USER GUIDE

TR71A2

T&D

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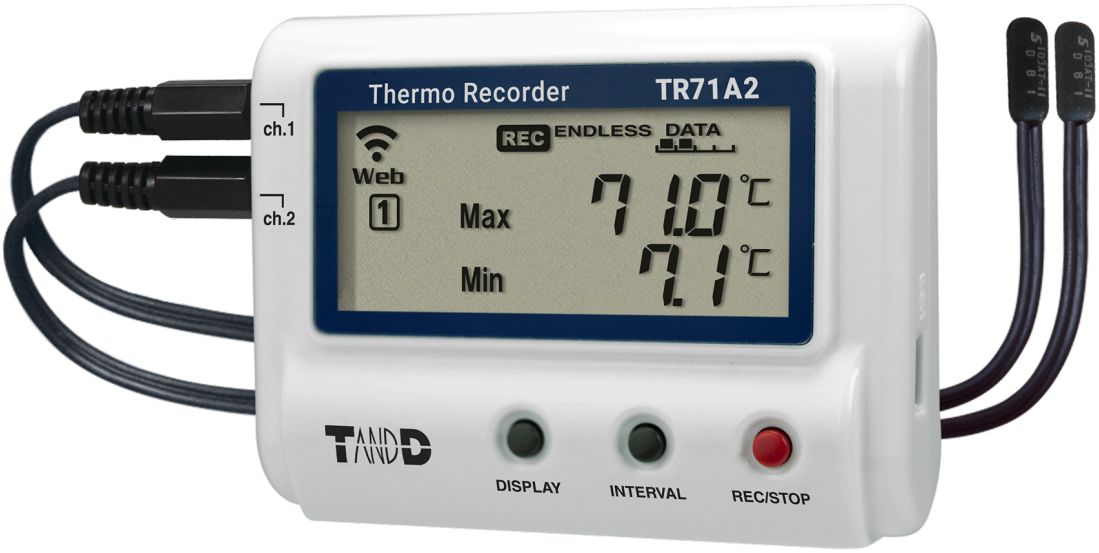

Thermo Recorder

TR7A2 series User's Manual

T&D Corporation

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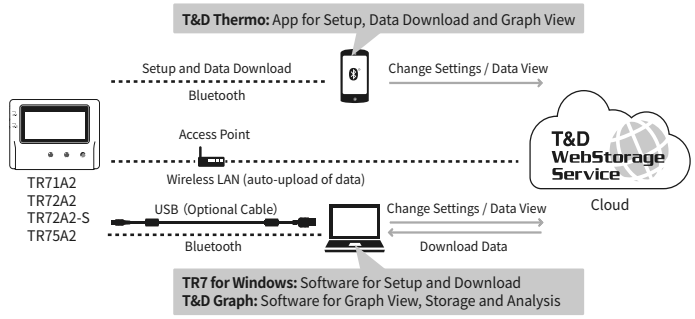
TR71A2, TR72A2, TR72A2-S and TR75A2 are cloud-based data loggers for measuring and recording temperature and humidity. By using our free cloud service, you can access your data on mobile devices and PCs anywhere, anytime. Also, the TR71A2 and TR75A2 have a vaccine mode that is useful for managing vaccine temperature.



* TR71A2, TR72A2, TR72A2-S and TR75A2 are hereinafter collectively referred to as TR7A2. Also, there are some places that TR7A2 is referred to as "logger" or "device".

Operational Differences by Measurement Mode (TR71A2, TR75A2)

	Normal Mode	Vaccine Mode
Max / Min Values	Max/Min temperature reading since the start of recording or reset (via buttons or software/app)	Max/Min recorded value since the start of recording or reset (via buttons or software/app)
Warning Judgment Time	30 sec to 60 min (9 selections) A warning will be issued when a measurement exceeds the set threshold value or a sensor error occurs for longer than the set judgment time.	0 sec (Same as recording interval) If a recorded value exceeds the set threshold value or if a sensor error occurs, a warning will be issued.
Warning Display [ALM] Icon	Warning alarms for exceeding a set upper and lower limit and for sensor errors will both disappear when the warning condition is resolved.	Warning alarms for exceeding a set upper and lower limit will not disappear even after a value returns to within the threshold range. Warning alarms for sensor errors will disappear upon return to normal.

Free Cloud Storage "T&D WebStorage Service"

"T&D WebStorage Service" enables you to access the uploaded recorded data from a web browser and check the current readings, remaining battery life of the device, and alert status. You can also receive warning notifications by email.

In order to use the service, user registration and device registration are required. Follow the steps below.

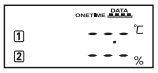
User and Device Registration Procedures

1. Access T&D WebStorage Service from the web browser.
   https://www.webstorage-service.com/
2. Click [Create Account] to go to the registration page, and follow the directions to complete the registration.
3. Login by entering the registered User ID and Password.
4. Click [Devices] in the left menu to open the Device Settings window.
5. Clicking the [+Device] button will take you to the Add a Device page.
6. Enter the serial number and registration code for the device, then click [Add].

Marks on LCD Screen

	Wireless LAN ON : Connected to the wireless network. (Signal strength: 1 to 3 bars) BLINKING : Unable to connect to the wireless network. OFF : Wireless LAN Settings are not made or Auto-Upload is "OFF".
Web	ON : Connected to the server. BLINKING : Unable to connect to the server. OFF : Wireless LAN Settings are not made or Auto-Upload is "OFF".
WPS	ON : Wireless LAN Setup using WPS Possible
COM	ON : Connected via LAN, Bluetooth or USB BLINKING: Communicating via LAN, Bluetooth or USB
REC	ON: Recording in progress BLINKING: Waiting for programmed start OFF: Recording stopped
ENDLESS ONETIME	ENDLESS : Upon reaching the logging capacity of 30,000 readings, the oldest data is overwritten and recording continues. ONETIME : Upon reaching the logging capacity of 30,000 readings, recording automatically stops. * Cannot be set or changed using buttons on the logger
DATA	Amount of Recorded Data in Device
	Battery Warning Mark BLINKING: Battery is low. ON: Battery is very low and Auto-Upload will stop. (Recording will continue.) RAPID BLINKING (3 sec): An external power supply has been connected. * Replacing the batteries while this is displayed will allow recording to continue uninterrupted. Please change the batteries as soon as possible when you see this mark. * If + (plus) and – (minus) are mistaken, or if the battery terminals + and – are shorted, the recorded data that is stored in the device will be lost. * Measurement and recording will cease approximately 3 minutes after removing batteries, so change as quickly as possible.
Upload	**Auto Upload Interval Indicator** * Will blink while Auto-Upload is in pause mode (See "Power Saving Settings")
Rec.	Recording Interval Indicator
1 2	Displayed Measurement Channel
ALM	BLINKING : Indicates either upper/lower limit error or sensor error
Max Min	Maximum and minimum values since the start of measurement or reset

Messages on LCD Screen

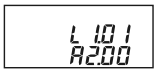


Indicates a sensor error (No sensor connected, improper connection, damaged, etc.)

Recording Full (Recording Stopped)
This appears when the logging capacity (30,000 readings) is reached in "ONETIME" mode.

Low Battery (Recording Stopped)
This appears if, after the battery warning mark is displayed, no action is taken and the batteries run out. Please refer to "About Battery Replacement" below, and change the batteries.

If the dead batteries are not changed, the display will automatically shut off. The previously recorded data will remain saved. The logger will then turn off the LCD display and reset the internal clock. Please refer to "About Battery Replacement" below, and change the batteries.

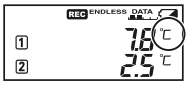


Firmware Version
This appears immediately after the power is turned on.

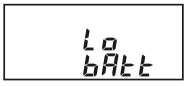
About Battery Replacement

Three stages of diminishing battery life are described below. It is recommended to replace the batteries at stage 1.

1. When it is time for the battery to be replaced, a battery life warning mark will appear.
   After Battery Replacement :
   • Recording will continue as it was before the battery replacement.
   • It is possible to download all saved recorded data.



2. If you continue to use the device without replacing the batteries, the display will show this message and recording will stop.
   After Battery Replacement :
   • Recording will remain stopped until you start recording. However, if the device communicates with the "T&D WebStorage Service" and the recorded data is successfully uploaded, recording will resume.
   • It is still possible to download all saved recorded data. Please note that if you start recording before the recorded data is downloaded to a computer or uploaded to the server, all recorded data in the device will be lost.



3. If the batteries are further left unchanged, the device will then turn off the LCD display and reset the internal clock.
   After Battery Replacement :
   • Recording will remain stopped until you start recording. However, if the device communicates with the "T&D WebStorage Service" and the recorded data is successfully uploaded, it will automatically synchronize the clock with the server and resume the recording.
   • If auto-upload is set to OFF, you will need to set the clock again.
   • It is still possible to download all saved recorded data. Please note that if you start recording before the recorded data is downloaded to a computer or uploaded to the server, all recorded data in the device will be lost.

Factory Default Settings

Recording Mode	: Endless
Recording Interval	: 10min
Auto-Upload	: OFF
Upload Destination	: T&D WebStorage Service
Warning Settings	: OFF
Max/Min Auto Reset	: ON / every day at 0:00
Power Saving Setting	: OFF
Time Zone	: UTC+1:00 for Serial Number "No.4XXXXXXX" / UTC-8:00 for Serial Number "No.3XXXXXXX"

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Recording Intervals & Estimated Maximum Recording Times

Recording Intervals & Estimated Maximum Recording Times

Recording Interval	1 sec	30 sec	5 min	10 min (default)	15 min	60 min
Estimated Time	About 8 hours	About 10 days	About 100 days	About 200 days	About 1 year	About 3.5 years

Recording Interval in Vaccine Mode: The 1-hour interval is not available.

Auto-Upload Intervals & Corresponding Estimated Battery Life

In general, the shorter the upload interval, the shorter the battery life. Also, it is possible to reduce battery consumption by setting time to pause auto-upload in [Power Saving Settings].

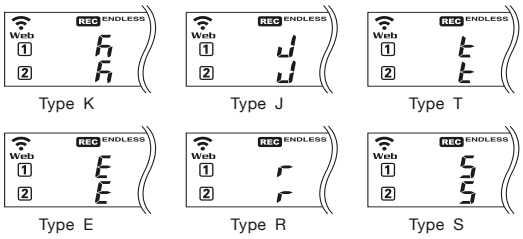
Upload Interval	1 min	10 min	1 hr	6hrs or more
Battery Life	About 5 days	About 1.5 months	About 7.5 months	About 18 months

* All estimates are based on operations carried out with a new battery and are in no way a guarantee of actual battery life.

* When Auto Upload is used frequently on TR71A2, the measurement of the internal sensor may rise by around 0.3℃.

Thermocouple Sensor Type (TR75A2 only)

By pressing and holding the <DISPLAY> button when in fixed display mode for Ch1/Ch2 current values, you can see which sensor type is currently set for each channel as shown below.



It is possible to use different types of sensors for Ch1 and Ch2.

The factory default setting is "K" for both channels. Depending on the thermocouple type you're going to use, make settings or changes using the PC software "TR7 for Windows", mobile app "T&D Thermo", or cloud-based "T&D WebStorage Service".

Via Bluetooth®: Device Settings and Data Download using Mobile App

Install the batteries and sensor(s) in the logger, and make sure the LCD is displaying measurements. The following explanations are based on the iOS version of T&D Thermo.

"T&D Thermo" App Preparation

1. Install "T&D Thermo" to your smartphone or tablet.

Mobile App "T&D Thermo"
https://tandd.com/software/td-thermo.html

2. Open "T&D Thermo".
3. On the top screen, tap [⊕ Add] to open the device registration page.
4. By selecting the desired device in the list of Nearby Bluetooth Devices, its serial number will be entered automatically. Enter the registration code, then tap [Apply].
   - When turning on the "T&D WebStorage Service" in the Target Entity field, your account for "T&D WebStorage Service" needs to be configured in Account Management. (Refer to the "T&D Thermo" HELP - [Accessing Cloud Storage] for details.)
5. After registering the devices, tap < to return to the top screen.

Device Settings Screen

1. Tap the device in the list to open the Device Info screen.
2. Tap [Bluetooth] at the bottom of the screen.
   The app connects to the device via Bluetooth and opens the Graph/Device Settings screen.

Device Info

Graph / Device Settings

Device/Recording/Warning Settings

Make necessary changes in [Name Settings], [Rec Settings] and [Warning Settings] menu. Tap [Apply] to apply the changes to the logger.

Name Settings

Recording Settings

Warning Settings

Items that can be set or changed in [Name Settings]:
Device Name, Group Name, Channel Name

Items that can be set or changed in [Rec Settings]:
Recording Start Method (Programmed Start or Immediate Start), Recording Interval, Recording Mode

* The Vaccine Mode setting is available for the TR71A2 and TR75A2; tap Measurement Mode and select Vaccine.
* Upon the start of a new recording session all stored data will be deleted from the device.
* Changes to the recording interval and recording mode are applied at the start of recording; they cannot be changed while recording is in progress.

Items that can be set or changed in [Warning Settings]:
Sensor Warning, Upper Limit, Lower Limit, Judgment Time, Battery Warning

* If you wish to make the upper/lower limit settings in Fahrenheit, change the temperature unit in [Other Settings].
* By making warning settings, you will see the ALM blinking on the LCD screen of the logger when a deviation such as temperature excursion is detected. In order to receive a warning email, you need to make the network settings. (See [Auto-Upload Settings].) Warning mail recipients can be set in the "T&D WebStorage Service".

Auto-Upload Settings

To automatically send recorded data to "T&D WebStorage Service" or to use the warning mail function, configure the wireless LAN settings and upload interval in [Network Settings].

* In addition, your account for T&D WebStorage Service needs to be selected in App Settings.

Items that can be set or changed in [Network Settings]:
Wireless LAN, Auto-Upload Interval

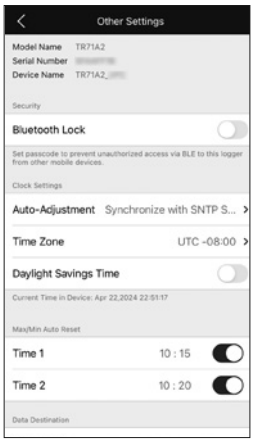
* DHCP and proxy settings can be made by selecting a network in WLAN Settings - Edit Network.

Power Saving Settings
To reduce battery consumption, it is possible to configure the period of time for pausing Auto-Upload. If a warning occurs during the paused time period, warning notifications and recorded data up to the time of the warning, will be sent.

* Power Saving Settings can be made only when the Auto-Upload Interval is three hours or less.

Clock Settings

Go to [Other Settings] - Clock Settings and make necessary settings related to the time.



Auto-Adjustment
When using Auto Upload to the "T&D WebStorage Service", select either [Synchronize with SNTP Server] (recommended) or [Synchronize with T&D WebStorage Service].

Time Zone
Specify the region where the device will be used.

Daylight Savings Time
When turning on this option for the device that automatically sends data to the "T&D WebStorage Service", you need to configure the Daylight Saving Time Display setting on the "T&D WebStorage Service" as well. For details, see [Via Cloud: Viewing Data in a Browser] - [Daylight Saving Time Display] in this manual.

Max/Min Auto Reset
TR7A2 has a function to automatically reset the maximum and minimum values on the LCD at specific time(s) of the day. If necessary, change the settings.

Default Setting: ON / 0:00 every day

Applying Settings

1. Tap the [Apply] button in each setting screen to send the settings information to the logger. The settings can also be applied by starting a recording from the Rec Settings.
   * Upon the start of a new recording session all stored data will be deleted from the device.
2. Place the device in the measurement location
   - Make sure to check the connection status. Refer to [Checking Connection Status] in this manual.

Output Options for Recorded Data (Save/Share/Report)

By tapping the [Bluetooth icon] at the bottom of the Device Info screen, the app will download and display data in the Graph/Device Settings screen.

The downloaded data can then be saved on the mobile device, shared via email or other methods, sent to the "T&D WebStorage Service", and output as a PDF report.

1. Tap the icon at the upper right of the graph to save graph data.
2. Go back to the Device Info screen and tap [Files] at the bottom of the screen.
3. Select a file from the file list and tap on the desired icon at the bottom of the screen.
   - By tapping [WebStorage] on the Device Info screen, you can download the recorded data from the "T&D WebStorage Service" to your mobile device for storage and sharing.

Via USB or Bluetooth® : Device Settings using Windows Software

Software Installation

1. Download “TR7 for Windows” from the T&D Website and install it to your computer.
   https://tandd.com/software/tr7win.html

2. Connect the device to your computer. When connecting via USB, the software will automatically open. If not, please open it manually from the Windows Start Menu or Start Screen.To use a Bluetooth connection, open the software and select [Bluetooth] as the Connection method in the area below the tool buttons. In the Bluetooth Device Management window, select a device and connect.
   Note: When connecting a device via Bluetooth for the first time, the device needs to be registered first using the registration code included with your product.

Clock Settings

Open [Clock Settings] from the [Settings] menu, and make necessary settings related to the time.

Auto-Adjustment
Select [Auto-Adjustment] when using Auto-Upload to automatically send the recorded data to the “T&D WebStorage Service”, or select [Set to computer Clock] when using a USB or Bluetooth connection to download data to your computer.

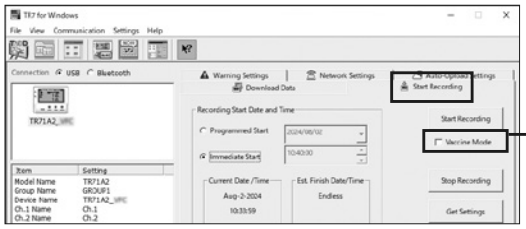
Time Zone
Specify the region where the device will be used.
When turning on the Daylight Savings Time option for the device that automatically sends data to the T&D WebStorage Service, you must also go to T&D WebStorage Service - [Data View] - [Clock Display Settings] and set the [Display using Daylight Savings Time info?] to “Yes”.

Max/Min Auto Reset
The TR7A2 has a function to automatically reset the maximum and minimum values on the LCD at specific time(s) of the day. If necessary, change the settings.

Default Setting: ON / 0:00 every day

Recording Settings

Click the [Start Recording] tab and make necessary settings for recording.



Check the box to use the TR71A2/75A2 in Vaccine Mode

Items that can be set or changed in [Start Recording] tab:
Recording Start Method (Programmed Start or Immediate Start), Recording Interval, Recording Mode, Group Name, Device Name, Channel Name

* **Recording Interval in Vaccine Mode:** The 1-hour interval is not available.

Warning Settings

Click the [Warning Settings] tab and make the necessary settings. By making warning settings, you will see the ALM blinking on the LCD screen of the logger when a deviation such as temperature excursion is detected. You can also receive a warning email by specifying “T&D WebStorage Service” as the destination and making wireless LAN settings in the [Network / Auto-Upload Settings]. Warning mail recipients can be set in the “T&D WebStorage Service” [Account] menu.

Items that can be set or changed in [Warning Settings] tab:
Upper Limit, Lower Limit, Sensor Warning, Judgment Time, Battery Warning

* By changing the temperature unit to Fahrenheit in [Settings] - [Temperature Unit Settings] menu, the upper and lower limits can be set in Fahrenheit here.

Network and Auto-Upload Settings

To automatically send recorded data to “T&D WebStorage Service” or to use the warning mail function, configure these settings in [Network Settings] and [Auto-Upload Settings] tab.

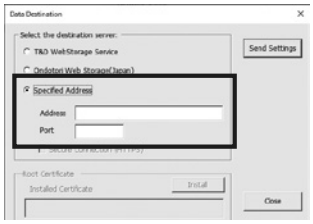
Items that can be set or changed in [Network Settings] tab:
DHCP, Settings, Proxy Server, and Connection Test

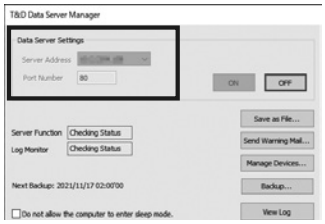
Items that can be set or changed in [Auto-Upload Settings] tab:
Data Destination, Auto-Upload Interval, Power Saving Settings, and Connection Test

> **Power Saving Settings**
> To reduce battery consumption, it is possible to configure the period of time for pausing Auto-Upload. If a warning occurs during the paused time period, warning notifications and recorded data up to the time of the warning, will be sent.
>
> * Power Saving Settings can be made only when the Auto-Upload Interval is three hours or less.

Data destination other than “T&D WebStorage Service”:
By setting the computer on which “T&D Data Server” is installed as the destination server, you can automatically save the recorded data in the server’s database. Monitoring of current readings and warnings via a web browser is also possible.

* Set the same IP address and port number for the data destination of “TR7 for Windows” and the server address of “T&D Data Server”.
* For details about operations of “T&D Data Server”, please refer to the software’s Help.





Applying Settings

1. Click the [Send Settings] button on the [Network Settings] tab or the [Auto-Upload Settings] tab to send the settings to the device. The settings can also be applied by clicking the [Start Recording] button in the [Start Recording] tab.
   * Upon the start of a new recording session all stored data will be deleted from the device
   * Connection test can be made from the [Connection Test] button. Error message will appear if an error occurs.

2. Place the device in the measurement location.
   * Make sure to check the connection status. Refer to [Checking Connection Status] in this manual.

Downloading Data and Viewing Graph

By connecting the TR7A2 to a computer via USB or Bluetooth, it is possible to download recorded data. Data downloaded can then be viewed in a graph for analysis by using the software “T&D Graph”.

1. Download “T&D Graph” from the T&D Website and install it to your computer.
   https://tandd.com/software/td-graph.html

2. Connect the TR7A2 to your computer.

3. Open “TR7 for Windows”, click on the [Download Data] tab and proceed with the download.
   *Upon completion of download, the summary (such as total time out of range) will be displayed.

If necessary, settings for “Graph Display” and “File Name” can be viewed and changed under [Detailed Settings]. When the [Create a CSV report file in the same folder] option is checked, a report file (CSV) that contains the maximum, minimum, and average values for each day and the total time of deviation will be saved in the same location as the recorded data.

If you check the [After downloading, automatically display graph] option in the [Download Data] tab - [Detailed Settings], “T&D Graph” will automatically open and display the graph after the download is complete.

Via Cloud: Viewing Data in a Browser

You can access “T&D WebStorage Service” to view the uploaded data and check and/or change the various settings.

Items that can be set or changed in individual Device Settings:

Device Name, Group Name, Rec Interval, Rec Mode, Time Difference, Temperature Unit, Channel Name, Auto-Upload Interval, Power Saving Settings, Warning Settings, Max/Min Auto Reset

* Note that the setting changes will not be actually applied until communication occursbetween the logger and “T&D WebStorage Service”. By pressing the <REC/STOP> button on the logger, however, settings can be applied immediately.

Daylight Saving Time Display

When the Daylight Saving Time option for a device that automatically sends data to the “T&D WebStorage Service” is turned on, you must also go to [Data View] - [Clock Display Settings] and set the [Display using Daylight Savings Time info?] to “Yes”.

Button Operations on the Device

Power ON/OFF	Press-and-hold*1 the <PWR> button.
Start*2 / Stop Recording	Press-and-hold*1 the <REC/STOP> button.
Check Recording Interval / Upload Interval	Press the <INTERVAL> button. With each pressing of the button, the display will switch between the recording interval (**Rec.**) and the upload interval (**Upload**).
Recording Interval setting	Press the <INTERVAL> button. While **Rec.** is displayed, press-and-hold*1*3 the <INTERVAL> until the interval time flashes. Press<INTERVAL> again to select the interval time.
Upload Interval Setting	Press the <INTERVAL> button twice. While **Upload** is displayed, press-and-hold*1 the <INTERVAL> until the interval time flashes. Press <INTERVAL> again to select the interval time.
Transmit Data and Settings to "T&D WebStorage Service"	Press the <REC/STOP>.
Cancel Communication	Press the <PWR>.
Switch Display Items and Pattern (Fixed or Alternating Display)	Press the <DISPLAY>. Each pressing of the button will change the display items and pattern (fixed or alternating display) as shown below: Ch1/Ch2 current values (fixed) → Ch1 MAX/MIN values (fixed) → Ch2 MAX/MIN values (fixed) → alternating display
Display Sensor Type (TR75A2)	Press-and-hold*1 the <DISPLAY> button.
Clear Max/Min (and ALM)	While Max/Min (and ALM) are displayed (in fixed display), press-and-hold*1 the <DISPLAY>.
Wireless LAN Settings using WPS	Press-and-hold*1 <PWR> and <DISPLAY> together.

1. “Press-and-hold” means to hold the button down for about 2 seconds. During recording, the power cannot be turned off.
2. Upon the start of recording, all previously recorded data in the unit will be deleted.
3. Recording Interval Setting cannot be changed while a recording session is in progress.

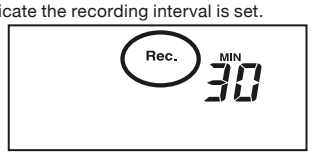
Before performing button operations, please read the attached document [Please Read First] and install the batteries and sensor(s) in the logger, and make sure the LCD is displaying measurements.

Recording Interval Setting

Follow the steps below to change the recording interval using the buttons on the device. The factory default setting for the recording interval is 10 minutes.

!	Upon the start of recording, all previously recorded data in the logger will be deleted. Note: When **REC** is ON (recording in progress), the logger cannot be turned off, nor can the recording interval be changed.

1. When **REC** is ON, press-and-hold the <REC/STOP> until it turns OFF (recording stops).
2. Press the <INTERVAL> button.
3. While **Rec.** is displayed, press-and-hold the <INTERVAL> until the interval time flashes.
4. Press the <INTERVAL> button again to select the interval time.
   Recording Intervals (**Rec.**) 1, 2, 5, 10, 15, 20, 30 SEC / 1, 2, 5, 10, 15, 20, 30, 60 MIN
5. When the desired interval appears, stop pressing the button. Within a few seconds, the display will return to measurement mode to indicate the recording interval is set.
6. Press-and-hold the <REC/STOP> button. **REC** will turn on and recording will start.



Recording Interval

Auto-Upload Interval Setting

Follow the steps below to change the Auto-Upload Interval using the buttons on the device. The factory default setting is OFF (no auto-upload).

Auto Upload Interval

1. Press the <INTERVAL> twice to display the Auto-Upload Interval.
2. While **Upload** is displayed, press-and-hold the <INTERVAL> until the interval time flashes.
3. Press <INTERVAL> again to select the interval time. Each press changes the interval as follows: OFF / 1, 2, 5, 10, 15, 20, 30 MIN / 1, 2, 3, 4, 6, 12, 24 HOUR
4. The interval time will stop flashing and the display will return to the normal measurement mode, confirming that it is set.

Wireless LAN Connection using WPS

This function is not available if your wireless LAN access point does not support WPS or the security setting is other than WPA/WPA2 PSK.

What is the WPS?

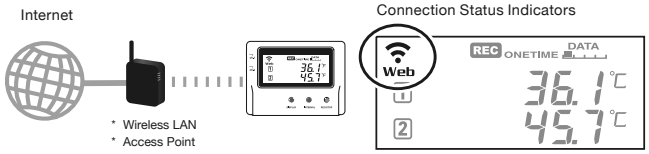
WPS (Wi-Fi Protected Setup) is a feature that makes it easy to set up a wireless LAN connection. It allows you to set up wireless LAN communication between the logger and a wireless access point (router) that supports WPS with just a push of a button on the logger. Button name of the WPS may differ depending on the router.

For details about operating WPS on the wireless LAN access point device, please check the User’s Manual that came with the unit.

1. Press the <PWR> and <DISPLAY> Buttons together until **WPS** appears on the LCD screen.
2. Set your wireless LAN access point to “WPS” mode.
   For details about Wireless LAN Access Point settings, refer to the user manual for that access point.
3. When the wireless LAN connection is successfully established, the mark on the LCD display will turn ON.

Checking Connection Status

Place the logger in the desired measurement location where Internet access is available.



Press the <REC/STOP> on the logger to immediately send the recorded data to “T&D WebStorage Service” without waiting for the next transmission. If the transmission is successful, and **Web** will remain ON after **COM** turns OFF.

is OFF or blinking	Unable to connect to the wireless network. Try adjusting the position of the device or its distance from the access point, or check the access point settings.
Web is blinking	Internet connection failed. Please check the access point’s internet connection.

For More Information and Support

Please contact the distributor from which you purchased the product.
https://tandd.com/purchasing/