

# Product User Guide

CTL2000



## CTL2000

Carcass Temperature Data Logger with 8 Remote Thermocouple Channels



To view the full MadgeTech product line, visit our website at [www.madgetech.com](http://www.madgetech.com).

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# Complete System

## CTL2000 Data Logger



Data Logger

CTL2000

## MadgeTech 4 Software



Type K Thermocouple

## Interface Device & USB Cable



IFC200  
Interface Cable

# Quick Start Steps

## Product Operation (Plugged In)

1. Install the MadgeTech 4 Software and USB Drivers onto a Windows PC.
2. The IFC200 interface device is a USB style interface; plug the USB portion of the interface into an available USB port on the PC and plug the opposite end of the cable into the communication port on the CTL2000.
3. Launch the MadgeTech 4 Software. The CTL2000 will appear in the connected devices window indicating the device has been recognized.
4. Select the start method, reading rate and any other parameters appropriate for the desired data logging application. Once configured, deploy the data logger by clicking the **Start** icon.
5. To download data, select the device in the list, click the **Stop** icon, and then click the **Download** icon. A graph will automatically display the data.

### Product Overview

MadgeTech's redesigned CTL2000 Carcass Temperature data logger is a rugged, one of a kind solution for temperature monitoring during carcass pasteurization cycles. Equipped with eight thermocouple ports, the CTL2000 monitors and records the temperatures of various sections of the carcass during pasteurization, providing a continuous and accurate temperature profile to verify and validate that harmful microorganisms are effectively depleted.

The durable enclosure is drop tested and designed to survive the elements of the slaughter environment. The top of the enclosure is made of food grade stainless steel with an industrial quality custom machined base that skirts the thermocouple ports to guard against debris infiltration and harsh wash down cycles. The quality materials and form factor options were chosen using sanitary standards and guidelines, and made with materials certified for direct food contact as described by NSF-51.

Measuring only eight inches in length and weighing only three pounds, the CTL2000 is easy to handle and hangs securely from the carcass by a single stainless steel hook. This device is capable of withstanding temperatures from -20 °C to 100 °C (-4 °F to +212 °F), allowing it to monitor the entire pasteurization process.

Each channel of the CTL2000 can store up to 129,024 readings which aids in the logging of multiples cycles. Reading rate capabilities range from as fast as four readings per second or as infrequently as one reading every 24 hours. The CTL2000 operates on user replaceable batteries and features a pushbutton start option directly on the device. Delayed start is user programmable from within the MadgeTech Software for up to six months in advance.

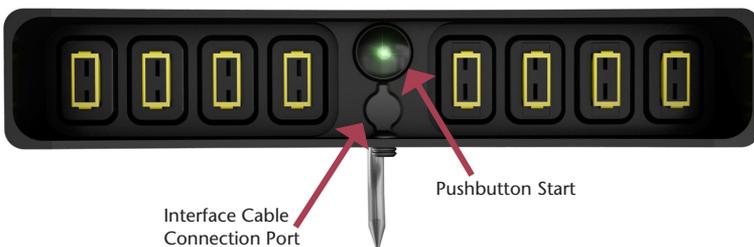
#### External Features

- **Dimensions:** 8.1 in x 6.5 in x 3.1 in (205 mm x 165 mm x 80 mm)
- **Weight:** 3.1 lb (49 oz)
- **Enclosure & Hooks:** 316 Stainless Steel
- **Gasket Seal:** EPDM rubber (NSF-51)
- **Pushbutton Start:** Located on the bottom of the data logger. (see below)
- **8 Thermocouple Ports** (Compatible with type K only)

#### LED's

Green LED:

- Blinks every 2 seconds to indicate unit is logging
- Blinks every 5 seconds to indicate unit is in delay start mode



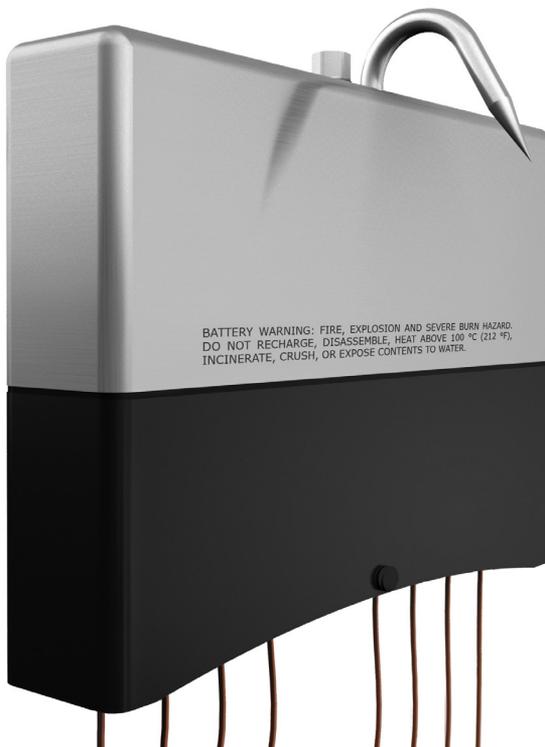
## Additional Features and Operation

### Password Settings

A password of a device that supports password capabilities can be set to protect it from being altered by unauthorized users. If the device does not have password capabilities, no password information will be displayed on the Device Properties screen.

#### To set the password of a device:

1. In the **Connected devices** panel, select the intended device to choose a password.
2. On the **Device** tab, in the **Information** group, click **Properties**. Users can also right-click on the device and select **Properties** in the context menu.
3. On the **General** tab, click the **Set password** button.
4. Enter and confirm the password in the box that appears, and then click **OK**.
5. The software will display the message below when the password has been successfully written.



# Additional Features and Operation

### Enable/Disable Channels

By default, all channels are enabled. To disable one or more channels follow the steps below.

#### To enable or disable a channel of a device:

1. In the **Connected devices** panel, select the intended device to enable/disable a channel.
2. On the **Device** tab, in the **Information** group, click **Properties**. Users can also right-click on the device and select **Properties** in the context menu.
3. On the **Channels** tab, toggle **Enable data recording** on and off to enable or disable the channel for the device.
4. Click **Ok**. Disabling channels increases the memory capacity of the enabled channels.

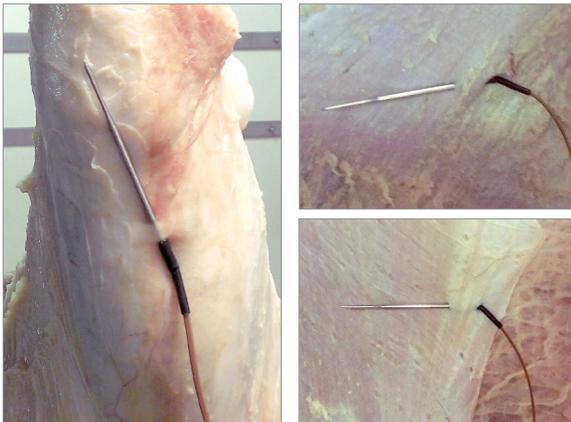
### Changing the Channel Name of a Device

#### To change the channel name of a device:

1. In the **Connected devices** panel, select the intended device to change the name of the thermocouple channel.
2. On the **Device** tab, in the **Information** group, click **Properties**. Users can also right-click on the device and select **Properties** in the context menu.
3. On the **Channel** tab, click the **Use custom name** checkbox to change the name of the thermocouple. (*Note: Only the thermocouple channel name can be changed.*) If there is no option to use a custom name, the device does not have the option to rename a thermocouple channel.

### Profiling with Thermocouples

Eight thermocouples can be inserted into different sections of the carcass to provide an overall temperature profile.



Photographs courtesy of JBS USA, LLC

## Still need help?

For more troubleshooting tips and information, refer to the built in help section of the MadgeTech 4 software, visit our Knowledge Base online at [www.madgetech.com/kbase](http://www.madgetech.com/kbase) or contact us for customer support at 603-456-2011.

## Installation Guide

### Installing the Interface Cable

Insert the IFC200 into a USB port. The drivers will install automatically. A blue light will illuminate on the IFC200 indicating successful installation.

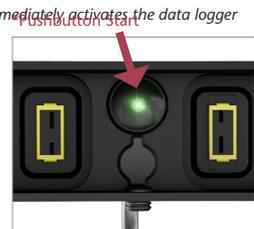
### Installing the Software

Software can also be downloaded from the MadgeTech website at the following link: [www.madgetech.com/software-download](http://www.madgetech.com/software-download). Follow the instructions provided in the Installation Wizard.

### 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.*

\*The CTL2000 also features a Pushbutton Start located at the base of the device which immediately activates the data logger while in the field. The pushbutton does not stop the data logger from logging.



### Manual Start

1. In the **Connected devices** panel, select the device. Confirm that the intended device is highlighted.
2. On the **Device** tab, in the **Control** group, click **Custom Start**. Users can also right-click on the device and select **Start**, and then **Custom Start** in the context menu.
3. Under the **Start** method section within the **Start device** screen, select the **Manual radio button**.
4. Choose any additional necessary start settings (such as reading interval, memory wraparound, stop method, etc.).
5. Click the **Start** button. The **Start device** box will close and the status column in the **Connected devices** panel will read, **Waiting for manual start**.

### 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.

### Product Maintenance

#### Recalibration

The CTL2000 standard calibration for the ambient channel are two points at 25 °C and 60 °C. The standard calibration for the thermocouple channel is one point at 0 mV.

MadgeTech recommends annual factory calibration, a reminder is automatically displayed in the software when the device is due. Digital calibration within the software is also available.

*Call for custom calibration options to accommodate specific application needs.*

*Prices and specifications subject to change. See MadgeTech's terms and conditions at [www.madgetech.com](http://www.madgetech.com)*

*To send devices to MadgeTech for calibration, service or repair, please use the MadgeTech RMA Process (next section).*

## RMA Instructions

To send a device back in to MadgeTech, follow the instructions below to create an RMA (Return Merchandise Authorization) on the MadgeTech website:

1. Visit [www.madgetech.com](http://www.madgetech.com), under the **Services** tab select **RMA Process**.
2. When the web page opens, please sign in. If this is the first time, select **Click here to register an account** and create one. Once signed in, click on the **Make New RMA** button and fill in all the blank fields.
3. Complete the applicable fields on the form including customer Billing and Shipping information, even if they are the same. Please see the field explanation below for a more detailed description about questions asked in the Device Information section.
4. When all of the fields are complete, click **Generate RMA**.
5. Print out the confirmation page that follows containing the RMA number and MadgeTech's address for shipping. **A Return Merchandise Authorization must be accompanied by a copy of the RMA paperwork and shipping is prepaid by the customer.** The RMA number should be clearly marked on the outside of the package.
6. Please ship the package via UPS, FedEx, TNT, or DHL to the address listed on the confirmation page. USPS will not ship MadgeTech data loggers.
7. A notification email will be automatically sent when MadgeTech has received the RMA.

## CTL2000 General Specifications

Reading Rate	4 readings per second up to 1 reading every 24 hours
Memory	129,024 readings per channel
LED Functionality:	Green LED: <ul style="list-style-type: none"> <li>• Blinks every 2 seconds to indicate unit is logging</li> <li>• Blinks every 5 seconds to indicate unit is in delay start mode</li> </ul>
Start Modes	Software programmable immediate start, pushbutton or delay start up to six months in advance.
Password Protection	An optional password may be programmed into the device to restrict access to configuration options. Data may be read without the password.
Memory Wrap Around	Yes
Battery Type	(2) 3.6V lithium battery included; user replaceable
Battery Life	4 years typical at a 5 minute reading rate
Calibration	MadgeTech recommends annual factory calibration. Digital calibration within the software is also available.
Calibration Date	Automatically recorded within the device
Data Format	Date and time stamped °C, °F, K, °R, mV, V
Time Accuracy	±1 minute/month
Computer Interface	IFC200 USB (Interface cable required)
Operating System Compatibility	XP SP3/Vista/Windows 7/Windows 8
MadgeTech Software Compatibility	<ul style="list-style-type: none"> <li>• Standard Software version 4.2.5.0 or later</li> <li>• Secure Software version 4.2.4.0 or later</li> </ul>
Operating Environment	Continuous use: -20 °C to +100 °C (-4 °F to +212 °F) 0 %RH to 100 %RH
IP Rating	IP67
Dimensions	8.1 in x 6.5 in x 3.1 in (205 mm x 165 mm x 80 mm)
Weight	3.1 lb (49 oz)
Materials	<ul style="list-style-type: none"> <li>• <b>Enclosure &amp; Hook:</b> 316 Stainless Steel</li> <li>• <b>Gasket Seal:</b> EPDM rubber (NSF-51)</li> </ul>

# Temperature

## 8 Internal Channels

Internal Channel Temperature Sensor	Semiconductor
Temperature Range	-20 °C to +100 °C (-4 °F to +212 °F)
Temperature Resolution	0.01 °C (0.018 °F)
Calibrated Accuracy	±0.5 °C (+10 °C to +80 °C)

## 8 Remote Channels

Remote Channel Temperature Sensor	Compatible with Type K Only ( <i>Thermocouples sold separately</i> )
Thermocouple Connection Type	Female Subminiature ( <i>SMP</i> )
Cold Junction Compensation	Automatic, based on internal channel
Thermocouple Temperature Range	-270 °C to +1370 °C (-454 °F to +2498 °F)
Temperature Resolution	0.1 °C (0.18 °F)
Calibrated Accuracy	±0.5 °C (±0.9 °F)

## Battery Warning

**WARNING: FIRE, EXPLOSION AND SEVERE BURN HAZARD. DO NOT RECHARGE, DISASSEMBLE, HEAT ABOVE 100 °C (212 °F), INCINERATE, CRUSH, OR EXPOSE CONTENTS TO WATER.**

*Specifications subject to change.  
See MadgeTech's terms and conditions at [www.madgetech.com](http://www.madgetech.com)*

# Troubleshooting Tips

## Why is the data logger not appearing in the software?

If the CTL2000 doesn't appear in the Connected Devices panel, or an error message is displayed while using the CTL2000, try the following:

- Ensure the **Only show claimed wireless devices** checkbox is unchecked.
- Check that the IFC200 is properly connected. For more information, see Troubleshooting Interface Cable problems (below).
- Ensure that the battery is not discharged. For best voltage accuracy, use a voltage meter connected to the battery of the device. If possible, try switching the battery with a new 7.2V lithium battery.
- Ensure that no other MadgeTech software (such as **MadgeTech 2**, or **MadgeNET**) is running.
- Ensure that **MadgeTech 4** is being used. **MadgeTech 2** and **MadgeNET** are not the correct software for connecting with the CTL2000.
- Ensure that the **Connected Devices** panel is large enough to display devices. This can be verified by positioning the cursor on the edge of the Connected Devices panel until the resize cursor appears, then dragging the edge of the panel to resize it. The screen layout may also be reset in the options menu by selecting **File, Options**, and scrolling to the bottom.

## Troubleshooting Interface Cable problems

**Check that the software properly recognizes the connected IFC200.**

If the data logger is not appearing in the **Connected Devices** list, it may be that the IFC200 is not properly connected.

1. In the software, click the **File** button, then click **Options**.
2. In the **Options** window, click **Communications**.
3. The **Detected Interfaces** box will list all of the available communication interfaces. If the IFC200 is listed here, then the software has correctly recognized and is ready to use it.

**Check that Windows recognizes the connected IFC200.**

If the software does not recognize the IFC200, there may be a problem with Windows or the USB drivers.

1. In Windows, click **Start**, right-click **Computer** and choose **Properties** or press **Windows+Break** as a keyboard shortcut.
2. Click **Device Manager** in the left hand column.
3. Double click **Universal Serial Bus Controllers**. Look for an entry for **Data logger Interface**.
5. If the entry is present, and there are no warning messages or icons, then windows has correctly recognized the connected IFC200.
6. If the entry is not present, or has an exclamation point icon next to it, the USB drivers may need to be installed. These are available on the software flash drive included with the IFC200, and on the MadgeTech website.

**Ensure that the USB end of the IFC200 is securely connected to the computer.**

1. Locate the USB-A plug of your IFC200.
2. If the interface cable is connected to your PC, unplug it.
3. Wait ten seconds, then reinsert it.
4. The older versions of the IFC200 will have a red LED illuminate to signify that it has been connected correctly. *(The LED may also become unlit after flashing red.)*
5. Newer IFC200s have different working LEDs.
  - a. The blue LED signifies that it is on and it is plugged into the computer correctly.
  - b. The amber LED signifies that it is busy. *(Searching for devices when a device is not plugged in, starting, stopping, downloading ect.)*
  - c. The green LED signifies that the device has been successfully found, started, stopped, downloaded ect. *(The LED may also become unlit after flashing green.)*
  - d. The red LED means the device has not been successfully found.

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