



# **TempSmart TS-100**

## **Temp & Humidity Data Logger**

# **User Guide**

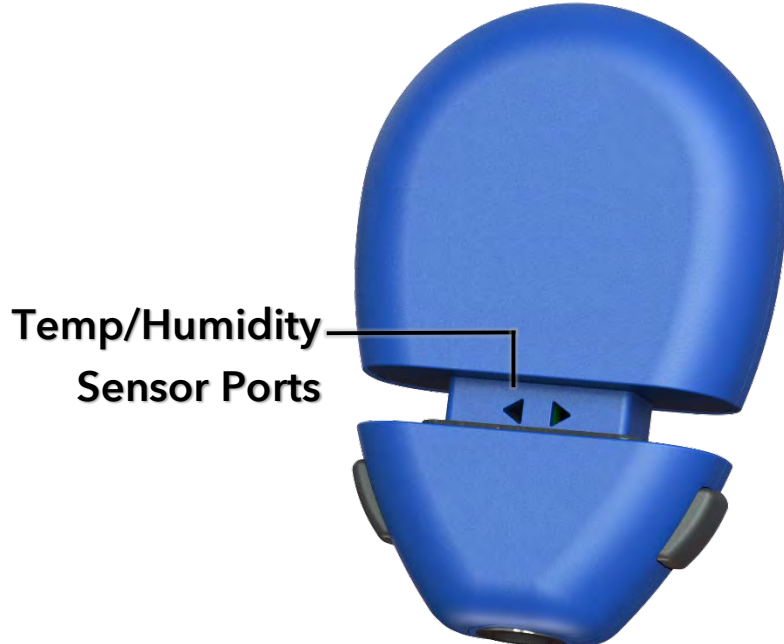
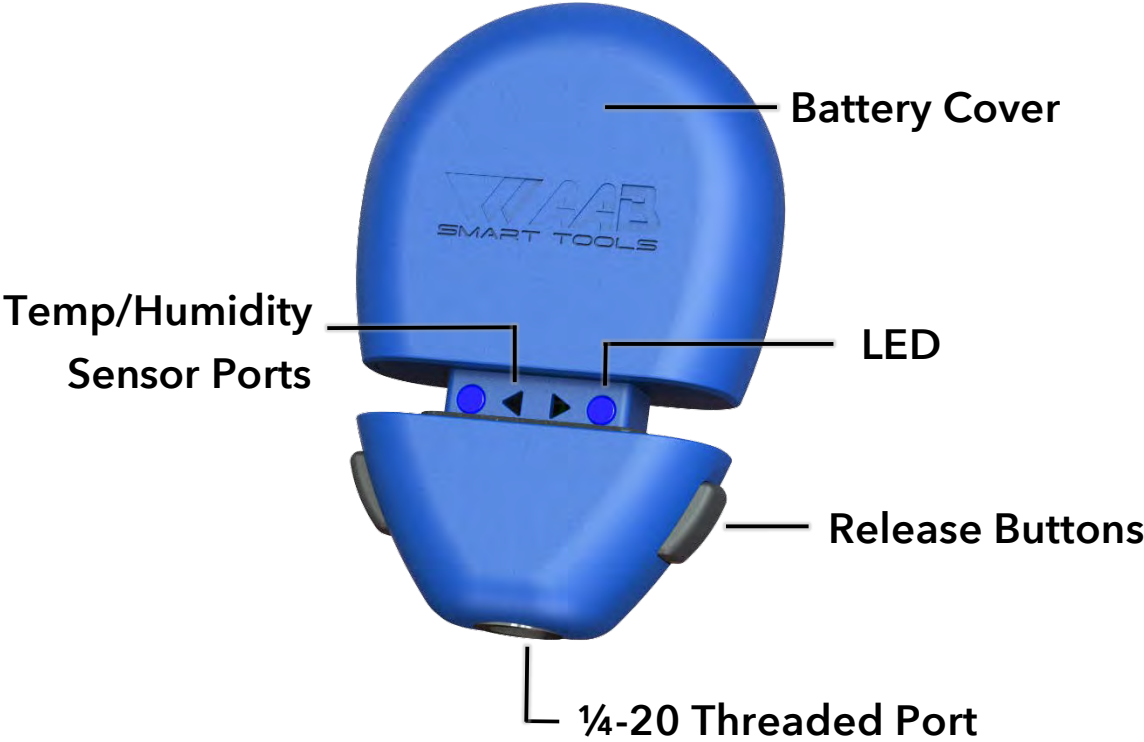
# Introduction to the TempSmart TS-100

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Overview



## First Connection


**Step One:** On your smartphone, go to the Apple App Store  or Google Play  and download the AAB Smart TS-100 app marked with an Orange icon .

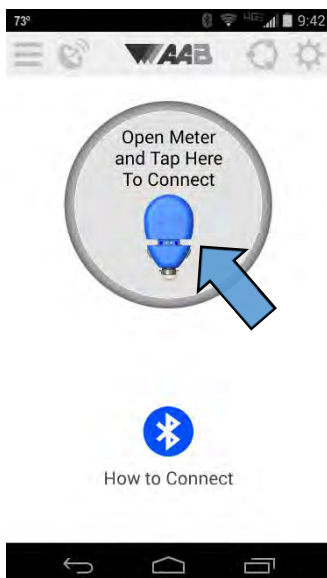
**Step Two:** Connecting the TS-100 to the app.

Start by pressing the side buttons to open and turn on the TS-100. The LED will begin blinking once a second for 30 seconds. This indicates that the unit is operating and the battery is good. At the end of the first 30 seconds, the meter will go into standby mode and will remain in standby mode as long as the meter is open. The meter can be connected to at any time while in the standby mode without physical interaction. Closing the meter turns it completely off.

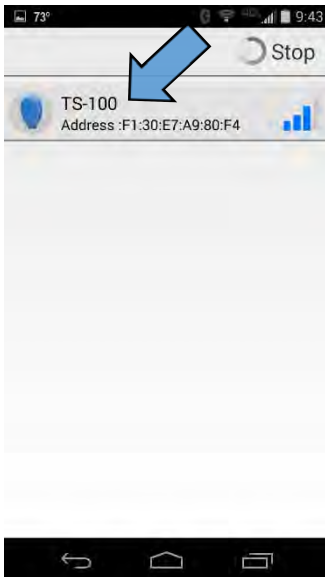


**Step Three:** Connecting the TS-100 to the app.

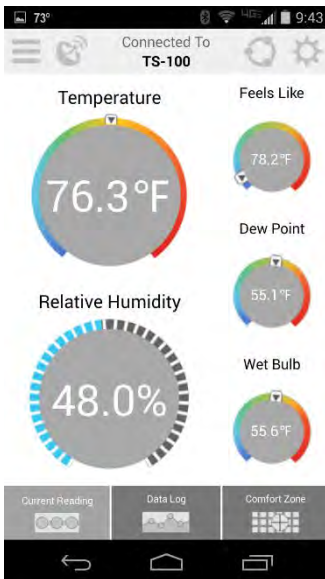
Start the app by selecting TS-100 orange icon  in the app list. After the opening screen animation, choose “Open Meter and Tap Here To Connect”.



The app will scan for TS-100s and display them in the list. Choose the desired TS-100 from the list to connect.



The TS-100 is now paired with the smartphone and ready for use.



## Settings

**NOTE: The Name, Company Name and Email Address are entered during the initial registration screen. They can not be entered in settings.**

**Name:** Used to display your name on reports.

**Company Name:** Used to display your company name on reports.

**Name This Device:** Each TS-100 can be given a custom name to uniquely identify it's location. Enter up to 15 characters for the custom name and then press Save at the bottom of the screen. The new name will appear the next time the TS-100 connects to your phone or tablet.

**Units:** Allows the selection of Metric or Standard units depending on the regional and user needs.

**Reading Views:** Changes graph display between radial and vertical styles.

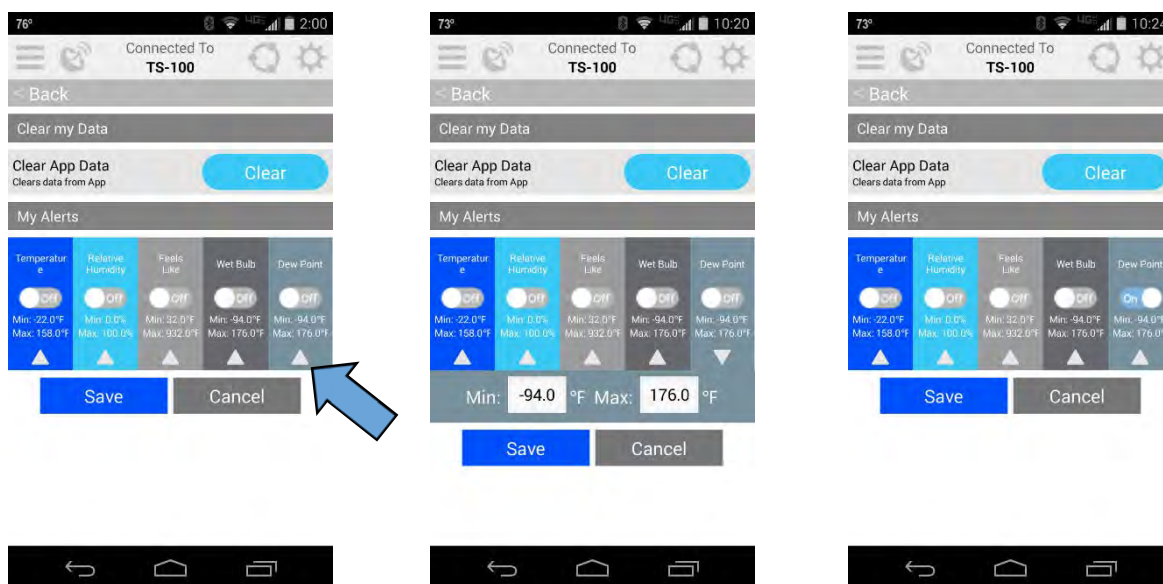
**Export Data:** This field can be used to relay the history log to an email address of your choosing.

**Connection:** Allows app to connect or disconnect from TS-100.

**Factory Default:** Resets the app back to factory default settings.

## Alerts

The TS-100 app allows alerts to be set, alerting the user if certain limits have been broken. To set a limit, press the gray arrow on the bottom of the measurement you wish to change. Enter the desired values and press save. To turn the alarm on, press the radio button associated with the measurement.



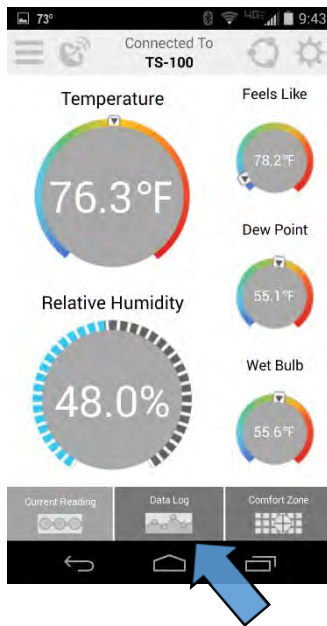
## Main App Screen

**Current Reading:** Displays the Dry Bulb Temperature and Relative Humidity in real-time. It also calculates Feels Like, Dew Point and Wet Bulb Temperatures. Definitions for each of these readings are included in the glossary at the end of this document.

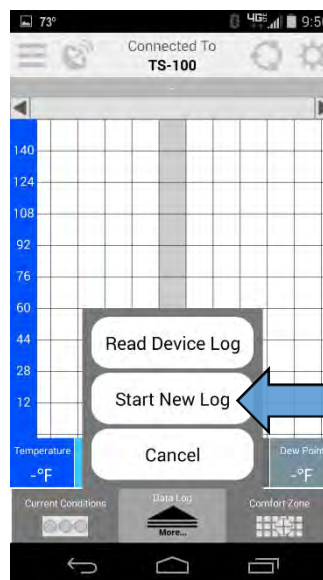
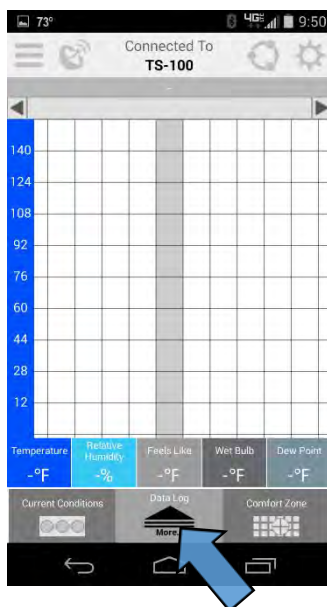
## Data Logging

Keeps a log of the temperature and humidity in intervals set by the user. To start data logging, connect the device to the app (see First Connection on page 4).

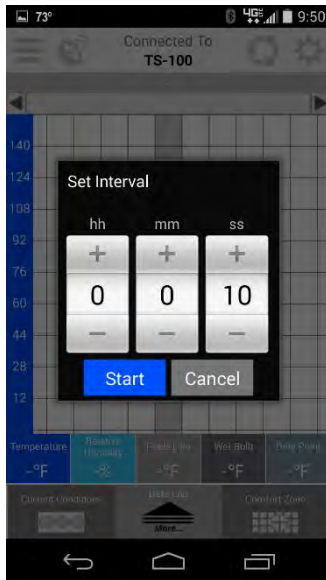
Once connected, choose “Data Log” at the bottom of the screen. This will bring up the Data Log screen.



To start logging, select “Data Log More...”, then “Start New Log” from the pop up menu.



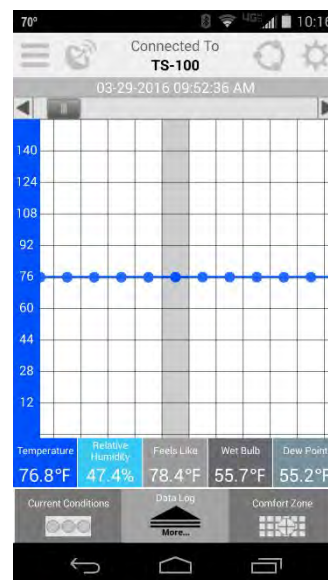
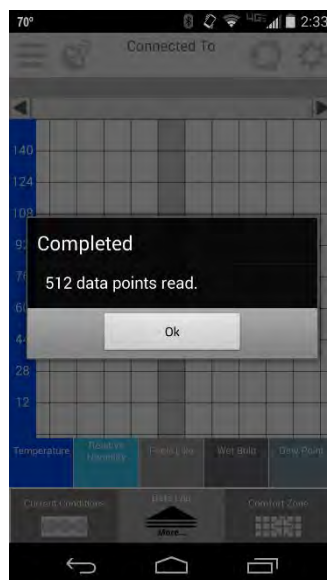
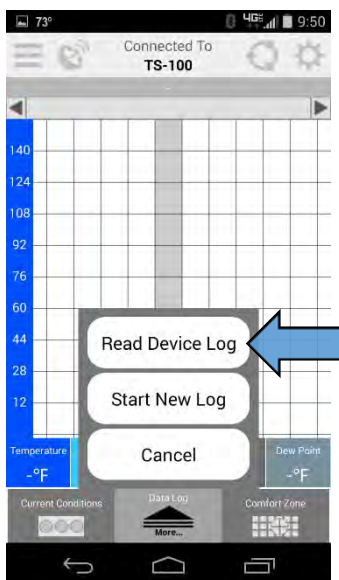
A new box will appear with three selectable time increments: hours (hh), minutes (mm), and seconds (ss). Set the desired increment (how often to record each reading) and select start.



The TS-100 will begin logging. The log is stored in the TS-100 memory and can be accessed at any time.

### Reading Data Log

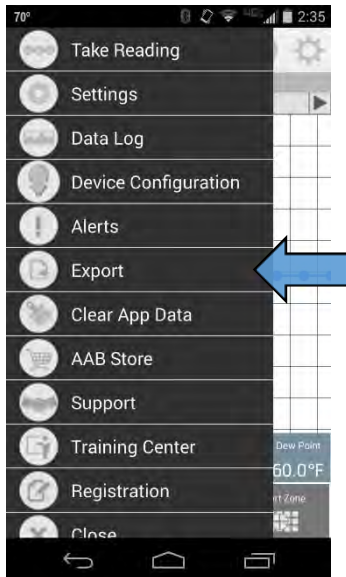
Once it has logged the needed amount of time, select “Data Log More...” and choose “Read Device Log”. This will download the log to your phone.





## Exporting Data

The TS-100 is able to export both saved data and the current data to a file or email. In order to export, first go to the drop down menu and choose Export.



This will bring you to the Export screen. At the top are the two options of Historical Reading (data imported through the log feature) or the Current Reading. For Historical Reading, the user can select certain date periods, rename the file, choose between html or csv file types, and add comments.

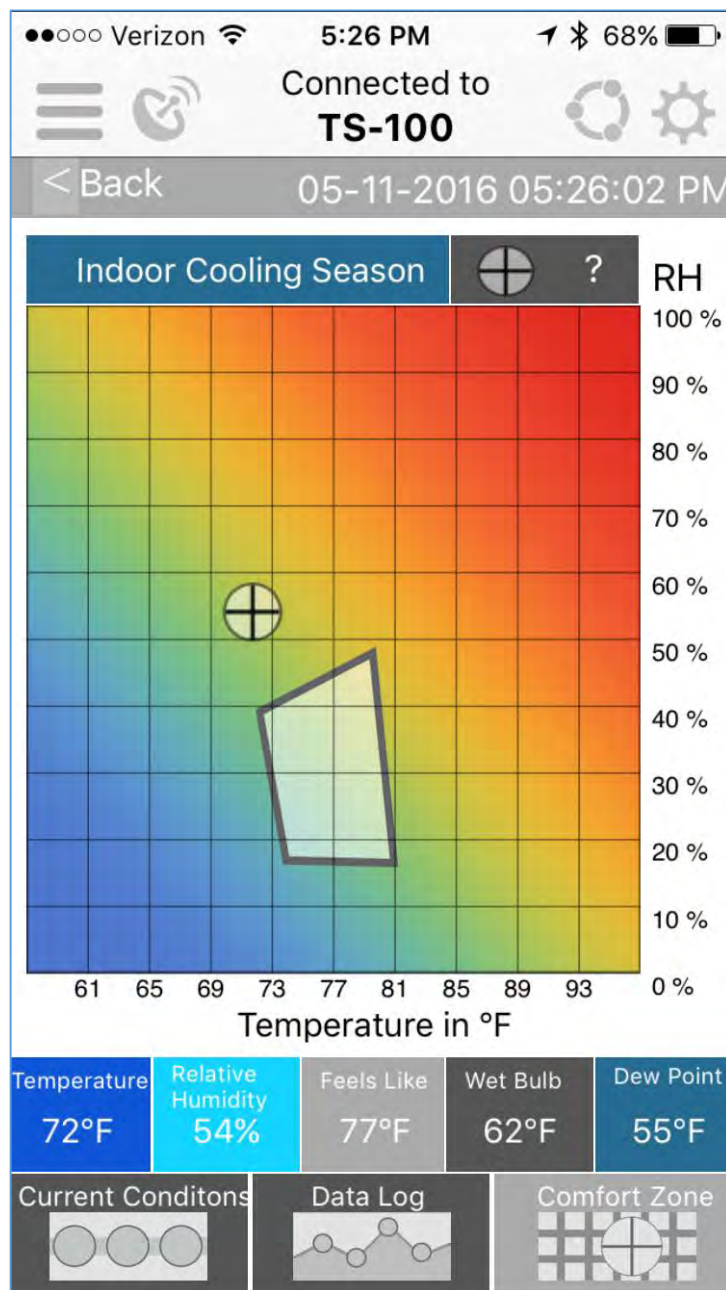
A screenshot of the Export screen in the TS-100 app. The screen has two tabs at the top: 'Historical Reading' (selected) and 'Current Reading'. Below the tabs are several input fields: 'From Date' and 'To Date' both set to '05-04-2016'; 'File Name' set to 'AAB TS-100' with a file type dropdown set to '.html'; and a 'Comment' text area. At the bottom are three buttons: 'Export', 'E-Mail', and 'Cancel'. The top of the screen shows a temperature of 70° and the time 2:35. The bottom of the screen shows the Android navigation bar.

Once completed, export or email can be chosen to save or send the data.

## Comfort Zone

Graphical representation of the relationship between temperature and humidity as it relates to indoor comfort. This helps people to understand the impact humidity can have on comfort vs seeing a specific temperature on a thermostat.

Please be sure to adjust the comfort zone for the season by clicking on Indoor Cooling Season or Indoor Heating Season at the top of the chart.



## LED Indicators

The two LED indicators flash in order to inform the user about the unit's operation. In normal operation, the LED will flash once every second for 30 seconds to let the user know the unit has been powered on. At the end of the first 30 seconds, the meter will go into standby mode and will remain in standby mode as long as the meter is open. The meter can be connected to at any time while in the standby mode without physical interaction. Closing the meter turns it completely off.

If the battery voltage falls below 2.8 volts, the TS-100 will automatically shut down the Bluetooth connection and will quickly flash three times every two seconds. Please see below for instructions on changing the battery.

## Maintenance

### Changing the battery

Step one: Using the indentation on the top of the unit, lift to pop the battery door open.



Step two: Pull the battery door off and flip the TS-100 over to remove the battery. Place in a new battery with the positive side facing up, as in the picture below.



Step three: Place the battery door back onto the TS-100, making sure all three clips are firmly seated.

### Cleaning

To clean the TS-100, use a dry dust free rag and wipe down exterior.

**\* Do not rinse or submerge! \***

### Storage

The ABM-200 is to be stored out of direct sunlight in temperatures between 32° and 95° F (0° and 35° C).

## Troubleshooting

PROBLEM	POSSIBLE CAUSE	CORRECTION
The TS-100 won't connect	Low battery	Replace battery
	Bluetooth off	Turn on phone's Bluetooth
	Out of range	Move closer to the device
*Slow temperature/humidity response	Low air flow	Move into air stream
	Ports blocked	Remove obstruction from front and/or rear ports
Incorrect temperature/humidity reading	Low Battery	Replace battery
	Meter acclimating	Give meter time to adjust to current conditions
	Ports blocked	Remove obstruction from front and/or rear ports
	Direct sunlight	Move from direct sunlight
Screw port doesn't work	Wrong thread size/type	Ensure accessory has a 1/4-20 threaded screw
Log doesn't show in email	Email service or anti-virus program is removing/stripping the attachment	Change settings in email or anti-virus program or use another email program

- The TempSmart TS-100 was designed to mechanically shield the sensor while closed and provide fast and accurate readings by exposing the sensors directly to the air when opened. When moving the device from extreme temperature or humidity conditions to another, it may require time to acclimate as with any measurement device.

## General Use

The TS-100 was designed for reading and logging temperature and humidity in order to aid the contractor in effectively balancing commercial and residential HVAC systems.

## Technical Data

**Temperature accuracy:**  $\pm 0.36^{\circ}\text{F}$ , ( $\pm 0.2^{\circ}\text{C}$ )

**Relative Humidity Accuracy:**  $\pm 3\%$

**Power:** Panasonic 3.6V, CR 2450 Coin Cell Lithium Battery

**Battery Life:** >500 hours of activity

**Units of Measure:** Standard Fahrenheit & Metric Celsius

**Operational temperature range:**  $-4^{\circ}\text{F}$  to  $+158^{\circ}\text{F}$  ( $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ )

## Glossary

**Comfort Zone:** The comfort zone displayed on the app is intended to be a graphic representation that is relative to the ASHRAE Standard 55 “Thermal Environmental Conditions for Human Occupancy”. This standard provides minimum requirements for acceptable thermal indoor environments and helps people to understand the relationship between temperature and humidity as they relate to comfort.

**Dew Point:** The atmospheric temperature below which water droplets begin to condense and dew can form.

**Feels Like:** The effect of humidity on perceived indoor temperature

**Humidity:** A quantity representing the amount of water vapor present in the air.

**Relative Humidity:** The amount of water vapor present in air expressed as a percentage of the amount needed for saturation at the same temperature.

**Dry Bulb Temperature:** Temperature of air measured by a thermometer freely exposed to the air but shielded from radiation and moisture. DBT is the temperature that is usually thought of as air temperature, and it is the true thermodynamic temperature.

**Wet Bulb Temperature:** The wet bulb temperature is the temperature air would have if it were cooled to saturation (100% relative humidity). Knowing the wet bulb temperature is important in determining the temperature of an area that can be achieved through evaporative cooling and/or removing the latent energy from a space.

**Temperature Differential or  $\Delta T$ :** difference in temperature between two spaces in a building, or between indoor and outdoor temperature.