RHTEMP1000EX

Intrinsically Safe Temperature and Humidity Data Logger with Stainless Steel Enclosure

PRODUCT USER GUIDE

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

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Product Notes

The **RHTemp1000Ex** carries hazardous location, intrinsically safe certification in accordance with the latest issue of:
IECEx 60079-0, IECEx 60079-11
Directive 2014/34/EU (known as ATEX)
FM3600, FM3610

Certified Intrinsically Safe for:

- Electrical Protection Concepts: IEC: 60079-11 Ex ia – Ex ic, Intrinsic Safety Zones 0-2
- Equipment Protection Level: Ga – Gc, Zones 0-2
- Gas Groups: IIC
- Temperature Class: T4

Operational Warnings

- When used in hazardous locations, the RHTemp1000Ex is to be ***installed prior*** to the location becoming hazardous and removed only after the area is no longer hazardous.
- The maximum allowed ambient temperature for the RHTemp1000Ex (under any circumstances) is 80 °C. The minimum rated operating temperature is -40 °C.
- The RHTemp1000Ex is approved for use only with the Tadiran TL-2150 battery. Replacement with any other battery will void the safety rating.
- Batteries are user replaceable, but are to be removed or replaced only in locations known to be non-hazardous.
- Tampering or replacement of non-factory components may adversely affect the safe use of the product, and prohibited. Except for replacement of the battery, the user may not service the RHTemp1000Ex. MadgeTech, Inc. or an authorized representative must perform all other service to the product.

Ordering Information

- 902154-00 — RHTemp1000Ex
- 900319-00 — IFC400
- 900325-00 — IFC406

Installation Guide

Installing the Software

The Software can be downloaded from the MadgeTech website at **madgetech.com**. Follow the instructions provided in the Installation Wizard.

Installing the Interface Cable

IFC400 or IFC406 — Follow the instructions provided in the Installation Wizard to install the USB Interface Drivers. Drivers can also be downloaded from the MadgeTech website at **madgetech.com**.

Device Operation

Connecting and Starting the Data Logger

1. Once the software is installed and running, plug the interface cable into the docking station (IFC400 or IFC406).
2. Connect the USB end of the interface cable into an open USB port on the computer.
3. Place the data logger into the docking station (IFC400 or IFC406).
4. The data logger will automatically appear under **Connected Devices** within the software.
5. 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.)*
6. The status of the device will change to **Running**, **Waiting to Start** or **Waiting to Manual Start**, depending upon your start method.
7. 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, unless user selectable memory wrap is enabled. At this point the device cannot be restarted until it has been re-armed by the computer.*

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Device Operation (cont'd)

Downloading Data from a Data Logger

1. Place the logger into the docking station (IFC400 or IFC406).
2. Highlight the data logger in the **Connected Devices** list. Click **Stop** on the menu bar.
3. Once the data logger is stopped, with the logger highlighted, click **Download**. You will be prompted to name your report.
4. Downloading will offload and save all the recorded data to the PC.

Device Maintenance

Battery Replacement

Materials: Replacement Battery (Tadiran TL-2150/S)

1. Observe Operational Warnings when removing and replacing the battery.
2. Unscrew the bottom of the data logger and remove the battery.
3. Place the new battery into the logger. ***Caution:*** *Observe correct battery polarity when installing.*
4. Screw the cover onto the data logger.

O-Rings

O-ring maintenance is a key factor when properly caring for the RHTemp1000Ex. 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 at **madgetech.com**, for information on how to prevent O-ring failure.

Recalibration

Recalibration is recommended annually. To send devices back for calibration, visit **madgetech.com**.

Additional Services:
Custom calibration and verification point options available, please call for pricing.

Call for custom calibration options to accommodate specific application needs. Prices and specifications subject to change. See MadgeTech's terms and conditions at ***madgetech.com****.*
To send devices to MadgeTech for calibration, service or repair, please use the MadgeTech RMA Process by visiting ***madgetech.com****.*

PRODUCT USER GUIDE

Description	RHTemp1000Ex
Temperature Sensor	Resistance Temperature Detector (RTD)
Temperature Range	-40 °C to +80 °C (-40 °F to +176 °F)
Temperature Resolution	0.01 °C (0.018 °F)
Calibrated Accuracy	±0.5 °C (0 °C to ±50 °C), ±0.9 °F (32 °F to 122 °F)
Humidity Sensor	Capacitive Polymer
Humidity Range	0 %RH to 100 %RH (non-condensing)
Humidity Resolution	0.1 %RH
Calibrated Accuracy	±3 %RH maximum
Specified Accuracy Range	25 %RH to 75 %RH, +20 °C to +40 °C Hysteresis Error 1 % Typical, 3% Maximum
Memory	32,767 Readings
Start Modes	Software programmable immediate or delay start, up to 2 years in advance
Real Time Recording	May be used with PC to monitor and record data in real time (PC interface not IS rated)
Reading Rate	1 reading every 2 seconds up to 1 reading every 12 hours
Lethality Equations	Sterilization Units and Pasteurization Units are available within software with a click of a button
Calibration	Digital calibration through software
Calibration Date	Automatically recorded within device and displayed in software
Battery Type	3.6V lithium battery included, user replaceable
Battery Life	2 years typical at 15 minute reading rate
Data Format	Date and time stamped °C, °F, K, °R
Time Accuracy	10 seconds/month (at 0 °C to 50 °C)
Required Interface Package	IFC400 or IFC406
Operating System Compatibility	Windows XP SP3 or later
MadgeTech Software Compatibility	Standard Software version 4.2.16.0 or later Secure Software version 4.2.15.0 or later
Operating Environment	-40 °C to +80 °C, 0 %RH to 95 %RH (case properly sealed)
Dimensions	1.7 in x 0.97 in x 0.97 in (42 mm x 24.6 mm x 24.6 mm)
Weight	2.3 oz (65 g)
Materials	316 Stainless Steel/Radel
IP Rating	Not Rated - **Caution:** Do not submerge this product to retain IS rating
Approvals	CE ATEX Certificate #: 19ATEX0126 IECEx Certificate #: BAS 19.0109 FM3610 approval by SGS North America, Inc.

Battery Warning: *FIRE, EXPLOSION, AND SEVERE BURN HAZARD. DO NOT SHORT CIRCUIT, CHARGE, FORCE OVER DISCHARGE, DISASSEMBLE, CRUSH, PENETRATE OR INCINERATE. BATTERY MAY LEAK OR EXPLODE IF HEATED ABOVE 80 °C (176 °F).*

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

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6 Warner Road, Warner, NH 03278
(603) 456-2011 • info@madgetech.com • madgetech.com

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APPENDIX A

EU Declaration of Conformity

No. DC-201901

The name and address of the manufacturer:
MadgeTech, Inc.
6 Warner Road
Warner, NH 03278 USA

Product model and description:
902154-00 RHTemp1000Ex – Temperature and Humidity Data Logger
902153-00, 902155-00, 902156-00, 902157-00 Temp1000EX Temperature Data Logger

This product conforms with the following Union harmonization legislation:
2014/34/EU

The following harmonized standards and other technical specification were used in support of the declaration:

Harmonized Standards:	EN 60079 - 0	Edition 2018
	EN 60079 - 11	Edition 2012
Other Standards and Specifications used:	None	

Notified body SGS Baseefa, number 1180 performed EU-Type examination in accordance with Annex III of the directive and issued the certificate: Baseefa19ATEX0126

Notified body SGS Baseefa, number 1180 performed Conformity to type based on quality assurance of the production process in accordance with Annex IV of the directive and issued the QA Notification document: Baseefa19ATEX0126

Declared on behalf of MadgeTech, Inc.

Dianne Moulton , Quality Manager
Issued from MadgeTech, Inc. Warner, NH USA November 26, 2019

1 # EU - TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU**

3 EU - Type Examination Certificate Number: **Baseefa19ATEX0126**

4 Product: **RHTEMP1000EX and TEMP1000EX**

5 Manufacturer: **MadgeTech, Inc**

6 Address: **6 Warner Road, Warner, NH 03278, USA**

7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 SGS Baseefa, Notified Body number 1180, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. **GB/BAS/ExTR19.0287/00**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 EN 60079-11:2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

Ⓔx II 1G Ex ia IIC T4 Ga (-40°C ≤ Ta ≤ +80°C)

SGS Baseefa Customer Reference No. **8001** Project File No. **19/0594 (SUW-4437700-TRF-03)**

SGS Baseefa Limited
Rockhead Business Park, Staden Lane,
Buxton, Derbyshire SK17 9RZ
Telephone +44 (0) 1298 766600 Fax +44 (0) 1298 766601
e-mail baseefa@sgs.com web site www.sgs.co.uk/sgsbaseefa
Registered in England No. 4305578.
Registered address: Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN

R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

13 **Schedule**

14 **Certificate Number Baseefa19ATEX0126**

15 Description of Product

The product is a temperature sensor TEMP1000EX and temperature with humidity sensor RHTEMP1000EX with additional model variants. These dataloggers are to monitor temperature and humidity for intended area of deployment. The data logging stops once the maximum memory capacity is reached. This data is extracted by removing the product from the area of deployment and putting it onto a docking station, through serial communication. Data recording will re-start only once reset by the computer. The data is then collected. These sensors are designed to be intrinsically safe for temperature range of -40°C < Tamb < 80°C. Equipment is designed for Zone 0, under EPL Ga for gas group IIC, classified under temperature code T4. Humidity range for the product is from 0% to 100% on RH scale. Equipment is powered by one Tadiran TL 2150 1/2AA cell. Product dimensions for TEMP Model Series is 2.65 in. X .97 in. dia., with various lengths of probe attachments based on utilization. And, RHTEMP Model Series is 1.7 in. X 0.97 in. X 0.97 in. They appear alike and are cylindrical portable sensors, with probe attachments, which is the difference in the Model Series.

16 Report Number

GB/BAS/ExTR19.0287/00

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.4.1	External effects
1.4.2	Aggressive substances, etc.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
902153-00	1 of 1	1.0	07/26/2019	TEMP1000EX-2, 2" PROBE TEMP DATA LOGGER ATEX/IECEX
SUB-1367006-02	1 of 1	1.0	07/26/2019	TEMP1000EX-2 MANUFACTURED ASSEMBLY
SUB-1367007-XX	1 of 1	1.0	07/22/2019	TEMP1000EX-XX ELECTRICAL ASSEMBLY
SUB-2105007-01	1 of 1	1.0	07/26/2019	1000EX PCB SUB ASSEMBLY
SUB-2106007-02	1 of 1	1.1	11/22/2019	HITEMP140 & 1000Ex 2" PROBE BOARD SUB ASSEMBLY
SVC-2104007-00	1 of 1	1.1	11/22/2019	BOARD HT & 1000Ex 2-PIN BATTERY CONTACT PCB ASSEMBLY
SVC-2105007-01	1 to 2	1.1	11/22/2019	1000EX PCB ASSEMBLY
902154-00	1 of 1	1.0	07/26/2019	RHTEMP1000EX, TEMP&RH DATA LOGGER, ATEX/IECEX
SUB-1368006-00	1 of 1	1.0	07/26/2019	RHTEMP1000EX MANUFACTURED ASSEMBLY
SUB-1368007-00	1 of 1	1.0	07/26/2019	RHTEMP1000EX ELECTRICAL ASSEMBLY
SUB-2107007-00	1 of 1	1.0	07/22/2019	HITEMP140 & 1000EX RH ADAPTER ASSEMBLY
SVC-2107007-01	1 of 1	1.1	11/22/2019	PCB ASSEMBLY, HITEMP140 & 1000EX RH SENSOR ADAPTER ASSEMBLY

Number	Sheet	Issue	Date	Description
902155-00	1 of 1	1.0	07/26/2019	TEMP1000EX-1, 1" PROBE TEMP DATA LOGGER ATEX/IECEX
SUB-1367006-01	1 of 1	1.0	07/26/2019	TEMP1000EX-1 MANUFACTURED ASSEMBLY
SUB-1367007-01	1 of 1	1.0	07/22/2019	TEMP1000EX-1 ELECTRICAL ASSEMBLY
902156-00	1 of 1	1.0	07/26/2019	TEMP1000EX-5.25, 5.25" PROBE TEMP DATA LOGGER ATEX/IECEX
SUB-1367006-03	1 of 1	1.0	07/26/2019	TEMP1000EX-5.25 MANUFACTURED ASSEMBLY
SUB-2106007-03	1 of 1	1.1	11/22/2019	HITEMP140 & 1000Ex 5.25" PROBE BOARD SUB ASSEMBLY
902157-00	1 of 1	1.0	07/26/2019	TEMP1000EX-7, 7" PROBE TEMP DATA LOGGER ATEX/IECEX
SUB-1367006-04	1 of 1	1.0	07/26/2019	TEMP1000EX-7 MANUFACTURED ASSEMBLY
SUB-2106007-04	1 of 1	1.1	11/22/2019	HITEMP140 & 1000Ex 7" PROBE BOARD SUB ASSEMBLY
DOC-902154-00	1 of 1	1.0	07/24/2019	RHTEMP100EX, TEMPERATURE AND HUMIDITY DATA LOGGER ATEX/IECEX
DOC-902155-00	1 of 1	1.0	07/24/2019	TEMP100EX-1, 1-INCH PROBE TEMPERATURE DATA LOGGER ATEX/IECEX
DOC-2104002-00	1 of 1	1.0	01/21/2019	HITEMP140 AND 1000EX SCHEMATIC DRAWING, 2-PIN BATTERY CONNECTION
DOC-2104003-00	1 of 1	1.0	01/21/2019	PCB ASSEMBLY, HITEMP140 AND 1000EX 2-PIN BATTERY CONNECTION
DOC-2105002-01	1 of 1	1.0	03/25/2019	SCHEMATIC DRAWING 1000EX PCB
DOC-2105003-01	1 of 1	1.0	05/30/2019	PCB ASSEMBLY, 1000EX
DOC-2106002-XX	1 of 1	1.0	05/31/2019	HITEMP140 AMD 1000EX SCHEMATIC DRAWING, RIGID AND FLEXIBLE ROBE ADAPTER
DOC-2106003-XX	1 of 1	1.0	05/31/2019	PCB ASSEMBLY, HITEMP140 AND 1000EX RIGID AND FLEXIBLE PROBE ADAPTER
DOC-2107002-01	1 of 1	1.0	05/31/2019	HITEMP140 AND 1000EX RELATIVE HUMIDITY SCHEMATIC DRAWING, SENSOR ADAPTER (RHI)
DOC-2107003-01	1 of 1	1.0	05/31/2019	PCB ASSEMBLY, HITEMP140 AND 1000EX RELATIVE HUMIDITY SENSOR ADAPTER (RHi)

The above drawings are associated and held with IECEx Certificate No. IECEx BAS 19.0109 Iss. 0