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HPS High Pressure Probe (#30063)

This product enables the remote data collection of high air pressure via standard computer networks. It is useful for real-time data collection from a wide variety of high pressure sources up to 1000 psi including compressed air sources in scientific, engineering, and manufacturing facilities. The high PSI limit depends on the product number. The sensor is designed to be used in conjunction with the Networked Robotics NTMS (Network Telemetry Monitoring System) hardware and with Networked Robotics Tempurity™ System software. Tempurity is designed for network-based data collection and monitoring of real-time scientific data in FDA-regulated environments.



Description

As shown in the figure above, the “NTMS” side of the High Pressure Probe connects to one of the four measurement ports of the Networked Robotics NTMS network hardware. The 7/16-20 UNF Air connector must be mated to a high pressure line. The probe measures the absolute gauge pressure in PSI units.

Versions

Several versions of this probe are available based on the high PSI range that is expected.

Packing List

This package includes the basic hardware you will need to connect the High Pressure Sensor to the NTMS.

- (1) High Pressure Sensor
- (1) CAT5E Cable

- (1) RJ45 Coupler for Extensions
- (1) Some versions may include air pressure input adapters

Data Collection from Any Combination of Monitored Devices

Because each NTMS4 unit has 4 “universal” measurement ports, data from any combination of Networked Robotics interfaces to scientific instruments and sensors can be collected with a single unit.

Installation

The Networked Robotics High Pressure Sensor is attached to a pressure source and to the Networked Robotics NTMS network hardware. There are three major steps in the installation of this product:

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

Each of these steps should be performed successfully before attempting to configure and monitor real-time pressure via the Tempurity System. Detailed information on configuring data collection in Tempurity is available in the Tempurity Systems User’s Guide (Networked Robotics document number “Tempurity-04-0006.5”) on the Networked Robotics web site.

1. Physical Installation

Data/Electronic Connections

The High Pressure Sensor can be installed as far as 100 meters from the Networked Robotics NTMS network hardware and connections are easily made and extended with CAT5 cable and the included couplers. You may wish to install the Networked Robotics NTMS hardware in a network closet, and then “patch” to the High Pressure Sensor at the monitored site via your company’s network cable plant.

The unit should not be subjected to extreme environmental ranges and should be placed in a location removed from possible exposure to high temperature, caustic liquids, or other harsh environmental conditions.

Connect the High Pressure Sensor to one of the four ports of an NTMS using the included Cat5 cable. Check that the NTMS is powered on, and verify that the data collection port is set properly for data collection from Temp:DCP (see below).

If the NTMS is powered on, and the CAT5E cable connection is made correctly between the High Pressure Sensor and the NTMS, an internal yellow LED on the High Pressure Sensor will illuminate while it does an internal calibration. It is somewhat hard to see on this sensor. It is viewable through the clear-side RJ45 connector. Every time the High Pressure Sensor probe is polled by the NTMS, the yellow LED will come on briefly.

Secure the unit to a convenient permanent location using the dual-lock provided on the back. The dual-lock sticks best to metal (except aluminum) or plastic surfaces. It may not adhere as well to surfaces such as drywall or wood, or to porous materials such as concrete. The probe can be removed from its dual-lock base for maintenance or cleaning.


Air Connections


Attach the high pressure line to be monitored to the sensor's 7/16-20 UNF Male air input connector. Adapters are likely to be required to interface to taps in your system. Use Teflon tape if possible on all connections to help prevent air leaks. Recommended torque to the air input connector is 18-20 Nm.

The 1 meter long cable from the sensor to the yellow HPS unit should be secured with cable ties or other means to the air line or elsewhere so that the connected HPS unit remains secure where mounted.

Turn off the high pressure line and attach the connections to the sensor air input. Then restore the pressure in the line.

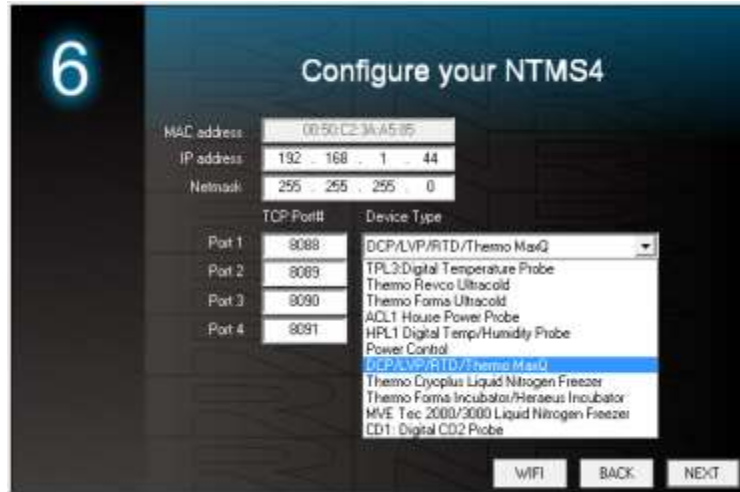
2. Configuring the NTMS

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. New sensor and interface types are being added periodically to the wizard so the screens below may change.

1. Run the wizard and verify that the NTMS to which the interface is attached is discovered. This NTMS must be running firmware revision 2.0 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. There are special precautions needed when upgrading an NTMS running firmware version 1.x to firmware version 2.0 or higher.



2. Select the NTMS to which the interface is attached, and proceed to the “NEXT” screen. (IP addresses must be set properly for your institution. If you are uncertain about the IP address to use, check with your network administrator.)
3. Click on the NTMS measurement port where the probe is connected, and under the “Device Type” drop down, select “DCP/LVP/RTD” as shown below.



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

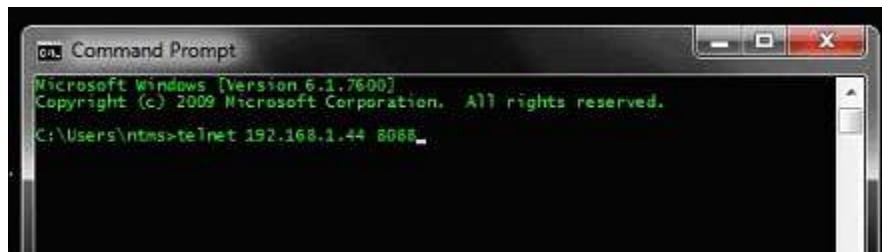
Note: If the NTMS measurement port is configured as the incorrect interface type (The correct type is “DCP”) in the NTMS Configuration Wizard, then the yellow light will never activate despite having the correct physical connection to both the NTMS and the voltage source.

3. Testing Data Collection through the Network

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

Windows clients may need to enable the Telnet utility as follows (Windows 7,8,10): 1 Start. 2 Control Panel. 3 Programs and Features. 4 Turn Windows Features on or off (upper right of screen). 5 Check “Telnet Client”. 6 Press Ok.

1. From Windows choose “START”, then “RUN”, and then type “CMD” and press return.
2. In the black screen type “Telnet” IP 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 “T”, the command character for this device. A pressure in PSI and the associated checksum value should be returned. For more about debugging network connections to monitored devices see the Tempurity System User’s Guide.

For use with the Tempurity System, you will need to add the network address (IP address and network port address) of the new monitored device (the high pressure sensor) to the Tempurity Server configuration. See the Tempurity System User's Guide section on server configuration for more information.

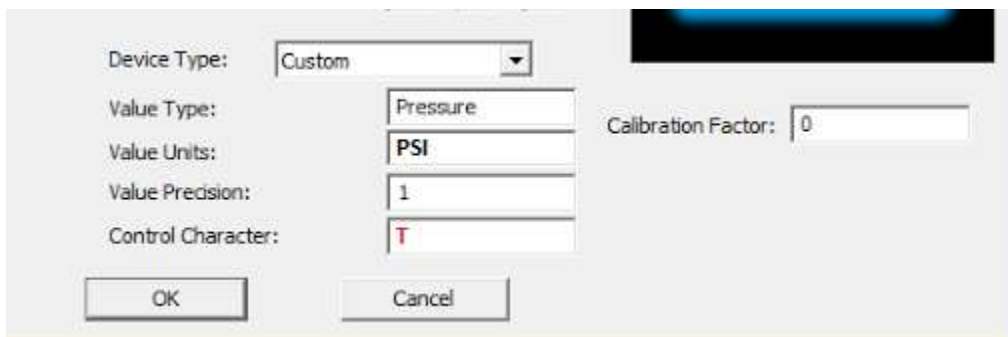
The control character for this interface is "T".

If a pressure in PSI units is not returned, check network parameters, network ports, firewalls, electrical and air connections and try again before attempting to configure data collection using Tempurity System software.

Configuring Data Collection in the Tempurity Server

Configuration Utility

Use of the High Pressure Sensor usually requires definition of a monitored device of type "Custom" in the Tempurity Server Configuration Utility. See the Tempurity System User's Guide, especially pages 38 and 39 of the Version 2 User's Guide (NR Document Number Tempurity 04 0006.5) and the section on Tempurity Server configuration for more information. The control character to acquire pressures from a High Pressure Sensor is "T". The figure below shows a potential configuration for a pressure sensor.



The screenshot shows a configuration dialog box with the following settings:

- Device Type: Custom
- Value Type: Pressure
- Value Units: PSI
- Value Precision: 1
- Control Character: T
- Calibration Factor: 0

Operation

The Networked Robotics' NTMS network hardware continually reads pressure in PSI units from the sensor at approximately 4 second intervals. The most recent value collected by the NTMS is available for network requests by the Tempurity System which by default collects remote data at one minute intervals.

During normal operation, the internal yellow LED will occasionally blink. The blink indicates an active data read by the NTMS. If the yellow LED does not activate, then either the configuration of the NTMS port has been changed and is no longer correct for a pressure sensor or the connection to the NTMS is lost and the cables or NTMS status should be checked.

Reference

Power Supply

The unit derives its power from the regulated 5 volts DC supplied by the Networked Robotics NTMS hardware. It requires no external supply.

Unique IDs

All Networked Robotics hardware holds electronic globally unique IDs. High Pressure Sensor IDs are of the format:

65:0000:0000:0302

Where the pre-colon number 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 Networked Robotics "Probe ID Unit" (Networked Robotics part number #30010) hardware through a USB connection.

Physical Specifications

Weight including sensor:	28.3 grams (6.9 ounces)
Length:	91.44 mm (3.6 inches)
Width:	66.22 mm (2.607 inches)
Height:	48 mm (1.102 inches)
Air input connector:	7/16-20 UNF Male SAE J1926-2 Straight Thread
Sensor cable length:	1 meter

Performance and Accuracy

The measurement capability of this product is built around the TE Connectivity 3200 line of pressure sensors. See the TE Connectivity 3200-series pressure sensor manual for more information.

Pressure Accuracy $\pm 0.25\%$ of full scale

Operating Temperature: -20 to $+85^{\circ}\text{C}$

Support

If you need assistance with your High Pressure Sensor or other products, contact Networked Robotics by phone at 877-FRZ-TEMP (877-379-8367) or by email at support@networkedrobotics.com