# Setting up T&D's TR-7wf Data Loggers
# With the TR-7wf/nw for Windows Software

V1.00

The TR-7wf Series of Wi-Fi enabled wireless loggers ship from the factory pre-configured for seamless integration with T&D's FREE cloud based WebStorage Service  Should circumstances dictate that the destination server remain inside the LAN, and the devices be prevented from sending recordings through the Internet, it is possible to redirect data uploads to a local server that is running the T&D Data Server software.  This software, and the utility for redirecting the IP address for data uploads, can be found in the Software Section of the www.tandd.com website.  In this guide, however, we will focus on setting up these loggers for use with the WebStorage Service, as they are configured from the factory.

Setup for the TR-7wf loggers is a relatively simple and straightforward process comprised of a few basic steps:

- Setting up a WebStorage Service account
- Registering your logger(s) with your account.
- Downloading and installing TR-7wf/nw for Windows
- Configuring the Data Logger's operating parameters
- Setting the Warning Parmaters
- Connecting the unit to your WiFi LAN and the Internet.

Below we will take a look at what is involved in each of these steps and later provide some tips and resources for troubleshooting some of the most common issues that customers encounter.

## I)  Set up a WebStorage Service Account

Some of the TR-7wf's most useful features, such as automatic data uploading or warning notifications, require integration with T&D's free WebStorage Service.  Although you can use the TR-7wf as a simple USB connected logger, the device relies on connection to the WebStorage Service for its complete functionality.

**T&D WebStorage Service**

1.  Using your browser go to **www.webstorage-service.com** . This can be a browser on your Smart Phone or Tablet, or from a PC if you prefer.
2. Click on the New User Registration link located along the top row of the page.
3. Enter an Email Address for the Account Administrator and a Password.
4. Your User ID will be sent to this Email address.  Note that this is also the default email address to which warning notifications will be sent, if enabled, so choose it accordingly.

*- Total Data Management via Cloud -*

**Required**
**E-mail Address**

EX) ondotori@tandd.co.jp

**Required**
**E-mail Address (Confirm)**

EX) ondotori@tandd.co.jp

**Required**
**Password**

EX) ●●●●●●●●

\* 4 to 16-digit alphanumeric code

☐ **I agree with** Service License Agreement **and** Privacy Policy.

**Submit** ❯

## II)  Register a TR-7wf Logger to your WebStorage Service Account

Tr-7wf Data Loggers can be registered to a WebStorage Service Account in two different ways.  The first is through a common Web Browser such as the one that was used to set up your WebStorage Service account.  Alternatively, it is also possible to register loggers using the T&D Thermo App on a Smart Phone or Tablet.  Here we will focus on the Web Browser approach.

1. After receiving the User ID, use it and the Password you chose to log in to your account. You will be taken directly to the Dashboard for your account.  If you scroll down a bit you will see the T&D WebStorage Service Start-Up Guide

**T&D WebStorage Service Start-Up Guide**
Follow the initial steps for your product.                                                         ✕

| TR-7wf/nw Series | TR4 Series | | |
|---|---|---|
| 1 | 2 | 3 |
| Register Device | Transmit Data | Check Data |
| Add a Device ❯ | See Manuals/Help ❯ | Go to Data View ❯ |
| | Refer to the manual or help for your product. | |

| RTR-500 Series | TR-700W Series | |
|---|---|
| 1 | 2 |
| Transmit Data | Check Data |
| See Manuals/Help ❯ | Go to Data View ❯ |
| Refer to the manual or help for your product. | |

2. Click on Add a Device in the TR-7wf/nw window pane.
3. Here you will be asked for the logger's Serial Number and Registration Code. There is a label with a Serial Number and Registration Code included in the box with the TR-7wf (attach this label to the back of the unit). You can also find this information displayed in the Device Properties window of the software, as shown below. Enter these and click on the Add button to register the TR-7wf to your account. You will then see an Added Successfully notice.
4. Click on the Back to Registered Devices List link.
5. You should now see your logger listed in the table with a status of Waiting for First Data, as shown below.

### TR-7wf/nw series

| Serial Number [Model] | Device Name | | Rec. Interval | Upload Interval | Warning Settings | Group Name | | |
|---|---|---|---|---|---|---|---|---|
| 32120001 [TR-71wf] | Entrance | 🕐 | 5 min | 5 min | | APPLE | Device Settings | 🗑 |
| 3212010C [TR-71wf] | --- | --- | --- | --- | --- | --- | Waiting for first data | 🗑 |

Note that the Device Name, Recording Interval, etc. are all blank at this stage. This information will be entered using the TR-7wf/nw for Windows software as we will discuss later.

## III) Download and Install TR-7wf/nw for Windows

Follow this link: http://www.tandd.com/software/index.html to download and install the TR-7wf/nw for Windows software. While you are on this page take a moment to review the other software items that are available for download here. This is where the **T&D Data Server** software that was discussed previously can be downloaded, as well as the **T&D Thermo** App, although this is best downloaded directly from the iOS or Android App Store.

**NOTE**: Here you can also download the **T&D Graph** software. In addition to being an extremely flexible data viewing tool, **T&D Graph** is the best tool for **downloading stored data** from the WebStorage Service for archiving and manipulation on a local PC.

### Search by Product Series

TR-7wf/nw Series - Temp/Humidity Data Logger
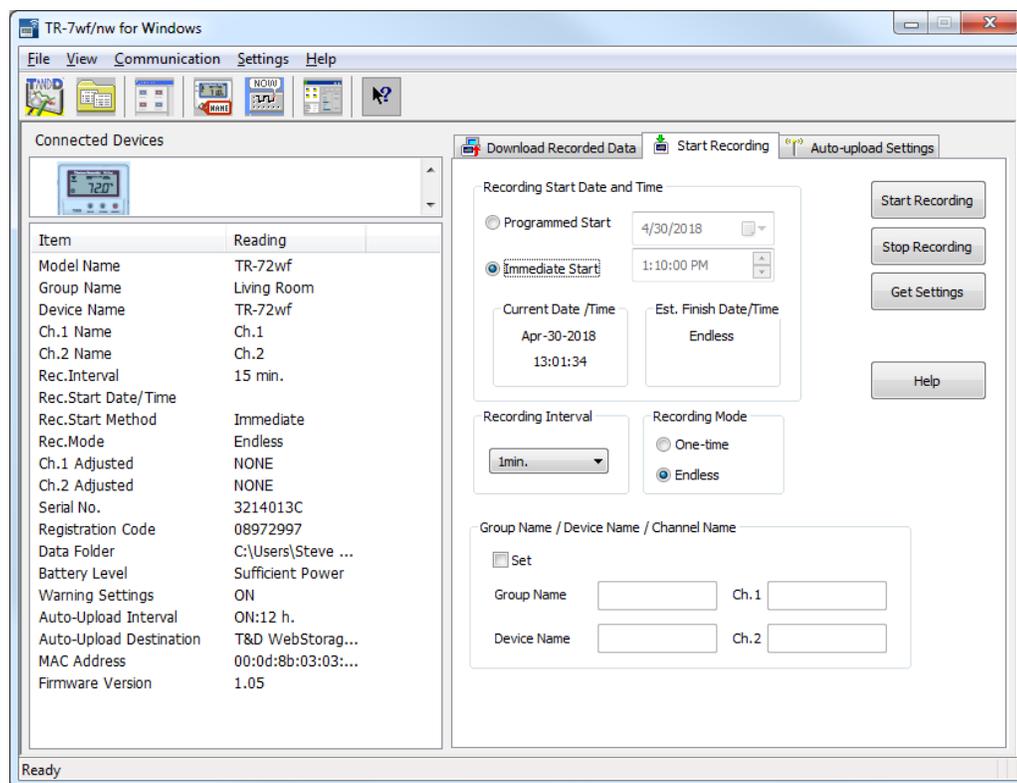
| Provided | ⬇ TR-7wf/nw for Windows |
| Optional | ⬇ T&D Graph |

**NOTE**: Here also is where you can find **Firmware Update** tools. While you are on this page make a note of the latest firmware revision level for your product. Later you will want to check it against the firmware revision that is currently installed in your logger using the TR-7wf/nw for Windows software.

## IV) Configure the Data Logger Operating Parameters

As previously mentioned with Device Registration, the logger operating parameters, such as Logger Name, Channel Names, Recording Interval, etc. can be configured in two different ways: One way is to use the **T&D Thermo** App.  Here, however, we will focus on using the **TR-7wf/nw for Windows** software.

1.  Open the TR-7wf/nw for Windows software.
2.  Connect the logger to your PC via a USB connection.
3.  The software window should populate with the current logger settings within a few seconds and look like this:



**Note:**  If the window does not populate with logger settings within a few seconds the problem invariably lays with installation of the USB driver.  For help with this go to the TR-7wf/nw for Windows folder under the Start Menu, select the Help and Support folder and then open the Help for Unit Recognition Failure page.  This will take you through the process of checking and re-installing the logger device driver.

4.  In the Start Recording Tab enter the Recording Mode, Recording Interval, Start Time and the Group, Device and Channel Names you wish to use.

5.  When you are done click on the Start Recording button.  If a recording session is already in process you will be prompted to Stop Recording before the new session can be started.

## V)  Setting the Warning Parameters

Click on the Auto-Upload Settings Tab.
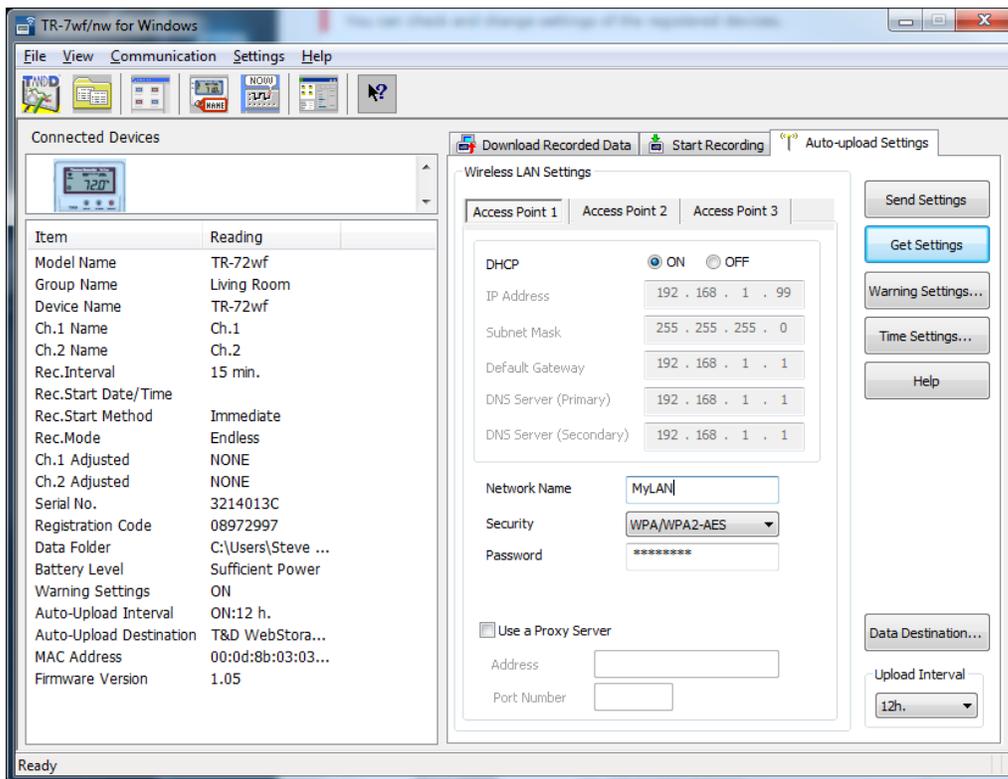


And then click on the Warning Settings button.  Here you will configure the parameters for the Alerts that the system will generate;
Note:  This need not be done at this time.  Warning Settings can be made / adjusted through the WebStorage Service Devices Page or though the T&D Thermo App at any subsequent time.

1.  Set the upper and lower limits for the "normal" readings zone for each channel.
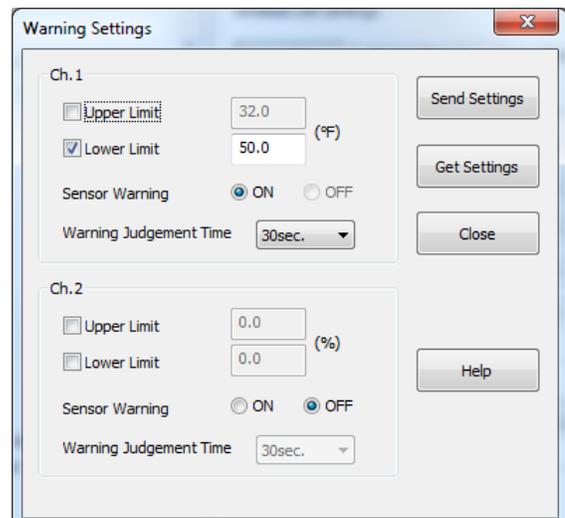
2. Sensor Warning will send an alert if a sensor becomes disconnected or fails.
3. The Warning Judgement time is the period that the condition remains active before an alert is generated.
4. Don't forget to click on Send Settings.

Having configured the logging and warning functions we are almost ready to set up the TR-7wf for connection to the WebStorage Service through the local wireless network. But first a bit of housekeeping:

Click on the Time Settings button. The WSS does not know the physical location of the logger's installation. Because of this it is necessary for the user to set the time zone where it is installed, as a function of offset from UTC (Coordinated Universal Time, or sometimes called GMT). In this window the user can also turn Daylight Savings Time on or off. When the settings are complete don't forget to click on Send Settings.
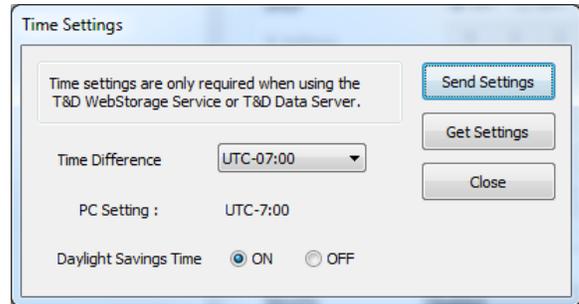
Just as a precaution, you should also click on the Data Destination button in the lower right corner of the main window. Be sure it is set to the T&D WebStorage Service and not to the Japanese server. If the wrong server is selected the unit will appear to be functioning normally but no data from it will show up in your account. Don't forget to click on Send Settings if you are changing the server destination.
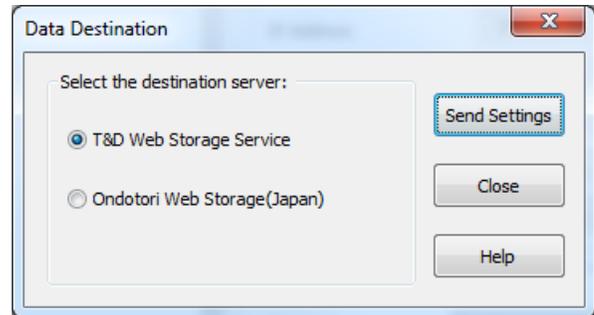
## VI) Connecting to Your WLAN and the Internet

As seen in the screen capture above, the TR-7wf/nw is capable of connecting to any of three preprogrammed Access Points. This can be useful in a very busy WiFi environment, but in most cases it is only necessary to set up the unit to connect with a single router.

1. Enter the network access parameters. By far the easiest way to do this is to leave the default of DHCP enabled. This will allow the unit to take all of the necessary IP addresses from the Access Point automatically. If you want to specify a fixed IP address for your logger you can do so by turning DHCP off. When you do this you will need to determine and enter the IP addresses for all of the fields in this box.
2. Enter the name of your Wireless LAN. This is commonly called the SSID.
3. Select the security protocol used by the Access Point to which you are connecting. The choices are : None, WEP, WPA and WPA2 / AES. These are the only security

protocols with which the TR-7wf is compatible.  As a general rule, the TR-7wf will not connect with networks using other security protocols, including token based Enterprise level protocols.

4.  Enter the Password for your network.

5.  If your organization uses a Proxy Server for Internet Access check the box and enter it's IP Address and the Port number to use.
**Note:**  The TR-7wf/nw cannot connect to a Proxy Server that requires authentication.

6.  Select an Upload Interval.  This is the interval at which the TR-7wf uploads its readings to the WebStorage Service.  It can be set to anywhere from once a minute to once a day.
**Important Note:**  The upload interval is the single largest factor in determining the unit's battery life.  The shorter the interval the quicker the batteries will deplete.
**Note:**  If a shorter upload interval is a must, and changing batteries becomes burdensome, the unit can be externally powered though the USB connecter by a standard cell phone charger.

7.  When you are done click on the Send Settings button.  (You can leave the USB cable connected for now, or remove it, as you wish.)

## VI)  Understanding the WiFi and Web Icons

At this point the Wifi and Web Icons become important indicators of understanding the status of logger connectivity.

The WiFi icon looks like this:

The Web Icon looks like this:  **Web**

When you click the Send Settings button in 7) above you will see that both the WiFi and the Web Icons will start to blink.  After about 15 seconds the logger will attempt to connect to the WebStorage Service through the WiFi Access Point.  While this process is in progress you will see the WiFi icon stop blinking and begin to scroll vertically.  When the process has completed, after about 5 seconds or so, one of three conditions will be reflected in the icons:

1)  **The WiFi icon and the Web icon are both on solid:**  Great!  The connection process was successful.  The logger was able to connect with the WebStorage Service server through the WLAN and Internet.

   a.  No data showing for the logger in the WebStorage Service Data View?  Wait a bit.  The WSS can take up to 5 minutes to display uploaded readings.

   b.  Still no data showing?  Make sure that the device has been properly registered. You can use the T&D Thermo App to verify this.

   c.  Make sure that the REC icon is on.  There will be no data uploaded to the WSS if the logger is not recording and has no readings to transfer.

   d.  Check to make sure that you are logged into the same WSS account to which the logger was registered.

e.  Make sure that you set the Data Destination in the Auto-Upload Settings tab to the WebStorage Service server.

2) **The WiFi icon and the Web icon both continue to blink:**  The connection attempt to the Access Point (or Router) failed.  If this happens try the following:

a.  Is the Battery Low icon showing?  If so install a fresh battery.  While the unit may seem to be operating normally, turning on the radio transmitter to connect with the AP can bring a marginal battery below the required operational voltage.
b.  Double check the WLAN info entered in the Auto-Upload Settings tab of the software and try sending them again.
c.  Check that the SSID entered is in the 2.4 GHz band and not 5 GHz.
d.  Make sure that the logger has a strong WiFi signal by moving closer to the AP and connecting again (you can force a connection by pressing the Display and Rec Stop buttons simultaneously).
e.  Check the router settings. If you are using the TR-71wf or 72wf make sure that your router has 802.11b access enabled (most usually by setting the router to Mixed Mode).  With the TR-75wf this should not be an issue.
f.  If the AP has MAC Address filtering enabled be sure to register the MAC Address of your logger (you can find this in the Device Properties window on the left side of the TR-7wf/nw software.)
g.  Check that the security protocol employed by the Access Point is one of the three options selectable in the Auto Upload Settings tab of the software.  As mentioned previously, the TR-7wf/nw is not compatible with token based Enterprise security schemes.

3) **The WiFi icon is on solid and the Web icon continues to blink.**  In this case the logger has connected successfully with the wireless Access Point but was not able to log onto the WebStorage Service server.  This is almost always a firewall issue.

a.  Double check the firewall settings on your network and make sure that the logger has a clear path out to the Internet.  Check this with another device, such as a PC, located at the same point on the WLAN.
b.  If you chose to turn off DHCP and enter the IP addresses manually, double check to see that the IP Address, Subnet Mask and other settings are correct.
c.  If you chose to turn off DHCP check the router settings to be sure that the IP address you entered is within the range that can be accepted.
d.  Check the router settings to make sure that the maximum number of users has not been exceeded.
e.  Check with your browser to see that the WebStorage Service is not currently down for maintenance.

# Appendix I
## Device Log File Codes

If you are still experiencing a problem after carefully going through each of the steps above, the TR-7wf/nw has a tool that will help point you in the right direction. The Device Log File can be viewed by clicking on the Communication pull-down menu in the software and then selecting Device Operation Log. This will open a window that will show the actions that have been taken by the logger, when they occurred
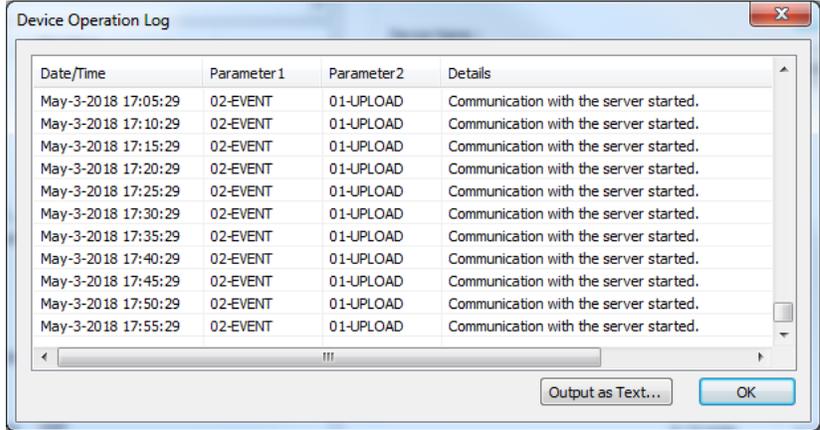


and the results of those actions. The events are sorted by Parameter 1 and specified by Parameter 2 with a description provided in the Details column. The log file on the right shows a sequence of successful data uploads to the WebStorage Service. While the error code and description may not provide the answer to the problem you are experiencing, it should be helpful in suggesting where to look. A complete listing of the TR-7wf/nw log file codes is below:

## When Parameter 1 = 02-EVENT (Event processing related logs)

| Parameter 2 | Contents | Details |
|---|---|---|
| 01-UPLOAD | In file uploading status | Communication with the server started. |
| 02-WARNING | In warning status | Warning transmission started. |
| 03-AP-MODE | Direct communication mode | Entered into Direct Communication (AP mode). |
| 04-WPS | WPS mode | Entered WPS mode. |
| | | |
| 06-FIRM_DOWNLOAD | New firmware | Received new firmware. |

## When Parameter 1 = 06-SYSTEM (System operation related logs)

| Parameter 2 | Contents | Details |
|---|---|---|
| 00-RESET | Reset Start | Operation started via power ON. |
| 01-BAT_LO | Battery LO | Communication cancelled due to low battery. Batteries need replaced. |
| 02-BAT_HI | Battery HI | Battery voltage recovered, but if "BAT_LO" appears, please replace batteries. |
| 03-BAT_SLP | Sleep mode | Entered sleep due to battery depletion. |
|  |  |  |
| C0-TEST_UPLOAD | UPLOAD via test | Communication with the server started via test command. |

## When Parameter 1 = 00-W-LAN (Wireless LAN related logs), or Parameter 1 = 08-LAN (LAN related logs)

| Parameter 2 | Contents | Details |
|---|---|---|
| 00-START | At the start of the Wireless LAN process | Communication started. |
| 01-OK | No Error | Operation succeeded. |
| 02-HALT | Fatal Error | Abnormal operation |
| 03-CANCEL | Process termination | Operation was cancelled. |
| 04-TMOUT | Timeout | Communication with the server failed. |
| 05-STBYFAIL | Standby process error | Abnormal operation |
| 06-BULK | Bulk transfer error | Abnormal operation |
|  |  |  |
| 0A-WPS_FAIL | WPS process error | WPS connection failed. Check access point. |
|  |  |  |
| 14-AP_FAIL | AP mode error | Direct communication (AP mode) failed. |
| 15-AP_TCPSY | TCP server startup error | Direct communication (AP mode) failed. |
|  |  |  |
| 1E-NOAP | Cannot find Access Point | Failed to connect to access point. Check wireless LAN settings (SSID, security, and password). |

| 1F-DHCP | DHCP error | Failed to obtain DHCP IP address, so could not connect to the server. |
|---|---|---|
| 20-DNS | DNS error | Failed to obtain DNS server address, so could not connect to the server. |
| 21-WEB | Communication error | Communication with the server failed. |
| 22-NTP | Time info retrieval error | Communication with the server failed. |
| 23-SETDATA | Setting value transmission error | Communication with the server failed. |
| 24-GETDATA | Setting value reception error | Communication with the server failed. |
| 25-WARN | Warning transmission error | Communication with the server failed. |
| 26-WSERR | Error response from server | Communication with the server failed. |
| 40-POWER | LAN power off | LAN connection failed. External power may be disconnected or battery level low. |
| 41-LINK | PHY Link signal not found | Communication with the server failed. Cable may be disconnected. |
| 42-DHCP | DHCP error | Failed to obtain DHCP IP address, so could not connect to the server. |
| 43-DNS | DNS error | Failed to obtain DNS server address, so could not connect to the server. |
| 44-PARM | Invalid value for IP address, Port number, etc. | Abnormal operation |
| 45-EXPOWER | No USB/POE power supply | Abnormal operation |
| 46-TCP | TCP socket communication error | Communication failed. |
| 47-UDP | UDP socket communication error | Communication failed. |
| 48-CONNECT | TCP connection error | Communication with the server failed. |
| 49-TIMEUP | Timeout | Communication with the server failed. |
| 4A-W5500 | W5500 setting error | Abnormal operation |

# Appendix II

## Details about the LCD Display

Other than the measurement display, the following is displayed on the LCD monitor.

| | |
|---|---|
|  | Shows the status of wireless LAN connection.<br>ON: Connected to the wireless network. (Signal strength: 1 to 3 bars)<br>BLINKING : Unable to connect to the wireless network.<br>OFF : Settings have not been made for the wireless LAN connection. |
| **Web** | Shows the status of the Internet connection.<br>ON : Connected to the Internet<br>BLINKING : Unable to connect to the Internet<br>OFF : Auto-upload is set to "OFF". |
| ①② | Shows the channel number of the measurement being displayed. |
| AP | This appears when direct communication with mobile devices is possible. |
| WPS | This appears when the wireless LAN setup using WPS is possible. |
| COM | This appears when the device is in wireless LAN communication or USB communication. |
| REC | Shows the recording status.<br>ON : Recording in progress   BLINKING : Waiting for programmed start<br>OFF : Recording stopped |
| ENDLESS ONETIME | Shows the recording mode, which can be changed via TR-7wf for Windows or ThermoWEB.<br>ENDLESS : Upon reaching the logging capacity of 8,000 readings, the oldest data will be overwritten and recording will continue.<br>ONETIME : Upon reaching the logging capacity of 8,000 readings, [FULL] will appear on the LCD display and recording will automatically stop. |
| DATA | The amount of recorded data in the device is shown here. |
| 🔋 | This appears when the battery level is low. Please change the batteries as soon as you see this mark. If the batteries are not changed but remain in use, the device will enter sleep mode ([SLP] will appear on LCD) and stop all operations. If the batteries are further left unchanged, all previously recorded data will be lost. |
| Upload. | This appears while the auto-upload interval is displayed by using the <INTERVAL> button. |
| Rec. | This appears while the recording interval is displayed by using the <INTERVAL> button. |

# Appendix III



# T&D Thermo

The **T&D Thermo** App from T&D Corporation can be used to accomplish a variety of functions with the TR-7wf Series of Wi-Fi enabled wireless Data Loggers.  This convenient App is available for free download from Apple's App Store for iOS devices, or from Google Play for Android devices, and can be used on both Smart Phones and Tablets.  Once installed, the App can be used to set up a TR-7wf logger, make device settings for the logger itself, configure T&D's free **WebStorage Service**, download recorded data for viewing, local archiving and sharing with colleagues.  By using the T&D Thermo App, it is entirely possible to access most all functions of a TR-7wf Data Logger with T&D's WebStorage Service without a PC.