

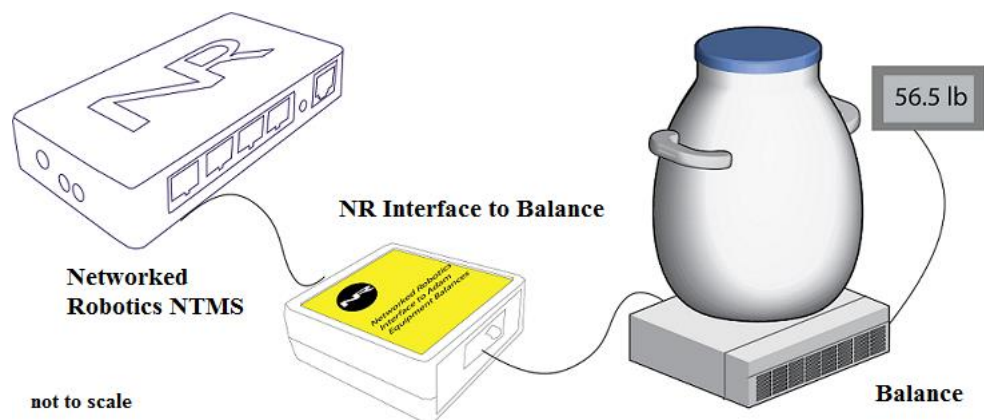


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## Networked Robotics Interface to Adam Equipment® Balances (#30042)

*This product enables the continuous remote data collection of weight from Adam Equipment balances. One example use for this product is for the weight-based monitoring of liquid nitrogen-filled dewars where monitoring liquid nitrogen level is critical in maintaining the temperature of stored samples. This 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 Adam Equipment Balance Interface connects to one of the four measurement ports of the Networked Robotics NTMS. The “Balance” side is connected to the serial digital output port of the balance. This unit supports the data collection of weight in either pounds or kilograms. It currently supports the CPwPlus-series platform balances including the “P”, “W”, and “M” series from Adam Equipment. Other Adam Equipment Balance models are not currently tested as of the date of this document but may be supported.*

*If you are using this product to monitor liquid nitrogen dewars care must be taken to use the correct scale with the correct-size balance platform for the base of each dewar. If your dewar uses a roller base or tipping stand you may need to implement weight-based monitoring via the CpWPlus W-series instruments from Adam Equipment which have a 500mm square base, a built-in rack to be vertically stable, and wheels to move the assembly easily. For available products see <https://www.adamequipment.com/cpwplus-weighing-scales>.*

## ***Packing List***

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

- (1) Adam Equipment Balance Interface
- (1) Balance interface Cable
- (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. For example temperature can be monitored inside dewars using our RTD Probe, product # 30014). You could also monitor atmospheric oxygen with our RTI gas sensor interface (product #30041). You can collect data from 4 dewar/balances or from any combination of our interfaces on the 4 ports of our network hardware.

## ***Installation***

The Networked Robotics Adam Equipment balance interface is attached to the balance and to the Networked Robotics NTMS network hardware. There are three major steps in the installation of this product:

- 1) Physical installation including configuration of balance parameters
- 2) Configuration of Networked Robotics NTMS hardware to which the balance 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***

#### ***Configuring the Balance for Data Collection***

The balance should be plugged into a power outlet. Although Adam Equipment balances can be battery-powered the unit should be permanently connected to power for continuous monitoring applications.

Data transmission parameters must be set correctly in the balance to enable network data transmission. Use the Adam Equipment balance operator’s manual available at [https://www.adamequipment.com/media/docs/Print%20Publications/Manuals/CPWplus\\_UM\\_EN.pdf](https://www.adamequipment.com/media/docs/Print%20Publications/Manuals/CPWplus_UM_EN.pdf) to make the changes.

The balance must be set to 2400 baud, 8 bits, 1 stop bit, and to the continuous streaming mode of data output labeled “trn 2” in the balance.

The unit may only be monitored in units of kilograms or pounds. Ounces and pounds-ounces are not valid units in this interface although they are possible on the balance. Make sure the balance is set to use units of pounds or kilograms. The following are instruction from the balance operator’s manual.

Hold the [Tare/Zero] key and then press the [On/Off] key  
Momentarily. release the [Tare/Zero] key. The display  
shows the first parameter - auto power off.

To exit the parameter setting at any time, press the [Print/Hold] key.

To scroll through the user parameters, press the [Unit] key (which will advance to the next parameter). To return to normal weighing, turn the scale off and back to on again or press the [Print/Hold] key.

The Communication address should say "Add 0" for address 0.

The baud rate should say "b 2400"  
Par should be "Par 1" (8 bits 1 stop bit)  
Transmission mode should be "trn 2" which is continuous output  
Hold should be set to "hod 1" or no hold.

## ***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 interface 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.


If you are using the balance to monitor a dewar it's extremely important to place the dewar squarely on the balance. If possible attach a safety cord to prevent tipping. If you are using CpwPlus -W series of balance attach the dewar to the balance's vertical rack with bungee cords or other means.

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 green LED will illuminate, and the red LED will illuminate periodically when the balance is polled by the NTMS hardware.


Connect the 9pin connector to the balance and use the included CAT5 cable from the connector to the connector labeled "Balance" on the interface. The yellow LED will illuminate when the balance is responding to the Networked Robotics interface.

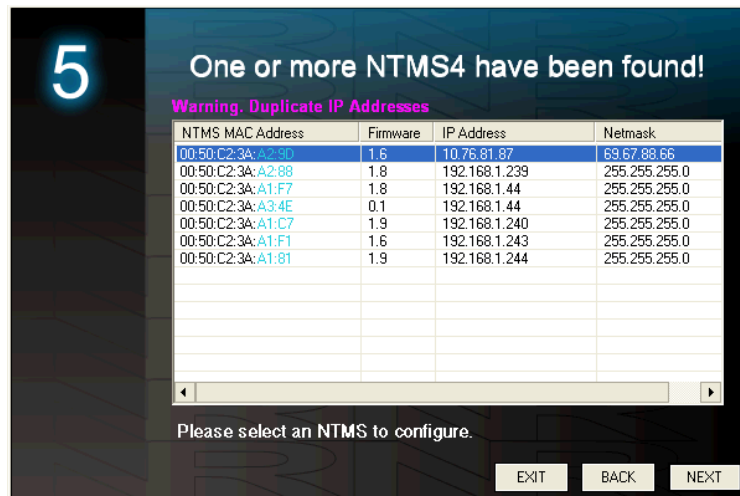
Secure the interface unit to a convenient permanent location using the dual-lock provided on the back. The dual-lock sticks best to metal (except aluminum) or plastic surfaces. It may not adhere as well to surfaces such as drywall or wood, or to porous materials such as concrete. The probe can be removed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

## ***2. Configuring the NTMS***

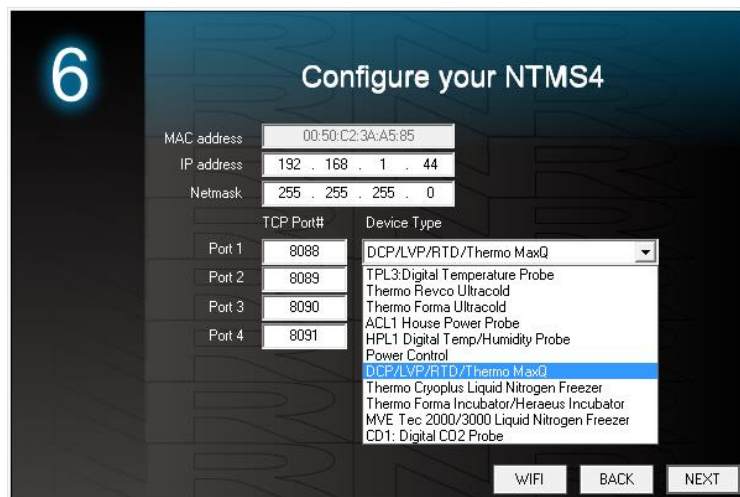
Configure your NTMS network hardware for data collection from this instrument. This is done by running the latest version of the NTMS Configuration Wizard  from any PC that is on the same subnet as the NTMS to be configured. You can obtain the configuration wizard from the "download" section of the Networked 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.

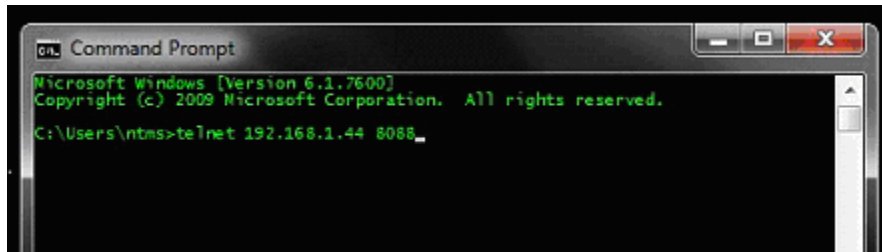
*Note: If the NTMS measurement port is configured as the incorrect interface type (The correct type is "DCP/LVP") in the NTMS Configuration Wizard, then the green LED light will never activate despite having the correct physical connection to both the NTMS and the voltage source.*

### **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.

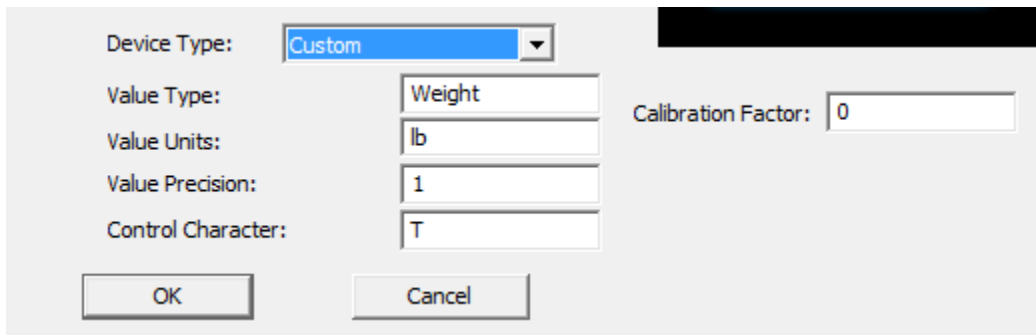
The control character for this interface is “T” for all products.

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 weight 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 balance interface is configured. In the case of these interfaces the value type would be “weight” for example and the units would be “lb” however “kg” can also be used if the balance is set to use kilogram units.



The image shows a configuration dialog box for a Networked Robotics balance interface. The dialog has a light gray background and a black title bar. It contains the following fields and controls:

- Device Type:** A dropdown menu with "Custom" selected.
- Value Type:** A text input field containing "Weight".
- Value Units:** A text input field containing "lb".
- Value Precision:** A text input field containing "1".
- Control Character:** A text input field containing "T".
- Calibration Factor:** A text input field containing "0".
- Buttons:** "OK" and "Cancel" buttons at the bottom.

## Operation

The Networked Robotics' NTMS network hardware continually reads values from the balance 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 from the balance. If the yellow LED does not activate then either the configuration of the balance serial port has been changed and is no longer correct for the interface or the connection is lost and the cables should be checked.

When a power failure occurs the balance will not automatically restart. You will need to turn the balance on manually using the on/off button on the display. A tare is recommended but is not always required however without a tare the reading may be somewhat affected by the power restart.

When the interface is disconnected from the balance or if the power of the balance is off the yellow light will stop blinking and the balance will read 0.

## Reference

### **Power Supply**

*The interface unit derives its power from the regulated 5 volts DC supplied by the Networked Robotics NTMS hardware. It requires no external supply.*

### **History**

*This product is a modified version of the Networked Robotics Streamer Probe on which several other Networked Robotics products are based. The balance is set to “stream” data continuously.*

### **Unique IDs**

*All Networked Robotics sensor hardware holds electronic globally unique IDs. The IDs for these Adam Equipment interface products - are of the format:*

**34:0000:0000:0302**

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 that of the Adam Equipment balance. See the manufacturer’s manual for the balance for details on the accuracy of the weight measurement. Networked Robotics rounds the hundredths digit displayed by the balance.

### **Support**

If you need assistance with your Networked Robotics Adam Equipment Balance 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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