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)

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/S 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 is 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
- 902208-00 — RHTemp1000Ex-KR
- 900319-00 — IFC400
- 900325-00 — IFC406
- 901745-00 — Battery Tadiran TL-2150/S

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 USB Interface Drivers

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**.
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. Move device to a non-hazardous location before replacing battery.
2. Observe Operational Warnings when removing and replacing the battery.
3. Unscrew the bottom of the data logger and remove the battery.
4. Place the new battery into the logger. ***Caution:*** *Observe correct battery polarity when installing.*
5. 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****.*

Communication

To ensure desired operation of the RHTemp1000Ex, **please keep the surface clear of any foreign objects or substances**. The RHTemp1000Ex's data is downloaded through external contact with the IFC400 or IFC406 docking station. Covering the surface with foreign objects **(i.e. Calibration Labels)** can prevent the communication and/or downloading process.

PRODUCT USER GUIDE

Temperature Specifications	
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 Specifications	
Humidity Sensor	Capacitive Polymer
Humidity Range	0 %RH to 100 %RH (non-condensing)
Humidity Resolution	0.1 %RH
Calibrated Accuracy	±3.0 %RH maximum
Specified Accuracy Range	25 %RH to 75 %RH, +20 °C to +40 °C Hysteresis Error 1 % typical, 3 % Maximum

General Specifications	
Memory	32,768 readings
Start Modes	Software programmable immediate start 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 second up to 1 reading every 24 hours
Calibration	Digital calibration through software
Calibration Date	Automatically recorded within device and displayed in software
Battery Type	Tadiran TL-2150/S 3.6V lithium battery included, user replaceable in a non-hazardous location
Battery Life	2 years typical at 15 minute reading rate
Data Format	Date and time stamped °C, °F, K, °R; %RH, mg/mL, Dew Point
Time Accuracy	10 seconds/month (at 0 °C to 50 °C)
Computer Interface	IFC400 or IFC406
Operating System Compatibility	Windows XP SP3 or later
Software Compatibility	Standard Software version 4.2.17.0 or later Secure Software version 4.2.16.0 or later
Operating Environment	-40 °C to +80 °C, 0 %RH to 100 %RH (case properly sealed)
Dimensions	Without Key Ring: 1.67 in x 0.97 in dia. (42.3 mm x 24.6 mm dia.) With Key Ring: 1.98 in x 0.97 in dia. (50.2 mm x 24.6 mm dia.)
Weight	Without Key Ring: 2.4 oz (68 g) With Key Ring: 2.2 oz (63 g)
Material	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

***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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DOC-1368036-00 REV 4 2020.08.05

APPENDIX A

EU Declaration of Conformity

No. DC-2020-03

According to EN ISO/IEC 17050-1:2004

The name and address of the manufacturer:

MadgeTech, Inc.
6 Warner Road
Warner, NH 03278 USA

Product model and description:

902153-00 - Temp1000EX-2
902154-00 - RHTemp1000EX
902155-00 - Temp1000EX-1
902156-00 - Temp1000EX-5.25
902157-00 - Temp1000EX-7
902208-00 - RHTemp1000EX-KR
902209-00 - Temp1000EX-1-KR
902210-00 - Temp1000EX-2-KR
902211-00 - Temp1000EX-5.25-KR
902212-00 - Temp1000EX-7-KR

This product conforms with the following Union harmonization legislation:

2014/34/EU – ATEX Directive

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

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

Additionally, product complies with the essential requirements, and carries the CE marking accordingly with:

2014/30/EU – EMC Directive
2011/65/EU – RoHS Directive

And conforms with the following product standards and/or normative documents:

IEC 61326-1 Edition 2013

Emission Requirements

CISPR 11, Radiated Emissions, 30 MHz to 1 GHz
Limit: CISPR 11, Group 1, Class A
Limit: FCC Class A

Enclosure Port

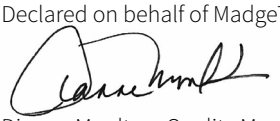
IEC 61000-4-2, Electrostatic Discharge
Level: 4 kV Contact, 8 kV Air Discharges

IEC 61000-4-3, Radiated Immunity (EM Field)
Level: 10 V/M, 80 to 1000 MHz
3 V/M, 1.4 to 2.0 GHz
1 V/M, 2.0 to 2.7 GHz

Supplementary Information:

The products were tested in a typical usage configuration.
RoHS Exemptions applied
6(a)), 7(c)-II

Declared on behalf of MadgeTech, Inc.



Dianne Moulton, Quality Manager
Issued from MadgeTech, Inc. Warner, NH USA February 24, 2020

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 – Issue 1**

4 Product: **RHTEMP1000EX and TEMP1000EX**

5 Manufacturer: **MadgeTech, Inc**

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

7 This re-issued certificate extends EU Type Examination Certificate No. Baseefa19ATEX0126 to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached 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. **See Certificate History**

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. **20/0143**

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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 – Issue 1

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. In addition, there is mechanical key ring feature provided on enclosure for aesthetic looks only. This design does not relate to safety or protection type of the product.

16 Report Number

See Certificate History

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

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
SUB-1367006-02	1 of 1	1.1	2/10/2020	TEMP1000EX-2 (IS) MANUFACTURED ASSEMBLY
SUB-1367006-01	1 of 1	1.1	2/10/2020	TEMP1000EX-1 (IS) MANUFACTURED ASSEMBLY
SUB-1367006-K1	1 of 1	1.0	2/10/2020	TEMP1000EX-1-KR (IS) MANUFACTURED ASSEMBLY WITH KE
SUB-1367006-K2	1 of 1	1.0	2/10/2020	TEMP1000EX-2-KR (IS) MANUFACTURED ASSEMBLY WITH KE
SUB-1367006-K3	1 of 1	1.0	2/10/2020	TEMP1000EX-5.25-KR (IS) MANUFACTURED ASSEMBLY WITH
SUB-1367006-K4	1 of 1	1.0	2/10/2020	TEMP1000EX-7-KR (IS) MANUFACTURED ASSEMBLY WITH KE
SUB-1368006-00	1 of 1	1.1	2/10/2020	RHTEMP1000EX (IS) MANUFACTURED ASSEMBLY
SUB-1368006-K0	1 of 1	1.0	2/10/2020	RHTEMP1000EX-KR (IS) MANUFACTURED ASSEMBLY WITH K
SUB-1367006-03	1 of 1	1.1	2/10/2020	TEMP1000EX-5.25 (IS) MANUFACTURED ASSEMBLY
SUB-1367006-04	1 of 1	1.1	2/10/2020	TEMP1000EX-7 (IS) MANUFACTURED ASSEMBLY

Number	Sheet	Issue	Date	Description
DOC-902154-00	1 of 1	1.1	1/17/2020	RHTEMP100EX, TEMPERATURE AND HUMIDITY DATA LOGGER
DOC-902155-00	1 of 1	1.1	1/15/2020	TEMP100EX TEMPERATURE DATA LOGGER

Current drawings which remain unaffected by this issue:

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-1367007-XX	1 of 1	1.0	07/22/2019	TEMP1000EX-XX ELECTRICAL ASSEMBLY
SVC-2105001-01	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-1368007-00	1 of 1	1.0	07/26/2019	RHTEMP1000EX ELECTRICAL ASSEMBLY
SVC-2107007-01	1 of 1	1.1	11/22/2019	PCB ASSEMBLY, HITEMP140 & 1000EX RH SENSOR ADAPTER ASSEMBLY
902155-00	1 of 1	1.0	07/26/2019	TEMP1000EX-1, 1" PROBE TEMP DATA LOGGER ATEX/IECEX
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-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-2106007-04	1 of 1	1.1	11/22/2019	HITEMP140 & 1000Ex 7" PROBE BOARD SUB ASSEMBLY
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.

20 Certificate History

Certificate No.	Date	Comments
Baseefa19ATEX0126	19 December 2019	The release of the prime certificate. The associated test and assessment against the requirements of EN IEC 60079-0: 2018 & EN 60079-11: 2012 is documented in Certification Report No. GB/BAS/ExTR19.0287/00 (held with IECEx BAS 19.0109 Iss. 0), Project File No. 19/0594.
Baseefa19ATEX0126 Issue 1	27 July 2020	This issue of the certificate permits the addition of variants of the equipment fitted with a key ring and other minor drawing changes not affecting the original assessment. The equipment description on page 2 of the certificate was updated to include reference to these key ring variants. No additional changes performed under this revision. The associated test and assessment of the above is documented in Certification Report No. GB/BAS/ExTR20.0079/00 (held with IECEx BAS 19.0109 Iss. 1), Project File No. 20/0143.
For drawings applicable to each issue, see original of that issue.		