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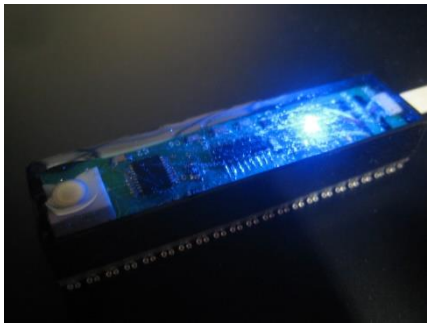
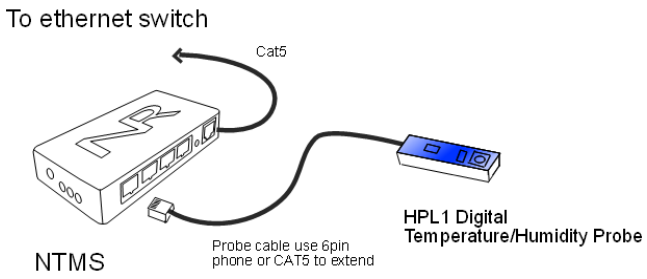
Digital Humidity Probe, HPL1 (#30009)

The Networked Robotics HPL1 Digital Humidity Probe enables the remote data collection and monitoring of both relative humidity and temperature via standard computer networks. The HPL1 is designed to be used in conjunction with the Networked Robotics NTMS (Network Telemetry Monitoring System) hardware and Networked Robotics Tempurity™ System software. The Tempurity System is designed for data collection and monitoring in FDA-regulated environments including pharmaceutical, medical, and food industries.





Description

The LED in the digital HPL1 indicates at-a-glance the state of the operation of the humidity probe to the network. The view window shows as blue when connected normally and flashes green when data is being collected from Networked Robotics' NTMS network hardware. The probe can be extended to up to 300 feet from the NTMS and probes can be patched via CAT5 cable plant to NTMS units mounted in network closets. Industrial Dual-lock® is used to attach the probe to a substrate so installation is quick and easy. Probes are coded with electronically unique readable IDs to enhance calibration quality and regulatory compliance.

Packing List

This package includes the basic hardware you will need to connect the HPL1 probe to the NTMS.

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

Hardware Installation

There are three major steps in the installation of this hardware

1) Physical installation
2) Configuration of the Networked Robotics NTMS hardware to which the HPL1 is attached
3) Manual testing of data collection via the network

Each of these steps, especially manual testing through the network, as described below, should be performed successfully before attempting to configure real-time data collection via the Tempurity System. Detailed information on configuring this monitored device through

Tempurity is available in the Tempurity System's User's Guide (Networked Robotics document number "Tempurity-04-0006.5") which is available on the Networked Robotics web site.

1. Physical Installation

Probe Location

Carefully select the location of the sensor. The white membrane in the tip of the probe allows humid air to reach the integrated circuit that determines the humidity measurement. The tip must not be blocked by samples or any other material.

The probe is water resistant and can be mounted outdoors. The white tip is resistant to the entry of water. It provides IP54 protection which protects against "splashing water". The HPL1 must not be submerged in any liquid.

Avoid the use of solvent vapors or other contaminants in cleaning. Certain solvents and plastics can release gases that bind with the polymer coating of the internal integrated circuit that produces the reading. Exposure to these substances will cause a shift in the humidity reading. For more information contact Networked Robotics.

Room Humidity and Measurements via 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 just a few hours. Using this method of installation, NTMS units are mounted on rack hardware and shelves in network closets. Each NTMS port is patched to an HPL1 via a network wall plate. The HPL1 can be attached directly to the wall plate using its Dual Lock® backing. This method allows very quick connect-time, but is best implemented in offices or laboratories that are well-populated with network wall plates.

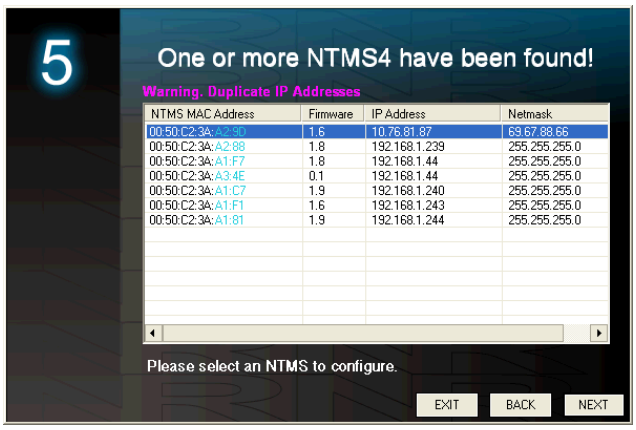
Attaching the HPL1 Probe to the Inside of a Refrigerator

To apply a Networked Robotics HPL1 digital temperature probe to the wall of your refrigerator first ensure that the refrigerator 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.)

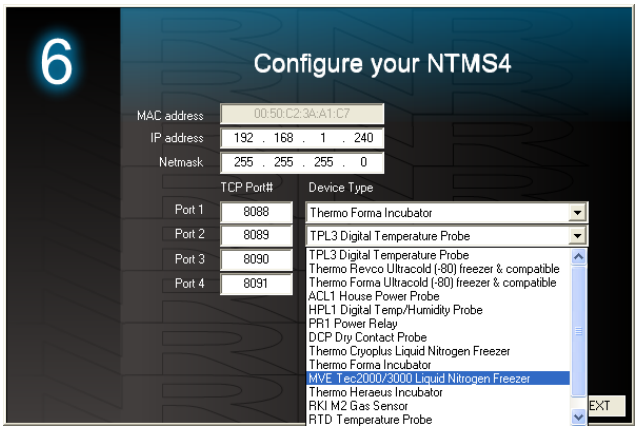
2. Configuring the NTMS for Data Collection

Configure your NTMS network hardware for data collection from this instrument. This is done by running the latest version of the NTMS Configuration Wizard  from any PC that is on the same subnet as the NTMS to be configured. You can obtain the configuration wizard from the "download" section of the Networked Robotics web page. See http://www.NetworkedRobotics.com\download\. New interface and sensor types are being added periodically to the wizard so the screens below may change.

1. Run the wizard from the same local area network as the NTMS and verify that the NTMS is discovered. (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.)



2. Select the NTMS, and proceed to the “NEXT” screen. (We will assume the IP address information is already set for your NTMS; if not, see the NTMS installation guide.)
3. Click on the NTMS measurement port where the probe is connected, and under the “Device Type” drop down, select “HPL1 Digital Temp/Humidity Probe” as shown.



4. Click “NEXT” to complete the NTMS configuration.

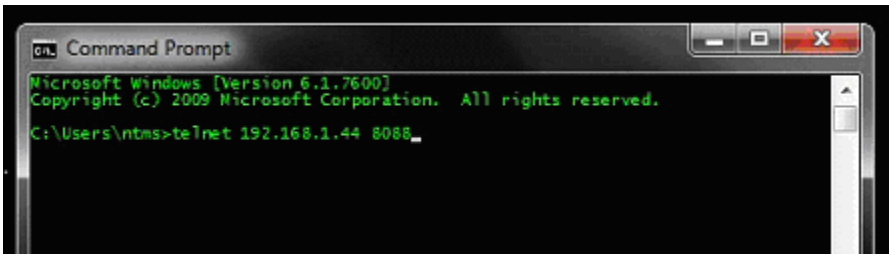
3. Testing Data Collection through the Network

Once the configuration is complete we recommend manually testing the ability to make network temperature measurements by using the “Telnet” utility from any PC. This commonly-used network utility sends simple network commands that will elicit a temperature reading from the TPL3. 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.

On Windows 7,8,10 clients you may need to enable the Telnet utility as follows: 1 Start 2 Control panel 3 Programs 4 Turn Windows Features on or off 5 Check “Telnet Client” 6 Click Ok.

1. From Windows click “START”, then “RUN”, and then type “CMD” and return.
2. At the black screen type “Telnet*” (space) IP- address (space) Port* (where *IP* is the IP address and *Port* is the network port address as selected by your use of the NTMS Configuration Wizard as described above.)



3. If you are successfully connected through the network you will see a blank screen.
4. Type a capital “H”; humidity and the associated checksum value should be returned.

Configuring Data Collection in Tempurity: The Tempurity Server Configuration Utility

In the Tempurity System, you will need to add two new monitored devices to the Tempurity Server configuration, one for temperature data collection and one for relative humidity data collection. See the Tempurity System User’s Guide and the section on server configuration for more information. The command character to acquire temperature is “T” and for humidity is “H”. The network addresses (IP and network port combination) will be the same for both of these Tempurity System monitored devices.

Operation

During normal operation, the blue LED on the HPL1 will be lit. The green LED will occasionally blink. The blink indicates an active data read by the NTMS. If the blue LED goes out permanently, this is an indication that the probe is not connected properly to the NTMS. If the green light does not blink, then this is an indication that either the NTMS data port is not configured properly for collection from the HPL1 type of “monitored device”, or that the cable or other physical connection to the NTMS should be checked.

Regardless of settings in the Tempurity System, the NTMS network hardware continually reads humidity and temperatures from the HPL1 at about 3-second intervals. The most recently collected values are available for network-side-initiated data requests by the Tempurity System.

Storage and Cleaning Procedures can Affect the Reading

Certain "outgassing" molecules, plastics and organic solvents in high concentration, can bind with the probe and affect the reading. The reading is permanently affected under normal environmental conditions. If your probe is to be stored for long periods or subject to harsh environmental conditions it is best to block the white sensor cap with Kapton® tape. The below is excerpted from the Sensirion handling guide.

> "Be particularly careful when using strong cleaning agents (e.g. detergents, alcohols, brominated or fluorinated solvents). Cleaning any part of a product might lead to high concentration of cleaning agents on the sensor."
>
> "Do not use polyethylene antistatic bags (light blue, pink or rose color). Do not use adhesive tapes inside packaging."
>
> "Use only recommended Kapton® tape Electrical Tape 92 by 3M™"

Reference

Unique IDs

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

06 0000:0000:0002

Where 6 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 "Digital Probe Calibration Programmer" (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 case sensitive commands:

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

Color Coding

HPL1 probes are color coded by mesh at the sensor and at the connection to the NTMS according to the last digit of their electronically embedded Networked Robotics unique ID. Examples are below:

Last Digit of Electronic ID	Color	Last Digit of Electronic ID	Color
0 Green		8 Black	
1 Yellow		9 Dk Blue	

See our support page on color codes for a full list of all 16 possible color codes and the associated last digit of the Networked Robotics unique ID.

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)

Ingress Protection: IP54

Performance and Accuracy

The HPL1 probe measurement capability is built around the Sensirion SHT15 integrated circuit. Accuracy of the SHT15 is listed as constant at 2% error between 10 and 90 percent relative humidity. The Sensirion chip reports temperature to .1 degrees Celsius and has a distribution of accuracies based on the temperature. For instance, 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 Sensirion SHT15 integrated circuit for more detailed information.

See the section "Storage and Cleaning Procedures can Affect the Reading" above.

Support

If you need assistance with your HPL1 Digital Humidity probe or other products, contact Networked Robotics by phone at 877-FRZ-TEMP (877-379-8367) or by email at support@networkedrobotics.com or visit our web page at http://www.NetworkedRobotics.com.