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Digital Carbon Dioxide Probe CO2-1 (#30061)

The Networked Robotics Carbon Dioxide Probe enables the remote data collection of incubator or atmospheric carbon dioxide concentration via standard computer networks. The probe is 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

A series of product numbers are used for different situations with expected maximum carbon dioxide levels. Products are available for 0-5% (#30061), and 0-1% (#30060). Product 30061 is designed for use in cell growth incubators that are designed to run at 5% CO₂ or lower.

One side of the CO₂ Probe connects to one of the four measurement ports of the NTMS4i version of Networked Robotics' NTMS4 network hardware. In incubators, ultra-flat wire connects the sensor, inside the incubator, to our network hardware outside the incubator.

The probe is designed to be used in environments of up to 95% humidity.

Packing List

This package includes the basic hardware you will need to connect the Carbon Dioxide Probe to the NTMS.

- (1) Carbon Dioxide Probe of selected range
- (1) Ultra-flat Cat5e cable
- (2) Suction Cups with twist ties

Data Collection from Any Combination of Monitored Devices

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

Installation

The Networked Robotics Digital Carbon Dioxide Probe is attached in an incubator, room, or other source of environmental carbon dioxide, and to the Networked Robotics NTMS network hardware as shown in the diagram above. There are three major steps in the installation of this product:

- 1) Physical installation
- 2) Configuration of Networked Robotics NTMS hardware to which the Carbon Dioxide Probe 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 Co2 concentration 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

In incubators the CO2 Probe should be located near the incubator’s fan in an area where airflow is unrestricted. Avoid areas where any object could block the unit’s sensing port – the clear side of probe.

The probe will be attached to the wall using the dual-lock backing. Peel off the backing strip of the two strips, and attach the probe in the appropriate location.

Access Port Connection

The photo below shows how the CO2 Probe is connected inside an incubator. The ultra-flat Cat5e cable can be run through either an access port or, if the incubator has no access port, through the incubator’s door seal.

It should be mounted with the sensing-side – the clear side with internal tubing a few inches from the fan.

Through-Door Connection


We recommend running the cable through the hinge-side of the exterior door. When connecting through the incubator door-seal it may be difficult to get the RJ45-end through the door seal. Every incubator is different but you may find it easier to run through the corner of glass interior door.

You can run the cable along the wall of the incubator and use the included suction cups and wire ties to support the cable.

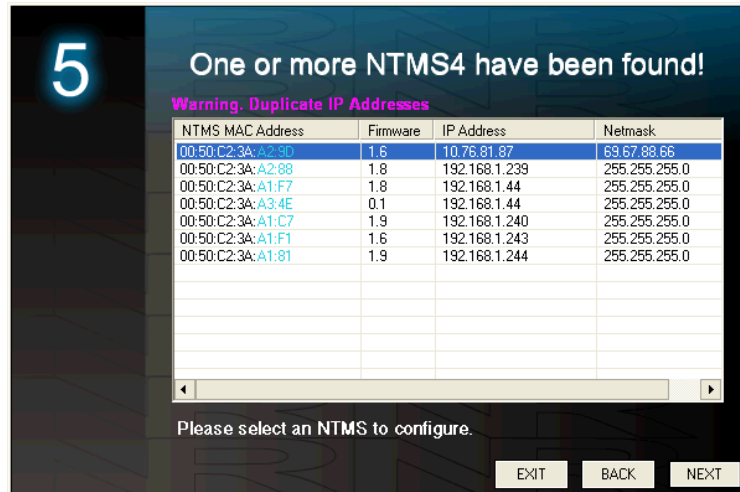


Secure the Co2 sensor to a convenient permanent location using the dual-lock provided on the back. The dual-lock sticks best to metal (except aluminum) or plastic surfaces. It may not adhere as well to surfaces such as drywall or wood, or to porous materials such as concrete. The probe can be removed from its dual-lock base for maintenance or cleaning.

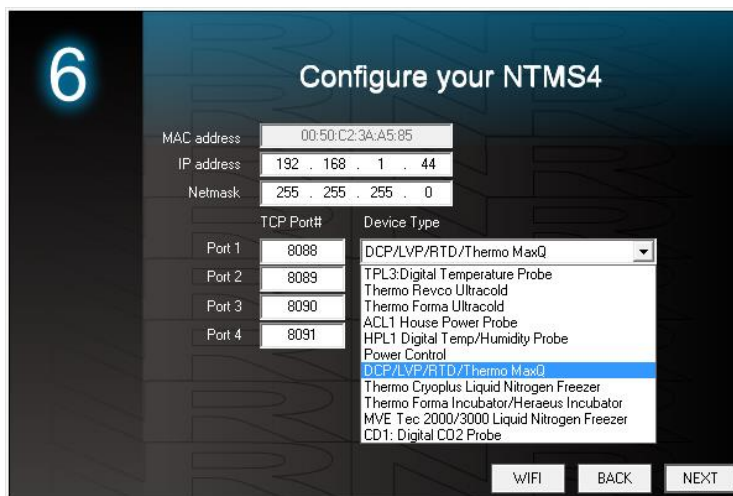
2. Configuring the NTMS

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 3.0 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, because this device is based on the Networked Robotics Low Voltage Probe choose DCP/LVP as shown below.
- 4.



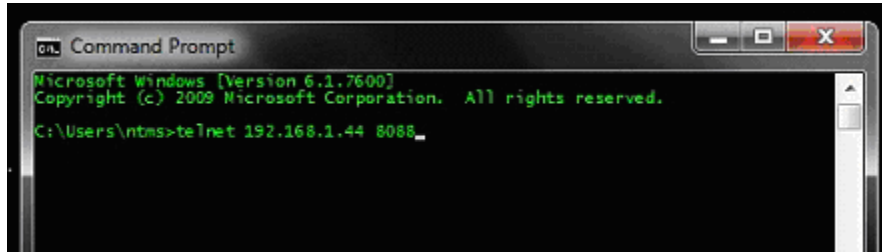
5. Click “NEXT” to complete the NTMS configuration.

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 voltage reading from the probe.

Windows 7 -10 clients may need to enable the Telnet utility as follows: 1 Start. 2 Control Panel. 2 Programs and Features. 3 Turn Windows Features on or off (upper right of screen). 4 Check “Telnet Client”. 5 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”, is the command character for this device. A CO2 percentage 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 voltage probe) to the Tempurity Server configuration. See the Tempurity System User’s Guide section on server configuration for more information.

If a carbon dioxide value is not returned, check network parameters, network ports, firewalls and 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 Carbon Dioxide Probe requires definition of a monitored device of type “CO2” in the Tempurity Server Configuration Utility. See the Tempurity System User’s Guide for more information.

The control character to acquire data from a Carbon Dioxide Probe is “T”.

Operation

The Networked Robotics’ NTMS4i-version network hardware continually reads CO2 concentrations from the Carbon Dioxide Probe 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.

Reference

Response time

< 2 minutes

10 minutes to maximum accuracy

Operating Conditions

Temperature: 0 to 50 C

Relative Humidity: 0 to 95% RH (non condensing)

Performance and Accuracy

This product is based on the Amphenol Advanced Sensors/Telaire 6615 diffusion sensor.

The probe is affected by altitude and should not be used without correction at high elevations.

75 PPM or 10% of reading whichever is greater

Power Supply

The Carbon Dioxide Probe derives its 5v power from the NTMS4i network hardware.

Unique IDs

This product contains an electronically embedded Unique ID of type 60 and 61.

*61:0000:0004:0002 for the 5% version and
60:0000:0000:0219*

Communications Specifications

The CO2 probe communicates with the NTMS4i using RS-232 at 1200bps 8N1. See the Networked Robotics Support section of our web page for more information.

Physical Specifications

Weight:	93.5 grams (3.3 ounces)
Length:	67.22 mm (3.6 inches)
Width:	66.22 mm (2.607 inches)
Height:	28 mm (1.102 inches)

Support

If you need assistance with your Networked Robotics Digital CO2 probes or other products, contact Networked Robotics by phone at 877-FRZ-TEMP (877-379-8367) or by email at support@networkedrobotics.com