

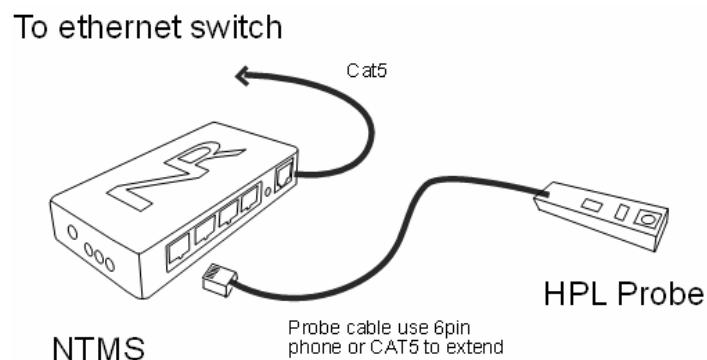
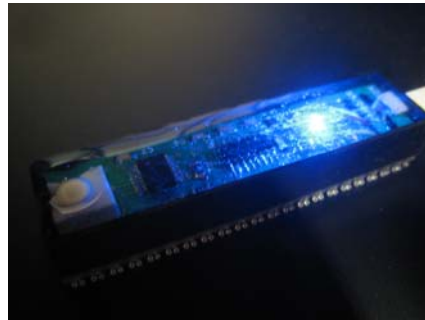


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## Humidity Probe, HPL-1 (#30009)

The Networked Robotics HPL1 Humidity probe allows the Tempurity System to monitor both temperature and relative humidity over the network. The HPL1 is designed to be used with the Networked Robotics NTMS (Network Telemetry Monitoring System) network hardware for network-based data collection. The HPL1 will be connected to one of the measurement ports on the NTMS unit.



## ***Collection from Multiple Monitored Devices***

Because each NTMS4 unit has 4 measurement ports, data from 4 HPL1s, or any combination of several types of monitored devices such as Networked Robotics sensors, direct connections to the data ports of many types of freezers and other scientific equipment, can be collected simultaneously. Only a single monitored device, an HPL1 humidity sensor, is shown in the figure above. See other Networked Robotics hardware manuals for descriptions of how to enable network-based data collection from other types of sensors and scientific instruments.

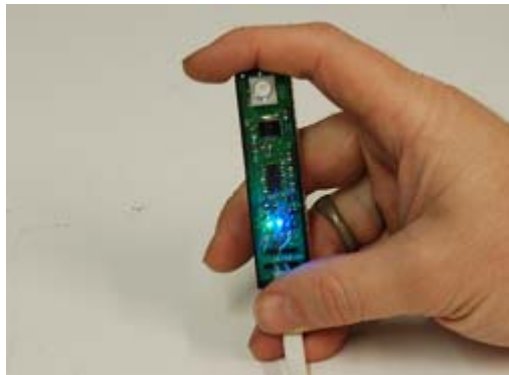
## ***Packing List***

Verify that your packaging is complete and contact us if anything is missing. This package includes the basic hardware you will need to connect the HPL1 probe to the NTMS.

- (1) HPL1 Humidity Probe
- (2) RJ-45 Coupler for extensions

## ***Electrical Specifications***

The HPL1 probe derives its power from the regulated 5 volts DC supplied by the Networked Robotics NTMS hardware, so no external power supply is required.



## ***Physical Installation***

The HPL1 probe unit can be as far as 100 meters from the Networked Robotics NTMS network hardware, and connections are easily extendable with CAT5 cable couplers. Use 6-pin phone cable or CAT5 network cable to extend the connections.

### **Wall plates**

In offices or laboratories that are well populated with network jacks, humidity and room temperatures from every room in the entire building can be visible to anyone on the network within a few hours. Using this method, NTMS units are mounted on rack hardware and shelves in a network closet. Each NTMS port is patched to a network wall plate. The HPL1 is plugged into the wall plate. This method allows very quick connect-time, but is best implemented in offices or laboratories with multiple CAT5 jacks and wall plates.

### **Probe Location**

The placement of the sensor can have an effect on the reading. Be sure to select an appropriate position for the sensor inside the monitored device or room that will represent the conditions of the material that you are protecting. The white plastic tip of the probe must not be blocked in any way. The white membrane allows humid air to reach the Sensiron integrated circuit that is responsible for the humidity measurement. If air's entrance to this chip is blocked, the humidity

reading will be inaccurate. The temperature reading is not affected by blockage at the white membrane. Avoid the use of solvent vapors or other contaminants, such as plastic parts around the sensor, as these may deposit over the HPL1's internal sensor over time and affect the reading.

The electronics of the unit are protected from high humidity and it can be mounted outside, or in areas of very high humidity. The HPL1 is not waterproof and should not be submerged in water. Total immersion in water will damage the HPL1 permanently.

### **Attaching the HPL1 Probe**

Secure the HPL1 probe to a convenient location using the dual-lock provided on the back. The dual-lock attaches best to metal or plastic surfaces. It will not adhere as well to surfaces such as drywall or wood, or to porous materials such as concrete.

### **Attaching the HPL1 Probe to the Inside of a Freezer**

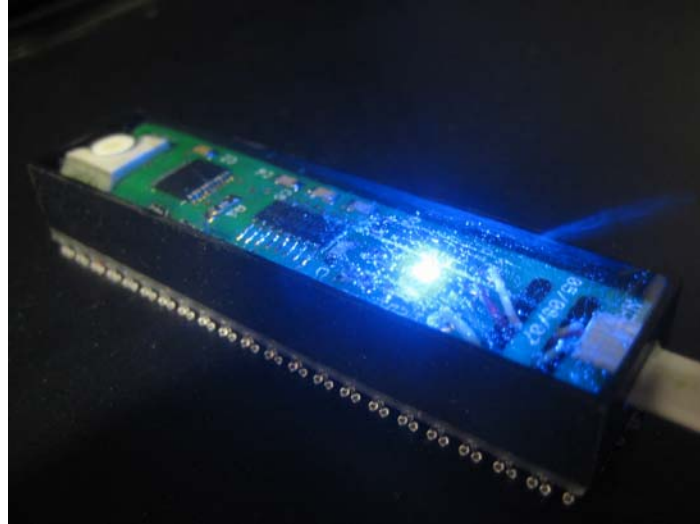
To apply a Networked Robotics HPL1 digital temperature probe to the wall of your refrigerator or freezer first ensure that the freezer wall is dry. If frost or condensation has built up on the wall, use a paper towel to dry it. In some cases you may want to briefly apply a gloved hand to the wall where the dual-lock will be affixed. This will warm the wall and increase the likelihood of a good bond. If the dual-lock backing does not adhere, check if the wall is as dry and as warm as possible and try again. You may wish to adjust the contact area of the dual-lock connecting the back of the probe to the freezer wall. The more contact area the better the holding power but the more difficult to disconnect the probe from the wall for calibration or replacement. The 6-pin wire used disturbs more of the door seal than does the Networked Robotics TPL3 probe. You may wish to use plumbers putty to block any potential disruptions in the door seal.

See the Tempurity System Quick Connect Guide and the Tempurity System User's Guide for more information.

### **Extensions**

The reach of the probes can be as far as 100 meters from the Networked Robotics NTMS network hardware. You can easily extend the length of any connection using the included RJ-45 coupler and either 6-pin phone cable or CAT5.

If the NTMS is powered up, and the CAT5E cable connection is made correctly between the TPL3 and the NTMS, the blue LED on the probe will illuminate.



The activation of the green LED periodically indicates that a dual temperature/humidity reading is being requested by the NTMS. If the green light stops blinking it is an indication that the logical or physical connection to the NTMS has been interrupted. If the NTMS port is configured as a monitored device type other than HPL1, the green light will never activate, despite the correct physical connection to the NTMS. See the instructions below on how to correctly configure the NTMS measurement port for HPL1 data collection.



### ***Configure the NTMS***

Finally, configure the NTMS measurement port for the new probe type. This is done by running the latest version of the NTMS Configuration Wizard. You can obtain the configuration wizard from the download section of the Networked Robotics web page. Older versions of the wizard (before version 3.0) will not have the appropriate probe type options. New probe types are being added periodically. Run the wizard and verify that the NTMS that the HPL1 is connected to is discovered. The NTMS hardware must be running firmware revision 1.6 or higher. If it is not, stop the installation and upgrade your NTMS hardware's firmware with the NTMS Upgrade Wizard available from the Networked Robotics download page (not shown).



be returned. For more about debugging network connections to probes see the appendix of the Tempurity System User's Guide.

For use with the Tempurity System, you will need to add the new device to the Tempurity Server configuration. See the Tempurity System User's Guide and the section on server configuration for more information.

## ***Operation***

The NTMS network hardware continually reads humidity and temperatures from the HPL1. The most recent values are available for network requests by the Tempurity System.

During normal operation, the blue LED on the HPL1 will be on. The green LED will occasionally blink. The blink indicates an active data read by the NTMS. If the blue LED ever goes out permanently, this is an indication that the configuration of the NTMS port is not correct for an HPL1 probe. If both lights are out, then the connection to the NTMS is lost and the cables or NTMS status should be checked.

## ***Unique IDs***

All Networked Robotics hardware holds electronic globally unique IDs. HPL1 probe IDs are of the format:

08:0000:0000:0002

Where 8 indicates the product number, and the other characters indicate the electronic ID of the unit. Electronic IDs can be read through a Windows computer using the "Probe ID Unit" (Networked Robotics part number #30010) hardware through a USB connection.

## ***Communications Specifications***

The HPL1 communicates with the NTMS using RS-232 at 1200bps. The HPL1 will accept the following commands:

- V: Display version info
- H: Take combined Humidity, Temperature reading
- A: Take readings at 1 second intervals until another key is entered.

## ***Physical Specifications***

Weight:	26.9 grams (9.5 ounces)
Length:	76.2 mm (3 inches)
Width:	19.0 mm (.75 inches)
Height:	9.9 mm (.39 inches)

## ***Performance and Accuracy***

The HPL1 probe measurement capability is built around the Sensiron SHT15 integrated circuit. Accuracy of the SHT15 is constant at 2% error between 10 and 90 percent relative humidity. The Sensiron chip reports to .1 degrees Celsius and has a distribution of accuracies based on the temperature. The chip has a temperature accuracy of .3 degrees at room temperature and 1.5

degrees Celsius at the maximum ranges of -40C and +125. See the data sheet of the Sensiron SHT15 for more information.

## ***Support***

If you need assistance with your HPL1 probe or other products, contact Networked Robotics by phone at 877-FRZ-TEMP (877-379-8367) or by email at [support@networkedrobotics.com](mailto:support@networkedrobotics.com)