

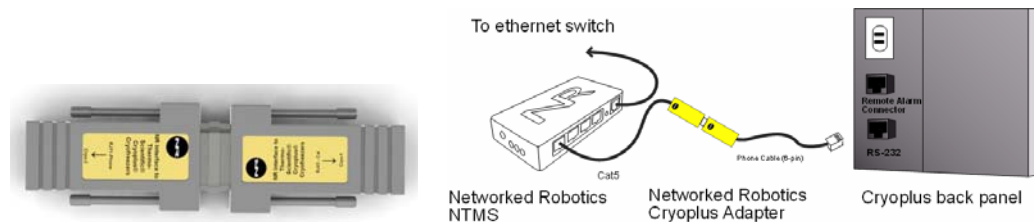


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## Networked Robotics Interface to Thermo Scientific® Cryoplus® Liquid Nitrogen Freezers (#30013)

The Networked Robotics Interface to Thermo Scientific® Cryoplus® cryofreezers enables the remote measurement of temperatures from all models of Cryoplus® liquid nitrogen freezers. This interface is designed to be used as part of the Tempurity™ System for the collection, storage, and monitoring of scientific data through computer networks. The interface is 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 interface is connected to the serial port on the back panel of the Cryoplus freezer and to the Networked Robotics NTMS network hardware as shown in the diagram above, thus enabling remote monitoring. Network requests for temperature to the cryofreezer return the temperature readings that are shown on the front panel of the instrument.

### Packing List

This package includes the basic hardware you will need to connect the Cryoplus freezer to the NTMS.

- (1) Networked Robotics Cryoplus Adapter (comprised of two pieces labeled NTMS and Cryoplus)
- (1) RJ-45 Coupler for extensions
- (1) Cat5 cable
- (1) Phone cable

### Collection from Multiple Monitored Devices

Because each NTMS4 unit has 4 measurement ports, data from 4 cryofreezers, or other types of monitored devices such as Networked Robotics sensors, or direct connections to many types of freezers or other scientific equipment, can be collected simultaneously. Only a single monitored device, a direct connection to a Cryoplus liquid nitrogen freezer is shown in the figure above.

## Hardware Installation

There are three major steps in the installation of this hardware:

- 1) Physical installation
- 2) Configuration of the Networked Robotics NTMS hardware
- 3) Manual testing of data collection via the network

Each of these steps 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 Systems User’s Guide (Networked Robotics document number “Tempurity-04-0006.5”) on the Networked Robotics web site.

### 1. Physical Installation

#### Cables

Use the included 6-pin phone cable to connect the interface adapter to the Cryoplus RS-232 connector, and the included Cat5 cable to connect the adapter to the NTMS measurement port as shown in the diagram above. The two connectors that make up the adapter are labeled and may not be reversed. Make sure that the Cryoplus-labeled unit is on the Cryoplus side, and the NTMS-labeled adapter is on the NTMS side of the connection.

Be careful not to connect the interface to the RJ-11 port labeled “Alarm Contacts”. This is the same format connector (phone-style connector) as that used for the RS-232 connection and is easy to connect inappropriately.


#### Cryofreezer Front Panel Setup


No setup steps are necessary to ensure that the cryofreezer sends data appropriately. Just plug the interface in at the back of the unit.

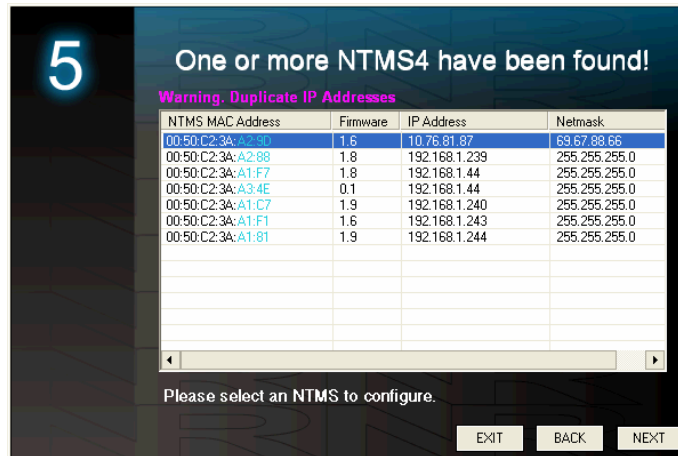
#### Extensions

The reach of the interface, and thus the cryofreezer, can be as far as 400 feet away 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. Extensions are best made on the NTMS side of the connection. You can mount your NTMS network hardware in a network closet, and “patch” the connection to a Cryofreezer adapter using a standard wall plate in your lab or office.

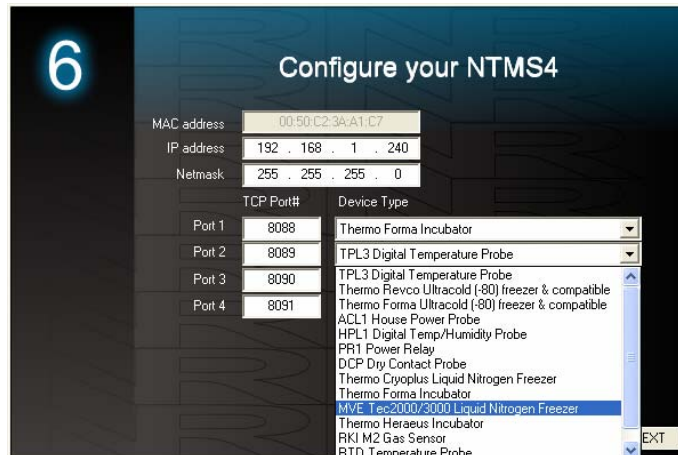
### 2. Configuring the NTMS

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 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.
3. Enter the correct static IP address and subnet mask for your facility.
4. Click on the NTMS measurement port where the probe is connected, and under the “Device Type” drop down, select the Thermo Cryoplus Liquid nitrogen freezer option.



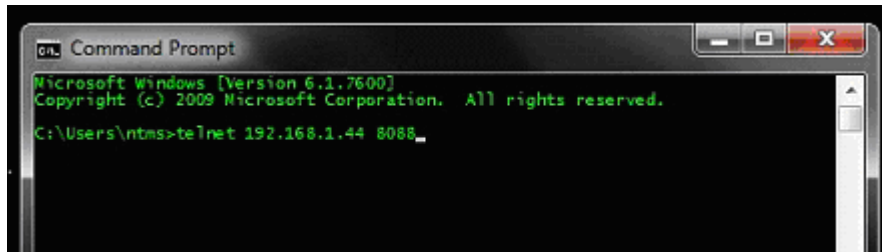
5. Click “NEXT” to complete the NTMS configuration.

### 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.

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

1. From Windows click “START”, then “RUN”, and then type “CMD” and return.
2. At the black screen type “Telnet” + IP Port ( where IP is the IP address and Port is the network port address (e.g.8088) as selected by your use of the NTMS Configuration Wizard in screen 6 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 interface. A temperature and the associated checksum value should be returned.

If a temperature is not returned, check network parameters, network ports, firewalls and connections and try again before attempting to configure data collection using Tempurity System software.

## **Operation**

The NTMS network hardware continually reads temperatures and other data from the cryofreezer(s). The most recent values are available for network requests by the Tempurity System. Each reading takes about 3 seconds.

As an alternative or supplemental method of temperature data collection, consider using the Networked Robotics RTD probe (Product #30014), which is a digital probe that uses an analog sensor for extreme temperature measurements. The RTD must be placed in the liquid nitrogen in an appropriate position relevant to the vapor-phase or liquid phase location that you are interested in measuring.

If you wish to store alarm (yes/no) information, you may also wish to use the Networked Robotics DCP (Product #30008) probe for data collection from the alarm contact connector on the Cryoplus.

## **Reference**

### **Unique IDs**

*Unique IDs are not supported via this direct interface as they are in the case when you are using Networked Robotics proprietary sensors for data collection.*

### **Communications Specifications**

*The RS232 connection between the Cryoplus and the NTMS operates at 9600,8,n1 speed and parity.*

### **Physical Specifications**

Weight:	68 grams
Length:	12.7 cm
Width:	3.18 cm
Height:	1.90 cm

## ***Support***

If you need assistance with your Networked Robotics interface to Cryoplus Freezers 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)

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