

# HITEMP140-FR

## HIGH TEMPERATURE DATA LOGGER

### WITH 2" FAST RESPONSE

### PROBE



#### HiTemp140-FR Features

- Fast Response Time
- $\pm 0.1$  °C (0.18 °F) Accuracy
- Measures from -200 °C to +260 °C (-328 °F to +500 °F)
- Submersible (IP68)
- NIST traceable
- User Replaceable Battery
- Trigger Settings
- Programmable Start and Stop Time
- 4 Hz Reading Rate
- Battery Life Indicator

#### Benefits

- Simple Setup and Installation
- Minimal Long-Term Maintenance
- Long-Term Field Deployment

#### Applications

- Autoclave Verification and Mapping
- Seafood Processing
  - Smoked Lobsters, Shellfish & Shrimp
- Steam Sterilization
- Oven Profiling
- Roasting
- Flash Freezing
- Frying

#### HiTemp140-FR-TSK Features

- Withstands Temperatures between -200 °C up to 250 °C
- Submersible
- Vented or Flush Enclosure Options

#### Benefits

- Validate a Wide Range of Temperature Processes Using One Data Logger
- Durable Thermal Shield Protects Probe and Allows for a Fast Response Time

MadgeTech has designed the HiTemp140-FR, a high temperature data logger with an ultra-fast response time, to record temperature during rapidly changing thermal processes. This high temperature data logger features a 2 inch x 0.0625 inch diameter probe and is capable of recording up to 4 Hz, which is 4 times faster than other data loggers in this class. This allows the temperature sensor to quickly adapt and accurately record temperature variations in changing environments. Applications include oven profiling, steam sterilization, chamber mapping, seafood processing, flash freezing and more.

MadgeTech's entire HiTemp140 data logger series is designed with food grade stainless steel. The device can be placed in environments up to 140 °C and the probe is capable of measuring from -200 °C to +260 °C (-328 °F to +500 °F). The HiTemp140-FR is also available with an optional thermal shield enclosure to extend the operating range of the data logger to -200 °C to +250 °C (-328 °F to +482 °F). The HiTemp140-FR-TSK (Thermal Shield Kit) comes with either a vented or flush top enclosure to accommodate a multitude of applications.

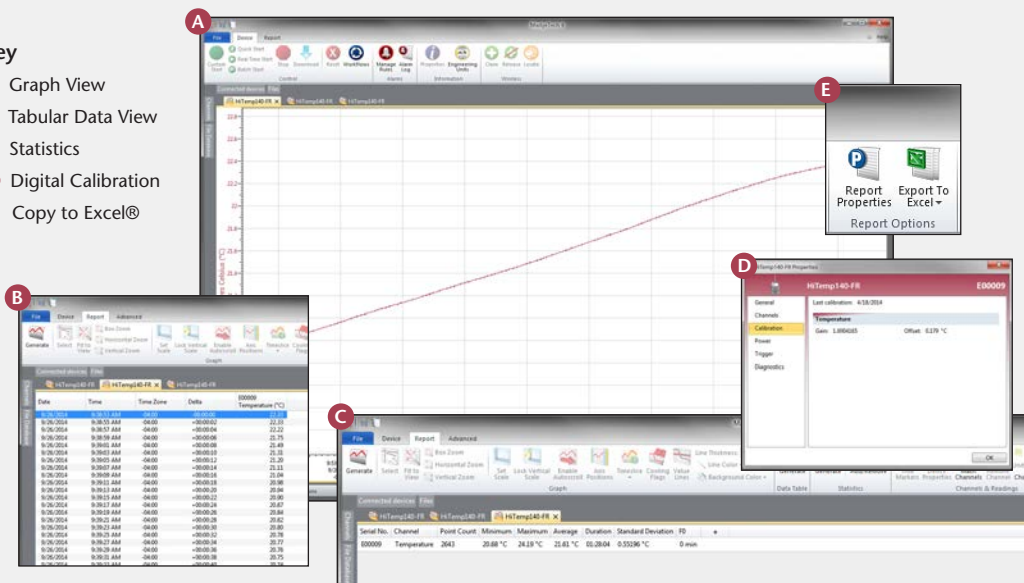
The Trigger Settings feature of the HiTemp140-FR allows users to configure high and low temperature thresholds that when met or exceeded, will automatically start or stop recording data to memory. This data logger is capable of storing up to 32,700 date and time stamped readings and features a nonvolatile solid state memory which retains data even if the battery becomes discharged.



## MADGETECH DATA LOGGER SOFTWARE

#### Key

- A** Graph View
- B** Tabular Data View
- C** Statistics
- D** Digital Calibration
- E** Copy to Excel®



#### Software Features:

- Multiple graph overlay
- Statistics
- Digital calibration
- Zoom in/ zoom out
- Lethality equations (F0, PU)
- Mean Kinetic Temperature
- Full time zone support
- Data annotation
- Min./Max./Average lines
- Data table view
- Automatic report generation
- Summary view
- Multilingual

# HITEMP140-FR SPECIFICATIONS\*

\*SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. SPECIFIC WARRANTY REMEDY LIMITATIONS

## Temperature

Temperature Sensor:	100 Ω Platinum RTD
Probe Measurement Range:	-200 °C to +260 °C (-328 °F to +500 °F)
Temperature Resolution:	0.01 °C (0.02 °F)
Calibrated Accuracy:	±0.1 °C/±0.18 °F (20 °C to +140 °C/68 °F to +284 °F)

## General

Data Logger Response Time:	In Air	In Water
	t <sub>60</sub> - 0:00:39 t <sub>90</sub> - 0:02:43	t <sub>60</sub> - 0:00:10 t <sub>90</sub> - 0:00:12
Reading Rate:	4 readings per second up to 1 reading every 24 hours	
Memory:	32,767 readings	
Start Modes:	<ul style="list-style-type: none"> <li>Software programmable immediate start</li> <li>Delay start up to 18 months in advance</li> </ul>	
Stop Modes:	Manual or Timed (specific date and time)	
Trigger Settings:	High & Low limits may be set. Once data meets or exceed sets limits, the device will record to memory. Bi-level start and stop triggers can also be programmed. Users can specify the number of readings to take after the device triggers.	
Readings in Trigger Settings Mode:	10,922 readings	
Real Time Recording:	May be used with PC to monitor & record data in real time	
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:	3.6V high-temperature lithium battery included; user replaceable
Battery Life:	2 years typical (1 minute reading rate)
Calibration:	Digital calibration through software
Calibration Date:	Automatically recorded within device
Data Format:	Date and time stamped °C, °F, °R, K
Time Accuracy:	±1 minute/month at 25 °C Extended Operation: ±202 minutes/month at 140 °C (±450 ppm)
Computer Interface:	IFC400 or IFC406 USB docking station required; 125,000 baud
Operating System Compatibility:	XP SP3/Vista/Windows 7/Windows 8
MadgeTech Software Compatibility:	<ul style="list-style-type: none"> <li>MadgeTech Standard Software version 4.2.3.0 or later</li> <li>MadgeTech Secure Software version 4.2.2.0 or later</li> </ul>
Operating Environment:	-40 °C to +140 °C (-40 °F to +284 °F), 0 %RH to 100 %RH, 0.002 PSIA to 100 PSIA
IP Rating:	IP68
Dimensions (body):	1.89 in x 0.970 in x 0.970 in (48 mm x 24.6 mm x 24.6 mm)
Dimensions (probe):	1.75 in x 0.0625 in dia. (0.188 in transitional dia.) 44.5 mm x 1.59 mm (4.78 mm Transitional dia.)
Weight:	65 g (2.3 oz)
Materials:	316 Stainless Steel, PEEK
Approvals:	CE

# HITEMP140-FR-TSK SPECIFICATIONS\*

Data Logger Response Time with Thermal Shield:	HiTemp140-FR-TSK (Flush)		HiTemp140-FR-TSK (Vented)	
	Exposure Time in Air	Exposure Time in Water	Exposure Time in Air	Exposure Time in Water
t <sub>60</sub> - 0:00:30	t <sub>60</sub> - 0:00:09	t <sub>60</sub> - 0:00:59	t <sub>60</sub> - 0:00:10	
t <sub>90</sub> - 0:13:10	t <sub>90</sub> - 0:00:12	t <sub>90</sub> - 0:22:10	t <sub>90</sub> - 0:00:12	
Dimensions (enclosure):	2.75 in x 2.0 in dia. (69.85 mm x 51 mm dia.)		4.3 in x 2.0 in dia. (109.2 mm x 50.8 mm dia.)	
Weight:	6.7 oz (190 g) not including data logger		9.5 oz (270 g) not including data logger	
Operating Environment:	-200 °C to +250 °C (-328 °F to +482 °F) (Time limited) 0 %RH to 100 %RH			
Material:	Enclosure: PTFE			

Maximum Exposure Time Chart	HiTemp140-FR-TSK (Flush)		HiTemp140-FR-TSK (Vented)	
	Exposure Time in Air (150 °C/302 °F)	Exposure Time in Liquid (150 °C/302 °F)	Exposure Time in Air (150 °C/302 °F)	Exposure Time in Liquid (150 °C/302 °F)
Ambient Temperature				
-200 °C (-328 °F)	12 minutes	N/A	14 minutes	N/A
-180 °C (-292 °F)	13 minutes	N/A	15 minutes	N/A
-160 °C (-256 °F)	15 minutes	N/A	16 minutes	N/A
-140 °C (-220 °F)	17 minutes	N/A	18 minutes	N/A
-120 °C (-184 °F)	19 minutes	N/A	21 minutes	N/A
-100 °C (-148 °F)	22 minutes	N/A	24 minutes	N/A
-80 °C (-112 °F)	27 minutes	N/A	30 minutes	N/A
-60 °C (-76 °F)	37 minutes	22 minutes	42 minutes	25 minutes
-40 °C to +140 °C (-40 °F to +284 °F)	Indefinitely	Indefinitely	Indefinitely	Indefinitely
150 °C (302 °F)	59 minutes	34 minutes	66 minutes	40 minutes
160 °C (320 °F)	51 minutes	29 minutes	57 minutes	34 minutes
170 °C (338 °F)	43 minutes	25 minutes	48 minutes	29 minutes
180 °C (356 °F)	37 minutes	23 minutes	42 minutes	26 minutes
190 °C (374 °F)	34 minutes	20 minutes	38 minutes	23 minutes
200 °C (392 °F)	31 minutes	18 minutes	34 minutes	21 minutes
210 °C (410 °F)	29 minutes	17 minutes	32 minutes	19 minutes
220 °C (428 °F)	27 minutes	16 minutes	30 minutes	18 minutes
230 °C (446 °F)	25 minutes	15 minutes	27 minutes	17 minutes
240 °C (464 °F)	23 minutes	14 minutes	26 minutes	16 minutes
250 °C (482 °F)	22 minutes	13 minutes	24 minutes	15 minutes

## Disclaimer and Terms of Use

Listed specifications can be used to determine maximum allowable exposure times for the HiTemp140 with Thermal Shield at different temperatures beyond the normal operating range of the logger. Both the data logger and Thermal Shield must be at ambient temperature (approximately 25 °C) before being placed in the extreme temperature environment.

Immediately following exposure to high temperature, the data logger should be removed from the thermal shield (using appropriate precautions, as it could be VERY hot) OR the datalogger and shield should be placed in a water bath (approximately 25 °C) for at least 15 minutes to allow it to cool. Failing to do this may allow heat trapped in the Thermal Shield to continue to heat the datalogger to potentially unsafe levels.

If your application involves a ramp up to a temperature above 140 °C and/or any complex temperature profile that isn't simply a constant temperature, please contact MadgeTech to determine whether the HiTemp140 with Thermal Shield is suitable. Please provide MadgeTech with a detailed description of your temperature profile, including temperatures, durations, ramp times, and process media (air, steam, oil, water, etc.) If MadgeTech is unable to definitively calculate the suitability of our product for your application, we can provide a test unit outfitted with a high temperature indicator sticker. This sticker has an indicator dot which will turn black if exposed to temperatures above 143 °C. Apply the sticker to the bottom of the data logger itself (not the thermal shield), remove the battery for safety, place the data logger into the thermal shield and run the assembly through the proposed temperature program. The first indicator dot on the sticker will turn black at 143 °C. If that happens, the HiTemp140 with thermal shield is not appropriate for the application and we will work to find a solution that is.

**BATTERY WARNING:** WARNING: FIRE, EXPLOSION, AND SEVERE BURN HAZARD. DO NOT SHORT CIRCUIT, CHARGE, FORCE OVER DISCHARGE, CRUSH, PENETRATE, OR INCINERATE. BATTERY MAY LEAK OR EXPLODE IF HEATED ABOVE 150 °C (302 °F).

## ORDERING INFORMATION

MODEL	DESCRIPTION
HiTemp140-FR	High Temperature Data Logger with a 2 inch Fast Response Probe.
HiTemp140-FR-TSK	HiTemp140-FR data logger and thermal shield (Flush or Vented).
HiTemp140-TS	Thermal Shield for the HiTemp140-FR data logger (Flush or Vented).
IFC400	Docking station with USB cable, software and manual.
IFC406	6 Port, Multiplexer docking station with USB cable, software and manual.
ER1425S-HT	Replacement battery for the HiTemp140-FR.

