Networked Robotics 4-20 Milliamp Current Interface, LVP4-20 (#30038)

This product enables the remote data collection of electrical current from 4-20 milliamp current loop data sources such as scientific instrument and sensor outputs. The product is designed to be used in conjunction with the Networked Robotics NTMS4 (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

The "NTMS" side of the 4-20 mA interface connects to one of the four measurement ports of the Networked Robotics NTMS and the leads are attached to the appropriate 4-20 mA outputs on an instrument or sensor via a pair of wires.

This unit reports current in centiamps (1/100th of an ampere). If you have an instrument that reports data in a 4-20mA output format and wish to store and report the data in the instrument's units (such as Pascals or percent Oxygen or Lumens) talk to Networked Robotics as we can customize this device for your instrument.

Packing List

This package includes the basic hardware you will need to connect the 4-20 mA Interface to the NTMS.

- (1) 4-20 mA Interface
- (1) Set of Connection Wires (may be shipped attached to Interface)

- (1) CAT5E Cable
- (1) RJ45 Coupler for Extensions

Data Collection from Any Combination of Monitored Devices

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 NTMS unit.

Installation

The Networked Robotics Current Interface is attached to a 4-20 mA 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 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 data 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

This product 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 this product 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, liquids, or other harsh environmental conditions.

Connect this product to one of the four ports of an NTMS using the CAT5 cable. Check that the NTMS is powered on and verify that the data collection port is set properly for data collection from LVP\DCP (see below).

If the NTMS is powered on, and the CAT5E cable connection is made correctly between this product and the NTMS, the yellow LED will illuminate while it does an internal calibration. Then it will go out when it is ready to be polled. Every time the Current Interface probe is polled by the NTMS, the 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.

Connections

Attach the purple wire to the 4-20 mA (+) output and the orange wire to the (-) of the relevant connector. Attach the Interface CAT5 cable to one of the four data collection ports of the NTMS.

If the purple and orange wire is not connected to the 4-20 mA Interface open the unit with a medium Philips head screwdriver and attach these to the green connector with a small Philips head screwdriver.

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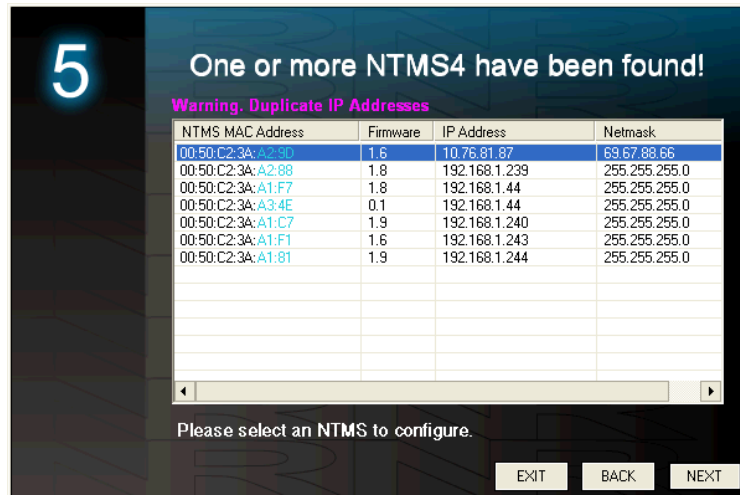
2. Select the NTMS to which the interface is attached, and proceed to the "NEXT" screen. (IP addresses must be set properly for your institution. If you are uncertain about the IP address to use, check with your network administrator.)
3. Click on the NTMS measurement port where the probe is connected,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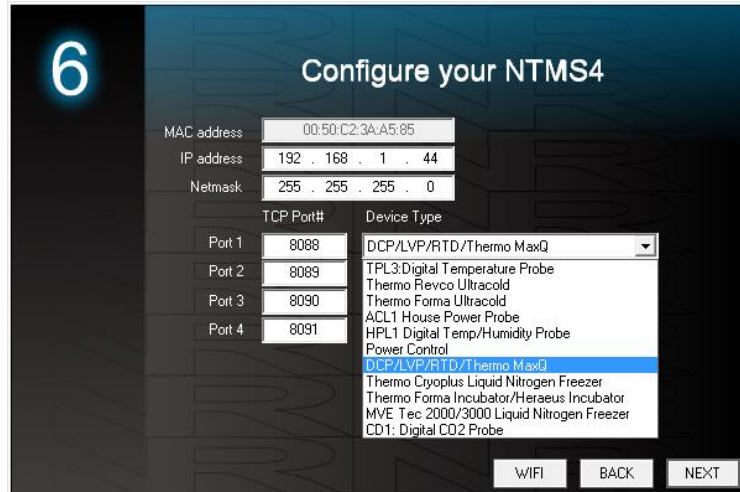
4. Click "NEXT" to complete the NTMS configuration.

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 current 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.
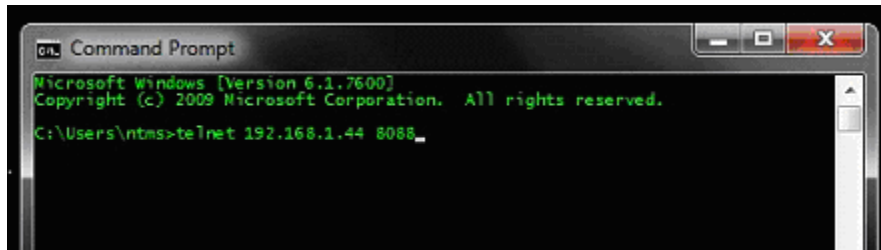
3. If you are successfully connected through the network you will see a blank screen.
4. Type a capital "T", the command character for this device. A reading and the associated checksum value should be returned. For non-temperature values ignore the reported units. For more about debugging network connections 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 4-20 mA current interface parameters) to the Tempurity Server configuration. See the Tempurity System User's Guide section on server configuration for more information.
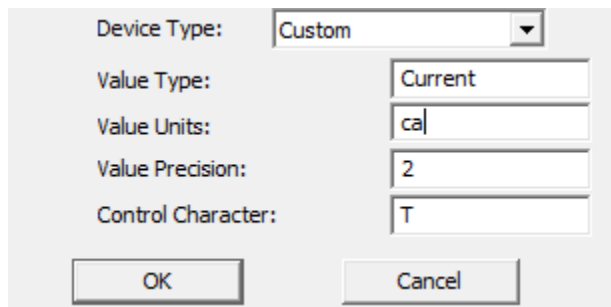
The control character for this interface is "T" for all products.

If the appropriate 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 this product for measuring electrical current requires the 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 current from this product is "T". The figure below shows how a Networked Robotics current interface is configured. In the case of these interfaces the value type would be current for example and the units would be centiamps.

Operation

The Networked Robotics' NTMS network hardware continually reads values from the 4-20ma source 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 yellow LED will occasionally blink. The blink indicates an active data read by the NTMS. If the yellow LED does not activate, either the configuration of the NTMS port has been changed and is no longer correct 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.

Resistive Load

The unit utilizes a 499 ohm resistive load. Some 4-20 mA outputs require a lower resistance. Check the operating manual on any 4-20 mA source to make sure that the specifications are appropriate.

History

This product is a version of the Networked Robotics Low Voltage Probe (Product #30019).

Unique IDs

All Networked Robotics sensor hardware holds electronic globally unique IDs. The IDs for these 4-20 mA interface products - are of the format:

33:0000:0000:0302

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

Physical Specifications

Weight:	65 grams (2.3 ounces)
Length:	77.22 mm (3.040 inches)
Width:	66.22 mm (2.607 inches)
Height:	48 mm (1.890 inches)

Performance and Accuracy

The measurement capability of this product is a combination of the accuracy produced by each instrument's 4-20 mA interface and the accuracy of our voltage sensor. Formal NIST-traceable calibration should be sought in regulatory environments. Tempurity System software can adjust readings to maximize accuracy according to calibration results if needed.

Support

If you need assistance with your Networked Robotics 4-20 mA Current Interface or other products, contact Networked Robotics by phone at 877-FRZ-TEMP (877-379-8367) or by email at support@networkedrobotics.com

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