

TR7 Series Thermo Recorder TR71A/ TR72A/ TR72A-S

User's Manual

T&D Corporation

tandd.com

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In this document, TR71A, TR72A and TR72A-S are collectively referred to as the “TR7A Series” or simply as the “device” or “logger” .

How to Use

There are mainly two ways to set up the device and manage the recorded data as follows.

Via Cloud: Automatic Data Upload

By using wireless LAN, the logger automatically uploads recorded data to the cloud storage. It enables the viewing of uploaded data and the changing of settings on your PC, smartphone and tablet.

Via PC: Setup and Download **See reverse side.**

Make settings and download data by using the USB connection and PC software.

- If you are using the TR71A for vaccine storage and management, please follow this method.

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” . ①② Displayed Measurement Channel WPS ON : Wireless LAN Setup using WPS Possible COM ON : Connected via Bluetooth or USB. BLINKING : Bluetooth or USB communication in Progress REC ON : Recording in Progress 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 : Indicates low battery ON : Wireless and Bluetooth communication will stop. (Recording will continue.) - 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. - The logger will stop measuring and recording data after about 3 minutes of battery removal. When replacing batteries, install new batteries as quickly as possible. Upload Auto Upload Interval Rec. Recording Interval ALM BLINKING : Indicates either upper/lower limit error or sensor error MaxMin Maximum and Minimum Readings
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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.
	Dead Battery If you take no action after the battery warning mark appears on the display, the logger will show this message and stop recording data. The logger will then turn off the LCD display and reset the internal clock. If you change the batteries at this point, it is still possible to download all saved recorded data. The recording cannot be continued.
	Upper part : Bootloader Version Lower part : Firmware Version This appears immediately after the power is turned on.

Button Operations

Power ON/OFF	Press-and-hold ^{*1} the <PWR> button.
Start/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 the <INTERVAL> button 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 the <INTERVAL> button 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> button.
Cancel Communication	Press the <PWR> button.
Switch Display Items and Pattern (Fixed or Alternating Display)	Press the <DISPLAY> button to switch the display: Ch1/Ch2 current values (fixed) → Ch1 Max/Min values (fixed) → Ch2 Max/Min values (fixed) → alternating display
Clear Max/Min (and ALM)	While Max/Min (and ALM) are displayed (in fixed display), press-and-hold ^{*1} the <DISPLAY> button.
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 two seconds.
^{*2}. Recording Interval setting cannot be changed while a recording session is in progress.

For the Users of TR71A

The TR71A has a “Vaccine Mode” setting that is suitable for such as vaccine storage and monitoring, which require strict temperature management. When this mode is enabled, the following features are available:

- Warning Judgement Time** : 0 sec. (immediate judgement)
 - Auto Reset Max/Min Values**
Monitor and record maximum and minimum temperatures for the day.
 - CSV File Created upon Data Download**
Manage reports on the daily maximum and minimum temperatures and total time out of range.
- To use the TR71A for vaccine management, please read the reverse side of this document carefully, and make settings in “Vaccine Mode” using the "TR7 for Windows" software.**
 - * The button operations (such as recording interval, auto-upload interval, and wireless LAN settings) can also be configured with this software.

Recording Interval Setting

Install the batteries and sensor(s) in the logger, and make sure the LCD is displaying measurements. The factory default setting for the recording interval is 10 minutes. Follow the procedure below to change this setting.

- Skip this setting if you don't need to change the recording interval.
- 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.

- Press-and-hold the <REC/STOP> button until **REC** turns OFF (recording stops).
- Press the <INTERVAL> button.
- While **Rec.** is displayed, press-and-hold the <INTERVAL> button until the interval time flashes.
- 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

- When the desired recording interval appears, stop pressing the button. Within a few seconds, the display will return to measurement mode to indicate the recording interval is set.

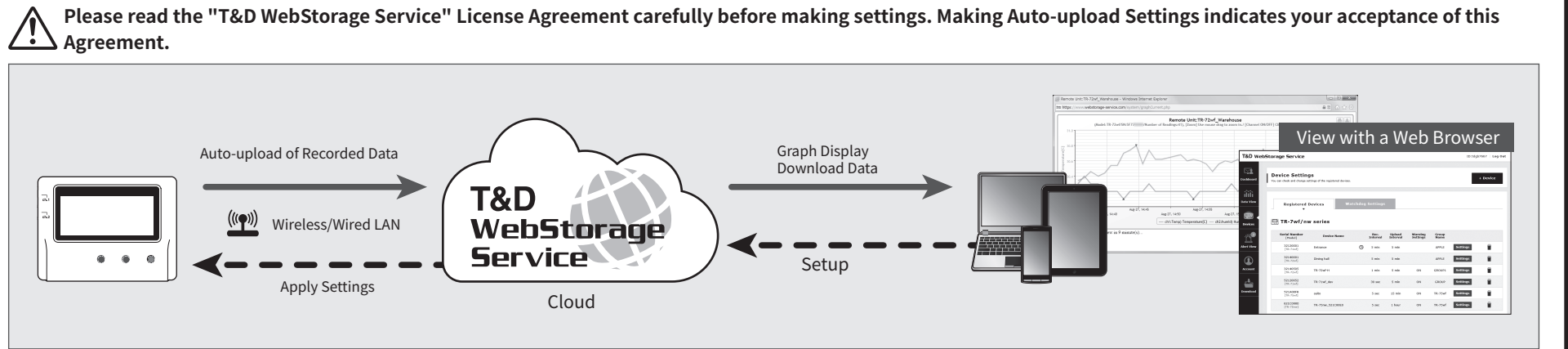
Ref: Recording Intervals & Estimated Maximum Recording Times

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

- Press-and-hold the <REC/STOP> button until **REC** turns ON (recording restarts).

Automatic Data Upload to the Cloud

The auto-upload function enables TR7 series loggers to automatically upload recorded data to the free cloud storage service "T&D WebStorage Service". The uploaded data is available for viewing from a web browser. The factory default setting is OFF (no auto-upload). Please follow the steps below to change the setting.



- This procedure requires Internet access via wireless LAN.
- Old data that exceeds the storage period will be deleted from "T&D WebStorage Service". Please check the details at T&D WebStorage Service License Agreement > Service Details.

If you wish to use a static IP address instead of DHCP, make network settings with the software. **See reverse side.**

STEP 1 Making Auto-Upload Settings

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

Auto Upload Interval

Ref: Auto-Upload Intervals & Corresponding Estimated Battery Life
In general, the shorter the upload interval, the shorter the battery life.

Upload Interval	1 min	10 min	1 hr	12hrs or more
Battery Life	About 10 days	About 2 months	About 1 year	About 15 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 TR71A, the measurement of the internal sensor may rise by around 0.3° C.

STEP 2 Making Wireless LAN Settings

To use the WPS feature, make sure to select WPS2-PSK(AES) or disable wireless security in your access point settings. Wireless LAN settings using WPS may not be possible depending on the supported features or settings of your wireless LAN access point. In this case, please make wireless network settings on PC.
See reverse side.

The following information is required:

- Network Name (SSID)
- Security (WEP 64bit/128bit, WPA-PSK (TKIP), WPA2-PSK (AES))
- Password (Network Key)

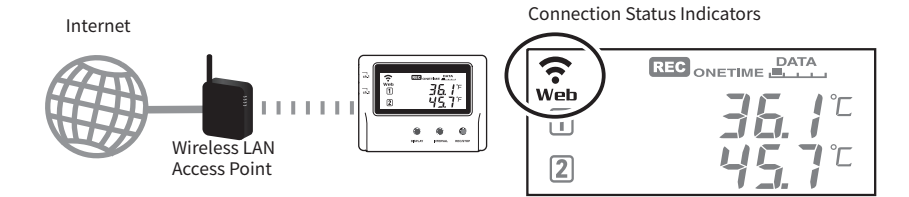
- Press the <PWR> and <DISPLAY> buttons together until **WPS** appears on the LCD screen.
- Set your wireless LAN access point to "WPS" mode.

For details about Wireless LAN Access Point settings, refer to the user manual for that access point.

- When the setup is successfully completed, the mark on the LCD display will turn ON.

STEP 3 Checking Connection Status

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



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

is OFF or blinking:	Unable to connect to the wireless network. Try changing the measurement location or adjusting the distance between the logger and the access point, and make the wireless LAN settings in STEP 2 again.
Web is blinking:	Internet connection failed. Please check the access point's internet connection.

STEP 4 Viewing Recorded Data

In order to view the recorded data on a web browser, it is necessary to register devices to T&D WebStorage Service in advance.

- Access "T&D WebStorage Service" from the web browser.
- https://www.webstorage-service.com/**
- Click [Create Account] to go to the registration page, and follow the directions to complete the registration. If you already have your User ID, go to the next step.
 - Login by entering the registered User ID and Password.
 - Click [Devices] in the left menu to open the Device Settings window.
 - Clicking the [+Device] button will take you to the Add a Device page.
 - Enter the serial number and registration code* for the target logger, then click [Add].
- * The registration code can be found on the supplied Registration Code Label.
- After data is sent to either by auto-upload or by pressing the <REC/STOP> button on the logger, the added device and its measurements will appear in the [Data View] window.

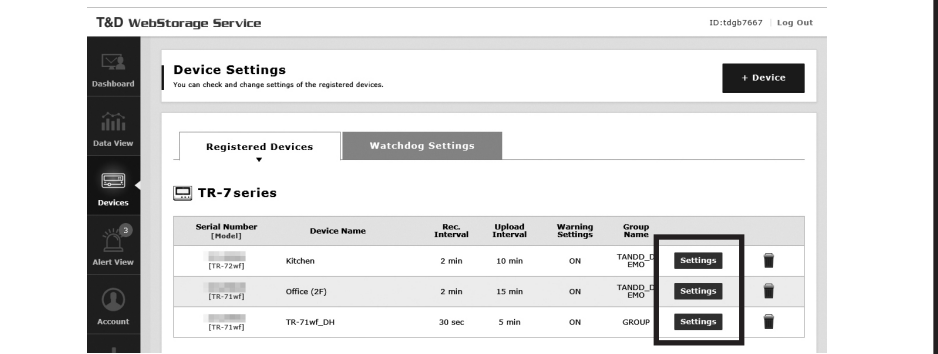
Troubleshooting Tips

- If measurements are not displayed:**
Check the screen of the logger and make sure **REC** is ON; If not, press-and-hold <REC/STOP> to start recording. See “Recording Interval Setting above.
- If the display of measurements is not refreshed:**
Try making the recording interval shorter. If the recording interval is set to longer than the upload interval, the same measurement is displayed until the next recording occurs and the new data is uploaded.
- If you lose your registration code label:**
Open the software "TR7 for Windows" and connect your logger via USB to the computer. The connected logger and its information will appear in the left boxes of the main window. The registration code can be found here.
- If you wish to save recorded data to PC:**
Use "T&D Graph" that is available for download from the T&D Website. See **Tips** on the reverse side.

STEP 5 Changing Device Settings

It is possible to change device settings by using "T&D WebStorage Service". In the Device Settings window click the [Settings] button to open the settings box. Make the necessary changes and click [Send Settings].

The setting changes will not be actually applied until communication occurs between the logger and "T&D WebStorage Service". By pressing the <REC/STOP> button on the logger, however, settings can be applied immediately.



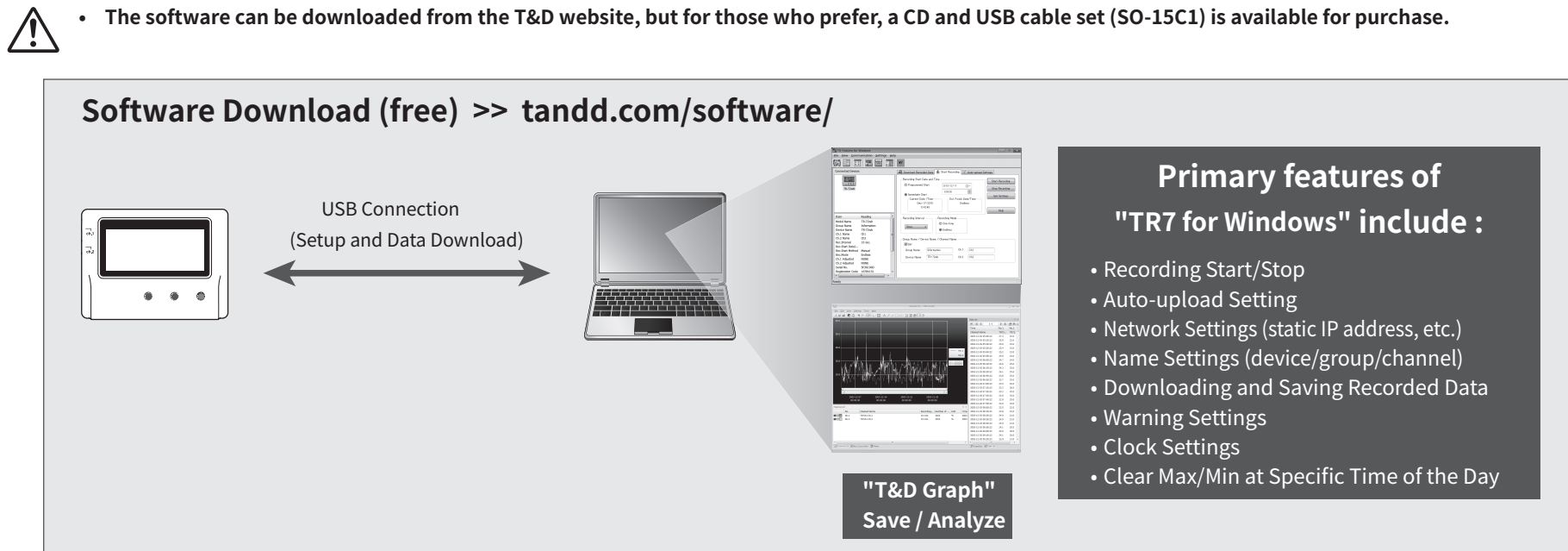
Setting Items which can be set or changed:

Device Info	Device Name, Group Name, Recording Interval, Recording Mode, Auto-Upload Interval, Time Difference, Temperature Unit, Channel Name
Warning Settings	Lower Limit, Upper Limit, Sensor Warning, Judgement Time, Battery Warning

PC over USB: Setup and Download

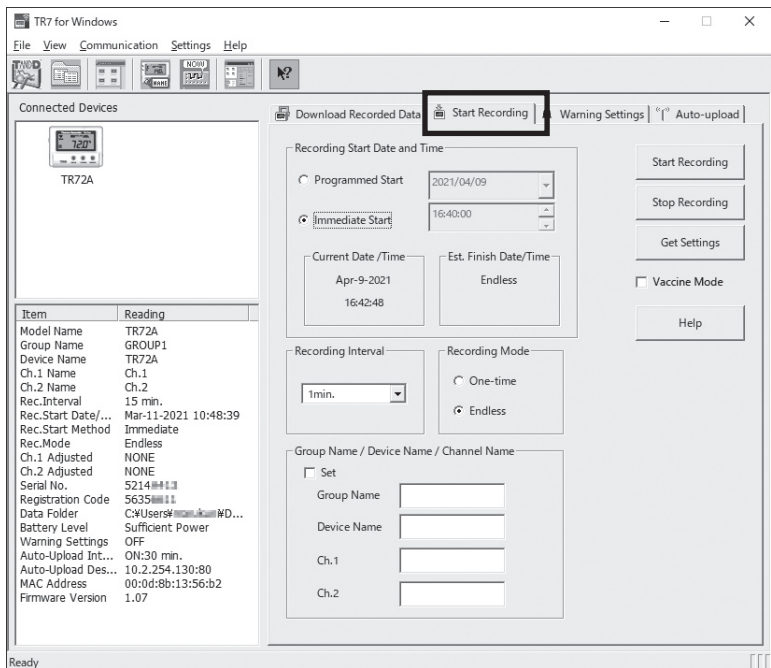
Using a USB connection between the logger and PC, make device settings and download recorded data via "TR7 for Windows".

- The software can be downloaded from the T&D website, but for those who prefer, a CD and USB cable set (SO-15C1) is available for purchase.



STEP 1 Device Settings

1. Download "TR7 for Windows" from the T&D Website and install it to your PC.
tandd.com/software/tr7forwin.html
2. Connect the logger via USB to your computer.
 - * "TR7 for Windows" will open automatically. (If not, please open it manually from the Windows Start Menu or Start Screen.)
3. Click the [Start Recording] tab and make necessary settings for recording.

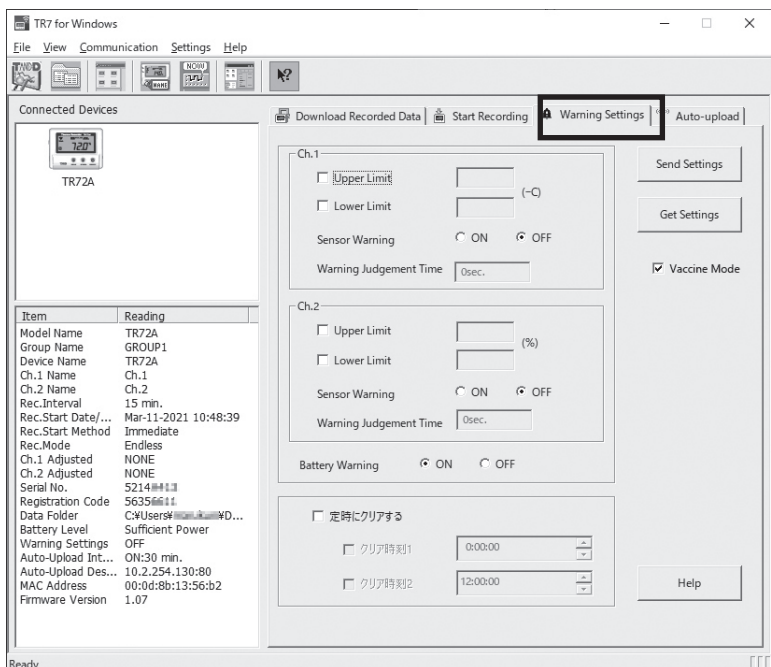


Setting Items in [Start Recording] tab:

Recording Start Method (Programmed Start or Immediate Start), Recording Interval, Recording Mode, Group Name, Device Name, Channel Name

- In Vaccine Mode:
 - Recording intervals will be short (30 sec, 1 min or 2 min) for strict monitoring.
 - * The warning judgment is made immediately at each recording interval.

4. Click the [Warning Settings] tab and make the necessary settings.



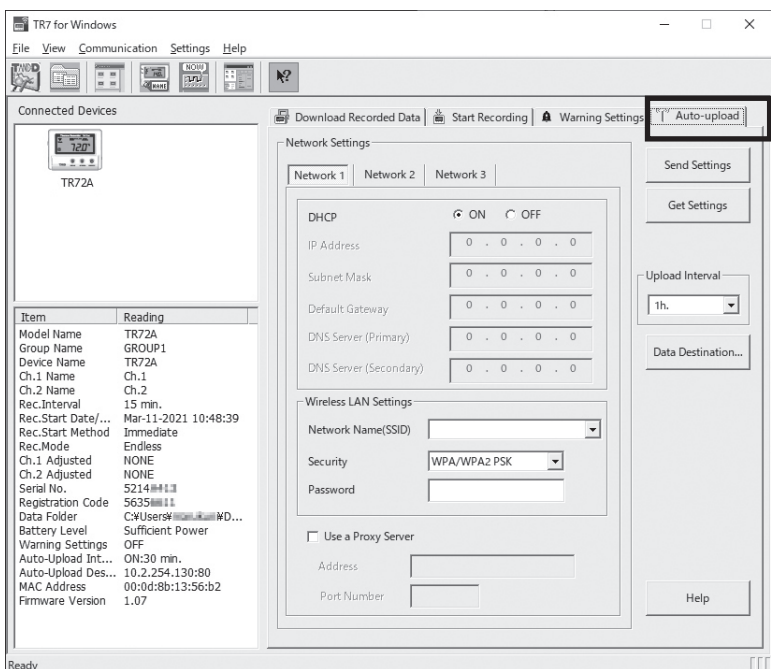
Setting Items in [Warning Settings] tab:

Lower Limit, Upper Limit, Sensor Warning, Warning Judgement Time, Battery Warning, Clear MAX/MIN Values at Specific Time (in Vaccine Mode only)

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

- In Vaccine Mode
 - Warning Judgment Time is set to 0 sec.(Warnings will be generated immediately when thresholds are reached.)
 - There is an option to automatically clear Max/Min values at specific time every day.
 - For details about the Vaccine Mode, see [TR7 for Windows Help].

5. Click the [Auto-upload Settings] tab and make wireless LAN network settings.



Setting Items in [Auto-upload Settings] tab:

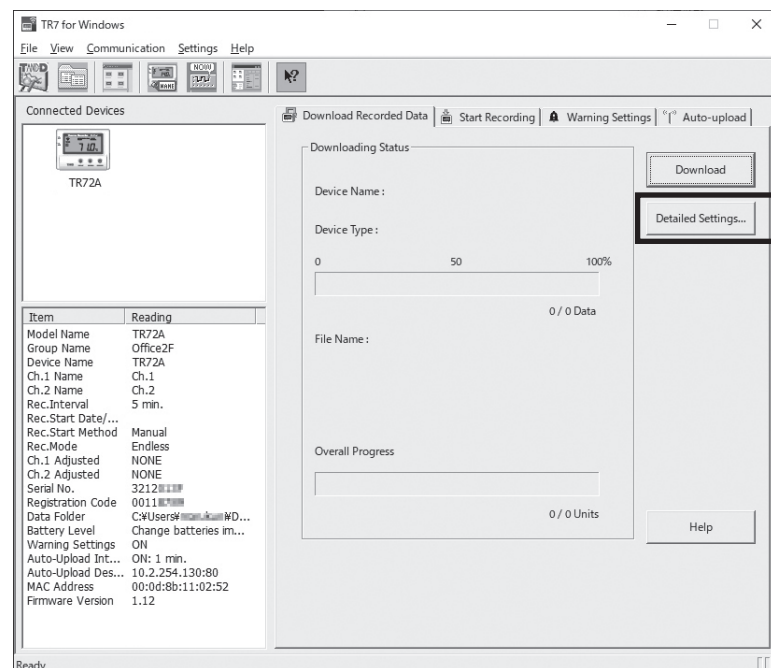
DHCP, Wireless LAN Settings, Proxy Server, Upload Interval, Data Destination

6. After having completed all the settings, click [Start Recording] (in the Start Recording tab) or [Send Settings] to send the setting contents to the logger.
 - * Upon the start of a new recording session all stored data will be deleted from the device.

STEP 2 Downloading Data and Viewing in Graph

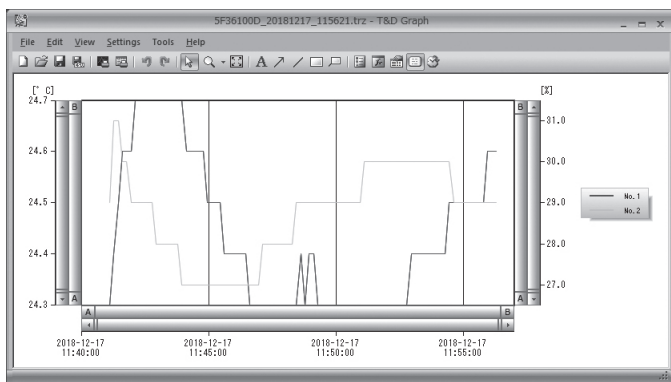
By using "T&D Graph", it is possible to view data downloaded from the logger in graph form.

1. Download "T&D Graph" from the T&D Website and install it to your PC.
tandd.com/software/td-graph.html
2. Connect the logger via USB to your computer.
3. Open "TR7 for Windows", click the [Download Data] tab and proceed with the download.
 - * Before starting the download, settings for "Graph Display" and "File Name" can be viewed and changed under [Detailed Settings].



- When downloading data from the TR71A that is set in Vaccine Mode, the total amount of time out of range (temperature excursion) will be displayed upon completion of the download. By calculating the time in warning, it can be used for vaccine quality control.

4. Upon completion of the download, "T&D Graph" will open and display the graph.



- * For details about software operations, please see the "Help" menu in each software.

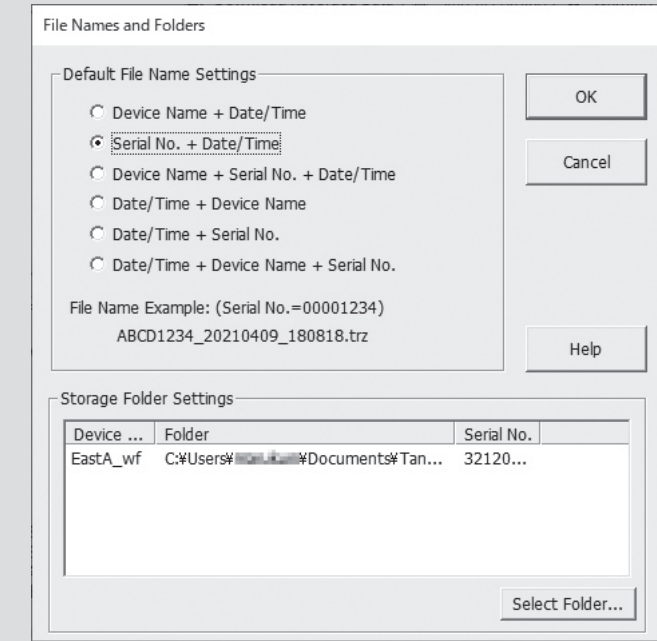
Storage Location of Recorded Data

Data downloaded via "TR7 for Windows" will be saved in the default folder "Documents(or My Documents)\Tandd Corp\TR7 for Windows".

Recorded data is saved in two formats: TRZ format file for display in the "T&D Graph" and CSV format file.

- By making warning settings for the TR71A in Vaccine Mode (to monitor upper and lower limits and to clear the MAX and MIN values at specific time of the day), the total time out-of-range and daily maximum and minimum temperatures are recorded in the CSV file, which can be used for daily reports.

The storage location can be viewed or changed from the [File] menu - [File Names and Folders] option.



Tips

What is the WPS?

WPS (Wi-Fi Protected Setup) is a feature that makes it easy to connect wireless LAN devices (such as smartphone, PC, TR7A, etc.) to a wireless router. Normally, when connecting a wireless LAN device to the network, you need to set the name (SSID) and password (encryption key) of the router manually. However, if your device and router support WPS, you can complete the wireless network setting with just a push of a button. Button name of the WPS may differ depending on the router.

Sensors

Optional Sensors

① Temperature Sensor suitable for Vaccine Management

When using the TR71A for vaccine management, we recommend the optional sensor TR-1106.

We offer a wide range of Temperature and Temperature-Humidity sensors, sensor extension cables, AC adaptors, etc. For details see information on T&D's Product Page or Optional Products Catalog, the Optional Products information on the Product Page.

tandd.com/catalog/files/op_others-eng.pdf

External Power Supply

It is possible to use USB bus power and AC adaptor (AD-05A2 or AD-05C2: sold separately) as a power source. When using an external power supply, installing batteries will make it possible to continue recording in the event of a power outage.

① Important Notice for Using an External Power Supply

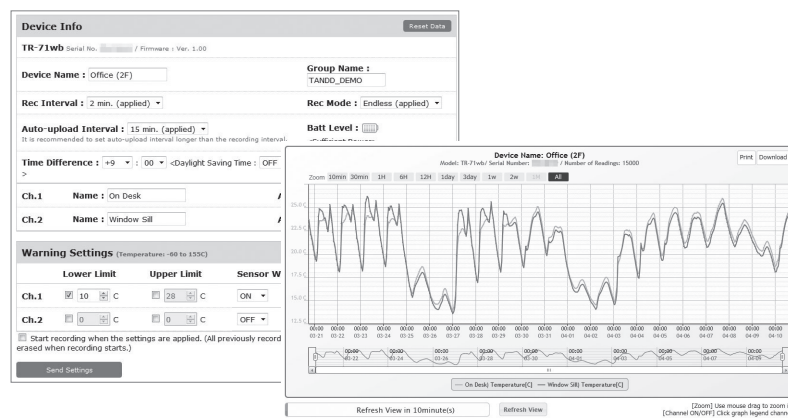
When using external power, the logger itself generates heat and the internal sensor of the TR71A will report a higher temperature than actual; we recommend using an external temperature sensor. Also, when an external sensor is used near the logger, it may be affected by the heat from the logger.

T&D WebStorage Service

"T&D WebStorage Service" is a free web-based cloud storage service provided by T&D Corporation. By uploading recorded data to "T&D WebStorage Service", it is possible to access your important data from anywhere in the world at any time you wish.

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

Via the browser you can check the current readings and battery level, view the graph, make warning settings, etc.

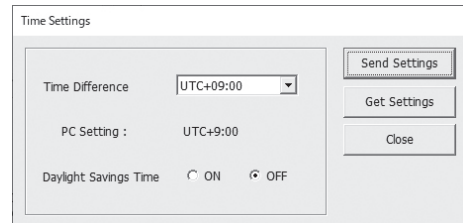


Time Difference Setting

Please set the time difference in your time zone on "TR7 for Windows" as well as "T&D WebStorage Service".

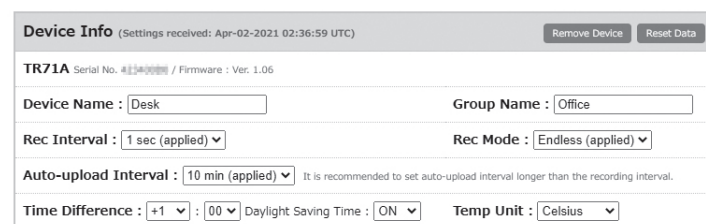
TR7 for Windows

[Settings] - [Clock Settings]



T&D WebStorage Service

[Devices] - [Settings] - [Device Info] - [Time Difference]



The default setting is as follows:

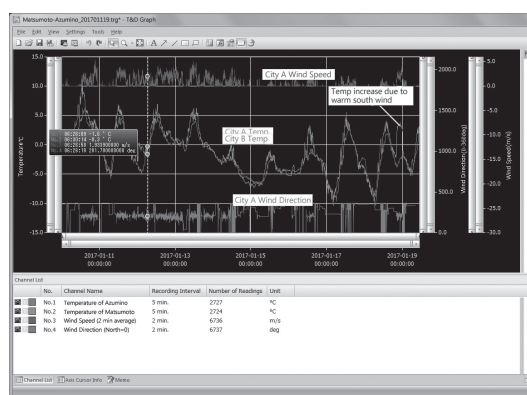
GMT +1:00 (for serial number "No.4XXXXXX")
GMT -8:00 (for serial number "No.3XXXXXX")

Other Software

T&D Graph

"T&D Graph" is a software program which enables the viewing of recorded data in graph form, whether the data is stored on a local computer or at "T&D WebStorage Service". Even if the data you wish to view is divided into multiple files, it is possible to merge them into one graph by specifying the device name and/or time period. The graph data can be saved as a graph file (.trg) or a text file (csv).

tandd.com/software/td-graph.html



Troubleshooting

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

