

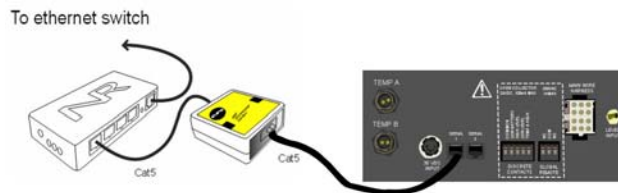


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## Networked Robotics Interface to Chart Biomedical® MVE Cryofreezers (#30021)

The Networked Robotics Chart Biomedical MVE Cryofreezer interface is designed to be used as part of the Tempurity™ System for collecting scientific data in real-time via standard computer networks. The interface is used in conjunction with the Networked Robotics NTMS (Network Telemetry Monitoring System) hardware. The Tempurity System is designed for data collection and monitoring in FDA-regulated environments.



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### Description

This product enables network data collection from the data communications ports of all MVE liquid nitrogen cryofreezers with TEC3000 and TEC2000 controllers. Your cryofreezer must utilize one of these controllers in order to use this product. This interface is capable of recording temperature, nitrogen level, and fill status from the cryofreezer. If your MVE model does not include a TEC controller, temperature can be collected from inside the cryofreezer via the use of the Networked Robotics RTD probe (Networked Robotics Product #30014).

### Packing List

This package includes the basic hardware you will need to connect MVE Cryofreezers to the NTMS.

- (1) MVE Interface
- (2) CAT5 Cable
- (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 MVE 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 cryofreezer 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

You will use the Networked Robotics NTMS4 network hardware and the Networked Robotics MVE interface shown below to enable data collection. The interface is custom-designed for easy connection. You need only to attach a CAT5 cable from the "serial" connector on the interface to the back panel of the cryofreezer or the TEC controller. Then attach another CAT5 cable from the "NTMS" port on the interface to an open data collection port on the Networked Robotics' network hardware.



### Attachment

The Networked Robotics MVE interface attaches via the dual-lock backing to metals (except aluminum) and plastic. It will not adhere to porous materials such as wood or drywall.

This interface can be mounted up to 300 feet from the cryofreezer. The interface can be in the same room or it can be "patched in" from network closets to freezers via a standard network wall plate.

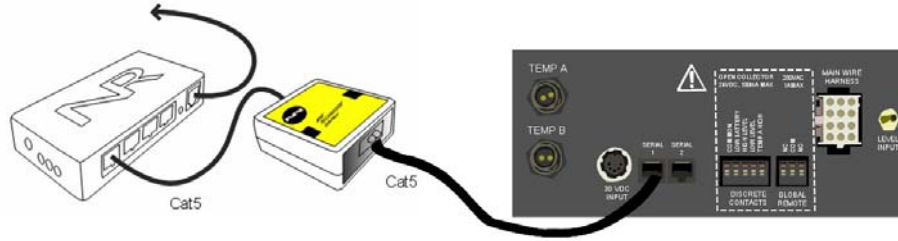
There are two types of controllers on MVE cryofreezers, cabinet-style freezers as shown below left on which data output connections are on the back of the unit, and vapor-style units, where the controller is elevated over the main nitrogen tank as shown below right.



## MVE Cryofreezers with TEC3000 Controllers

The mechanism of connection to freezers with TEC3000 controllers is shown below. Attach the MVE interface to any open NTMS port, and to the “Serial 1” connector on the back of the TEC3000 or instrument back panel. You may wish to enhance your monitoring capability by simultaneously watching the alarm contact pins on the TEC3000 controller. This is done with the Networked Robotics DCP Probe (Networked Robotics Product #30008 – not shown) which can be connected to the alarm contacts and to any open NTMS port.

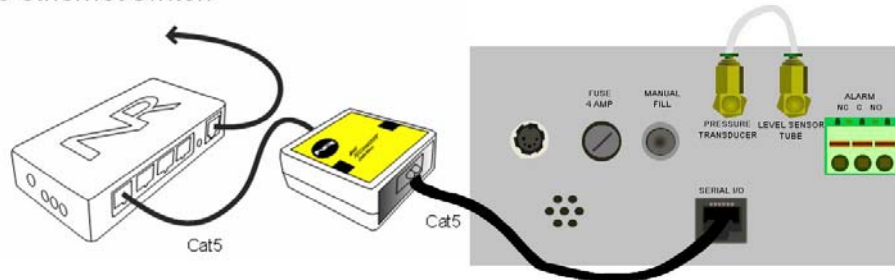
To ethernet switch



## MVE Cryofreezers with TEC2000 Controllers

Connections to MVE freezers with TEC2000 controllers are made to the “Serial I/O” port of the controller.

To ethernet switch



## Front Panel Setup

The front panel of the TEC3000 controller is shown below.



No instrument configuration is necessary as long as the instrument is set to default values. If not, make sure that data communication is set to 9600, n,8,1.

The interface returns nitrogen level values in the units that have been selected at the front panel. Because there is a 9999.9 value limit in the data reported, there are some larger MVE cryofreezer models for which data collection in millimeters is close to this limit. You should either use inches as the units for these instrument types, or enable high nitrogen level set points that are lower than this maximum.


### Extensions


You can easily extend the length of any connection to 300 feet using the included RJ-45 coupler and standard network cable (CAT5 cable).

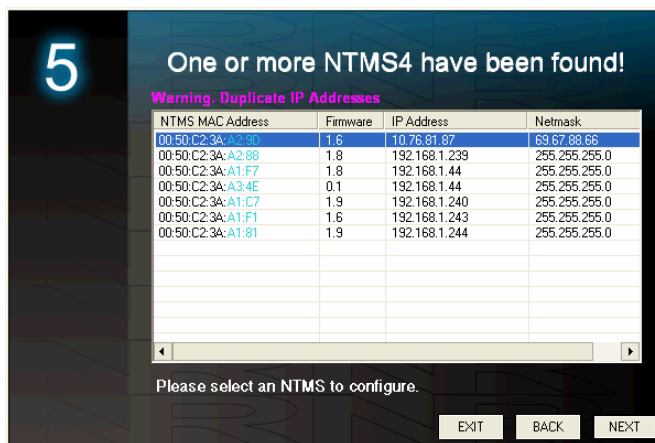
### Collecting via Multiple Interfaces

Each of the 4 ports on our NTMS hardware can be used to collect data via a variety of different methods of which this MVE interface is only one. For example you could collect data from the MVE serial interface on port 1, use Networked Robotics RTD probes on ports 2 and 3, and a Networked Robotics Dry Contact Probe (Networked Robotics Product #30008) on port 4.

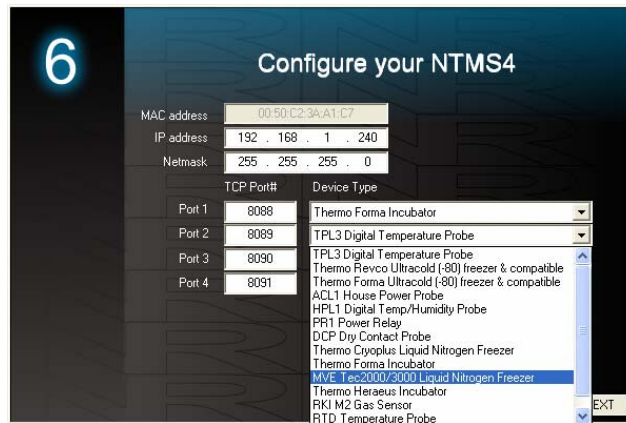
## 2. Configuring the NTMS

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 MVE 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 MVE 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 “MVE TEC2000/3000Cryofreezers” or equivalent.



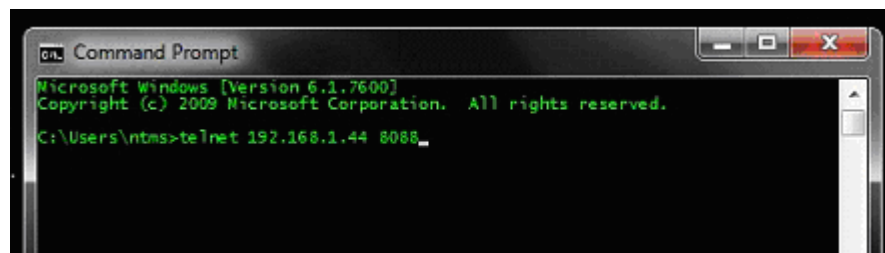
4. Click “NEXT” to complete the NTMS configuration.

### 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 MVE. 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 Press Ok.

1. From Windows XP click “START”, then “RUN”, and then type “CMD” and return.
2. At the black screen type “Telnet” *IP-Address* *Port* ( where *IP* is the IP address of the NTMS to which the freezer is connected and *Port* is the network port address as selected by your use of the NTMS Configuration Wizard – usually 8088-8091 as shown above.)



3. If you are successfully connected through the network you will see a blank screen.
4. Type a capital “T”; “L”, or “F”, the command characters for this interface. With “T” a temperature and the associated checksum value should be returned.
5. Type a capital “L” and a level will be returned in the current units.
6. Type a capital “F” and the fill status (1, or 0) will be returned.

When data is returned as expected you are able to proceed to configure data collection in the Tempurity System. If data is not returned check your network configuration, cabling, and front panel setup and try again.

## **Operation**

The NTMS takes readings from the MVE approximately every 3 seconds. The most recent values are available for network requests by the Tempurity System.

The OFAF (one fill all fill) protocol is not available on freezers to which this interface is connected.

Units for the “level” parameter are best set to inches. This interface reports values to 999.9 and thus has a reportable maximum level reading of 999.9. Some larger MVE models have reservoirs taller than this maximum.

Do not change units for any parameter once Tempurity System value limits are defined. Tempurity recognizes numeric values independent of units. If you change the units on the front panel, you must readjust the limits in the Tempurity System and restart the Tempurity Server.

## **Command Characters and Tempurity System Setup**

The Tempurity System command character for temperature is “T”. Use the “Temperature” type in the Tempurity Server Configuration.

The Tempurity System command character for nitrogen level is “L”. Use the “Custom” type in the Tempurity Server Configuration.

The Tempurity System command character for fill status is “F”. Use the “Custom” type in the Tempurity Server Configuration

Case matters.

## **Reference**

### **Unique IDs**

*Unique electronic IDs are not available in this product.*

### **Communications Specifications**

*The MVE interface is designed to work at 9600, n, 8, 1 serial transmission rate.*

### **Physical Specifications**

Weight:	56 grams (2.0 ounces)
Length:	67.22 mm (2.647 inches)
Width:	66.22 mm (2.607 inches)
Height:	28 mm (1.102 inches)

### **Performance and Accuracy**

*See Chart Biomedical manuals for accuracy information. This product reports the values that are derived by the MVE Cryofreezer and does not produce data independently. The Tempurity System reports the same values that are shown on the front panel of the MVE freezer.*

## **Support**

If you need assistance with your Chart Biomedical MVE Cryofreezer interface 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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