Networked Robotics Corporation
4900 Hopyard Rd Suite 100
Pleasanton, CA 94588. USA
Toll free (877) FRZ-TEMP
(877) GLP-TEMP

info@networkedrobotics.com
support@networkedrobotics.com

NetworkedRobotics.com

Networked Robotics Interface to Thermo Fisher Scientific® MaxQ® Orbital Shakers and Incubated Shakers (#30022)

The Networked Robotics Interface to Thermo Fisher Scientific® MaxQ® shakers and incubated shakers is used in conjunction with Networked Robotics' NTMS (Network Telemetry Monitoring System) hardware and Networked Robotics' Tempurity™ System software. The Tempurity System is engineered for data collection and monitoring in FDA-regulated environments including the pharmaceutical, medical, and food industries.
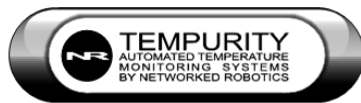
Description

The use of this product is designed to ensure that cell manufacturing processes are not interrupted. This product allows real-time network-based data collection and monitoring of RPM and temperature data from this line of instrumentation. All MaxQ instruments produce RPM data. The incubated models of the MaxQ line also send temperature. MaxQ® shakers and incubated shakers are primarily sold under the Thermo Fisher Scientific® brand however they are also available under the Barnstead® and Lab-Line® brands. The maximum speed recognized by this interface is 399 RPM.
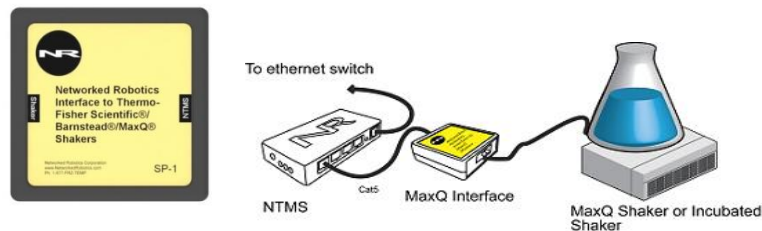
The MaxQ line has both digital and analog versions of each model. This product is compatible with the digital-version models only, all of which have serial data ports for data output. Digital versions comprise the E-series and have "SHKE" model numbers. The SHKE 420, 481, 2000, 4000, 4450, 5000, and 7000 models support the use of this product. This interface is not appropriate for use with the A-series (analog) versions of the MaxQ line.

As is the case with this product and all of Networked Robotics' direct-connections to scientific instruments, the data that is stored in the Tempurity System is the same as the data shown on the front panel of the shaker or incubated shaker.

Packing List

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

- (1) MaxQ Interface
- (1) MaxQ Serial Interface Connector
- (1) RJ-45 Coupler for extensions
- (2) Cat5 Cable

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, especially manual testing through the network, as described below, 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 System's User's Guide (Networked Robotics document number "Tempurity-04-0006.5") on the Networked Robotics web site.

1. Physical Installation

Attaching the MaxQ Interface

Attachment methods will vary by shaker model. You will attach this MaxQ interface either to the back of the shaker under its ventilation slots, or to a tabletop or wall nearby. Secure the MaxQ Interface using the "dual-lock" backing provided. The "dual-lock" sticks best to metal (except aluminum) or plastic surfaces. It may not adhere as well to porous surfaces such as drywall, wood, or concrete.

Connect the MaxQ Interface to one of the four ports of an NTMS as shown in the figure above using the included standard network cable. A flashing yellow light indicates that the instrument is acquiring data from the instrument. Once the NTMS port is configured properly the red light will blink every few seconds indicating transmission from the interface to the NTMS. The green light is on when connected to the NTMS.

If nothing on the NTMS side of the interface is illuminated, then check the connection to the NTMS. Check that the NTMS is powered on, and verify that the port is set properly for data collection from the DCP/RTD or MaxQ shaker (see below) type of instrument.

Connect another Cat5 cable from the MaxQ Interface to the shaker's serial port using the serial interface connector provided. The Yellow LED on the instrument side of the interface will take one or two minutes to start flashing. If it does not illuminate, check to make sure that the interface circuit is connected properly to the shaker and that the shaker is turned on.

An Option for Connection: Collecting MaxQ data via Wall Plates

In offices or laboratories that are well-populated with network jacks you can collect from instruments through network wall plates. Using this installation method, NTMS units are mounted on rack hardware and shelves in a network closet as shown. Each MaxQ or other "monitored device" is patched to an NTMS via a network wall plate.

| network closet | room or lab | to shaker |
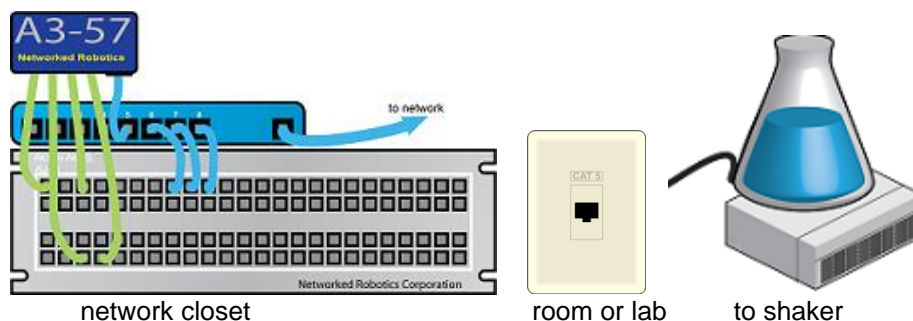
Extensions

The MaxQ Interface can be extended to 300 feet from the Networked Robotics NTMS network hardware. You can easily extend the length of any connection using the included RJ-45 coupler and standard CAT5 network cable.

2. Configuring the NTMS Physical Port for the Appropriate Data Collection Type

Configure your NTMS network hardware for data collection from this type of instrument.

This is done by running the latest version of the NTMS Configuration Wizard from any PC that is on the same subnet (behind the same router) 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.
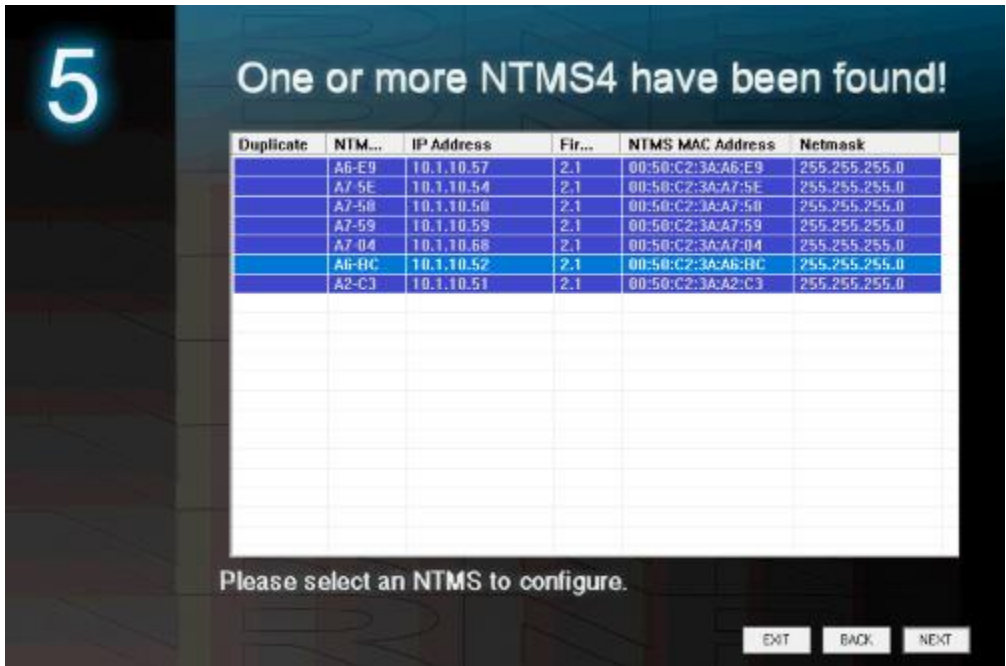
3. Select the NTMS to which the interface is attached and proceed to the "NEXT" screen. (IP addresses must be set properly for your institution. If you are uncertain about the IP address to use, check with your network administrator.)
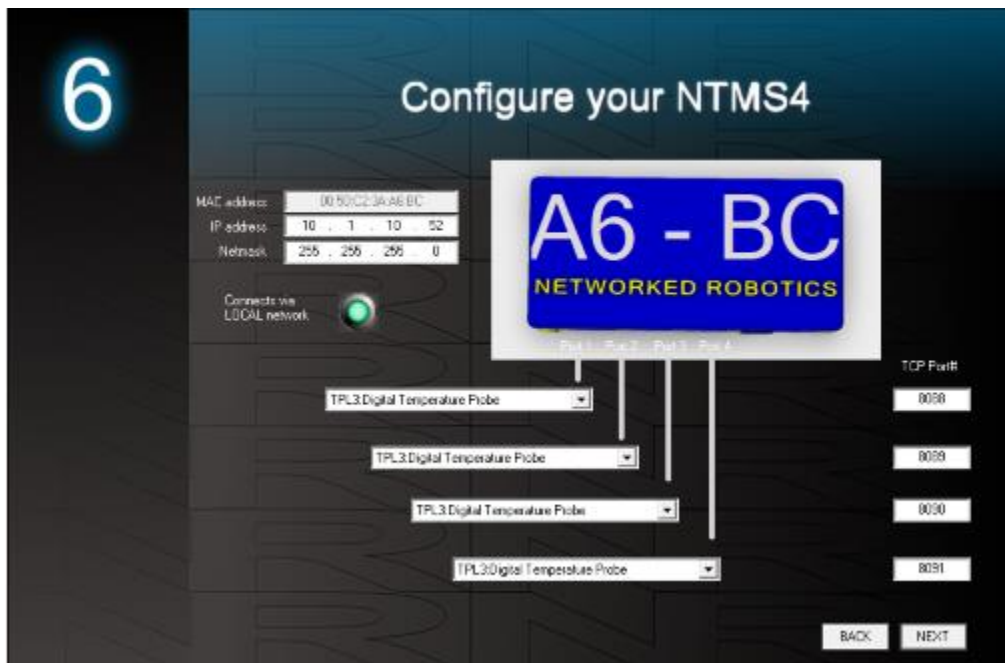
4. Click on the drop-down for the physical port on the NTMS where the probe is connected, and under the "Device Type" drop down, select DCP/LVP/RTD.
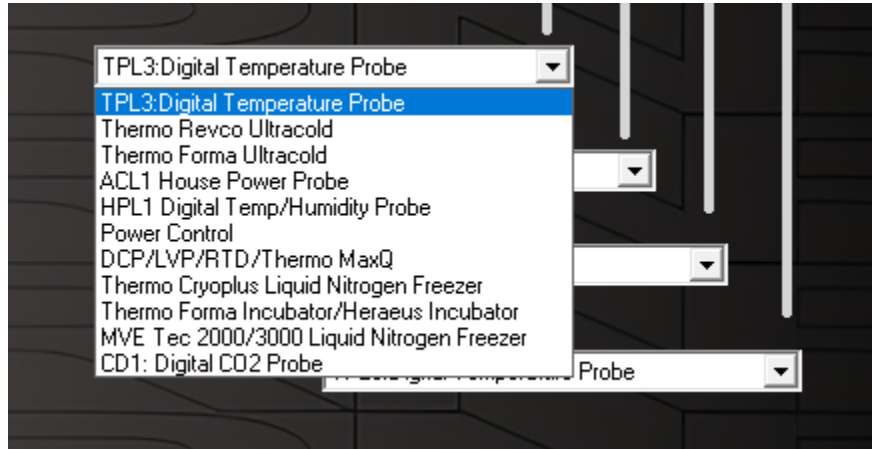

3. Testing Data Collection through the Network

Once the configuration is complete, we recommend manually testing the ability to make network temperature measurements by using the common "Telnet" utility. This can be done from any networked computer with access to the NTMS network hardware.

Telnet is included with Windows but you may need to activate it. On Windows 10 and 11 computers activate the Telnet utility as follows: 1 Start 2 Control panel 3 Programs 4 Turn Windows Features on or off 5 Check "Telnet Client" 6 Click Ok

1. From the Windows Command Prompt. On some Windows versions click the Windows key (start), then type "CMD", and then click on the command prompt.

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.)

   For example "Telnet 10.1.200.3 8088"
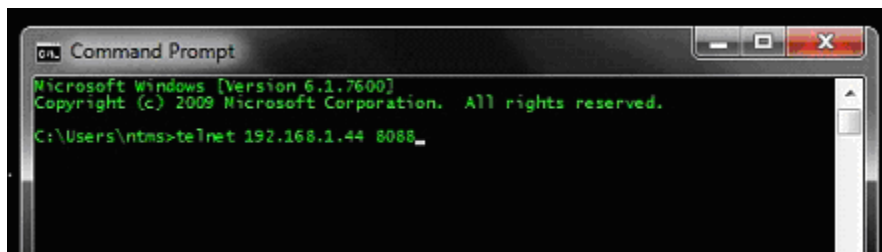
3. If you are successfully connected through the network you will see a blank screen.

4. Type a capital "T" the command character for this probe. A temperature and the associated checksum value should be returned.

Failure to connect indicates a network problem. An "error" message indicates a problem in the connection at the instrument. If a temperature is not returned, check network parameters, network ports, firewalls and connections and try again. It is best to confirm successful network data collection using Telnet before attempting to configure data collection in the Tempurity System.

For more about debugging network connections to probes see the appendix of the Tempurity System User's Guide.

5. If you are successfully connected through the network you will see a blank screen.
6. Type a capital "R", or "T", the command characters for this probe. An RPM value and the associated checksum value should be returned.

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

Operation

NTMS network hardware continually reads RPM from the MaxQ Interface. Each reading takes about 3 seconds. The most recent values are available for network requests by the Tempurity System.

Important: This MaxQ Interface is not capable of detecting a broken belt condition because the instrument's electronics are not capable of detecting and reporting this type of event. If the belt breaks the interface will continue to report the RPM of the motors even though the sample is not being moved.
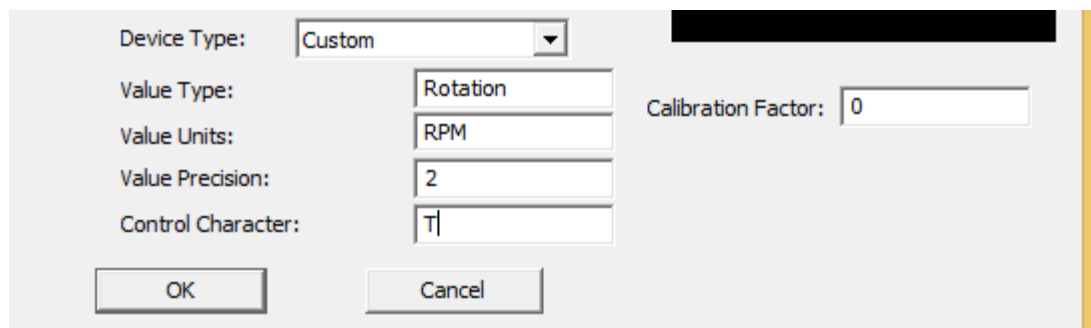
Many error conditions will produce an RPM of 0. Tempurity System limits should be set with a low limit of more than 0 RPM in order to recognize these conditions as errors.

Configuring Data Collection in the Tempurity Server Configuration Utility 🔧

Use of this product for measuring RPM 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 data from this product is upper-case "T".

The figure below shows how a Networked Robotics balance interface is configured. In the case of these interfaces the value type would be "weight" for example and the units would be "RPM".

Reference

Communication

This product is based on Networked Robotics' "Streamer Probe".
MaxQ shakers send data at:

19200 Baud
Data bits 8
Parity none
Stop bits 1
Flow Control None

Interface Cable
DB-9 Pin 2 = NTMS RJ45 pin 5 = RD
DB-9 Pin 3 = NTMS RJ45 pin 6 = TD
DB-9 Pin 5 = NTMS RJ45 pin 4 = GND

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

This product reports values as they are obtained from the MaxQ shaker. These values correspond to the values that are displayed on the front panel of the instrument. Accuracy is per manufacturer's documented specifications. Follow the manufacturer's instructions for calibration.

Support

If you need assistance with your Networked Robotics MaxQ Shaker and Incubated Shaker Interface or other products, contact Networked Robotics by phone at 877-FRZ-TEMP (877-379-8367) or by email at support@networkedrobotics.com

Thermo Fisher Scientific® is a registered trademark of Thermo Fisher Scientific Inc. Networked Robotics Corporation is not affiliated with Thermo Fisher Scientific Inc. MaxQ® is a registered trademark of Lab-Line Instruments Inc. Networked Robotics Corporation is not affiliated with Lab-Line Instruments.