



## RFOT

Wireless Meat Temperature Data Logger

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## Quick Start Steps

1. Install the MadgeTech 4 Software and USB Drivers onto a Windows PC.
2. Connect the RFC1000 wireless transceiver (sold separately) to the Windows PC with the provided USB cable.
3. To activate the wireless mode on the RFOT, unscrew the end cap and gently separate the end from the body of the logger 2-3 inches. Flip the black switch located inside to the wireless position to the '1' position ('0' indicates non-wireless mode, '1' indicates wireless mode). Screw the end cap back in place and ensure the fit is tightly sealed.
4. Launch the MadgeTech 4 Software. All active MadgeTech data loggers that are within range will automatically appear in the Connected Devices window.
5. Select the data logger within the Connected Devices window and click the **Claim** icon.
6. 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 **Start**.
7. 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

The MadgeTech RFOT is a two-way wireless meat cooking and cooling data logger. The RFOT's rugged design, equipped with a flexible piercing probe allows it to be used in harsh environments. The RFOT is perfectly suited for use in smokehouses, ovens and other cooking processes up to 212 °F (100 °C) as well as refrigerators and freezers down to -4 °F (-20 °C). The RFOT is completely splash-proof, and can withstand wash down cycles. The RFOT records and wirelessly transmits internal product temperature readings back to a central PC for instant real-time monitoring, even when a smokehouse or freezer door is closed. The RFOT allows the user to also set-up real-time wireless alarming within the software, so that the user is notified by email or text if an alarm condition has been met or exceeded. The RFOT assists in complying with HACCP requirements as well as USDA regulations.

## Options & Accessories



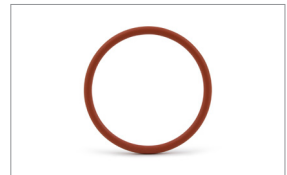
### RFOT-SMP

Features a 2.5 inch probe for smaller diameter products such as hot dogs and sausage



### TLH-5903

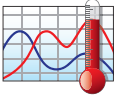
3.6V Lithium Battery



### RFOT-O-Ring

Replacement O-Rings for the RFOT

## Software Installation



### MadgeTech 4 Software

The MadgeTech 4 Software makes the process of downloading and reviewing data quick and easy, and is free to download from the MadgeTech website.

#### Installing the MadgeTech 4 Software

1. Download the MadgeTech 4 Software on a Windows PC by going to: [www.madgetech.com/software-download](http://www.madgetech.com/software-download).
2. Locate and unzip the downloaded file (typically you can do this by right clicking on the file and selecting **Extract**).
3. Open the **MTInstaller.exe** file.
4. You will be prompted to select a language, then follow the instructions provided in the MadgeTech 4 Setup Wizard to finish the MadgeTech 4 Software installation.

#### Installing the USB Interface Driver

USB Interface Drivers can easily be installed on a Windows PC, if they are not already available and running.

1. Download the USB Interface Driver on a Windows PC by going to: [www.madgetech.com/software-download](http://www.madgetech.com/software-download).
2. Locate and unzip the downloaded file (typically you can do this by right clicking on the file and selecting **Extract**).
3. Open the **PreInstaller.exe** file.
4. Select **Install** on the dialog box.

For more detailed information, download the MadgeTech Software Manual at: [www.madgetech.com/mt4-software-manual.pdf](http://www.madgetech.com/mt4-software-manual.pdf)



### MadgeTech Cloud Services

MadgeTech Cloud Services allows users to remotely monitor and manage groups of data loggers throughout a large facility or multiple locations, from any internet enabled device. Transmit real-time data to the MadgeTech Cloud Services platform via the MadgeTech Data Logger Software running on a central PC or transmit directly to the MadgeTech Cloud without a PC using the MadgeTech RFC1000 Cloud Relay (sold separately). Sign up for a MadgeTech Cloud Services account at [www.madgetech.com/cloud](http://www.madgetech.com/cloud).

For more detailed information, download the MadgeTech Cloud Services Manual at: [www.madgetech.com/mt-cloud-manual.pdf](http://www.madgetech.com/mt-cloud-manual.pdf)

## Activating & Deploying the Data Logger

1. Connect the RFC1000 wireless transceiver (sold separately) to the Windows PC with the provided USB cable.
2. Additional RFC1000's can be used as repeaters to transmit over greater distances. If transmitting over a distance greater than 500 feet indoors, 2,000 feet outdoors or there are walls, obstacles or corners that need to be maneuvered around, set up additional RFC1000's as needed. Plug each one into an electrical outlet in the desired locations.
3. Activate wireless transmission mode on the RFOT by unscrewing the end cap and gently separating the end from the body of the data logger 2-3 inches. Flip the black switch located inside to the wireless position to '1' ('0' indicates non-wireless mode, '1' indicates wireless mode).
4. On the Windows PC, launch the MadgeTech 4 Software.
5. All active data loggers will be listed in the Device tab within the Connected Devices panel, showing that the data loggers are recognized.
6. To claim a data logger, select the desired data logger in the list and click the **Claim** icon.
7. Once the data logger has been claimed, select a start method in the Device tab.



For steps to claim the data logger and view data using MadgeTech Cloud Services, refer to the MadgeTech Cloud Services Software Manual at: [www.madgetech.com/mt-cloud-manual.pdf](http://www.madgetech.com/mt-cloud-manual.pdf)

### Mounting Instructions

For best performance, the RFOT should always be hung by the hook in an upright position. This will allow for the best path for the wireless signal.

### Transmission Distance

Typical transmission distance from an RFC1000 to an RFOT:

- » Unobstructed line of sight (outdoors): 2,000 feet max
- » Typical urban environment (indoors): 500 feet max

### Obstacles

Obstacles will decrease the line-of-sight from an RFC1000 to another RFC1000 as well as from an RFC1000 to an RFOT. Obstacles that interfere with or decrease the wireless signal could include but are not limited to smokehouse doors, freezer/refrigerator doors, building structures such as walls and metal beams and internal traffic such as forklifts and metal racks or carts. Additional RFC1000's can be placed near obstacles to lengthen and strengthen the wireless signal.

### Deflection

When a wireless signal “hits” an object such as a metal wall, the wireless signal will not just stop but rather it could turn a corner, bend or slow down. When installing the RFC1000's obstacles and possible deflection should also be considered.



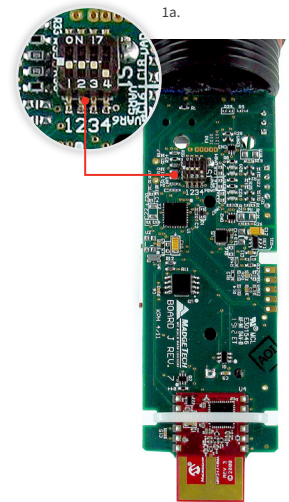
# Channel Programming

Different wireless channels may be used to create multiple networks in one area, or to avoid wireless interference from other devices. Any MadgeTech data logger or RFC1000 wireless transceiver that is on the same network is required to use the same channel. If all of the devices are not on the same channel, the devices will not communicate with one another. MadgeTech wireless data loggers and RFC1000 wireless transceivers are programmed by default on channel 25.

*CHANNEL NOTE: MadgeTech wireless data loggers and wireless transceivers purchased prior to April 15, 2016 are programmed by default to channel 11. Please refer to the Product User Guide provided with these devices for instructions to change the channel selection if needed.*

## Changing the channel settings of the RFOT

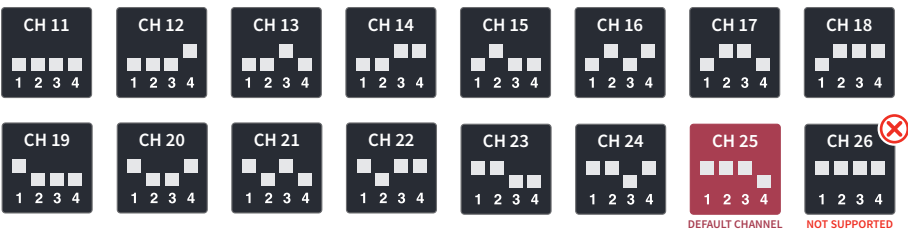
1. Unscrew the end cap and gently separating the end from the body of the data logger. Flip the black switch located inside to the wireless position to '0' ('0' indicates non-wireless mode, '1' indicates wireless mode).
2. The RFOT has a set of DIP Switches located on the back of the PCB, on the opposite side of the battery (diagram 1a).
3. Change the DIP Switches to match the desired channel (diagram 1b).
4. Return the wireless switch to '1'.
5. Screw the body of the logger back together making sure the O-Rings are not visible.



## Channel DIP Switch Orientation

The images below show the orientations available of the switches for each channel.

1b.



To configuring the channel settings of the RFC1000 wireless transceiver (sold separately), please refer to the RFC1000 Product User Guide that shipped with the product or download it from the MadgeTech website at [www.madgetech.com](http://www.madgetech.com).

## Product Maintenance

### Battery Replacement

**Materials:** TLH-5903 Replacement Battery

1. Unscrew the end cap and gently separating the end from the body of the data logger.
2. Grasp the circuit board firmly on either side of the battery holder with one hand and pull the battery out of the holder with the other.
3. Install the new battery as shown by the diagram on the bottom of the battery holder.
4. Screw the body of the logger back together making sure the O-Rings are not visible.



### O-Ring Replacement

**Materials:** RFOT-O-Ring

1. Unscrew the end cap from the RFOT to expose the O-Ring.
2. Use a small pointed tool (knife or pick) to pry the old O-Ring out of its groove.
3. Make sure that the O-Ring groove is free of any dirt or debris.
4. Partially screw the mating parts back together leaving the O-Ring groove exposed.
5. Apply a thin coat of silicone based lubricant to the O-Ring.
6. Stretch the O-Ring over the cap and into its groove.

**WARNING:** Avoid stretching the O-Ring over the threads. Sharp threads can cut the new O-Ring.

### O-Ring Maintenance

O-Ring maintenance is a key factor when properly caring for the RFOT. The O-Rings ensure a tight seal and prevent liquid from entering the inside of the device. Please refer to the application note “*O-Rings 101: Protecting Your Data*”, found on the MadgeTech website, for information on how to prevent O-Ring failure.

### Recalibration

**Recalibration is recommended annually for any MadgeTech data logger.** A reminder is automatically displayed in the MadgeTech 4 Software when the device is due.

# RMA Instructions

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

1. Go to [www.madgetech.com/rma](http://www.madgetech.com/rma).
2. Sign into your account. For new customers, select **Create an Account**.
3. Once signed in, click on the **Make New RMA** button.
4. 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.
5. When all of the fields are complete, click **Generate RMA**.
6. 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.
7. Ship the package via UPS, FedEx, TNT, or DHL to the address listed on the confirmation page. **USPS will not ship MadgeTech data loggers.**
8. A notification email will be automatically sent when MadgeTech has received the RMA.

# Troubleshooting

## Why is the wireless data logger not appearing in the MadgeTech 4 Software?

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

- » Ensure the data logger and RFC1000 are on the same wireless channel. If the devices are not on the same channel, the devices will not communicate with one another. Please refer to the Channel Programming section for information on changing the device channel.
- » Check that the RFC1000 is properly connected. For more information, see *Troubleshooting wireless transceiver 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 9V lithium.
- » Ensure that the **MadgeTech 4 Software** is being used, and that no other MadgeTech Software (such as **MadgeTech 2**, or **MadgeNET**) is open and running in the background. **MadgeTech 2** and **MadgeNET** are not the compatible with the RFOT.
- » 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.



## Compliance Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

### **Countries approved for use, purchase and distribution:**

Australia, Austria, Belgium, Bulgaria, Canada, Chile, China, Columbia, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Estonia, Finland, France, Germany, Greece, Honduras, Hungary, Iceland, Ireland, Israel, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Mexico, New Zealand, Norway, Peru, Poland, Portugal, Romania, Saudi Arabia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, The Netherlands, Turkey, United Kingdom, United States, Venezuela, Vietnam

## Temperature

Probe Temperature Range	-50 °C to +200 °C (-58 °F to +392 °F)
Resolution	0.01 °C (0.018 °F)
Calibrated Accuracy	±0.1 °C at 0 °C to 100 °C (±0.18 °F at 32 °F to 212 °F) ±0.5 °C (±0.9 °F) outside of that range

## Resistance

Nominal Range	0 Ω to 500 Ω
Resolution	0.001 Ω
Calibrated Accuracy	±0.015 Ω
Specified Accuracy Range	0 Ω to 500 Ω at 25 °C

## Wireless

RF Frequency	2.45 GHz IEEE 802.15.4 ultra-low power wireless transceiver with fully bi-directional communication
Band	ISM band 2.405-2.475 GHz. Operation (channels 11 through 25) @ 250 kbps
Maximum Output Power	+0 dBm typical
Wireless Interface	RFC1000, RFC1000-CE, RFC1000-IP69K or RFC1000 Cloud Relay
Transmission Distance	Unobstructed line of sight (outdoors): 2,000 feet max Typical urban environment (indoors): 500 feet max

**BATTERY 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.

## General Specifications

<b>Reading Rate</b>	1 reading every 2 seconds up to 1 reading every 24 hours
<b>Memory</b>	20,000 readings; software configurable memory wrap
<b>Memory Wrap Around</b>	Yes
<b>Start Modes</b>	Immediate Start & Delayed Start
<b>Calibration</b>	Digital calibration through the MadgeTech 4 Software
<b>Calibration Date</b>	Automatically recorded within device
<b>Battery Type</b>	3.6V lithium battery included; <b>user replaceable</b>
<b>Battery Life</b>	2 years typical
<b>Data Format</b>	Date and time stamped °C, °F, K, °R
<b>Time Accuracy</b>	±1 minute/month (at 25 °C)
<b>Computer Interface</b>	USB (interface cable required)
<b>PC Compatibility</b>	MadgeTech 4: Windows 10, 8, 7, Vista, Window XP with SP3
<b>MadgeTech Cloud Services Compatible</b>	Yes
<b>Operating Environment</b>	-20 °C to +100 °C (-4 °F to +212 °F), 0 %RH to 100 %RH non-condensing
<b>Dimensions</b>	Body: 8.7 in x 1.75 in dia. (221 mm x 44 mm dia.) Hook: 0.5 in (13 mm) Cable Length: 30 in (760 mm)
<b>Probe Lengths</b>	RFOT-FR: 1.75 inch (45 mm), 0.063 in (1.6 mm) tip RFOT-4-TD: 4.0 inch (102 mm), 0.125 in (3.2 mm) tip RFOT-4: 4.0 inch (102 mm), 0.188 in (4.8 mm) tip RFOT-7: 7.0 inch (177 mm), 0.188 in (4.8 mm) tip
<b>Weight</b>	8.8 oz (250 g)
<b>Material</b>	Body: Acetal Copolymer Cable Jacket: Silicone Polyurethane
<b>Approvals</b>	CE, US (FCC), CA (IC)

# Need Help?

## Product Support & Troubleshooting:

- » Refer to the Troubleshooting section of this document.
- » Visit our Knowledge Base online at [www.madgetech.com/kbase](http://www.madgetech.com/kbase).
- » Contact our friendly Customer Support Team at (603) 456-2011 or [support@madgetech.com](mailto:support@madgetech.com).

## MadgeTech 4 Software Support:

- » Refer to the built-in help section of the MadgeTech 4 Software.
- » Download the MadgeTech 4 Software Manual at:  
[www.madgetech.com/mt4-software-manual.pdf](http://www.madgetech.com/mt4-software-manual.pdf)

## MadgeTech Cloud Services Support:

- » Download the MadgeTech Cloud Services Software Manual at:  
[www.madgetech.com/mt-cloud-manual.pdf](http://www.madgetech.com/mt-cloud-manual.pdf)



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