THS-3

Temperature and Humidity Sensor

Installation and Quick Setup Guide

1.800.548.4264
www.ftsenvironmental.com

700-THS3 Rev. 6 – 05 May 2015

Contact information

FTS
1065 Henry Eng Place
Victoria, B.C., V9B 6B2
CANADA

www.ftsenvironmental.com

Toll-free	1-800-548-4264
Local	250-478-5561
Technical support	**http://support.ftsenvironmental.com**

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Table of Contents

Chapter 1 Introduction

1.1 General Description

The THS-3 is a combined analog Temperature and Relative Humidity sensor. Temperature is sensed by an encapsulated thermistor housed in a stainless steel tube. Thermistor contacts are brought directly to the sensor connector for easy temperature measurement. Relative Humidity is measured using a capacitive-type humidity transducer. A microprocessor internal to the THS-3 sensor measures the transducer humidity, performs the appropriate conversion, and outputs a voltage proportional to the relative humidity (0 to 1 Vdc equals 0 to 100% RH) on the sensor connector.

The T/H sensor assembly (see Figure 1-1) houses the sensors and associated electronics. Both sensors are protected from air-borne contaminants by a replaceable sensor filter. The sensor assembly is mounted to an anodized aluminum base and housed inside white louvers that make up the solar screen. The purpose of the screen is to prevent solar heating of the sensors that would introduce large inaccuracies in the data. At the same time, airflow is permitted to aid in correct ambient readings.

The sensor is mounted on an aluminum sensor support arm that can be attached to a mast or tower.

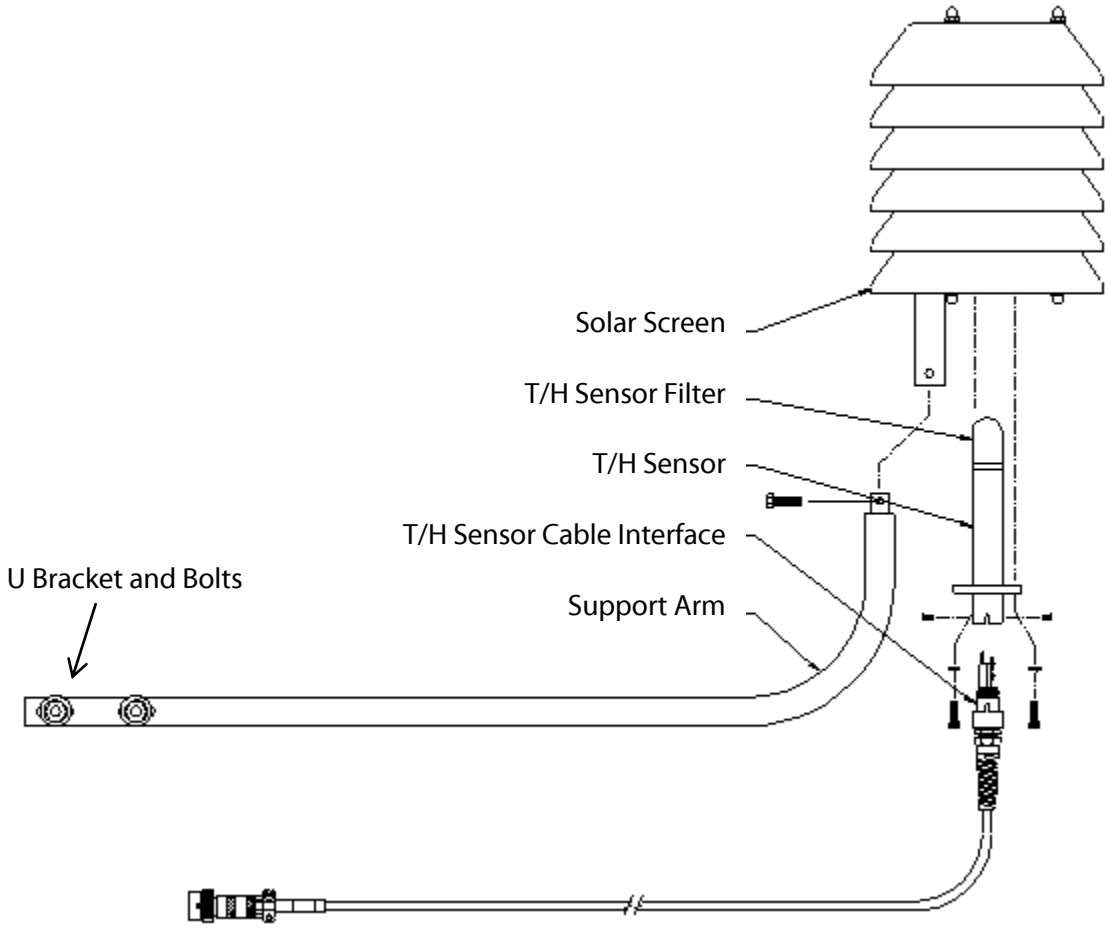
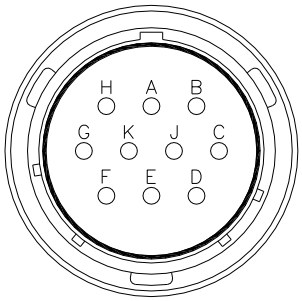


Figure 1-1: THS-3 Temperature and Humidity Sensor – Exploded View

1.1.1 Connections

The THS-3 sensor connector is an environmentally sealed, bayonet mount, keyed, military style connector. This connector is waterproof even without a mating connector attached. Electrical signal connections for the THS-3 connector are shown in the table below.



PIN	SIGNAL
B	**Power** (+12Vdc nominal)
C	**Chassis Ground**
D	**Humidity Output** (0-1Vdc for 0-100% RH)
F	**Temperature Output** (thermistor +)
J	**Ground** (Power & Humidity Output)
K	**Temperature Ground** (thermistor -)
others	**No Connect**

Table 1: THS Sensor Signal Connections

1.2 Specifications

The specifications for the THS-3 Temperature and Humidity Sensor are shown in Table 2.

General	Operating Temperature: -40 to 60°C Operating Humidity: 0 to 100% RH Operating Voltage: 9.6 to 20 Vdc, 12 V nominal Operating Current: less than 1 mA Measurement Speed: less than 50 ms
Temperature	Type: Encapsulated Thermistor Output: 10k ohm @ 25°C Accuracy: +/- 0.1°C (0 to 60°C) Resolution: 0.1°C
Humidity	Type: Capacitive Sensor Output: 0 to 1 Vdc Resolution: 1% Accuracy: +/- 2% (0 to 100% RH)
Filter	High Density Polyethylene Pore size: 35 microns Hydrophobic

Table 2

Chapter 2 Installation and Maintenance

2.1 General

In order to install the THS-3, the following equipment will be needed:

a) a 5/16" hex wrench for attaching the THS to the support arm mount;

b) a ¼ " wrench to tighten the U-Bolt assembly; and

c) cable ties to attach the cable to the tower assembly.

Prior to installation observe the site and ensure the following can be achieved for optimum performance of the sensor:

a) The sensor should be in the open, in a shade free area to ensure accurate temperature readings.

b) The sensor should be well away from external sources of heat (i.e. any equipment at the site that might generate heat).

c) The sensor support arm should be levelled (tower mount should be levelled).

2.1.1 Installation Height

Correct installation height is dependent on regulations for the jurisdiction in which the equipment is to be deployed. Ensure you review local regulations prior to installation.

In the United States the THS-3 Temperature & Humidity sensor is to be installed on the south side of the mast 4 to 8 feet above ground. The Canadian regulations are to install the sensor on the south side of the mast 1 to 1.3 meters above the ground.

Sensor height is also dependant on regional weather conditions. The sensor should be installed at a height that is above the worst case estimate for snow levels in the area.

2.2 Tower Mounting

The procedure for tower mounting the THS-3 is as follows:

1. Remove the locking screw from the support arm mount and then slide the THS-3 assembly support arm mount (Figure 2-1). If the sensor is deployed in a coastal or otherwise corrosive environment, lubricate the locking screw with white lithium grease to prevent seizing. Secure the assembly with the locking screw.

Figure 2-1: Attaching the assembly to the support arm

2. Loosely attach the support arm to the mast or tower with the clamp bolts at the desired sensor height. Ensure the support arm's "V" is fitted to the pole.

Figure 2-2: U-Bolt assembly and support arm attachment

3. In the northern hemisphere, position the support arm so that the sensor is positioned south of the mast and on the north side of the solar panel to ensure neither pieces of equipment will be shaded. In the southern hemisphere, the positioning will be opposite.

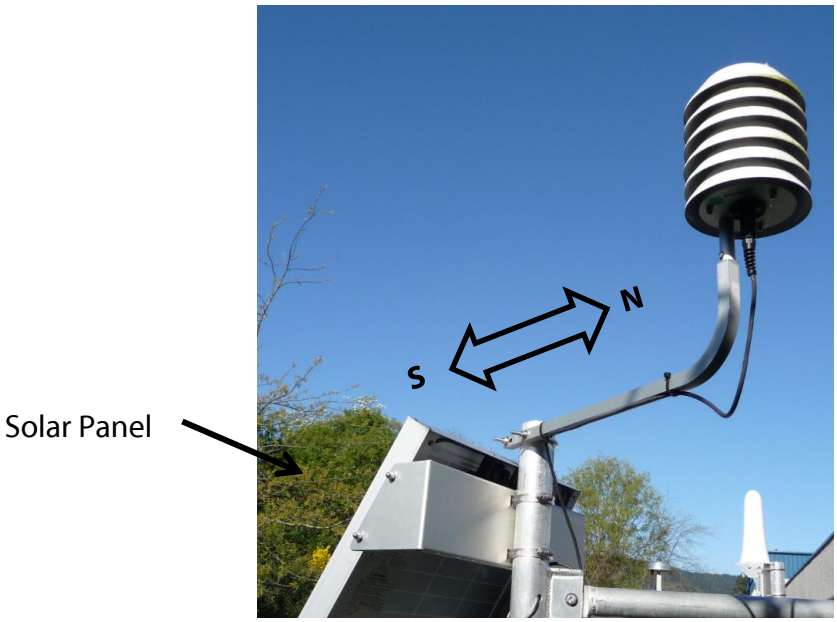


Figure 2-3: Support arm positioning (northern hemisphere)
(Note: support arm may not appear exactly as shown)

4. Attach the sensor cable to the support arm and the mast using cable ties.
5. Connect the sensor cable to the data logger's Temperature / Humidity connector (red ring).

NOTE: Key Installation Points:

a) The sensor should be in the open, in a shade free area to ensure accurate temperature readings.

b) The sensor should be well away from external sources of heat (i.e. any equipment at the site that might generate heat).

c) The sensor should be given a minimum of thirty minutes to acclimatize to a site after installation before data is taken.

2.3 Maintenance

FTS recommends that the sensor be returned to FTS for a yearly check of the THS-3 sensor's calibration.
Also, FTS recommends that during any site visit a visual check of the THS-3 cable, connector and sensor filter is performed. Any observable damage should be noted so that the appropriate repairs can be performed. The THS-3 sensor filter (FTS part number: 03-THS3-6192) is field replaceable in the event that the sensor filter is clogged.
Please contact FTS technical support if the unit ceases to operate properly.

2.3.1 Inspecting and Replacing the Filter

To inspect the THS-3 filter, you must first remove the sensor from the housing assembly.

a) Remove any cable ties which will prevent the sensor from being removed from the housing being careful not to damage the cable

b) Use a 5/8" Allen key to remove the three bolts securing the base of the sensor to the base plate of the housing assembly.

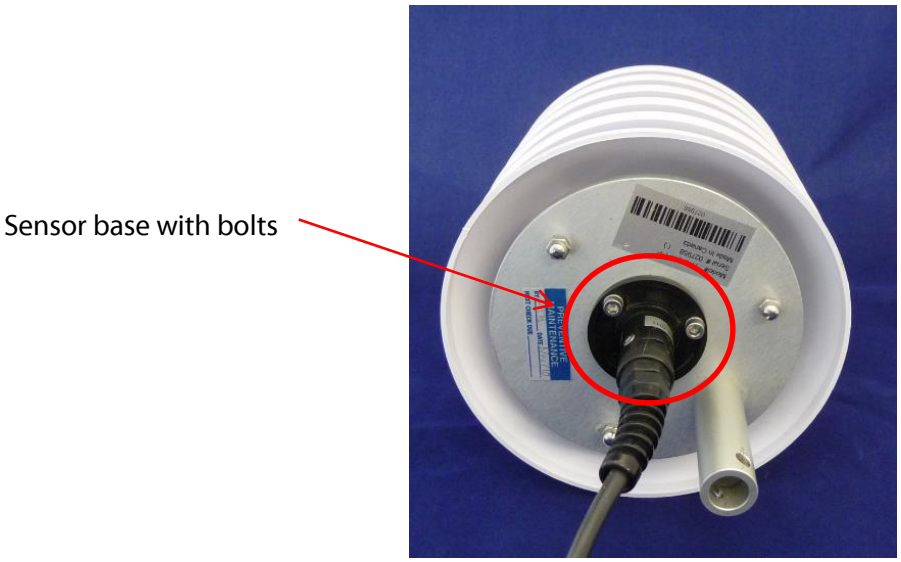


Figure 2-4: Sensor base showing bolts

c) Gently remove the sensor and inspect the filter for cleanliness.

d) If the filter requires replacing, unscrew the white filter and replace it with a new one, being careful not to touch or contaminate the inner sensors.

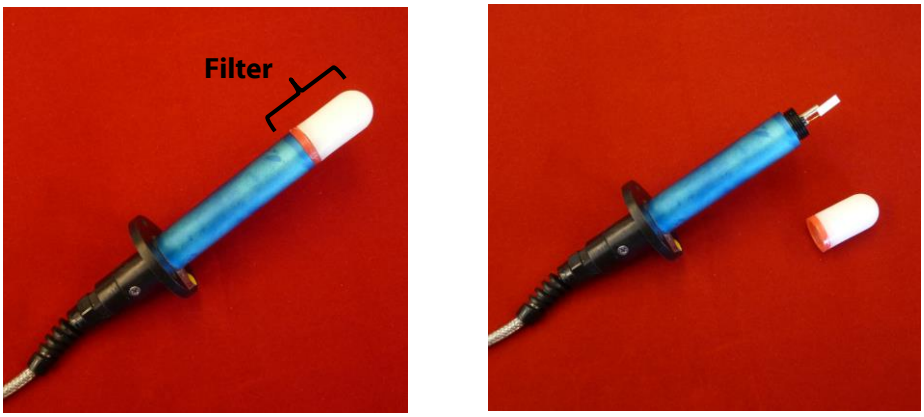


Figure 2-5: THS showing filter on and filter off

e) Replace the sensor in the housing assembly, tightening all bolts and replacing cable ties as necessary.

Chapter 3 Sensor Quick Setup Guide

This chapter will take you through the steps to set up (configure) the THS3 with an Axiom datalogger. It is meant as a quick reference. Detailed instructions can be found in the Axiom User Guide and Axiom Configuration Reference.

> NOTE: After installation, the sensor should be given a minimum of thirty minutes to acclimatize to a site before data is taken.

3.1 Configuring the THS-3

1) Connect the THS-3 to the data logger on the red Temperature and Humidity port.

2) From the data logger's home page, select the Sensors icon.

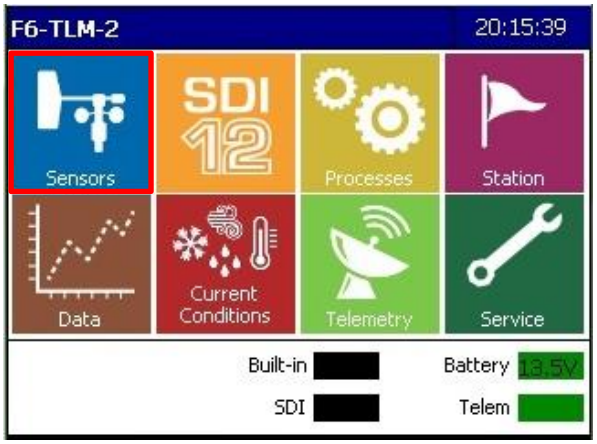


Figure 3-1: Home Page

The next screen (SDI Sensor Mapping) will display the icons of the dedicated sensors which are already added and set up.

3) To add the THS-3, select the Add icon, then press on the Air icon.

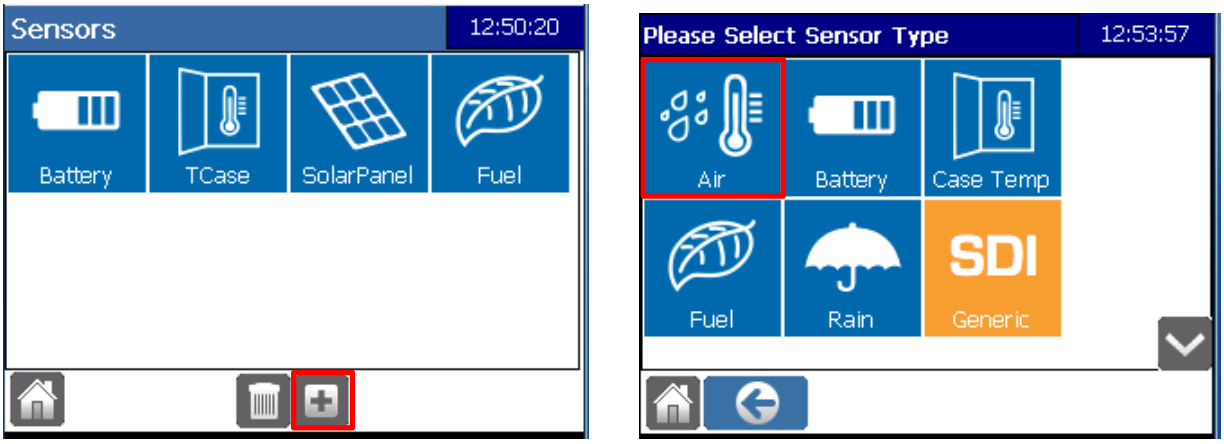


Figure 3-2: Adding the THS-3

4) The Air Sensor Setup screen will be displayed:

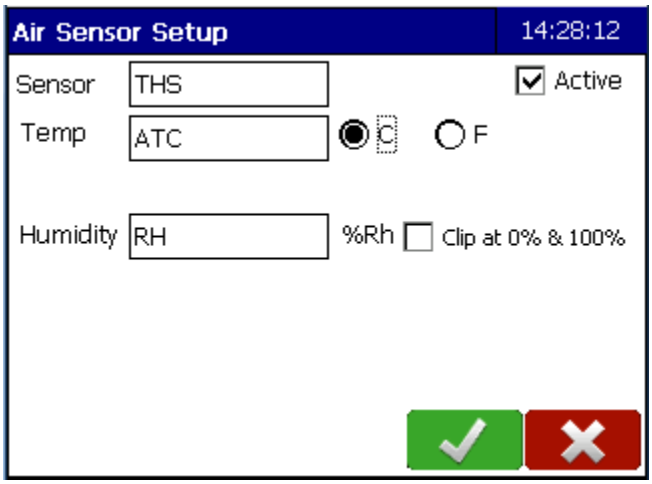


Figure 3-3:

5) Edit the fields by pressing on the field box:

Sensor: The default name for the sensor is THS. You can change this if desired.

Active: This box must be checked in order for the sensor to collect data

Temp: This is the air temperature. The default name is ATC. You can change this if desired. The default units of measurement is Celsius (C). To change to degrees Fahrenheit, select the (F) radial button.

Humidity: This is the relative humidity.

Clip at 0% & 100%: If checked, causes the datalogger to limit humidity values read from the sensor to the range of 0 to 100%. That is, any air sensor humidity measurements above 100% are reported as 100% and any measurements less than 0% are reported as 0%.

If the Clip at 0% & 100% is not enabled and the sensor reads outside of its range (higher than 117%) then an error (ERR) will be reported.

6) Select OK  .

i) If In-line Logging is enabled (from Station<Advanced<Edit<In-line Logging) the In Line Logging screen will be displayed. Go to Section 3.2;

ii) If In-line Logging is not enabled, you will be returned to the Sensors screen. Go to Section 3.3.

3.2 In-line Logging

In order to view and collect data on a variable, it must be logged. In-line Logging provides the user an option to set up simplified Logging and add variables to Current Conditions from the Sensor Setup screen . However, In-line Logging does not have the full functionality of regular logging using the functions in the Data screens. Logging of the variables will be in accordance with the sensor read times and no logging offset can be input. Additionally, although In-line Logging can be viewed through the Data functions, it can only be amended through the WindSonic Sensor Setup screen.

> NOTE: In-Line Logging does not have the full functionality as setting up Logging through the Data screen.

1) Select the Edit button  , then Input the desired the Logging Interval (press on the hour, minute, or second box to highlight it in blue and use the arrows to select the value).

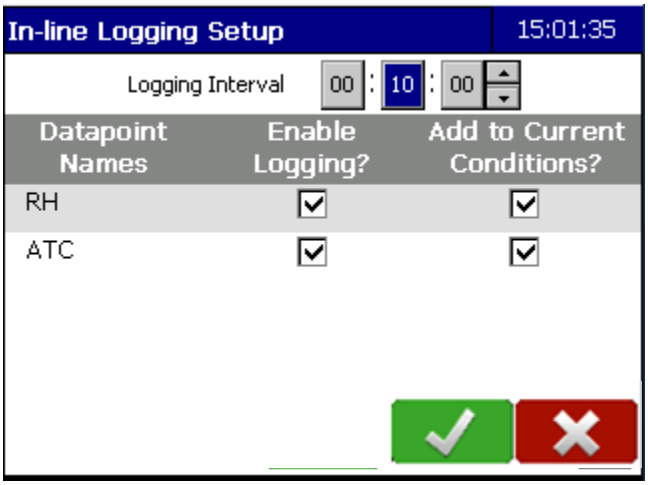


Figure 3-4: In-line Logging Setup

2) Check Enable Logging and if you want these values to be displayed in Current Conditions, check the Current Condition box. The logging interval will now be displayed in green in the Logging Intervals screen (Data>Setup).

3) Select OK. Return to the Home Page

3.3 Regular Logging

If the In-line Logging option was not used, you must set up logging in order to view and collect data on a variable. Regular logging provides the user the ability to create more complex logging than that offered by the In-line Logging option.

1) From the Home page, select the Data icon and then the Setup Cog.

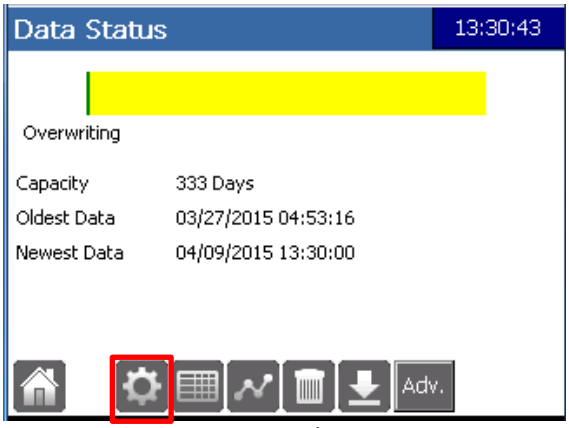


Figure 3-5: Regular Logging

2) The Logging intervals screen will be displayed. If there are already logging intervals set up they will be seen here. Logging intervals created through the Data functions, as described here, are displayed in blue. Logging intervals created using the In-line Logging feature are displayed in green.

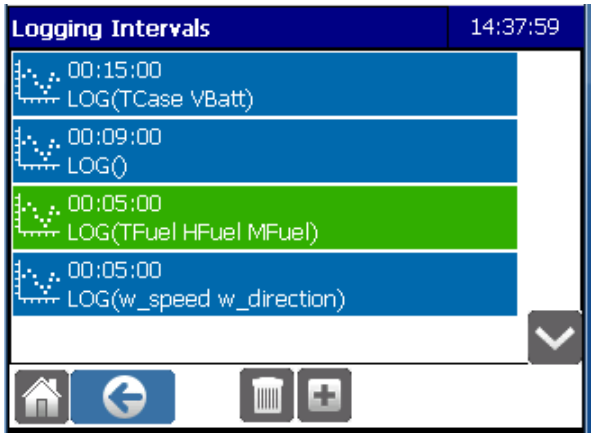


Figure 3-6: Logging Intervals

3) Press the Add icon, then the Edit icon. Set the desired logging interval and offset times.

NOTE: Logging intervals should not be less than the input measuring interval.

4) Scroll down the list of the Available Variables. Press on ATC and then use Move Right Arrow to shift it to the Logged Variables field. Do the same with the RH variable.

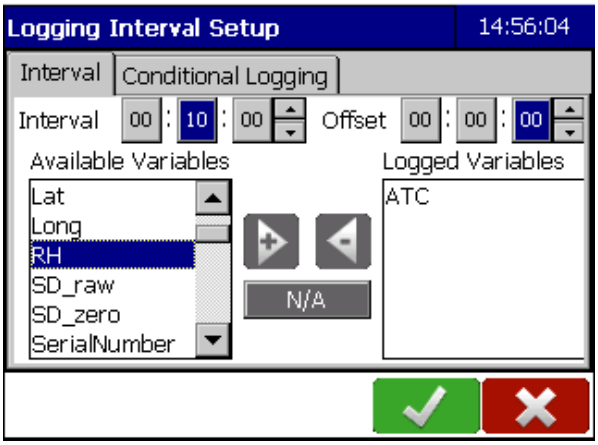


Figure 3-7

5) Once done, select OK and the new Logging interval will be displayed in the Logging Interval page. Return to the Home page.

3.4 Confirm Sensor Operation

Now that the THS-3 is setup, confirm its operation and ensure data is being logged.

1) From the Home page select the Data icon to display the Data Status screen. Then select the Table icon.

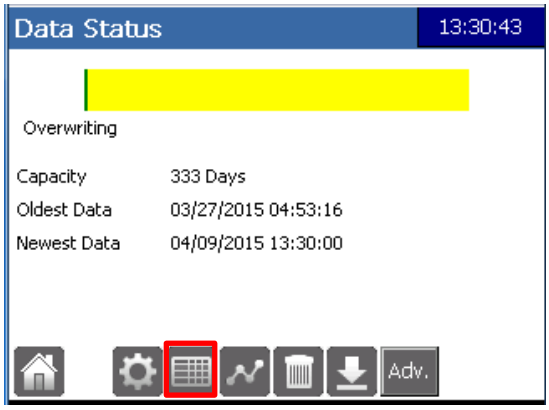


Figure 3-8: View Data

2) If the temperature and humidity variables are not displayed, use the arrow or the scroll bar until they come into view. Data will be displayed.

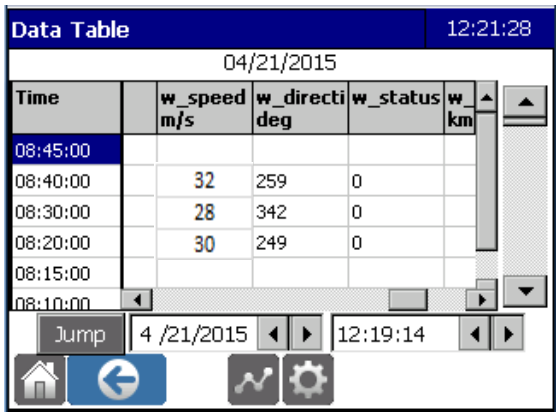


Figure 3-9: WindSonic Data

3) Return to the Home page.

3.5 Changing the Setup

If you want to change the setup, from the Home page select the blue Sensors icon, then select the THS icon. Select the Set up Cog which will bring you to the THS Sensor Setup page. Press on the Edit icon and make desired changes (see Section 3.1 paragraphs 4-6).

Document Revision History

Revision	Date	Description
1	27 Jul, 2006	Original release
2	2 Oct, 2006	Updated specifications.
3	25 Jan, 2007	Added special order specification.
4	11 Oct, 2007	Updated for new filter, updated specifications.
5	27 Apr, 2015	Format change. Updated pictures. Added Quick Setup Guide.
6	5 May, 2015	Minor corrections