → ③ [Selected Account] → ⑤ [Apply] after entering your account information.

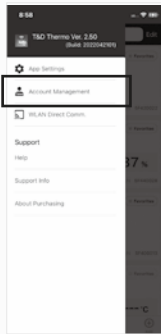
App Home Screen

① [Menu Button]



Menu Screen

② [Account Management]



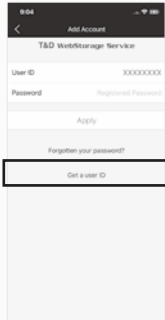
App Settings

③ [Selected Account]



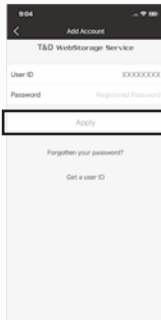
Add Account

④ [Get a User ID]

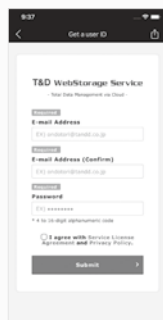


Add Account

⑤ [Apply]



Getting a User ID

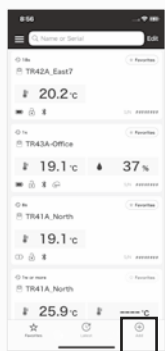


3 Add a Device to the App

- 3.1 Tap ⑥ [+Add Button] in the lower right corner of the home screen to open the Add Device screen. The app will automatically search for nearby devices and list them at the bottom of the screen. Select and tap the device to add from the list of Nearby Bluetooth Devices. (⑦ [Device to Add])
- 3.2 Enter the registration code (that can be found on the label supplied with the product), then tap ⑧ [Apply].
When the device is successfully added, it will be listed on the home screen.
(If you have lost Registration Code Label *1)

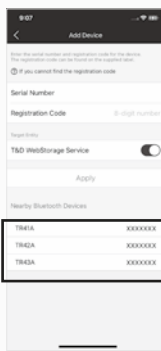
App Home Screen

⑥ [+Add Button]



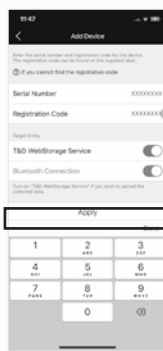
Add Device Screen

⑦ [Device to Add]



Add Device Screen

⑧ [Apply]



4 Collect Data from the Logger

- 4.1 In the list on the home screen, tap the target ⑨ [Device] to open the Device Info screen. When you tap the ⑩ [Bluetooth Button], the app will connect to the device, collect data and plot a graph.
- 4.2 **If a WebStorage account is set up (Step 2):**
The data collected in Step 4.1 will be automatically uploaded to the WebStorage.

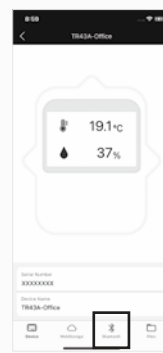
App Home Screen

⑨ [Device]



Device Info Screen

⑩ [Bluetooth Button]



T&D WebStorage Service

T&D WebStorage Service (referred to as "WebStorage") is a free cloud storage service provided by T&D Corporation.

It can store up to 450 days of data depending on the recording interval set for the device. Using in conjunction with the "T&D Graph" software allows for downloading stored data from the WebStorage for analysis on your computer.

T&D WebStorage Service Registration / Login

<https://www.webstorage-service.com>



T&D Graph

T&D Graph is a Windows software that contains a variety of useful functions including the ability to read and merge multiple data files, display recorded data in graph and/or list form, and save or print data graphs and lists.

It allows access to data stored in the T&D WebStorage Service for data analysis by inserting shapes and posting comments and/or memos on the displayed graph. It also has a feature to calculate the MKT (Mean Kinetic Temperature)*2

Refer to the HELP for operational details.

https://cdn.tandd.co.jp/glb/html_help/tdgraph-help-eng/



Note

*1 The registration code can be found by opening the back cover of the logger.

*2 Mean Kinetic Temperature (MKT) is a weighted non-linear average that shows the effects of temperature variations over time. It is used to aid evaluation of temperature excursions for temperature-sensitive goods during storage and transportation.