Temperature Data Logging Solutions for
USDA Regulation Compliance and HACCP Programs in the

Meat Industry

MADGETECH
WE BUILD DATA LOGGERS

Simplifying How the World Measures & Records Data

MadgeTech, Inc. is a global company, based in New England and founded on old-fashioned principles, customer service, quality, and trust. MadgeTech's President, Norman Carlson, started the company in 1996 and charted the growth of the product lines and services while maintaining those solid core principles.

Our 'Can Do' team of engineers and technical staff consistently incorporate new and innovative ideas into our data loggers. In short, we push the envelope, raising the bar in innovation and quality. Our competitors have praised us by adopting many of our ideas as their own. Over time, MadgeTech has become the industry standard in the data logger market.

MadgeTech continuously develops new, cutting-edge products, creating solutions for our customers around the world in industries across the board. Our growing network of distributors has expanded our presence to markets far beyond our home-headquarters in New Hampshire, our products are now sold in over 100 countries around the world.

Our employees are committed to quality and customer satisfaction. Behind the full range of MadgeTech's products and services is the cumulative expertise of experienced engineers, manufacturing and electronic professionals and technicians. Our knowledgeable sales team can offer technical advice to assist in selecting the right product for each application, as well as providing after-sales support.

MadgeTech is dedicated to providing customers with reliable, affordable products, hassle-free ordering, and excellent service, saving customers time and money. It is our goal to earn your trust in meeting your needs and providing innovative solutions. The products and services that bear the MadgeTech name come with quality assurance and the best support in the industry today.

Norman E. Carlson,

Founder & President

Data Logging Solutions for Temperature Critical Applications in the Meat Industry

Wireless Continuous Process Monitoring

Meat Cooking & Cooling

Post-Slaughter Pasteurization Cycles

Smokehouses

Oven Temperature Profiling

Meat Storage

Wireless Continuous Process Monitoring
Cooking, Cooling and Storage Data Loggers

MadgeTech's wireless, continuous monitoring data logging system provides a streamlined solution for measuring and recording the cooking, cooling and storage of meat and food products. Wireless data loggers are placed throughout a facility to measure processes such as cooking and cooling cycles or environmental monitoring in coolers, freezers or warehouses. The RFC1000 transceivers are placed throughout the site and communicate with the wireless data loggers. Full communication is performed wirelessly and real-time data is sent back to a central PC. If the data received is out of a safe range, the system can be configured to send an email, text message or on-screen alarm. Data can be transmitted up to 2000 ft maximum outdoors (line of sight, unobstructed) and 500 ft maximum indoors. To transmit over longer distances, additional RFC1000s are added.

Wireless Meat Temperature Monitoring
RFOT

The RFOT is designed for use in monitoring and recording the temperature of meat products during cooking, cooling and storage. It can be used in smokers and other cooking processes up to 212 °F (100 °C) as well as coolers and freezers down to -4 °F (-20 °C). It is completely splash proof and can withstand wash down cycles.

Once the loggers are deployed, they can be stopped and started, and data can be downloaded, from a central PC.

New! Rugged T-Handle
Tested to withstand thousands of cycles.

RFOT-HDA
Probe attachment designed for use with hot dogs, sausages and other small linked meat products.

Wireless Data Loggers

RFRHTemp2000A & RFTCTemp2000A

MadgeTech has designed the 2000A Wireless Series for customers that require employees to check temperatures of coolers, freezers, warehouses, etc. This series includes a digital display to see the current reading, as well as minimum, maximum and average statistics based on the data recorded to memory. Data is also sent wirelessly back to a central PC through the RFC1000 mesh network.

This series also includes an audible alarm to alert users in close proximity. If the temperature or humidity exceeds the safe range, the audible alarm enables the user to take immediate action. Email, text message or on-screen alerts can also be configured.

Applications

- Coolers
- Freezers
- Warehouses
- Thermal Mapping

The **RFRHTemp2000A** is a wireless temperature and humidity data logger. It is ideal for monitoring warehouses and other temperature and humidity sensitive environments. The **RFTCTemp2000A** is a wireless thermocouple based temperature data logger. This device can measure both ambient temperature as well as thermocouple temperature and can be used for ovens, coolers, freezers, and more.

Features

- LCD Screen
- Audible and LED Alarm Indicators
- Battery Life Indicator

◄ RFRHTemp2000A
Wireless Temperature and Humidity Data Logger with LCD display on table mount.

RFTCTemp2000A ►
Wireless Thermocouple Based Temperature Data Logger with LCD display on wall mount.

Therm-A-lert Series

The Therm-A-lert Series is designed for wireless environmental monitoring throughout a facility. The **Therm-A-lert-P** is designed to measure temperatures within coolers and freezers. The built in external RTD probe comes with a rigid 4.0 in (102 mm) probe sheath with 9 ft of lead wire to thread into the cooler or freezer, while the body of the data logger can remain at ambient conditions.

The **Therm-A-lert** and **Therm-A-lert-RH** measure ambient temperature and humidity, respectively. They are ideal for monitoring warehouses and other temperature and humidity sensitive environments.

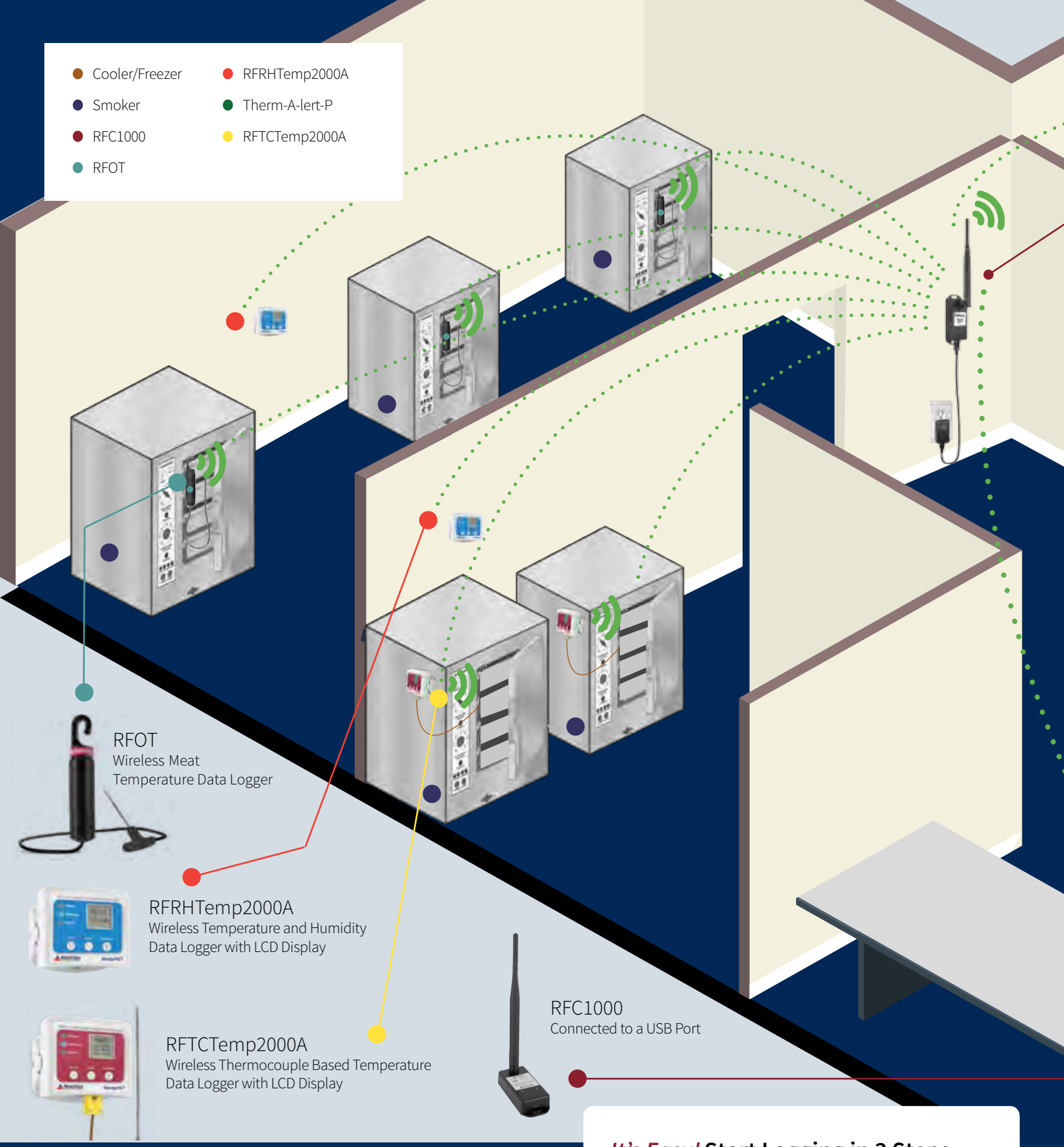
Features

- Greater Internal Memory Storage
- Great Value

Therm-A-lert-P
Wireless Temperature Data Logger with External RTD Probe

Therm-A-lert-RH
Wireless Humidity and Temperature Data Logger

Therm-A-lert
Wireless Temperature Data Logger



RFOT
Wireless Meat
Temperature Data Logger

RFRHTemp2000A
Wireless Temperature and Humidity
Data Logger with LCD Display

RFTCTemp2000A
Wireless Thermocouple Based Temperature
Data Logger with LCD Display

RFC1000
Connected to a USB Port

WIRELESS DIAGRAM for the RFOT, RFRHTemp2000A, RFTCTemp2000A, and Therm-A-lert Series Data Loggers

It's Easy! Start Logging in 3 Steps...

1. Deploy the Data Loggers
2. Wirelessly Start the Data Loggers
3. Data is instantly transmitted to a computer for real-time monitoring. If user selectable alarm ranges have been exceeded, an email, text message or on-screen alarm will be received.

RFC1000
Connected to a Power Outlet

Therm-A-lert-P
Wireless Temperature
Data Logger with
External RTD Probe

RFC1000

Wireless Transceiver

The RFC1000 is a wireless transceiver for the RFOT, Therm-A-lert and RF2000A Series of Data Loggers. The RFC1000 features a 7.0 in (178 mm) pivoting external antenna, which increases the transmission distance and provides greater signal strength, and also allows more flexibility with mounting orientation.

RFC1000-IP69K

Splash Proof Wireless Transceiver

For environments that require high pressure, high temperature wash down, MadgeTech has designed the RFC1000-IP69K. This new splash proof transceiver can be installed directly in the wash down location, ensuring 100% communication throughout the entire process.

Standalone

Cooking, Cooling and Storage Data Loggers

High Temperature Wet or Dry Processing Applications

HiTemp140 Series

The MadgeTech HiTemp140 and HiTemp140-PT Series data loggers are designed to be used in a wide range of food and meat applications to help comply with HACCP requirements and USDA regulations. These data loggers can indefinitely withstand temperatures of up to 284 °F (140 °C) and are completely submersible. The RTD probe and food-grade stainless steel enclosure, is available in both rigid and flexible probe models. This series allows customers to create a custom validation kit for smokehouse monitoring, oven mapping, pasteurization and more.

The HiTemp140 features a needle point RTD probe for easy insertion into a product. Various probe lengths and diameters are available for different types of products.

Product Name	Applications
HiTemp140-2	Canning
HiTemp140-2-TD	Canning
HiTemp140-5.25	Canning, Internal Temperature Product Monitoring: Sausage
HiTemp140-5.25-TD	Canning, Internal Temperature Product Monitoring: Sausage
HiTemp140-7	Internal Temperature Product Monitoring: Hams, Briskets and other Large Meat Products

The HiTemp140-PT features a 24.0 in (610 mm) stainless steel flexible wire with rigid probe sheath that is available in a 1.0 in (25 mm) or 5.0 in (127 mm) length.

Product Name	Applications
HiTemp140-PT-1	Internal Temperature Product Monitoring: Bacon, Small Sausage Links, Jerky, Patties, Nuggets
HiTemp140-PT-5	Internal Temperature Product Monitoring: Bacon, Small Sausage Links, Jerky, Patties, Nuggets

HiTemp140-1 *HiTemp140-2* *HiTemp140-5.25* *HiTemp140-7* *HiTemp140-PT-1*

Extended Temperature Monitoring

Thermal Shield

For applications above 284 °F (140 °C), a thermal shield is available for the HiTemp140 and HiTemp140-PT Series data loggers. Made of food-grade PTFE, the Thermal Shield extends the operating temperature of the data logger for extreme temperature monitoring.

HiTemp140 Series shown in Thermal Shields.
Vented model and flush-top shown.

Time vs Temperature Chart

Ambient Temperature	Exposure Time in Air	Exposure Time in Liquid
-328 °F (-200 °C)	18 minutes	n/a
-292 °F (-180 °C)	19 minutes	n/a
-256 °F (-160 °C)	21 minutes	n/a
-220 °F (-140 °C)	24 minutes	n/a
-184 °F (-120 °C)	27 minutes	n/a
-148 °F (-100 °C)	32 minutes	n/a
-112 °F (-80 °C)	40 minutes	n/a
-76 °F (-60 °C)	55 minutes	25 minutes
-40 °F (-40 °C)	70 minutes	32 minutes
-4 °F to +284 °F (-20 °C to +140 °C)	Indefinitely	Indefinitely
302 °F (150 °C)	88 minutes	40 minutes
320 °F (160 °C)	75 minutes	34 minutes
338 °F (170 °C)	63 minutes	29 minutes
356 °F (180 °C)	55 minutes	26 minutes
374 °F (190 °C)	50 minutes	23 minutes
392 °F (200 °C)	45 minutes	21 minutes
410 °F (210 °C)	42 minutes	19 minutes
428 °F (220 °C)	39 minutes	18 minutes
446 °F (230 °C)	36 minutes	17 minutes
464 °F (240 °C)	34 minutes	16 minutes
482 °F (250 °C)	32 minutes	15 minutes

Vented Model
Protects Probe

Flush Model
Allows for Probe Piercing

HiTemp140 Series Applications

- HACCP Programs
- Compliance with USDA Regulations
- Food and Meat Process Monitoring
- Oven Monitoring and Mapping
- Cooling and Storage Monitoring
- Pasteurization
- Conveyor Cooking and Cooling Cycles

Standalone
Cooking, Cooling and Storage Data Loggers

Validate Post-Slaughter Pasteurization Cycles

CTL2000

The CTL2000 Carcass Temperature Data Logger measures and records data utilizing up to eight thermocouple channels, allowing the user to verify and validate post-slaughter pasteurization cycles. The CTL2000 aids in reducing pathogens, and helps to ensure that post-slaughter pasteurization process parameters are met.

The CTL2000 has a black anodized aluminum enclosure with a stainless steel hook allowing the device to be hung directly from a carcass. This durable data logger is splash proof and can be used throughout the entire pasteurization process. The CTL2000 can measure and record data utilizing up to eight thermocouples which can be inserted into different sections of the carcass to provide an overall temperature profile.

Marinating and Tenderizing

MicroTemp

The MicroTemp is a miniature, submersible temperature data logger. Only 2.6 in (66 mm) tall and 0.7 in (18 mm) in diameter and completely housed in a food-grade 316 stainless steel enclosure, this recorder can easily withstand acidic ingredients and monitor and record temperature throughout the entire marinating and tenderizing process.

4 Channel Oven Temperature Profiler

QuadThermoVault

The QuadThermoVault is a four channel thermally insulated oven temperature profiler. The QuadThermoVault features a stainless steel enclosure with PTFE insulation and can withstand oven temperatures of up to 662 °F for up to 25 minutes. The device sits at 2.45 in (62 mm), allowing it to fit inside most conveyer ovens, and comes equipped with four thermocouples to monitor multiple locations. An eight channel model is also available.

Time vs Temperature Chart

Ambient Temperature	Maximum Duration
212 °F (100 °C)	110 minutes
302 °F (150 °C)	62 minutes
392 °F (200 °C)	45 minutes
482 °F (250 °C)	35 minutes
500 °F (260 °C)	33 minutes
572 °F (300 °C)	30 minutes
662 °F (350 °C)	25 minutes

Extreme Temperature Monitoring

ThermoVault140-PT-1

The ThermoVault140-PT-1 is an extreme, high temperature thermal barrier designed for use with the HiTemp140-PT-1 data loggers. The thermal barrier is a stainless steel enclosure containing a Dewar flask and PTFE insulation. This durable system can withstand temperatures up to 482 °F (250 °C) when completely submerged and 662 °F (350 °C) in dry heat applications. The ThermoVault140-PT-1 is built for use in harsh applications that require extreme temperature monitoring and is ideal for ovens of all kinds.

Time vs Temperature Chart

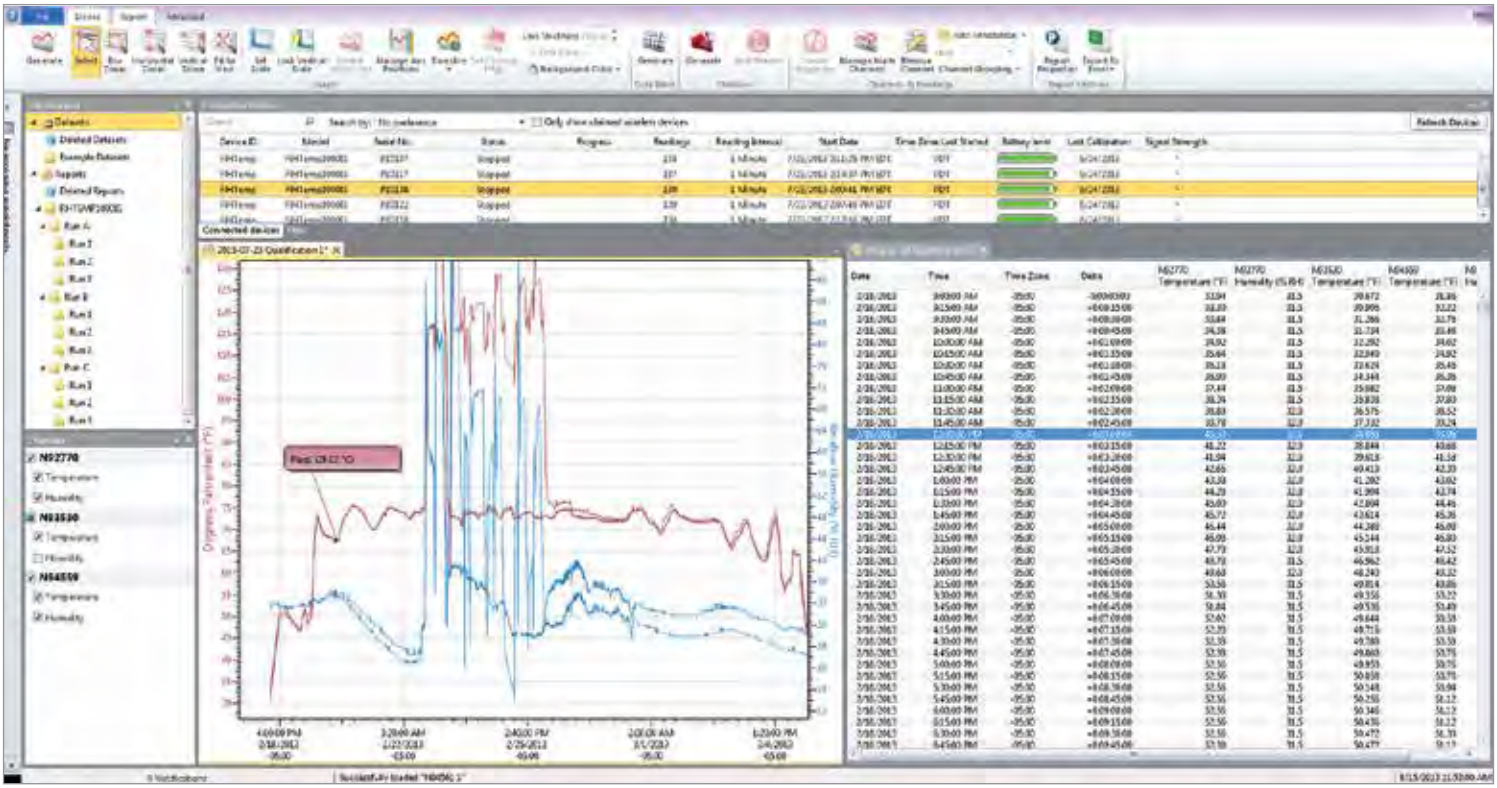
Ambient Temperature	Time In Air To Max Internal Temperature	Time In Liquid To Max Internal Temperature
302 °F (150 °C)	525 minutes	285 minutes
392 °F (200 °C)	285 minutes	120 minutes
482 °F (250 °C)	205 minutes	80 minutes
572 °F (300 °C)	165 minutes*	n/a
662 °F (350 °C)	140 minutes*	n/a

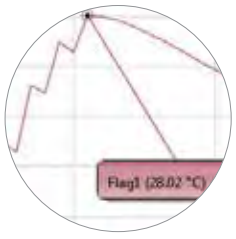
**Please consult the measurement range of your data logger for temperatures over 250°C. (The thermal barrier extends the operating temperature of the data logger up to, but not exceeding the measurement range)*

MadgeTech Data Logger Software

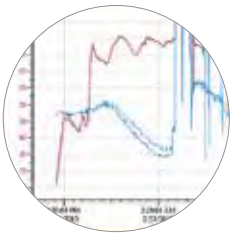
This simple, easy-to-use, Windows-based software enables the user to effortlessly collect, display, and analyze data. A variety of powerful tools can be used to examine, export, and print professional quality reports with just a click of the mouse. This software can be downloaded for free from the MadgeTech website.

Simple, Easy-to-use, Windows-based Software



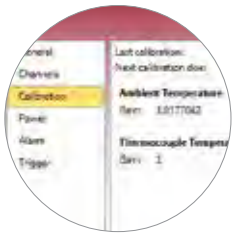


Cooling Flags


Graph View


Tabular Data View


Statistics


Digital Calibration

Copy to Excel

Software Features

- Multiple Graph Overlay
- Statistics
- Digital Calibration
- Zoom In / Zoom Out
- Timeslice
- Lethality Equations (F0, PU)
- Mean Kinetic Temperature
- Full Time Zone Support
- Data Annotation
- User Friendly File Management
- Min. / Max. / Average Lines
- Cooling Flags
- Data Table View
- Automatic Report Generation
- Summary View

MadgeTech Data Logger Software

MadgeTech 4.0 Software can communicate with multiple loggers through multiple interface cables. Capable of simultaneous start, stop and download of over 100 devices, this software serves as your virtual command center for large scale facilities and small. Display your data in graphs, with tabbed views and multi-monitor support. Utilize the infinite graphing flexibility by combining channels and datasets as desired. All graphing makes use of accelerated graphics hardware for real-time updating and high performance visuals.

The MadgeTech 4.0 Software is designed with a built-in database for automatic storage of downloaded data. The look and feel is organized much like standard email programs to aid in user friendliness and ease of use. The MadgeTech 4.0 software also offers extensive alarming options across multiple devices, wireless and non-wireless. Alarm output options include email, on-screen, text message and run-a-program alerts.

To round out the list of improvements, MadgeTech 4.0 has a powerful and comprehensive statistics system that allows the user to customize and view statistics as desired. Another feature is customizable engineering units. This enables users to support and program devices with many different unit types as well as the ability to display them as an alternate unit if desired.

The MadgeTech 4.0 Software is available to download for free from our website, **www.madgetech.com.**

Matrix






Product	RFOT	RFRHTemp2000A	RFTCTemp2000A	Therm-A-lert-P	Therm-A-lert	Therm-A-lert-RH
Range	Body: -4 °F to +212 °F (-20 °C to +100 °C) Probe: -58 °F to +392 °F (-50 °C to +200 °C)	-4 °F to +140 °F (20 °C to +60 °C) 0 to 95 %RH	-4 °F to +140 °F (-20 °C to +60 °C)	Body: -4 °F to +176 °F (-20 °C to +80 °C) Probe: -328 °F to +500 °F (-200 °C to +260 °C)	-4 °F to +176 °F (-20 °C to +80 °C)	Body: -4 °F to +176 °F (-20 °C to +80 °C) 0 to 95 %RH noncondensing
Resolution	0.018 °F (0.01 °C)	0.018 °F (0.01 °C) 0.1 %RH	0.018 °F (0.01 °C)	0.018 °F (0.01 °C)	0.018 °F (0.01 °C)	0.018 °F (0.01 °C) 0.1 %RH
Calibrated Accuracy	±0.18 °F / ±0.1 °C (14 °F to 302 °F / -10 °C to +150 °C) ±0.9 °F / ±0.5 °C (outside of that range)	±0.9 °F / ±0.5 °C (32 °F to 131 °F / 0 °C to +55 °C) ±3.0 %RH, ±2.0 %RH typical @ 25 °C (10 %RH to 90 %RH; 5 °C to 55 °C)	±0.9 °F (±0.50 °C)	±0.18 °F / ±0.1 °C (-4 °F to +176 °F / -20 °C to +80 °C)	±0.9 °F / ±0.5 °C (32 °F to 122 °F / 0 °C to +50 °C)	±0.9 °F / ±0.5 °C (32 °F to 122 °F / 0 °C to +50 °C) ±3.0 %RH (±2 %RH typical at 77 °F / 25 °C)
Memory	20,000 Readings	16,128 Readings	16,128 Readings	30,000 Readings	30,000 Readings	15,000 Readings
IP Rating	IP67, Splash Proof	IP31	IP31	IP31	IP31	IP31
Material	TECAFORM®	ABS Plastic	ABS Plastic	ABS Plastic	ABS Plastic	ABS Plastic
Required Interface Cable	RFC1000	RFC1000	RFC1000	RFC1000	RFC1000	RFC1000
Probe	4.0 in (102 mm) External RTD Probe	Internal Sensor	External Thermocouple Probe *Not Included*	4.5 in (114 mm) External RTD Probe	Internal Sensor	Internal Sensor
More Details	Refer to page 4	Refer to page 5	Refer to page 5	Refer to page 5	Refer to page 5	Refer to page 5

HACCP (Hazard Analysis and Critical Control Points): Seven Principal Steps

1. Conduct a hazard analysis

Identify the potential hazard(s) associated with food production at all stages, from primary production, processing, manufacture and distribution until the point of consumption. Assess the likelihood of occurrence of the hazard(s) and identify measures for their control.

2. Identify the critical control points (CCPs)

Determine the points, procedures, or operational steps that can be controlled to eliminate the hazard(s) or minimize its (their) likelihood of occurrence. A “step” means any stage in food production and/or manufacture including the receipt and/or production of raw materials, harvesting, transport, formulation, processing, storage, etc.

3. Establish critical limit(s)

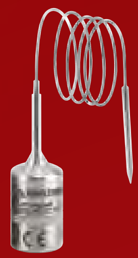
Establish critical limit(s) which must be met to ensure the CCP is under control.

MadgeTech offers data loggers that enable the user to monitor and record temperature, humidity and other parameters to establish critical limits.

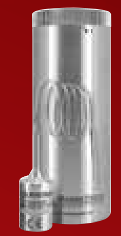
4. Establish Procedures to Monitor control of the CCP

a. What will be monitored b. How will it be monitored c. How often will it be monitored d. Who will perform the monitoring

MadgeTech Data Loggers help to ensure critical control limits are being met. They can be used to validate ovens, freezers, coolers or be used to monitor the internal temperature of product in process.






HiTemp140	HiTemp140-PT	HiTemp140-TSK	CTL2000	MicroTemp	ThermoVault140-PT-1	QuadThermoVault
-328 °F to +482 °F (-200 °C to +250 °C)	-328 °F to +482 °F (-200 °C to +250 °C)	-328 °F to +482 °F (-200 °C to +250 °C)	Internal: -4 °F to +140 °F (-20 °C to +60 °C) Remote: -436 °F to +2498 °F (-260 °C to +1370 °C)	-40 °F to +176 °F (-40 °C to +80 °C)	-328 °F to +662 °F (-200 °C to +350 °C)	-40 °F to +662 °F (-40 °C to +350 °C)
0.018 °F (0.01 °C)	0.018 °F (0.01 °C)	0.018 °F (0.01 °C)	0.09 °F (0.05 °C)	0.018 °F (0.01 °C)	0.018 °F (0.01 °C)	0.09 °F (0.05 °C)
±0.18 °F / ±0.1 °C (68 °F to +284 °F / 20 °C to +140 °C) ±0.54 °F / ±0.3 °C (-4 °F to +67.98 °F / -20 °C to +19.99 °C) ±0.72 °F / ±0.4 °C (-40 °F to -4.02 °F / -40 °C to -20.01 °C)	±0.18 °F / ±0.1 °C (68 °F to +284 °F / 20 °C to +140 °C) ±0.54 °F / ±0.3 °C (-4 °F to +67.98 °F / -20 °C to +19.99 °C) ±0.72 °F / ±0.4 °C (-40 °F to -4.02 °F / -40 °C to -20.01 °C)	±0.18 °F / ±0.1 °C (68 °F to +284 °F / 20 °C to +140 °C) ±0.54 °F / ±0.3 °C (-4 °F to +67.98 °F / -20 °C to +19.99 °C) ±0.72 °F / ±0.4 °C (-40 °F to -4.02 °F / -40 °C to -20.01 °C)	±0.9 °F (±0.5 °C)	±0.9 °F (±0.5 °C)	±0.18 °F / ±0.1 °C (68 °F to +284 °F / 20 °C to +140 °C) ±0.54 °F / ±0.3 °C (-4 °F to +67.98 °F / -20 °C to +19.99 °C) ±0.72 °F / ±0.4 °C (-40 °F to -4.02 °F / -40 °C to -20.01 °C)	±0.9 °F (±0.5 °C)
32,700 Readings	32,700 Readings	32,700 Readings	500,000 Readings per Channel	32,767 Readings	32,700 Readings	1,000,000 Readings per Channel
IP68	IP68	IP68	IP65, Splash Proof	IP68	IP50 (no O-Ring) IP68 (with O-Ring)	Not Rated
316 Stainless Steel	316 Stainless Steel	316 Stainless Steel Enclosure: PTFE	Anodized Aluminum	316 Stainless Steel	Enclosure: 300 Series Stainless Steel Insulation: Dewar Flask & PTFE	304 Stainless Steel with PTFE insulation
IFC400 or IFC406	IFC400 or IFC406	IFC400 or IFC406	IFC200	IFC202	IFC400 or IFC406	IFC200
External RTD Probe	External RTD Probe	External RTD Probe	External Thermocouple Probe *Not Included*	Internal Sensor	External RTD Probe	External Thermocouple Probe, Type K Thermocouple Included
Refer to page 8	Refer to page 8	Refer to page 9	Refer to page 10	Refer to page 10	Refer to page 11	Refer to page 11

5. Establish Corrective Action Procedures
Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.

6. Establish a Record Keeping System
Establish documentation concerning all procedures and records appropriate to these principles and their application.

The MadgeTech Software makes record keeping a simple task. Easily tailor graphs and create custom reports for the product being processed to help comply with federal guidelines and regulations.

7. Establish Verification Procedures
Establish procedures for verification to confirm that the HACCP system is working effectively.

MadgeTech data loggers play a key role in the HACCP plan. MadgeTech offers SOP’s (Standard Operating Procedure’s) to aid the user to ensure the data loggers are installed correctly, operating properly and performing as they should.

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