THE DATA LOGGER CATALOG

MADGETECH
WE BUILD DATA LOGGERS

MADGETECH
WE BUILD DATA LOGGERS

From the President

MadgeTech, Inc. is a global company, based in New England and founded on some old-fashioned principles, customer service, quality, and trust. Our Can Do team of engineers and technical staff has consistently incorporated new and innovative ideas into our data loggers. In short, we have pushed the envelope and raised the bar in innovation and quality. Our competitors have praised us by adopting many of our ideas as their own. Over time, MadgeTech has taken the lead and become the industry standard in the low-cost, reusable data logger market.

MadgeTech continuously strives to develop 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. We have been able to accomplish an excellent growth record in all areas of business through continuous improvements in design, customer-service, and quality. Our employees are committed to quality and customer satisfaction. Behind the full range of MadgeTech's products is the cumulative expertise of experienced engineers, manufacturing and electronic professionals and technicians. Each sales person 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 our success is shown as the name MadgeTech becomes synonymous with Data Loggers.

Finally, on behalf of the entire staff here at MadgeTech I wish to thank you, our customers, for providing us with the feedback necessary to make us a better company. A lot of hard work and effort was expended to produce this catalog. Every attempt was made to make it helpful, accurate and somewhat entertaining. Your feedback is always welcome. As the president of MadgeTech it is my job to tell you how exciting all of our products are. If you're like me, you will want to jump right to what is new and innovative and exciting. For those people, I suggest turning to pages 24, 25, 48, 51, 82 and 101.

Norman E. Carlson,

Founder and President

MadgeTech data loggers are small, battery-powered, intelligent, electronic devices that record measurements of physical parameters in the world, for later retrieval by computers. Our data loggers are fully enhanced with our software, which is unsurpassed in both ease of use and performance. As current technology constantly improves, MadgeTech defines its mission to incorporate the latest technology within its data loggers as soon as available. This has enabled MadgeTech to take the lead in price and performance, as we continue our commitment to pursue improvements in our existing data loggers as well as design and develop new ones.

Table of Contents

Table of Contents

The MadgeTech Software is unique in the industry for making complicated analyses simple.

The software starts with basic data logger functions: starting, stopping, and downloading the MadgeTech data loggers. All of these functions bring up intuitive windows allowing users to view and set parameters to their specific needs.

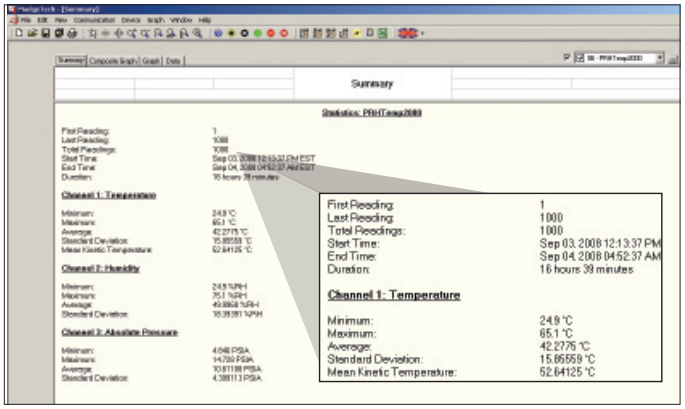
CUSTOMIZABLE GRAPHS

There are many ways the data graphs can be customized for presentation. Adding annotations (see page 4) and graph titles make the graph understandable. Aesthetics can also be addressed; the graphs can change in color (lines, data background), line thickness, data point frequency and datapoint symbols. The time and data axis spans are fully configurable to allow the user to analyze certain sections of data.

For visual identification the maximum, minimum, average and Mean Kinetic Temperature (MKT) lines can be viewed on the graph. A fixed value line can also be shown to recognize a critical temperature point.

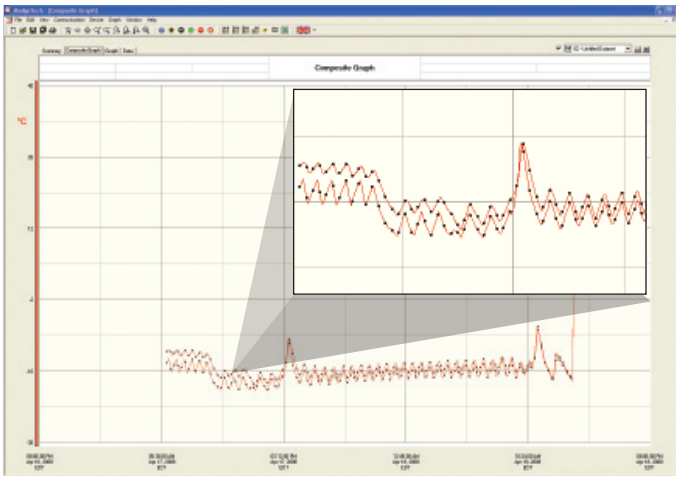
SUMMARY VIEW AND TABLE VIEW

For immediate analysis and review, the Summary tab shows the statistical data (as appropriate) for the data visible in the graph window. For example, if the MKT of a Temp101 data set is required for a certain time period, the horizontal (time) zoom tool is used to select the duration. Then when the Summary tab is clicked, the MKT of the temperature data from the time period will be calculated and displayed. The Data tab shows the time stamp and data values of each sample in a matrix format.



OVERLAYED GRAPHS

For profiling, graphs from multiple data loggers can be overlayed onto a single graph for simple, easy comparison. For example, for an overall thermal profile of a warehouse or clean room each dataset can be displayed on one graph for comparison. Switching between viewing one dataset and multiple datasets is handled by simply clicking the Graph and Composite Graph tabs located at the top of the screen. The Composite Graph tab shows all the open datasets, while the Graph tab shows only one dataset at a time. The Composite Graph can synchronize the time scales to time-align all data or simply overlay all data to compare datasets from different runs.



UNITS OF MEASURE AND ANALYSIS

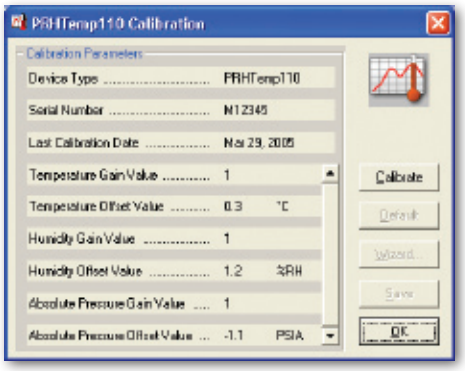
The MadgeTech software effortlessly converts data into the industry standard measurement units. Most common measurement units are available to minimize manual conversion. Users can easily switch from displaying one unit of measurement to another. Unit preferences can be stored such that all data is displayed in the user's preferred unit and range. Complex analyses such as Mean Kinetic Temperature, Sterilization Units and Pasteurization Units can be performed with just one click of the mouse. If custom analysis is needed beyond what the software can perform, the data can be automatically exported to an MS Excel® spreadsheet.

ENGINEERING UNITS

One of the most useful features in the software is the ability to use customizable Engineering Units. Loggers that measure current, voltage, pulse, state, and event can convert the measured data to a more appropriate unit. For example, a 4-20mA flow meter might output 4mA for 0 liters of water and 20mA for 5 liters of water. Using Engineering Units, a user can set up the Logger to display the data in liters rather than milliamps — a useful feature for presentations! Multiple channel data loggers can have different Engineering Units for each channel. For example, if a QuadVolt is used to study a battery powered system, the Engineering Units could be set as follows: Ch. 1 – battery voltage; Ch. 2 - charge current; Ch. 3 - discharge current; Ch. 4 - battery temperature.

DIGITAL CALIBRATION

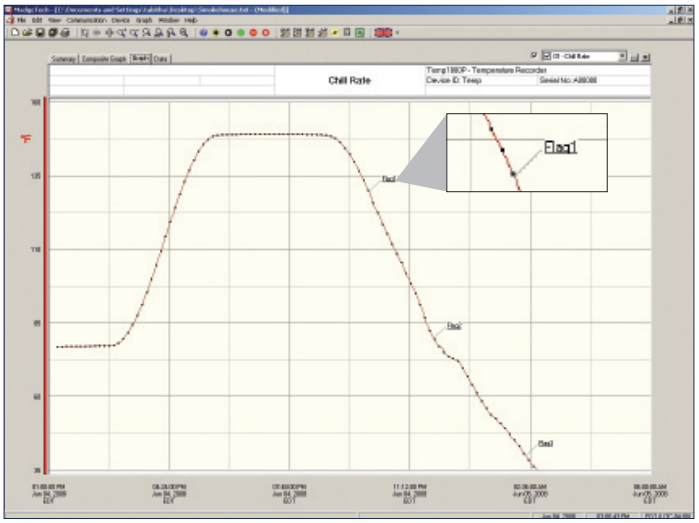
For added convenience, our software allows the user to calibrate the data logger with either a one-point or two–point calibration (sensor and logger dependent). This is especially useful when using probes since calibration parameters can change from one probe to another.



For ease of use the software has a calibration wizard which asks for the calibration points (e.g. the actual value & measured value of two separate points) and calculates, then inserts the appropriate calibration coefficients automatically.

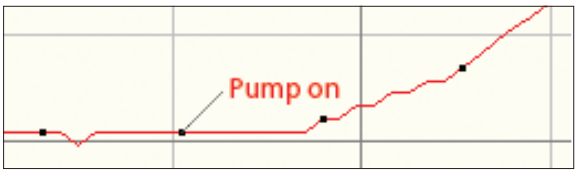
HACCP COOLING FLAGS

To satisfy HACCP requirements, the MadgeTech software allows the input of up to five critical control points. Each point is clearly marked on the graph and the summary tab provides the temperature, time elapsed and rate of cool down in degrees per minute, providing instant visual verification they have been met. Records can be printed for auditor reviews, while electronic hard copies can be saved to a hard drive.



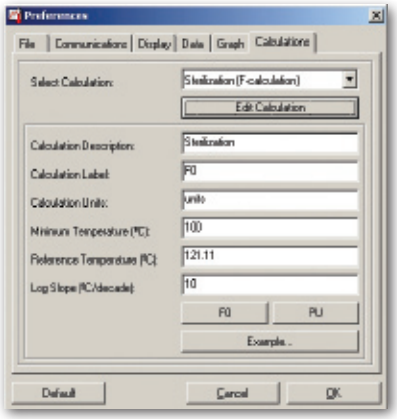
ANNOTATIONS

The annotation capability allows the user to associate comments (eg. “closed door” or “pump on”) with specific data points on a graph. This is especially useful for presentations and allows for permanently demarcating salient events in the data.



LETHALITY EQUATIONS

For customers validating pasteurization and steam sterilization processes the software automatically calculates the kill factor for either Pasteurization (PU) or Sterilization (F0), depending on the users preferences. This data is displayed in the summary tab and is automatically calculated from the data displayed in the graph tab. For more information, see page 114.



AUTOMATIC REPORTING

The MadgeTech software’s Automatic Report Generator offers the ability to combine and analyze data from multiple loggers into a single report. The delta, minimum, and maximum statistics can be calculated automatically for each parameter. The graph can be printed along with the report to provide the necessary data and process information. The software offers several options for standard reports with prompts to tailor the report by exporting to MS Excel® and adding your company’s logo.

Features

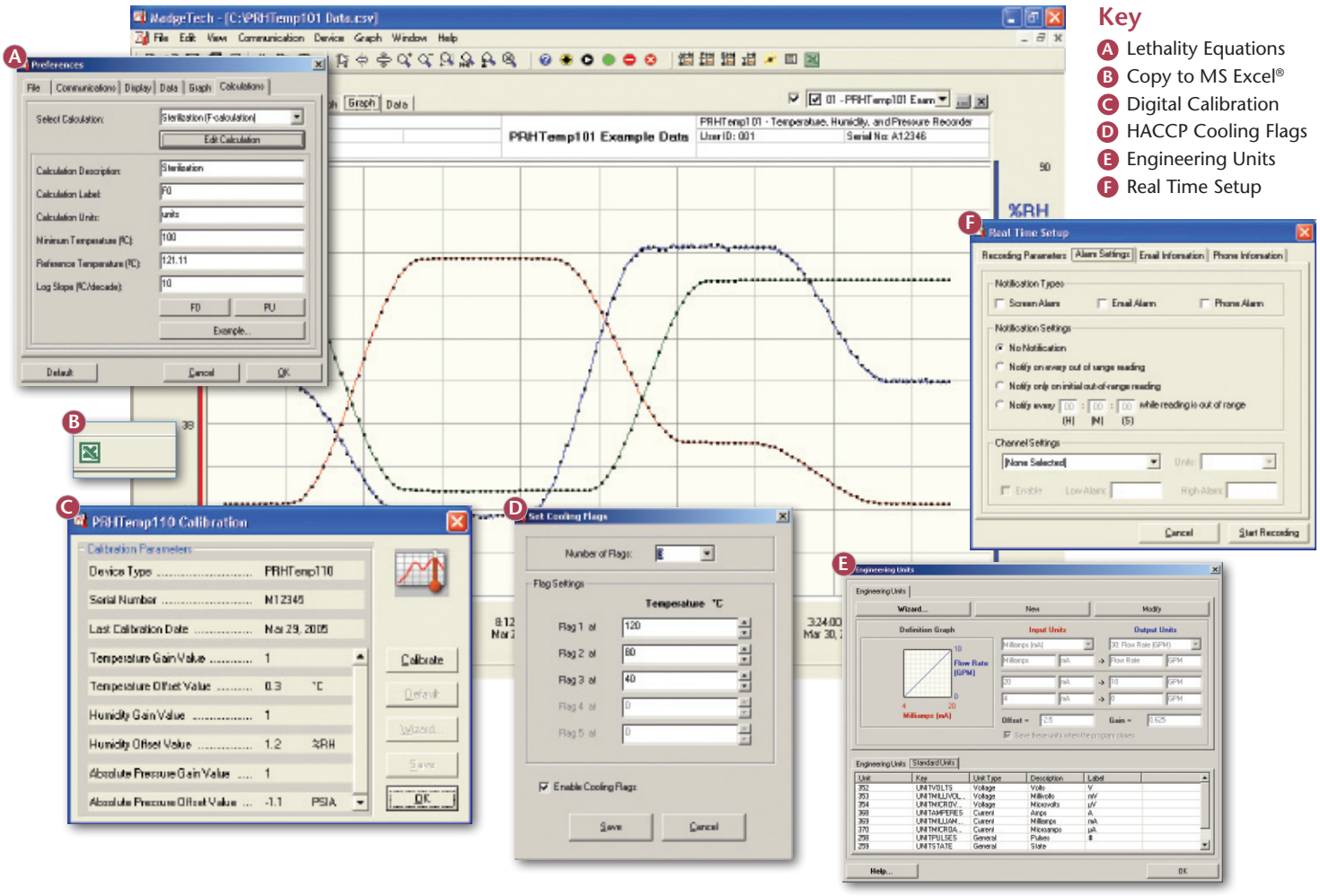
- Real time recording
- Wireless and real time alarming
- Multiple graph overlay
- Automatic export to MS Excel®
- Engineering Units
- Digital calibration
- Zoom features
- HACCP cooling flags
- Multilingual
- Full time zone support
- Data annotation
- Summary view
- Statistics calculations
- Lethality equations
- Data table view
- Displays fixed value lines

REAL TIME AND WIRELESS RECORDING AND ALARMING

The real time recording feature in the software allows a logger that is connected to the PC to report and display data on the PC screen in real time. The wireless series is configured at the PC and placed in a location to monitor. The data logger then transmits data back to the RFC101A receiver.

The software can be configured for scheduled automatic saving of the data, minimizing the chance of losing valuable data. Alarm limits can be set for any type of unit. Alarm notifications can be sent via PC screen, e-mail or text messaging in any combination. Email notification may be used with many compatible SMS (Short Messaging Service) cell phones and pagers.

Please see page 101 for information on MadgeTech's 21 CFR Part 11 Secure Software.



Key

- A Lethality Equations
- B Copy to MS Excel®
- C Digital Calibration
- D HACCP Cooling Flags
- E Engineering Units
- F Real Time Setup

Product Matrix

LCD DISPLAY

Data Logger	TCTemp2000	QuadTemp2000	OctTemp2000	RTDTemp2000	RHTemp2000
Description	Single Channel Thermocouple Based Temperature Logger with an LCD	Four Channel Thermocouple Based Temperature Logger with an LCD	Eight Channel Thermocouple Based Temperature Logger with an LCD	Single Channel Precision RTD Based Temperature Logger with an LCD	Humidity and Temperature Logger with an LCD
Range	-20 to +60°C Thermocouple types: J,K,T,E,R,S,B,N (-260 to 1820 °C)	-20 to +60 °C ambient Thermocouple Types: J,K,T,E,R,S,B,N (-260 to 1820 °C)	-20 to +60 °C ambient Thermocouple Types: J,K,T,E,R,S,B,N (-260 to 1820 °C)	-200 to +850°C	-20 to +60°C 0 to 95%RH
Accuracy	±0.5°C (0 to +50°C)	±0.5°C (0 to +50°C)	±0.5°C (0 to +50°C)	±0.05°C (-200 to +260°C) ±0.3°C (+260 to +850°C)	±0.5°C (0 to +50°C) ±3%RH
Resolution	0.1°C	0.1 °C	0.1 °C	0.01°C	0.1°C 0.1%RH
Memory	131,071 per channel	512,000 per channel	256,000 per channel	174,762	131,071 per channel
Dimensions	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)	7.24" x 2.70" x 1.15" (184mm x 67mm x 30mm)	7.24"x 2.70"x 1.40" (184mm x 67mm x 36mm)	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)
NIST Certificate	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 6 months	0 to 6 months	0 to 6 months	0 to 6 months	0 to 6 months
Alarm	No	No	No	No	No
Water Resistant	No	No	No	No	No
Features	Large back-lit LCD, front keypad with lock feature, user selectable measurement units	Large back-lit LCD, front keypad with lock feature, user selectable measurement units	Large back-lit LCD, front keypad with lock feature, user selectable measurement units	Large back-lit LCD, front keypad with lock feature, user selectable measurement units	Large back-lit LCD, Simultaneous display of temperature and humidity front keypad with lock
For More Information	Go to Page 22	Go to Page 24	Go to Page 25	Go to Page 23	Go to Page 26

LCD DISPLAY





Data Logger	PRHTemp2000	PR2000	Process2000	pHTemp2000	Volt2000
Description	Barometric Pressure, Temperature and Humidity Logger with an LCD	Pressure Logger with 1/4" NPT Connection and an LCD	Low Level DC Current Logger with an LCD	pH and Temperature Logger with an LCD	Low Level DC Voltage Logger with an LCD
Range	-20 to +60°C 0 to 95%RH 0 to 30PSIA	See Table Below	See Table Below	0.00 to 14.00 pH -200 to +850°C	See Table Below
Accuracy	±0.5°C (0 to +50°C) 3%RH ±1%FSR	See Table Below	See Table Below	±0.1pH (±1mV) ±0.1°C @ 25°C ambient	See Table Below
Resolution	0.1°C 0.1%RH 0.002PSIA	See Table Below	See Table Below	0.01pH 0.01°C	See Table Below
Memory	87,381 per channel	262,143	262,143	131,071 per channel	262,143
Dimensions	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)	5.1" x 4.8" x 1.78" (130mm x 122mm x 45mm)	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)
NIST Certificate	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 6 months	0 to 6 months	0 to 6 months	0 to 6 months	0 to 6 months
Alarm	No	No	No	No	No
Water Resistant	No	Splashproof (IP65)	No	No	No
Features	Large back-lit LCD, front keypad with lock feature, user selectable measurement units	Large back-lit LCD, 1/4" NPT connection, real-time graphing, user selectable measurement units	Large back-lit LCD, front keypad with lock feature, user selectable measurement units	Large back-lit LCD, front keypad with lock feature, user selectable measurement units	Large back-lit LCD, front keypad with lock feature, user selectable measurement units
For More Information	Go to Page 28	Go to Page 27	Go to Page 30	Go to Page 29	Go to Page 31

Process2000 Range, Accuracy & Resolution

Nominal Range	±1mA	±25mA	±100mA
Measurement Range	±1.25mA	±30mA	±120mA
Common Mode Input Range	0 to 2.5V	0 to 2.5V	0 to 2.5V
Resolution	0.05µA	1µA	5µA
Calibrated Accuracy @ 25°C	±0.5%FSR	±0.1%FSR	±0.1%FSR
Input Impedance	50Ω	10Ω	10Ω

PR2000 Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500	0-1000 PSIA	0-5000PSIA
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution (PSI)	0.002	0.005	0.02	0.05	0.05	0.2

Volt2000 Range, Accuracy & Resolution

Nominal Range	±100mV	0 to 2.5V	0 to 15V	0 to 30V
Measurement Range (VDC)	±150mV	-0.25 to 2.75	-1 to 16	-2 to 32
Common Mode Input Range	0 to 2.5V	-	-	-
Accuracy	±0.01%FSR	±0.01%FSR	±0.10%FSR	±0.10%FSR
Resolution (mV)	5µV	0.1	0.5	1.0

Product Matrix

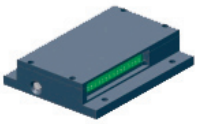
TEMPERATURE






Data Logger	Cryo-Temp	HiTemp150	HiTemp150-FP	IRTC110	MicroTemp	OctRTD
Description	-86°C Water Resistant Dry Ice Logger	150°C Submersible Temperature Logger with Rigid Probe	150°C Submersible Temperature Logger with Flexible Probe	Infrared Thermocouple Based Temperature Logger	Miniature Temperature Logger with 316L Stainless Steel Enclosure	Eight Channel 100Ω RTD Based Temperature Logger
Range	-86 to 35°C	-40 to +150°C	-40 to +150 °C	-17 to +70°C	-40 to +80 °C	-200 To +850 °C 100Ω pt. RTD
Accuracy	±1.0°C	±0.5°C	±0.5 °C	±0.5°C	±0.5°C	±0.1 °C
Resolution	0.1°C	0.05°C	0.05 °C	0.1°C	0.1°C	0.01 °C
Memory	32,767	32,767	32,767	16,383 per channel	32,767	10,922 per channel
Dimensions	3.3" x 2.1" x 0.4" (83mm x 54mm x 11mm)	Body: 1.1" x 1.75" dia. (28mm x 45mm dia.) Probe: 2.0" x 3/16" dia. (50mm x 5mm dia.)	Body: 1.1" x 1.75" dia. (28mm x 45mm dia.) Probe: 4" x 1/8" dia. (102mm x 4mm dia.)	1.7" x 2.3" x 0.8" (44mm x 59mm x 21mm)	2.6" x 0.7" dia. (66mm x 18mm dia.)	3.5" X 4.4" X 1.5" (89mm x 112mm x 39mm)
NIST Certificate	Yes	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 30 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	Yes	No	No	No	Yes	No
Water Resistant	Splashproof (IP65)	Submersible	Submersible	No*	Submersible	No
Features	Ultra low operating temperature, no external probes or wiring, magnetic start	Rugged, reusable, software calibration, high temperature, integral probe	Rugged, reusable, software calibration, high temperature, flexible probe	10 year battery life, fast 57,600 baud download, software calibration, reusable	Small size, rugged, software calibration, reusable	Software calibration, reusable, small size, screw terminal connection, mounting holes
For More Information	Go to Page 51	Go to Page 48	Go to Page 49	Go to Page 39	Go to Page 45	Go to Page 37





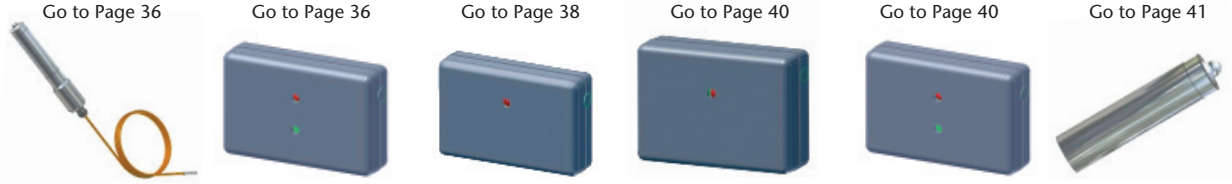

Data Logger	OctTemp	OT1000	QuadRTD	QuadTemp	QuadThermoVault	RFOT
Description	Eight Channel Thermocouple Based Temperature Logger	Meat Cooking and Cool Down with Flexible Piercing Probe	Four Channel 100Ω RTD Based Temperature Logger	Four Channel Thermocouple Based Temperature Logger	Four Channel Oven Temperature Logger	Wireless Meat Cooking and Cool Down Logger with Flexible Piercing Probe
Range	-20 to +60 °C ambient Thermocouple Types: J,K,T,E,R,S,B,N (-260 to 1820°C)	-50 to +200 °C	-200 To +850 °C 100Ω pt. RTD	-20 to +60 °C ambient Thermocouple Types: J,K,T,E,R,S,B,N (-260 to 1820°C)	-40 to +350 °C Type K Thermocouple (included)	-50 to +200 °C
Accuracy	±0.5°C	±0.1°C	±0.1°C	±0.5°C	±0.5°C	±0.1°C
Resolution	0.1°C	0.01°C	0.01°C	0.1°C	0.1°C	0.01°C
Memory	14,563 per channel	21,845	21,845 per channel	26,214 per channel	26,214 per channel	21,845
Dimensions	3.5" x 4.4" x 1.5" (89mm x 112mm x 39mm)	Body: 8" x 1.75" dia. (203mm x 44mm dia.) Hook ID: 0.5"(12.7mm) Probe: 4" x 0.130" dia. (101mm x 3.3mm dia.)	3.5" X 4.4" X 1.0" (89mm x 112mm x 26mm)	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)	6.5" x 7.9" x 3.2" (165mm x 200mm x 82mm)	Body: 8" x 1.75" dia. (203mm x 44mm dia.) Hook ID: 0.5"(12.7mm) Probe: 4" x 0.130" dia. (101mm x 3.3mm dia.)
NIST Certificate	Yes	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	No	No	No	No	No
Water Resistant	No	Splashproof (IP67)	No	No	No	Splashproof (IP67)
Features	Software calibration, reusable, small size, thermocouple mini-plug connectors, mounting holes	Flexible probe, rubber enclosed cable, waterproof, ideal for food processing, reusable	Software calibration, reusable, small size, screw terminal connection, mounting holes	Software calibration, reusable, small size, thermocouple mini-plug connectors, mounting holes	Insulated box for oven profiling up to 572°F for 30 minutes, external type K thermocouple included	Flexible probe, rubber enclosed cable, waterproof, ideal for food processing, reusable
For More Information	Go to Page 43	Go to Page 53	Go to Page 37	Go to Page 43	Go to Page 44	Go to Page 53

**See waterbox, page 97.*

MADGETECH WE BUILD DATA LOGGERS
Tel: 603.456.2011 Fax: 603.456.2012 www.madgetech.com info@madgetech.com

TEMPERATURE

Data Logger	RTDTemp101	RTDTemp110	SGTemp1000	TC110	TC110-2MB	TC4000
Description	100Ω RTD Based Temperature Logger	100Ω RTD Based Temperature Logger with 10 year Battery Life	Precision RTD Based Temperature Logger for Use with Smart Gasket®	Thermocouple Based Temperature Logger with 10 Year Battery Life	Thermocouple Based Temperature Logger with Extended Memory	Thermocouple Based Temperature Logger
Range	-200 to +850 °C 100Ω Pt. RTD	-200 to +850°C 100Ω Pt. RTD	-50°C to 150°C 100Ω Pt. RTD	-40 to +80 °C ambient Thermocouple Types: J,K,T,E,R,S,B,N (-260 to +1820°C)	-40 to +80 °C Thermocouple Types: J,K,T,E,R,S,B,N (-260 to +1820°C)	-40 to +80 °C ambient Thermocouple Types: J,K,T,E,R,S,B,N (-260 to 1820 °C)
Accuracy	±0.05°C	±0.1°C	±0.1°C	±0.5°C	±0.5°C	±0.5°C
Resolution	0.01°C	0.01°C	0.01°C	0.1°C	0.1°C	0.1°C
Memory	21,845	21,845	21,845	16,383 per channel	262,144 per channel	16,383 per channel
Dimensions	1.4" x 2.5" x 0.6" (35mm x 64mm x 16mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)	Body: 2.75" x 1.5" dia. (70mm x 38mm dia.) Probe: 1.15" x .095" dia. (29mm x 2mm dia)	1.7" x 2.3" x 0.8" (44mm x 59mm x 21mm)	1.7" x 2.3" x 0.8" (44mm x 59mm x 21mm)	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)
NIST Certificate	Yes	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	No	No	No	No	No
Water Resistant	No*	No*	Yes	No*	No*	No*
Features	Software calibration, reusable, small size, external 2,3,4 wire RTD probe	10 year battery life, fast 57,600 baud download, software calibration, reusable, small size, external 2,3 or 4 wire RTD probe	Precision temperature logger ideal for monitoring temperature through a gasket	10 year battery life, fast 57,600 baud download, software calibration, small size, thermocouple mini-plug or screw terminal	2 year battery life, wide temperature range, software calibration, 2 MB memory	Software calibration, reusable, small size, red LED indicator, thermocouple mini-plug or screw terminal connection
For More Information	Go to Page 36	Go to Page 36	Go to Page 38	Go to Page 40	Go to Page 40	Go to Page 41



Data Logger	TCTemp1000	Temp100	Temp101	Temp110	TempRetriever	Temp1000
Description	Rugged Thermocouple Based Temperature Logger	Temperature Logger with Pushbutton Start/Stop	Temperature Logger	Temperature Logger with 10 year battery life	Temperature Logger with Pushbutton Start/Stop	Submersible, Rugged, Temperature Logger in Aluminum or Stainless Steel Enclosure
Range	-40 to +80°C ambient Thermocouple Types: J,K,T,E,R,S,B,N (-260 to 1820 °C)	-40 to +80°C	-40 to +80°C	-40 to +80°C	-40 to +80°C	-40 to +80°C
Accuracy	±0.5°C	±0.5°C	±0.5°C	±0.5°C	±0.5°C	±0.5°C
Resolution	0.1°C	0.1°C	0.1°C	0.1°C	0.1°C	0.1°C
Memory	16,383 per channel	32,767	32,767	32,767	16,383	32,767
Dimensions	7.4" x 1.2" dia. (188mm x 31 mm dia.)	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)	1.7" x 2.3" x 0.8" (42mm x 59mm x 21mm)	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)	4.3" x 1.0" dia. (110mm x 26mm dia.)
NIST Certificate	Yes	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	Yes	Yes	No	Yes	No
Water Resistant	Submersible	No*	No*	No*	No*	Submersible
Features	Rugged, submersible, software calibration, wide range, thermocouple	Software calibration, reusable, small size, red & green indicators, pushbutton start	Software calibration, reusable, small size	10 year battery life; fast 57,600 baud download, software calibration, small size	Software calibration, reusable, small size, push button start, red and green indicators	Rugged, reusable, software calibration, wide range
For More Information	Go to Page 42	Go to Page 32	Go to Page 32	Go to Page 32	Go to Page 33	Go to Page 46

**See waterbox, page 97.*

Product Matrix

TEMPERATURE





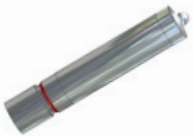
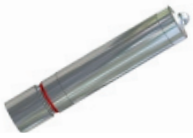

Data Logger	Temp1000FP	Temp1000IS	Temp1000P	Temp1000S	Thermovault	TransiTemp
Description	Rugged Temperature Logger with 10.8" Flexible Probe	Submersible, Rugged, Intrinsically Safe Temperature Logger, Aluminum or Stainless Steel Enclosure	Meat Cooking and Cool Down Logger with Piercing Probe	Rugged Temperature Logger with 1" Rigid Probe	Single Channel Oven Temperature Logger	Single or Multiple Use In-Transit Temperature Logger
Range	-40 to +150°C	-40 to +80°C	Body: -40 to +80°C Probe: -100 to +260°C	-40 to +150°C	-40 to +350°C Type K Thermocouple (Included)	-20 to +70°C
Accuracy	±0.5°C	±0.5°C	0.05°C	±0.5°C	±0.5°C (0 to +50°C)	±0.5°C (-10 to +40°C) ±1.0°C (-20 to +70°C)
Resolution	0.05°C	0.1°C	±0.5°C	0.05°C	0.1°C	0.1°C
Memory	32,767	32,767	32,767	32,767	16,383 per channel	8,191
Dimensions	Body 5.7" x 1.25" dia. (145mm x 32mm dia.) Probe 10.8" x 1/8" dia. (275mm x 4mm dia.)	4.3" x 1.0" dia. (108mm x 26mm dia.)	Body 4.5" x 1.0" dia (115mm x 26mm dia.) Probe 6.75" x 3/16" dia. (172mm x 5mm dia.)	Body 4.8" x 1.0" dia. (122mm x 26mm dia.) Probe 1" x 3/16" dia. (26mm x 5mm dia.)	4.8" x 4.8" x 2.5" (122mm x 122mm x 65mm)	1.9" x 3.6" x 0.7" (46mm x 92mm x 18mm)
NIST Certificate	Yes	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180	0 to 30 days
Alarm	No	No	No	No	No	Yes
Water Resistant	Submersible	Submersible	Yes	Submersible	No	No
Features	Rugged, reusable, software calibration, high temperature, integral flexible probe	Intrinsically Safe, NEMA 4X, 6P, rugged, reusable, software calibration	Rugged, submersible, reusable, software calibration, wide range, integral probe	Rugged, reusable, software calibration, high temperature, integral probe	Insulated box for oven profiling up to 662 °F for 12 minutes, external type K thermocouple (included)	Single-use and multi-use, red and green indicators, low cost, convenient size, pushbutton start
For More Information	Go to Page 50	Go to Page 47	Go to Page 52	Go to Page 50	Go to Page 44	Go to Page 34

**See waterbox, page 97.*


Data Logger	TransiTempII	TransiTemp-EC
Description	Cold Chain Temperature Logger	Single or Multiple Use In-Transit Economy Temperature Logger
Range	-40 to +80°C	-20 to +70°C
Accuracy	±0.5°C (-10 to +40°C) ±1.0°C (-20 to +70°C)	±0.5°C (-10 to +40°C) ±1.0°C (-20 to +70°C)
Resolution	0.1°C	0.1°C
Memory	32,767	8,191
Dimensions	3.3" x 2.1" x 0.4" (83mm x 54mm x 11mm)	1.7" x 2.6" x 0.6" (44mm x 67mm x 16mm)
NIST Certificate	Yes	Yes
Delayed Start	0 to 30 days	0 to 30 days
Alarm	Yes	Yes
Water Resistant	Splashproof (IP65)	No
Features	Programmable or manual start, splash resistant, sleek enclosure with lanyard attachment, multi use	Single-use and multi-use, red and green indicators, low cost, convenient size, pushbutton start
For More Information	Go to Page 34	Go to Page 35

HUMIDITY




Data Logger	MicroRHTemp	RHTemp101	RHTemp110	RHTemp1000	RHTemp1000IS	TempRetrieverRH
Description	Miniature Temperature and Humidity Logger with Stainless Steel Enclosure	Temperature and Humidity Logger	Temperature and Humidity Logger with 10 Year Battery Life	Rugged Humidity and Temperature Logger with Aluminum or Stainless Steel Enclosure	Intrinsically Safe Humidity and Temperature Logger with Aluminum or Stainless Steel Enclosure	Temperature and Humidity Logger
Range	0 to +50°C 0 to 95% RH	-40 to +80°C 0 to 95%RH	-40 to +80°C 0 to 95%RH	-40 to +80°C 0 to 100%RH	-40 to +80°C 0 to 100%RH	-40 to +80°C 0 to 95%RH
Accuracy	±0.5°C ±3.0%RH	±0.5°C ±3.0%RH	±0.5°C ±3.0%RH	±0.5°C ±3.0%RH	±0.5°C ±3.0%RH	±0.5°C ±3.0%RH
Resolution	0.1°C 0.1%RH	0.1°C 0.5%RH	0.1°C 0.5%RH	0.1°C 0.5%RH	0.1°C 0.5%RH	0.1°C 0.1%RH
Memory	16,383 per channel	21,845 per channel	21,845 per channel	21,845 per channel	21,845 per channel	16,383 per channel
Dimensions	1.5" x 0.6" dia. (39mm x 16mm dia.)	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)	1.7" x 2.3" x 0.8" (43mm x 59mm x 21mm)	5.4" x 1.0" dia. (138mm x 26mm dia.)	5.4" x 1.0" dia. (138mm x 26mm dia.)	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)
NIST Certificate	Yes	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 180 days	0 to 180	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	Temperature	No	No	No	No	Temperature
Water Resistant	No	No	No	Yes	No	No
Features	Automatic dew point and water concentration calculations	Small size, software calibration, reusable, automatic dew point and water concentration calculations	10 Year battery life; fast 57,600 baud download, software calibration, automatic dew point and water concentration calculations	Rugged, software calibration, wide range, reusable, automatic dew point and water concentration calculations	Rated Intrinsically Safe, software calibration, automatic dew point and water concentration calculations	LED alarm indication, miniature size, reusable, push button start/stop
For More Information	Go to Page 58	Go to Page 54	Go to Page 54	Go to Page 59	Go to Page 60	Go to Page 57


Data Logger	TransiTemp-RH	TransiTempII-RH
Description	Single or Multi-Use Temperature and Humidity Logger	Temperature and Humidity Logger
Range	-20 to +70°C 0 to 90%RH	-40 to +80°C 0 to 95%RH
Accuracy	±0.5°C (-10 to +40°C) ±1.0°C (-20 to +70°C) ±5%RH (0 to 90%RH)	±0.5°C ±5.0%RH
Resolution	0.1°C 0.1%RH	0.1°C 0.1%RH
Memory	8,191 per channel	16,383 per channel
Dimensions	1.9" x 3.6" x 0.7" (49mm x 92mm x 18mm)	3.3" x 2.1" x 0.4" (83mm x 54mm x 11mm)
NIST Certificate	Yes	Yes
Delayed Start	0 to 30 days	0 to 30 days
Alarm	Temperature	Temperature
Water Resistant	Yes	Splash proof (IP64)
Features	Single-use or multi-use, reusable, automatic, dew point & water vapor concentration calculations	Low cost, user selectable alarm limits, splash proof (IP64), manual, magnetic, or programmable start
For More Information	Go to Page 56	Go to Page 55

Product Matrix

PRESSURE

Data Logger	PRTC110	PRTC210	PRTemp101	PrTemp110	PRTemp110-5PSID	PRHTemp101
Description	Differential Pressure and Thermocouple Logger	Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	Barometric Pressure and Temperature Logger	Barometric Pressure and Temperature Logger with 10 Year Battery Life	Differential Pressure and Temperature Logger	Pressure, Temperature and Humidity Logger
Range	-20 to +80°C ambient Thermocouple Types: See Table Below 0 to 2 in H2O (Differential)	-20 to +80°C ambient See Tables Below	-40 to +80°C 0 – 30PSIA	-40 to +80°C 0 – 30PSIA	-40 to +80°C 0 to 5PSID	-40 to +80°C 0 to 95%RH 0 – 30PSIA
Accuracy	±0.5°C See Table Below 2% FSR (0.25% @ 25°C Typical)	±0.5°C See Tables Below	±0.5 °C ±1% FSR @ 25°C (±0.2% Typical)	±0.5°C ±1% FSR @ 25°C (±0.2% Typical)	±0.5°C ±2% FSR @ 25°C (±0.4% Typical)	±0.5°C 3.0%RH ±1% FSR @ 25°C (±0.2% Typical)
Resolution	0.1°C See Table Below 0.002inH2O	0.1°C See Tables Below	0.1°C 0.002PSI	0.1°C 0.002PSI	0.1°C 0.0005PSI	0.1°C 0.5%RH 0.002PSI
Memory	10,922 per channel	21,844 per channel	8,191 per channel	16,383 per channel	16,383 per channel	13,107 per channel
Dimensions	2.7" x 1.6" x 0.8" (68mm x 41mm x 20mm)	2.2" x 2.5" x 0.9" (55mm x 63mm x 22mm)	1.4" x 2.2" x 0.9" (35mm x 56mm x 23mm)	1.7" x 2.3" x 0.9" (44mm x 59mm x 23mm)	1.7" x 2.3" x 0.9" (44mm x 59mm x 23mm)	1.7" x 2.3" x 0.9" (44mm x 59mm x 23mm)
NIST Certificate	Yes	Yes	Yes	Yes	Yes	Yes
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180	0 to 180 days	0 to 180 days
Alarm	No	Yes	No	No	No	No
Water Resistant	No	No	No	No	No	No
Features	10+ year battery life; fast 57,600 baud download, software calibration, small size	NPT fitting, fast 57,600 baud download, software calibration, small size, automatic calculation of mmhg, inches, pascals, torr, altitude, etc.	Software calibration, small size, automatic calculation of mm Hg, inches, pascals, torr, altitude, etc.	10+ year battery life; fast 57,600 baud download, software calibration, small size, automatic calculation of mmhg, inches, pascals, torr, altitude, etc.	Two small pressure ports for monitoring differential pressure software calibration, 57,600 baud	Software calibration, small size, automatic calculation of mmhg, inches, pascals, torr, altitude, dew point, water vapor concentration, etc.
For More Information	Go to Page 62	Go to Page 63	Go to Page 61	Go to Page 61	Go to Page 61	Go to Page 68

PrTC210 Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500
Accuracy	2% FSR, 0.25% @ 25°C Typical			
Resolution (PSI)	0.002	0.005	0.02	0.05

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

PRESSURE






Data Logger	PRHTemp110	PRTemp1000D	PRTemp1000	PRTemp1000IS	PRTrans1000	PRTrans1000IS
Description	Temperature, Humidity and Pressure Logger with 10 Year Battery Life	Differential Pressure and Temperature Logger	Rugged Pressure and Temperature Logger	Intrinsically Safe Pressure and Temperature Logger	High Speed Transient Pressure Logger	Rugged Intrinsically Safe Transient Pressure Logger
Range	-40 to +80°C 0 to 95%RH 0 – 30PSIA	-20 to +80°C See Table Below	-40 to +80°C See Table Below	-40 to +80°C See Table Below	See Table Below	See Table Below
Accuracy	±0.5°C 3%RH ±1% FSR @ 25°C (±0.2% Typical)	±0.5°C (0 to 50°C) See Table Below	±0.5°C See Table Below	±0.5°C See Table Below	See Table Below	See Table Below
Resolution	0.1°C 0.5%RH 0.002PSIA	0.1°C See Table Below	0.1°C See Table Below	0.1°C See Table Below	See Table Below	See Table Below
Memory	13,107 per channel	16,383 per channel	16,383 per channel	16,383 per channel	Up to 262,143 samples	Up to 262,143 samples
Dimensions	1.7" x 2.3" x 0.9" (44mm x 59mm x 23mm)	Body: 6.7" x 1" dia. (170mm x 25mm dia.) Sensor: 3.4" x 3.0" x 1.0" (86mm x 76mm x 25mm dia.) Cable: 12" (304mm)	6.4" x 1.25" dia. (163mm x 32mm dia.)	6.4" x 1.25" dia. (163mm x 32mm dia.)	6.4" x 1.25" dia. (163mm x 32mm dia.)	6.4" x 1.25" dia. (163mm x 32mm dia.)
NIST Certificate	Yes	Yes	Yes	Yes	No	No
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 7 days	0 to 7 days
Alarm	No	No	No	No	No	No
Water Resistant	No	Submersible	Submersible	No	Submersible	No
Features	10+ year battery life, fast download, software calibration, small size, automatic calculation of mmhg, inches, pascals, torr, altitude, dew point, water concentration, etc.	Rugged, reusable, programmable start time, ¼" NPT differential connections, software calibration	Rugged design, software calibration, wide range, reusable, automatic calculation of mmhg, inches, pascals, torr, altitude, etc., ¼" male NPT connection or submersible	Rugged design, software calibration, wide range, reusable, automatic calculation of mmhg, inches, Pascals, torr, altitude, etc., ¼" male NPT connection	Rugged design, software calibration, wide range, reusable, automatic calculation of mmhg, inches, Pascals, Torr, altitude, etc., ¼" male NPT connection or submersible	Rugged design, software calibration, wide range, reusable, automatic calculation of mmhg, inches, Pascals, Torr, altitude, etc., ¼" male NPT connection
For More Information	Go to Page 69	Go to Page 64	Go to Page 66	Go to Page 67	Go to Page 65	Go to Page 67

PRTemp1000, PRTemp1000IS Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500	0-1000	0-5000
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution (PSI)	0.002	0.005	0.02	0.05	0.05	0.2

PRTrans1000 & PRTrans1000IS Range, Accuracy & Resolution

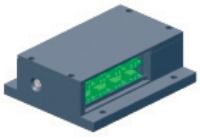
Range (PSI)	0-30	0-100	0-300	0-500	0-1000	0-5000
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution (PSI)	0.02	0.1	0.2	0.5	1.0	5

PRTemp1000D Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500
Accuracy	±0.25% FSR, 0.1% @ 25°C Typical			
Resolution (PSI)	0.002	0.005	0.02	0.05

Product Matrix

VOLTAGE




Data Logger	OctVolt	QuadVolt	Volt101	Volt110
Description	Eight Channel Low Level DC Voltage Logger	Four Channel Low Level DC Voltage Logger	Low Level DC Voltage Logger	Low Level DC Voltage Logger with 10 Year Battery Life
Range	±100mVDC 0 to 2.5VDC 0 to 15VDC 0 to 30VDC	±100mVDC 0 to 2.5VDC 0 to 15VDC 0 to 30VDC	±100mVDC 0 to 2.5VDC 0 to 15VDC 0 to 30VDC	±100mVDC 0 to 2.5VDC 0 to 15VDC 0 to 30VDC
Accuracy	±0.01%FSR @ 25°C ±0.01%FSR @ 25°C ±0.10%FSR @ 25°C ±0.10%FSR @ 25°C	±0.01%FSR @ 25°C ±0.01%FSR @ 25°C ±0.10%FSR @ 25°C ±0.10%FSR @ 25°C	±0.01%FSR @ 25°C ±0.01%FSR @ 25°C ±0.10%FSR @ 25°C ±0.10%FSR @ 25°C	±0.01%FSR @ 25°C ±0.01%FSR @ 25°C ±0.10%FSR @ 25°C ±0.10%FSR @ 25°C
Resolution	5µVDC 0.1mVDC 0.5mVDC 1.0mVDC	5µVDC 0.1mVDC 0.5mVDC 1.0mVDC	5µVDC 0.1mVDC 0.5mVDC 1.0mVDC	5µVDC 0.1mVDC 0.5mVDC 1.0mVDC
Memory	16,383 per channel	32,767 per channel	32,767	32,767
Dimensions	3.5" x 4.4" x 1.5" (89mm x 112mm x 39mm)	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)	1.4" x 2.5" x 0.6" (36mm x 64mm x 16mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)
NIST Certificate	No	No	No	No
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	No	No	No
Water Resistant	No	No	No*	No*
Features	Programmable engineering units, software calibration, reusable, small size, mounting holes	Programmable engineering units, software calibration, reusable, small size, mounting holes	Programmable engineering units, software calibration, reusable, small size	10+ year battery life, fast download, programmable engineering units, software calibration, reusable, small size
For More Information	Go to Page 71	Go to Page 71	Go to Page 71	Go to Page 71


Data Logger	Event101	Event110
Description	Event Logger	Event Logger with 10 Year Battery Life
Input Range	0 to 12VDC continuous (0 to 30VDC peak)	0 to 12VDC continuous (0 to 30VDC peak)
Input Low	<0.4V	<0.4V
Input High	>2.7V	>2.7V
Memory	13,107 events	13,107 events
Dimensions	1.4" x 2.5" x 0.6" (36mm x 64mm x 16mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)
NIST Certificate	No	No
Delayed Start	0 to 180 days	0 to 180 days
Alarm	No	No
Water Resistant	No*	No*
Features	Programmable engineering units, reusable, small size	10+ year battery life; fast 57,600 baud download, programmable engineering units, reusable, small size
For More Information	Go to Page 72	Go to Page 72


Data Logger	Pulse101	Pulse110
Description	Pulse Logger	Pulse Logger with 10 Year Battery Life
Maximum Pulse Rate	100Hz	100Hz
Input Range	0 to 12VDC continuous (0 to 30VDC peak)	0 to 12VDC continuous (0 to 30VDC peak)
Input Low	<0.4V	<0.4V
Input High	>2.7V	>2.7V
Memory	16,383 intervals	16,383 intervals
Dimensions	1.4" x 2.5" x 0.6" (36mm x 64mm x 16mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)
NIST Certificate	No	No
Delayed Start	0 to 180 days	0 to 180 days
Alarm	No	No
Water Resistant	No*	No*
Features	Programmable engineering units, reusable, small size	Fast 57,600 download, programmable engineering units, reusable, small size
For More Information	Go to Page 73	Go to Page 73

See waterbox page 97.

STATE




Data Logger	OctState	QuadState	State101	State110
Description	Eight Channel State Logger	Four Channel State Logger	State Logger	State Logger with 10 Year Battery Life
Input Range	0 to 12VDC continuous (0 to 30VDC peak)	0 to 12VDC continuous (0 to 30VDC peak)	0 to 12VDC continuous (0 to 30VDC peak)	0 to 12VDC continuous (0 to 30VDC peak)
Input Low	<0.4V	<0.4V	<0.4V	<0.4V
Input High	>2.7V	>2.7V	>2.7V	>2.7V
Memory	13,107 states per channel	13,107 states per channel	13,107 states	13,107 states
Dimensions	3.5″ x 4.4″ x 1.5″ (89mm x 112mm x 39mm)	3.5″ x 4.4″ x 1.0″ (89mm x 112mm x 26mm)	1.4″ x 2.5″ x 0.6″ (36mm x 64mm x 16mm)	1.7″ x 2.7″ x 0.8″ (44mm x 69mm x 21mm)
NIST Certificate	No	No	No	No
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	No	No	No
Water Resistant	No	No	No*	No*
Features	Interfaces to contact closures, programmable engineering units, convenient size mounting holes, removable screw terminals	Interfaces to contact closures, programmable engineering units, convenient size mounting holes, removable screw terminals	Programmable engineering units, reusable, small size	10+ year battery life; fast 57,600 download, programmable engineering units, reusable, small size
For More Information	Go to Page 75	Go to Page 75	Go to Page 75	Go to Page 75

CURRENT




Data Logger	OctProcess	Process101	Process110	QuadProcess
Description	Eight Channel Low Level DC Current Logger	Low Level DC Current Logger	Low Level DC Current Logger with 10 Year Battery Life	Four Channel Low Level DC Current Logger
Range	±1mADC ±25mADC ±100mADC	-20 to +100 mADC	±1 mADC ±25 mADC ±100 mADC	±1 mADC ±25 mADC ±100 mADC
Accuracy	±0.5%FSR @ 25°C ±0.1%FSR @ 25°C ±0.1%FSR @ 25°C	±0.1% FSR @ 25°C	±0.5%FSR @ 25°C ±0.1%FSR @ 25°C ±0.1%FSR @ 25°C	±0.5%FSR @ 25°C ±0.1%FSR @ 25°C ±0.1%FSR @ 25°C
Resolution	0.05µA 1µA 5µA	10µA	0.05µA 1µA 5µA	0.05µA 1µA 5µA
Memory	16,383 per channel	32,767	32,767	32,767 per channel
Dimensions	3.5″ x 4.4″ x 1.5″ (89mm x 112mm x 39mm)	1.4″ x 2.5″ x 0.6″ (35mm x 64mm x 16mm)	1.7″ x 2.7″ x 0.8″ (44mm x 69mm x 21mm)	3.5″ x 4.4″ x 1.0″ (89mm x 112mm x 26mm)
NIST Certificate	No	No	No	No
Delayed Start	0 to 180 days	0 to180 days	0 to 180 days	0 to 180 days
Alarm	No	No	No	No
Water Resistant	No	No*	No*	No
Features	Programmable engineering units, software calibration, reusable, small size, mounting holes	Programmable engineering units, software calibration, reusable, small size	10+ year battery life, fast download, programmable engineering units, software calibration, reusable, small size	Programmable engineering units, software calibration, reusable, small size, mounting holes
For More Information	Go to Page 76	Go to Page 76	Go to Page 76	Go to Page 76

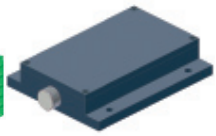
Product Matrix

SHOCK

Data Logger	Shock101	Shock101-EB	SVR101	TSR101	UltraShock	UltraShock-EB
Description	Tri-Axial Shock Logger	Tri-Axial Shock Logger with Extended Battery Life	Spectral Vibration Logger	Tri-Axial Transient Shock Logger	Tri-Axial Shock, Temperature, Humidity and Barometric Pressure Logger	Tri-Axial Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life
Range	See Table Below	See Table Below	±5g, ±50g	See Table Below	Shock: See Table Below -20 to +60°C 0 to 95%RH 0 to 30PSIA	-18 to +55°C 0 to 95%RH 0 to 30PSIA Shock: See Table Below
Accuracy	See Table Below	See Table Below	±0.2g, ±1g	See Table Below	Shock: See Table Below ±0.5°C ±3%RH ±1% FSR @25°C	Shock: See Table Below ±0.5°C ±3%RH ±1% FSR @25°C
Resolution	See Table Below	See Table Below	0.01g, 0.05g	See Table Below	Shock: See Table Below 0.1°C 0.5%RH 0.002PSI	Shock: See Table Below 0.1°C 0.5%RH 0.002PSI
Memory	349,525 per axis	349,525 per axis	16Mbit flash (3,800 samples)	349,500 per axis	174,762 per channel	174,762 per channel
Operating Range	Alkaline -18°C to 55°C Lithium -20°C to 60°C	-18°C to 55°C	Alkaline -18°C to 55°C Lithium -20°C to 60°C	Alkaline -18°C to 55°C Lithium -20°C to 60°C	Alkaline -18°C to 55°C Lithium -20°C to 60°C	-18°C to 55°C
Dimensions	3.5" x 4.4" x 1.0" (89mm x 112mmx 26mm)	5.5" x 5.2" x 3.2" (140mm x 132mm x 8mm)	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)	3.5" x 4.4" x 1.0" (89mm x 112mm x 28mm)	5.5" x 5.2" x 3.2" (140mm x 132mm x 80mm)
NIST Certificate	No	No	No	No	Yes	Yes
Delayed Start	0 to 180 days	0 to 180 days	0 to 7 days	0 to 7 days	0 to 180 days	0 to 180 days
Alarm	No	No	No	No	No	No
Water Resistant	Weather Tight (IP63)	No	Weather Tight (IP63)	Weather Tight (IP63)	No	No
Features	Rugged design, software calibration, wide range, reusable, automatic calculation of total G force, etc	60 day battery life, rugged design, software calibration, wide range, reusable, automatic calculation of total G force, etc	Trigger mode, computes real time FFT, peak shock	Tri-axial shock recording, built in accelerometers, programmable start time, reusable.	Rugged design, software calibration, wide range, reusable, automatic calculation of total G force, temperature, pressure, and humidity all-in-one	60 day battery life, rugged design, software calibration, wide range, reusable, automatic calculation of total G force, temperature, pressure, and humidity all-in-one
For More Information	Go to Page 78	Go to Page 79	Go to Page 83	Go to Page 82	Go to Page 80	Go to Page 81

Shock101, Shock101-EB, UltraShock, UltraShock-EB, and TSR101
Acceleration Range, Resolution and Calibrated Accuracy

Range (g)	±5	±50	±100	±250
Accuracy (g)	±0.2	±1	±2	±4
Resolution (g)	0.01	0.05	0.1	0.2

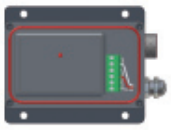
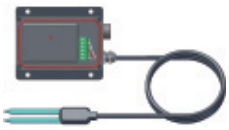
WATER LEVEL			pH	BRIDGE/STRAIN		
						
Data Logger	**Level1000**	**Level2000**	**pHTemp101**	**Bridge110**	**Bridge120**	**BrTrans210**
Description	Water Level and Temperature Logger	Vented Water Level and Temperature Logger	pH and Temperature Logger	Bridge Logger	20Hz Bridge Logger	High Speed Bridge/ Strain Logger
Range	0 to +80°C 0 to 30′	0 to +80°C 0 to 30′	-240 to +125°C 0 to 14 pH (±1000mV)	See Table Below	See Table Below	See Table Below
Accuracy	±0.5°C ±0.3% FSR @ 25°C	±0.5°C ±0.3% FSR @ 25°C	±0.1°C ±0.1pH	See Table Below	See Table Below	See Table Below
Resolution	0.1°C 0.05″	0.1°C 0.02″	0.01°C 0.01pH	See Table Below	See Table Below	See Table Below
Memory	16,383 per channel	16,383 per channel	13,107 per channel	32,767	32,767	1.048 million readings
Dimensions	5.7″ x 1.25″ dia (145mm x 32mm dia.)	Submersible end: 9.1″ x 1.25″ dia. (232mm x 32mm dia.) Communications end: 7.1″ x 1.2″ dia. (181mm x 31mm dia.), plus cable	2.4″ x 4.5″ x 1.0″ (61mm x 115mm x 26mm)	1.7″ x 2.7″ x 0.8″ (44mm x 69mm x 21mm)	1.7″ x 2.7″ x 0.8″ (44mm x 69mm x 21mm)	3.5″ x 4.4″ x 1.0″ (89mm x 112mm x 26mm)
NIST Certificate	Yes	Yes	No	No	No	No
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	No	No	No	No	No
Water Resistant	Submersible	Submersible	No	No*	No*	No
Features	Rugged design, software calibration, wide range, reusable	Rugged design, software calibration, wide range, reusable, atmospheric pressure compensated	Software calibration, small size, automatic temperature compensation, BNC connector	10+ year battery life; fast 57,600 baud download, software calibration, small size, screw terminal connection, 2.5V reference voltage	Fast 57,600 baud download, software calibration, small size, screw terminal connection	Features trigger-ing, and high speed recording up to 100 samples per second.
For More Information	Go to Page 84	Go to Page 84	Go to Page 85	Go to Page 86	Go to Page 86	Go to Page 87

Bridge110, Bridge120, and BrTrans210 Range, Resolution, & Accuracy

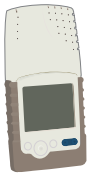
Nominal Range	±10mV	±25mV	±100mV	±1000mV
Measurement Range	±15mV	±37.5mV	±150mV	±1200mV
Resolution	1µV	2.5µV	5µV	50µV
Calibrated Accuracy	±0.25%FSR	±0.10%FSR	±0.05%FSR	±0.01%FSR
Input Range	0 to 2.5V	0 to 2.5V	0 to 2.5V	0 to 2.5V
Reference Voltage	2.5V	2.5V	2.5V	2.5V

Product Matrix

SYSTEMS

					
Data Logger	**ETR110**	**Rain110**	**Therm•A•lert**	**SMR110**	**Wind110**
Description	Exhaust Temperature Recording System	Rainfall Recording System	Wireless Temperature Notification System	Soil Moisture Recording System	Wind Speed Recording System
Range	See Table Below -40 to +80°C Thermocouple types: J,K,T,E,R,S,B,N	0 to 60°C	Data Logger: -30 to +70°C External Probe: -50 to +80°C	EC-5: 0 to 100% VWC saturation EC-20: 0 to 40% VWC saturation	0 to 170 mph (76m/s)
Accuracy	See Table Below ±0.5°C	±4% over range of 1" to 6" per hour	±0.5°C	Data Logger: ±10mv EC-5: ±3% typical, ALL soils EC-20: ± 4% typical on low EC and medium textured soils	±2 mph 0-10 mph ±2.5% of reading 10-100mph
Resolution	See Table Below 0.1°C	0.01" (0.254 mm)	0.01°C	0.002m^3/m^3	Varies with reading rate 0.17 mph @ 5 sec. rate
Memory	16,383 per channel	13,107 samples [131" (332 cm) of rain]	5,461	32,767	16,383
Dimensions	2.9" x 4.0" x 1.1" (74mm x 102mm x 28mm)	**Sensor:** 12.0"H x 8.4"dia. (305mm x 214mm dia.) **Enclosure:** 2.9" x 4.0" x 1.1" (74mm x 102mm x 28mm)	**Logger:** 1.7" x 2.7" x 0.8" plus 2" antenna (42mm x 69mm x 21mm + 51mm antenna) **Probe Length:** 2.5" for 30ml, 3" for 60ml, and 4.5" for 250ml glycol bottle **Wire Length:** 3.5" for all versions	**Enclosure:** 2.9" x 4.0" x 1.1" (74mm x 102mm x 28mm) **Cable:** 16'(5m) **SMR110-5 Probe:** 2.1" x 0.6" x 0.06" (54mm x 16mm X 1.6mm) **SMR110-20 Probe:** 10" x 1.25" x 0.06" (254mm x 32mm X 1.6mm)	**Sensor (rotation diameter):** 7.5" (191mm) **Enclosure:** 2.9" x 4.0" x 1.1" (74mm x 102mm x 28mm)
NIST Certificate	No	No	Yes	No	No
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	No	Yes	No	No
Water Resistant	Yes	Yes	No	Yes	Yes
Features	Automatic temperature profiling, low cost, user friendly, easy to install and remove	Displays data in rainfall units, long battery life	Own internal memory, real-time operation, programmable start time, miniature size, multiple transmitter configurations, memory wrap	High accuracy sensor, simple soil insertion, weatherproof enclosure, user calibration through MadgeTech software	Long battery life
For More Information	Go to Page 89	Go to Page 88	Go to Page 90	Go to Page 89	Go to Page 88

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

Systems		
		
Data Logger	**7001-CO2**	**Motion110**
Description	Carbon Dioxide Monitor	Motion Logger
Range	**Display:** 0 to 10,000 ppm 0 to 50°C (32 to 122°F) **With Logger:** 0 to 4,000 ppm 0 to 40°C	**Detection Distance:** 5M **Detection Range:** >80°
Accuracy	±50ppm or 5% of reading, whichever is greater ±1°C	N/A
Resolution	**Display:** 1 ppm 0.1°C **With Logger:** 0.05 ppm 0.005°C	**Time Resolution:** 1 second (reading rate dependent)
Memory	Data logger dependant	13,107
NIST Certificate	No	No
Delayed Start	Data Logger dependant	0 to 180 days
Alarm	No	No
Water Resistant	No	No
Features	Dual beam, absorption infrared gas sensor, built in CO2 and temperature sensors, and a large LCD display	High speed download, up to a five year battery life, small size, reusable
For More Information	Go to Page 91	Go to Page 90

Product Matrix

WIRELESS





Data Logger	RFpHTemp101	RFProcess101A	RFPulse101A	RFRHTemp101A	RFRTDTemp101A
Description	pH and Temperature Logger and Wireless Transmitter	Low Level DC Current Logger and Wireless Transmitter	Pulse Logger and Wireless Transmitter	Humidity and Temperature Logger and Wireless Transmitter	Precision RTD Based Temperature Logger and Wireless Transmitter
Measurement Range	-40 to +125°C 0 to 14 pH	±1mA ±30mA ±120mA	0 to 12VDC continuous: 0 to 30VDC peak	-30 to +70°C 0 to 95%RH	-200 to +850°C
Accuracy	±0.1°C ±0.1pH	±0.5% ±0.1% ±0.1%	–	±0.5°C ±3%RH	±0.1°C
Resolution	0.01°C 0.01pH	0.05µA 1µA 5µA	–	0.1°C 0.5%RH	0.01°C
Memory	13,107 per channel	8,191	4,095	5,461 per channel	5,461
Dimensions	2.4" x 4.5" x 1.0" plus 2" antenna (61mm x 114mm x 26mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)
NIST Certificate	No	No	No	Yes	Yes
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	No	No	No	No
Water Resistant	No	No	No	No	No
Features	Software configurable, multiple transmitter configurations, memory wrap-around, miniature size, user friendly, BNC connector	Software configurable, multiple transmitter configurations, memory wrap-around, miniature size, user friendly, programmable engineering units	Software configurable, multiple transmitter configurations, memory wrap-around, miniature size, user friendly, programmable engineering units	Software configurable, multiple transmitter configurations, memory wrap-around, miniature size, user friendly, automatic dew point and water concentration	Software configurable, multiple transmitter configurations, memory wrap-around, miniature size, user friendly, external 2,3, or 4 wire RTD probe
For More Information	Go to Page 95	Go to Page 95	Go to Page 95	Go to Page 94	Go to Page 94

WIRELESS



Data Logger	RFTC4000A	RFTemp101A	RFVolt101A
Description	Thermocouple Based Temperature Logger and Wireless Transmitter	Temperature Logger and Wireless Transmitter	Low Level DC Voltage Logger and Wireless Transmitter
Measurement Range	-30 to +70°C ambient Thermocouple Types: See Table Below	-30 to +70°C	±100mV -1 to 16V -20 to 32V
Accuracy	±0.5°C See Table Below	±0.5°C	±0.01% FSR ±0.1% FSR ±0.01% FSR
Resolution	0.1°C See Table Below	0.1°C	5µV 0.5mV 1mV
Memory	4,095 per channel	8,191	8,191
Dimensions	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)
NIST Certificate	Yes	Yes	No
Delayed Start	0 to 180 days	0 to 180 days	0 to 180 days
Alarm	No	No	No
Water Resistant	No	No	No
Features	Software configurable, multiple transmitter configurations, memory wrap-around, miniature size, user friendly, thermocouple mini-plug or screw terminal connection	Software configurable, multiple transmitter configurations, memory wrap-around, miniature size, user friendly	Software configurable, multiple transmitter configurations, memory wrap-around, miniature size, user friendly, programmable engineering units
For More Information	Go to Page 94	Go to Page 94	Go to Page 95

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

LCD Display Single Channel Thermocouple

TCTEMP2000
SINGLE CHANNEL THERMOCOUPLE LOGGER WITH AN LCD

Features

- Large Backlit LCD
- User-Friendly Front Panel
- High Speed Downloading
- Minimum/Maximum & Average Statistics
- Low Battery Indicator
- External Power or User Replaceable Battery

Applications

- Environmental Studies
- HVAC
- Food
- Concrete Curing
- Cryo-preservation
- Engine Studies
- Furnace Monitoring

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

MadgeTech's 2000 series LCD data loggers combine the visibility of strip chart recorders with the precision of data loggers. The display loggers are available for pressure, temperature, humidity, pH, current and voltage. Each logger features an eight button key pad, large LCD screen, black anodized aluminum casing, and on-screen statistics.

The TCTemp2000 is a thermocouple temperature logger with an internal temperature sensor and one external thermocouple input. Compatible with J, K, T, E, R, S, B and N type thermocouples, the device can record 131,071 readings per channel.

The convenient LCD screen allows for instant viewing of the current ambient and thermocouple temperature reading. This provides users with an instantaneous reading. When using an infrared thermocouple, users can find the difference between the air temperature and surface temperature.

Specifications†

Part Number	TCTemp2000
Temperature Sensor	Semiconductor
Internal Temperature Range	-20 to +60°C
Internal Temperature Resolution	0.1°C
Internal Calibrated Accuracy	±0.5°C (0 to +50°C)
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B, and N
Remote Channel Range, Resolution and Accuracy	See Table Above
Memory	131,071 per channel
Sample Rate	2 seconds up to 24 hours
Required Interface Package	IFC110 or IFC200
Typical Battery Life	1 year battery life at 1 minute reading rate with display off 30 days typical with continuous LCD use Optional AC adapter available
Baud Rate	115,200
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Black anodized aluminum
Dimensions	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

RTDTEMP2000
SINGLE CHANNEL PRECISION RTD LOGGER WITH AN LCD

Features
- Large Backlit LCD
- User-Friendly Front Panel
- High Speed Downloading
- Minimum/Maximum & Average Statistics
- Low Battery Indicator
- External Power or User Replaceable Battery

Applications
- Precision Temperature Recording
- Laboratory Monitoring
- Warehouse Monitoring
- Calibration Labs

The RTDTemp2000 is an RTD based temperature logger, with an LCD. Its precise measurement readings and high accuracy make this logger useful in a variety of temperature monitoring applications such as calibration chamber monitoring, research studies, and environmental studies.

Specifications†

Part Number	RTDTemp2000
Temperature Sensor	100Ω Platinum RTD
Temperature Range	-200 to +850°C
Temperature Resolution	0.01°C
Calibrated Accuracy	±0.05°C (-200 to +260°C) ±0.3°C (+260 to +850°C)
Memory	174,762
Sample Rate	2 seconds up to 24 hours
Required interface Package	IFC110 or IFC200
Typical Battery Life	1 year battery life at 1 minute reading rate with display off 30 days typical with continuous LCD display use Optional AC adapter available
Baud Rate	115,200
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Black anodized aluminum
Dimensions	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
TCTemp2000	Single Channel Thermocouple Based Temperature Logger with an LCD
RTDTemp2000	Single Channel Precision RTD Based Temperature Logger with an LCD

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	Replacement battery for the TCTemp2000 and RTDTemp2000
DC9V-NA	Wall mounted 120VAC/9VDC power adapter. (North American model)
DC9V-EU	Wall mounted 230VAC@50Hz/9VDC power adapter. (European model)

LCD Display Multiple Channel Thermocouple

QUADTEMP2000
FOUR CHANNEL THERMOCOUPLE LOGGER WITH AN LCD

Features

QuadTemp2000 & OctTemp2000

- Large Backlit LCD
- User-Friendly Front Panel
- High Speed Downloading
- Minimum/Maximum & Average Statistics
- Low Battery Indicator
- External Power or User Replaceable Battery

Applications

QuadTemp2000 & OctTemp2000

- Monitor Multiple Locations
- Warehouse Monitoring
- Refrigerator Monitoring
- Oven Monitoring
- Medical/Pharmaceutical
- HVAC

Specifications†

Part Number	QuadTemp2000
Internal Channel Temperature Sensor	Semiconductor
Internal Channel Temperature Resolution	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C (0 to +50°C)
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B, N
Remote Channel Range, Resolution & Accuracy	See Table Next Page
Cold Jct. Compensation	Automatic
Channels	Four
Memory	512,000 per channel
Sample Rate	User selectable from 8Hz to 24 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	TBD
Operating Environment	-20 to +60°C
Submersible	No
Material	Black anodized aluminum
Dimensions	7.24" x 2.70" x 1.15" (184mm x 67mm x 30mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The all-new QuadTemp2000 and OctTemp2000 thermocouple display loggers represent the very latest in data recording technology. MadgeTech's engineers built on our existing QuadTemp and OctTemp Loggers and added many new features as well as a display.

These loggers feature user-configurable graphical screens allowing any combination of channels to be displayed, as well as indication of the logger's status, battery life and available memory. Both are capable of simultaneously sampling each channel eight times a second, so it's fortunate each device is equipped with a massive 64 megabit of memory allowing 17 hours of continuous recording on all channels at full speed.

The QuadTemp2000 and OctTemp2000 also have the capability to enable and disable unused channels to conserve recording space. A QuadTemp2000 can log at 8Hz on a single channel for an astounding 68 hours!

† Specifications subject to limits or conditions. Consult product data sheet.

OCTEMP2000
EIGHT CHANNEL THERMOCOUPLE LOGGER WITH AN LCD

All of the existing QuadTemp and OctTemp's features are retained including memory wrap, delay start and digital calibration as well as a few new ones such as programmable stop methods, higher download speeds, extended ID, multiple thermocouple types and customizable channel names.

In addition, each channel includes its own high-resolution silicon sensor for automatic cold junction compensation, offering superior accuracy even in fast changing ambient conditions.

Weighing in at around 20 ounces, the new QuadTemp2000 and OctTemp2000 are sleeker than ever before making them attractive and portable. These devices can be powered by a single 9V battery or a wall mounted 9V power supply.

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

Specifications†

Part Number	OctTemp2000
Internal Channel Temperature Sensor	Semiconductor
Internal Channel Temperature Resolution	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C (0 to +50°C)
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B, N
Remote Channel Range, Resolution & Accuracy	See Table Above
Cold Jct. Compensation	Automatic
Channels	Eight
Memory	256,000 per channel
Sample Rate	User selectable from 8Hz to 24 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	TBD
Operating Environment	-20 to +60°C
Submersible	No
Material	Black anodized aluminum
Dimensions	7.24"x2.70"x1.40" (184mm x 67mm x 36mm)
Approvals	CE Pending

Ordering Information

Product ID	Description
QuadTemp2000	Four Channel Thermocouple Based Temperature Logger with an LCD
OctTemp2000	Eight Channel Thermocouple Based Temperature Logger with an LCD

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	Replacement battery for the QuadTemp2000 and OctTemp2000
DC9V-NA	Wall mounted 120VAC/9VDC power adapter. (North American model)
DC9V-EU	Wall mounted 230VAC@50Hz/9VDC power adapter. (European model)

LCD Display Humidity and Temperature

RHTEMP2000
HUMIDITY AND TEMPERATURE LOGGER WITH AN LCD

Features

- Large Backlit LCD
- User-Friendly Front Panel
- High Speed Downloading
- Minimum/Maximum & Average Statistics
- Low Battery Indicator
- External Power or User Replaceable Battery

Applications

- Warehouse Monitoring
- Museum Monitoring
- Manufacturing Environments
- Quality Assurance
- Assembly Lines
- Laboratory Monitoring
- Medical/Pharmaceutical

Specifications†

Part Number	RHTemp2000
Temperature Sensor	Semiconductor
Temperature Range	-20 to +60°C
Temperature Resolution	0.1°C
Temperature Accuracy	±0.5°C (0 to 50°C)
Humidity Sensor	Internal semiconductor
Humidity Range	0 to 95%RH
Humidity Resolution	0.1%RH
Humidity Accuracy	±3%RH (±2%RH typical @25°C)
Memory	131,071 per channel
Sample Rate	2 seconds up to 24 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	1 year battery life at 1 minute reading rate with display off 30 days typical with continuous LCD use Optional AC adapter available
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Black anodized aluminum
Dimensions	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The RHTemp2000 is a temperature and humidity logger with an LCD. The device can measure and record 131,071 readings per channel, and will retain data even if AC or battery power are lost. It is perfect for applications such as HVAC, warehouse, laboratory and museum monitoring. The temperature and humidity can be calibrated to a NIST traceable standard. The eight button key pad and large LCD set this data logger apart from other humidity loggers on the market.

Available on-screen data includes: statistics (min, max, average) for both channels; recording status (start, stop and recording rate); display options (channels shown, units, text size); and calibration information (date calibrated, date for recalibration). Statistics can be cleared at any time during logging.

PR2000
PRESSURE DATA LOGGER
WITH 1/4" NPT CONNECTION AND AN LCD

Features
- Large Backlit LCD
- User-Friendly Front Panel
- High Speed Downloading
- Minimum/Maximum & Average Statistics
- Low Battery Indicator
- External Power or User Replaceable Battery

Applications
- Precision Pressure Recording
- Geothermal
- Hydraulic Systems
- Pneumatics

The PR2000 is a pressure logger with an LCD display. It is ideal for applications requiring precise displayed pressure readings, and with an IP65 rating, it is suitable for outdoor use. The device comes equipped with on-screen real-time graphing, an enhancement that helps to quickly visualize data trends. It has a memory capacity of 262,143 readings, and features a 1/4" NPT connection, enabling users to quickly fasten it onto pipes.

PR2000 Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500	0-1000 PSIA	0-5000PSIA
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution (PSI)	0.002	0.005	0.02	0.05	0.05	0.2

Specifications†

Part Number	PR2000
Pressure Sensor	Semiconductor (strain gauge)
Pressure Range	See Table Above
Pressure Resolution	
Calibrated Pressure Accuracy	
Memory	262,143
Sample Rate	2 seconds up to 24 hours
Required Interface Package	IFC110 or IFC200
Typical Battery Life	1 year battery life at 1 minute reading rate with display off 30 days typical with continuous LCD use Optional AC power available
Baud Rate	115,200
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Black anodized aluminum
Dimensions	5.1" x 4.8" x 1.78" (130mm x 122mm x 45mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
RHTemp2000	Humidity and Temperature Logger with an LCD
PR2000*	Pressure Logger with 1/4" NPT Connection and an LCD
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	Replacement battery for the RHTemp2000
DC9V-NA	Wall mounted 120VAC/9VDC power adapter. (North American model)
DC9V-EU	Wall mounted 230VAC@50Hz/9VDC power adapter. (European model)

**Note: PR2000 uses 6 AA batteries*

PRHTEMP2000
BAROMETRIC PRESSURE, TEMPERATURE AND HUMIDITY LOGGER WITH AN LCD

Features
- Large Backlit LCD
- User-Friendly Front Panel
- High Speed Downloading
- Minimum/Maximum & Average Statistics
- Low Battery Indicator
- External Power or User Replaceable Battery

Applications
- Warehouse Monitoring
- Manufacturing Environments
- Quality Assurance
- Assembly Lines
- Laboratory Monitoring
- Medical/Pharmaceutical

Specifications†

Part Number	PRHTemp2000
Temperature Sensor	Semiconductor
Temperature Range	-20 to +60°C
Temperature Resolution	0.1°C
Calibrated Temperature Accuracy	±0.5°C (0 to +50°C)
Pressure Sensor	Semiconductor (strain gauge)
Pressure Range	0 to 30PSIA
Pressure Resolution	0.002PSI
Calibrated Pressure Accuracy	±1%FSR @ 25°C, ±0.2% typical
Humidity Sensor	Internal Semiconductor
Humidity Range	0 to 95%RH
Humidity Resolution	0.1%RH
Calibrated Humidity Accuracy	±3%RH, ±2%RH typical @ 25°C
Memory	87,381 per channel
Sample Rate	2 seconds up to 24 hours
Required Interface Package	IFC110 or IFC200
Typical Battery Life	1 year battery life at 1 minute reading rate with display off 30 days typical with continuous LCD use Optional AC adapter available
Baud Rate	115,200
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Black anodized aluminum
Dimensions	4.8" x 3.3" x 1.25" " (122mm x 84mm x 32mm)
Approvals	CE

The PRHTemp2000 is perfect for applications requiring instantaneous readings of environmental parameters, including temperature, humidity and barometric pressure. With 87,381 readings per channel, the PRHTemp2000 has one of the largest memory capacities of any similar data logger on the market. The non-volatile memory will retain recorded data, even if AC or battery power are lost. Parameters can be calibrated to a N.I.S.T. traceable standard.

Available on-screen data includes: statistics (min, max, average) for both channels; recording status (start, stop and recording rate); display options (channels shown, units, text size); and calibration information (date calibrated, date for recalibration). Statistics can be cleared at any time during logging.

PHTEMP2000
PH AND TEMPERATURE DATA LOGGER WITH AN LCD

Applications

- pH Recording
- ORP Recording
- Precision Temperature Recording
- Sewer Treatment Plants
- Waste Water Studies
- Environmental Studies
- Wetland Monitoring
- Surface and Water Monitoring

The pHTemp2000 is a battery powered, stand alone pH and temperature logger with an LCD. This all-in-one compact, portable, easy to use device will measure and record up to 131,071 readings per channel. The pHTemp2000 will directly connect to many commonly used pH and ORP electrodes through a female BNC connector mounted on its side. Temperature is measured by directly connecting an RTD to the pHTemp2000. Temperature compensation is automatically done internally to the unit.

The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged. The device can be started and stopped directly from your computer. The pHTemp2000 makes data retrieval quick and easy. Simply plug it into an empty com port and our user-friendly software does the rest.

Specifications†

Part Number	pHTemp2000
pH Input Connection	Female BNC jack
pH Range	0.00 to 14.00pH
pH Resolution	0.01pH (0.1mV)
pH Calibrated Accuracy	±0.1pH (±1mV)
Temperature Sensor	2, 3 or 4 wire 100 ohms platinum RTD
Temperature Range	-200 to +850°C
Temperature Resolution	0.01°C
Calibrated Accuracy	±0.1°C @ 25°C ambient
Memory	131,071 per channel
Sample Rate	2 seconds to 24 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	1 year battery life at 1 minute reading rate with display off 30 days typical with continuous LCD use Optional AC adapter available
Operating Environment	-5 to +50°C, 0 to 95%RH (non-condensing)
Materials	Black anodized aluminum
Dimensions	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
PRHTemp2000	Barometric Pressure, Temperature and Humidity Logger with an LCD
pHTemp2000	pH and Temperature Logger with an LCD
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	Replacement battery for the PRHTemp2000 and pHTemp2000
DC9V-NA	Wall mounted 120VAC/9VDC power adapter. (North American model)
DC9V-EU	Wall mounted 230VAC@50Hz/9VDC power adapter. (European model)

LCD Display Low Level DC Current

PROCESS2000
LOW LEVEL DC CURRENT LOGGER WITH AN LCD

Features

- Large Backlit LCD
- User-Friendly Front Panel
- High Speed Downloading
- Minimum/Maximum & Average Statistics
- Low Battery Indicator
- External Power or User Replaceable Battery

Applications

- 4 to 20 mA Current Recording
- Precision Current Recording
- Battery Studies
- Photo-Voltaic Studies
- Low Level Signal Monitoring
- Biological Sensor Monitoring

Specifications†

Part Number	Process2000
Current Range	See Table Below
Current Resolution	
Current Calibrated Accuracy	
Input Impedance	
Memory	262,143
Sample Rates	1 second to 24 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	1 year battery life at 1 minute reading rate with display off 30 days typical with continuous LCD use Optional AC adapter available
Operating Environment	-20 to +60°C, 0 to 95%RH non-condensing
Material	Black anodized aluminum
Dimensions	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The Process2000 is a low level DC current logger. It is designed for accuracy and flexibility unequaled in the 4-20mA loop sensor and control industry. The Process2000 has all the features associated with a data logger and also has an LCD for displaying readings in real time. It can be inserted almost anywhere because it adds very little resistance to the loop (10Ω typical). Since it operates with an internal battery (user replaceable), ground loop errors can be avoided.

The Process2000 can measure currents that are slightly negative, allowing for other uses as well. With 16 bits of resolution, it is ideal for accurately measuring battery currents, solar cell currents and other current sources. The device can measure and record up to 262,143 readings in non-volatile memory, retaining valuable data even if the battery should become discharged. Additionally, customized engineering units can be defined to map the measured data to almost any unit imaginable. For example, a 4-20mA flow meter might output 4mA current for 0 liters of water and 20mA current for 5 liters of water. Using the Engineering Units in the device, the logger can be set up to display the data in liters rather than milliamps— a useful feature for presentations!

Nominal Range	±1mA	±25mA	±100mA
Measurement Range	±1.25mA	±30mA	±120mA
Common Mode Input Range	0 to 2.5V	0 to 2.5V	0 to 2.5V
Resolution	0.05µA	1µA	5µA
Calibrated Accuracy @ 25°C	±0.5%FSR	±0.1%FSR	±0.1%FSR
Input Impedance	50Ω	10Ω	10Ω

VOLT2000
LOW LEVEL DC VOLTAGE LOGGER WITH AN LCD

Applications

- Current Shunts
- Battery Studies
- Photo-Voltaic Studies
- Low Level Signal Monitoring
- Biological Sensor Monitoring

The Volt2000 is a low level DC voltage data logger. It is designed for accuracy and flexibility. The device has all the features associated with a data logger and also has an LCD for displaying readings in real time. The Volt2000 can measure and record up to 262,143 readings, and its non-volatile memory will retain data even if AC or battery power are lost. Since it operates with an internal battery (user replaceable), ground loop errors can be avoided. The Volt2000 can measure voltage that is slightly negative, allowing for other uses as well.

With 16 bits of resolution, it is ideal for accurately measuring battery voltage and other low level signals. The Volt2000 has customizable engineering units so data can be mapped to almost any unit.

Specifications†

Part Number	Volt2000
Voltage Range	See Table Below
Voltage Resolution	
Voltage Calibrated Accuracy	
Input Impedance	
Memory	262,143
Sample Rates	1 second to 24 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	1 year battery life at 1 minute reading rate with display off 30 days typical with continuous LCD use Optional AC adapter available
Operating Environment	-20 to +60°C, 0 to 95%RH non-condensing
Material	Black anodized aluminum
Dimensions	4.8" x 3.3" x 1.25" (122mm x 84mm x 32mm)
Approvals	CE Pending

Nominal Range	±100mV	0 to2.5V	0 to 15V	0 to 30V
Measurement Range (VDC)	±150mV	-0.25 to 2.75	-1 to 16	-2 to 32
Common Mode Input Range	0 to 2.5V	-	-	-
Accuracy	±0.01%FSR	±0.01%FSR	±0.10%FSR	±0.10%FSR
Resolution (mV)	5µV	0.1	0.5	1.0

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Process2000	Low Level DC Current Logger with an LCD
Volt2000	Low Level DC Voltage Logger with an LCD

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	Replacement battery for the Process2000 and Volt2000
DC9V-NA	Wall mounted 120VAC/9VDC power adapter. (North American model)
DC9V-EU	Wall mounted 230VAC@50Hz/9VDC power adapter. (European model)

TEMP100, TEMP101, TEMP110
GENERAL PURPOSE TEMPERATURE LOGGERS

Applications

Temp100
Temp101
Temp110
TempRetriever

- Shipping
- Museums
- R&D
- Warehouses
- HVAC
- Temperature Mapping

The MadgeTech line of standard temperature data loggers allow for a myriad of application and budgets at hand. They are all specified similarly in temperature, range, accuracy, and resolution but differ in download speeds, memory size, and extra features such as alarm and pushbutton start & stop.

Our standard line of portable temperature loggers excel in dry applications such as shipping, museums, R&D, warehouses, and HVAC. The LED alarm indicator makes it easy to know when pre-set temperature limits have been exceeded.

The Temp100, Temp101, and the Temp110 share the powerful yet intuitive MadgeTech software. When starting these devices the user can set the start time, sample rate, alarm limits, and an ID field for keeping track of the loggers.

The offloaded data can be viewed in degrees of Celsius, Fahrenheit, Kelvin, and Rankine. The software automatically calculates Mean Kinetic Temperature, and other useful temperature statistics. To see the required analysis, it only takes one click, and the data is exported to MS Excel®.

Specifications†

Part Number	Temp100	Temp101
Sensor	Internal semiconductor	Internal semiconductor
Temperature Range	-40 to +80°C	-40 to +80°C
Temperature Resolution	0.1°C	0.1°C
Calibrated Accuracy	±0.5°C (0 to +50°C)	±0.5°C (0 to +50°C)
Memory	32,767	32,767
Sample Rate	2 seconds up to 12 hours	2 seconds up to 12 hours
Alarm	Yes	Yes
LED Indicator	Red & Green	Red
Pushbutton Start	Yes	No
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	2,400
Typical Battery Life	1 year	1 year
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing	-40 to +80°C 0 to 95%RH non-condensing
Submersible	No	No
Material	ABS plastic	ABS plastic
Dimensions	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)
Single/Multi-Use	Multi-use	Multi-use
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

TEMPRETRIEVER
GENERAL PURPOSE TEMPERATURE LOGGER

Features

Temp100
- External Pushbutton to Start & Stop Data logging
- LED Alarm Indication
- 2,400 Baud Download Rate
- 1 Year Typical Battery Life

Temp101
- LED Alarm Indication
- 2,400 Baud Download Rate
- 1 year Typical Battery Life

TempRetriever
- Low Cost
- User-Friendly
- LED Alarm Indication
- Pushbutton Start

Temp110
- 57,600 Baud Offload Speed (24X faster)
- 10 Year Typical Battery Life

The TempRetriever's specifications are overqualified for its budget-minded price. The accuracy of ±0.5°C and 0.1°C resolution coupled with 16,383 readings of non-volatile memory, 1-year battery life, and LED alarm indication makes this a perfect temperature logger when keeping costs down is paramount. Industries such as education, research, and perishable goods transportation will all benefit from the remarkable value this little TempRetriever represents.

Specifications †

Part Number	TempRetriever	Temp110
Sensor	Internal semiconductor	Internal semiconductor
Temperature Range	-40 to +80°C	-40 to +80°C
Temperature Resolution	0.1°C	0.1°C
Calibrated Accuracy	±0.5°C (0 to +50°C)	±0.5°C (0 to +50°C)
Memory	16,383	32,767
Sample Rate	5 seconds up to 30 minutes	2 seconds up to 12 hours
Alarm	Yes	No
LED Indicator	Red & Green	Red
Pushbutton Start	Yes	No
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	38,400	57,600
Typical Battery Life	1 year	10 years (15 minute reading rate, 25°C)
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing	-40 to +80°C 0 to 95%RH non-condensing
Submersible	No	No
Material	ABS plastic	ABS plastic
Dimensions	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)	1.7" x 2.3" x 0.8"" (44mm x 59mm x 21mm)
Single/Multi-Use	Multi-use	Multi-use
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Temp100	Temperature Logger with Pushbutton Start/Stop
Temp101	Temperature Logger
TempRetriever	Temperature Logger with Pushbutton Start/Stop
Temp110	Temperature Logger with 10 year battery life
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC–7PN	3.6V lithium replacement battery for Temp100, Temp101, Temp110 and TempRetriever

TRANSITEMP AND TRANSITEMPII SHIPPING AND TRANSPORTATION LOGGERS

Applications

- Shipping Verification
- Cold Chain Monitoring
- Medical/Pharmaceutical
- Storage

Did the perishable goods arrive in top condition? *"To measure is to know"* is a fitting quote from Lord Kelvin. The TransiTemp line is the ideal temperature logger for "knowing" the transit environment. The accuracy of ±0.5°C and up to 32,767 data points of non-volatile memory will measure and record temperature during shipping.

Specifications†

Part Number	TransiTemp	TransiTempII
Sensor	Internal semiconductor	Internal semiconductor
Temperature Range	-20 to +70°C	-40 to +80°C
Temperature Resolution	0.1°C	0.1°C
Calibrated Accuracy	±0.5°C (-10 to +40°C) ±1.0°C (-20 to +70°C)	±0.5°C (-10 to +40°C) ±1.0°C (-20 to +70°C)
Memory	8,191	32,767
Sample Rate	5 seconds up to 30 minutes	5 seconds up to 30 minutes
Alarm	Yes	Yes
LED Indicator	Red & Green	Red, Yellow & Green
Pushbutton Start	Yes	Yes
Required Interface Package	IFC110 or IFC200	IFC300
Baud Rate	38,400	38,400
Typical Battery Life	90 days typical 120 days at a 25°C, 5 minute reading rate	1 Year
Operating Environment	-20 to +70°C 0 to 90%RH non-condensing	-40 to +80°C 0 to 100%RH
Submersible	No	Splash Proof (IP65)
Material	ABS plastic	ABS plastic
Dimensions	1.9" x 3.6" x 0.7" (49mm x 92mm x 18mm)	3.3" x 2.1" x 0.4" (83mm x 54mm x 11mm)
Single/Multi-Use	Single/Multi-use available	Multi-Use
Compliance	–	EN 12830
Approvals	CE	CE

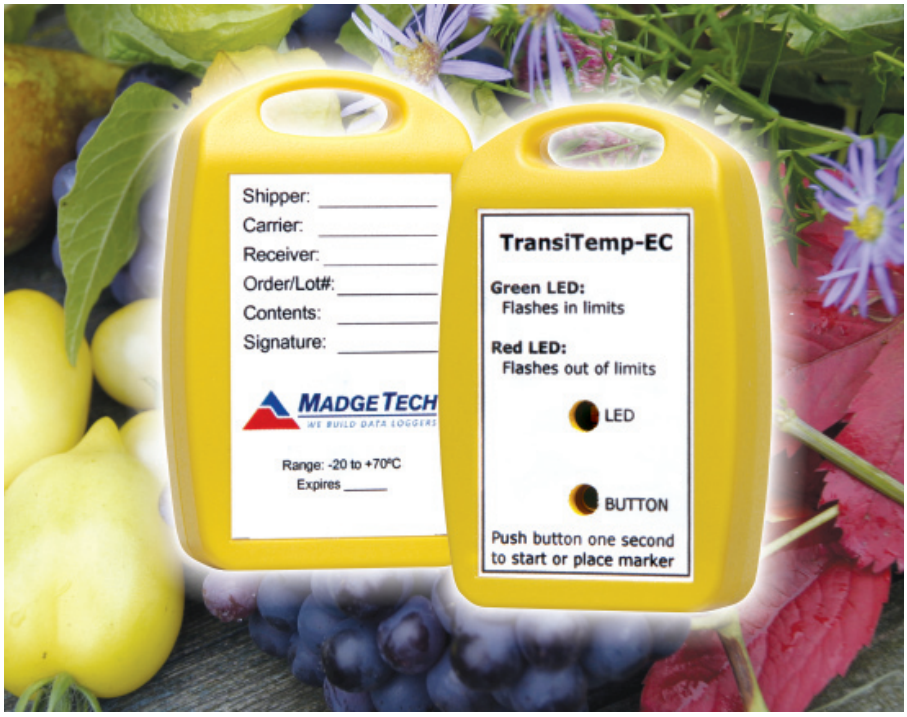
† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The TransiTempII is a splash proof (IP65) temperature data logger featuring a highly precise semiconductor temperature sensor and an ABS plastic enclosure. This affordable, N.I.S.T. traceable device is ideal for monitoring and recording the temperature of perishable products, including food items and medical/pharmaceutical goods, both in storage and in transit. The TransiTempII uses the IFC300 USB docking station for quick data download.

As products become more heavily regulated and Cold Chain monitoring expands, the TransiTemp line is increasingly used in food, cosmetics pharmaceuticals, and chemical transportation. The unit features a magnetic start (TransiTempII) or a pushbutton start (TransiTemp-EC and TransiTemp) and LED alarm indicators.

The TransiTemp is designed to match all budgets, a single-use and multi-use version is offered. The single-use version will only operate one time and does not require a PC to start the device— only a press of the button. After use, the single-use version can be returned to MadgeTech for a partial credit. The multiple use version is completely reusable and is cost effective when used frequently.

TRANSITEMP-EC
SHIPPING AND TRANSPORTATION LOGGERS



Features

- Low Cost
- Shipping Label
- Pushbutton Start
- Lanyard Attachment

The TransiTemp-EC is similar in many ways to the TransiTemp but it is designed specifically for high volume, low cost in-transit recording. The TransiTemp-EC has a specially molded case with a handle for convenient attachment. The TransiTemp uses the same interface cable compatible with most other MadgeTech products whereas the TransiTemp-EC has a unique interface connector (IFC103).

Specifications†

Part Number	TransiTemp-EC
Sensor	Internal semiconductor
Temperature Range	-20 to +70°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C (-10 to +40°C) ±1.0°C (-20 to +70°C)
Memory	8,191
Sample Rate	5 seconds up to 30 minutes
Alarm	Yes
LED Indicator	Red & Green
Pushbutton Start	Yes
Required Interface Package	IFC103
Baud Rate	38,400
Typical Battery Life	90 days
Operating Environment	-20 to +70°C 0 to 90%RH non-condensing
Submersible	No
Material	ABS plastic
Dimensions	1.7" x 2.6" x 0.6" (44mm x 67mm x 16mm)
Single/Multi-Use	Single/Multi-use available
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
TransiTempII*	Cold Chain Temperature Logger
TransiTemp	Single-Use In-Transit Temperature Logger
TransiTemp-Multi	Multi-Use In-Transit Temperature Logger
TransiTemp-EC*	Single-Use Economy Temperature Logger
TransiTemp-EC-Multi	Multi-Use Economy Temperature Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable for TransiTemp
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable for TransiTemp
IFC103	Includes software, manual and 9–pin computer interface cable for TransiTemp-EC
IFC300	Includes software, manual, Quick Start guide and USB docking station for TransiTempII
NIST	N.I.S.T. Calibration Certificate
CR2032	Replacement battery for the TransiTemp-Multi

*TransiTemp-EC-Single, and TransiTempII batteries are not user replaceable

Temperature Single Channel Precision RTD

When temperature precision is the name of the data recording game, the MadgeTech RTD series of temperature loggers is the device to use. When used with a 2, 3, or 4 wire 100Ω platinum RTD, these loggers provide excellent resolution (0.01°C) and accuracy (up to ±0.05°C). The ultra–high resolution in concert with software calibration yields unparalleled precision across a wide range of temperatures.

The RTD sensor does not suffer from the cold–junction issues of a thermocouple sensor, nor the errors at high & low temperatures of a thermistor. Thus the RTD series of temperature loggers is ideal for measuring precision environmental chambers, oil baths, pH solutions, and a host of laboratory applications.

RTDTEMP101 & RTDTEMP110 SINGLE CHANNEL PRECISION RTD LOGGERS

Features

RTDTemp101

- Single Channel RTD
- 21,845 Readings
- Small Size
- Low Cost, High Performance

RTDTemp110

- Single Channel RTD
- 21,845 Readings
- Small Size
- High Speed Download
- Up to 10 Year Battery Life

Specifications†

Part Number	RTDTemp101	RTDTemp110	QuadRTD	OctRTD
Sensor	External: 2, 3, or 4 wire 100Ω platinum RTD	External: 2, 3, or 4 wire 100Ω platinum RTD	External: 2, 3, or 4 wire 100Ω platinum RTD	External: 2, 3, or 4 wire 100Ω platinum RTD
Temperature Range	–200 to +850°C	–200 to +850°C	–200 to +850°C	–200 to +850°C
Temperature Resolution	0.01°C	0.01°C	0.01°C	0.01°C
Calibrated Accuracy	±0.05°C	±0.1°C	±0.1°C	±0.1°C
Memory	21,845	21,845	21,845 per channel	10,922 per channel
Sample Rate	2 seconds up to 12 hours	2 seconds up to 12 hours	2 seconds up to 12 hours	2 seconds up to 12 hours
Channels	1	1	4	8
LED Indicator	Red	Red	None	None
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	57,600	2,400	2,400
Typical Battery Life	1 year	10 years	1 year	1 year
Operating Environment	–40 to +80°C 0 to 95%RH non–condensing	–40 to +80°C 0 to 95%RH non–condensing	–20 to +60°C 0 to 95%RH non–condensing	–20 to +60°C 0 to 95%RH non–condensing
Submersible	No	No	No	No
Material	ABS plastic	ABS plastic	Anodized aluminum	Anodized aluminum
Dimensions	1.4" x 2.5" x 0.6" (36mm x 64mm x 16mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)	3.5" x 4.4" x 1.5" (89mm x 112mm x 39mm)
Approvals	CE	CE	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

QUADRTD AND OCTRTD
FOUR AND EIGHT CHANNEL PRECISION RTD LOGGERS

Features

QuadRTD

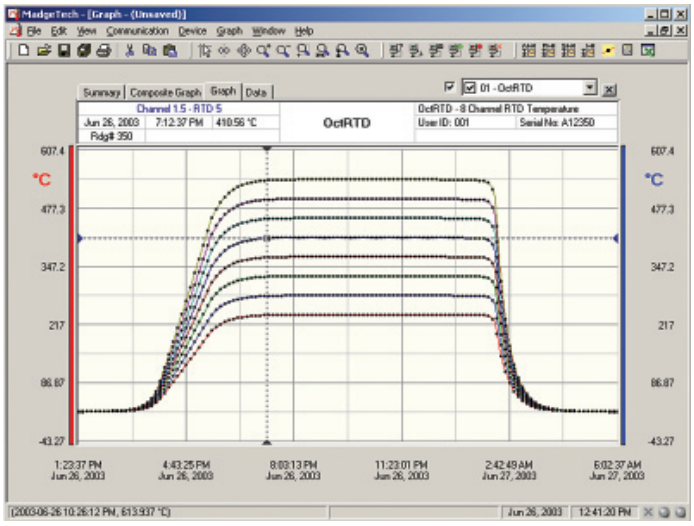
- Four Channels of RTD Temperature
- 21,845 Readings per Channel
- Rugged Casing
- Mounting Holes Provided

OctRTD

- Eight Channels of RTD Temperature
- 10,922 Readings per Channel
- Rugged Casing
- Mounting Holes Provided

While the RTDTemp101 and RTDTemp110 are single channel loggers, the QuadRTD and OctRTD record four and eight channels, respectively. They all share the powerful yet pragmatic MadgeTech software which can display the units in degrees of Celsius, Fahrenheit, Kelvin, Rankine, and in Ohms. Analyses of data are quickly performed, and, for further analysis, one click will load data into an MS Excel® spreadsheet.

Analyze data using the software's powerful tools to examine, export, and print professional-looking graphs.



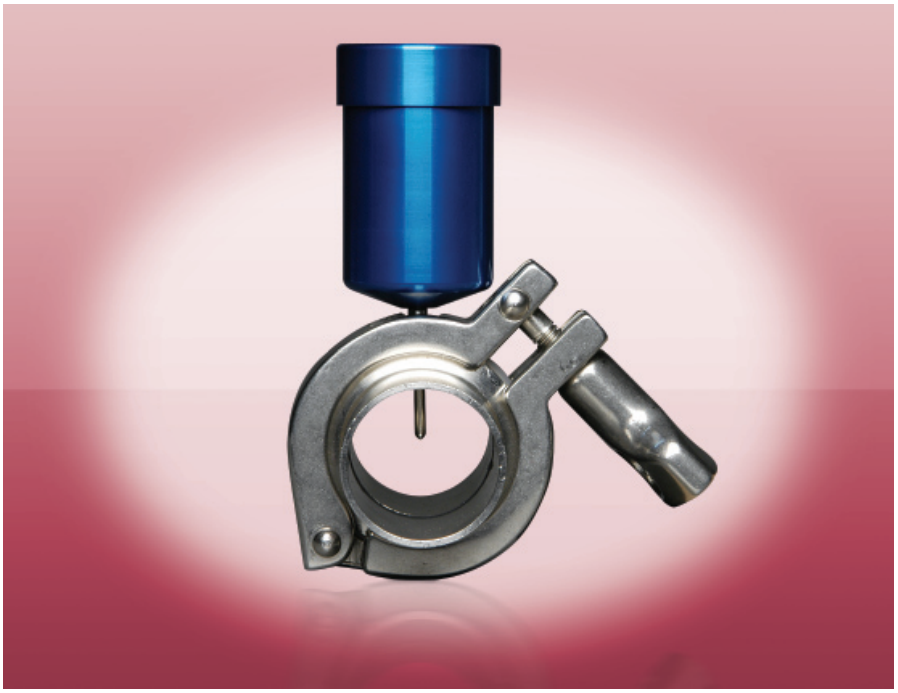
Ordering Information

Product ID	Description
RTDTemp101	100Ω RTD based Temperature Logger
RTDTemp110	100Ω RTD based Temperature Logger with 10 year battery life
QuadRTD	Four Channel, 100Ω RTD based Temperature Logger
OctRTD	Eight Channel, 100Ω RTD based Temperature Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC–7PN	Replacement battery for RTDTemp101 and RTDTemp110
U9VL–J	Replacement battery for QuadRTD and OctRTD

Temperature Precision RTD for Use with Smart Gasket®

SGTEMP1000
PRECISION RTD FOR USE WITH SMART GASKET®



Features
- Miniature Size
- Light Weight
- User-friendly
- Started/Stopped Directly from a Computer

Applications
- Precision Temperature Recording
- Pharmaceutical
- Food
- Beverage
- Dairy

Specifications†

Part Number	SGTemp1000
Sensor	Internal semiconductor
Temperature Range	-50°C to +150°C for probe
Temperature Resolution	0.01°C
Calibrated Accuracy	±0.1°C
Memory	21,845
Sample Rate	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +80°C 0 to 95% RH
Submersible	Splash-proof, IP65
Material	Anodized aluminum
Dimensions	Body: 2.75" x 1.5" dia. (70mm x 38mm dia.) Probe: 1.15" x .095" dia. (29mm x 2mm dia.)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The SGTemp1000 is a stand alone, precision temperature data logger. Its main purpose is for monitoring the internal temperature of pipelines through a Smart Gasket®. By utilizing an RTD temperature sensor and thin diameter probe, the device provides accurate readings and a fast response time. The lightweight aluminum case allows it to be oriented perpendicular through a gasket into a pipeline.

The device can measure and record up to 21,845 measurements and the storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged.

IRTC110
INFRARED THERMOCOUPLE LOGGER

Features
- 10 Year Battery Life
- Wide Temperature Range
- Non-contact Temperature Recording
- Miniature Size

Applications
- Non-contact temperature monitoring
- Surface temperature recording
- Monitoring moving objects
- Long distance temperature measurement

The IRTC110 is a miniature, battery powered, infrared thermocouple based temperature logger. The device provides instantaneous, non-contact temperature measurements, and a high speed download.

It comes fully equipped with a Type K thermocouple that measures temperatures between 25 – 80°C (80 – 180°F). The device is ideal for monitoring temperature in remote locations or for industrial parts where thermocouple wires may intertwine. The IRTC110 is compatible with other infrared thermocouples. Please contact MadgeTech for details.

Specifications†

Part Number	IRTC110
Internal Channel Temperature Sensor	Semiconductor
Internal Channel Temperature Resolution	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C
Remote Channel Temperature Sensor	Thermocouple Type K (included) (call for other available types)
Remote Channel Range, Resolution & Accuracy	25 to +80°C 0.1°C ±0.5°C
Cold Jct. Compensation	Automatic
Channels	1 Internal & 1 Remote
Memory	16,383 per channel
Sample Rate	2 seconds up to 12 hours
LED Indicator	Red
Required Interface Package	IFC110 or IFC200
Baud Rate	57,600
Typical Battery Life	10 years
Operating Environment	-17 to +70°C 0 to 95%RH non-condensing
Submersible	No
Material	ABS plastic
Dimensions	1.7" x 2.3" x 0.8" (44mm x 59mm x 21mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
SGTemp1000	Precision RTD Based Temperature Logger for Use with Smart Gasket®
IRTC110	Infrared Thermocouple Based Temperature Logger
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	3.6V, lithium battery, replacement battery for the IRTC110 and SGTemp1000

Temperature Single Channel Thermocouple

TC110 AND TC110-2MB SINGLE CHANNEL THERMOCOUPLE LOGGERS

Features

TC110
- Long Battery Life
- High Speed Download

TC110-2MB
- 2 year Battery Life
- Large Memory

TC4000
- Small Size
- Low Cost
- Wide Temperature Range

Specifications†

Part Number	TC110	TC110-2MB
Internal Channel Temperature Sensor	Semiconductor	Semiconductor
Internal Channel Temperature Resolution	0.1°C	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C (0 to +50°C)	±0.5°C (0 to +50°C)
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B ,N	Thermocouple Types J, K, T, E, R, S, B ,N
Remote Channel Range, Resolution & Accuracy	See Table On Next Page	See Table On Next Page
Cold Jct. Compensation	Automatic	Automatic
Channels	1 Internal & 1 Remote	1 Internal & 1 Remote
Memory	16,383 per channel	262,144 per channel
Sample Rate	2 seconds up to 12 hours	1 seconds up to 12 hours
LED Indicator	Red	Red
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	57,600	57,600
Typical Battery Life	10 years	2 years
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing	-40 to +80°C 0 to 95%RH non-condensing
Submersible	No	No
Material	ABS plastic	ABS plastic
Dimensions	1.7" x 2.3" x 0.8" (44mm x 59mm x 21mm)	1.7" x 2.3" x 0.8" (44mm x 59mm x 21mm)
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Thermocouples are some of the most popular temperature sensors available today. They are used to measure wide temperature ranges and are rugged and inexpensive. Accordingly, they have become widely used throughout many industries.

MadgeTech offers a full line of thermocouple data loggers to fit most any application. They are designed to accept thermocouple types J, K, T, E, R, S, B, and N, and offer up to 16 bits of resolution. In addition to the thermocouple inputs, all of our thermocouple loggers offer an internal temperature sensor that can be used to monitor and record ambient temperatures.

Each thermocouple logger comes standard with SMP-style (miniature) connectors for quick and easy setup. They are also available with removable screw terminal (ST) input connections upon request.

TC4000
SINGLE CHANNEL THERMOCOUPLE LOGGER

With the user-friendly MadgeTech software, data is simply downloaded to a computer where the readings are displayed in degrees Celsius, Fahrenheit, Kelvin, or Rankine. The software allows the user to view all data points and even a summary of the data being viewed for calculations such as Mean Kinetic Temperature. If additional analysis of the data is needed, the data can be easily exported to MS Excel® by simply clicking a button.

The TC4000 and TC110 are single-channel thermocouple loggers, both of which can record up to 16,383 readings. The TC110 also offers higher download speeds and can extend the battery life up to ten years.

The TC110-2MB offers the same great features as the TC110, only with additional memory. This compact, portable, easy to use device can measure and record 262,144 measurements per channel, providing a week's worth of data at a 2 second reading rate.

Table Applies to both single & multi channel thermocouple loggers

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

Specifications†

Part Number	TC4000
Internal Channel Temperature Sensor	Semiconductor
Internal Channel Temperature Resolution	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B ,N
Remote Channel Range, Resolution & Accuracy	See Table Above
Cold Jct. Compensation	Automatic
Channels	1 Internal & 1 Remote
Memory	16,383 per channel
Sample Rate	2 seconds up to 12 hours
LED Indicator	Red
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing
Submersible	No
Material	ABS plastic
Dimensions	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
TC4000-MP	Thermocouple Based Temperature Logger with standard mini plug connector
TC4000-ST	Thermocouple Based Temperature Logger with fixed screw terminals
TC4000-TB	Thermocouple Based Temperature Logger with pluggable screw terminals
TC110-MP	Thermocouple Based Temperature Logger with standard mini plug and 10 year battery life
TC110-ST	Thermocouple Based Temperature Logger with fixed screw terminal and 10 year battery life
TC110-TB	Thermocouple Based Temperature Logger with pluggable screw terminals and 10 year battery life
TC110-2MB	Thermocouple Based Temperature Logger with extended memory and standard mini-plug connector
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC–7PN	Replacement battery for the TC4000 TC110 and TC110-2MB

Temperature Submersible Rugged Thermocouple

TCTEMP1000
SUBMERSIBLE RUGGED THERMOCOUPLE LOGGER

Applications

- Monitor Concrete Curing
- Asphalt Curing
- Well Monitoring
- Environmental Studies
- Fabrication

The TCTemp1000 is a rugged thermocouple temperature logger that has the ability to be placed in environments where other thermocouple loggers cannot. Its rugged construction and stainless steel enclosure allows this fully submersible device to be placed virtually anywhere.

An SMP-style connector is exposed by loosening the cord grip and unscrewing the water-tight thermocouple enclosure at the end of the logger. This allows for easy replacement of thermocouples if the probes become damaged or intentionally cut as in many concrete curing applications. The TCTemp1000 comes standard with a 6' type K thermocouple probe.

With our user-friendly software, the TCTemp1000 allows users to perform a single or two-point calibration on the device. It also has a second internal temperature sensor that can be used to monitor ambient temperatures. These features ensure the device has the highest possible accuracy on all collected readings up to 16,383.

Once the TCTemp1000's data is downloaded to a computer, the readings may be displayed in degrees Celsius, Fahrenheit, Kelvin, or Rankine. The software allows the user to view all data points, and even a summary of the data being viewed for calculations such as Mean Kinetic Temperature. If additional analysis of the data is needed, the data can be easily exported to MS Excel® with one click.

Specifications†

Part Number	TCTemp1000
Internal Channel Temperature Sensor	Semiconductor
Internal Channel Temperature Resolution	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B ,N
Remote Channel Range, Resolution & Accuracy	See Table On Next Page
Cold Jct. Compensation	Automatic
Memory	16,383 per channel
Sample Rate	2 seconds up to 12 hours
LED Indicator	None
Channels	1 Internal & 1 Remote
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +80°C 0 to 100%RH
Submersible	Yes
Material	303 stainless steel
Dimensions	7.4" x 1.2" dia. (188mm x 31mm dia.)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

QUADTEMP AND OCTTEMP
FOUR AND EIGHT CHANNEL THERMOCOUPLE LOGGERS

Features

QuadTemp & OctTemp

- Multiple Channel (4 or 8)
- Mounting Holes Provided
- Compact Size
- Rugged Design

The QuadTemp and OctTemp are multiple channel thermocouple loggers. The QuadTemp is a four channel thermocouple logger that records up to 26,214 readings per channel. The OctTemp, an eight-channel thermocouple logger, records up to 14,563 readings per channel.

Table Applies to both single and multiple channel thermocouple loggers

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

Specifications†

Part Number	QuadTemp	OctTemp
Internal Channel Temperature Sensor	Semiconductor	Semiconductor
Internal Channel Temperature Resolution	0.1°C	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C	±0.5°C
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B ,N	Thermocouple Types J, K, T, E, R, S, B ,N
Remote Channel Range, Resolution & Accuracy	See Table Above	See Table Above
Cold Jct. Compensation	Automatic	Automatic
Channels	1 Internal & 4 Remote	1 Internal & 8 Remote
Memory	26,214 per channel	14,563 per channel
Sample Rate	5 seconds up to 12 hours	5 seconds up to 12 hours
LED Indicator	None	None
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	2,400
Typical Battery Life	1 year	1 year
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing	-20 to +60°C 0 to 95%RH non-condensing
Submersible	No	No
Material	Anodized aluminum	Anodized aluminum
Dimensions	3.5″ x 4.4″ x 1.0″ (89mm x 112mm x 26mm)	3.5″ x 4.4″ x 1.5″ (89mm x 112mm x 39mm)
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
TCTemp1000	Rugged Thermocouple Based Temperature Logger
QuadTemp	Four Channel Thermocouple Based Temperature Logger
OctTemp	Eight Channel Thermocouple Based Temperature Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
TL-2150	3.6V Lithium replacement battery for the TCTemp1000
U9VL-J	9.0 Volt, lithium battery, replacement battery for the QuadTemp and OctTemp.

Temperature Single and Multiple Channel Oven Profiler

THERMOVAULT
SINGLE AND FOUR CHANNEL OVEN LOGGERS

Maximum Exposure Time		
Ambient Temperature	**Single Channel**	**Quad Channel**
100°C (212°F)	52 min	110 min
150°C (302°F)	30 min	62 min
200°C (392°F)	22 min	45 min
250°C (482°F)	17 min	35 min
260°C (500°F)	16 min	33 min
300°C (572°F)	15 min	30 min
350°C (662°F)	12 min	25 min

Applications

- Powder Coating Cure Ovens
- Wet Coating Cure Ovens
- Batch Ovens
- Conveyor Ovens

Oven temperature profiling on a regular basis can help ensure that a quality product is consistently produced. Profiling enables users to optimize their process, prove process control, and make corrections to a process when required.

The MadgeTech oven temperature loggers are thermally insulated to withstand extreme temperatures. This, along with the stainless steel enclosure allows the device to be used in applications such as powder coating cure ovens, wet coating cure ovens, batch ovens, and conveyor ovens. The external thermocouple probes provide accurate temperature measurements with fast response times.

The ThermoVault is a single channel oven temperature logger. It has the ability to record up to 16,383 temperature measurements. The QuadThermoVault is a four channel oven temperature logger with the ability to record up to 26,214 temperature measurements per channel. Both devices are easily removable from their insulated enclosures, which makes setup and data retrieval straightforward.

The MadgeTech user-friendly software easily downloads the data to a computer, where the readings may be displayed in degrees of Celsius, Fahrenheit, Kelvin, or Rankine. The software allows the user to view all data points, and even a summary of the data being viewed for calculations such as Mean Kinetic Temperature. If additional analysis of the data is needed, the data can be easily exported to MS Excel® by the simple click of a button.

Specifications†

Part Number	ThermoVault	QuadThermoVault
Internal Channel Temperature Sensor	Semiconductor	Semiconductor
Internal Channel Temperature Resolution	0.1°C	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C	±0.5°C
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B ,N	Thermocouple Types J, K, T, E, R, S, B ,N
Remote Channel Range, Resolution & Accuracy	See Table on Page 43	See Table on Page 43
Cold Jct. Compensation	Automatic	Automatic
Channels	1 Internal & 1 Remote	1 Internal & 4 Remote
Memory	16,383 per channel	26,214 per channel
Sample Rate	2 seconds up to 12 hours	5 seconds up to 12 hours
LED Indicator	None	None
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	2,400
Typical Battery Life	1 year	1 year
Operating Environment	See table above 0 to 95%RH non-condensing	See table above 0 to 95%RH non-condensing
Material	304 stainless steel w/ PTFE insulation	304 stainless steel w/ PTFE insulation
Dimensions	4.8" x 4.8" x 2.5" (122mm x 122mm x 65mm)	6.5" x 7.9" x 3.2" (165mm x 200mm x 82mm)
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

MICROTEMP MINIATURE SUBMERSIBLE RUGGED LOGGER

The MicroTemp: Measuring temperatures in tiny places.

Features

- Micro-sized
- Up to 1 Year Battery Life
- Fits in Most Bottles
- Food Grade, Submersible Casing
- Eyelet Holder for String Attachment
- Submersible up to 150'

Applications

- Food Processing
- HACCP Programs
- Environmental Studies
- Well Monitoring

The MicroTemp is a miniature and submersible self-contained temperature logger. Just 2.6" (66mm) tall and 0.7" (18mm) in diameter, this logger is the candidate for the tightest locations. It can even fit down the neck of most beverage bottles! The small size has big features -- this is an industrial grade instrument that boasts an accuracy specification of ±0.5°C (room temperature) and will operate in temperatures from -40°C to +80°C (-40°F to +176°F). Its food grade stainless steel casing makes it inert to most common fluids and gasses.

Extra features: The LED alarm indicator alerts when the chosen temperature limits have been exceeded. The calibration option, via software, allows for calibration checks and corrections as required.

It operates with user-replaceable batteries for one year (typical use) and downloads data (32,767 readings) quickly to a PC. MadgeTech's miniature technology opens up new options for documenting and ensuring proper environments for pharmaceuticals, biomedical research, food processing, and transport.

The easy to use yet versatile software not only allows viewing of the data in degrees Celsius and Fahrenheit, but also in Kelvin and Rankine. The software will save you time by automatically calculating Pasteurization Units, Sterilization Units, and Mean Kinetic Temperature. Need a custom analysis? It takes just one click to export the data to MS Excel®.

Specifications†

Part Number	MicroTemp
Sensor	Internal semiconductor
Temperature Range	-40 to +80°C
Resolution	0.1°C
Calibrated Accuracy	±0.5°C
Memory	32,767
Sample Rate	2 seconds up to 12 hours
Alarm	Yes
LED Indicator	Red & Green
Required Interface Package	IFC102 or IFC202
Baud Rate	38,400
Typical Battery Life	1 year
*Operating Environment	-40 to +80°C 0 to 100%RH
Submersible	Yes
Material	316L food grade stainless steel
Dimensions	2.6" x 0.7" dia. (66mm x 18mm dia.)
Approvals	CE

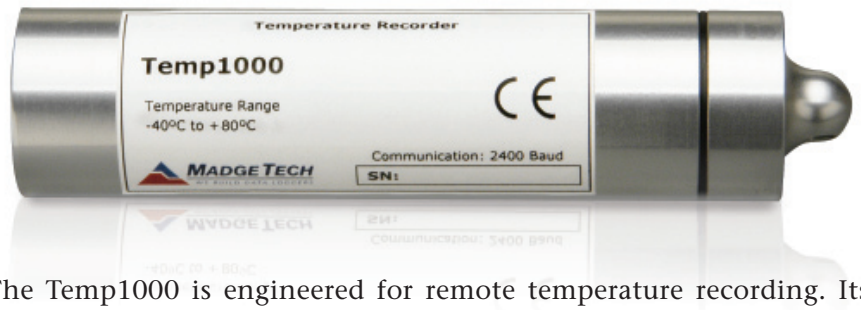
† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
ThermoVault	Single Channel Oven Temperature Logger
QuadThermoVault	Four Channel Oven Temperature Logger
MicroTemp	Miniature temperature logger with 316L stainless steel enclosure
Accessories	**Description**
IFC102	Includes software, manual, mini-plug adapter and 9-pin computer interface cable for MicroTemp
IFC202	Includes software, manual, Quick Start Guide, mini-plug adapter and USB computer interface cable for MicroTemp
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	Replacement battery for ThermoVault
U9VL-J	Replacement battery for QuadThermoVault
ER14250	Replacement battery for MicroTemp

Temperature Submersible Rugged

TEMP1000
SUBMERSIBLE RUGGED LOGGER



The Temp1000 is engineered for remote temperature recording. Its rugged enclosure lends itself to be useful in applications such as dishwashers and sterilization, but is also commonly used in environmental studies, food storage, and medical and pharmaceutical applications.

The Temp1000 is submersible up to 150' (45m) of water and can record temperatures of up to +80°C (176°F)*.

With the Temp1000's capability to record 32,767 data points and the ability to record every 2 seconds, all the data needed can be captured even for brief events. The user-replaceable battery is rated to one year of typical use. The non-volatile memory will hold valuable data indefinitely even if the battery should become discharged.

The MadgeTech software will display data in degrees Celsius, Fahrenheit, Kelvin, and Rankine. If further analysis is needed, data can be automatically exported to a MS Excel® spreadsheet.

Features
- Rugged
- Submersible to 150'
- Programmable Start Time
- Real-time Operation
- Reusable

Applications
- Environmental Studies
- Food Storage
- Medical and Pharmaceutical

Specifications†

Part Number	Temp1000
Sensor	Internal semiconductor
Temperature Range*	-40 to +80°C
Resolution	0.1°C
Calibrated Accuracy	±0.5°C
Memory	32,767
Sample Rate	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment*	-40 to +80°C 0 to 100%RH
Submersible	Yes
Material	Available in anodized aluminum or 303 stainless steel
Dimensions	4.3" x 1.0" dia. (110mm x 26mm dia.)
Approvals	CE

* Contact factory for extended operating range.

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The Rugged Temperature Series is engineered to provide users with the ability to monitor temperature in extreme and harsh environments.

TEMP1000IS
INTRINSICALLY SAFE* LOGGER

Features
- Intrinsically Safe
- User Friendly
- NEMA 4X, 6P

Applications
- EtO Sterilization
- Hazardous Environment Monitoring
- Oil, Petroleum, Gas Monitoring

This rugged, temperature logger can safely handle hostile environments. The Temp1000IS is certified Intrinsically Safe for hazardous environments*. The Temp1000IS has carved its niche in the Ethylene Oxide Sterilization (EtO) market but is equally at home in environmental studies, food storage, medical and pharmaceutical markets.

With the capacity to record 32,767 data points and ability to record every 2 seconds, data can be captured for even brief events. The battery is rated to one year of typical use. The non-volatile memory will hold valuable data indefinitely even if the battery should become discharged.

The MadgeTech software displays data in degrees of Celsius, Fahrenheit, Kelvin, and Rankine. If the powerful software does not do the exact analysis needed, one click will export the data to MS Excel®.

**The Temp1000IS has been certified by FM Approvals as intrinsically safe for Class I, Division 1, groups A, B, C, D and non-incendive for Class I, Division 2, groups A, B, C, D hazardous environments.*

Specifications†

Part Number	Temp1000IS
Sensor	Internal semiconductor
Temperature Range	-40 to +80°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C
Memory	32,767
Sample Rate	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +80°C 0 to 100% RH
Submersible	Yes
Material	Available in anodized aluminum or 303 stainless steel
Dimensions	4.3" x 1.0" dia. (110mm x 26mm dia.)
Approvals	CE, IS rated

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Temp1000	Submersible, Rugged, Temperature Logger with aluminum enclosure
Temp1000-SS	Submersible, Rugged, Temperature Logger with stainless steel enclosure
Temp1000IS	Submersible, Rugged, Intrinsically Safe Temperature Logger with aluminum enclosure
Temp1000IS-SS	Submersible, Rugged, Intrinsically Safe Temperature Logger with stainless steel enclosure
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
TL-2150	3.6V lithium replacement battery for Temp1000 and Temp1000IS

Temperature 150°C Submersible with Rigid Probe

HITEMP150
150°C SUBMERSIBLE LOGGER WITH RIGID PROBE

Features

- Measurement Range of -40 to +150°C
- Rigid 2" External Probe
- Ideal for Harsh Environments
- Miniature Size
- Fully Submersible
- Automatic Calculation of Lethality Equations

Applications

- Autoclave Validation
- Food Processing
- Medical Pharmaceutical
- Extreme Temperature Monitoring
- Thermal Processes

Specifications†

Part Number	HiTemp150
Sensor	100Ω Platinum RTD
Temperature Range	-40 to +150°C
Resolution	0.05°C
Calibrated Accuracy	±0.5°C (over 100°C span)
Memory	32,767
Sample Rate	1 second up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +150°C 0 to 100%RH 150 PSIG
Submersible	Yes
Material	316 stainless steel
Dimensions	Body: 1.1" x 1.75" dia. (28mm x 45mm) Probe: 2.0" x 3/16" dia. (50mm x 5mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The HiTemp150 is a rugged, submersible, temperature data logger which can be used to record temperatures between -40 and 150°C. It can record up to 32,767 temperature readings.

The HiTemp150 features a 2" rigid external probe with fast response time to ensure accurate temperature readings and is ideal for use in harsh environments. Its real time clock ensures that all the data is time and date stamped. The device can be started and stopped directly from your computer and its small size allows it to fit almost anywhere.

The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged.

The HiTemp150 makes data retrieval quick and easy. Simply plug the device into an empty COM or USB port and our user-friendly software does the rest.

HITEMP150FP

150°C SUBMERSIBLE LOGGER WITH FLEXIBLE PROBE

Features

- Ideal for Harsh Environments
- Flexible Probe
- Silicone Rubber Enclosed Cable
- 316 Stainless Steel Enclosure
- Automatic Calculation of Lethality Equations

Applications

- Autoclave Validation
- Food Processing
- Medical Pharmaceutical
- Extreme Temperature Monitoring
- Thermal Processes

The HiTemp150FP is a rugged, reusable temperature logger specifically designed for deployment in harsh environments. It comes with a standard 24" flexible silicone rubber enclosed cable, 4" penetration style stainless steel probe, and 316 stainless steel body (other cable and probe lengths available through special order).

With a measurement range of -40°C to +150°C, the HiTemp150FP is perfect for use in autoclaves, medical and pharmaceutical labs, food preparation and processing plants, dishwashers, and other applications involving extreme temperatures.

The HiTemp150FP features an RTD temperature sensor, which allows for extremely fast response times and highly accurate readings.

Reading rates are configurable from once every second to once every twelve hours. With a reading capacity of 32,767 data points, the HiTemp150FP is perfect for use in even the longest of processes. Its real time clock ensures that all data is time and date stamped, making it easy to track and analyze temperature changes.

Specifications†

Part Number	HiTemp150FP
Sensor	100Ω Platinum RTD
Temperature Range	-40 to +150°C
Resolution	0.05°C
Calibrated Accuracy	±0.5°C (over 100°C span)
Memory	32,767
Sample Rate	1 second up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +150°C 0 to 100%RH
Submersible	Yes
Material	Body & Probe: 316 stainless steel Cable: Silicone Rubber
Dimensions	Body: 1.1" x 1.75" dia. (28mm x 45mm) Probe: 4.0" x 1/8" dia. (102mm x 4mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
HiTemp150	150°C Submersible Temperature Logger with Rigid Probe
HiTemp150FP	150°C Submersible Temperature Logger with Flexible Probe
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
3B5700	Replacement battery for the HiTemp150 and HiTemp150FP

Temperature 150°C Submersible Rugged with Probe

TEMP1000FP
150°C TEMPERATURE LOGGER
WITH FLEXIBLE PROBE*

**The minimum bending radius of the probe is 2", bending only once. Avoid bending the probe anywhere along its first 2.5" from the tip.*

Applications

- Autoclaves
- Dishwasher Testing
- Food Preparation Processing
- Smoke Houses
- Environmental Studies
- R&D

TEMP1000S
150°C TEMPERATURE LOGGER

When the temperature to be measured is too hot for other loggers, the Temp1000S and Temp1000FP are the solution. The Temp1000FP has a 10.8" flexible probe* allowing it to reach deep inside flasks and other irregularly shaped objects. The Temp1000S has a 1" rigid probe, providing the same fast response time in a smaller package.

The devices' high temperature rating of 150°C (302°F) make the Temp1000S and Temp1000FP advantageous for use in autoclaves, food processing and R&D.

After downloading the data, the powerful MadgeTech software allows viewing of the data in degrees Celsius, Fahrenheit, Kelvin and Rankine. The software will automatically calculate the Mean Kinetic Temperature and Pasteurization Units. If an alternate analysis is needed, it's just one click to load data file automatically into MS Excel®.

Specifications†

Part Number	Temp1000S	Temp1000FP
Sensor	Integral 1" probe 100Ω Platinum RTD	Integral 10.8" flexible probe* 100Ω Platinum RTD
Temperature Range	-40 to +150°C	-40 to +150°C
Temperature Resolution	0.05°C	0.05°C
Calibrated Accuracy	±0.5°C	±0.5°C
Memory	32,767	32,767
Sample Rate	2 seconds up to 12 hours	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	2,400
Typical Battery Life	1 year	1 year
Operating Environment	-40 to +150°C, 0 to 100% RH, 60 PSIG	-40 to +150°C, 0 to 100% RH, 60 PSIG
Submersible	Yes	Yes
Material	303 Stainless Steel	Body: 303 Stainless Steel Probe: 304 Stainless Steel
Dimensions	Body: 4.8" x 1.0" dia (122mm x 26mm dia.) Probe: 1.0" x 3/16" dia. (26mm x 5mm dia.)	Body: 5.7" x 1.25" dia. (145mm x 32mm dia.) Probe: 10.8" x 1/8" dia. (275mm x 4mm dia.)
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

CRYO-TEMP
-86°C WATER RESISTANT DRY ICE LOGGER

Features
- Monitors Temperature Down To -86°C
- Magnetic Start
- LED Status Indicators
- Splash Resistant

Applications
- Dry Ice Shipments
- Blood Plasma Freezers
- Vaccines
- Pharmaceuticals
- Frozen Foods
- Shipping Containers
- Cryo-Preservation

The Cryo-Temp is an ultra low temperature data logger that can be placed in and monitor temperatures as low as -86°C.

The enclosure is designed with a handle for easy attachment and is splash proof. The device utilizes a USB docking station to communicate with a personal computer*. The Cryo-Temp provides date and time stamped temperature readings and uses the MadgeTech Data Logging Software.

The MadgeTech software enables users to view the Cryo-Temp data in graphical or tabular form. High and low alarm limits and high and low warning limits can be programmed through the software. Users can set the alarm limits in the range required for the goods to be maintained. The Cryo-Temp also allows users to set warning limits to alert when the temperature is nearing a high or low alarm limit, so that proper action can be taken to ensure the integrity of the goods.

**USB docking station sold separately*

Specifications†

Part Number	Cryo-Temp
Sensor	Thermistor
Temperature Range	-86 to +35°C
Resolution	0.1°C
Calibrated Accuracy	±1.0°C (-80 to 0°C)
Memory	32,767
Sample Rate	5 seconds up to 30 minutes
Required Interface Package	IFC300
Baud Rate	38,400
Typical Battery Life	2 years typical @ 25°C, 1 min. reading intervals
Operating Environment	-86 to +35°C 0 to 95%RH
Submersible	Splash Proof (IP65)
Material	ABS Plastic
Dimensions	3.3" x 2.1" x 0.4" (83mm x 54mm x 11mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Temp1000S	Rugged Temperature Logger with 1" Rigid Probe
Temp1000FP	Rugged Temperature Logger with 10.8" Flexible Probe
Cryo-Temp*	-86°C Water Resistant Dry Ice Logger
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
IFC300	Includes software, manual, Quick Start guide and USB docking station for Cryo-Temp
NIST	N.I.S.T. Calibration Certificate
3B5700	Replacement battery for Temp1000S and Temp1000FP

**Cryo-Temp batteries are not user replaceable.*

Temperature Meat Cooking and Cool Down with Piercing Probe

TEMP1000P
MEAT COOKING AND COOL DOWN LOGGER WITH PIERCING PROBE

Features

- Fast Response Time
- Submersible
- Real Time Operation
- Rugged Design
- Automatic Calculation of Lethality Equations
- Automatic Cool Down Time Calculation

The 7" probe on the Temp1000P helps users to measure and record internal temperatures deep within a product.

Specifications†

Part Number	Temp1000P
Sensor	Integral 7" probe 100Ω Platinum RTD
Body Temperature Range*	-40 to +80°C
Probe Temperature Range	-100 to +260°C
Temperature Resolution	0.05°C
Calibrated Accuracy	±0.5°C
Memory	32,767 readings
Sample Rate	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment*	-40 to +80°C 0 to 100%RH
Submersible	Yes
Material	Body: 303 stainless steel Probe: 304 stainless steel
Dimensions	Body: 4.5" x 1.0" dia. (115mm x 26mm dia.) Probe: 6.75" x 3/16" dia. (172mm x 5mm dia.)
Approvals	CE

* Extended operating temperature ranges available. Contact factory for details.

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The 7" probe on the Temp1000P reaches for the temperature needed and records it with precision. The probe has a resolution of 0.05°C and a range of -100°C to +260°C. (The body of the Temp1000P is rated for -40°C to +80°C*).

Food processing of large items (eg. hams, beef sides) requires temperature validation deep inside the product to ensure the cooking, cooling or storage processes are within specification. The food-grade 7" probe has a sharp point for easy insertion into the product. The Temp1000P is submersible so it can be used during washing or spraying.

The MadgeTech software will display the data in degrees Celsius, Fahrenheit, Kelvin, and Rankine. The software also includes built-in Pasteurization Units and Sterilization Units analyses. If the powerful MadgeTech software does not provide the exact analysis needed, one click will export the data to MS Excel®.

RFOT AND OT1000
MEAT COOKING AND COOL DOWN LOGGER WITH FLEXIBLE PIERCING PROBE

Features
- Flexible Probe
- Waterproof
- Mounting Hook
- Automatic Cool Down Calculation

Applications
- Meat Processing
- HACCP Compliance
- Cool Down Monitoring

The MadgeTech RFOT is a wireless temperature logger with an external probe. This device can be used in the process of cooking or cooling food product. The wireless transmission allows data to be sent to a central computer for real time monitoring. Immediate corrective action can be taken to ensure the product runs through the prescribed cycles.

Cooking temperatures can be monitored and processes validated. The RFOT also has redundant on-board memory that will record all the transmitted data in case of a failure such as a power outage.

The probes can be digitally calibrated through our software quickly, even before each run if desired.

The MadgeTech software includes temperature flags which can be set up to indicate the HACCP cool-down temperatures and calculate cool-down rates.

Madgetech also offers a non-wireless version of the RFOT called the OT1000. See below for specifications.

Specifications†

Part Number	RFOT	OT1000 (non-wireless)
Sensor	100Ω Platinum RTD	100Ω Platinum RTD
*Temperature Range	-50 to +200°C	-50 to +200°C
Resolution	0.01°C	0.01°C
Calibrated Accuracy	±0.1°C	±0.1°C
Memory	21,845	21,845
Sample Rate	30 seconds up to 12 hours	30 seconds up to 12 hours
Required Interface Package	RFC101A	IFC110 or IFC200
Baud Rate	57,600	57,600
RF Baud Rate	4,800	–
Typical Battery Life	1 year	1 year
Operating Environment	-30 to +100°C 0 to 100%RH	-30 to +100°C 0 to 100%RH
Submersible	Splashproof (IP67)	Splashproof (IP67)
Material	Tecaform®	Tecaform®
Dimensions	Body: 8" x 1.75" dia. (203mm x 44mm dia.) Hook ID: 0.5" (13mm) Probe: 4" x 0.130" dia. (101mm x 3mm dia.)	Body: 8" x 1.75" dia. (203mm x 44mm dia.) Hook ID: 0.5" (13mm) Probe: 4" x 0.130" dia. (101mm x 3mm dia.)
Approvals	–	–

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Temp1000P	Meat Cooking and Cool Down Logger with Piercing Probe
RFOT	Wireless Meat Cooking and Cool Down Logger with Flexible Probe
OT1000	Meat Cooking and Cool Down Logger with Flexible Probe
Accessories	**Description**
RFC101A	Radio frequency receiver for RF series and includes software, manual, power supply and IFC110
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
TLH-5902	Replacement battery for RFOT and OT1000

RHTEMP101 AND RHTEMP110 GENERAL PURPOSE LOGGERS

Features

- Miniature Size
- Low Cost
- Real-time Operation
- Temperature Alarming

Applications

- Storage
- HVAC
- Museum Monitoring
- HACCP Programs
- Horticulture
- Laboratory, R&D

To ensure the quality of perishable goods, temperature and humidity monitoring has become essential in applications such as transportation and storage, horticulture, and heating and ventilation. With MadgeTech's humidity and temperature loggers, safeguarding against dangerous environments is made simple.

Specifications†

Part Number	RHTemp101	RHTemp110
Temperature Sensor	Internal semiconductor	Internal semiconductor
Temperature Range	-40 to +80°C	-40 to +80°C
Temperature Resolution	0.1°C	0.1°C
Temperature Accuracy	±0.5°C (0 to +50°C)	±0.5°C (0 to +50°C)
Humidity Sensor	Internal semiconductor	Internal semiconductor
Humidity Range	0 to 95%RH	0 to 95%RH
Humidity Resolution	0.5%RH	0.5%RH
Humidity Accuracy	±3.0%RH	±3.0%RH
Memory	21,845 per channel	21,845 per channel
Sample Rate	2 seconds up to 12 hours	2 seconds up to 12 hours
RH Units	%RH, dew pt., water vapor concentration (mg/ml)	%RH, dew pt., water vapor concentration (mg/ml)
Alarm	Temperature	No
LED Indicator	Red	Red
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	57,600
Typical Battery Life	1 year	10 years
Operating Environment	-40 to 80°C, 0 to 95% RH non-condensing	-40 to 80°C, 0 to 95% RH non-condensing
Submersible	No	No
Materials	ABS plastic	ABS plastic
Dimensions	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)	1.7" x 2.3" x 0.8" (44mm x 59mm x 21mm)
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The RHTemp101 and RHTemp110 are temperature and humidity loggers. No external probes are required to achieve their high performance as both the humidity and temperature sensors are internal to the device. They both offer high resolution and accuracy as well as the ability to record up to 21,845 readings per channel. The RHTemp110 also offers higher download speeds and can extend the battery life up to ten years.

With MadgeTech's user-friendly software, the data can be displayed with a variety of different configurable options. Humidity readings can be displayed in relative humidity, water vapor concentration or even dew point. For additional analysis, data can be easily exported to MS Excel® with one click.

Other applications for temperature and humidity loggers include monitoring conditions in clean rooms, laboratory environments, and stability and calibration chambers.

TRANSITEMPII-RH
SHIPPING AND TRANSPORTATION LOGGER

To prove the highest quality of perishable goods is maintained throughout the shipping process, MadgeTech developed the TransiTempII-RH temperature and humidity data logger for transport and food safety.

Why is humidity important? With most perishable goods, it is crucial to know not only the temperature but the humidity as well. Perishable goods have critical temperature ranges, and this is true of humidity also.

Some items require high humidity conditions (e.g., eggs, cheese, fish, fruit), while other items are best stored at low humidity (e.g., sugar, salt, pharmaceuticals, paper). There are many commonly shipped items for which RH in the 45-55% range is ideal (e.g., chocolate, hops, cereal, clay, textiles). The salient point: Goods can be shipped/stored at the right temperature but the wrong humidity.

The TransiTempII-RH has a magnetic start and an LED alarm indicator should the temperature exceed customer set limits. Customers will know immediately if the quality of goods has been compromised during shipping.

Applications

- Shipping and Storage
- HVAC
- Museum Monitoring
- Horticulture
- Laboratory R&D
- Medical Pharmaceutical

Offloading the data with MadgeTech software will succinctly present the data in order to determine the merit of the goods. The versatile MadgeTech software not only displays data in standard temperature and humidity units but also can show Mean Kinetic Temperature and exactly when temperature data exceeds customer set alarm limits.

MadgeTech data loggers are always the leader in price and performance, and the TransiTempII-RH is no exception.

Specifications†

Part Number	TransiTempII-RH
Temperature Sensor	Semiconductor
Temperature Range	-40 to +80°C
Temperature Resolution	0.1°C
Temperature Accuracy	±0.5°C
Humidity Sensor	Capacitive Polymer
Humidity Range	0 to 95%RH
Humidity Resolution	0.1%RH
Humidity Accuracy	±5.0%RH
Memory	16,383 per channel
Sample Rate	5 seconds to 30 minutes
RH Units	%RH, dew pt., water vapor concentration (mg/ml)
Alarm	Temperature
LED Indicator	Red, Yellow, and Green
Required Interface Package	IFC300
Baud Rate	38,400
Typical Battery Life	1 year
Operating Environment	-40 to 80°C, 0 to 95% RH non-condensing
Submersible	Splash Proof (IP64)
Materials	ABS plastic
Dimensions	3.3" x 2.1" x 0.4" (83mm x 54mm x 11mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
RHTemp101	Temperature and Humidity Logger
RHTemp110	Temperature and Humidity Logger with 10 year battery life
TransiTempII-RH*	Temperature and Humidity Logger
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IF200	Includes software, manual, Quick Start Guide and USB computer interface cable
IF300	Includes software, manual, Quick Start guide and USB docking station for TransiTempII-RH
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	3.6V lithium replacement battery for the RHTemp101 and RHTemp110

**The TransiTempII-RH batteries are not user replaceable.*

TRANSITEMP-RH
SHIPPING AND TRANSPORTATION LOGGER

Features
- Low Cost
- User Selectable Alarm Limits
- Push-button Start

Applications
- Storage
- HVAC
- Museum Monitoring
- HACCP Programs
- Refrigeration
- Meat Aging
- Laboratory, R&D

Specifications†

Part Number	TransiTemp-RH
Temperature Sensor	Internal semiconductor
Temperature Range	-20 to +70°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C (-10 to +40°C) ±1.0°C (-20 to +70°C)
Humidity Sensor	Internal Semiconductor
Humidity Range	0 to 90%RH
Humidity Resolution	0.1%RH
Calibrated Accuracy	±5%RH
Memory	8,191 per channel
Sample Rate	5 seconds up to 30 minutes
RH Units	%RH, dew pt., water vapor concentration (mg/ml)
Alarm	Temperature
LED Indicator	Red & Green
Required Interface Package	IFC110 or IFC200
Baud Rate	38,400
Typical Battery Life	90 days
Operating Environment	-20 to +70°C 0 to 90%RH non-condensing
Submersible	Splashproof (IP64)
Materials	ABS plastic
Dimensions	1.9" x 3.6" x 0.7" (49mm x 92mm x 18mm)
Approvals	CE

The TransiTemp-RH is a humidity and temperature data logger that is ideal for monitoring and recording the temperature and humidity of products during storage and shipping.

No external probes are required to achieve its high performance as both the temperature and humidity sensors are internal to the device. The TransiTemp-RH has a humidity resolution of 0.1% RH and typical accuracy of ±3.5% RH at 25°C. It can record up to 8,191 readings per channel.

To match all budgets, a single-use and multi-use version is offered. The single-use version will only operate one time and does not require a PC to start the device— only a press of the button. After use, the single-use version can be returned to MadgeTech for a partial credit. The multiple use version is completely reusable and is cost effective when used frequently.

TEMPRETRIEVERRH
SHIPPING AND TRANSPORTATION LOGGER

Features
- LED Alarm Indicators
- Miniature Size
- Reusable
- Push Button Start/Stop

Applications
- Storage
- HVAC
- HACCP Programs

The TempRetrieverRH makes safeguarding against dangerous shipping environments simple. To ensure the quality of perishable goods, temperature and humidity monitoring have become essential in applications such as transportation and storage, horticulture and heating and ventilation.

The TempRetrieverRH can record up to 16,383 readings in its non-volatile memory and with a typical one year battery life, this makes for the perfect temperature and humidity logger when keeping down costs is essential.

Safeguard your products against dangerous shipping environments with the MadgeTech TempRetrieverRH

Specifications†

Part Number	TempRetrieverRH
Temperature Sensor	Semiconductor
Temperature Range	-40 to +80°C
Temperature Resolution	0.1°C
Temperature Accuracy	±0.5°C
Humidity Sensor	Semiconductor
Humidity Range	0 to 95%RH
Humidity Resolution	0.1%RH
Humidity Accuracy	±3.0%RH
Memory	16,383 per channel
Sample Rate	5 seconds to 30 minutes
RH Units	%RH, dew pt., water vapor concentration (mg/ml)
Alarm	Temperature
LED Indicator	Red & Green
Required Interface Package	IFC110 or IFC200
Baud Rate	38,400
Typical Battery Life	1 year
Operating Environment	-40 to 80°C 0 to 95% RH non-condensing
Submersible	No
Materials	ABS plastic
Dimensions	1.4" x 2.2" x 0.6" (36mm x 56mm x 16mm)
Approvals	CE

Ordering Information

Product ID	Description
TransiTemp-RH*	Single Use Temperature and Humidity Logger
TransiTemp-RH-Multi	Multiple Use Temperature and Humidity Logger
TempRetrieverRH	Temperature and Humidity Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
CR2032	Replacement battery for TransiTemp-RH-Multi
LTC-7PN	3.6V lithium replacement battery for the TempRetrieverRH

**The TransiTemp-RH batteries are not user replaceable.*

† Specifications subject to change without notice. Consult product data sheet. Visit www.madgetech.com for full Warranty information and Terms and Conditions.

MICRORHTEMP
MINIATURE RUGGED LOGGER

Applications

- Medical/Pharmaceutical
- Cold Chain Monitoring
- Shipping and Storage
- Warehouse Monitoring
- HVAC
- Museum Monitoring
- Environmental Studies
- Implement HACCP Programs
- Research Studies

Special Features

- Stainless Steel Casing
- LED Alarm

The MicroRHTemp:
Small in size, big in performance.

Specifications†

Part Number	MicroRHTemp
Temperature Sensor	Internal semiconductor
Temperature Range	0 to +50°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C
Humidity Sensor	Internal semiconductor
Humidity Range	0 to 95%RH
Humidity Resolution	0.1%RH
Calibrated Accuracy	±3.0%RH
Memory	16,383 per channel
Sample Rate	2 seconds up to 12 hours
RH Units	%RH, dew pt., water vapor concentration (mg/ml)
LED Indicator	Red & Green
Required Interface Package	IFC102 or IFC202
Baud Rate	38,400
Typical Battery Life	1 year
Operating Environment	0 to +50°C 0 to 95% RH non-condensing
Submersible	No
Materials	303 stainless steel
Dimensions	1.5" x 0.6" dia. (39mm x 16mm dia.)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The MicroRHTemp is the world's smallest self-contained temperature and humidity logger. Just 1.5" (39mm) tall and 0.6" (16mm) in diameter, this logger will tuck away in the tightest places, including most pill bottles. Don't be fooled by the small size — this sophisticated and robust instrument boasts an accuracy specification of ±0.5°C and ±3% RH (at room temperature).

The calibration option (via software) allows for calibration checks and corrections as processes require.

It operates with user-replaceable batteries for 1 year (typical use) and downloads data (16,383 readings per channel) quickly to a PC. MadgeTech's miniature technology opens up new options for documenting and ensuring proper environments for pharmaceuticals, museums, warehouse, food production, and transport.

The easy, yet versatile, software allows viewing of the data not only in standard humidity and temperature units but also Rankine, Kelvin, dew point, and water vapor concentration. Calculations of the minimum, maximum, and average for each channel as well as the Mean Kinetic Temperature on the temperature channel are all done automatically in the software. If a custom analysis is needed, one click will export the data to MS Excel®.

RHTEMP1000
RUGGED LOGGER

Features
- Rugged
- Reusable
- Automatic Dew Point & Vapor Concentration Calculations
- Programmable Start Time
- Real-time Operation
- N.I.S.T. Traceable Available

Applications
- Implement HACCP Programs
- Food Preparation and Processing
- Environmental Studies
- Medical/Pharmaceutical

Measuring temperature and humidity, this rugged remote logger is ideal for environmental studies, food storage, medical and pharmaceutical markets.

With the capacity to record 21,845 readings per channel and the ability to record every 2 seconds, you can capture all the data you need even for brief events. The user-replaceable battery is rated for one year of typical use. The non-volatile memory will hold valuable data indefinitely even if the battery should become discharged.

The rugged and versatile design allows the device to be used for many different applications. When the humidity sensor cap of the device is open, the humidity sensor is exposed to the environment allowing the device to accurately measure and record both humidity and temperature. When the sensor cap is closed, the device can be used to accurately monitor temperature while submerged in up to 150' (45m) of water.

The MadgeTech software will display data in units of temperature, relative humidity, dew point and water vapor concentration. If the powerful software does not present the exact analysis needed, it is just one click to export the data to MS Excel®.

Specifications†

Part Number	RHTemp1000
Temperature Sensor	Internal semiconductor
Temperature Range	-40 to +80°C
Temperature Resolution	0.1°C
Temperature Accuracy	±0.5°C
Humidity Sensor	Internal semiconductor
Humidity Range	0 to 100%RH
Humidity Resolution	0.5%RH
Humidity Accuracy	±3.0%RH
Memory	21,845 per channel
Sample Rate	2 seconds up to 12 hours
RH Units	%RH, dew pt., water vapor concentration (mg/ml)
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +80°C 0 to 100%RH
Submersible	Yes
Materials	Available in aluminum or 303 stainless steel
Dimensions	5.4" x 1.0" dia. (138mm x 26mm dia.)
Approvals	CE

Ordering Information

Product ID	Description
MicroRHTemp	Miniature Humidity and Temperature Logger with stainless steel enclosure
RHTemp1000	Rugged Humidity and Temperature Logger with aluminium enclosure
RHTemp1000-SS	Rugged Humidity and Temperature Logger with stainless steel enclosure
Accessories	**Description**
IFC102	Includes software, manual, mini-plug adapter and 9-pin computer interface cable
IFC202	Includes software, manual, Quick Start Guide, mini-plug adapter and USB computer interface cable
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
TL-2150	Replacement battery for the RHTemp1000 and RHTemp1000-SS
SR1154W	Replacement battery for the MicroRHTemp (2 required)

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

RHTEMP1000IS INTRINSICALLY SAFE LOGGER*

Features

- Intrinsically Safe
- Rugged
- Reusable
- Automatic Dew Point & Vapor Concentration Calculations
- Programmable Start Time
- N.I.S.T. Traceable Available

Applications

- EtO Sterilization
- Hostile Environment Monitoring

The RHTemp1000IS is similar in measurement specifications to the RHTemp1000 but is also rated Intrinsically Safe (IS) for hazardous environments*.

The RHTemp1000IS has carved its niche in the Ethylene Oxide Sterilization (EtO) market** and other hazardous environments but is equally at home anywhere the RHTemp1000 is used.

* *The RHTemp1000IS has been certified by FM Approvals as intrinsically safe for Class I, Division 1, groups A, B, C, D and non-incendive for Class I, Division 2, groups A, B, C, D hazardous environments.*

** *No humidity sensor is unaffected by the EtO process. MadgeTech recommends frequent humidity calibrations and humidity sensor replacements every 6-12 months when used in these environments.*

See Page 121 for Calibration Information

Specifications†

Part Number	RHTemp1000IS
Temperature Sensor	Internal semiconductor
Temperature Range	-40 to +80°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C
Humidity Sensor	Internal semiconductor
Humidity Range	0 to 100%RH
Humidity Resolution	0.5%RH
Calibrated Accuracy	±3.0%RH
Memory	21,845 per channel
Sample Rate	2 seconds up to 12 hours
RH Units	%RH, dew pt., water vapor concentration (mg/ml)
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +80°C 0 to 100% RH non-condensing
Submersible	No
Materials	Available in aluminum or stainless steel
Dimensions	5.4" x 1.0" dia. (138mm x 26mm dia.)
Approvals	CE, IS rated

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
RHTemp1000IS	Intrinsically Safe Humidity and Temperature Logger with aluminum Enclosure
RHTemp1000IS-SS	Intrinsically Safe Humidity and Temperature Logger with stainless steel enclosure
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
TL-2150	Replacement battery for the RHTemp1000IS and RHTemp1000IS-SS

PRTEMP101 & PRTEMP110
GENERAL PURPOSE LOGGERS

Features
- Miniature Size
- Low-cost
- User-friendly

Applications
- Altitude Validation
- Barometry
- Environmental Studies
- HVAC
- Clean Room
- Shipping

The PRTemp101 and PRTemp110 are similar devices for use when measuring both ambient air pressure (or altitude) and temperature. This can be valuable information for transporting live animals and other pressure and temperature sensitive goods. The data loggers can also be used for product processing (e.g. roasted coffee beans outgassing) and altitude validation (e.g. hiking, airplane, helicopter, model rockets, skydiving, hang gliding, etc).

The professional grade PRTemp110 has a typical battery life of 10 years with high-speed download (57,600 baud) and can record 16,383 readings per channel.

The PRTemp101 has a typical one-year battery life, 2,400 baud download speed and can record 8,191 readings per channel. The non-volatile memory will retain data even if the battery becomes discharged.

The powerful MadgeTech software displays your temperature in the degrees Celsius, Fahrenheit, Kelvin and Rankine. The pressure channel can be viewed in PSIA, inHg, mmHg, bar, atm, Torr, Pascals, kPa, MPa and altitude (feet, meters).

The PRTemp110 is also available with a differential pressure sensor, called the PRTemp110-5PSID. The small range makes it ideal for monitoring clean rooms where high accuracy is critical.

Specifications†

Part Number	PRTemp101	PRTemp110
Temperature Sensor	Semiconductor	Semiconductor
Temperature Range	-40 to +80°C	-40 to +80°C
Temperature Resolution	0.1°C	0.1°C
Calibrated Accuracy	±0.5°C	±0.5°C
Pressure Sensor	Semiconductor (strain gauge)	Semiconductor (strain gauge)
Pressure Range	0 to 30PSIA	0 to 30PSIA
Pressure Resolution	0.002PSI	0.002PSI
Calibrated Accuracy	±1%FSR @ 25°C, ±0.2% typical	±1%FSR @ 25°C, ±0.2% typical
Memory	8,191 per channel	16,383 per channel
Sample Rate	2 seconds up to 12 hours	2 seconds up to 12 hours
LED Indicator	Red	Red
Typical Battery Life	1 year	10 years
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	57,600
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing	-40 to +80°C 0 to 95%RH non-condensing
Materials	ABS plastic	ABS plastic
Dimensions	1.4" x 2.2" x 0.9" (36mm x 56mm x 23mm)	1.7" x 2.3" x 0.9" (44mm x 59mm x 23mm)
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
PRTemp101	Barometric Pressure and Temperature Logger
PRTemp110	Barometric Pressure and Temperature Logger with 10 year battery life
PRTemp110-5PSID	Differential Pressure and Temperature Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC-3PN	3.6V lithium replacement battery for PRTemp101
LTC-7PN	3.6V lithium replacement battery for PRTemp110 and PRTemp110-5PSID

PRTC110
DIFFERENTIAL PRESSURE AND THERMOCOUPLE LOGGER

Features

- Fast Response Time
- Miniature Size
- Records up to 10,922 Readings per Channel

Applications

- R&D
- Diagnostics
- Recording Differential Pressure and Temperature
- Clean Rooms
- Pneumatics

Specifications†

Part Number	PRTC110
Internal Channel Temperature Sensor	Semiconductor
Internal Channel Temperature Resolution	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B ,N
Remote Channel Range, Resolution & Accuracy	See Table On Next Page
Pressure Sensor	Semiconductor (strain gauge)
Pressure Range (nominal)	0 to 2 inH2O (differential)
Pressure Range (max)	-2 to +4 inH2O (differential)
Pressure Resolution	0.002 inH2O
Pressure Accuracy	2% FSR, 0.25% @ 25°C typical
Cold Jct. Compensation	Automatic
Channels	2 Internal & 1 Remote
Memory	10,922 per channel
Sample Rate	2 seconds to 12 hours
LED Indicator	Red
Required Interface Package	IFC110 or IFC200
Baud Rate	57,600
Typical Battery Life	2 years
Operating Environment	-20 to +80°C 0 to 95%RH non-condensing
Material	ABS Plastic
Dimensions	2.7" x 1.6" x 0.8" (68mm x 41mm x 20mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The PRTC110 is a differential pressure and temperature logger, ideal for use in factory and laboratory applications. The differential pressure sensor measures between 0 and 2 inH2O (0 to 0.0722 PSID).

The PRTC110 features a real-time clock module and a battery life up to 2 years and allows for high speed downloads. This device will measure and record up to 10,922 measurements per channel. The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged. The PRTC110 can be started and stopped directly from your computer and its small size allows it to fit almost anywhere.

The PRTC110 makes data retrieval quick and easy. Simply plug the device into an empty COM or USB port and our user-friendly software does the rest.

PRTC210
PRESSURE AND THERMOCOUPLE LOGGER WITH 1/8" NPT CONNECTION

Features

- Up to a 2 Year Battery Life
- Measures a Wide Temperature Range
- 1/8" NPT Connection

The PRTC210 is a pressure and thermocouple temperature data logger. It features a standard 1/8" NPT connection, which allows for a quick, hassle-free installation. The thermocouple channel can be utilized by a compression fitting installed in the pipeline.

The PRTC210 is available in a variety of ranges, from 30 to 500 PSI. This N.I.S.T traceable device features high-speed downloads, real-time operation, and programmable start times.

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

Specifications†

Part Number	PrTC210
Internal Channel Temperature Sensor	Semiconductor
Internal Channel Temperature Resolution	0.1°C
Internal Channel Calibrated Accuracy	±0.5°C
Remote Channel Temperature Sensor	Thermocouple Types J, K, T, E, R, S, B ,N
Remote Channel Range, Resolution & Accuracy	See Table Above
Pressure Sensor	Semiconductor (strain gauge)
Pressure Range (nominal)	See Table Below
Pressure Resolution	
Pressure Accuracy	
Cold Jct. Compensation	Automatic
Channels	2 Internal & 1 Remote
Memory	21,844 per channel
Sample Rate	2 seconds to 12 hours
LED Indicator	Red
Required Interface Package	IFC110 or IFC200
Baud Rate	57,600
Typical Battery Life	10 years
Operating Environment	-20 to +80°C 0 to 95%RH non-condensing
Material	Delrin
Dimensions	2.2" x 2.5" x 0.9" (55mm x 63mm x 22mm)
Approvals	CE Pending

PrTC210 Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500	0-1000	0-5000
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution (PSI)	0.002	0.005	0.02	0.05	0.05	0.2

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
PRTC110	Differential Pressure and Thermocouple Based Temperature Logger
PRTC210	Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	3.6V lithium replacement battery for PRTC110 and PRTC210

PRTEMP1000D
DIFFERENTIAL PRESSURE AND TEMPERATURE LOGGER WITH DUAL 1/4" NPT CONNECTIONS

Features
- Rugged
- Programmable Start Time
- Real-time Operation
- User Friendly

Applications
- Geothermal
- Pneumatics
- Process Control Systems
- Gas Compressors
- Chemical Processing
- Pulp and Paper Processing
- Wellhead Monitoring

Specifications†

Part Number	PRTemp1000D
Temperature Sensor	Semiconductor (strain gauge)
Temperature Range	-20 to +80°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C (0 to +50°C)
Pressure Sensor	Semiconductor (strain gauge)
Pressure Range	See Table Below
Pressure Resolution	
Calibrated Accuracy	
Memory	16,383 per channel
Sample Rate	2 seconds up to 12 hours
Typical Battery Life	1 year
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Operating Environment	-20 to +80°C 0 to 95%RH non-condensing
Materials	Stainless Steel
Dimensions	**Body:** 6.7" x 1" dia. (170mm x 25mm dia.) **Sensor:** 3.4" x 3.0" x 1.0" (86mm x 76mm x 25mm dia.) **Cable:** 12" (304mm)
Approval	CE Pending

PRTemp1000D Range, Accuracy & Resolution

Range (PSID)	0-30	0-100	0-300	0-500
Accuracy	±0.25% FSR, 0.1% @ 25°C Typical			
Resolution (PSID)	0.002	0.005	0.02	0.05

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The PRTemp1000D is a rugged pressure data logger that accurately monitors and records pressure and temperature at user programmable reading intervals. The stainless steel design allows for the device to be placed in harsh environments, which makes it well suited for use with air conditioning systems, chilled water, hot water, air, gas, oil and steam pressure systems.

The PRTemp1000D is a direct replacement for strip chart loggers. Data does not need to be read manually, improving and streamlining further processes. The small size of the units simplifies installation while battery operation, with a service life of over 1 year, means that it will not be necessary to provide external power sources at the measurement locations.

For custom reports and analysis, the MadgeTech software allows for calculation of the minimum and maximum values automatically. Data can be automatically exported to Excel® by a click of the mouse.

High Speed Transient Pressure with 1/4" NPT Connection

PRTRANS1000
HIGH SPEED TRANSIENT LOGGER WITH 1/4" NPT CONNECTION

Challenge: Transient events need to be captured at a high sample rate but the events of interest are erratically spread over a long period of time.

Solution: The PRTrans1000 is the pressure logger to tackle the challenge. It samples up to 100Hz (10ms), but will only trigger on pressure limits that are pre-set by the user. Start the trigger on high and/or low thresholds and end the trigger after either a chosen number of samples or when the signal crosses over a chosen stop threshold. It can record up to 255 events and take as many as 262,143 pressure samples. The logger also shows up to 32 samples of "pre-trigger" data so it can reveal what caused the trigger in the first place.

The PRTrans1000 is a battery operated unit with a standard ¼" NPT connection for easy coupling to pressure systems. Completely submersible, the stainless steel sensor can measure the pressure of most common fluids and gasses. The non-volatile memory will retain valuable data even if the (user-replaceable) battery becomes discharged.

See page 67 for Intrinsically Safe devices.

Features

- Up to 100Hz Operation
- Software Selectable Trigger Modes and Threshold Level
- Rugged
- Submersible to 150'
- 32 Sample Pre-Trigger Buffer
- ¼" NPT Pressure Connection

Applications

- Water Hammer
- Compressors
- Pumps
- Pneumatics/Hydraulics
- Process Control Systems
- Lubrication Systems
- Chemical Processing
- Pressure Reducing Values
- Waste Water Treatment
- Wellhead Monitoring
- Mooring Systems
- Hydroelectric Dams

Specifications†

Part Number	PRTrans1000
Sensor	Semiconductor (strain gauge)
Pressure Range	See Table Below
Pressure Resolution	
Pressure Accuracy	
Memory	262,143 samples
Sample Rate	10 milliseconds to 1 second
Units	PSIA(G), inches, altitude, Torr, mmHg, bar, Pascals
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	3 days @ 10 milliseconds/sample
Operating Environment	-40 to +80°C 0 to 100%RH
Submersible	Yes
Materials	303 stainless steel
Dimensions	6.4" x 1.25" dia. (163mm x 32mm dia.)
Approvals	CE

PRTrans1000 Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500	0-1000	0-5000
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution(PSI)	0.02	0.1	0.2	0.5	1.0	5

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
PRTemp1000D	Differential Pressure and Temperature Logger
PrTrans1000*	High Speed Transient Pressure Logger
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
TL-2150	Replacement battery for PRTrans1000 and PRTemp1000D

*See price list for absolute or gauge pressure options

Pressure and Temperature Standard with 1/4" NPT Connection

PRTEMP1000
STANDARD LOGGER WITH 1/4" NPT CONNECTION

Features
- Rugged
- Submersible
- Programmable Start Time
- Real-time Operation
- User Friendly
- ¼" NPT Pressure Connection
- Low Cost

Applications
- Compressors
- Pumps
- Pneumatics
- Process Control Systems
- Lubrication Systems
- Chemical Processing
- Waste Water Treatment
- HVAC

Specifications†

Part Number	PRTemp1000
Sensor	Internal semiconductor
Temperature Range	-40 to +80°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C
Pressure Range Pressure Resolution Pressure Accuracy	See Table Below
Memory	16,383 per channel
Sample Rate	2 seconds up to 12 hours
Pressure Units	PSIA(G), inches, altitude, Torr, mmHg, Pascals
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-40 to +80°C 0 to 100%RH
Submersible	Yes
Materials	303 stainless steel
Dimensions	6.4" x 1.25" dia. (163mm x 32mm dia.)
Approvals	CE

PRTemp1000 Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500	0-1000	0-5000
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution (PSI)	0.002	0.005	0.02	0.05	0.05	0.2

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The MadgeTech PRTemp1000 is a rugged pressure logger that accurately monitors and records pressure and temperature at user programmable reading intervals. The rugged stainless steel design allows for the device to be placed in harsh environments, which makes it well suited for use with air conditioning systems, chilled water, hot water, air, gas, oil, and steam pressure systems.

The internal temperature sensor provides accurate temperature measurements without the need of a separate temperature logger. The data logger can be started to take measurements as often as every two seconds, up to one reading every twelve hours. It will store up to 16,383 readings in its non-volatile memory.

The PRTemp1000 uses a rugged stainless steel pressure strain gauge to accurately measure the pressure. The device comes standard with a common ¼" NPT connection, which allows the logger to be adapted to almost any pressure fitting. The PRTemp1000 is also available with a fully submersible adapter upon request (up to 100 PSI).

There are many different pressure ranges available to suit most any application. The standard pressure ranges are 30 PSIA(G), 100 PSIA(G), 300 PSIA(G), 500 PSIA(G), 1000 PSIA, and 5000 PSIA. Other ranges are also available upon request.

See page 67 for Intrinsically Safe devices.

PRTEMP1000IS
INTRINSICALLY SAFE* LOGGER
WITH 1/4" NPT CONNECTION

Features
- Rugged
- Programmable Start Time
- Real-time Operation
- User Friendly
- ¼" NPT Pressure Connection
- Low Cost
- Intrinsically Safe

Applications
- Oil & Gas Industries
- Compressors
- Pumps
- Pneumatics
- Process Control Systems
- Lubrication Systems
- Chemical Processing
- Waste Water Treatment
- HVAC

Safety is paramount when measuring pressure in hazardous environments. Rugged design and powerful software is needed to ensure that the data your process requires can be retained and analyzed. The MadgeTech Intrinsically Safe series meets these demands. The PRTemp1000IS* records temperature and pressure and the PRTrans1000IS* records high-speed pressure transients. The MadgeTech software simplifies analysis.

For the petrochemical, mineral extraction, Ethylene Oxide Sterilization (EtO) and other hazardous environment industries, the MadgeTech Intrinsically Safe series safely obtains and promptly analyzes the data needed.

PRTemp1000IS Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500	0-1000	0-5000
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution (PSI)	0.002	0.005	0.02	0.05	0.05	0.2

PRTrans1000IS Range, Accuracy & Resolution

Range (PSI)	0-30	0-100	0-300	0-500	0-1000	0-5000
Accuracy	2% FSR, 0.25% @ 25°C Typical					
Resolution (PSI)	0.02	0.1	0.2	0.5	1.0	5

* *The PRTemp1000IS and PRTrans1000IS have been certified by FM Approvals as intrinsically safe for Class I, Division 1, groups A, B, C, D and non-incendive for Class I, Division 2, groups A, B, C, D hazardous environments.*

Specifications†

Part Number	PRTemp1000IS	PRTrans1000IS
Temperature Sensor	Internal semiconductor	-
Temperature Range	-40 to +80°C	-
Temperature Resolution	0.1°C	-
Calibrated Accuracy	±0.5°C	-
Pressure Sensor	Semiconductor Strain Gauge	Semiconductor Strain Gauge
Pressure Range	See Table Above	See Table Above
Pressure Resolution		
Pressure Accuracy		
Memory	16,383 per channel	Up to 262,143 samples
Sample Rate	2 seconds up to 12 hours	10 milliseconds to 1 second
Pressure Units	PSIA(G), inches, altitude, Torr, mmHg, Pascals	PSIA(G), inches, altitude, Torr, mmHg, bar, Pascals
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	115,200
Typical Battery Life	1 year	3 days @ 10 milliseconds/sample
Operating Environment	-40 to +80°C 0 to 100%RH	-40 to +80°C 0 to 100%RH
Submersible	No	No
Materials	303 stainless steel	303 stainless steel
Dimensions	6.4" x 1.25" dia. (163mm x 32mm dia.)	6.4" x 1.25" dia. (163mm x 32mm dia.)
Approvals	CE, IS Rated	CE, IS Rated

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
PRTemp1000**	Rugged Pressure and Temperature Logger
PRTemp1000IS**	Intrinsically Safe Pressure and Temperature Logger
PRTrans1000IS**	Intrinsically Safe Transient Pressure Logger
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
TL-2150	Replacement battery for PrTemp1000 PRTemp1000IS and PRTrans1000IS

**See price list for absolute or gauge pressure options

Barometric Pressure, Temperature and Humidity General Purpose

PRHTEMP101
GENERAL PURPOSE

Applications

- Shipping Live Cargo
- Altitude Validation
- Environmental Studies
- HVAC
- Food Storage
- Research & Development

Specifications†

Part Number	PRHTemp101
Temperature Sensor	Internal semiconductor
Temperature Range	-40 to +80°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C
Pressure Sensor	Semiconductor (strain gauge)
Pressure Range	0 to 30PSIA
Pressure Resolution	0.002PSIA
Calibrated Accuracy	±1%FSR @ 25°C, ±0.2% typical
Humidity Sensor	Internal semiconductor
Humidity Range	0 to 95%RH
Humidity Resolution	0.5%RH
Calibrated Accuracy	±3.0%RH
Memory	13,107 per channel
Sample Rate	2 seconds up to 12 hours
LED Indicator	Red
Typical Battery Life	1 year
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing
Materials	ABS plastic
Dimensions	1.7" x 2.3" x 0.9" (44mm x 59mm x 23mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Complete environmental monitoring can be performed easily with MadgeTech's all-inclusive pressure, humidity, and temperature loggers. These loggers are engineered for their small size, convenience and reliability, which makes them ideal for many different applications. The PRHTemp110 and PRHTemp101 are often used in transportation, HVAC systems, medical devices, and the automotive industry.

The PRHTemp101 features an accessible pressure port that allows tubing to be directly connected to the device. The pressure sensor comes standard in a 0 to 30PSIA range, with a pressure resolution of 0.002PSIA.

The device can measure and record 13,107 readings per channel, and can be set to record a reading every two seconds up to one every twelve hours.

PRHTEMP110
GENERAL PURPOSE WITH 10 YEAR BATTERY LIFE

Features
- 10 Year Battery Life
- Compact
- Versatile
- Low-cost
- High Speed Download
- User Friendly

The PRHTemp110 has all the same features as the PRHTemp101, but has the added benefits of a 10 year battery life and a 57,600 baud rate.

Specifications†

Part Number	PRHTemp110
Temperature Sensor	Internal semiconductor
Temperature Range	-40 to +80°C
Temperature Resolution	0.1°C
Calibrated Accuracy	±0.5°C
Pressure Sensor	Semiconductor (strain gauge)
Pressure Range	0 to 30PSIA
Pressure Resolution	0.002PSIA
Calibrated Accuracy	±1%FSR @ 25°C, ±0.2% typical
Humidity Sensor	Internal semiconductor
Humidity Range	0 to 95%RH
Humidity Resolution	0.5%RH
Calibrated Accuracy	±3.0%RH
Memory	13,107 per channel
Sample Rate	2 seconds up to 12 hours
LED Indicator	Red
Typical Battery Life	10 years
Required Interface Package	IFC110 or IFC200
Baud Rate	57,600
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing
Materials	ABS plastic
Dimensions	1.7" x 2.3" x 0.9" (44mm x 59mm x 23mm)
Approvals	CE

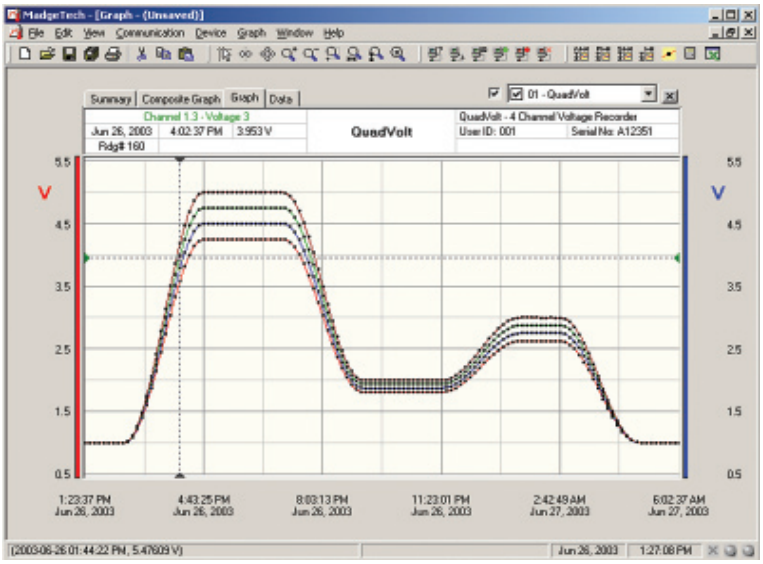
† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
PRHTemp101	Pressure, Temperature and Humidity Logger
PRHTemp110	Pressure, Temperature and Humidity Logger with 10 year battery life
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	Replacement battery for PRHTemp101 and PRHTemp110

Low Level DC Voltage Single and Multiple Channel

LOW LEVEL DC VOLTAGE SOFTWARE EXAMPLE



Measuring voltage is one of the most basic, yet useful types of measurements commonly used today. There are many applications where the voltage level can provide necessary information used to enhance performance and/or give users proper control of their equipment.

MadgeTech's low level voltage data loggers are geared toward helping users measure and record low level voltages with high accuracy and resolution. All of our voltage loggers record 16-bits of resolution, which make them ideal for accurately measuring battery voltages, fuel cells, photovoltaic cells, thermopiles, and many other common voltage sources. With programmable Engineering Units available, the user can scale the input voltage to most any type of unit desired. For example, a flow rate sensor with a voltage output could be displayed as flow rate in the software graph and data. Similarly, any sensor with a voltage output can be displayed in its native units by mapping the voltage output to an Engineering Unit with the desired name. The software even has a wizard to calculate the offset and gain required to convert the voltage to Engineering Units.

The Volt101 and Volt110 are single channel voltage loggers. Each are able to record up to 32,767 readings and feature a red LED to indicate device operation. The Volt110 also offers higher speed downloads (57,600 baud) and can extend the battery life up to ten years.

The QuadVolt and OctVolt data loggers are multiple channel voltage loggers. The QuadVolt is a four channel voltage logger that can record up to 32,767 readings per channel. The OctVolt has eight input channels and can record up to 16,383 readings per channel.

All of our voltage loggers are offered in four different input voltage ranges; ±100mV, 2.5V, 15V, and 30V.

Applications

- Low Level Signal Monitoring
- Medical/Pharmaceutical
- Battery Studies
- Photovoltaic Studies
- Environmental Studies
- Current Shunts
- Thermopile recording
- Monitor Production Processes
- Meteorological Equipment Recording (outputs)
  - UV A & B Recording
  - Irradiance Recording

Ordering Information

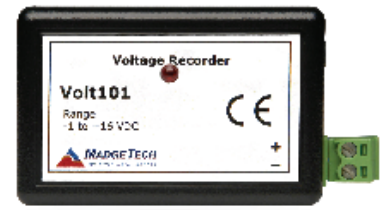
Product ID	Description
Volt101-100mV	±100mV Voltage Logger
Volt101-2.5	2.5V Voltage Logger
Volt101-15	15V Voltage Logger
Volt101-30	30V Voltage Logger
Volt110-100mV	±100mV Voltage Logger
Volt110-2.5	2.5V Voltage Logger
Volt110-15	15V Voltage Logger
Volt110-30	30V Voltage Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	Replacement battery for Volt101 and Volt110

Product ID	Description
QuadVolt-100mV	Four Channel ±100mV Voltage Logger
QuadVolt–2.5	Four Channel 2.5V Voltage Logger
QuadVolt–15	Four Channel 15V Voltage Logger
QuadVolt–30	Four Channel 30V Voltage Logger
OctVolt-100mV	Eight Channel ±100mV Voltage Logger
OctVolt-2.5	Eight Channel 2.5V Voltage Logger
OctVolt-15	Eight Channel 15V Voltage Logger
OctVolt-30	Eight Channel 30V Voltage Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	Replacement battery for QuadVolt and OctVolt

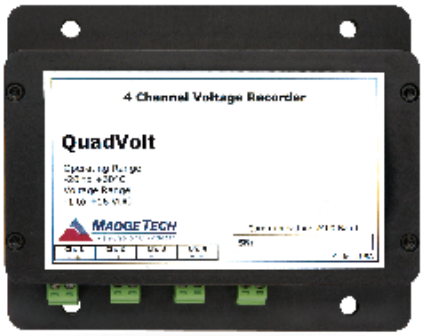
VOLT101 VOLTAGE LOGGER



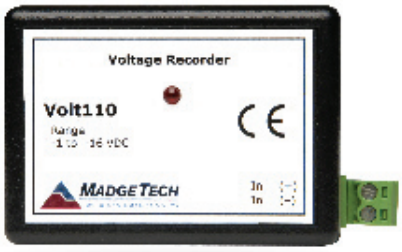
Features

- Real-time Operation
- Programmable Engineering Units
- Low Cost
- Compact
- Miniature Size
- User Friendly
- Programmable Start Time

QUADVOLT FOUR CHANNEL VOLTAGE LOGGER



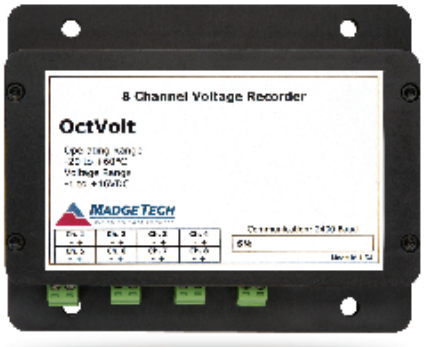
VOLT110 VOLTAGE LOGGER



Features a real-time clock module that extends the battery life up to 10 years and provides high-speed download.

The QuadVolt and OctVolt offer the performance of the Volt101 with the addition of a four channel or eight channel capacity.

OCTVOLT EIGHT CHANNEL VOLTAGE LOGGER



Specifications†

† Specifications subject to change without notice. Consult product data sheet. Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Part Number	Volt101	Volt110	QuadVolt	OctVolt
Voltage Range	See Table Below*			
Voltage Resolution				
Calibrated Accuracy				
Memory	32,767	32,767	32,767 per channel	16,383 per channel
Sample Rate	1 second up to 12 hours	1 second up to 12 hours	1 second up to 12 hours	1 second up to 12 hours
LED Indicator	Red	Red	None	None
Channels	One	One	Four	Eight
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	57,600	2,400	2,400
Typical Battery Life	1 year	10 years	1 year	1 year
Operating Environment	–40 to +80°C 0 to 95%RH non–condensing	–40 to +80°C 0 to 95%RH non–condensing	–20 to +60°C 0 to 95%RH non–condensing	–20 to +60°C 0 to 95%RH non–condensing
Material	ABS plastic	ABS plastic	Anodized aluminum	Anodized aluminum
Dimensions	1.4″ x 2.5″ x 0.6″ (36mm x 64mm x 16mm)	1.7″ x 2.7″ x 0.8″ (44mm x 69mm x 21mm)	3.5″ x 4.4″ x 1.0″ (89mm x 112mm x 26mm)	3.5″ x 4.4″ x 1.5″ (89mm x 112mm x 39mm)
Approvals	CE	CE	CE - 100mV Only	CE- 100mV Only

***Volt101, Volt110, QuadVolt & OctVolt Range, Resolution and Calibrated Accuracy**

Nominal Range	±100mV	0 to2.5V	0 to 15V	0 to 30V
Measurement Range (VDC)	±150mV	-0.25 to 2.75	-1 to 16	-2 to 32
Common Mode Input Range	0 to 2.5V	-	-	-
Accuracy	±0.01%FSR	±0.01%FSR	±0.10%FSR	±0.10%FSR
Resolution (mV)	5µV	0.1	0.5	1.0

EVENT101 & EVENT110
GENERAL PURPOSE LOGGERS

Applications

- Tipping Bucket Rain Gauges
- Gas and Water Metering
- Traffic Studies
- Contact Closure Monitoring
- Time Studies
- Security Systems

MadgeTech's event loggers record a time stamped data point when an event takes place within a user defined reading interval. The reading interval can be easily set using the MadgeTech software to be from one second up to twelve hours. When an event occurs on the input of the event logger, the date and time is recorded to memory at the end of the reading interval. By only writing to memory when an actual event occurs on the input, the length of time the data loggers can record to memory is maximized (13,107 events).

The event loggers can interface with many different sources such as contact closures, pulse output transducers and event initiators. These loggers also have programmable engineering units, which give the user the ability to scale the data collected into user defined units, such as inches of water. A common application for an event logger is monitoring tipping-bucket rain gauges. The event logger will record the time when the bucket tips and the contact is closed, indicating a certain amount of rainfall.

Specifications†

Part Number	Event101	Event110
Input Range	0 to 12VDC continuous; (0 to 30VDC peak)	0 to 12VDC continuous; (0 to 30VDC peak)
Input Low	<0.4V	<0.4V
Input High	>2.7V	>2.7V
Internal Weak Pull-Up	<500µA	<500µA
Recommended Duty Cycle for Inputs Greater than 12VDC (over 1 minute interval)	18V: <50% 24V: <25% 30V: <10%	18V: <50% 24V: <25% 30V: <10%
Sample Rate	1 second to 12 hours	1 second to 12 hours
Minimum Time Resolution	1 second	1 second
Minimum Input Active (Low) Time	1 millisecond	4 milliseconds
Memory	13,107 events	13,107 events
LED Indicator	Red	Red
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	57,600
Typical Battery Life	1 year	10 years
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing	-40 to +80°C 0 to 95%RH non-condensing
Materials	ABS plastic	ABS plastic
Dimensions	1.4" x 2.5" x 0.6" (36mm x 64mm x 16mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The Event101 and Event110 are single channel event loggers that can detect an event that lasts for as little as 10 milliseconds. The Event110 also offers higher download speeds and can extend the battery life up to ten years.

Ordering Information

Product ID	Description
Event101	Event Logger
Event110	Event Logger with 10 year battery life
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
LTC-7PN	Replacement battery for Event101 and Event110

PULSE101 & PULSE110 GENERAL PURPOSE

Applications

- Flow Rate Recording
- Gas and Water Metering
- Traffic Studies
- Frequency Recording
- Speedometer/Rotational Speed Indicators
- Remote Counting and Totalizing

MadgeTech pulse data loggers record the number of pulses that occur over a user specified period of time. The time period can be chosen in software to be from one second up to twelve hours. Both data loggers can collect as many as 100 pulses per second (100Hz) and store up to 16,383 totalized pulse counts.

The pulse loggers can interface with many different sources such as contact closures, pulse output transducers, and pulse initiators. A common application for the pulse logger is measuring the flow rate or total volume through a pipeline. With the programmable engineering units, the user has the ability to scale the data collected into meaningful units such as gallons per minute. Specifically this unique option enables the user to easily linearize and scale most any transducer that provides a pulse or contact closure output to the user required units.

The Pulse101 and Pulse110 can be used interchangeably in most applications. The major difference between the two loggers is the Pulse110 also offers higher speed downloads (57,600 baud) and can extend the battery life up to ten years.

Specifications†

Part Number	Pulse101	Pulse110
Maximum Pulse Rate	100Hz	100Hz
Input Range	0 to 12VDC continuous; (0 to 30VDC peak)	0 to 12VDC continuous; (0 to 30VDC peak)
Input Low	<0.4V	<0.4V
Input High	>2.7V	>2.7V
Internal Weak Pull-Up	<500µA	<500µA
Recommended Duty Cycle for Inputs Greater than 12VDC (over 1 minute interval)	18V: <50% 24V: <25% 30V: <10%	18V: <50% 24V: <25% 30V: <10%
Minimum Input Active (Low) Time	1 millisecond	4 milliseconds
LED Indicator	Red	Red
Memory	16,383	16,383
Sample Rate	1 second to 12 hours	1 second to 12 hours
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	57,600
Typical Battery Life	1 year	10 years
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing	-40 to +80°C 0 to 95%RH non-condensing
Materials	ABS plastic	ABS plastic
Dimensions	1.4" x 2.5" x 0.6" (36mm x 64mm x 16mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Pulse101	Pulse Logger
Pulse110	Pulse Logger with 10 year battery life
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
LTC-7PN	Replacement battery for Pulse101 and Pulse110

State Single and Multiple Channel

STATE LOGGER

State loggers are useful for collecting data on the duration of an event. Our loggers can capture any event that lasts longer than one second. Some typical applications for state loggers include monitoring a furnace, air conditioner or pump turning on and off or how long a door is left opened or closed.

Our state loggers record a time-stamped value whenever the state of the input signal changes. They sample the state of the input at a user specified time interval and record to memory only if the state has changed from the previous sample. This efficient method of writing to memory maximizes the length of time the data loggers can record.

The State101 and State110 are single-channel state loggers which can record up to 13,107 time stamped state changes. The State110 also offers higher download speeds and can extend the battery life up to ten years.

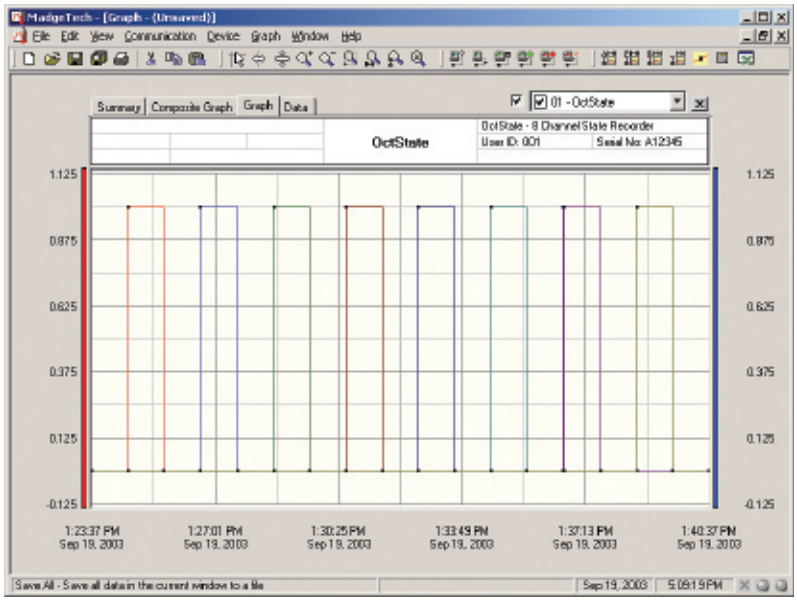
The QuadState and OctState data loggers are multiple channel state loggers which can each record up to 52,428 time stamped state changes. The QuadState is a four channel logger, while the OctState has eight input channels.

The MadgeTech state loggers and software have the unique ability to allow user-chosen Engineering Units to be entered into the loggers. This allows for complete flexibility for each application. For example, a water pump, when on, pumps 10 liters/minute. Using the Engineering Units in software, the state logger can set up to equate the ON state with 10 liters and the OFF state with 0 liters. After the data is offloaded, the units displayed will be in units of liters (instead of "1"or "0") and the summary will show, for example, the average volume of water pumped.

If a custom analysis of state data is necessary (even in Engineering Units), one click will bring the data into an MS Excel® spreadsheet.

Applications

- Security Systems
- Power On/Off
- Time Studies
- Status or State Recording



Ordering Information

Product ID	Description
State101	State Logger
State110	State Logger with 10 year battery life
QuadState	Four Channel State Logger
OctState	Eight Channel State Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
LTC-7PN	Replacement battery for State101 and State110
U9VL-J	Replacement battery for QuadState and OctState

STATE101
STATE LOGGER

Features

- Real-time Operation
- Accepts TTL or Contact Closure Inputs
- Compact
- Programmable Engineering Units
- Programmable Start Time

QUADSTATE
FOUR CHANNEL STATE LOGGER

STATE110
STATE LOGGER

Features a real-time clock module and extended battery life up to 10 years and allows for high speed downloads.

The QuadState and OctState offer all the performance of the State101 with the addition of a four channel or eight channel capacity.

OCTSTATE
EIGHT CHANNEL STATE LOGGER

Specifications†

Part Number	State101	State110	QuadState	OctState
Input Range	0 to 12VDC continuous; (0 to 30VDC peak)	0 to 12VDC continuous; (0 to 30VDC peak)	0 to 12VDC continuous; (0 to 30VDC peak)	0 to 12VDC continuous; (0 to 30VDC peak)
Input Low	<0.4V	<0.4V	<0.4V	<0.4V
Input High	>2.7V	>2.7V	>2.7V	>2.7V
Internal Weak Pullup	<500µA	<500µA	<500µA	<500µA
Recommended Duty Cycle for Inputs Greater Than 12VDC (over 1 minute interval)	18V: <50% 24V: <25% 30V: <10%	18V: <50% 24V: <25% 30V: <10%	18V: <50% 24V: <25% 30V: <10%	18V: <50% 24V: <25% 30V: <10%
Resolution	1 second	1 second	1 second	1 second
Channels	One	One	Four	Eight
Memory	13,107 states	13,107 states	52,428 states per channel	52,428 states per channel
Sample Rate	1 second to 12 hours	1 second to 12 hours	1 second to 12 hours	1 second to 12 hours
LED Indicator	Red	Red	None	None
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	57,600	2,400	2,400
Typical Battery Life	1 year	10 years	1 year	1 year
Operating Environment	–40 to +80°C 0 to 95%RH non–condensing	–40 to +80°C 0 to 95%RH non–condensing	–20 to +60°C 0 to 95%RH non–condensing	–20 to +60°C 0 to 95%RH non–condensing
Material	ABS plastic	ABS plastic	Anodized aluminum	Anodized aluminum
Dimensions	1.4″ x 2.5″ x 0.6″ (36mm x 64mm x 16mm)	1.7″ x 2.7″ x 0.8″ (44mm x 69mm x 21mm)	3.5″ x 4.4″ x 1.0″ (89mm x 112mm x 26mm)	3.5″ x 4.4″ x 1.5″ (89mm x 112mm x 39mm)
Approval	CE	CE	–	–

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Low Level DC Current Single and Multiple Channel

PROCESS101 LOW LEVEL DC CURRENT LOGGER

Features

- Real-time Operation
- Programmable Engineering Units
- Programmable Start Time
- Low Cost
- Reusable
- Compact
- User-Friendly

QUADPROCESS FOUR CHANNEL LOW LEVEL DC CURRENT LOGGER

PROCESS110 LOW LEVEL DC CURRENT LOGGER

Features a real-time clock module and extended battery life up to 10 years and allows for high speed downloads.

OCTPROCESS EIGHT CHANNEL LOW LEVEL DC CURRENT LOGGER

The QuadProcess and OctProcess offers the performance of the Process101 with the addition of a four channel or eight channel capacity.

***Process110, QuadProcess & OctProcess Range, Resolution and Calibrated Accuracy**

Nominal Range	±1mA	±25mA	±100mA
Measurement Range	±1.5mA	±30mA	±120mA
Common Mode Input Range	0 to 2.5V	0 to 2.5V	0 to 2.5V
Resolution	0.05µA	1µA	5µA
Calibrated Accuracy @ 25°C	±0.5%FSR	±0.1%FSR	±0.1%FSR
Input Impedance	50Ω	10Ω	2Ω

Specifications†

† Specifications subject to change without notice. Consult product data sheet. Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Part Number	Process101	Process110	QuadProcess	OctProcess
Current Range	-20 to +100mADC	See Table Above*		
Resolution	10µA			
Calibrated Accuracy	±0.1% FSR @ 25°C			
Input Impedance	10Ω			
Channels	1	1	4	8
Memory	32,767 readings	32,767 readings	32,767 readings per channel	16,383 readings per channel
Sample Rates	1 second up to 12 hours	1 second up to 12 hours	1 second up to 12 hours	1 second up to 12 hours
LED Indicator	Red	Red	None	None
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	57,600	2,400	2,400
Typical Battery Life	1 year	10 years	1 year	1 year
Operating Environment	–40 to +80°C 0 to 95%RH non–condensing	–40 to +80°C 0 to 95%RH non–condensing	–20 to +60°C 0 to 95%RH non–condensing	–20 to +60°C 0 to 95%RH non–condensing
Material	ABS plastic	ABS plastic	Anodized aluminum	Anodized aluminum
Dimensions	1.4" x 2.5" x 0.6" (36mm x 64mm x 16mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)	3.5" x 4.4" x 1.5" (89mm x 112mm x 39mm)
Approvals	CE	CE	CE	CE

MadgeTech's Process series of data loggers are engineered for accuracy and flexibility unequaled in the 4-20mA loop sensor and control industry. They can be inserted almost anywhere because they add very little resistance to the loop (10Ω typical). Additionally, customized Engineering Units can be defined to map the measured data to almost any unit imaginable. For example, a 4-20mA water meter might exert 4mA current for 0 liters of water and 20mA current for 5 liters of water. Using Engineering Units, the logger can be set up to natively display the data in liters rather than milliamps — a useful feature for presentations!

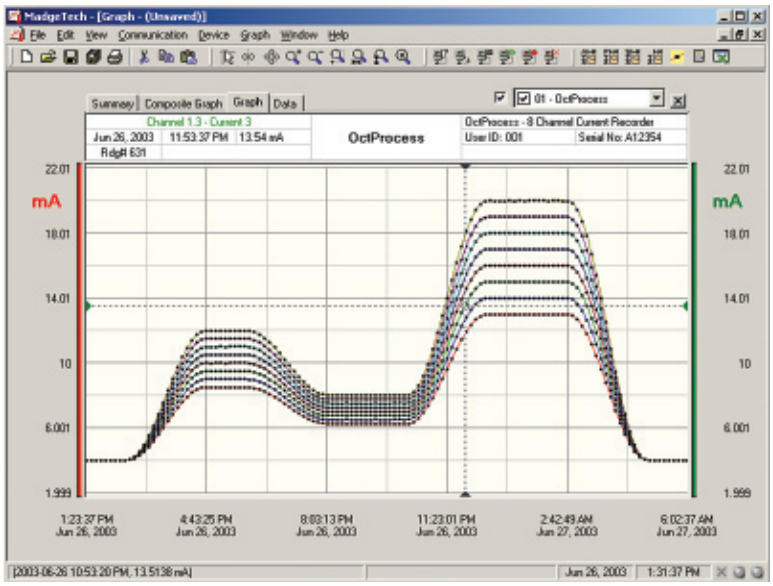
The Process data loggers can measure negative currents, allowing for other uses. With 16 bits of resolution, they are ideal for accurately measuring battery currents, solar cell currents and other current sources. Since they operate with an internal battery (replaceable), ground loop errors can be avoided.

The Process101 and Process110 are small, lightweight single channel current data loggers that can be placed in-line where needed. The QuadProcess and OctProcess are four and eight channel current loggers respectively. These rugged loggers can be bolted in place and will record data on multiple channels.

Applications

- 4 to 20 mA Recording
- Low Level Signal Monitoring
- Photovoltaic Studies
- Battery Studies
- Biological Sensor Monitoring
- Factory Process Control
- Research and Development

Up to Eight Channel Process Loggers



8-Channel Process Graph

Engineering Units can now be individually programmed for each channel. This feature allows for separate units to be displayed for different channels.

Calculate averages, minimum, maximum, and standard deviation with the touch of a button.

Ordering Information

Product ID	Description
Process101	-20 to +100mADC Current Logger
Process110-1	±1mADC Current Logger
Process110-25	±25mADC Current Logger
Process110-100	±100mADC Current Logger
QuadProcess-1	±1mADC Four Channel Current Logger
QuadProcess-25	±25mADC Four Channel Current Logger
QuadProcess-100	±100mADC Four Channel Current Logger
OctProcess-1	±1mADC Eight Channel Current Logger
OctProcess-25	±25mADC Eight Channel Current Logger
OctProcess-100	±100mADC Eight Channel Current Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	Replacement battery for Process101 and Process110
U9VL-J	Replacement battery for QuadProcess and OctProcess

SHOCK101
TRI-AXIAL SHOCK LOGGER

Features

Shock101 and Shock101-EB

- 3-Axis Shock Recording
- Built in Accelerometers
- Compact
- Low-cost

The Shock101 and Shock101-EB are fully programmable, tri-axial shock loggers. They measure and record peak acceleration levels for three axis (X, Y and Z) over a user-specified time period. The time period can be programmed using the MadgeTech software from 64 samples per second up to 5 minutes. Independent of the user defined time period, the loggers continuously sample the accelerometers at a rate of 512Hz to ensure that no event goes uncaptured.

At the end of the user defined time period, the largest acceleration value measured during the time period is recorded to the non-volatile memory (349,525 readings per axis). The data can easily be analyzed using the MadgeTech software, which allows the user to view all data points or to view a summary of statistics such as the average, minimum, and maximum acceleration values. A software calculated vector sum of all three axis is automatically displayed along with all readings to provide the user with the overall acceleration of the equipment or shipment being monitored.

Both the Shock101 and Shock101-EB have user replaceable batteries. The Shock101-EB extends the battery life to more than eight times that of the Shock101.

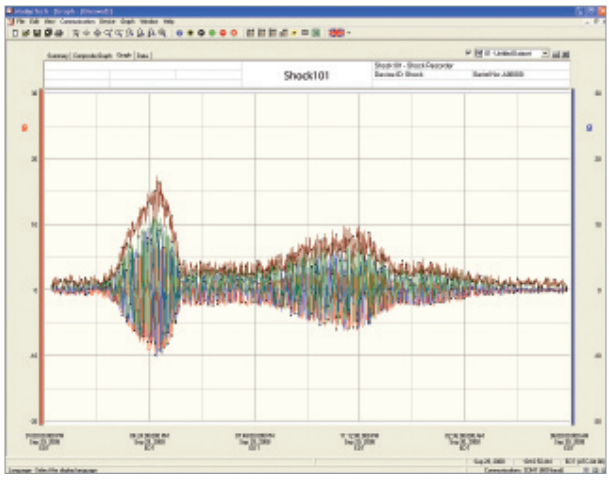
Specifications†

Part Number	Shock101
Channels	Shock (3 axis)
Acceleration Range	See Table Below*
Resolution	
Calibrated Accuracy	
Memory	349,525 per axis
Sample Rate	512Hz (1.953 milliseconds)
Reading Rate	64Hz to 5 minutes
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	7 days
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Anodized aluminum
Dimensions	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)
Approvals	CE

***Shock101 Acceleration Range, Resolution and Calibrated Accuracy**

Range (g)	±5	±50	±100	±250
Accuracy (g)	±0.2	±1	±2	±4
Resolution (g)	0.01	0.05	0.1	0.2

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.



SHOCK101-EB
TRI-AXIAL SHOCK LOGGER WITH EXTENDED BATTERY

The Shock101-EB is built with all the capabilities of the Shock101, but offers users the convenience of an extended battery life of two months.

Applications

Shock101 and Shock101-EB

- Shipment Monitoring
- Brake Testing
- Fragility Testing
- Laboratory Drop Testing
- Machinery Monitoring
- Railcar Coupling Impact
- Insurance Claims
- Mechanical Stress

Specifications†

Part Number	Shock101-EB
Channels	Shock (3 axis)
Acceleration Range	See Table Below*
Resolution	
Calibrated Accuracy	
Memory	349,525 per axis
Sample Rate	512Hz (1.953 milliseconds)
Reading Rate	64Hz up to 5 minutes
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	60 days
Operating Environment	-18 to +55°C 0 to 95%RH non-condensing
Materials	Anodized aluminum
Dimensions	5.5" x 5.2" x 3.2" (140mm x 132mm x 80mm)
Approvals	CE

***Shock101-EB Acceleration Range, Resolution and Calibrated Accuracy**

Range (g)	±5	±50	±100	±250
Accuracy (g)	±0.2	±1	±2	±4
Resolution (g)	0.01	0.05	0.1	0.2

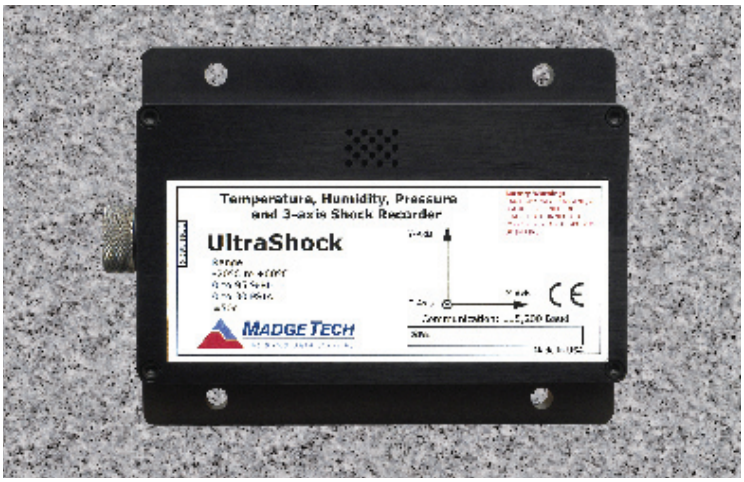
† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Shock101-5	Tri-axial 5G, Shock Logger
Shock101-50	Tri-axial 50G, Shock Logger
Shock101-100	Tri-axial 100G, Shock Logger
Shock101-250	Tri-axial 250G, Shock Logger
Shock101-5-EB	Tri-axial 5G, Shock Logger with extended battery life
Shock101-50-EB	Tri-axial 50G, Shock Logger with extended battery life
Shock101-100-EB	Tri-axial 100G, Shock Logger with extended battery life
Shock101-250-EB	Tri-axial 250G, Shock Logger with extended battery life

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	9V lithium replacement battery for the Shock101
MN1300	1.5V D-cell replacement battery for the Shock101-EB (6 required)

ULTRASHOCK
TRI-AXIAL TEMPERATURE HUMIDITY AND BAROMETRIC PRESSURE LOGGER



Features

UltraShock and UltraShock-EB

- All Inclusive Design
- Compact
- High Speed Download
- Real-time Operation
- Versatile

Specifications†

Part Number	UltraShock
Channels	Shock (3 axis) Temperature Humidity Pressure
Range	Shock: See Table Below -20 to +60°C 0 to 95%RH; 0 to 30 PSIA
Resolution	Shock: See Table Below 0.1°C 0.5%RH 0.002 PSIA
Calibrated Accuracy	Shock: See Table Below ±0.5°C ±3%RH ±1% FSR @ 25°C
Memory	174,762 per channel
Sample Rate	512 Hz (1.953 Millisecond)
Reading Rate	64Hz to 5 minutes for shock, selectable in software. Temperature, pressure & humidity sampled approx. every 2 seconds at intervals faster than 2 seconds. Otherwise, sampled at the reading rate.
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	7 days
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Anodized aluminum
Dimensions	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)
Approvals	CE

***UltraShock Acceleration Range, Resolution and Calibrated Accuracy**

Range (g)	±5	±50	±100	±250
Accuracy (g)	±0.2	±1	±2	±4
Resolution (g)	0.01	0.05	0.1	0.2

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

The UltraShock and UltraShock-EB are designed to be the complete solution for environmental monitoring. These loggers will measure and record temperature, humidity, pressure and the peak acceleration levels for three axis (X, Y and Z) at the user selected reading interval. The time period can be programmed using the MadgeTech software to be from 64 samples per second to up to five minutes. During each reading interval, the loggers continuously sample the accelerometers at a rate of 512Hz to ensure that no event goes uncaptured.

The temperature, humidity and pressure channels are sampled every two seconds or at the sample rate if slower than two seconds.

The loggers can store up to 174,762 readings per channel in non-volatile memory. The data can easily be analyzed using the MadgeTech software, which allows the user to view all data points or to view useful statistical information pertaining to each channel. A software calculated vector sum of the three axis is automatically displayed along with every reading to provide the user with the overall acceleration of the equipment or shipment being monitored. If additional analysis of the data needs to be performed, the data can be easily exported to MS Excel® by simply clicking a button.

Both the UltraShock and UltraShock-EB have user replaceable batteries. The UltraShock-EB extends the battery life to greater than eight times (two months) that of the standard UltraShock.

ULTRASHOCK-EB
TRI-AXIAL TEMPERATURE HUMIDITY AND BAROMETRIC PRESSURE LOGGER WITH EXTENDED BATTERY

Applications

UltraShock and UltraShock-EB

- Shipping Live Cargo
- Aircraft Turbulence
- Endurance Testing
- Complete Environmental Monitoring
- Assembly Line Monitoring
- Brake and Crash Testing

Specifications†

Part Number	UltraShock-EB
Channels	Shock (3 axis) Temperature Humidity Pressure
Range	Shock: See Table Below -20 to +54°C 0 to 95%RH 0 to 30 PSIA
Resolution	Shock: See Table Below 0.1°C 0.1%RH 0.002 PSIA
Calibrated Accuracy	Shock: See Table Below ±0.5°C ±3%RH ±1% FSR @ 25°C
Memory	174,762 per channel
Sample Rate	512Hz (1.953 milliseconds)
Reading Rate	64Hz to 5 minutes for shock, selectable in software. Temperature, pressure & humidity sampled approx. every 2 seconds at intervals faster than 2 seconds. Otherwise, sampled at the reading rate.
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	60 days
Operating Environment	-18 to +55°C 0 to 95%RH non-condensing
Materials	Anodized aluminum
Dimensions	5.5" x 5.4" x 3.2" (140mm x 137mm x 80mm)
Approvals	CE

***UltraShock-EB Acceleration Range, Resolution and Calibrated Accuracy**

Range (g)	±5	±50	±100	±250
Accuracy (g)	±0.2	±1	±2	±4
Resolution (g)	0.01	0.05	0.1	0.2

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
UltraShock-5	Tri-axial 5G Shock, Temperature, Humidity and Barometric Pressure Logger
UltraShock-50	Tri-axial 50G Shock, Temperature, Humidity and Barometric Pressure Logger
UltraShock-100	Tri-axial 100G Shock, Temperature, Humidity and Barometric Pressure Logger
UltraShock-250	Tri-axial 250G Shock Temperature, Humidity and Barometric Pressure Logger
UltraShock-5-EB	Tri-axial 5G Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life
UltraShock-50-EB	Tri-axial 50G Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life
UltraShock-100-EB	Tri-axial 100G Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life
UltraShock-250-EB	Tri-axial 250G Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	9V lithium replacement battery for the UltraShock
MN1300	1.5V D-cell replacement battery for the UltraShock-EB (6 required)

TSR101
TRI-AXIAL TRANSIENT LOGGER

Features
- Built in Accelerometers
- Compact
- High Speed Download
- Programmable Trigger Levels

Applications
- Fragility Testing
- Laboratory Drop Testing
- Brake Testing
- Monitoring Shipments
- Machinery Monitoring
- Crash Testing
- Acceleration Monitoring

The TSR101 is a battery powered, 3-axis shock logger. The device measures and records instantaneous shock levels when the user-selectable trigger settings have been exceeded. This allows for only pertinent data to be captured for the user. There are 15 rates to choose from ranging from 1024Hz to 1Hz. The TSR101 records pre-trigger data up to 50 readings, followed by the number of samples set by the user. The window size can be set by the user from 256 readings to full memory.

The TSR101 is valuable in characterizing environments such as packaging and fragility assessment (drop testing), brake and crash testing, and shipping validation. This compact, easy to use device can measure and record approximately 349,500 measurements per axis. The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged. The device can be started and stopped directly from your computer and its small size allows it to fit almost anywhere. The TSR101 makes data retrieval quick and easy. Simply plug it into an empty COM or USB port and our user-friendly software does the rest.

The TSR101 also comes in an extended battery version, the TSR101-EB, that has a battery life of up to 30 days.

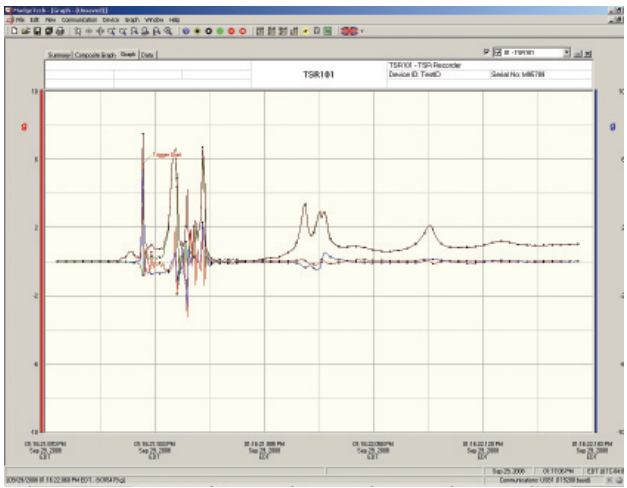
Specifications†

Part Number	TSR101
Acceleration Sensor	MEMS Semiconductor
Acceleration Range Acceleration Resolution Calibrated Accuracy	See Table Below*
Memory	349,500 per axis
Sample Rate	15 options from 1024Hz (.976ms) to 1 second
Window Size	256 readings to full memory
Pre-trigger Data	50 readings
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	7 Days
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Anodized aluminum
Dimensions	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)
Approvals	CE

***TSR101 Acceleration Range, Resolution and Calibrated Accuracy**

Range (g)	±5	±50	±100	±250
Accuracy (g)	±0.2	±1	±2	±4
Resolution (g)	0.01	0.05	0.1	0.2

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.



SVR101
TRI-AXIAL SPECTRAL VIBRATION LOGGER

Features

- FFT in Real-time
- Records Vibration Frequencies and Peak Acceleration
- Calculates Spectral Intensity in Real-time While Logging
- User Programmable Trigger Levels
- High Speed Download
- Programmable Start Time
- Built-in Accelerometers

The SVR101 is a self-contained device engineered to record accelerations for spectral analysis of vibration and peaks. This device records and time-tags 3-axis vibrations and peaks to provide a history of shock/vibration conditions. The SVR101 measures and computes real-time spectral data using an FFT (Fast Fourier Transform) from 0 to 128 Hertz. To make efficient use of memory, the SVR101 only takes data when the (user preset) trigger level is exceeded. The minimum sampling rate is 2 seconds and the device can display peak X, Y, and Z shock data, vector sum for data evaluated, up to 4 hours.

The SVR101 is a critical instrument for quantifying and understanding vibrations and shocks in many applications. From transportation to automotive design, motor failure detection to mechanical resonance, the SVR101 can go to remote places, operate from battery, and store the data in non-volatile memory — retaining the data even if the batteries discharge. Call MadgeTech for extended battery life options.

Specifications†

Part Number	SVR101
Acceleration Sensor	MEMS Semiconductor
Acceleration Range	±5g , ±50g
Acceleration Resolution	0.05g
Calibrated Accuracy	±1g
Sampling Rate	256Hz (decimated to 128Hz)
FFT Range	0 to 128Hz (1Hz bins)
FFT Window Period	2 seconds
FFT Sampling Period	2 seconds to 14,400 seconds (4 hrs)
Memory	16Mbit (3,971 samples)
Reading Rate	2 seconds up to 4 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	60 hours (9V lithium)
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Anodized aluminum
Dimensions	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)
Approvals	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Applications

- Machinery Failure Detection
- Detect Mechanical Resonances
- Endurance Testing
- Problem Diagnostics
- Wind Resonance on Structures and Support
- Vehicle Vibration
- Materials Research

Ordering Information

Product ID	Description
TSR101-5	5G Tri-Axial Transient Shock Logger
TSR101-50	50G Tri-Axial Transient Shock Logger
TSR101-100	100G Tri-Axial Transient Shock Logger
TSR101-250	250G Tri-Axial Transient Shock Logger
TSR101-5-EB	5G Tri-Axial Transient Shock Logger with Extended Battery
TSR101-50-EB	50G Tri-Axial Transient Shock Logger with Extended Battery
TSR101-100-EB	100G Tri-Axial Transient Shock Logger with Extended Battery
TSR101-250-EB	250G Tri-Axial Transient Shock Logger with Extended Battery
SVR101-5	5G Spectral Vibration Logger
SVR101-50	50G Spectral Vibration Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	9V lithium replacement battery for the TSR101 and SVR101
MN1300	1.5V D-cell replacement battery for the TSR101-EB (6 required)

LEVEL1000 AND LEVEL2000
WATER LEVEL AND TEMPERATURE LOGGERS

Features
- Rugged Design
- Simple to Use
- Powerful Software Simplifies Analysis
- Stainless Steel

Applications
- Water Level Monitoring
- Well Monitoring
- Waste Water Treatment
- Flood Analysis
- Groundwater Monitoring
- Irrigation Canals
- Lake and Wetland Studies
- Storm water Studies
- Landfill/Hazardous Site Analysis
- Environmental Studies

The MadgeTech Level loggers accurately monitor and record water level and temperature over time. The rugged stainless steel design allows for the devices to be placed in harsh environments which makes them well suited for use in waste water treatment facilities, monitoring well and ground water levels, irrigation canals, lake and wetland studies and many other water level applications.

The internal temperature sensor provides accurate temperature measurements without the need for a separate temperature logger. Each logger can be started to take measurements every two seconds for rapid changes in water level up to one reading every 12 hours. They will store up to 16,383 readings in their non-volatile memory.

Both loggers use a rugged stainless steel pressure transducer to accurately measure and record the water level. Our user-friendly software will display measurements in the user's choice of feet, inches, meters, centimeters, millimeters or PSI.

The Level1000 utilizes an absolute pressure sensor. This allows for the unit to be self-contained, but does not compensate for atmospheric pressure fluctuations. The Level2000 incorporates a gauge pressure sensor with a vent tube to compensate for atmospheric pressure fluctuations. The vented tube also allows for communication with the logger while the logger is in its environment.

Specifications†

Part Number	Level1000	Level2000
Temperature Sensor	Internal Semiconductor	Internal Semiconductor
Temperature Range	0 to +80°C	0 to +80°C
Temperature Resolution	0.1°C	0.1°C
Calibrated Accuracy	±0.5°C	±0.5°C
Pressure Sensor	Semiconductor (strain gauge)	Semiconductor (strain gauge)
Nominal Range	0 to 30′	0 to 30′
Level Resolution	0.05″	0.02″
Calibrated Accuracy	±0.3%FSR @ 25°C	±0.3%FSR @ 25°C
Memory	16,383 per channel	16,383 per channel
Sample Rate	2 seconds up to 12 hours	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	2,400	2,400
Typical Battery Life	1 year	1 year
Operating Environment	0 to +80°C, 0 to 100%RH	0 to +80°C, 0 to 100%RH
Submersible	Yes	Yes
Material	303 stainless steel	303 stainless steel
Dimensions	5.7″ x 1.25″ dia. (145mm x 32mm dia.)	Submersible end: 9.1″ x 1.25″ dia (232mm x 32mm dia) Communications end: 7.1″ x 1.2″ dia (181mm x 31mm dia), plus cable
Approvals	CE	CE

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Level1000	Water Level and Temperature Logger
Level2000	Vented Water Level and Temperature Logger—Specify cable length of 1′ to 30′
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
TL-2150	Replacement battery for Level1000 and Level2000

PHTEMP101
pH AND TEMPERATURE LOGGER

Applications

- Wastewater
- Water Quality
- Environmental/Wetlands
- Industrial Influent/Effluent
- Water Districts and Municipal Water Systems
- Process Water Quality
- Recreation/Park Management
- Pulp and Paper Industry

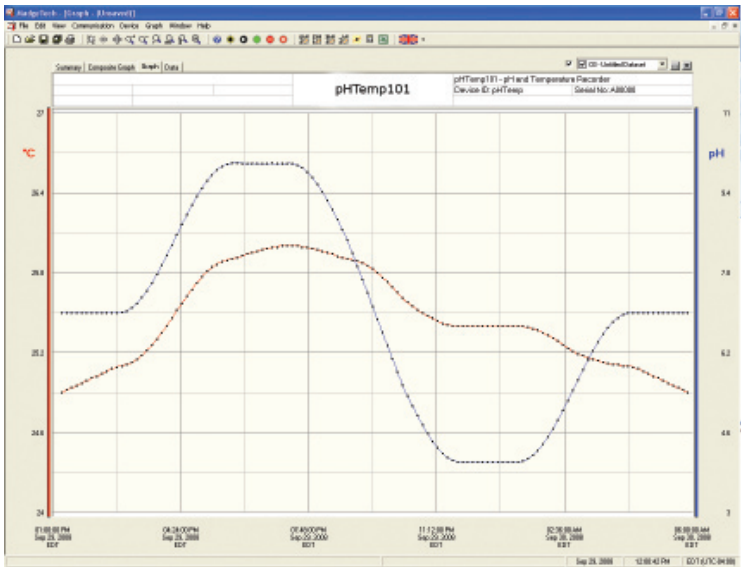
The pHTemp101 can measure the full pH range from 0 to 14pH with 0.1pH accuracy and store 13,107 points of data in its non-volatile memory. Even if the battery should become discharged, the data will be retained.

The ultra-high impedance input of the pHTemp101 eliminates the need for expensive and bulky pre-amps to use common pH and ORP probes. It can work with probes up to 300 MΩ impedance*. Additionally it requires an RTD temperature sensor for proper temperature compensation of the pH readings.

Many customers in the waste water industry, for example, use the real-time recording capability of the pHTemp101 and the MadgeTech software to monitor the pH of effluent. This real-time data can be saved from the PC automatically for archive purposes.

**Please note that the input connector must be kept impeccably clean! Even the light touch of a finger is enough to contaminate the connector and cause erroneous readings. Be certain not to contaminate any internal electronic components when changing the battery.*

Once the pHTemp101 data is downloaded to the PC, the MadgeTech software takes over and allows viewing of the data in degrees of Celsius, Fahrenheit, Kelvin and Rankine (Temperature channel) or in Ohms and (pH channel) pH, millivolts, Volts or (optional) Engineering Units.



Specifications†

Part Number	pHTemp101
pH Input Connection	Female BNC jack
pH Range	0 to 14pH (±1000mV)
pH Resolution	0.01pH
pH Accuracy	±0.1pH
Temperature Sensor	2, 3 or 4 wire 100Ω platinum RTD
Probe Temperature Range	-40 to +125°C
Temperature Resolution	0.01°C
Calibrated Accuracy	±0.1°C
Memory	13,107 per channel
Sample Rate	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	2,400
Typical Battery Life	1 year
Operating Environment	-5 to +50°C 0 to 95%RH non-condensing
Materials	ABS plastic
Dimensions	2.4" x 4.5" x 1.0" (61mm x 115mm x 26mm)
Approvals	CE

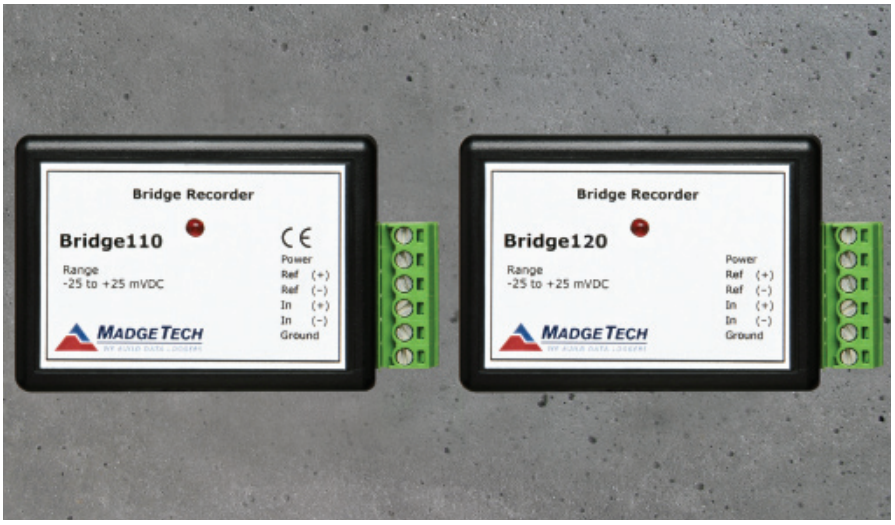
† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
pHTemp101	pH and Temperature Logger

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
U9VL-J	Replacement battery for pHTemp101

BRIDGE110 AND BRIDGE120
BRIDGE/STRAIN GAUGE LOGGERS



Applications

- Strain Gauges
- Load Cells
- Pressure Transducers
- Torque Sensors
- Load Bolts
- Position Transducers/LVDTs

Specifications†

Part Number	Bridge110	Bridge120
Range	See Table Below*	See Table Below*
Resolution		
Accuracy		
Memory	32,767	32,767
Sample Rate	1 second up to 12 hours	20Hz to 12hours
Units	V, mV, µV, Engineering Units specified through software	V, mV, µV, Engineering Units specified through software
Required Interface Package	IFC110 or IFC200	IFC110 or IFC200
Baud Rate	57,600	57,600
Typical Battery Life	10 years	25 Days
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing	-40 to +80°C 0 to 95%RH non-condensing
Materials	ABS plastic	ABS plastic
Dimensions	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)	1.7" x 2.7" x 0.8" (44mm x 69mm x 21mm)
Approvals	CE	CE Pending

*Bridge110 and Bridge120 Range, Resolution, & Accuracy

Nominal Range	±10mV	±25mV	±100mV	±1000mV
Measurement Range	±15mV	±37.5mV	±150mV	±1200mV
Resolution	1µV	2.5µV	5µV	50µV
Calibrated Accuracy	±0.25%FSR	±0.10%FSR	±0.05%FSR	±0.01%FSR
Input Range	0 to 2.5V	0 to 2.5V	0 to 2.5V	0 to 2.5V
Reference Voltage	2.5V	2.5V	2.5V	2.5V

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Strain gauges and load cells are handy little sensors that can be used to detect strain, stress, torque, sheer and pressure. Consequently they can be found just about anywhere; vehicles, bridges, plumbing, pneumatics, paving equipment, sky-scrapers, digital scales and even tectonic plates.

MadgeTech engineers developed the Bridge110 with technology that allows the user to take it where it needs to go.

The small self-contained logger fits in the palm of your hand, runs for up to 10 years on a single internal battery and can provide laboratory grade resolution as low as 1 microvolt (depending on input range).

The Bridge120 has all the same features as the Bridge110, but with the added benefit of a 20Hz reading rate.

The powerful MadgeTech software can display the offloaded data in units of volts, millivolts, microvolts, and user-defined Engineering Units. If further analysis is needed, one click will export formatted data to an MS Excel® spreadsheet.

BRTRANS210
HIGH SPEED BRIDGE/STRAIN LOGGER

Applications

- Vehicles
- Bridges
- Pneumatic Systems
- Paving Equipment
- System Integration

The BrTrans210 is a self-contained data logger that records an electrical signal from a strain gauge or a load cell. The device is available in ranges of ±10mV, ±25mV, ±100mV, ±1000mV, and features triggering and high speed recording at up to 100 samples per second. Applications are facilitated by the BrTrans210s' ability to record the electrical resistance variations proportional to the level of strain an object experiences. Not only can the BrTrans210 sample as fast as 100 samples per second, it also records and stores more than 1 million data points to non-volatile memory. There are many practical applications for the BrTrans210 ranging from vehicles and bridges, to plumbing, pneumatic systems, paving equipment and shafts.

With the powerful MadgeTech software, features such as data manipulation, report generation, user-defined engineering units, and MS Excel® compatibility make analyzing data simple. Where it is critical to accurately measure changes in resistance, the BrTrans210 provides excellent performance.

Specifications†

Part Number	BrTrans210
Range	See Table Below*
Resolution	
Accuracy	
Memory	1.048 million readings
Sample Rate	100Hz to 5 minutes
Units	Volts, Millivolts, Microvolts, and user-defined Engineering Units
Required Interface Package	IFC110 or IFC200
Baud Rate	115,200
Typical Battery Life	30 days typical
Operating Environment	-20 to +60°C 0 to 95%RH non-condensing
Materials	Anodized aluminium
Dimensions	3.5" x 4.4" x 1.0" (89mm x 112mm x 26mm)
Approvals	CE Pending

BrTrans210 Range, Resolution, & Accuracy

Nominal Range	±10mV	±25mV	±100mV	±1000mV
Measurement Range	±15mV	±37.5mV	±150mV	±1200mV
Resolution	1µV	2.5µV	5µV	50µV
Calibrated Accuracy	±0.25%FSR	±0.10%FSR	±0.05%FSR	±0.01%FSR
Input Range	0 to 2.5V	0 to 2.5V	0 to 2.5V	0 to 2.5V
Reference Voltage	2.5V	2.5V	2.5V	2.5V

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
Bridge110-10	10mV Bridge Logger
Bridge110-25	25mV Bridge Logger
Bridge110-100	100mV Bridge Logger
Bridge110-1000	1000mV Bridge Logger
Bridge120-10	10mV, 20Hz, Bridge Logger
Bridge120-25	25mV, 20Hz, Bridge Logger
Bridge120-100	100mV, 20Hz, Bridge Logger
Bridge120-1000	1000mV, 20Hz, Bridge Logger
BrTrans210-10	±10mV High Speed Bridge/Strain Logger
BrTrans210-25	±25mV High Speed Bridge/Strain Logger
BrTrans210-100	±100mV High Speed Bridge/Strain Logger
BrTrans210-1000	±1000mV High Speed Bridge/Strain Logger
Accessories	**Description**
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	Replacement battery for Bridge110 and Bridge120
U9VL-J	Replacement battery for BRTrans210

RAIN110
RAINFALL LOGGER

The Rain110 is a complete system for measuring and recording rainfall over long periods of time.

The Rain 110 can measure rainfall with a resolution of 0.01" (0.0254cm) and record up to 6" (15cm) of rainfall per hour. This system will only record to memory when rainfall is present, maximizing the amount of time the system can record. Using this method, the system can record up to 131" (332cm) of rainfall. For additional bucket sizes contact MadgeTech.

Using the data logger's built-in Engineering Units, the data can be offloaded and displayed in user-specified units (eg. inches, centimeters). The software can "totalize" the rain bucket tips, allowing easy viewing of the accumulated rainfall over the time period of interest.

Specifications†

Part Number	Rain110
Accuracy	±4% over range of 1" to 6"per hour
Orifice	8" dia. (204mm dia.)
Reed Switch Contact Rating	3W, 28VAC
Rainfall Per Bucket Tip	0.01" (0.254mm)
Operating Temperature Range	0 to 60°C (32 to 140°F)
Construction Materials	Funnel: anodized aluminum; Base, body, bracket, tipping bucket: PVC
Mounting	(3) 1/4" dia. holes on 9.5" dia. circle
Tripod/Mast Kit	Contact MadgeTech for availability
Rain Gauge Dimensions	12.0" x 8.4" dia. (305mm x 214mm dia.)
Shipping Weight	10lbs (4.5kg)
Memory	13,107 samples 131" (332cm) of rain
Baud Rate	57,600
Typical Battery Life	10 years
Enclosure Dimensions	2.9" x 4.0" x 1.1" (74mm x 102mm x 28mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

WIND110
WIND SPEED LOGGER

The Wind110 is a complete basic system for measuring and recording wind speed over long periods of time.

This system can record at user specified intervals from one second up to twelve hours. This allows the user to receive instantaneous wind speed at faster reading intervals, or average wind speed over longer intervals. The Wind110 can accurately measure and record wind speed up to 170 mph (79m/s) and the anemometer can survive gusts up to 214 mph (95m/s)

Using the logger's built-in Engineering Units, the data can be offloaded and displayed in user-specified units (eg. mph, kph, L, m/s).

Specifications†

Part Number	Wind110
Gust Survival Speed	214 mph (95m/s)
Threshold Wind Speed	1.75 mph (0.75m/s)
Maximum Measurable Speed	0 to 170 mph (76m/s)
Accuracy	±2 mph 0-10 mph ±2.5% of reading 10-100 mph
Resolution	Varies with reading rate 0.17 mph @ 5 sec rate
Rotation Diameter	7.5" (191mm)
Weight	18.1oz. (513g)
Mount	Accepts 0.5" (13mm) dia. Mast
Tripod/Mast Kit	Contact MadgeTech for availability
Operating Temperature Range	-40 to 60°C (-40 to 140°F)
Memory	16,383
Baud Rate	57,600
Typical Battery Life	10 years
Enclosure Dimensions	2.9" x 4.0" x 1.1" (74mm x 102mm x 28mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.

Ordering Information

Product ID	Description
Rain110	Rainfall Recording System, includes a tipping-bucket Rain Gauge, data logger, weatherproof box, necessary cabling and the IFC110 PC interface kit (with software)
Wind110	Wind Speed Recording System, includes an anemometer (wind speed sensor), data logger, weatherproof box, necessary cabling and the IFC110 interface kit (with software). Mounting mast available— contact MadgeTech.

Accessories	Description
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB interface cable
LTC-7PN	Replacement battery for Wind110 and Rain110

ETR110
EXHAUST TEMPERATURE RECORDING

The ETR110 is a complete Exhaust Temperature Profiling Kit designed to profile the exhaust temperature of on-road vehicles and off-road equipment, including tractor trailers, buses, trucks, waste water vehicles, and sweepers. The ETR110 kit comes assembled and includes a data logger, temperature sensor (thermocouple), weatherproof enclosure, IFC200 interface cable, hex screwdriver and software.

Setup is fast and easy. A ¼" NPT coupler *(not supplied)* is attached to the exhaust pipe; the use of a compression fitting allows for the thermocouple to be placed directly in the exhaust stream, providing for highly accurate profiling. The data logger, which is contained within the weatherproof enclosure, is then mounted to the vehicle.

Specifications†

Part Number	ETR110
Internal Temperature Sensor	Semiconductor
Internal Channel Temperature Resolution	0.1°C
Channel Calibrated Accuracy	±0.5°C
Remote Channel Temperature Sensor	Thermocouple types J,K,T,E,R,S,B,N
Remote Channel Range Remote Channel Resolution Remote Channel Accuracy	See Table Below
Memory	16,383 per channel
Sample Rate	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	57,600
Typical Battery Life	10 years
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing
Material	ABS Plastic
LED Indicator	Red
Dimensions	2.9" x 4.0" x 1.1" (73mm x 102mm x 28mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.

Thermocouple	Range (°C)	Resolution	Accuracy
J	-210 to +760	0.1°C	±0.5°C
K	-260 to +1370	0.1°C	±0.5°C
T	-260 to +400	0.1°C	±0.5°C
E	-260 to +980	0.1°C	±0.5°C
R	-50 to +1760	0.5°C	±2.0°C
S	-50 to +1760	0.5°C	±2.0°C
B	+60 to +1820	0.5°C	±2.0°C
N	-260 to +1300	0.1°C	±0.5°C

SMR110
SOIL MOISTURE LOGGER

The SMR110 is a small, battery powered, soil moisture data logger in a weatherproof enclosure. It provides accurate volumetric water content measurements over a complete range from dry to saturated.

The SMR110 features a 10-year battery for long-term deployments and soil studies, over multiple seasons. With its built-in memory, the data logger can monitor and record over 32,767 soil moisture measurements. The EC-5, a high accuracy soil moisture probe (pictured above), has a response time of 10ms and can be placed in any type of soil. The EC-20 probe is designed for use in medium-textured soils.

Specifications†

Part Number	SMR110
Sensor	External soil moisture probe
Measurement Range	0~100% VWC saturation (SMR110-5) 0~40% VWC saturation (SMR110-20)
Resolution	0.002m³/m³
Accuracy	**Data Logger:** 10mV **Probe:** (EC-5) ± 3% typical, ALL soils (EC-20) ± 4% typical on low EC and medium textured soils
Memory	32,767
Sample Rate	2 seconds up to 12 hours
Required Interface Package	IFC110 or IFC200
Baud Rate	57,600
Typical Battery Life	10 years
Operating Environment	-40 to +80°C 0 to 95%RH non-condensing
Dimensions	**Enclosure:** 2.9" x 4.0" x 1.1" (73mm x 102mm x 28mm) **Cable:** 16'(5m) **SMR110-5 Probe:** 2.1" x 0.6" x 0.06" (54mm x 16mm X 1.6mm) **SMR110-20 Probe:** 10" x 1.25" x 0.06" (254mm x 32mm X 1.6mm) probe
Approvals	CE Pending

Ordering Information

Product ID	Description
ETR110	Exhaust Temperature Recording System, includes datalogger (TC110-TB), temperature sensor (thermocouple), weatherproof enclosure, interface cable (IFC200), hex screwdriver and software
SMR110-5	Soil Moisture Recording System, includes data logger, weatherproof enclosure, and EC-5 probe. (software & interface cable kit required, not included)
SMR110-20	Soil Moisture Recording System, includes data logger, weatherproof enclosure, and EC-5 probe. (software & interface cable kit required, not included)
LTC-7PN	Replacement battery for ETR110 and SMR110.

THERM•A•LERT WIRELESS TEMPERATURE NOTIFICATION SYSTEM

The Therm•A•lert temperature monitoring and alarming system is designed specifically for refrigerators, freezers, and incubators. The system can be used to monitor a single temperature location and be expanded to include hundreds of locations in a building by adding more transmitters. This system offers notification of temperature deviations, recording detailed time stamped files for archiving.

Data received from a temperature transmitter can be graphed automatically on your PC, forwarding alarms via call pagers, text messages or e-mails, as selected.

Therm•A•lert is a battery powered, miniature wireless temperature transmitter. It comes with a RFRTDTemp101A and a probe mounted in a miniature bottle filled with ethylene glycol. The bottle simulates actual product temperature, not ambient air.

For traceability, transmitters can be supplied with a NIST traceable certificate.

Specifications†

Part Number	Therm•A•lert
External Temperature Sensor	External RTD 2,3 or 4 wire 100 ohms pt RTD
External Temperature Range	-50~+80°C
External Temperature Resolution	0.01°C
External Temperature Calibrated Accuracy	±0.5°C (over 100°C span)
Memory	54,619 readings
Sample Rate	30 seconds to 1 every 12 hours
Required Interface Package	RFC101A or RFC200A
PC Baud Rate	57,600
RF Carrier Frequency	418 ±0.075MHz
RF Baud Rate	4,800
Range (Line of Site Outdoors)	Up to 120' (36m)
Range (Line of Site Indoors)	Up to 40' (12m)
Battery Life	1 year
Materials	ABS plastic
Operating Environment	-30 to +70°C; 0 to 95%RH non-condensing
Dimensions	1.7" x 2.7" x 0.8" plus 2.0" antenna (42mm x 69mm x 21mm + 51mm antenna)
Approvals	US (FCC), CA (IC)

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

MOTION110 MOTION DATA LOGGER

The Motion110 is a miniature, low cost, recording device which senses motion and records time intervals during which motion occurs. The device can record up to 13,107 time stamped events and will not consume memory when it doesn't record motion.

Once activated the Motion110 senses and records transition or state changes at the input. The devices real-time clock ensures that all data is time and date stamped. The storage medium is non-volatile solid state memory, providing maximum data security even if the battery becomes discharged.

Specifications†

Part Number	Motion110
Detection Distance	5M
Detection Range	>80°
Time Resolution	1 second (reading rate dependent)
Memory	13,107
Required Interface Package	IFC110 or IFC200
Baud Rate	57,600
Battery Life	5 years typical at 25°C
Operating Environment	-20 to +60°C, 0 to 95%RH Non-condensing
Material	ABS Plastic
Dimensions	7" x 2.7" x 0.8" (44mm x 69mm x 21mm)
Approvals	CE Pending

† Specifications subject to change without notice. Consult product data sheet.

Ordering Information

Product ID	Description
RFRTDTemp101A-30	Therm•A•lert includes 30ml Glycol Bottle with Probe, and Wireless Transmitter
RFRTDTemp101A-60	Therm•A•lert includes 60ml Glycol Bottle with Probe, and Wireless Transmitter
RFRTDTemp101A-250	Therm•A•lert includes 250ml Glycol Bottle with Probe, and Wireless Transmitter
Motion110	Motion data logger

Accessories	Description
RFC101A	Includes wireless receiver, software, manual, power supply and IFC110
RFC200A	Includes Wireless Receiver, Software, Manual, Power Supply, IFC200 and Serial to USB Converter (for RF Receiver)
IFC110	Includes software, manual and 9–pin computer interface cable
IFC200	Includes software, manual, Quick Start Guide and USB interface cable
LTC-7PN	Replacement battery for RFRTDTemp101A-30, RFRTDTemp101A-60, and RFRTDTemp101A-250, and Motion110

7001-CO2
CARBON DIOXIDE MONITOR

Applications

- IAQ (Indoor Air Quality) Studies
- HVAC System Testing and Servicing
- Agricultural, Plant Growth Studies
- Building Studies

Features

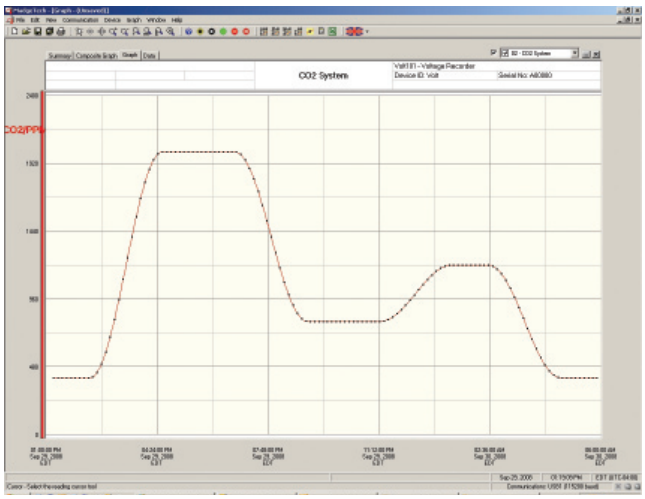
- Dual Beam, Absorption Infrared Gas Sensor Technology
- Large LCD
- Operates on batteries or plug in, AC power Adapter (included)

Designed for residential and commercial use, the Telaire 7001, CO2 monitor is an essential tool for detecting carbon dioxide and temperature levels in a wide variety of air quality studies and applications. When used with the MadgeTech family of Volt Loggers*, CO2 levels (ppm) and/or temperature data can be recorded with time and date stamps for graphing and detailed analysis.

This data can be used to test for low or substandard ventilation in buildings, offices, hospitals, schools, etc. Energy saving opportunities can be identified in over-ventilated spaces. The presence of combustion fumes from vehicles and equipment may also be detected. Poor air quality and ventilation complaints can be verified.

Air handlers and exchangers can be diagnosed for service or repairs. Sick buildings may be monitored and improvements made in ventilation systems, from data recorded in baseline and post-retrofit studies. Performance of heating and air conditioning systems can be analyzed. Building occupancy information can also be obtained from CO2 level data. CO2 and temperature data are also useful in agricultural, plant growth and greenhouse design applications and studies. Even retail stores benefit (increased sales!) from appropriate CO2 levels.

** The single channel Volt110-15V or Volt101-15V can only record either the CO2 or temperature. The QuadVolt-15V can record both.*



Specifications†

Part Number	70001-CO2
CO2 Range	0 to 10,000 ppm (display) 0 to 4,000 ppm (voltage output)
CO2 Resolution	1ppm (display) 0.05ppm (Volt110)
CO2 Accuracy	±50ppm or 5% of reading, whichever is greater
CO2 Response Time	<60 seconds for a 90% of step change)
Temperature Range	0 to 50°C (LCD display) 0 to 40°C (voltage output)
Temperature Resolution	0.1°C (LCD display) 0.005°C (Volt110)
Temperature Accuracy	±1°C
Operating Environment	0 to 50°C
Typical Battery Life	80 hours
Approvals	–

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

Ordering Information

Product ID	Description
7001-CO2	Carbon dioxide monitor
Volt101-15	15V Voltage Logger
Volt110-15	15V Voltage Logger
QuadVolt–15	Four Channel 15V Voltage Logger

Accessories	Description
Cable2070	CO2 monitor to data logger interface cable

**See page 70 for Voltage Loggers*

Wireless Features

- Real-time wireless data transmission
- Transmitter battery life up to 10 years
- Supports multiple transmitters with one receiver
- Data redundantly stored in transmitters
- Configurable in software (via direct PC interface)

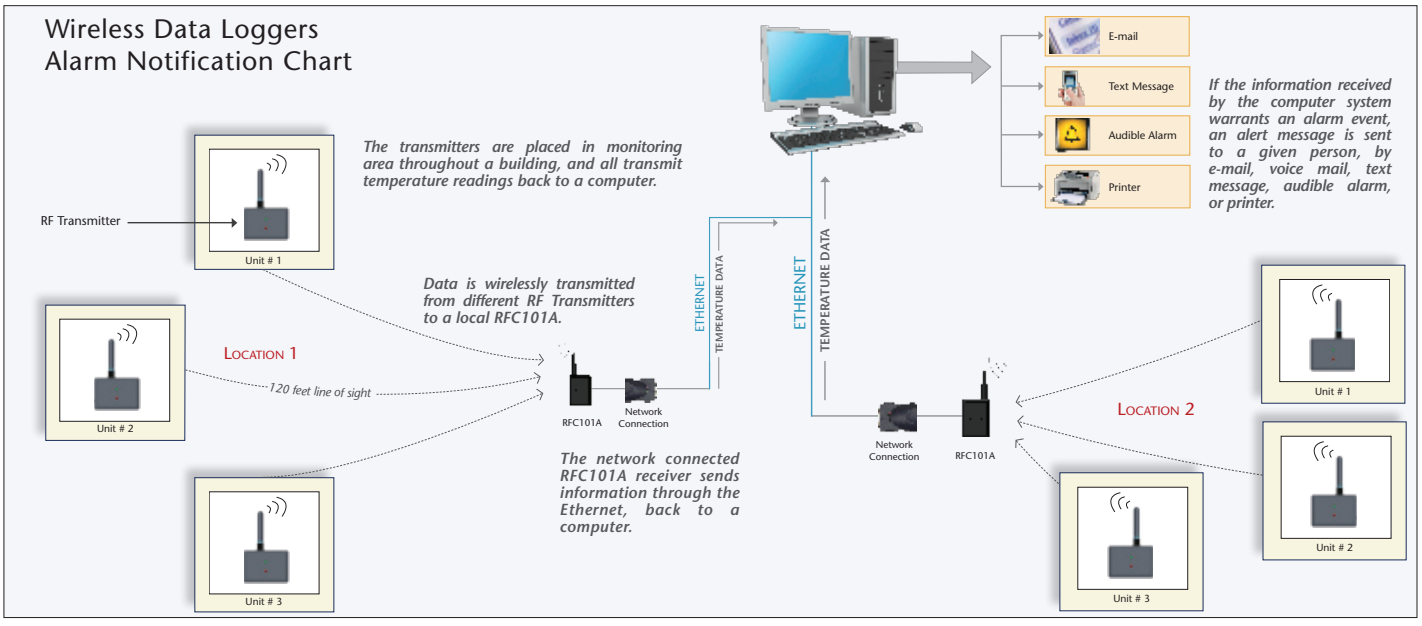
MadgeTech offers a complete series of data loggers with built-in wireless transmitters. The RF series expands upon the same technology used in the 110 series products by providing a full host of wireless features to ensure transmission reliability. These loggers are true "data loggers", as all data is redundantly stored internally, ensuring that all events are captured. The devices can be configured to transmit data wirelessly, over the serial communications port, or both.

To easily change the transmitting/logging parameters, the RF transmitters can be connected directly to the PC via an IFC110 or IFC200 cable. In this way, all the transmitting and recording options can be set, such as transmission interval, transmission mode (RF, serial), randomization, and error correction.

Once deployed, the logger will begin to transmit the data as configured (and/or records data internally). An external switch can be configured to manually turn the transmissions ON or OFF without affecting the logging. The transmissions are received by an RFC101A which is connected to a local PC. The MadgeTech software on the PC receives the data and displays (in graph and table form) the data in real time.

The typical line-of-sight range for these transmitters is 120' (36m), but this range can be significantly reduced by walls or other obstacles in particular, metal walls. Transmitting from inside a walk-in freezer, for example, may not be possible. In cases such as these, it is best to mount the transmitter outside and place a sensor inside (eg. RFTC4000A, RFRTDTemp101A). If greater distance is needed and AC power available, the RFExtender wireless transceivers can extend RF transmission to 1 mile (1.6km) line-of sight.

The battery life of the transmitters is subject to various operating parameters, but under typical use and with factory presets, an RF series transmitter will operate up to 4 years while transmitting every 8 minutes. Under ideal conditions, the battery will last up to 10 years while transmitting every 4 hours.



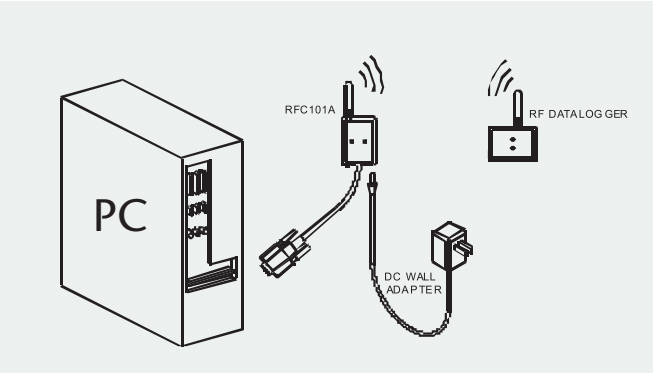


Fig. 1 Typical system set-up

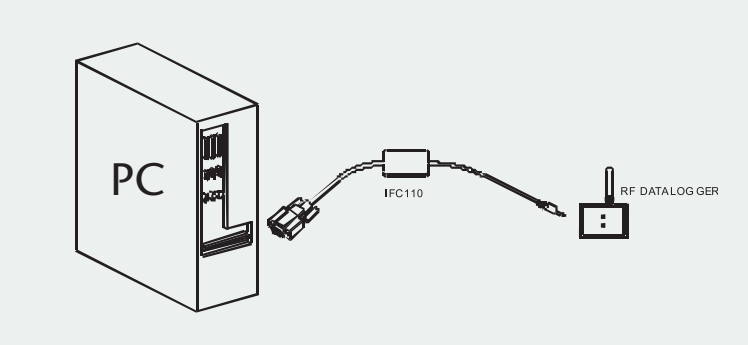


Fig. 2 Direct connection to a PC

Ordering Information

Product ID	Description
RFTemp101A	Temperature Logger and Wireless Transmitter
RFRTDTemp101A	Precision RTD Based Temperature Logger and Wireless Transmitter
RFTC4000A	Thermocouple Based Temperature Logger and Wireless Transmitter
RFRHTemp101A	Humidity and Temperature Logger and Wireless Transmitter
RFVolt101A-100mV	±100mV Voltage Logger and Wireless Transmitter
RFVolt101A-15	15V Voltage Logger and Wireless Transmitter
RFVolt101A-30	30V Voltage Logger and Wireless Transmitter
RFProcess101A-1	±1mA Current Logger and Wireless Transmitter
RFProcess101A-25	±25mA Current Logger and Wireless Transmitter
RFProcess101A-100	±100mA Current Logger and Wireless Transmitter
RFpHTemp101A	pH and Temperature Logger and Wireless Transmitter
RFPulse101A	Pulse Logger and Wireless Transmitter
Accessories	**Description**
RFC101A	Includes wireless receiver, software, manual, power supply & IFC110
RFC200A	Includes Wireless Receiver, Software, Manual, Power supply, IFC200 and Serial to USB Converter (For RF Receiver)
NIST	N.I.S.T. Calibration Certificate
LTC-7PN	Replacement battery for RFTemp101A, RFRTDTemp101A, RFTC4000A, RFRHTemp101A, RFVolt101A, RFProcess101A and RFPulse101A
U9VL-J	Replacement battery for RFpHTemp101A

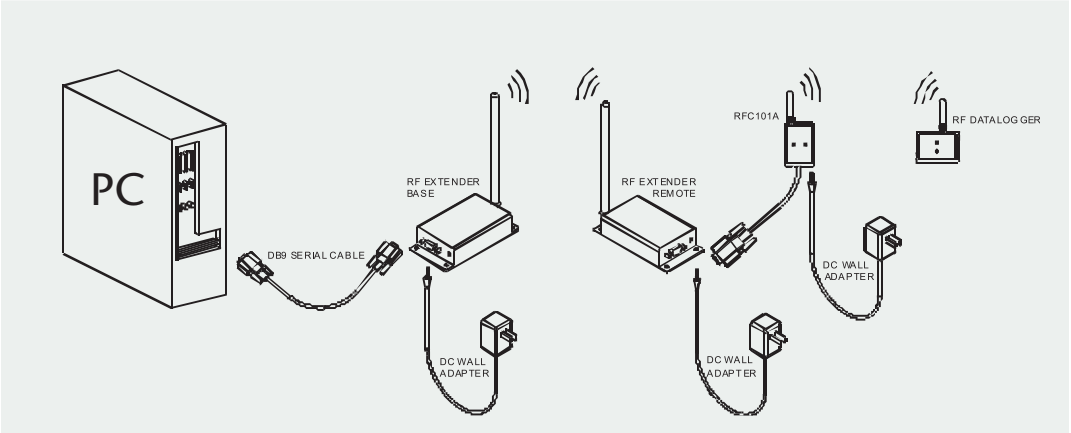


Fig. 3 Increasing transmission range with an RF Extender

Wireless Temperature and Humidity

Specifications†

Part Number	RFTemp101A	RFRTDTemp101A	RFTC4000A	RFRHTemp101A
Internal Temperature Sensor	Internal Semiconductor	-	Internal Semiconductor	Internal Semiconductor
Internal Temperature Range	-30°C to +70°C	-	-30°C to 70°C	-30°C to + 70°C
Internal Temperature Resolution	0.1°C	-	0.1°C	0.1°C
Internal Temperature Calibrated Accuracy	±0.5°C	-	±0.5°C	±0.5°C
External Temperature Sensor	-	External RTD 2,3 or 4 wire 100Ω pt RTD	External Thermocouple J, K, T, E, R, S, B, and N	-
External Temperature Range	-	-200°C to 850°C	Probe Dependent	-
External Temperature Resolution	-	0.01°C	Probe Dependent	-
External Temperature Calibrated Accuracy	-	±0.1°C	Probe Dependent	-
RH Measurement Range	-	-	-	0 to 95%RH
RH Resolution	-	-	-	0.5%RH
RH Calibrated Accuracy	-	-	-	±3%RH
Memory	8,191	5,461	4,095 per channel	5,461 per channel
Sample Rate	30 seconds up to 12 hours	30 seconds up to 12 hours	30 seconds up to 12 hours	30 seconds up to 12 hours
LED Indicator	Red & Green	Red & Green	Red & Green	Red & Green
Required Interface Package	RFC101A or RFC200A	RFC101A or RFC200A	RFC101A or RFC200A	RFC101A or RFC200A
PC Baud Rate	57,600	57,600	57,600	57,600
RF Carrier Frequency	418 ± 0.075MHz	418 ± 0.075MHz	418 ± 0.075MHz	418 ± 0.075MHz
RF Baud Rate	4,800	4,800	4,800	4,800
Output Power	< 0dBm typical (< 1mW)	< 0dBm typical (< 1mW)	< 0dBm typical (< 1mW)	< 0dBm typical (< 1mW)
Receiver Sensitivity (RFC101A)	-90dBm typical	-90dBm typical	-90dBm typical	-90dBm typical
Range (typical outdoors/line of sight)	Up to 120' (36m)	Up to 120' (36m)	Up to 120' (36m)	Up to 120' (36m)
Range (typical indoors/urban)	Up to 40' (12m)	Up to 40' (12m)	Up to 40' (12m)	Up to 40' (12m)
Approvals	US (FCC), CA (IC)	US (FCC), CA (IC)	US (FCC), CA (IC)	US (FCC), CA (IC)
Typical Battery Life	1 year	1 year	1 year	1 year
Material	ABS plastic	ABS plastic	ABS plastic	ABS plastic
Operating Environment	-30 to +70°C 0 to 95%RH non-condensing	-30 to +70°C 0 to 95%RH non-condensing	-30 to +70°C 0 to 95%RH non-condensing	-30 to +70°C 0 to 95%RH non-condensing
Dimensions	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

RFVOLT101A VOLTAGE LOGGER & WIRELESS TRANSMITTER

RFPROCESS101A CURRENT LOGGER & WIRELESS TRANSMITTER

RFPHTEMP101A pH/TEMPERATURE LOGGER & WIRELESS TRANSMITTER

RFPULSE PULSE LOGGER & WIRELESS TRANSMITTER

Specifications†

Part Number	RFVolt101A			RFProcess101A			RFpHTemp101A	RFPulse101A
Part Number Suffix	-100mV	-15V	-30V	- 1mA	- 25mA	- 100mA		
Measurement Range	±100mV	0 to 15V	0 to 30V	±1mA	±25mA	±100mA	-	0 to 12VDC continuous: 0 to 30VDC peak
Measurement Resolution	5µV	0.5mV	1mV	0.05µA	1µA	5µA	-	-
Calibrated Accuracy (%FSR)	±0.01%	±0.1%	±0.1%	±0.5%	±0.1%	±0.1%	-	-
pH Measurement Range	-	-	-	-	-	-	0 to 14 pH	-
pH Measurement Resolution	-	-	-	-	-	-	0.01 pH	-
pH Calibrated Accuracy	-	-	-	-	-	-	±0.1 pH	-
RTD Measurement Range	-	-	-	-	-	-	-40 to +125°C	-
RTD Measurement Resolution	-	-	-	-	-	-	0.01°C	-
RTD Calibrated Accuracy	-	-	-	-	-	-	±0.1°C @ 25°C	-
Internal Weak Pull-up	-	-	-	-	-	-	-	<500µA
Pulse Width	-	-	-	-	-	-	-	4 milliseconds
Pulse Rate	-	-	-	-	-	-	100 per second	100Hz
Input Impedance	-	-	-	-	-	-	-	>1 kΩ
Memory	8,191			8,191			13,107 per channel	4,095
Sample Rate	30 seconds up to 12 hours			30 seconds up to 12 hours			30 seconds up to 12 hours	30 seconds up to 12 hours
LED Indicator	Red & Green			Red & Green			Red & Green	Red & Green
Required Interface Package	RFC101A or RFC200A			RFC101A or RFC200A			RFC101A or RFC200A	RFC101A or RFC200A
PC Baud Rate	57,600			57,600			57,600	57,600
RF Carrier Frequency	418 ± 0.075MHz			418 ± 0.075MHz			418 ± 0.075MHz	418 ± 0.075MHz
RF Baud Rate	4,800			4,800			4,800	4,800
Output Power	< 0dBm typical (< 1mW)			< 0dBm typical (< 1mW)			< 0dBm typical (< 1mW)	< 0dBm typical (< 1mW)
Receiver Sensitivity (RFC101A)	-90dBm typical			-90dBm typical			-90dBm typical	-90dBm typical
Range (typical outdoors/line of sight)	Up to 120' (36m)			Up to 120' (36m)			Up to 120' (36m)	Up to 120' (36m)
Range (typical indoors/urban)	Up to 40' (12m)			Up to 40' (12m)			Up to 40' (12m)	Up to 40' (12m)
Approvals	US (FCC), CA (IC)			US (FCC), CA (IC)			US (FCC), CA (IC)	US (FCC), CA (IC)
Typical Battery Life	1 year			1 year			1 year	1 year
Material	ABS plastic			ABS plastic			ABS plastic	ABS plastic
Operating Environment	-30 to +70°C 0 to 95%RH non-condensing			-30 to +70°C 0 to 95%RH non-condensing			-5 to +50°C 0 to 95%RH non-condensing	-30 to +70°C 0 to 95%RH non-condensing
Dimensions	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)			1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)			2.4" x 4.5" x 1.0" plus 2" antenna (61mm x 114mm x 26mm + 51mm antenna)	1.7" x 2.7" x 0.8" plus 2" antenna (44mm x 69mm x 21mm + 51mm antenna)

† Specifications subject to change without notice. Consult product data sheet.
Visit www.madgetech.com for full Warranty information and Terms and Conditions.

CURRENT SWITCHES

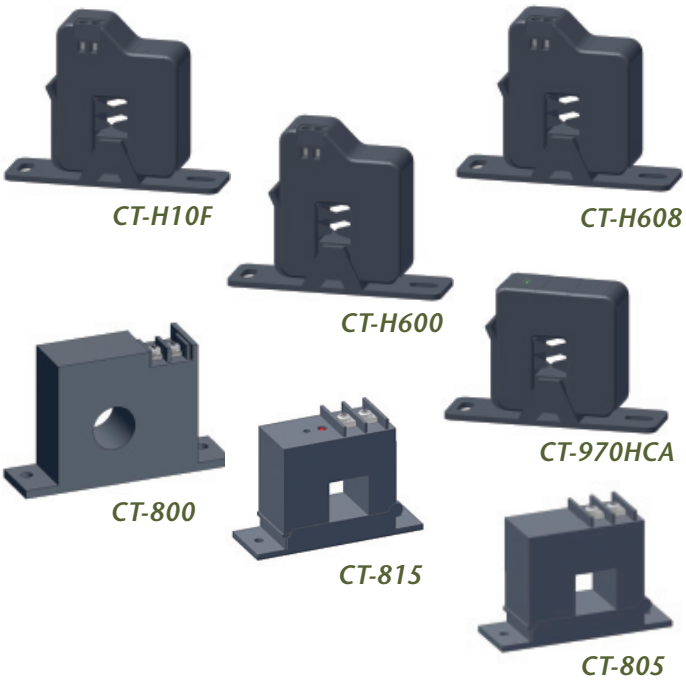
There are many useful applications for current switches. For example, they are useful for power consumption of lighting, refrigerator/cooler duty cycles, and service hours on an elevator motor. Of course there are the high-amperage applications which benefit from CTs that can record in single or three phase applications, residential, and commercial. Whether you are interested in gathering equipment usage and duration data, want to meter for billing purposes, or to keep energy costs down, the CT series of currents switches can help you do this.

In both powered and self-powered configurations, these CTs will either close a contact when an AC/DC current level is exceeded, or can provide a low-level current output (4-20mA) that can be used to measure extremely high levels of current. When the CTs are used as an accessory to the State101 and State110 you will know when the AC/DC device drew current that exceeded the trip point, and the duration. When CTs with a mA output are used as an accessory with the Process101, QuadProcess, and OctProcess you will know the precise level of current.

CTs are setup by running one of the AC/DC power lines through the core of the CT. There are solid and split cores. Split cores simply mean the current switch can be opened for easier and quicker installation. Other CTs have the same functionality, but provide a mA output, which makes recording high amperages with a small device easy.

The CTs are rated to 250 amps AC/DC, but the CT-800 is fixed to trip at 1A, and the CT805 at 1.5A. The CT-815 has an adjustable trip point (1.5A to 150A) and also has an LED indicator for when the trip point is exceeded. Other current switches such as the CT-970HCA, CT-H10F are provided so that users can monitor high levels of amperage and record this data via a 4-20mA output signal with the Process101, QuadProcess, OctProcess, or the Process2000 LCD logger. Other CTs are available that output in Volts and Pulses.

Model	Range (A)	Setpoints (A)	Status LED	Core
CT-800	1 to 250	1 (fixed)	No	Solid
CT-805	1.5 to 250	1.5 (fixed)	No	Split
CT-815	1.5 to 250	1.5 to 150 (adjustable)	Yes	Split
CT-H600	.15 to 200A	.5A (fixed)	No	Solid
CT-H608	1.25 to 50A	1.5 (fixed)	Yes	Split
CT-H10F	3.5 to 100A	Self-Learning	Yes	Split
CT-970HCA	0 to 200A	N/A	Yes	Split



Ordering Information

Product ID	Description
CT-H10F	Current Switch, 3.5-100A Continuous, Split-Core, Auto-Calibration, 4-20mA Output
CT-H600	Current Relay Switch, 0.15-200A, Fixed Setpoint, No Status LEDs
CT-H608	Current Relay Switch, 1.25-50A, Adjustable Setpoint, Status LEDs
CT-800	Current Switch, 1A Setpoint
CT-805	Current Switch, 1.5A Setpoint With Split Core
CT-815	Current Switch, Adjustable Setpoint With Split Core and Status LED
CT-970HCA	Split-Core Low Current 4-20mA & 0-10VDC DC Current Transducer with LED and Amperage range of 0 to 50/100/200 ADC (slide switch select-able), requires external power source (15-24VAC/DC).

WIRELESS ACCESSORIES

RFEXTENDER COMPONENTS

Ordering Information

Product ID	Description
RFEXT-KIT*	The RFEXT-KIT enables wireless communication for the majority of the MadgeTech data logger line. It includes (2) wireless transceivers, (1) DB9 serial extension cable, (1) RFEXT-IFC interface cable, (2) power transformers, (2) antennas, and (1) software CD.
RFEXT-BASE*	The RFEXT-BASE is an expansion module for use at a PC (Base Station). It includes (1) wireless transceiver, (1) DB9 serial extension cable, (1) power transformer, (1) antenna, and (1) software CD.
RFEXT-REMOTE*	The RFEXT-REMOTE is an expansion module for use with a MadgeTech data logger. It includes (1) wireless transceiver, (1) RFEXT-IFC interface cable, (1) power transformer, and (1) antenna.
RFEXT*	The RFEXT is a generic "expansion module" for use with either a PC or MadgeTech data logger. It includes (1) wireless transceiver, (1) DB9 serial extension cable, (1) RFEXT-IFC interface cable, (1) power transformer, (1) antenna, and (1) software CD.

**Available in 900MHz and 2.4GHz.*

BTIF1000 BLUETOOTH® INTERFACE

The BTIF1000** adds Bluetooth® wireless capabilities to the PRTemp1000 data logger. It is designed to replace the IFC110 or IFC200 with a high-speed secure wireless link. This enables wireless in-the-field downloading using MadgeTechs new Pocket PC software. It is fully Bluetooth® qualified and has a modular FCC approval (contains FCC ID QOQWT12).

Ordering Information

Product ID	Description
BTIF1000	Bluetooth® data logger interface
Accessories	**Description**
TL-5955	Battery for BTIF1000

***Not for use with intrinsically safe data loggers.*

WATERBOX110C

Many MadgeTech data loggers are watertight, but those not designed to that specification may be required to operate in wet environments or even submersed in water. For these applications, we recommend the WaterBox110C. The WaterBox is made from tough, impact resistant ABS plastic with a clear polycarbonate lid. It measure 2.9" x 4.0" x 1.1" in size and can withstand temperatures from -40 to +90ºC.

The WaterBox110C has a positive locking latch, silicone o-ring seal, coin slot vacuum release, a durable lanyard, and an access hole and cable gland for bringing in an external probe or signal. The device is water resistant, but, due to the cable gland, it is not submersible. Inside, there is a custom foam insert that cushions and secures the data logger. The box is large enough to accommodate most 101 and 110 series devices. Contact MadgeTech to ensure compatibility.

pH 1 pH ELECTRODE

A general laboratory electrode for use with the pHTemp101 data logger. This is a clear epoxy-bodied, gel-filled combination electrode that covers the entire 0 to 14pH range. The electrode has a response time of less than one second and a temperature range of 0 to 100°C. The pH1 also includes a soaker storage bottle.

Ordering Information

Product ID	Description
Waterbox110C	Water resistant enclosure with cable gland feed through
pH1	pH electrode for laboratory use

Data Logger Accessories

CABLES, SOFTWARE AND ASSEMBLIES

IFC110

Serial cable for use with most MadgeTech Data Loggers

IFC102

Serial cable for use with the MicroTemp and MicroRHTemp

IFC103

Serial cable for use with the TransiTemp-EC

IFC200

USB cable for use with most MadgeTech Data loggers

IFC202

USB cable for use with the MicroTemp and the MicroRHTemp

IFC300

USB docking station for use with the TransiTempII, TransiTempII-RH and CryoTemp

RFC101A

Serial cable for use with wireless loggers

RFC200A

USB cable for use with wireless loggers

USB1

USB101

TIBBO DS202R

Interface a data logger to a network

AC ADAPTERS FOR USE WITH THE MADGETECH 2000 SERIES

DC9V-NA

DC9V-EU

Ordering Information

Product ID	Description
IFC110	Includes software, manual and 9-pin computer interface cable
IFC102	Includes software, manual and 9-pin computer interface cable for MicroTemp and MicroRHTemp
IFC103	Includes software, manual and 9-pin computer interface cable for Transi-Temp-EC
IFC200	Includes software, manual, Quick Start Guide and USB computer interface cable
IFC202	Includes software, manual, Quick Start Guide, mini-plug adapter and USB computer interface cable for MicroTemp and MicroRHTemp
IFC300	USB Docking Station (USB cable and software included)
USB1	USB to RS232 converter
USB101	IFC110 and USB1 package
TIBBO DS202R	Ethernet to serial device converter
RFC101A	Radio frequency receiver for RF series and includes software, manual, power supply and IFC110
RFC200A	Radio frequency receiver for RF series and Includes Wireless Receiver, Software, Manual, Power Supply, IFC200 and Serial to USB Converter (For RF Receiver)
DC9V-NA	Wall mounted 120VAC/9VDC power adapter. (North American model)
DC9V-EU	Wall mounted 230VAC@50Hz/9VDC power adapter. (European model)

WEATHER ACCESSORIES

RAINGAUGE

The RainGauge accessory is the same gauge included in the Rain110 rainfall recording system. It can be ordered separately to replace a lost or damaged gauge, or by customers who do not require all of the components of the Rain110 (water resistant logger enclosure, PC interface cable). The gauge comes with the cabling necessary to interface to the Event101 or Event110. See page 88 for specifications of the Rain110.

ANEMOMETER

The anemometer accessory is the same anemometer included in the Wind110 wind speed logger system (see page 88 for specifications). It may be ordered separately by customers who already own a Pulse101 or Pulse110, or who do not require the water resistant enclosure or PC interface cable included with the Wind110.

Ordering Information

Product ID	Description
RainGauge	RainGauge accessory for Event101 and Event110
Anemometer	Wind speed accessory for Pulse101 and Pulse110

PLATINUM RTD PROBES

MadgeTech offers a variety of RTD probes to fit your application. These RTD probes directly connect to any MadgeTech RTD data logger.

Ordering Information

Product ID	Description
RTDS-4-3/16-6-36	Precision 100Ω, 4 wire RTD probe,3/16" diameter, 6"long, stainless steel sheathing, with 36" Teflon® insulated wires
RTDS-4-3/16-12-36	Precision 100Ω, 4 wire RTD probe, 3/16" diameter, 12" long stainless steel sheathing, with 36" Teflon® insulated wires
RTDSMS-4-3/16-6-36	Precision 100Ω, 4 wire RTD probe, 3/16" diameter, 6" long stainless steel sheathing with 36" Teflon® insulated wires and metal strain relief at beginning of probe
RTDSMS-4-3/16-12-36	Precision 100Ω, 4 wire RTD probe, 3/16" diameter, 12" long stainless steel sheathing with 36" Teflon® insulated wires and metal strain relief at beginning of probe

THERMOCOUPLE PROBES

MadgeTech offers many different types of thermocouples to connect directly to the thermocouple data loggers. For custom probes, please contact MadgeTech.

Ordering Information

Product ID	Description
TC-J-TT-24-36-SMP	Type J, 36" long, 24 Gauge, Teflon Insulated, Thermocouple with Mini Plug and Welded Tip
TC-J-TT-24-72-SMP	Type J, 72" long, 24 Gauge, Teflon Insulated, Thermocouple with Mini Plug and Welded Tip
TC-K-TT-24-36-SMP	Type K, 36" long, 24 Gauge, Teflon Insulated, Thermocouple with Mini Plug and Welded Tip
TC-K-TT-24-72-SMP	Type K, 72" long, 24 Gauge, Teflon Insulated, Thermocouple with Mini Plug and Welded Tip
TC-T-TT-24-36-SMP	Type T, 36" long, 24 Gauge, Teflon Insulated, Thermocouple with Mini Plug and Welded Tip
TC-T-TT-24-72-SMP	Type T, 72" long, 24 Gauge, Teflon Insulated, Thermocouple with Mini Plug and Welded Tip
TC-E-TT-24-36-SMP	Type E, 36" long, 24 Gauge, Teflon Insulated, Thermocouple with Mini Plug and Welded Tip
TC-E-TT-24-72-SMP	Type E, 72" long, 24 Gauge, Teflon Insulated, Thermocouple with Mini Plug and Welded Tip

WM-300
WALL-MOUNTING STATION

The WM-300 is a wall-mounting station that is built for use with the Cryo-Temp, TransiTempII, or the TransiTempII-RH. It can be mounted using the adhesive tape along the back or it can be screwed to a wall or any flat surface.

Ordering Information

Product ID	Description
WM-300	Wall-mounting station for use with Cryo-temp, TransiTempII, or TransiTempII-RH

REPLACEMENT BATTERIES

To identify the correct battery consult the appropriate catalog page. Due to U.S. and International regulations we cannot ship more than 24 lithium batteries per shipment.

LITHIUM BATTERY WARNING: FIRE, EXPLOSION, AND SEVERE BURN HAZARD. DO NOT RECHARGE, DISASSEMBLE, HEAT, INCINERATE OR EXPOSE CONTENTS TO WATER.

Ordering Information

Product ID	Description
SR1154W	1.55 Volt silver oxide coin cell
CR2032	3.0 Volt lithium coin cell
LTC-3PN	3.6 Volt lithium battery, 350mAH
TL-2150	3.6 Volt lithium battery, ½AA, axial leads
LTC-7PN	3.6 Volt lithium battery, 750mAH
U9VL-J	9.0 Volt lithium battery, 1200mAH
3B5700	150°C ½AA high temperature battery
ER14250	3.6 Volt lithium battery, 100mAH
TLH-5902	3.6 Volt lithium battery, ½AA
TL-5955	Lithium battery, $^2/_3$AA axial leads

MADGETECH SECURE SOFTWARE

TO AID IN COMPLIANCE WITH 21 CFR PART 11

Regulations and working practices designed to ensure development and quality are kept to a very high standard and are implemented in accordance with GAMP (IQ/OQ/PQ) and enforced by the FDA and other regulatory bodies. Those that apply to environmental monitoring are addressed with MadgeTech Secure.

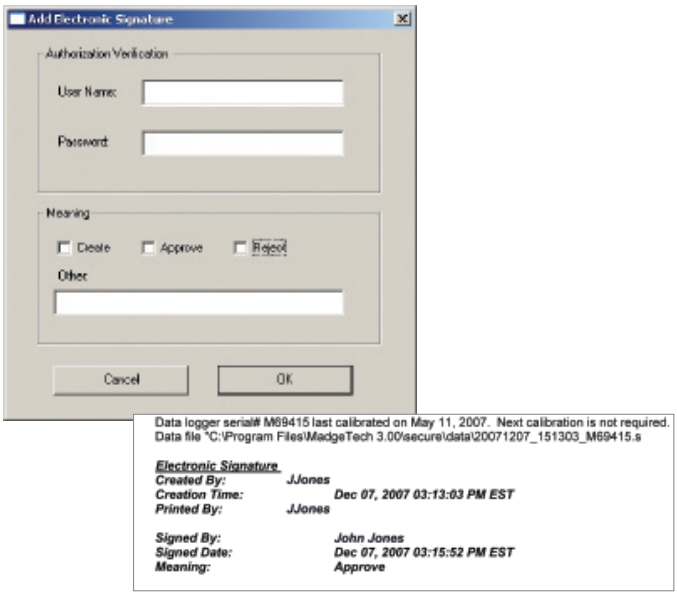
MadgeTech Secure software encompasses the same features as our standard software, but is enhanced to help users comply with FDA 21 CFR Part 11 requirements.

Certain criteria such as electronic signatures, access codes, secure data file, and an audit trail are incorporated into the software to provide data integrity.

IQ/OQ/PQ protocols can be purchased and implemented to validate that the software has been installed and is operating correctly. Additional support is available for full software training.

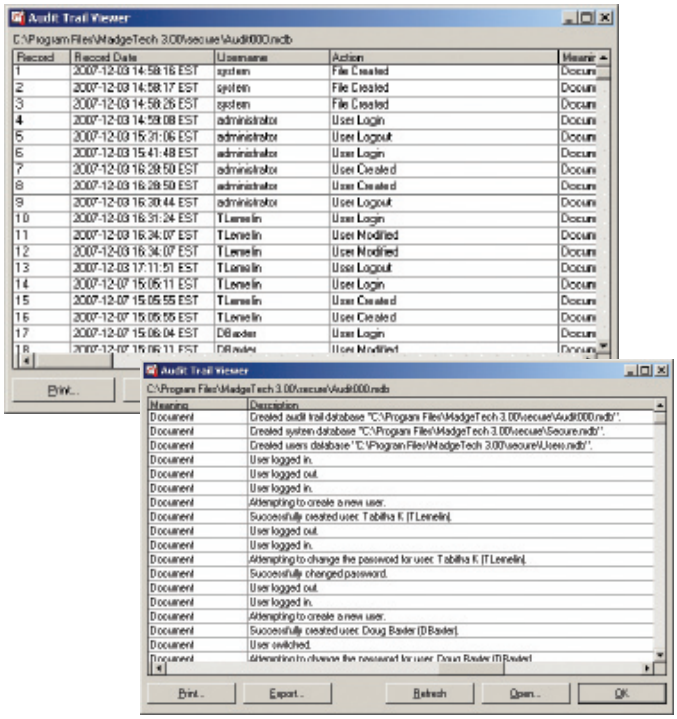
ELECTRONIC SIGNATURES

The electronic signature contains the printed name of the signer, date and time of signing and the meaning of the signing.



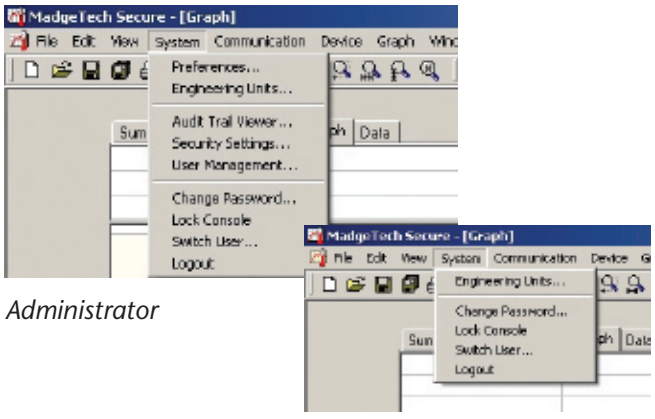
AUDIT TRAIL

An Audit Trail is kept automatically with information such as who logged in, who logged out, what files were downloaded, saved, printed, etc. Each record is date and time stamped and includes user information.



ADMINISTRATOR SETTINGS & USER SETTINGS

The software provides two levels of user access, either administrator or user. Administrators have access to all the security settings, while users only have access to start, stop, download and analyze data from a data logger.

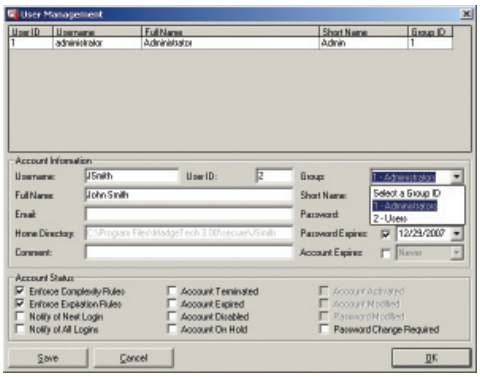


Administrator

User

ADDING USERS

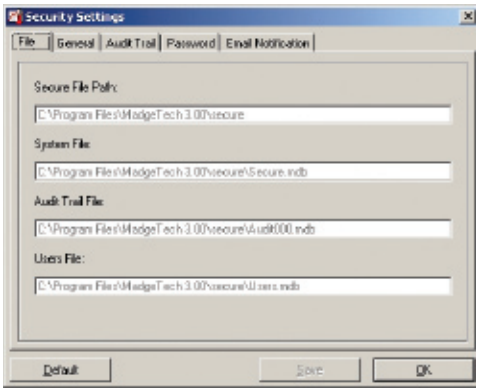
Administrators and users can easily be added in the User Management tab. The User Management tab is only available to administrative users.



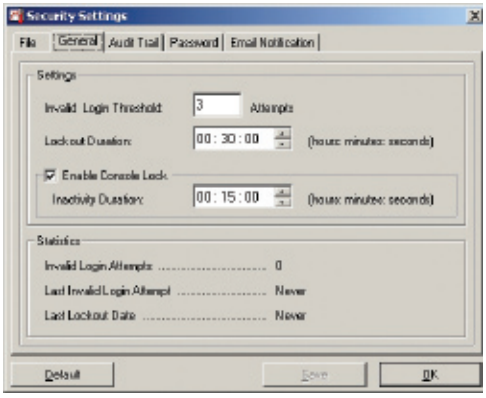
Numerous password and account settings options are available for the administrator to set to ensure security for each user.

SECURITY SETTINGS

An administrator is required to set the security settings for the software.

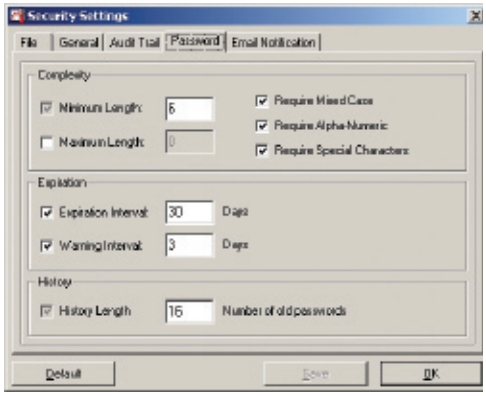


Databases and files can be assigned to save in a protected file.

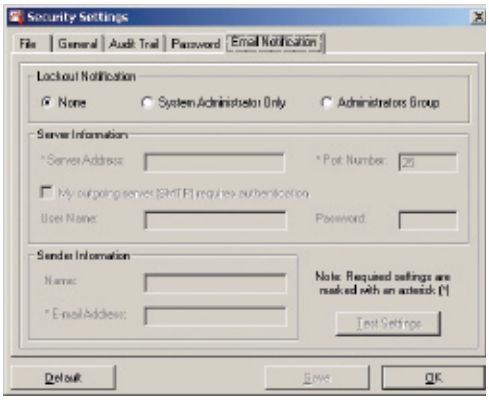


Login and lock out options can be configured. Statistics are also shown for these options

The Audit Trail tab provides flexibility to choose the maximum size, maximum file life and to begin a new audit trail.



Password security features ensure users have a unique password.



E-mail notification features provide additional security.

MADGETECH WE BUILD DATA LOGGERS
Tel: 603.456.2011 Fax: 603.456.2012 www.madgetech.com info@madgetech.com

IQ/OQ/PQ SERVICE PLAN

DATA LOGGING SYSTEM IQ/OQ/PQ ON-SITE SERVICES

MadgeTech now provides on-site IQ/OQ/PQ services to help the user validate the data logging system. Our trained staff are familiar with the standard IQ/OQ/PQ protocols of the MadgeTech data logging system. This service is a cost-effective means to save time and ensure proper implementation of IQ/OQ/PQ of the MadgeTech data logging system with a minimal disruption to staff and operations.

KEY BENEFITS

- Custom IQ/OQ/PQ protocol generation
- Product/protocol expertise
- On-site qualification by trained individuals
- Recommendations for PQ and ongoing maintenance
- Comprehensive qualification report supplied upon completion

A member of the MadgeTech staff will provide the protocol and on-site services to expedite the required MadgeTech data logging system validation. We will work with the end user to conduct test protocols including IQ, OQ and PQ. As part of this validation service, MadgeTech will provide protocols and a comprehensive final report that documents all testing that was performed and results that were obtained. Recommendations will be made for testing worst-case and normal operating conditions of the instruments, future performance qualification and on-going maintenance. Certified operator training will also be provided as part of the completion of the service.

MadgeTech performs extensive product qualification testing prior to releasing new products to the marketplace. This includes independent testing of the hardware and software components, as well as integrated testing of the complete data logger system. Despite this detailed testing, regulatory agencies still require that the end-user validate the data logging system in the environment in which it will be used. This validation process includes installation qualification (IQ), operational qualification (OQ) and ongoing performance qualification (PQ). MadgeTech offers standard protocol templates and on-site services to help end-users fulfill their validation requirements.

DATA LOGGING SYSTEM IQ/OQ/PQ PROTOCOL

MadgeTech provides the IQ/OQ/PQ protocol to establish that the MadgeTech system has been received as specified, is properly installed on the computer in the selected environment, that this environment is suitable and appropriate for use of the MadgeTech system and that proper communication occurs between the MadgeTech data logger(s) and the computer. In addition, this protocol will verify that proper communication occurs between the MadgeTech data logger(s) and the computer, that the MadgeTech system functions and performs as specified on the computer in the selected environment and will provide a basic framework for typical use of the system.

AREAS EVALUATED

Installation Qualification (IQ)

- A description of the MadgeTech system
- Verification that all MadgeTech system equipment, software and accessories are received in good condition
- A check for complete documentation
- Verification that the installation of MadgeTech equipment is completed properly
- Verification that MadgeTech software is installed properly on the target workstation
- Verification of basic communication between MadgeTech data logger(s) and the target workstation(s)

Operational Qualification (OQ)

- Functional verification of MadgeTech data loggers
- Handling and maintenance information for the use of MadgeTech equipment
- MadgeTech operating procedures for primary functions
- Verification of proper communication between the MadgeTech data logger(s) and the workstation(s)
- Verification that the data logger hardware is operational

Performance Qualification (PQ) Recommendation

- Additional handling precautions for maintaining the accuracy of MadgeTech equipment
- Periodic maintenance information for the use of MadgeTech equipment
- Periodic calibration verification in the field
- Comparison of the reported values to a known good standard
- Verification of acceptable performance in the target system

For more information or to arrange for an on-site visit, please contact MadgeTech at (603) 456-2011.

Validation Workbook

Meeting compliance regulations for the FDA's Good Manufacturing Practices, or those set forth in Quality Plans, has become increasingly complex. MadgeTech has simplified this process by offering IQ/OQ/PQ protocols for its standard and secure (21 CFR part 11) software.

This enormous time and money saving feature eliminates the need to develop in-house software and validation procedures. The MadgeTech IQ/OQ/PQ protocol is in support of FDA and cGMP guidelines for your business.

In addition, MadgeTech offers a Software Validation Workbook (SVW) to help the user verify the functionality of the software. The document defines the procedure for validating the operation of MadgeTech data logger software, and takes users through the steps of the validation procedure to verify and document the functionality of the software.

The Software Validation Workbook is not required to meet cGMP or FDA requirements, but is incorporated into existing quality control plans.

Contact MadgeTech for details and to discuss your application and requirements.

Ordering Information

Product ID	Description
SVP-Standard	IQ/OQ/PQ Protocol for MadgeTech Standard Software
SVP-Secure	IQ/OQ/PQ Protocol for MadgeTech Secure Software
VW-Standard	Standard Software Validation Workbook
VW-Secure	Secure Software Validation Workbook

What is Mean Kinetic Temperature?

Mean Kinetic Temperature (MKT) is a simplified way of expressing the overall effect of temperature fluctuations during storage or shipment of perishable goods. Consider the following example:

Example:

A dozen eggs sat:

In a 20°C room for 2 hours
In a 2°C refrigerator for 4 hours
And on a 25°C loading dock for 1 hour

Using MKT we can calculate that the temperature profile of the eggs was "thermally equivalent" to storing them at 15.7°C for 7 hours.

How is Mean Kinetic Temperature Calculated?

Technically speaking, MKT is an expression of cumulative thermal stress experienced by a product at varying temperatures during storage and distribution. In other words, MKT is a calculated, single temperature that is analogous to the effects of temperature variations over a period of time.

MKT is not a simple weighted average. The calculation of MKT gives the higher temperatures a greater weight when computing the average than would a simple numerical average or an arithmetic mean. This weighting is determined by a geometric transformation— the natural logarithm of the absolute temperature.

The International Conference on Harmonization (ICH) stability testing guidelines define MKT as 'a single derived temperature which, if maintained over a defined period, would afford the same thermal challenge to a pharmaceutical product as would have been experienced over a range of both higher and lower temperatures for an equivalent defined period'.

By using this unequal weighting of the higher temperatures in a temperature series, MKT takes into consideration the accelerated rate of thermal degradation of materials at these higher temperatures. Therefore, MKT provides for the non-linear effect of temperature.

MKT is expressed as:

$$\frac{\Delta H/R}{-ln\left(\frac{e^{-\Delta H/RT_1}+e^{-\Delta H/RT_2}+\ldots+e^{-\Delta H/RT_n}}{n}\right)}$$

Where…
Δ H = activation energy (typically from 60 to 100 kJ/mol for solids and liquids)
R = 0.0083144 kJ/mol·K (universal gas constant)
T = temperature in degrees Kelvin
n = the number of sample periods over which data is collected

Note 1: ln is the natural log and e^x is the natural log base.
Note 2: Changing the activation energy from 60 to 100 has a very minimal effect on the MKT. If unsure, use a value of 83.144.

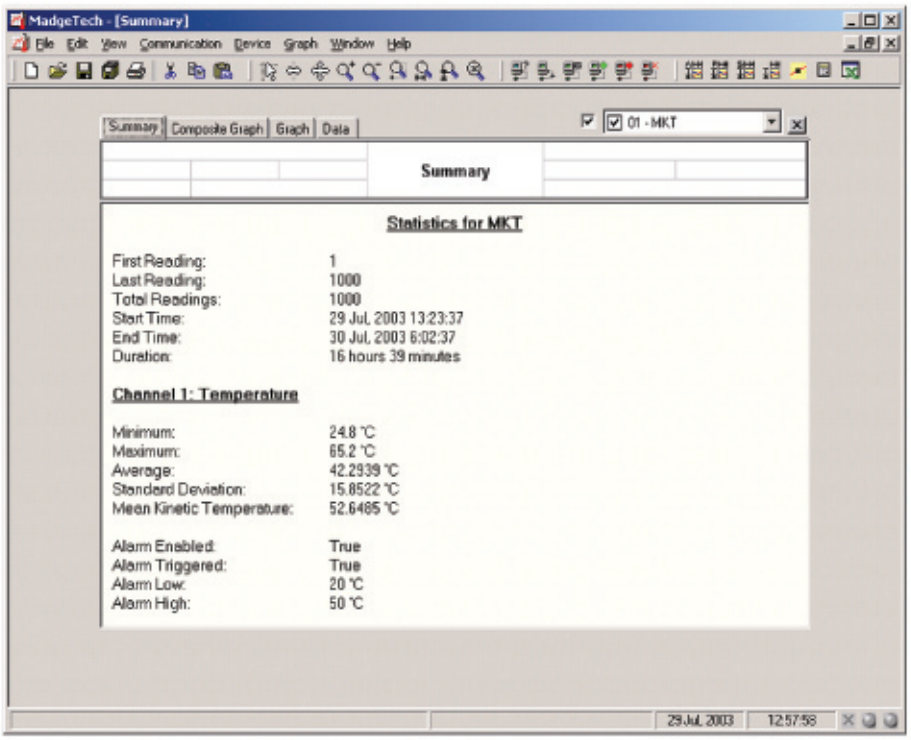
Why is MKT Important in the Life of Pharmaceuticals and Perishable Goods?

The pharmaceutical and food industries are two closely regulated markets. The FDA provides regulations that require warehouse and shipment temperatures to be closely controlled and monitored. In addition, The FDA requires well documented verification of these storage environments and any corrective actions taken if temperatures exceed specified storage conditions. The calculation of MKT is regarded by the FDA as an action taken to verify if a particular perishable has exceeded storage conditions.

In addition to compliance with the FDA regulations, MKT can help distributors and manufacturers determine if improper storage and handling of goods that may have occurred during shipment and/or unloading, has affected the shelf life of their product.

How Does MadgeTech Make MKT Simple?

MadgeTech's software Automatically calculates MKT for any of our temperature loggers as shown in the summary report below:



The MadgeTech algorithm has been validated against the United States Pharmacopeia (USP) and will yield a value within 0.1°C for all inputs. It is also important to note that the MadgeTech software uses constants that are more recent and marginally more accurate than the USP. MadgeTech obtains these constants from the CODATA/ NIST recommended values.

The software assumes activation energy of 0.008314472 kJ/mol for its calculation. In fact, any value between 60 and 100 kJ/mol, which covers most solids and liquids, will have only a small effect on the final value.

Of course, extreme temperature even over a very small time period can damage most foods or pharmaceuticals. Per the above example, putting an egg in a 75°C oven for 1/2 hour will bring the MKT to 45.4°C, but the egg ill be irreversibly damaged (ie. Cooked). Consequently, there are maximum and minimum temperature limits established by the FDA. MadgeTech data loggers make monitoring these extremes easy with user settable alarm limits so out-of-limit temperatures can be easily identified.

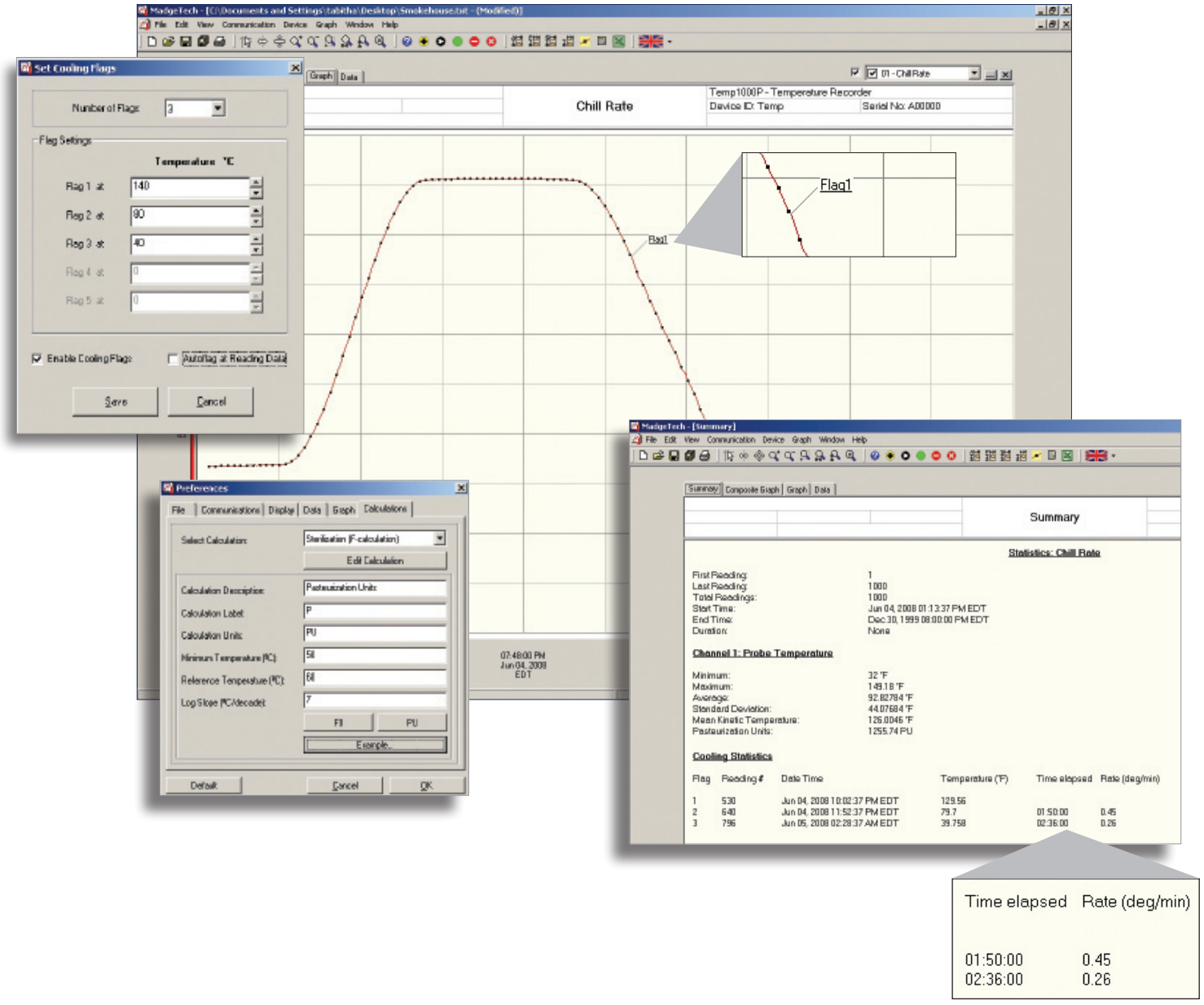
Any data downloaded from a MadgeTech temperature data logger offers the user instant access to MKT and the vital information that our users need to comply with FDA regulations and/or make cost effective decisions on the acceptance or storage of perishable goods.

Meeting USDA Compliance Guidelines Using the MadgeTech Software

USDA Compliance Guidelines

FSIS – Appendix A – "Meeting Lethality Performance Standards"
MadgeTech's software automatically calculates the kill factor in PU (Pasteurization Units). A PU is calculated based on 1 minute at 60°C, but the user has the ability to change the reference temperature and Z-value to determine the kill factor for other product such as beef and poultry. The data is provided on the summary tab for instant validation.

FSIS – Appendix B – "Cooling Heat-Treated Meat and Poultry Products"
The MadgeTech software automatically recalls up to 5 preset cooling points. Each point is clearly marked on the graph by a flag and the summary provides the temperature, time elapsed and rate of cool down in degrees per minute. Instant access to this information makes record keeping and report generation quick and simple.



Choosing Between a State, Event, or Pulse Recorder

The State, Event, and Pulse recorders, although related, each serve very different purposes in meeting the needs of a specific application.

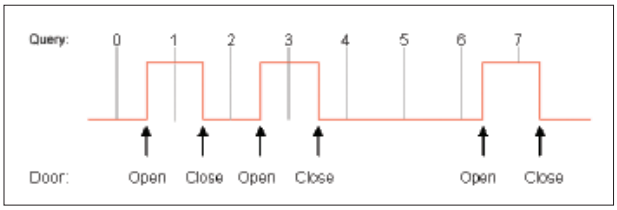
A State Recorder indicates how long an event lasts, an Event Recorder indicates when an event occurs, and a pulse Recorder indicates the number of times an event occurred in a given time interval.

This application note will discuss the differences between these three types of units and provide some insight into practical applications to help the user choose the correct product for their application.

State Recorder

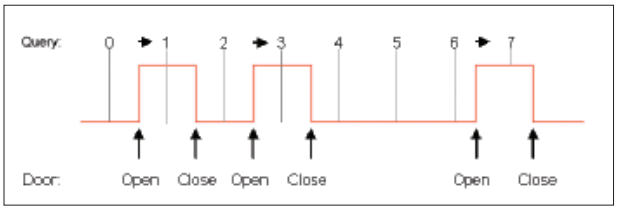
The State Recorder records a time-stamped value whenever the state of the signal changes over a period of time. This is useful when the user needs to be able to collect data on an event duration.

Example:
If the user is monitoring traffic through a door, the State Recorder would take a data point:
1. When the door opens
2. When the door closes



The State Recorder records the data points to indicate how long a door was open; that is, the data collected tells the user that a change in the "state" of the door occurred:
1. When the door opened at 9:30:00 am
2. When the door closed at 9:30:05 am

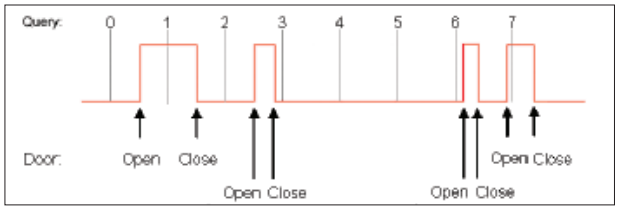
The user can then calculate that the door was open for a period of 5 seconds.



However it should be noted that if the leading edge of a state occurs between position 0 and position 1, it will be recorded as taking place at position 1.

The State Recorder samples the state of the input at fixed intervals. In order for a state change to be recorded, the change must be present at the time it is sampled. If more than one transition occurs between position 0 and position 1, only the state of the input at the time of the sample will be recorded. Therefore, the sample period must be set to less than the minimum time required for the input signal to rise and fall. If the change in state does not persist long enough to be active at the time of sampling, it will be missed.

Example:
If it takes 30 seconds for a garage door to open and close, the time period should be set to less than 30 seconds to ensure the state change is not missed



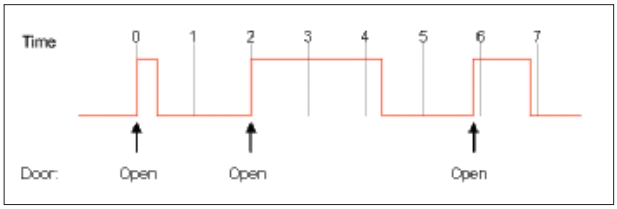
Another example of an application for the State Recorder is the monitoring of a furnace or pump turning on and off, both of which have a long enough state change to be captured by the State Recorder.

Event Recorder

The Event Recorder records a single direction time-stamped data point when an event takes place within a fixed reading interval. This is useful when the user needs to be able to collect data on when an event occurred, but does not need to know the duration of the event.

Example:
If the user is monitoring the traffic flow through a door, the Event Recorder will take a data point recording:

1. That the door opened, and
2. That the door opened again, and
3. That the door opened again.

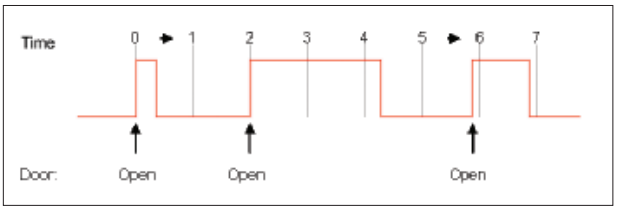


Unlike the State Recorder, the Event Recorder does not provide the data points that would indicate how long the door was open. The Event Recorder can track the number of times the door was opened, but not how long it was open for.

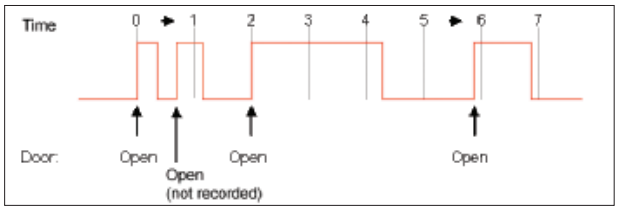
Example:
Data from the Event Recorder tells the User that events occurred:
1. When the door opened at 9:30:00 am, and
2. When the door opened at 9:37:04 am, and
3. When the door opened again at 12:22:13 pm

Thus, the user can track the number of times the door was opened, but not how long the door was open each time.

The Event Recorder has a resolution of 1 second. This means that the device has the ability to record an event every second. Unlike the State Recorder, the Event Recorder does not require a persistent signal. The Event Recorder will trigger on the leading edge of the signal transition. However, it should be noted that:



If a data point occurs between position 0 and position 1, it will be recorded as having taken place at position 1.



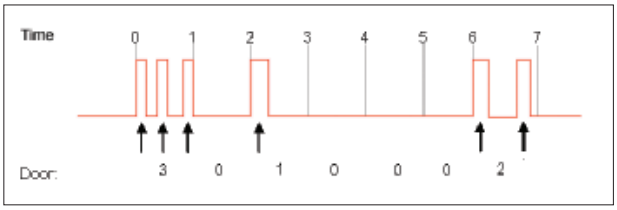
If more than one data point occurs between position 0 and position 1, only a single data point will be recorded.

Another common application for an Event Recorder is monitoring tipping-bucket rain gauges. The Event Recorder will record data when the bucket tips and the contact is closed. It is unlikely that the bucket on the rain gauge will tip more than once per second, therefore the Event Recorder will not miss recording any data points.

Pulse Recorder

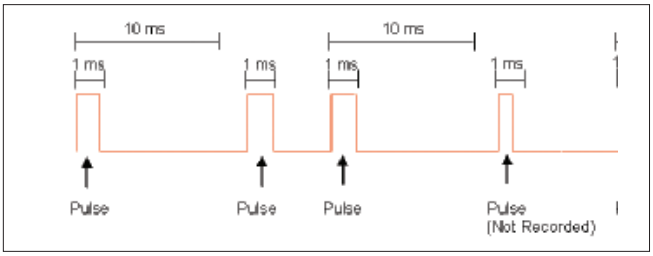
The Pulse Recorder records the number of pulses that happen over a period of time. Unlike the State or Event Recorder, the device does not time-stamp each pulse, but rather groups together or bins the number of pulses according to the time period they occurred in.

Example:
If the user is monitoring traffic through a door, the Pulse Recorder will log the number of times the door was opened during each interval:
1. The door was opened 3 times between 9:30 and 9:31 am
2. The door was opened once between 9:47 and 9:48 am
3. The door opened twice between 12:32 and 12:33 pm



The Pulse recorder requires a signal of at least 1ms duration and at least 10ms between the leading edge of each pulse to be counted. If these conditions are met, then every pulse will be logged, with up to nearly 4.3 million pulses per time interval.

Conversely, a pulse may not be recorded if it is less than 1 ms or if more than one pulse occurs within a 10ms period. If the latter happens, further data points may not be recorded until 10ms after the first pulse.



A common application for the Pulse Recorder is to measure the flow rate or total volume of a pipeline. The Pulse Recorder collects pulses generated by a flow meter and uses that information to calculate the number of gallons per minute. The flow meter produces a pulse that is too rapid to be collected by the Event or State, yet can easily be binned by the Pulse Recorder. The important data here is not the exact time when the pulse took place, but rather the number or pulses in a time interval.

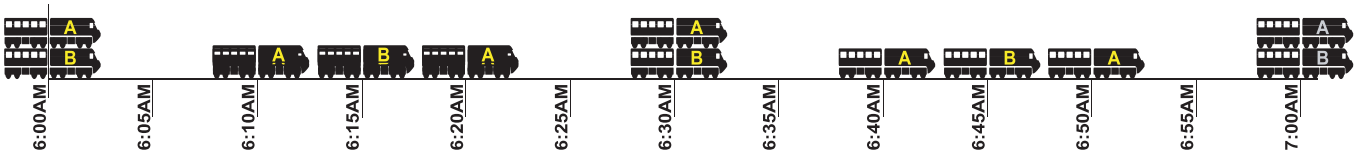
If you have any further questions about your application, please contact MadgeTech Customer Support at 603.456.2011, or via e-mail: support@madgetech.com

Technical Reference: An Informal Guide to Fast Fourier Transform (FFT)

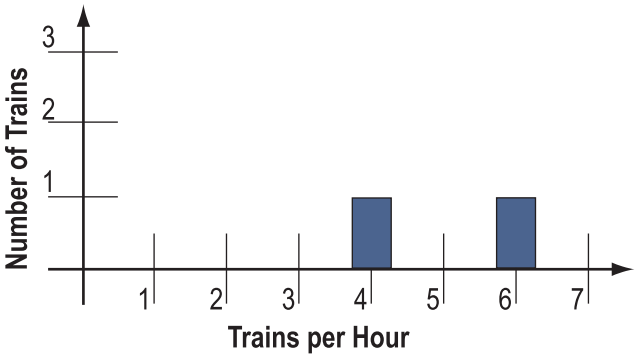
The term FFT stands for Fast Fourier Transform. This begs the questions: Who is Fourier? What is he transforming? And why is he going fast?

Jean Baptiste Joseph Fourier was one of the premier mathematicians of the 19th century. One of the many problems he solved was understanding the relationship between complex periodic signals (eg. vibrations) and the simple individual frequencies that, when added together, created the complex signal. He created a mathematical formula called the Fourier Transform which converted a complex signal into its basic frequencies. (In technical terms, the formula converted a signal from the time domain to the frequency domain.)

An example of the relationship between the time domain and the frequency domain: Say for example, a train schedule indicated that Train A runs every 10 minutes and Train B runs every 15 minutes. They both start running at 6AM in the morning. In the time domain, the schedule would look something like this:



In the frequency domain, the train schedule would look something like this:

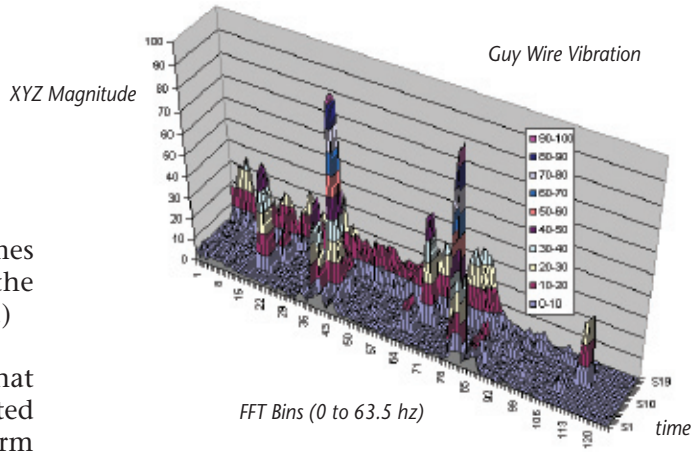


Do you see the relationship? The frequency of Train A is 6 times an hour where as Train B is 4 times an hour. (Note that the information of when the hour begins is lost in the transform.)

In 1965, two mathematicians, Cooley and Tukey, realized that the complex signal could be "factorized" before being operated on by the Fourier Transform. The benefit was that the Transform could be executed on computers much faster than before, while introducing only slight errors to the calculation. This became known as the Fast Fourier Transform.

With regards to vibration, the MadgeTech SVR101 uses the FFT to "break down" the complex vibrations to indicate the simple vibrations that comprise a complex vibration. One real-world example involves the guy wires that anchor high-voltage towers. In harsh winter conditions, the guy wires become coated with a hard packed and heavy combination of ice and snow called rime. When winds blow across the wires, the laden guy-wire begins to vibrate. The vibration can become strong enough to snap the guy-wire and leave the towers unanchored. Using a device like the SVR101, the strongest frequencies can be identified and steps can be taken to diminish the strongest modes of vibration, saving the power grid from a potential disaster.

GUY WIRE VIBRATION (FFT EXAMPLE)



The MadgeTech 101 and 110 Series

The 110 series data loggers are specified with up to a 10 year battery life, while continuing to use the same battery as our previously available 101 series data loggers (1 year typical battery life). This product note will explain the differences in technology between the two series, demonstrate how to optimize the battery life of the 110 series to achieve the 10 year life specified, and help users select the appropriate type of product for their application.

Features

The chart below shows some of the similar and different features of the two types of data loggers.

Data Logger Comparison Chart (Typical Values)

Feature	101 Series Logger	110 Series Logger
Weight	1 oz	2oz
Dimensions	0.6" x 1.4" x 2.5"	0.8" x 1.7" x 2.7"
Battery	LTC-7PN, 3.6V / 750 mAh	LTC-7PN, 3.6V / 750 mAh
Battery Life	1 year at 1 minute rate	10 years at 15 minute rate
Operating Environment	Indoor conditions	Indoor Conditions
Temperature	-40 to +80°C	-40 to +80°C
Humidity	0 to 95%RH non-condensing	0 to 95%RH non-condensing
Physical Memory	64 kB	64 kB
Communications	2400 baud	57600 baud
Download Time	9 minutes for full logger	30 seconds for full logger
Time Accuracy	1 minute/month	1 minute/month

The major differences between the loggers are download speed, battery life, size, and price.

Download Speed

The 110 series communicates with the PC at a speed of 57,600 baud, compared with a speed of 2400 baud for the 101 series. This means that a 110 series logger can potentially download about 24 times faster than the 101 series. In practice, the Temp101 downloads a full run (32,767 temperature readings) in about 9 minutes of sustained communication. The Temp110 downloads the same amount of data in about 30 seconds. This can be a major advantage if the user is collecting and downloading large amounts of data. A higher download speed is valuable.

Battery Life

The following chart compares battery life at different reading rates for the two types of logger. These are estimated typical values, and may not apply to a specific type of logger.

Battery Life Comparison Chart (Typical Values a 25°C

Reading Rate	101 Series Logger	110 Series Logger
2 seconds	4 months	1 month
5 seconds	5 months	2 months
10 seconds	6 months	3 months
15 seconds	8 months	4 months
30 seconds	12 months	8 months
1 minute	18 months	18 months
5 minutes	2 years	4 years
10 minutes	2 years	6 years
15 minutes	2 years	10 years
30 minutes	2 years	11 years
1 hour	2 years	12 years

The chart shows that battery life can be significantly better for the 110 series loggers when they are used at long reading intervals, 1 reading per minute or above. An important consideration not reflected in the chart is download or communication frequency. The 110 series is designed with a higher communication speed, which means a 110 series device uses more battery power than a 101 series device when it is communicating with a PC. The chart assumes that the devices are deployed for a full run (e.g. 32,767 temperature readings), then downloaded once and relaunched.

Since most long-term logging applications are recording at intervals between 1 minute and 1 hour, and they are downloaded infrequently, the 110 series is an excellent choice for these applications. For very long-term applications, where a logger will only be serviced yearly or at even longer intervals, the 110 series is the only choice.

The 101 series battery life tops out at around 2 years of sustained operation. Under these circumstances, the 101 battery would have to be replaced every year to maintain proper operation. Short-term logging applications may be better served with either type of device. The determination is usually made based on the user's preferences for battery life and download speed. Typically, larger amounts of data make higher download speed more attractive. Fault logging is a common application where the user needs the most recent data available after a fault has occurred, but otherwise does not need the data at all. This typically involves a logger running continuously at a fairly short recording interval in wraparound mode.

The Volt101 or Volt110 series logger running at a 2 second rate would store enough data for 18 hours of information before the fault appeared. At a short recording interval, the 101 series is preferred because the battery will typically last for several months before needing to be changed. At a long recording interval, such as 1 minute, the logger will provide weeks or months of data before the fault, and the 110 series is preferred.

The following chart summarizes some of the applications, and indicates which type of device is preferred for use in that application.

Application Comparison Chart

Application	101 Series Logger	110 Series Logger
Long-term Logging Long reading interval Infrequent Downloads		Yes
Very Long-term Logging Unattended operation Years between downloads		Yes
Short-term Logging Minutes to hours Small amounts of data	Yes	
Short-term Logging Minutes to hours Larger amounts of data		Yes
Fault Logging Long-term Short reading interval Wraparound enabled Data rarely needed	Yes	
Fault Logging Long-term Longer reading interval Wraparound enabled Data rarely needed		Yes

Physical size

The 110 series is physically slightly larger than the 101 series to accommodate the additional electronics required for the more advanced power management. This may make it unsuitable for some applications that would accept the 101 series loggers.

Price

The 110 series is more expensive than the 101 series because of the additional electronics required. This may be a problem in the more common parameters, such as temperature and humidity, because there are many low-cost alternatives available. In other applications, the price is less important. The instrumentation-quality measurements performed by the 101 and 110 series put them in competition with much higher-priced equipment, and many of the "10-year" loggers provided by other manufacturers are priced at hundreds of dollars more.

Mean Kinetic Temperature

The Mean Kinetic Temperature formula generates a single temperature from a complete temperature profile which represents the "thermal equivalent" of the profile.

$$\frac{\Delta H/R}{-ln\left(\frac{e^{-\Delta H/RT_1}+e^{-\Delta H/RT_2}+\ldots+e^{-\Delta H/RT_n}}{n}\right)}$$

Where…
△ H = activation energy (typically from 60 to 100 kJ/mol for solids and liquids)
R = 0.0083144 kJ/mol·K (universal gas constant)
T = temperature in degrees Kelvin
n = the number of sample periods over which data is collected

Note 1: ln is the natural log and e^x is the natural log base.
Note 2: Changing the activation energy from 60 to 100 has a very minimal effect on the MKT. If unsure, use a value of 83.144.

Dewpoint

Dewpoint is the temperature at which any moisture absorbed in the air will condense into water droplets.

$$T_{dewpoint} = \frac{c \times \left(\ln(RH) + \frac{b \times T}{T + c}\right)}{b - \left(\ln(RH) + \frac{b \times T}{T + c}\right)}$$

Where T is in Degrees Celsius
RH is %RH/100 (i.e. 95% is 0.95)
c = 237.3
b = 17.269

Lethality Equations

Lethality Equations generate values which describe the amount by which micro-organisms, micro-organism spores and viruses are destroyed as heat is applied to destroy as many micro-organisms, micro-organism spores and viruses as possible without affecting the flavor of the edibles.

Sterilization Units (F_0)

$$F_0 = \sum\left(L(T) \times \frac{\Delta time}{timeref}\right)$$

where…

$L(T) = 10^{\frac{(T - Tempref)}{Z}}$ for T≥Tmin
L(T) = 0 for T< Tmin

Tmin = 100°C
T = current temperature in °C
Tempref = 121.111°C (250°F)
△ time = time between samples in minutes
timeref = 1 minute
Z = 10°C

Pasteurization Units (PU)

$$PU = \sum\left(L(T) \times \frac{\Delta time}{timeref}\right)$$

where…

$L(T) = 10^{\frac{(T - Tempref)}{Z}}$ for T≥Tmin
L(T) = 0 for T< Tmin

Tmin = 50°C
T = current temperature in °C
Tempref = 60°C
△ time = time between samples in minutes
timeref = 1 minute
Z = 7°C

The MadgeTech Data Logging System allows users to create Engineering Units to receive output signals from a variety of sensors and have this information expressed as other, more meaningful units of analysis.

Application:
Measure brake cylinder pressure on a train

Materials:

- MadgeTech Software
- MadgeTech Process Series Logger, ±100mADC measurement range
- Pressure Transducer, 0-300 PSI, 4-20mA output, self-powered

In this setup, the application is to record the output signal of a pressure sensor attached to brake air-lines. As seen above, the pressure transducer used in this setup has a 4-20mA output signal and a 0-300 PSI measurement range. This signal is recorded by the MadgeTech Process Series Logger, and stored in NVRAM as current measurements. Later, when this information is offloaded into the MadgeTech Software for analysis the current measurements can be converted into pressure measurements. Here is how it is done:

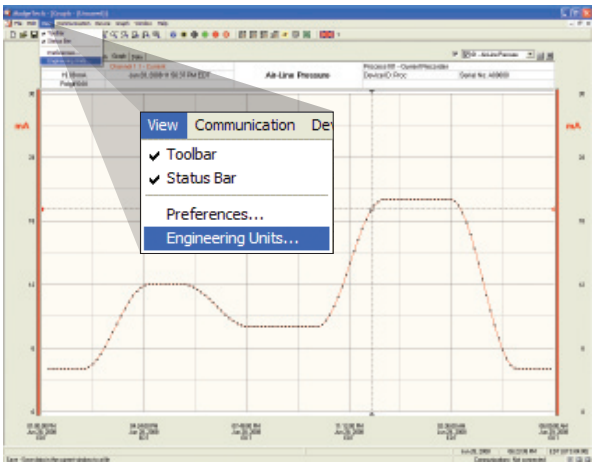


Fig 1. Once the amperage information from the MadgeTech Process Logger is downloaded into the MadgeTech Software, click "View" then "Engineering Units".

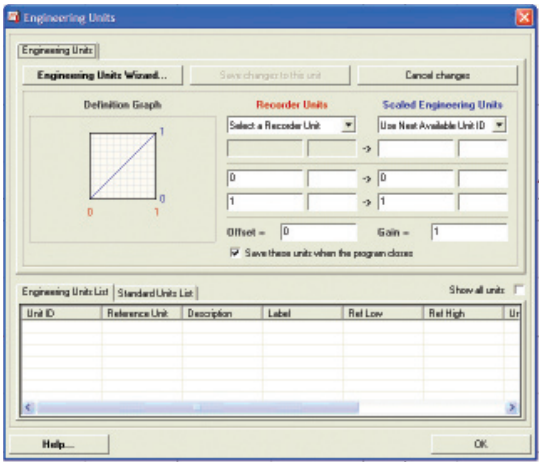


Fig 2. Once the Engineering Units window appears, the user can either manually program the "Logger Units" and "Scaled Engineering Units" sections, or can use the "Engineering Units Wizard". In this application, then Engineering Units Wizard will be used.

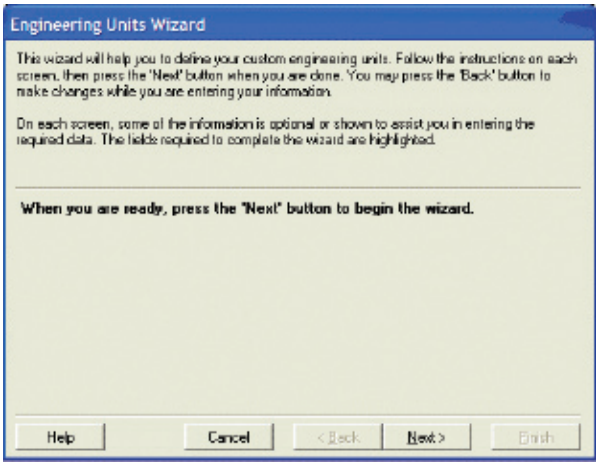


Fig 3. This is the first window of the Engineering Units Window. A description of the Engineering Units Wizard is displayed. Click "Next" to start.

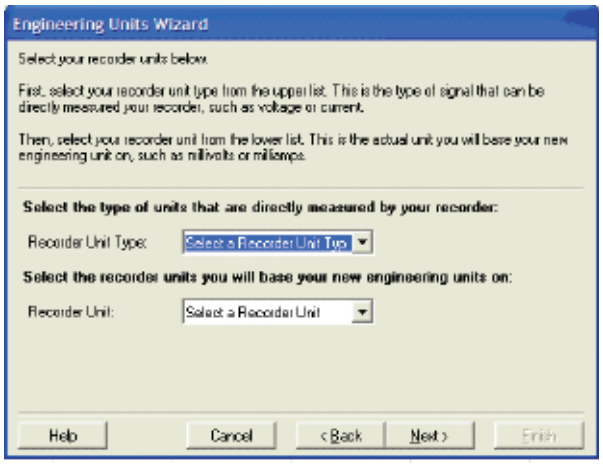


Fig 4. This window asks the user to specify the "Logger Unit Type" and the "Logger Unit". This is where information about the Pressure Transducer used in this setup is specified. For reference, the pressure sensor used in this setup has a 0-300 PSI measurement range and a 4-20mA output.

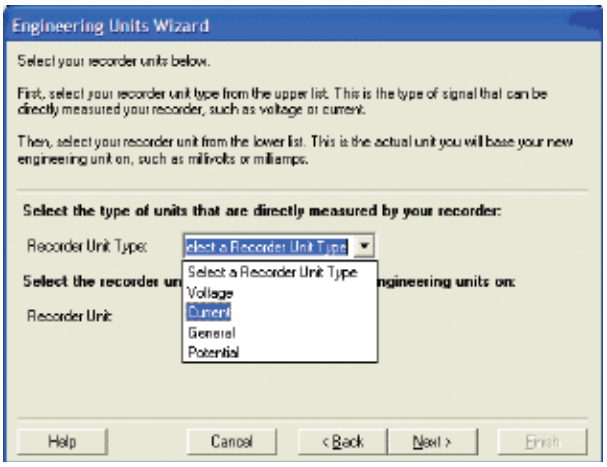


Fig 5. Here the user is specifying "Current" because the output signal of the pressure transducer is in mA (current).

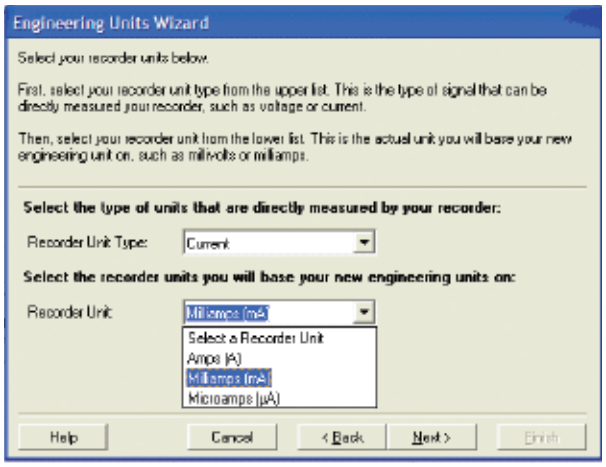


Fig 6. Here the user is specifying "Milliamps (mA)" because the pressure transducer has a 4-20 mA output signal. Once these values are specified click the "Next" button.

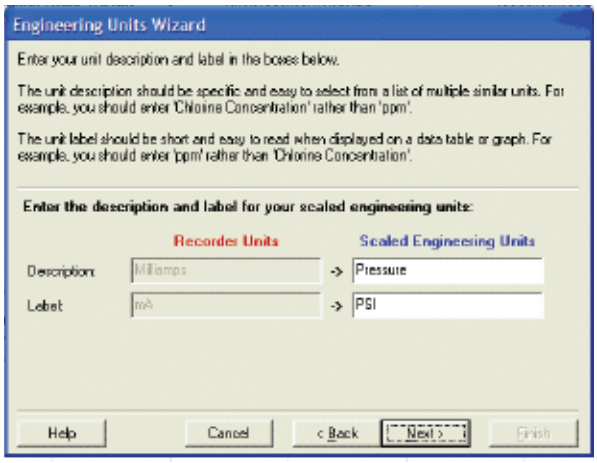


Fig 7. In this window the user programs the "Scaled Engineering Units", which allow the amperages units shown in Fig 1, to be expressed as "Pressure" with a label of "PSI" indicating that pressure shall be expressed, and the Label is PSI indicating the data is pounds per square inch. Click "Next" to continue.

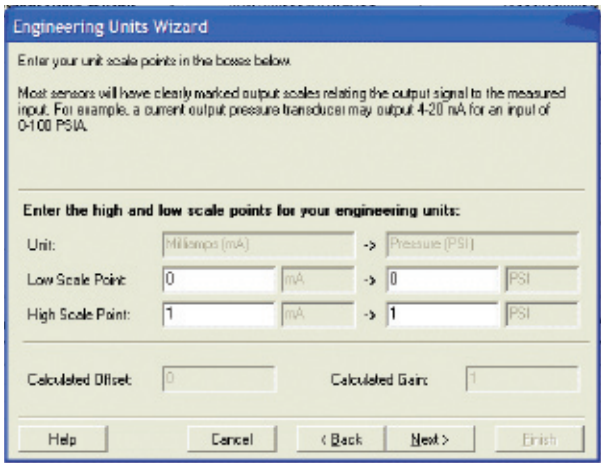


Fig 8. This window is where the user will enter the values of the external transducer including the "Low Scale Point" which is the low range of the pressure transducer output (i.e. 4), and the "High Scale Point" which is the high range of the pressure transducer output (i.e. 20). Once these are entered, the user will specify the range of the external transducer by entering the low range of the pressure transducer (i.e. 0) into the text box adjacent to the "Low Scale Point" under the "Pressure (PSI)" column and then enter the high range of the pressure transducer (i.e. 300) into the text box adjacent to the "High Scale Point" under the "Pressure (PSI)" column.

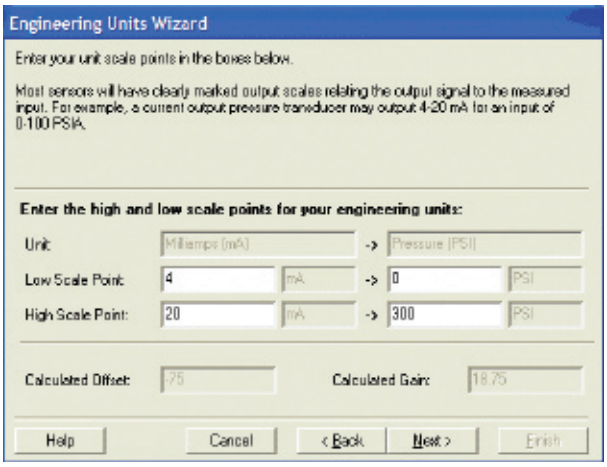


Fig 9. This window shows the entered values from Fig 8, and also displays how the MadgeTech software has automatically created a "Calculated Offset" and "Calculated Gain". Click "Next" to continue.

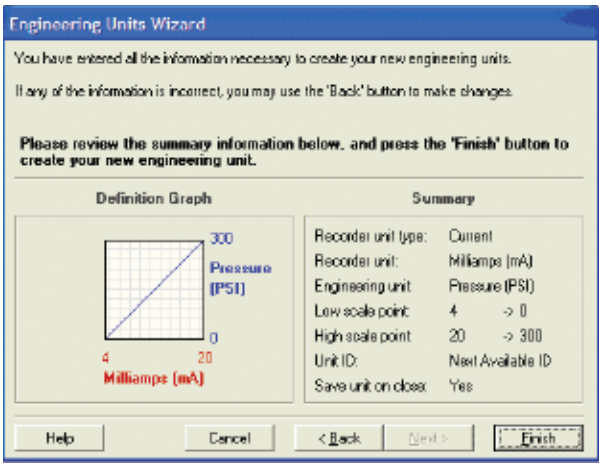


Fig 11. The final step of the "Engineering Units Wizard" summarizes the information that was entered and displays a "Definition Graph", which is how the information will be graphically represented and analyzed. Click the "Finish" button and then "OK" as the final confirmation.

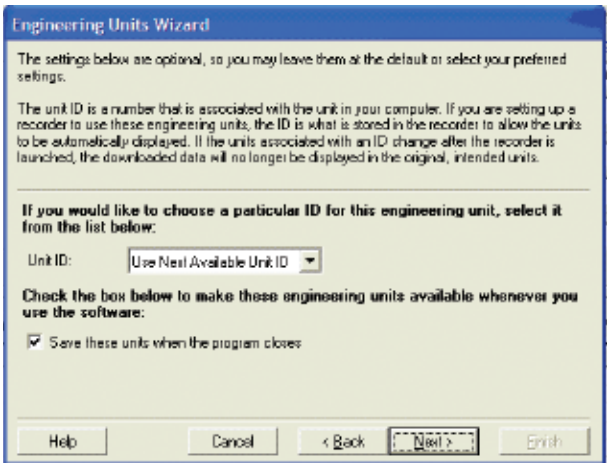


Fig 10. This window allows the user to program a "Unit ID" for the engineering unit that is being created. Click the "Next" button to continue.

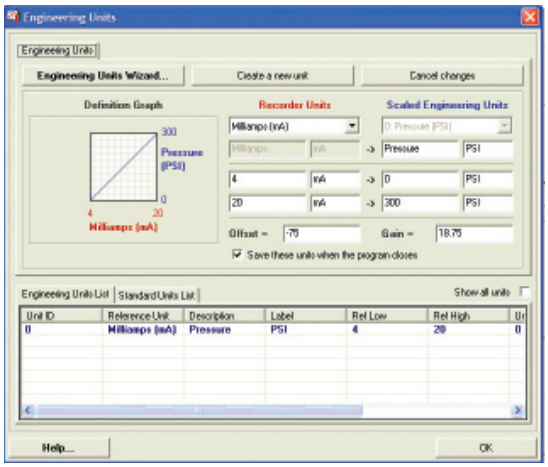


Fig 12. The user is returned to the "Engineering Units" window. Notice how the new engineering unit is now shown under the "Engineering Units List" as Unit ID 0. Click "OK" to close the engineering units window.

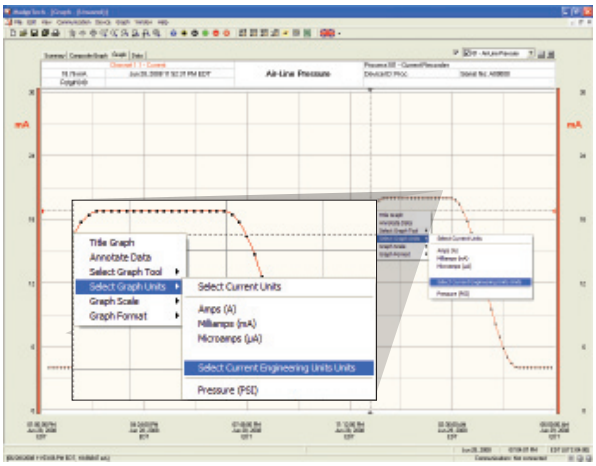


Fig 13. Back in the software, with the amperage data displayed from the Process101 current logger, select any data point with the left mouse button and right click to bring up the context menu. When the menu appears, click "Select Graph Units" and choose the engineering unit that you would like to use. In this case, the application is measure brake air-line pressure, so a Pressure engineering unit was created. Click "Pressure (PSI)".

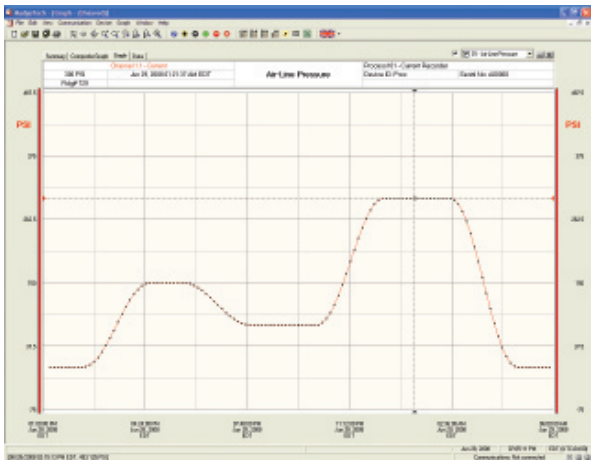


Fig 14. The data that has been recorded using the MadgeTech Process Series current logger connected to an external pressure sensor can now be analyzed and manipulated as units of pressure.

The engineering units function is simple and easy to use. The user only needs to program the units that are being recorded, and then program how they shall be expressed.

Example Circuit Diagram To Measure Voltage

(Volt101, Volt110 100mV series)

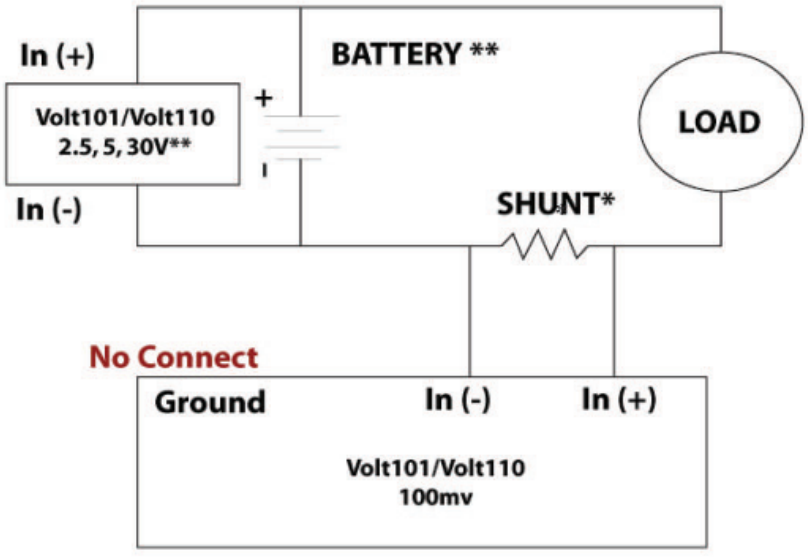
**Shunt value depends on the maximum expected load current. For example for a 10A max use a 0.01Ω shunt.*

*** Select Voltage range to match maximum battery voltage.*

Warning:

- Do not connect ground terminal of Volt101-100mV data logger to ANYTHING. Doing so will damage the logger.

- Disconnect data logger from the circuit BEFORE connecting data loggers to PC Interface cable.



Installation of the Wind110 (Pulse110-2 pos. terminal block)

The anemometer should be mounted vertically in an open area, as high up as possible. It should be mounted on a pole so that the Wind110 is unobstructed and clear of debris. It can be mounted using a cotter pin on a 13 mm (0.5 in.) diameter mast with a #35 hole, 11 mm (0.35 in.) from the top. The anemometer is non-directional, and will measure wind blowing in any horizontal direction. To ensure the most accurate readings, adjust the position of the anemometer on the bracket so that it is level. Run the 25' (ft.) of provided cable to the location where the data logger will be mounted, securing it roughly every 2 feet. There are 4 mounting holes (0.2 in. diameter spaced 2.5 in. square) on the watertight enclosure.

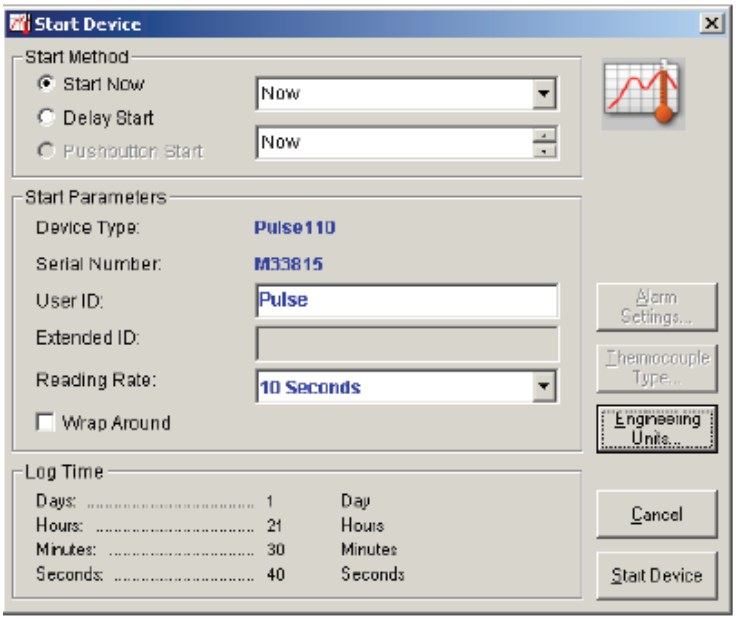
PC and Interface Cable Set-up

A computer running Windows with the MadgeTech software v2.00.58a (or higher) is required. Once the software is installed, a MadgeTech IFC110 or IFC200 interface cable is required to communicate with the logger. To install the software and interface cable, consult the Wind110 Product Information Card on the MadgeTech web site.

Once the software is installed and the interface cable (or IFC200) is connected to the PC, you are ready to communicate with the Wind110 data logger. To establish communications, the first step is to unscrew the stainless steel plug from the enclosure. The second step is to insert the 3.5mm plug of the interface cable through the hole in the enclosure and completely into the data logger. The third step is to ensure that a 57600 baud rate is checked under the "Communications"-> "Select Baud Rate" menu bar option within the MadgeTech software.

Launch the Wind110

The Wind110 is programmed to record wind speed (mph) every 10 seconds, but can be changed when starting the device. To start the device, select the "Device" -> "Start Device" menu option in the software, and the following screen should appear:



If a 10 second reading rate is acceptable, click the "Start Device" menu bar option to start the device. Wait for a dialog box to appear that indicates the device has been started successfully. Unplug the interface cable, and replace the stainless steel watertight plug.

Changing the Reading Rate

If a different reading rate is desired, for example to extend the logging time, or to more accurately record gust values, the engineering units gain will have to be reprogrammed on the device. To do this, click the "Engineering Units..." button from the "Start Device" dialog box, and use the "Device Units Wizard." Follow the wizard's prompts to accomplish the following:

1) Enable use of portable engineering units.

2) Enter an appropriate description and label (MPH or KPH).

3) Enter the Offset and Gain values (offset=0 / gain=see below).

4) Enable Engineering Units.

Click the "Finish" button to save the units to the device.

The Engineering Units are based on a linear conversion of the measured data y = m*x + b, where m=gain b=offset x=measured value and y=engineered value. With the Wind110, the offset will always = 0. The gain will change depending on the desired units and reading rate. The anemometer is calibrated to produce 120 pulses per second at 102mph. To get a gain value from that, we use a Gain of 102[mph] / (120[1/sec] x Reading Rate [sec]). To read in different units (e.g. KPH, knots) the gain value must be multiplied by an appropriate conversion factor.

Engineering Units Quick Reference (1 pulse/reading rate)

Engineering Units Gain

Reading Rate	*MPH*	*KPH*	*M/S*	*KNOTS*
2 sec	0.425	0.68397	0.18999	0.36931
5 sec	0.17	0.27359	0.075997	0.14773
10 sec	0.085	0.13679	0.037998	0.073863
30 sec	0.028333	0.045598	0.012666	0.024621
1 min	0.014167	0.022799	0.0063331	0.0123100
5 min	0.0028333	0.0045598	0.0012666	0.0024621
10 min	0.0014167	0.0022799	0.00063331	0.0012310

Why Calibrate?
All physical sensors become less accurate due to the environment, usage, stress, and time. The degree to which these changes occur varies from device to device. For example, a voltage device will drift very little over the years whereas a humidity sensor can drift significantly in several weeks if subjected to a corrosive environment.

Calibration
Periodic calibration increases measurement confidence by comparing a measurement device to a traceable standard. Proper periodic calibration ensures the accuracy of a data logger throughout its life. To meet the growing demand for factory calibration, support has been added for calibration certificates.

Calibration Certificates
The calibration certificates are generated at the end of the manufacturing process. Each certificate indicates the date and conditions of calibration. These certificates provide the documentation needed to satisfy most requirements, certifying that a product has been properly calibrated. The calibration certificate also provides traceability back to The National Institute of Standards and Technology (NIST) upon request

Calibration Options
MadgeTech offers the following parameters for NIST calibration: temperature, relative humidity, voltage, ohm, current, pressure, and bridge/strain. We also offer the following non-NIST calibrations: shock (g), and pH. The following data loggers cannot be calibrated but we can offer a "Certificate of Conformance": Pulse, Event and State. For details on our calibration program, please contact Technical Support.

Calibration Made Easy
In order to return a data logger please go to our web site (www.madgetech.com) and follow the steps outlined below.

Go to the ***Services*** tab and select ***RMA Process***.

When the web page opens, select "***click here to register an account***" to create your account.

Fill in the billing and shipping information and click the ***Register*** button to save your information.

Once you have saved this data, go back to the ***Service tab***, ***RMA Process***. Click on the "***Make New RMA***" button. You may need to scroll past the billing and shipping information to fill the information about the data logger(s). Please enter the serial number and the reason why you are returning the data logger. Click the ***Generate RMA*** button.

Print the page which will have the RMA number and MadgeTech's physical address. Ship the data logger and RMA form back to the address listed on the form.

You will be able to log in at any time to check on the status of your RMA by going to the web site and logging in.

Calibration of New Data Loggers
Calibration is included within the purchase price of a new data logger. This does not include a N.I.S.T. certificate. If a N.I.S.T. certificate is requested at the time of, or post purchase, additional fees will apply.

Standard N.I.S.T. certificate costs are as follows:

Set-up Fee: $30.00

Charge Per Channel: $30.00

Calibration of Returned Data Loggers
All MadgeTech data loggers that require calibration are recommended by the manufacturer to be returned annually for recalibration.

Standard recalibration costs are as follows:

Set-up Fee:
$10.00 without a N.I.S.T. Certificate
$30.00 with a N.I.S.T Certificate

Charge Per Channel: $30.00

For custom calibration options and pricing, please contact MadgeTech.

Ordering Information

Customer Satisfaction
Your satisfaction is our top priority at MadgeTech and we take your suggestions very seriously. The input and ideas we gain are used to develop innovative, dependable and accurate data loggers, designed specifically with your needs in mind. Whether calling with a technical question, placing an order or inquiring on a shipment, you will be assisted by our dedicated team every step of the way.

Ordering
Orders may be placed with a local distributor (see page 134 for distributor listing) or with MadgeTech by phone, fax, email, or website. Upon receipt of your purchase order number, we will promptly begin to process your request.

Payment Terms
MadgeTech accepts MC, Visa, American Express, COD, and prepaid orders (a $30.00 USD transfer fee applies to all bank transfers). Net 30 day credit terms can be established upon credit approval with our financial department.

Pricing
Contact a MadgeTech sales office or distributor for the current price list. Prices indicated are in US dollars. Prices and specifications are subject to change without notice. Pricing does not include shipping, product surcharges, GST, insurance, or any other duties, taxis, freight, or import charges. While every effort is made to ensure the accuracy of information in the sales literature, MadgeTech is not liable for typographical errors or omissions.

Shipping
All orders will be shipped United Parcel Service (UPS) ground unless otherwise specified. Transportation fees, insurance, and special handling are additional charges. Freight charges are added to the invoice.

Return Merchandise Authorization (RMA)
All returned merchandise must be accompanied by an RMA number and shipped prepaid by the customer. Visit www.madgetech.com/rma for the RMA process.

Calibration Service
See page 121 for calibration information and our calibration service.

Battery Warning
Most MadgeTech data loggers contain a lithium battery. Do not cut the battery open, incinerate, or recharge. Do not heat lithium batteries above 80ºC (60ºC in case of 9V, 70ºC coin cell, 54ºC alkaline AA) unless the battery is specifically rated for higher temperatures. Dispose of the battery in accordance with local regulations.

Limited Liability
Specifications are subject to change without notice. Specific warranty and remedy limitations apply, see next page. Go to www.madgetech.com to consult specific data sheet battery limitations or contact the factory.

Software
The MadgeTech Standard software may be downloaded from our website at any time for upgrades and evaluation.

Operating Hours
8:00 a.m. to 6:00 p.m. (EST) Monday – Friday

Contact Information
Physical Address:
879 Maple Street
Contoocook, NH 03229

Mailing Address:
PO Box 50
Warner, NH 03278

Website: www.madgetech.com
Phone: 603-456-2011
Fax: 603-456-2012
Email: sales@madgetech.com

Terms and Conditions

All products furnished by MadgeTech, Inc. ("Seller") shall be in accordance with the following terms and conditions unless otherwise stated in writing:

These Terms and Conditions ("Terms and Conditions") govern (a) all sales quotations and sales of components, equipment, parts, and other products ("Product") from, and (b) all service proposals and provisions of services by Seller to the buyer of the Products ("Buyer"). These Terms and Conditions shall take precedence over any terms and conditions which appear on Buyer's order or other form or any other writing or electronic transmission from Buyer. Any terms or conditions on any of Buyer's forms, recordings, electronic transmissions, or orders that are different from or in addition to these Terms and Conditions are specifically rejected. Any modification to these Terms and Conditions must be agreed to and executed in writing by Seller. Seller's failure to object to provisions contained in any communication from Buyer shall not be construed as a waiver of these Terms and Conditions or as an acceptance of any such provision. Trade custom, trade usage and past performance are superseded by these terms and conditions and shall not be used to interpret these terms and conditions. In the event that Product includes software, the software is licensed to Buyer in object code form only in accordance with Seller's standard Software License Terms that are included below.

1. Quotations and Proposals.
Only a written quotation or proposal shall constitute Seller's Quotation or Proposal hereunder, and it shall expire on the expiration date indicated on said Quotation or Proposal, or, if no date is specified, then thirty (30) days after the date of the Quotation or Proposal. Any Quotation or Proposal may be modified or withdrawn by Seller, in whole or in part, at any time prior to acceptance of an order by Seller.

2. Orders and Acceptance of Orders.
By submitting an order to Seller, Buyer agrees to be subject to these Terms and Conditions in their entirety. All orders must be submitted in writing (including, without limitation, by electronic mail) and reference the particular Seller Quotation or Proposal under which they are being submitted. No order shall be binding upon Seller unless and until such order is accepted (or otherwise processed) by Seller at its principal office in New Hampshire.

3. Prices.
Prices of Product and services shall be as specified on Seller's then current list price, unless otherwise stated by Seller in writing. Any goods or services to be manufactured or provided by any third party which are assigned for purchase to Seller by Buyer in connection with an accepted order shall be assigned in writing at the current price in effect at the time of Seller's acceptance of Buyer's order. Should the price of any such goods or services increase prior to Seller's shipment, Seller's price to Buyer shall be increased by the difference between the original price and the price in effect at the time of shipment to Buyer.

4. Taxes.
Unless otherwise specified in writing by Seller, prices do not include federal, state, or local sales, use, or other taxes or governmental charges of any nature whatsoever, now or hereafter enacted, or any other fees, bonds or other assessments. All such taxes, governmental charges, fees, bonds and assessments are paid by Buyer unless Buyer provides Seller with a proper exemption certificate. Buyer agrees to indemnify Seller and hold it harmless from any and all such taxes, governmental charges, fees, bonds and assessments, and any and all interest and penalties related thereto. Seller may, in its discretion, add such taxes, governmental charges, fees, bonds and assessments to the price or bill for such taxes, governmental charges, fees, bonds and assessments separately.

5. Shipments.
All Product will be shipped F.O.B. shipping point unless specifically agreed to by Seller in writing. Shipments shall be subject to approval of Buyer's credit by Seller. In the case where Buyer's credit is or has become unacceptable to Seller, in its sole discretion, Seller may, at its option, terminate the order, refuse to make shipment or refuse to make further shipments, in each case unless and until payment is made by Buyer or satisfactory security for payment is received by Seller, prior to shipment. In the absence of specific instructions, Seller will select the carrier but shall not be deemed thereby to assume any liability in connection with the shipment, nor shall the carrier be construed to be the agent of Seller. Buyer must provide its own insurance. Title and risk of loss or damage shall pass from Seller to Buyer upon delivery by Seller to the possession of the carrier. Any claims for loss, damage, or misdelivery shall be filed with the carrier. Unless otherwise specified in writing by Seller, Buyer is responsible for all site preparation and for receiving, storing, installing, starting up and maintaining all Product. In its sole discretion, Seller may provide a quotation for services to assist Buyer in some or all of these functions if requested.

6. Delivery Dates.
The estimated shipping schedule stated or confirmed by Seller is based on Seller's prompt receipt of all necessary information and/or goods from Buyer to properly process the order, and does not constitute a commitment to deliver Product in accordance therewith. Seller will use reasonable efforts to ship on or before the estimated shipping dates. Should these reasonable efforts entail additional costs as a result of actions or inactions of parties outside the control of Seller, including, without limitation, those of Buyer, Seller shall be entitled to additional compensation.

7. Terms and Methods of Payment.
All payments are to be made in U.S. Dollars. Unless otherwise specified in writing by Seller, all payments are due net 30 days from date of invoice. Past due amounts will bear interest at 1% per month, 18% per annum (but in no event more than the maximum amount permitted by law). Without limiting any other remedies available to it at law or in equity, Seller shall have the right to terminate the order or to suspend further deliveries under any order and agreement with Buyer in the event that Buyer fails to make any payment to Seller when due. Seller may recover all costs of collecting past due amounts (including reasonable legal fees and expenses).

8. Security Interest.
Buyer hereby grants to Seller a lien and security interest in all Product as security for the performance by Buyer of all of its obligations for the purchase of Product (including payment). Buyer agrees to execute such documents to evidence and perfect said security interest as Seller may require. Buyer appoints Seller as its agent and attorney-in-fact for the purpose of executing all such documents on Buyer's behalf, including, without limitation, financing statements, and for the purposes of taking any and all other action for the perfection and enforcement of such security interest. Seller has the right to file a copy of Buyer's order and this document as a financing statement.

9. Contingencies.
Seller shall not be liable for any delay in delivery or performance, or for non-delivery or non-performance, in whole or in part, caused by the occurrence of any contingency beyond Seller's control, including, without limitation, sabotage, insurrection, riot or other act of civil disobedience, act of a public enemy, terrorism, failure or delay in transportation, act of any government or any agency or subdivision thereof, judicial action, labor dispute, accident, fire, explosion, flood, storm or other act of God, shortage of labor, fuel, raw material, or machinery or technical failure, where Seller has exercised ordinary care in the prevention thereof. If any such contingency occurs, Seller may allocate production and deliveries among Seller's customers in any manner deemed reasonable by Seller.

10. Substitutions and Modifications of Equipment.
Seller reserves the right to discontinue the manufacture of any Product, and may otherwise modify the design and specifications of Product, provided the modifications do not adversely affect the performance of the Product. Product may be newly manufactured or assembled by Seller from new parts. In addition, Seller may furnish suitable substitutes for materials unobtainable because of priorities or regulations established by government authority or non-availability of materials from suppliers.

11. Conditions of Warranties.
To the extent that Seller has relied upon any specifications, information, representation of operating conditions or other data or information supplied by Buyer to Seller in the selection or design of Product and/or provision of services, and in the event that actual operating conditions or other conditions differ from those represented by Buyer and relied upon by Seller, any warranties or other provisions that are affected by such conditions shall terminate, unless otherwise mutually agreed upon in writing. Upon any nonpayment by Buyer when due, all warranties and other obligations of Seller with respect to Product delivered and/or services provided by Seller to Buyer shall terminate.

12. Termination.
No products may be returned without prior written approval of Seller. Orders accepted by Seller may be canceled by Buyer only with the written consent of Seller and upon Buyer's reimbursement of Seller for all losses, damages, costs, lost profits and expenses arising from such cancellation. Seller shall have the right to cancel any order placed, or to refuse, or to delay, the shipment thereof for failure of Buyer to make all payments when due to Seller, or any other reasonable requirements established by Seller, or for any acts or omissions of Buyer that delay Seller's performance. In the event of bankruptcy or insolvency of Buyer, or in the event any proceeding is brought by or against Buyer, voluntarily or involuntarily, under any provision of the U.S. Bankruptcy Code or any other insolvency law, Seller shall be entitled to cancel any order then outstanding, at any time during the period allowed for filing claims against the estate, and shall receive reimbursements for its reasonable and proper cancellation charges.

13. Non-Waiver of Default.
If Seller elects to continue to make shipments or perform under an accepted order, Seller's action shall not constitute a waiver of any default by Buyer or in any way affect Seller's legal remedies for any such default.

14. Applicable Law.
The validity, performance, and construction of these Terms and Conditions shall be governed by the laws of the State of New Hampshire. All controversies and disputes arising under these Terms and Conditions or pertaining to Product or services shall be resolved by the state or federal courts in New Hampshire. The parties consent to jurisdiction of said courts and to service of process in any manner approved by said courts.

15. Government Contracts.
If the Product is to be used in the performance of a government contract or subcontract, the government contract number and a statement to this effect shall appear on Buyer's purchase order, and in such event, those clauses of the applicable govern-

ment procurement regulation which are mandatorily required by federal statute to be included in government subcontracts shall be included in the order and, upon acceptance by Seller, shall be incorporated herein by reference.

16. Export.
If the Products ordered are to be exported from the United States, the quoted shipping dates are subject to receipt of all export documents and authorizations. Regardless of ultimate destination, the prices quoted are based on packing for domestic shipment unless otherwise stated in writing. Buyer agrees to provide Seller in writing with the ultimate destination and identity of the end-user prior to shipment if the products are to be exported. Unless otherwise specifically agreed to by Seller in writing, Buyer shall not export, or re-export, either directly or indirectly, any Product or any system incorporating said Product, without first obtaining a license from the United States Department of Commerce or any other agency or department of the United States government, as required.

17. Assignment.
These Terms and Conditions shall be binding upon and inure to the benefit of the parties and the successors and assigns of the entire business and goodwill of either Seller or Buyer, or of that part of the business of either used in the performance hereof, but shall not be otherwise assignable.

18. Notice.
All notices given hereunder shall be in writing and shall be sent or delivered by first class U.S. mail, national overnight courier, confirmed facsimile, electronic mail or by hand to the address or facsimile number of the other party set forth in the Quotation, Proposal or Acknowledgment, or to such other address as such party may designate from time to time by such notice. All notices shall be deemed effective:

(a) three days after depositing in the U.S. mail
(b) one day after depositing with a national overnight courier or
(c) immediately when sent or delivered by confirmed facsimile, electronic mail or by hand.

19. Remedies.
All Seller's rights and remedies, whether evidenced hereby or by any other agreement, instrument, or paper, shall be cumulative and may be exercised singularly or concurrently.

20. Limited Warranty.

A. Seller Manufactured Products and Seller Provided Services.
Seller warrants to Buyer that:
(i) Seller manufactured Software (as defined in Section 23 below) shall execute the programming instructions provided by Seller, and

(ii) Seller manufactured Product and consumables and Seller provided services shall be free from material defects in material and workmanship under normal uses and care, in each case until the expiration of the applicable warranty period specified below;

(iii) Seller manufactured Product is warranted for the shorter of twelve (12) months from the date of initial installation or fifteen (15) months from the date of shipment by Seller. Seller manufactured consumables and Software, and Seller provided services are warranted for a period of 1 year from the date of shipment or completion, as applicable. If Buyer discovers any warranty defect and notifies Seller thereof in writing during the applicable warranty period, Seller shall, at its option, promptly correct any defects that are found by Seller, or repair or replace F.O.B. point of manufacture that portion of the Seller manufactured Products, consumables or Software found by Seller to be defective, or refund the price of the defective portion of the Seller manufactured Products, consumables or Software, or of the defective portion of the Seller provided services. All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable power sources, unsuitable environmental conditions, accident, misuse, improper installation, modification, repair, storage or handling, or any other cause not the fault of Seller are not covered by this limited warranty, and shall be at Buyer's expense. Seller shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing in advance by an authorized representative of Seller. All costs of dismantling, re-installation and freight, and the time and expenses of Seller's personnel for site travel and diagnosis under this limited warranty shall be borne by Buyer unless accepted in writing by Seller. Seller manufactured Products, consumables and Software, and Seller provided services, repaired, replaced or corrected during the applicable warranty period shall be in warranty for the greater of the remainder of the applicable original warranty period.

THE FOREGOING STATES THE SOLE AND EXCLUSIVE WARRANTY AND LIABILITY OF SELLER FOR BREACH OF WARRANTY AND IS IN LIEU OF ALL OTHER REPRESENTATIONS, WARRANTIES AND COVENANTS, EXPRESS OR IMPLIED, IN REGARD THERETO. EXCEPT FOR THE EXPRESS LIMITED WARRANTY SET FORTH IN THIS SECTION, SELLER DOES NOT MAKE AND HEREBY DISCLAIMS ANY AND ALL REPRESENTATIONS AND WARRANTIES OF ANY KIND WHATSOEVER, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OR ACCURACY, ADEQUACY OR COMPLETENESS OF DATA MEASUREMENT, WITH RESPECT TO ANY OF THE SELLER MANUFACTURED PRODUCTS, CONSUMABLES OR SOFTWARE, OR ANY OF THE SELLER PROVIDED SERVICES.

Any drawings submitted with the Products are only to show the general style, arrangement, and approximate dimensions of the Products.

B. Equipment, Consumables, Software and Services Manufactured or Provided by Others.
SELLER DOES NOT MAKE, AND HEREBY DISCLAIMS, ANY AND ALL REPRESENTATIONS AND WARRANTIES OF ANY KIND WHATSOEVER, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT OR ACCURACY, ADEQUACY OR COMPLETENESS OF DATA MEASUREMENT, WITH RESPECT TO ANY EQUIPMENT, COMPONENTS, PARTS, CONSUMABLES, SOFTWARE OR SERVICES SOLD TO BUYER BY SELLER THAT ARE NOT MANUFACTURED OR PROVIDED BY SELLER. Seller shall assign the manufacturer's or service provider's warranty applicable to such equipment, components, parts, consumables, Software and services to the extent permitted, to Buyer. Seller will provide Buyer with available warranty information.

21. Limitations.
IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION WHATSOEVER, (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL SELLER'S LIABILITY EXCEED THE PRICE ACTUALLY PAID BY BUYER TO SELLER FOR THE SPECIFIC PRODUCTS, CONSUMABLES AND/OR SOFTWARE MANUFACTURED, AND/OR SERVICES PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. SELLER SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE FOR ANY LOSS OF REVENUE, LOSS OF PROFITS OR ANY INCIDENTAL, INDIRECT, SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, WHETHER OR NOT FORESEEABLE. NO ACTION, REGARDLESS OF FORM, ARISING OUT OF ANY TRANSACTION GOVERNED BY THESE TERMS AND CONDITIONS, MAY BE BROUGHT BY EITHER PARTY MORE THAN TWO (2) YEARS AFTER THE CAUSE OF ACTION HAS ACCRUED. The foregoing allocation of risk and limitation of liability has been agreed to by the parties and forms the basis of their willingness to enter into any accepted purchase order.

22. Software License.
(A) For purposes hereof, "Software" means the computer programs included in the Product at delivery, together with all codes, techniques, software tools, formats, designs, concepts, methods, and ideas associated with those computer programs. The term also includes all copies of any part of the software, as well as the manual(s) and printed materials provided by Seller.

(B) Seller grants Buyer a non- exclusive, non-transferable license to use the Software, in object code form only, according to the terms set forth below. Buyer may operate the Software only (i) in conjunction with and as part of the Product; (ii) in the manner in which it is intended by Seller; and (iii) at Buyer's plant site where the Product is first used. Buyer may negotiate with Seller separate licenses to use the Software at other plant sites. Buyer's use of Software shall be governed exclusively by Seller's and/or an third party owner's applicable license terms.

(C) Buyer shall not (i) make the Software available to any person or entity other than its employees, who must use the Software only as specified above; (ii) modify the Software or merge it with another program; (iii) reverse engineer, disassemble, decompile, or make any attempt to discover the source code of the Software; (iv) translate or create derivative works based on the Software; (v) remove, obscure, or alter any notice of the patent, copyright, or other proprietary rights related to the Software; (vi) sub-license, sell, lend, rent, or lease any portion of the Software; (vii) copy any portion of the Software; (viii) operate the Software other than in conjunction with operation of Product; or (ix) transfer the Software in violation of applicable United States Export laws and regulations.

(D) The Software involves valuable proprietary rights to Seller and others. There is no transfer to Buyer of any title to or any ownership of the Software or any patent, copyright, trade secret, trade name, trademark, and other proprietary rights related to the Software, regardless of the form in which they exist. Seller may at any time replace, modify, alter, improve, enhance, or change the Software.

(E) Both the license and Buyer's right to use the Software terminate automatically if Buyer violates any of these Terms and Conditions. In the event of termination, Buyer must immediately return, or destroy, all copies of the Software.

Last updated September 2008.

Product Name	Description	Price (US$)
	LCD DISPLAY LOGGERS	
TCTemp2000	Single Channel Thermocouple Based Temperature Logger with an LCD	$499.00
RTDTemp2000	Single Channel Precision RTD Based Temperature Logger with an LCD	$499.00
QuadTemp2000	Four Channel Thermocouple Based Temperature Logger with an LCD	$699.00
OctTemp2000	Eight Channel Thermocouple Based Temperature Logger with an LCD	$1,100.00
RHTemp2000	Temperature and Humidity Logger with an LCD	$399.00
PRHTemp2000	Barometric Pressure, Temperature and Humidity Logger with an LCD	$499.00
PR2000-30-PSIA	30 PSIA Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-30-PSIG	30 PSIG Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-100-PSIA	100 PSIA Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-100-PSIG	100 PSIG Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-300-PSIA	300 PSIA Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-300-PSIA	300 PSIG Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-500-PSIA	500 PSIA Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-500-PSIA	500 PSIG Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-1000-PSIA	1000 PSIA Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
PR2000-5000-PSIA	5000 PSIA Pressure Logger with 1/4" NPT Connection and an LCD	$849.00
Process2000	Low Level DC Current Logger with an LCD	$499.00
pHTemp2000	pH and Temperature Logger with an LCD	$599.00
Volt2000	Low Level DC Voltage Logger with an LCD	$499.00
	TEMPERATURE	
Cryo-Temp	-86°C Water Resistant Dry Ice Logger	$199.00
HiTemp150	150°C Submersible Temperature Logger with Rigid Probe	$499.00
HiTemp150-FP	150°C Submersible Temperature Logger with Flexible Probe	$499.00
IRTC110	Infrared Thermocouple Based Temperature Logger	$399.00
MicroTemp	Miniature Data Logger with 316L Stainless Steel Enclosure	$199.00
OctRTD	Eight Channel 100 Ohm RTD Based Temperature Logger	$999.00
OctTemp	Eight Channel Thermocouple Based Temperature Logger	$999.00
OT1000	Meat Cooking and Cool Down Logger with Flexible Probe	$399.00
QuadRTD	Four Channel 100 Ohm RTD Based Temperature Logger	$599.00
QuadTemp	Four Channel Thermocouple Based Temperature Logger	$599.00
QuadThermoVault	Four Channel Oven Temperature Logger	$1,499.00
RFOT	Wireless Meat Cooking and Cool Down Logger with Flexible Probe	$499.00
RTDTemp101	100 Ohm RTD Based Temperature Logger	$199.00
RTDTemp110	100 Ohm RTD Based Temperature Logger with 10 year battery life	$299.00
SGTemp1000	Precision RTD Based Temperature Logger for Use with Smart Gasket®	$399.00
TC110-MP	Thermocouple Based Temperature Logger with Standard Mini-Plug and 10 Year Battery Life	$249.00
TC110-ST	Thermocouple Based Temperature Logger with Fixed Screw Terminal and 10 year Battery Life	$249.00

TC110-TB	Thermocouple Based Temperature Logger with Pluggable Screw Terminals and 10 Year Battery Life	$249.00
TC110-2MB	Thermocouple Based Temperature Logger with Extended Memory and Standard Mini-Plug Connector	$299.00
TC4000-MP	Thermocouple Based Temperature Logger with Standard Mini-Plug Connectors	$199.00
TC4000-ST	Thermocouple Based Temperature Logger with fixed screw terminals	$199.00
TC4000-TB	Thermocouple Based Temperature Logger with pluggable screw terminals	$199.00
TCTemp1000	Rugged Thermocouple Based Temperature Logger	$299.00
Temp100	Temperature Logger with Pushbutton Start/Stop	$109.00
Temp101	Temperature Logger	$79.00
Temp110	Temperature Logger with 10 Year Battery Life	$199.00
TempRetriever	Temperature Logger with Pushbutton Start/Stop	$39.00
Temp1000	Submersible, Rugged Temperature Logger with Aluminum Enclosure	$199.00
Temp1000-SS	Submersible, Rugged Temperature Logger with Stainless Steel Enclosure	$249.00
Temp1000S	Rugged Temperature Logger with 1" Rigid Probe	$499.00
Temp1000FP	Rugged Temperature Logger with 10.8" Flexible Probe	$649.00
Temp1000P	Meat Cooking and Cool Down Logger with Piercing Probe	$399.00
Temp1000IS	Submersible, Rugged, Intrinsically Safe Temperature Logger with Aluminum Enclosure	$199.00
Temp1000IS-SS	Submersible, Rugged, Intrinsically Safe Temperature Logger with Stainless Steel Enclosure	$249.00
ThermoVault	Single Channel Oven Temperature Logger	$999.00
TransiTemp	Single Use In-Transit Temperature Logger	$23.50
TransiTemp-Multi	Multiple Use In-Transit Temperature Logger	$49.00
TransiTemp-EC	Single Use Economy Temperature Logger	$19.99
TransiTemp-EC-Multi	Multiple Use Economy Temperature Logger	$29.99
TransiTempII	Cold Chain Temperature Logger	$49.00

HUMIDITY

MicroRHTemp	Miniature Humidity and Temperature Logger with Stainless Steel Enclosure	$299.00
RHTemp101	Temperature and Humidity Logger	$199.00
RHTemp110	Temperature and Humidity Logger with 10 year battery life	$299.00
RHTemp1000	Rugged Humidity and Temperature Logger with Aluminum Enclosure	$399.00
RHTemp1000-SS	Rugged Humidity and Temperature Logger with Stainless Steel Enclosure	$449.00
RHTemp1000IS	Intrinsically Safe Humidity and Temperature Logger with Aluminum Enclosure	$399.00
RHTemp1000IS-SS	Intrinsically Safe Humidity and Temperature Logger with Stainless Steel Enclosure	$449.00
TempRetrieverRH	Temperature and Humidity Logger	$99.00
TransiTemp-RH	Single Use Temperature and Humidity Logger	$39.00
TransiTemp-RH-Multi	Multiple Use Temperature and Humidity Logger	$99.00
TransiTempII-RH	Multiple Use Temperature and Humidity Logger	$99.00

PRESSURE

PRTC110	Differential Pressure and Thermocouple Based Temperature Logger	$399.00
PRTC210-30-PSIA	30 PSIA Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTC210-30-PSIG	30 PSIG Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00

PRTC210-100-PSIA	100 PSIA Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTC210-100-PSIG	100 PSIG Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTC210-300-PSIA	300 PSIA Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTC210-300-PSIG	300 PSIG Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTC210-500-PSIA	500 PSIA Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTC210-500-PSIG	500 PSIG Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTC210-1000-PSIA	1000 PSIA Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTC210-5000-PSIA	5000 PSIA Pressure and Thermocouple Temperature Logger with 1/8" NPT Connection	$649.00
PRTemp101	Barometric Pressure and Temperature Logger	$229.00
PRTemp110	Barometric Pressure and Temperature Logger with 10 Year Battery Life	$329.00
PRTemp110D	Differential Pressure and Temperature Logger	$329.00
PRTemp1000-30-PSIA	0 to 30 PSIA Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-30-PSIG	0 to 30 PSIG Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-100-PSIA	0 to 100 PSIA Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-100-PSIG	0 to 100 PSIG Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-300-PSIA	0 to 300 PSIA Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-300-PSIG	0 to 300 PSIG Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-500-PSIA	0 to 500 PSIA Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-500-PSIG	0 to 500 PSIG Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-1000-PSIA	0 to 1000 PSIA Rugged Pressure and Temperature Logger	$649.00
PRTemp1000-5000-PSIA	0 to 5000 PSIA Rugged Pressure and Temperature Logger	$649.00
PRTemp1000IS-30-PSIA	0 to 30 PSIA Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-30-PSIG	0 to 30 PSIG Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-100-PSIA	0 to 100 PSIA Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-100-PSIG	0 to 100 PSIG Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-300-PSIA	0 to 300 PSIA Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-300-PSIG	0 to 300 PSIG Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-500-PSIA	0 to 500 PSIA Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-500-PSIG	0 to 500 PSIG Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-1000-PSIA	0 to 1000 PSIA Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTemp1000IS-5000-PSIA	0 to 5000 PSIA Intrinsically Safe Pressure and Temperature Logger	$649.00
PRTrans1000-30-PSIA	0 to 30 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000-30-PSIG	0 to 30 PSIG High Speed Transient Pressure Logger	$649.00
PRTrans1000-100-PSIA	0 to 100 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000-100-PSIG	0 to 100 PSIG High Speed Transient Pressure Logger	$649.00
PRTrans1000-300-PSIA	0 to 300 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000-300-PSIG	0 to 300 PSIG High Speed Transient Pressure Logger	$649.00
PRTrans1000-500-PSIA	0 to 500 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000-500-PSIG	0 to 500 PSIG High Speed Transient Pressure Logger	$649.00
PRTrans1000-1000-PSIA	0 to 1000 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000-5000-PSIA	0 to 5000 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-30-PSIA	0 to 30 PSIA High Speed Transient Pressure Logger	$649.00

PRTrans1000IS-30-PSIG	0 to 30 PSIG High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-100-PSIA	0 to 100 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-100-PSIG	0 to 100 PSIG High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-300-PSIA	0 to 300 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-300-PSIG	0 to 300 PSIG High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-500-PSIA	0 to 500 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-500-PSIG	0 to 500 PSIG High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-1000-PSIA	0 to 1000 PSIA High Speed Transient Pressure Logger	$649.00
PRTrans1000IS-5000-PSIA	0 to 5000 PSIA High Speed Transient Pressure Logger	$649.00
PRHTemp101	Pressure, Temperature and Humidity Logger	$299.00
PRHTemp110	Pressure, Temperature and Humidity Logger with 10 Year Battery Life	$399.00
PRTemp1000D-30	0-30 PSID, Differential Pressure and Temperature Logger	$2,299.00
PRTemp1000D-100	0-100 PSID, Differential Pressure and Temperature Logger	$2,299.00
PRTemp1000D-300	0-300 PSID, Differential Pressure and Temperature Logger	$2,299.00
PRTemp1000D-500	0-500 PSID, Differential Pressure and Temperature Logger	$2,299.00

VOLTAGE		
Volt101-100mV	Low Level, -100mV to 100mV, Differential Input, DC Voltage Logger	$199.00
Volt101-2.5V	Low Level, -0.25V to +2.75V, DC Voltage Logger	$199.00
Volt101-15V	Low Level, -1V to 16V, DC Voltage Logger	$199.00
Volt101-30V	Low Level, -2V to 32V, DC Voltage Logger	$199.00
Volt110-100mV	Low Level, -100mV to 100mV, Differential Input, DC Voltage Logger with 10 Year Battery Life	$299.00
Volt110-2.5V	Low Level, -0.25V to +2.75V, DC Voltage Logger with 10 Year Battery Life	$299.00
Volt110-15V	Low Level, -1V to 16V, DC Voltage Logger with 10 Year Battery Life	$299.00
Volt110-30V	Low Level, -2V to 32V, DC Voltage Logger with 10 Year Battery Life	$299.00
QuadVolt-100mV	Four Channel, Low Level, -100mV to 100mV, Differential Input, DC Voltage Logger	$599.00
QuadVolt-2.5V	Four Channel, Low Level, -0.25V to +2.75V, DC Voltage Logger	$599.00
QuadVolt-15V	Four Channel, Low Level, -1V to 16V, DC Voltage Logger	$599.00
QuadVolt-30V	Four Channel, Low Level, -2V to 32V, DC Voltage Logger	$599.00
OctVolt-100mV	Eight Channel, Low Level, -100mV to 100mV, Differential Input, DC Voltage Logger	$999.00
OctVolt-2.5V	Eight Channel, Low Level, -0.25V to +2.75V, DC Voltage Logger	$999.00
OctVolt-15V	Eight Channel, Low Level, -1V to 16V, DC Voltage Logger	$999.00
OctVolt-30V	Eight Channel, Low Level, -2V to 32V, DC Voltage Logger	$999.00

COUNTER/EVENT		
Event101	Event Logger	$99.00
Event110	Event Logger with 10 Year Battery Life	$199.00
Pulse101	Pulse Logger	$99.00
Pulse110	Pulse Logger with 10 Year Battery Life	$199.00
State101	State Logger	$99.00
State110	State Logger with 10 Year Battery Life	$199.00

QuadState	Four Channel State Logger	$399.00
OctState	Eight Channel State Logger	$699.00

CURRENT		
Process101	Low Level, -20mA to 100mA DC Current Logger	$199.00
Process110-1mA	Low Level, -1mA to 1mA DC Current Logger w/ 10 year battery life	$299.00
Process110-25mA	Low Level, -25mA to 25mA DC Current Logger w/ 10 year battery life	$299.00
Process110-100mA	Low Level, -100mA to 100mA DC Current Logger w/ 10 year battery life	$299.00
QuadProcess-1mA	Four Channel Low Level, -1mA to 1mA DC Current Logger	$599.00
QuadProcess-25mA	Four Channel Low Level, -25mA to 25mA DC Current Logger	$599.00
QuadProcess-100mA	Four Channel Low Level, -100mA to 100mA DC Current Logger	$599.00
OctProcess-1mA	Eight Channel Low Level, -1mA to 1mA DC Current Logger	$999.00
OctProcess-25mA	Eight Channel Low Level, -25mA to 25mA DC Current Logger	$999.00
OctProcess-100mA	Eight Channel Low Level,-100mA to 100mA DC Current Logger	$999.00

SHOCK		
Shock101-5	Tri-Axial, 5G Shock Logger	$599.00
Shock101-50	Tri-Axial, 50G Shock Logger	$599.00
Shock101-100	Tri-Axial, 100G Shock Logger	$599.00
Shock101-250	Tri-Axial, 250G Shock Logger	$599.00
Shock101-5-EB	Tri-Axial, 5G Shock Logger with Extended Battery Life	$749.00
Shock101-50-EB	Tri-Axial, 50G Shock Logger with Extended Battery Life	$749.00
Shock101-100-EB	Tri-Axial, 100G Shock Logger with Extended Battery Life	$749.00
Shock101-250-EB	Tri-Axial, 250G Shock Logger with Extended Battery Life	$749.00
TSR101-5	Tri-Axial, 5G Transient Shock Logger	$599.00
TSR101-50	Tri-Axial, 50G Transient Shock Logger	$599.00
TSR101-100	Tri-Axial, 100G Transient Shock Logger	$599.00
TSR101-250	Tri-Axial, 250G Transient Shock Logger	$599.00
TSR101-5-EB	Tri-Axial, 5G Transient Shock Logger with Extended Battery Life	$599.00
TSR101-50-EB	Tri-Axial, 50G Transient Shock Logger with Extended Battery Life	$599.00
TSR101-100-EB	Tri-Axial, 100G Transient Shock Logger with Extended Battery Life	$599.00
TSR101-250-EB	Tri-Axial, 250G Transient Shock Logger with Extended Battery Life	$599.00
UltraShock-5	Tri-Axial, 5G Shock, Temperature, Humidity and Barometric Pressure Logger	$799.00
UltraShock-50	Tri-Axial, 50G Shock, Temperature, Humidity and Barometric Pressure Logger	$799.00
UltraShock-100	Tri-Axial, 100G Shock, Temperature, Humidity and Barometric Pressure Logger	$799.00
UltraShock-250	Tri-Axial, 250G Shock, Temperature, Humidity and Barometric Pressure Logger	$799.00
UltraShock-5-EB	Tri-Axial, 5G Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life	$899.00
UltraShock-50-EB	Tri-Axial, 50G Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life	$899.00
UltraShock-100-EB	Tri-Axial, 100G Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life	$899.00
UltraShock-250-EB	Tri-Axial, 250G Shock, Temperature, Humidity and Barometric Pressure Logger with Extended Battery Life	$899.00
SVR101-5	5G Spectral Vibration Logger	$599.00
SVR101-50	50G Spectral Vibration Logger	$599.00

U.S. Price List

WATER LEVEL/PH		
Level1000	Water Level and Temperature Logger	$649.00
Level2000	Vented Eater Level and Temperature Logger	$749.00
pHTemp101	pH and Temperature Logger	$399.00

BRIDGE/STRAIN		
Bridge110-10mV	10mV Bridge Logger	$499.00
Bridge110-25mV	25mV Bridge Logger	$499.00
Bridge110-100mV	100mV Bridge Logger	$499.00
Bridge110-1000mV	1000mV Bridge Logger	$499.00
Bridge120-10mV	10mV, 20Hz, Bridge Logger	$549.00
Bridge120-25mV	25mV, 20Hz, Bridge Logger	$549.00
Bridge120-100mV	100mV, 20Hz, Bridge Logger	$549.00
Bridge120-1000mV	120mV, 20Hz, Bridge Logger	$549.00
BRTrans210-10mV	±10mV, High Speed Bridge/Strain Logger	$599.00
BrTrans210-25mV	±25mV, High Speed Bridge/Strain Logger	$599.00
BrTrans210-100mV	±100mV, High Speed Bridge/Strain Logger	$599.00
BrTrans210-1000mV	±1000mV, High Speed Bridge/Strain Logger	$599.00

COMPLETE SYSTEMS		
7001-CO2	Carbon Dioxide Monitor	$420.00
ETR110	Exhaust Temperature Recording System	$399.00
Motion110	Motion Recorder	$249.00
Rain110	Rainfall Recording System	$599.00
SMR110-5	Soil Moisture Recording System w/ EC-5 probe	$299.00
SMR110-20	Soil Moisture Recording System w/ EC-20 probe	$299.00
Therm•A•lert	Precision Temperature Data Logger and Wireless Transmitter Comes in 30, 60, and 250mL Sizes	$329.00
Wind110	Wind Speed Recording System	$399.00

WIRELESS		
RFTemp101A	Temperature Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$199.00
RFRTDTemp101A	Precision Temperature Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$329.00
RFTC4000A	Thermocouple Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$249.00
RFRHTemp101A	Humidity / Temperature Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$269.00
RFVolt101A-100mV	±100mV, Differential Input, DC Voltage Logger and Wireless Transmitter (Approved for use in the US and Canada)	$249.00
RFVolt101A-15V	-1V to +16V, DC Voltage Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$249.00
RFVolt101A-30V	-2V to +32V, DC Voltage Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$249.00
RFProcess101A-1mA	±1mA DC Current Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$249.00
RFProcess101A-25mA	±25mA DC Current Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$249.00
RFProcess101A-100mA	±100mA DC Current Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$249.00
RFpHTemp101A	pH and Temperature Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$449.00
RFPulse101A	Pulse Logger and Wireless Transmitter (Note: Approved for use in the US and Canada only.)	$249.00

ADAPTERS		
DC9V-NA	9 Volt AC Adapter (North American version)	$13.00
DC9V-EU	9 Volt AC Adapter (European version)	$13.00

AGRICULTURAL ACCESSORIES		
EC-5	Soil moisture probe, 0-100% VWC, 2.1" length with 16' cable	$130.00
EC-20	Soil moisture probe, 0-40% VWC, 10" length w/ 16' cable	$130.00

AIR QUALITY ACCESSORIES		
7001-CO2	Monitor CO2 monitor, AC adapter and Users manual	$430.00
CABLE2070	CO2 monitor to data logger interface cable	$25.00

BATTERIES		
CR1225	Coin Cell battery	$5.00
CR1632	Coin Cell battery	$5.00
CR2032	Coin Cell battery (-20°C to +70°C operating environment)	$5.00
ER14250	3.6V Lithium 100 mAH	$5.00
LTC-3PN (BL-4PN)	3.6 Volt, Lithium Battery, 350 mAH	$10.00
LTC-7PN	3.6 Volt, Lithium Battery, 750 mAH	$10.00
MN1300	D-cell Alkaline Battery	$5.00
SR1154W	Coin Cell for the MicroRHTemp, aka 357 or 303	$5.00
TL-2150	3.6 Volt, Lithium Battery, rated up to +80°C	$10.00
TLH-5902	3.6 Volt, Lithium Battery, 1/2 AA, Axial Leads, rated up to +125°C	$15.00
U9VL-J	9.0 Volt, Lithium 1200 mAH Battery	$15.00
3B5700	150°C 1/2 AA High Temperature Battery	$99.00
TL-5955	Lithium Battery, 2/3AA axial leads, for BTIF1000	$15.00

CABLES		
IFC102	PC Interface Cable for Micro Series	$99.00
IFC103	PC Interface Cable for TransiTemp-EC Series	$99.00
IFC110	PC Interface Cable for Standard Series	$99.00
IFC200	USB Interface Cable for Standard Series	$119.00
IFC202	USB Interface Cable for Micro Series	$119.00
IFC300	USB Docking Station	$69.00
RFC101A	Radio Frequency Receiver for RF Series (includes RFC101A, IFC110, Software)	$199.00
RFC200A	Radio Frequency Receiver for RF Series (includes RFC101A, USB-1, IFC200, Software)	$249.00
USB-1	USB to RS232 Converter	$49.00
USB101	IFC110 & USB-1 Package	$129.00
TIBBO DS202R	DS202 Serial to Ethernet Converter	$135.00

CALIBRATION CERTIFICATES		
N.I.S.T. Certificate	Certificate of Calibration, per N.I.S.T.	$60.00

CURRENT SWITCHES		
970HCA	Split-Core Low Current 4-20mA & 0-10VDC DC Current Transducer (requires external power source)	$220.00
CT-800	Current switch, 1 A set point	$40.00
CT-805	Current switch, 1.5 A set point	$50.00
CT-815	Current switch, Adjustable set point w/ split core and LED	$70.00
CT-H10F	Current Switch, 3.5-100A Continuous, Split-Core, Auto-Calibration, 4-20mA Output	$128.50
CT-H600	Current relay switch, 0.15 - 200A, fixed setpoint, no status LEDs	$65.00
CT-H608	Current relay switch, 1.25 - 50A, adjustable setpoint, status LEDs	$100.00

ENCLOSURES/WALLMOUNTS		
Waterbox110C	Water resistant enclosure with cable gland	$35.00
WM-300	Wall mount accessory for IFC300 series data loggers	$20.00

PH PROBES		
pH1	General Purpose pH Probe	$53.00

RTD PROBES		
RTDS-4-3/16-6-36 6-36	Precision 100 ohm, 4 wire RTD probe	$84.00
RTDS-4-3/16-12-36 12-36	Precision 100 ohm, 4 wire RTD probe	$84.00
RTDSMS-4-3/16-6-36 6-36	Precision 100 ohm, 4 wire RTD probe	$97.00
RTDSMS-4-3/16-12-36 12-36	Precision 100 ohm, 4 wire RTD probe	$97.00

SOFTWARE		
SVP-Standard	Protocols for validating the standard data logging system in an end-user environment	$400.00
SVP-Secure	Protocols for validating the 21 CFR Part 11 ready, secure data logging system in an end-user environment	$600.00
SVP-Secure License	License for MadgeTech SVP-Secure Software (unlimited users, license per computer)	$1,000.00

THERMOCOUPLE PROBES		
TC-J-TT-24-36-SMP	Type J, 36" long, 24 gauge, Teflon® insulated, thermocouple w/ mini plug and welded tip	$20.00
TC-J-TT-24-72-SMP	Type J, 72" long, 24 gauge, Teflon® insulated, thermocouple w/ mini plug and welded tip	$20.00
TC-K-TT-24-36-SMP	Type K, 36" long, 24 gauge, Teflon® insulated, thermocouple w/ mini plug and welded tip	$20.00
TC-K-TT-24-72-SMP	Type K, 72" long, 24 gauge, Teflon® insulated, thermocouple w/ mini plug and welded tip	$20.00
TC-T-TT-24-36-SMP	Type T, 36" long, 24 gauge, Teflon® insulated, thermocouple w/ mini plug and welded tip	$20.00
TC-T-TT-24-72-SMP	Type T, 72" long, 24 gauge, Teflon® insulated, thermocouple w/ mini plug and welded tip	$20.00
TC-E-TT-24-36-SMP	Type E, 36" long, 24 gauge, Teflon® insulated, thermocouple w/ mini plug and welded tip	$20.00
TC-E-TT-24-72-SMP	Type E, 72" long, 24 gauge, Teflon® insulated, thermocouple w/ mini plug and welded tip	$20.00

WEATHER ACCESSORIES		
RainGauge	Rain Gauge accessory for the Event101 and Event110	$399.00
Anemometer	Wind speed accessory for Pulse101 and Pulse110	$149.00

WIRELESS ACCESSORIES		
BTIF1000	Bluetooth® data logger interface	$229.00
RFEXT-KIT	RF Extender Kit, "STARTER KIT" Includes (2) Wireless transceiver modules, (2) antennas, (2) wall-mount power supplies, (1) DB9 serial extension cable (for PC), (1) male null modem adapter (1) IFC110 interface cable, (1) software CD and (1) Data Logger and Software Operating Manual	$999.00
RFEXT-REMOTE	RF Extender Remote, "LOGGER EXPANSION PACK" RF Extender Remote, "LOGGER EXPANSION PACK" Includes (1) Wireless transceiver module, (1) antenna, (1) wall-mount power supply, (1) male null modem adapter and (1) IFC110	$499.00
RFEXT-BASE	RF Extender Base "PC EXPANSION PACK" RF Extender Base "PC EXPANSION PACK" Includes (1) Wireless transceiver module, (1) antenna, (1) wall-mount power supply, (1) DB9 serial extension cable (for PC) and (1) software CD	$499.00
RFEXT-EXPANSION	RF Extender, "EXPANSION MODULE" RF Extender, "EXPANSION MODULE" includes (1) wireless transceiver module, (1) antenna, (1) wall-mount power supply, (1) male null modem adapter, (1) DB9 serial extension cable (for PC), (1) IFC110, (1) software CD and (1) Data Logger and Software Operating Manual	$599.00
RFEXT-KIT-2.4GHZ	RF Extender Kit, "STARTER KIT" Includes (2) Wireless transceiver modules, (2) antennas, (2) wall-mount power supplies, (1) DB9 serial extension cable (for PC), (1) male null modem adapter (1) IFC110 interface cable, (1) software CD and (1) Data Logger and Software Operating Manual	$999.00
RFEXT-REMOTE-2.4GHZ	RF Extender Remote, "LOGGER EXPANSION PACK" RF Extender Remote, "LOGGER EXPANSION PACK" Includes (1) Wireless transceiver module, (1) antenna, (1) wall-mount power supply, (1) male null modem adapter and (1) IFC110	$499.00
RFEXT-BASE-2.4GHZ	RF Extender Base "PC EXPANSION PACK" RF Extender Base "PC EXPANSION PACK" Includes (1) Wireless transceiver module, (1) antenna, (1) wall-mount power supply, (1) DB9 serial extension cable (for PC) and (1) software CD	$499.00
RFEXT-EXPANSION-2.4GHZ	RF Extender, "EXPANSION MODULE" RF Extender, "EXPANSION MODULE" includes (1) wireless transceiver module, (1) antenna, (1) wall-mount power supply, (1) male null modem adapter, (1) DB9 serial extension cable (for PC), (1) IFC110, (1) software CD and (1) Data Logger and Software Operating Manual	$599.00

Note: 900MHz RFExtender modules are for use in the US and Canada only. The 2.4GHz is for worldwide use.

- PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE
- PRICES DO NOT INCLUDE SHIPPING
- PRODUCTS MAY CONTAIN LITHIUM BATTERIES. PLEASE SEE INDIVIDUAL SPECIFIC PRODUCT DATA SHEETS FOR WARNINGS REGARDING THE USE OF THESE PRODUCTS.
- SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. SPECIFIC WARRANTY AND REMEDY LIMITATIONS APPLY. CALL 1-603-456-2011 OR VISIT WWW.MADGETECH.COM FOR DETAILS
- VOLUME DISCOUNTS AVAILABLE, PLEASE CALL FOR PRICE QUOTES

Worldwide Sales Support

Africa

Egypt

Egyptian Engineering Systems
Phone: +20 (0) 02 450 6814
Fax: +20 (0) 02 455 7196
www.ees9.com
ees9@link.net

South Africa

Vangard Projects
Phone: +27 (0) 11 913-3199
Fax: +27 (0) 11 913-1261
E-mail: sales@v-projects.co.za
Web: www.v-projects.co.za

Impact Measurement Solutions
Phone: +27 082 929-4128
Fax: +27 011 902-4679
E-mail: Ken2@telkomsa.net
www.impactms.co.za

Asia

China (P.R.C)

MadgeTech, Inc. Sales Office
Phone: +86 (0) 25 81618495
Fax: +86 (0) 25 83684080
Mobile: 13016959118
www.madgetech.com/chinese/
gewen@madgetech.com
njyongxin@163.com

Che Scientific Co. Ltd.
Phone: +86 (0) 21 6248 1061
Fax: +86 (0) 21 6248 0647
www.chescientific.com
shanghai@chescientific.com

Che Scientific Co. Ltd.
Phone: +86 (0) 20 8130 3870
Fax: +86 (0) 20 8130 3873
www.chescientific.com
guangzhou@chescientific.com

Che Scientific Co. Ltd.
Phone: +86 (0) 575 865 3041
Fax: +86 (0) 575 864 8563
www.chescientific.com
reyue@public.sxptt.zj.cn

Hong Kong

Che Scientific Co. Ltd.
Phone: +852 2481 1323
Fax: +852 2418 1302
www.chescientific.com
sales@chescientific.com

India

RVP Marketing
Phone: +91 (0) 79 26448582
Fax: +91 (0) 79 26441861
rvpmktgad1@gmail.com

Indonesia

P.T. BUDI ARTA SAKTI
Phone: +21 5713903
Fax: +21 5713904
ptbas@cbn.net.id

Japan

MK Scientific, Inc.
Phone: +81 (0) 45 852 7531
Fax: +81 (0) 45 852 7521
www.mksci.com
sales@mksci.com

Malaysia

Network Square Sdn Bhd
Phone: +60 (0) 3 62734576
Fax: +60 (0) 3 62734571
www.networksquare.com
nsedl@pd.jaring.my

Singapore

Tritherm Technology
Phone: +65 68534270
Fax: +65 68534269
www.tritherm.com
sales@tritherm.com

South Korea

TESSOL
Phone: +82 (0) 31 713 5988
Fax: +82 (0) 31 713 5982
www.tessol.com

Taiwan

Rixen Technology Co., LTD
Phone: +886 2 8647 2585
Fax: +886 2 8647 2552
www.rixen.com.tw/index_e.htm
rixen@ms45.hinet.net

Thailand

Neotrade Enterprise L.P.
Phone: +66 (0) 2 216 4141
Fax: +66 (0) 2 613 7199
neotradeenterprise@gmail.com

Vietnam

VIET THANH CO. LTD.
Phone: +84 (0) 8 240 2131
Fax: +84 (0) 8 726 9595
vietthanh_co@vnn.vn

Neotrade Enterprise L.P.
Phone: +66 (0) 2 216 4141
Fax: +66 (0) 2 613 7199
neotradeenterprise@gmail.com

Australia

Pacific Sensors Technologies
Phone: +61 (0) 0423 915 077
Fax: +61 (0) 02 8572 9496
www.pacificsensortech.com.au
sales@pacificsensortech.com.au

New Zealand

PROSOL Limited
Phone: +64 (0) 9 414 1028
mike@prosol.co.nz

Europe

Benulux

Pimzo's Technical Trading Company
Phone: +31 (0) 174 520 510
Fax: +31 (0) 174 528 628
www.pimzos.nl
info@pimzos.nl

Bosnia, Croatia, Hertzegovina, Macedonia, Montenegro, Serbia, Slovenia

ARNE d.o.o.
Phone: +386 1 561 03 10
Fax: +386 1 561 03 30
www.arne.si
www.measurement-solutions.net
info@arne.si

Denmark

Logos Test & Measurement A/S
Phone: +45 45 87 78 96
Fax: + 45 45 93 02 67
www.logostest.dk/
bwi@logos.dk

Finland

Hantekno Oy
Phone: +358 (0) 9 53066570
Fax: +358 (0) 9 53066530
www.hantekno.com
info@hantekno.com

France

OCEASOFT
Phone: +33 (0)4 99 13 67 30
Fax : +33 (0)4 67 42 84 13
info@oceasoft.com

SM2I
Phone: +33 (0) 1 34 89 78 78
Fax: +33 (0) 1 34 89 54 53
www.sm2i.com
sm2i@sm2i.com

DiMelco
Phone: +33 (0) 3 20 62 06 80
Fax: +33 (0) 3 20 96 95 62
www.dimelco.com
commercial@dimelco.com

Germany

HERO Instruments
Phone: +49 (0)6104-98570
Fax: +49 (0)6104-985733
www.hero-instruments.de
hero-instruments@t-online.de

Wachendorff
Phone: +49 (0) 6722-9965-0
Fax: +49 (0) 6722-9965-43
www.wachendorff.de/
kontakt@wachendorf.de

Hungary

Kalibra59
Phone: +36 30 2123972
Fax: +36 27 358876
www.kalibra59.hu
kalibra59@kalibra59.hu

Italy

Delta Strumenti
Phone: +39 (0) 332 604 667
Fax: +39 0332 610 511
www.deltastrumenti.it
info@deltastrumenti.it

Norway

Sensorconsult as
Phone: +47 55 18 30 48
Fax: +47 55 18 30 49
www.sensorconsult.com
post@sensorconsult.no

Poland

PW MERKURY SC
Phone: +48 (0) 61 8305 847
Fax: +48 (0) 61 8305 847
www.pw-merkury.com.pl
merk@pw-merkury.com.pl

Portugal

Antonio Mouthinho Ca. Lda Precision Instruments
Phone: +351 225 193 120
Fax: +351 225 193 129
www.antoniomoutinho.pt
info@antoniomoutinho.pt

Romania

Ascora Ecoterm S.R.L.
Phone:/Fax: +40 (0) 244 355778
ascora@centrale-cazane.ro

Spain

Sumelco Technologies
Phone: +34 943 22 40 08
Fax: +34 943 22 40 09
www.sumelco.com
info@sumelco.com

Controltemp S.L.
Phone: +34 93 574 13 20
Fax: +34 93 574 41 16
www.controltemp.es
informacion@controltemp.es

Sweden

System Technology
Phone: +46 (0) 13 35 70 30
Fax: +46 (0) 13 14 05 30
www.systemtech.se
sales@systemtech.se

Switzerland

Spirig
Phone: +41 (0) 55 222 6900
Fax: +41 (0) 55 222 6969
www.spirig.com
support.world@spirig.com

Turkey

Metroloji Okulu
Phone: +90 (0) 216 308 41 08
Fax: +90 (0) 216 308 41 13
www.metrolojiokulu.com
okul@metrolojiokulu.com

Ram Olcu ve Kontrol Sistemleri Dis Tic. Ltd. Sti.
Phone: +90 (0) 212 320 0995
Fax: +90 (0) 212-320-0996
www.ram-limited.com
info@ram-limited.com

United Kingdom

Wessex Power
Phone: +44 (0) 1202 723000
Fax: +44 (0)1202 723400
www.wessexpower.com
SGTtemp@wessexpower.co.uk

Worldwide Sales Support

Middle East

Israel

Instrumetrics Engineering LTD.
Phone: +972 9 7645820
Fax: +972 9 7645821
www.instrumetrics.com
sales@instrumetrics.com

Saudi Arabia

BP Solar
Phone: +966 (0) 1 265 1573
Fax: +966 (0) 1 265 1556
asim@bpsarabia.com.sa

North America

United States

MadgeTech, Inc
World Head Quarters
Phone: (603) 456 2011
Fax: (603) 456 2012
www.madgetech.com
sales@madgetech.com

Canada

MadgeTech Canada, Inc. (Montreal) Corporate Office
Phone: (514) 267-3545
Fax: (450) 679-6480
www.madgetech.com
sales@madgetech.com

Alberta

Optimum Energy Products
Phone: (403) 256-3636
Toll Free: 877-766-5412
Fax: (403) 256-3431
www.optimumenergy.com
info@optimumenergy.com

Thermo-Kinetics
Phone: (403) 252-2522
Fax: (403) 252-2778
www.thermo-kinetics.com
dataloggers@thermo-kinetics.com

Thermo-Kinetics
Phone: (780) 448-1580
Fax: (780) 463-5164
www.thermo-kinetics.com
dataloggers@thermo-kinetics.com

British Columbia

Thermo-Kinetics
Phone: (604) 231-0711
Fax: (604) 270-3644
www.thermo-kinetics.com
dataloggers@thermo-kinetics.com

Ontario

Thermo-Kinetics
Phone: (905) 670-2266
Fax: (905) 670-8530
www.thermo-kinetics.com
dataloggers@thermo-kinetics.com

Quebec

Thermo-Kinetics
Phone: (514) 856-0370
Fax: (514) 856-0373
www.thermo-kinetics.com
dataloggers@thermo-kinetics.com

South America

Mexico

Logicbus
Phone: +52 (01) 33 3823-4349
Fax: +52 (01) 33 3854-5975
www.logicbus.com.mx
ventas@logicbus.com.mx

Measuring and Recording Real Data
Around the world...

And Beyond.

MADGETECH
WE BUILD DATA LOGGERS