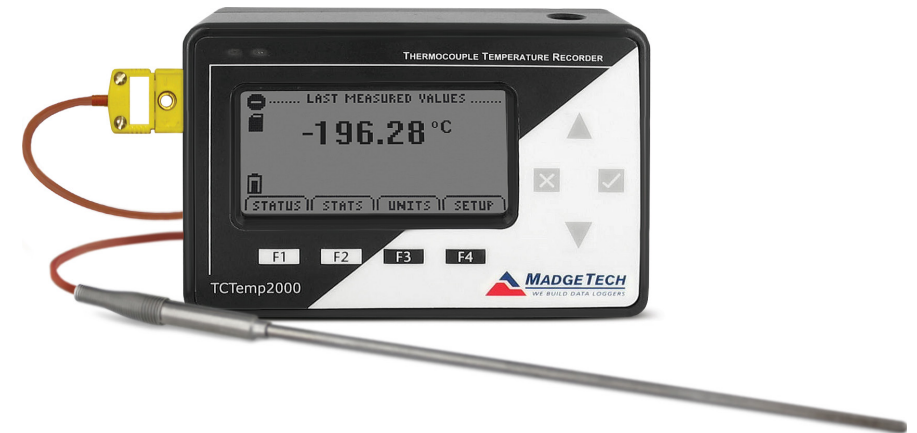## LNDS

Description	LNDS
Temperature Sensor	Type E Thermocouple
Thermocouple Measurement Range	-200 °C to +260 °C (-328 °F to +500 °F)
Thermocouple Resolution	0.1 °C (0.18 °F)
Thermocouple Calibrated Accuracy	±0.5 °C (±0.9 °F)
Internal Channel Temperature Range	-20 °C to +60 °C (-4 °F to +140 °F)
Internal Temperature Resolution	0.1 °C (0.18 °F)
Internal Calibrated Accuracy	±0.5 °C (0 to +50 ºC)
Cold Jct. Compensation	Automatic
Memory	131,071/channel
Sample Rate	2 second up to 24 hours
Channels	1 Internal & 1 Remote
Required Interface Package	IFC200
Baud Rate	115,200
Reading Rate	1 reading every 2 seconds to 1 every 24 hours
Battery Type	9v lithium battery included, **user replaceable**, optional AC adapter
Typical Battery Life	1 year with display off, 30 days with continuous LCD and no backlight
Operating Environment	-20 °C to +60 °C (-4 °F to 140 °F) 0%RH to 95%RH
Material	Black Anodized Aluminum
Dimensions	4.8" x 3.3" x 1.25" (122 mm x 84 mm x 32 mm)
Weight	16 oz
Approval	–

LNDS
Liquid Nitrogen Data Logging System

Battery Warning

WARNING: DISCARD USED BATTERY PROMPTLY. KEEP OUT OF REACH OF CHILDREN. DO NOT DISPOSE OF IN FIRE, RECHARGE, PUT IN BACKWARDS, DISASSEMBLE, OR MIX WITH OTHER BATTERY TYPES. MAY EXPLODE, FLAME, OR LEAK AND CAUSE PERSONAL INJURY.

Specifications subject to change.
See MadgeTech's terms and conditions at www.madgetech.com

To view the full MadgeTech product line, visit our website at www.madgetech.com.

Product Notes

The LNDS is a liquid nitrogen monitoring and data logging system. The thermocouple can be placed into the liquid nitrogen tank with the lid closed upon it. Verify the thermocouple probe is sealed by the gasket on the lid.

A type E thermocouple is supplied with the system and is recommended for use with the LNDS.

The convenient LCD provides access to the current temperature, as well as minimum, maximum and average statistics.

Backlight
The backlight uses a significant amount of battery life. Refer to the manual to configure the auto shut-off when not in use.

Selecting Thermocouple Type
To change the thermocouple type in the MadgeTech software:
 - In the **Connected Devices** panel, click the device desired.
 - On the **Device** Tab, in the **Information** Group, click **Properties**. Or, right-click the device and select **Properties** in the context menu.
 - On the **General** Tab, change the Thermocouple type in the drop down menu.
 - Apply these changes, there will be a prompt to reset the device, select **yes**.

Set Password
To password protect the device so that others cannot start, stop or reset the device;
 - In the **Connected Devices** panel, click the device desired.
 - On the **Device** Tab, in the **Information** Group, click **Properties**. Or, right-click the device and select **Properties** in the context menu.
 - On the **General** Tab, click **Set Password**.
 - Enter and confirm the password in the box that appears, then select **OK**.

Installation Guide

Installing the Interface cable
 - IFC200: Insert the device into a USB port. The drivers will install automatically.

Installing the software
IThe Software can be downloaded from the MadgeTech website at the following link: www. madgetech.com/software-download.

Wiring the System

Wiring Diagrams
The diagram to the right shows how to connect the thermocouple.
Warning: Note the polarity instructions. Do not attach wires to the wrong terminals.

For additional information refer to the TCTemp2000 manual and "Data Logger & Software Operating Manual".

Connector for interface cable

Device Operation

Connecting and Starting the data logger
 - Once the software is installed and running, plug the interface cable into the data logger.
 - Connect the USB end of the interface cable into an open USB port on the computer.
 - The device will appear in the Connected Devices list, highlight the desired data logger.
 - For most applications, select **"Custom Start"** from the menu bar and choose the desired start method, reading rate and other parameters appropriate for the data logging application and click **"Start"**. (*"Quick Start" applies the most recent custom start options, "Batch Start" is used for managing multiple loggers at once, "Real Time Start" stores the dataset as it records while connected to the logger.*)
 - The status of the device will change to **"Running"**, **"Waiting to Start"** or **"Waiting to Manual Start"**, depending upon your start method.
 - Disconnect the data logger from the interface cable and place it in the environment to measure.

Note: The device will stop recording data when the end of memory is reached or the device is stopped. At this point the device cannot be restarted until it has been re-armed by the computer.

Downloading data from a data logger
 - Connect the logger to the interface cable.
 - Highlight the data logger in the Connected Devices list. Click **"Stop"** on the menu bar.
 - Once the data logger is stopped, with the logger highlighted, click **"Download"**. You will be prompted to name your report.
 - Downloading will offload and save all the recorded data to the PC.

Device Maintenance

Battery Replacement
Materials: 3/32" HEX Driver (Allen Key), Replacement Battery (U9VL-J)
 - Remove the back cover from the device by unscrewing the four screws.
 - Remove the battery from its compartment and unsnap it from the connector.
 - Snap the new battery into the terminals and verify it is secure.
 - Replace the cover taking care not to pinch the wires. Screw the enclosure back together securely.
Note: Be sure not to over tighten the screws or strip the threads.

Recalibration
Liquid Nitrogen Calibration
Consists of one point at 25 °C for the internal channel and -196 °C, -80 °C, 0 °C for the thermocouple channel.

Custom calibration/verification options available, please call for pricing.

Prices and specifications subject to change. See MadgeTech's terms and conditions at www.madgetech.com To return devices for servicing, visit www.madgetech.com, select Services then RMA Process.