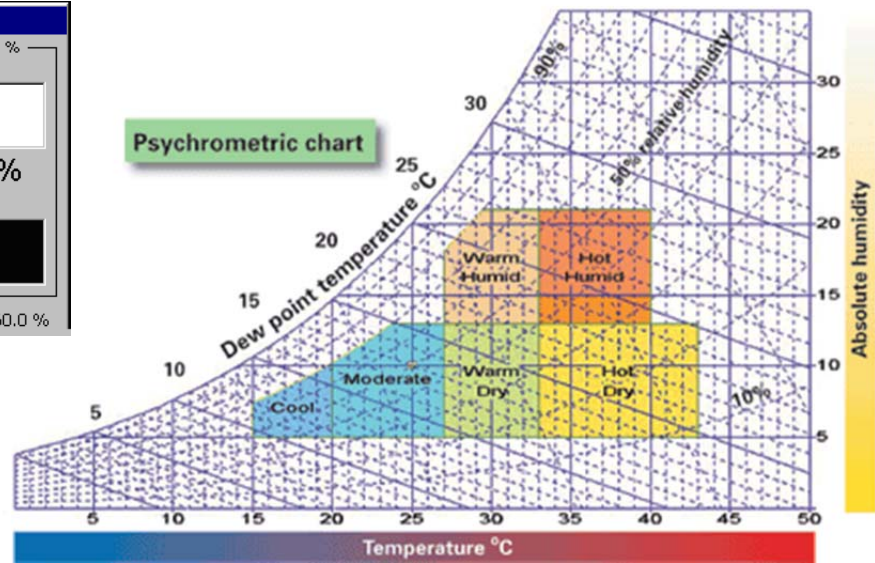
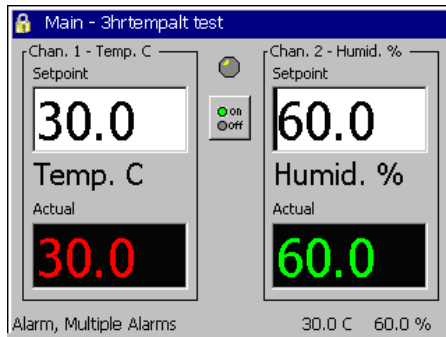


## Wet Bulb/Dry Bulb Humidity Measurements



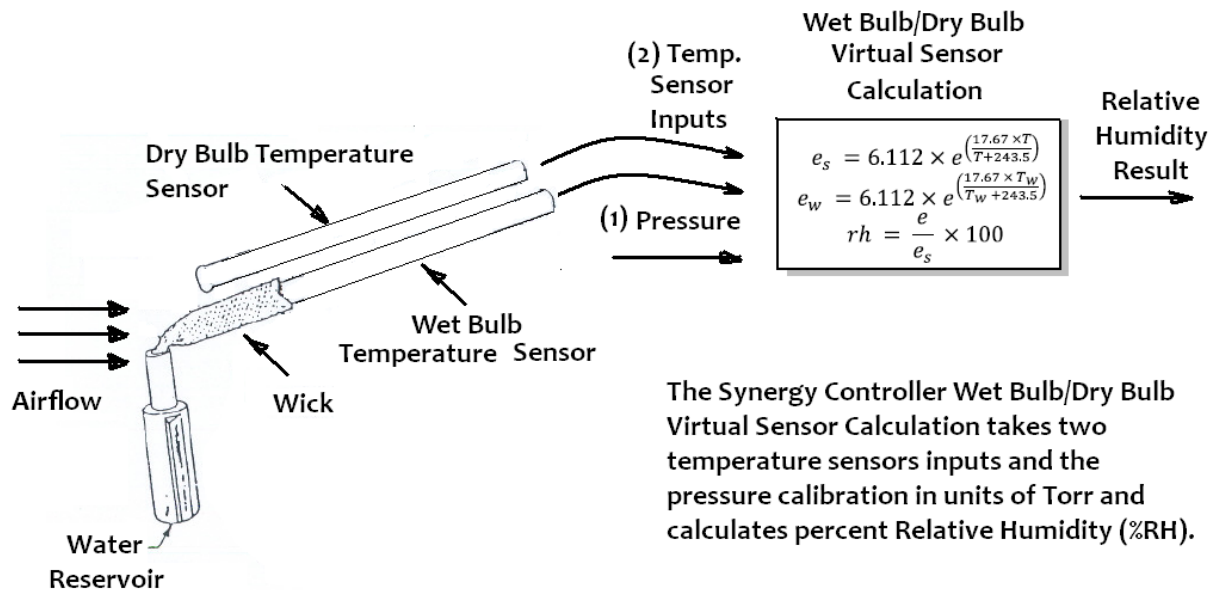
### Overview

The calculation of Relative Humidity using a wet-bulb and a dry-bulb thermometer involves the science of psychometrics.

The Synergy Controller, both the full sized Micro and Micro2 and the ¼ DIN Nano, can use a wet-bulb and a dry-bulb temperature sensor to measure Relative Humidity as an alternative to an electronic RH sensor.

To make these measurements, a wet-bulb sensor infers the amount of moisture in the air when the evaporation from a moist cloth wick placed over the sensor lowers its temperature reading. When the air surrounding the wet-bulb sensor is dry, evaporation of moisture from the wick is faster than when the air is moist. If the air is saturated, no evaporation from the wick occurs and the temperature of the wet-bulb sensor is the same as the temperature of the dry-bulb sensor.

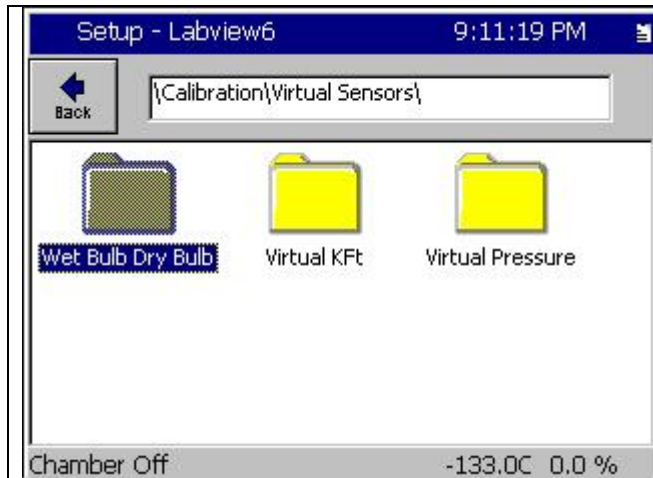
The block diagram on the following page describes these calculations and the sensor inputs.



App\_Note\_58\_Graphic D

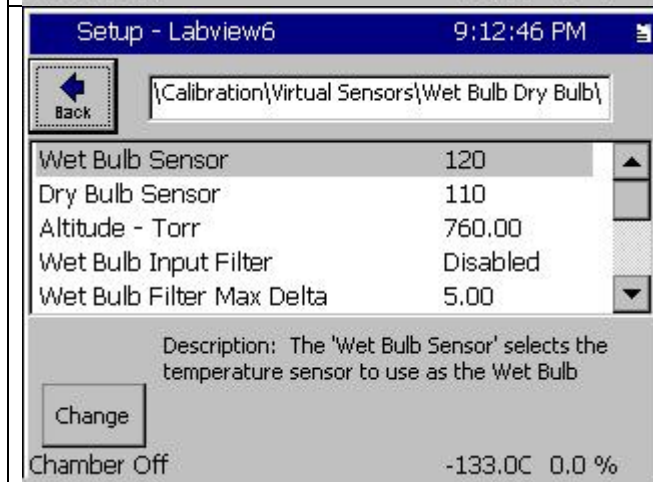
### Setup as follows:

	<p>Select the Channel Calibration folder in the Setup screen for the Humidity Channel (typically Channel 2). Highlight the <b>CH2 Sensor Select</b> Parameter and press <b>Change</b> button.</p>
	<p>Select the Wet Bulb/Dry Bulb Virtual Sensor as shown on the left.</p>



Configure the Wet Bulb/Dry Bulb Virtual Sensor as follows:

Open the Wet Bulb/Dry Bulb folder under Virtual Sensors as shown on the left.



Set the sensor ID's for the Wet Bulb and Dry Bulb temperature sensors as required.

In the example on the left, Wet Bulb Sensor 120 is RTD2, and Dry Bulb Sensor 110 is RTD1.

Note that the Input Filter can be enabled to reduce measurement noise.

## Notes:

1. To provide the greatest accuracy the Synergy Controller's wet-bulb sensor requires moderate air flow. Airflow of 700 ft/min provides the best accuracy. Errors up to 15% can occur if the air movement is too slow.
2. The wet-bulb temperature sensor should be shielded from the radiant heat. Errors up to 15% can occur if there is too much heat radiation.
3. The Synergy Controller provides a pressure (Torr) calibration field to compensate for ambient pressure at the measurement site. This improves the accuracy of the measurement.

## About the Synergy Controller Family

Tidal Engineering's Synergy Controllers including the Synergy Micro 2, Synergy Quattro, and the ¼ DIN Synergy Nano provide state-of-the-art usability and connectivity for environmental test control and data acquisition. They combine the functions of a chamber controller and a data logger and are designed to improve test efficiency by supporting both factory automation and test and measurement protocols and standards.

Synergy Controller feature highlights includes:

- ➔ Color touch screen
- ➔ Ethernet, RS-232 and GPIB communications
- ➔ Built in 100 MB Data logger with USB drive support
- ➔ Data Acquisition, up to 64 T-type thermocouples (Optional)
- ➔ Built-in Web Server for remote control; WebTouch Remote™
- ➔ Compatible with Synergy Manager for PC based control, monitoring and programming.
- ➔ Built-in FTP Server for factory automation and test and measurement applications

For more information regarding these controllers please see the Synergy Controller Technical Manual on our website at <http://www.tidaleng.com/synergy.htm>

## About Tidal Engineering

Headquartered in Randolph, NJ, Tidal Engineering Corporation has been designing and building award-winning embedded hardware and software for test and measurement and data acquisition applications since 1992. The company is recognized for technical expertise in such areas as environmental test chamber control, Embedded IEEE 488, and turnkey SCADA (Supervisory Control and Data Acquisition) systems.

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