TM

Overview – THUM-OEM

The THUM-OEM is a modified version of the THUM. This new version can have up to 3 external sensors connected. It also has 2 options for on the board temperature sensor, either a temperature & RH sensor or a temperature only sensor. All of the functions and sensors can be accessed through the DLL. The DLL was written in VC++ and is for use on Windows operating systems.

Currently there are two versions of the THUM-OEM. Due to the differences in the Infrared and Ultrasonic proximity sensors, there needed to be a slight change in circuitry on the THUM. The THUM-OEM will be marked on the bottom with either a **T** or a **TU**. The ultrasonic sensor will work with the TU version. The infrared sensor will work with the T version. All other sensors will work with either version.
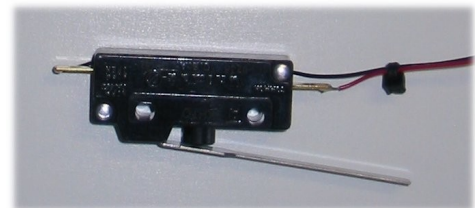

Socket 3
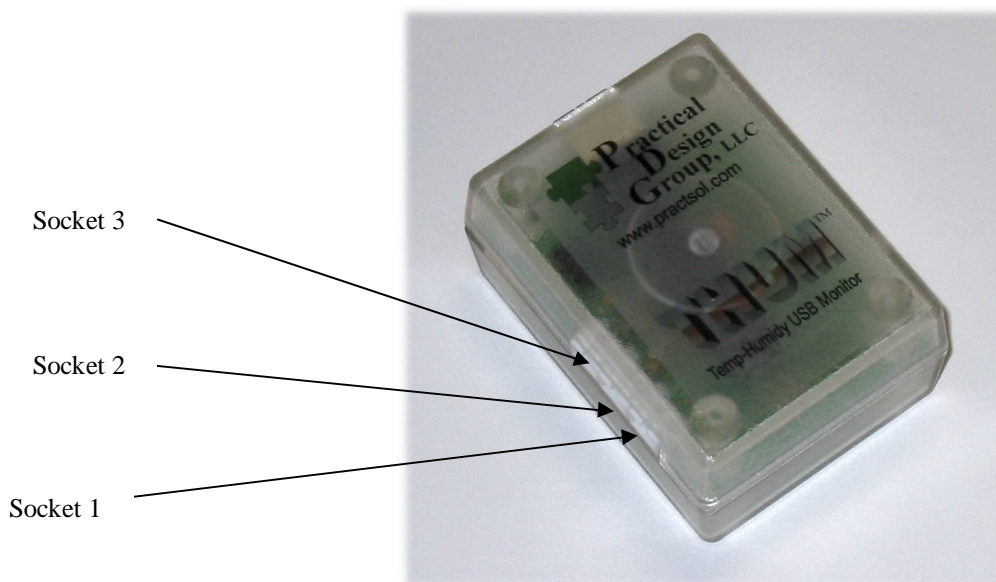
Socket 2

Socket 1

The THUM-OEM has 3 sockets for connecting external sensors.

External switch - use our switch or your own to detect things such as a door being opened.
Connect the external switch to **Socket 1, 2, or 3**
The DLL returns a value of **1 if the switch is open** and a value of **0 if the switch is closed**.

Infrared proximity sensor - detect the presence of an object within 3 cm to 30 cm

The infrared sensor outputs an integer reading relative to the objects distance from the sensor. The infrared sensor is non-linear and does not have a great deal of accuracy, but it does work well to detect if an object is present within its operating range. The last page of this document shows an example output curve taken from the datasheet.
Connect the infrared proximity sensor to **Socket 1** of a THUM-OEM which has a serial number starting with **T-**.
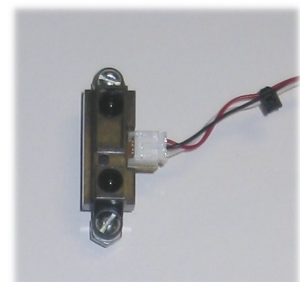
Ultrasonic proximity sensor - detect the presence of an object within 1 inch to 4 feet. This sensor provides a linear output so it can be used to detect approximate distance also. The ultrasonic sensor outputs an integer reading relative to the object's distance from the sensor. This sensor has a linear output and is much more accurate than the infrared sensor. A proximity sensor can be used to detect if someone approaches or leaves a kiosk which can start a sequence of events. A proximity sensor can also be used to detect the level of dispensed items remaining. Currently, when the object is more than 4 or 5 feet the readings will start to become smaller.

Here is the formula for converting the ultrasonic reading to inches:

$$inches = -0.1730805 + (0.011227463 \times ultrasonic\ reading)$$

Connect the ultrasonic proximity sensor to **Socket 1 & 2** of a THUM-OEM which has a serial number starting with **TU-**. The connector that goes to socket 1 will be marked to signify it goes to socket 1.
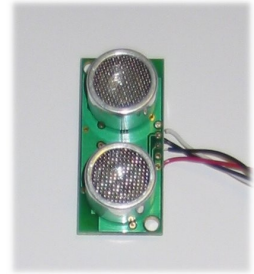
External temperature sensor - this sensor can be added to detect the temperature in a second location, such as the temperature outside of a kiosk.

Connect the external temperature sensor to **Socket 2**.

Installation

1. Connect the THUM to an available USB port.

A window should appear briefly stating that a USB Temp/Humidity Sensor has been found. The driver for the device comes with Windows, so it should complete the driver install without the user having to install any special drivers. The green LED should light after the THUM has been initialized.

2. Install the software you will be using to communicate with the device.

Note: Only one running program at a time can connect to a THUM. If you attempt to connect to a THUM with two programs at the same time, errors will occur.

System Requirements

Processor	Pentium 300 MHz or faster
Operating System	Windows 98SE, 2000, or XP
Memory	32 MB RAM
Other	1 available USB 1.1 or 2 port

Support

If you are having problems or need help implementing the THUM please contact Practical Design Group, LLC by going to www.practsol.com or sending e-mail to support@practsol.com

Infrared Sensor output

Fig.6 Analog Output Voltage vs. Distance to Reflective Object

GP2D12

Draft	Reflectivity
White	90%
Gray	18%

Analog output voltage V_O (V)

Gray

White

Distance to reflective object L (cm)