Gem Recorder & Alarm

Installation Guide

Care and Use Guide

GDMCS

Congratulations!

Your Gem Recorder and Alarm is a high-quality instrument built into your refrigerator/freezer to protect the contents and maintain an exact record of the temperature history. It will store over 1.5 years of temperature history.

Sensor Accuracy:
The Gem Recorder & Alarm display-unit logs and displays information that it retrieves from its sensors. The sensors are accurate for the temperatures being measured but may over time (two or three years) decrease in accuracy. To insure that they remain accurate you should recalibrate them (see *Calibration Procedures*) every 1 to 2 years.

Power:
The Gem Recorder and Alarm uses a power adaptor, which plugs into a socket on the top of your Gem refrigerator. Each Gem Recorder and Alarm also has a 9vdc battery, to ensure that the Gem Recorder and Alarm will operate for at least 48 hours during a power failure.

If a power failure does occur, the LCD display will automatically go to sleep 20 seconds and a pulsing alarm will begin to ring, after it switches to battery power. Having the display go to sleep is normal and increases the life of the battery.

If normal power is missing, the power light, which normally glows a bright green, will still glow very faintly. This is an indication that the unit is still collecting data and is being powered by the 9vdc batter. If the 'Missing AC alarm' is activated, the internal buzzer will beep in 1-second intervals for 10 minutes every 2 hours. This will continue until wall power is restored.

During a power outage the user can verify that the unit is collecting data by pressing the '**ENT**' key. This will wake up the display for 20 seconds so that the chart can be seen. Note: Repeatedly pressing the '**ENT**' key will put a large drain on the 9vdc battery and shorten its life.

Internal Alarm & Relay:
The Gem Recorder & Alarm has an internal buzzer and an external relay that will be triggered if the temperature becomes too warm or too cold. The internal alarm is a pezio buzzer similar to one used in a microwave. The external relay is a dry-contact normally open (N/O) relay that can be used to trigger a phone dialer, external alarm or building alarm alert system.

Factory Service and Returns:

Please call for a return authorization (RA) prior to sending any instrument for repairs. (see page 31 for warranty information).

Table of Contents

Components and Packing List

Your Gem Recorder & Alarm is built into your Gem Refrigerator and the sensors are in place within the cooler and/or freezer cavity.

You should have received:
1. A normal sized CD which contains:
    a. Calibration Procedures
    b. This Users Guide
    c. Alarm behavior description sheet
    d. Copy of the PC download software
2. A small-sized CD with drivers for the PC interface cable.
3. A 9 volt battery

The PC download software can be copied from the CD, or downloaded from our web site at: http://www.2dillc.com/PC-software/PC_software.html

You will be asked for a user name and password.
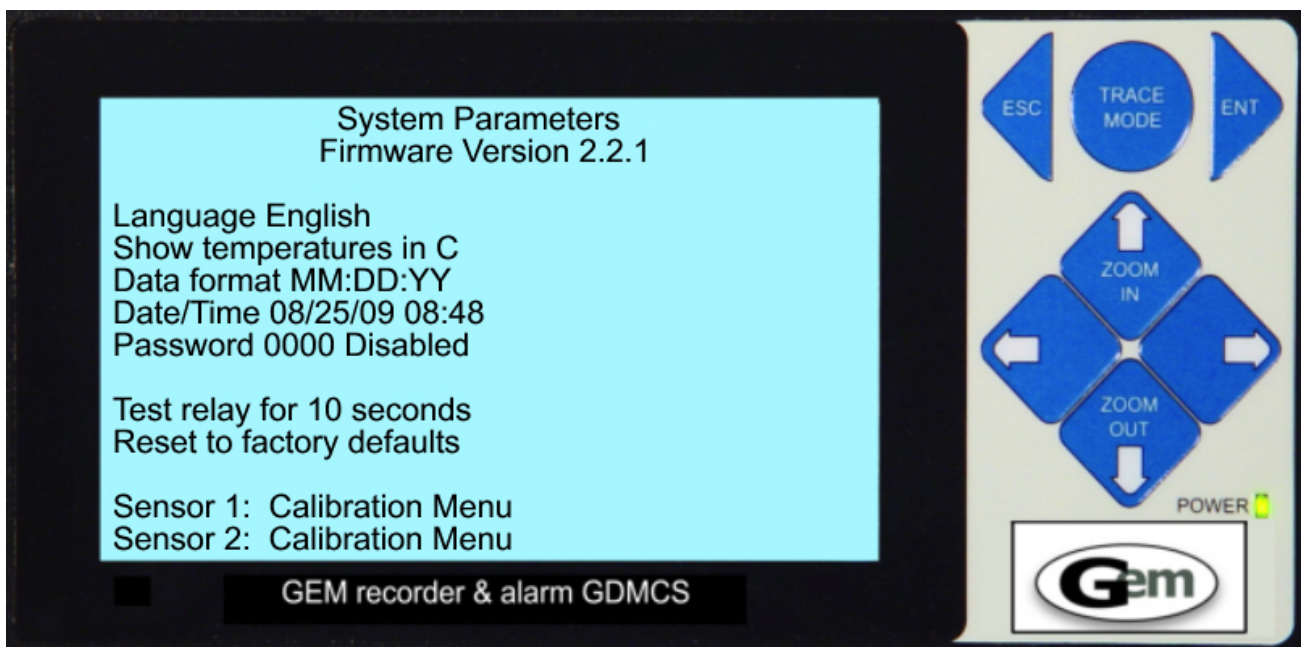
Username: 2di
Password: 6901

Quick Start

Your Gem Recorder and Alarm will begin operating when the
refrigerator/freezer is plugged into the wall power.

1. **Remove the protective film on the display.**
2. **When the System Parameters menu comes up.** Use the '**ENT**' key to move to the
   Date/Time field and scroll in the correct date and time with the **'UP'** and **'DOWN'** arrow
   keys pressing '**ENT**' each time. (When you leave this menu, you will be warned that all data
   will be erased. Select 'yes' and press '**ENT**'.
3. *You can also enter a password, on this menu, and enable it to keep others from accessing the
   menu system.* **Record the password.** *If you forget it, there is no way to recover it without
   loosing all collected and stored data.*
4. Press the **'ESC'** key twice to return to the chart display screen. (**Note:** you do not need to
   access any of the other fields at this time).

5. **Install the 9vdc battery.** Plug the 9-volt battery into the battery connector and attach the
   battery to the back of the top panel of the refrigerator. You will have to reach over the top of
   the front panel on the right side of the alarm for this.
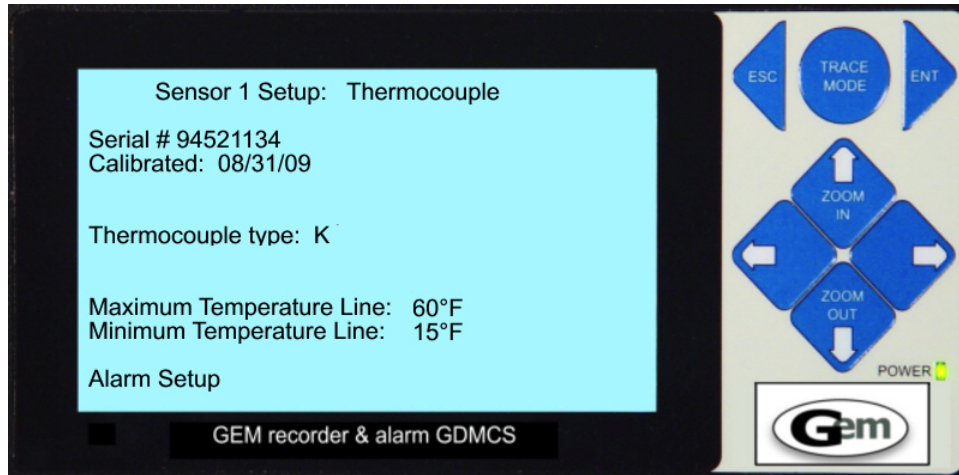6. Gently **pull out the thin plastic strip** at the upper left side of the display unit.

 Operational Tip: *Never replace the battery if the power light is not a bright green or allow
the battery to completely discharge, as data loss will occur.*

7. **To change the sensor settings:**
   a. Your Gem Recorder and Alarm is preset for your refrigerator and freezer. Your sensor actually sense the temperature every 5 seconds and records the temperature every 10 minutes (to eliminate false alarms from the door being open or during a defrost cycle). You can change the temperature reference line (the 'Y' axis of the chart) on the chart display if desired by following the procedure below.

   i. **Press** the 'ENT' key to enter the menu system
   ii. **Select** the correct sensor setup menu (sensor 1 or sensor 2) with the 'right arrow key' and press 'ENT'. The screen will look similar to the picture above.
   iii. **Set the Maximum and Minimum temperature lines**. These are the limits of the displayed chart. They are not the limits of the temperatures that can be collected, but are upper and lower chart display limits. Note: Temperatures that fall outside these limits will appear as a straight line at the top and bottom lines of the chart. Press 'ENT' after each setting.
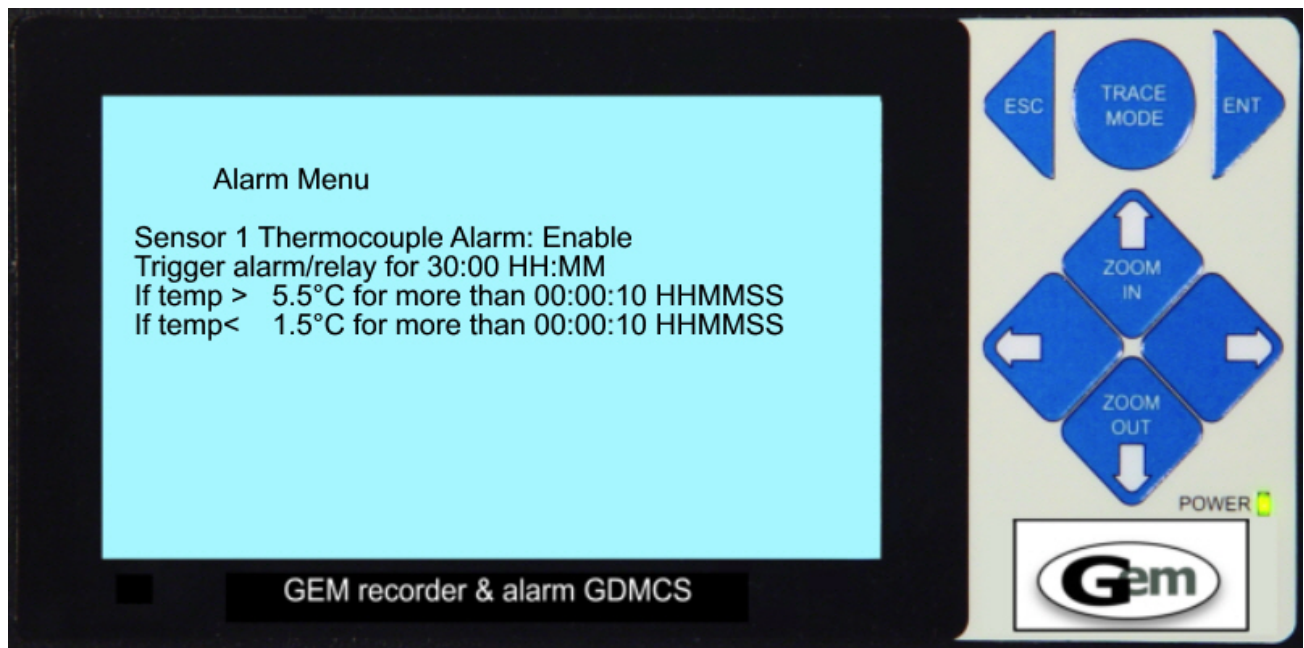   iv. Press **'ESC'** to return to the display screen.

Operational Tip: *The UP and DOWN arrow keys are used to scroll through possible setting in each data field. Once you select a value, press the 'ENT' key to enter it.*

8. To change alarm settings.

The alarm menu for each sensor can be accessed through each sensor's setup menu.

Warning: Your alarms are preset to become active four hours after the refrigerator/freezer begins operating. Do not go to the alarm menu (even if you do not change anything) before the period expires. If you do the alarm will not automatically enable after four hours and you will have to enable it manually.

The alarm menu

Alarm Menu		
Setting	*Choice*	*Impact on Gem Recorder and Alarm Operation*
Relay	Enable | Disable	Enables or disables the alarm settings that follow
00:00	MM:SS	Duration of buzzer and relay closure (00:00 for indefinite)
If temp > °	Temperature	High temperature trigger point
xx:xx:xx	HR:MM:SS	How long the temperature must remain before triggering alarm
If temp< °	Temperature	Low temperature trigger point
xx:xx:xx	HR:MM:SS	How long the temperature must remain before triggering alarm

Operational Tip: *Leave the Trigger Relay setting at 00:00 to have the alarm ring continually until manually shut off by pressing the ESC key or the temperature returns to a safe temperature.*

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Alarm Behavior:

The alarm is triggered once the measurement has moved outside the 'safe' zone for the set period of time, as defined on this alarm setup menu.

When an alarm is triggered several things happen:
1. The internal alarm begins to 'ring'
2. The external relay closes
3. The alarm condition flashes on the screen
4. A capital letter 'A' is printed on the chart.

Note: The clock that controls the alarm is different than the one that controls the logging of data. You could get an alarm and see an 'A' and 'a' on the chart display but you may not see a high temperature recorded on the chart if the data store rate is less frequent than the alarm interval.

Your Gem Recorder and Alarm is preset to ring if temperature moves out the safe zone for more than 15 minutes.

Once triggered, the alarm will stay on until one of the following conditions occurs:

1) A single measurement is taken that is within the safe parameters. At this point, the alarm timer resets so that the alarm condition must be violated for the amount of time specified in the alarm menu again before the alarm is triggered again. *Note Even a single safe measurement will stop the alarm, open the relay and cause the alarm timer to reset.*

2) The user presses the 'ESC' key.
   a. The buzzer is silenced
   b. The relay is opened
   c. A small letter 'a' is printed on the chart
   d. The alarm timer is reset.

For example, if the alarm is set to trigger when the temperature rises above 5.5°C degrees for 15 minutes and the temperature rises above 5.5°C degrees for 15 minutes the alarm will sound and the relay close. The user then presses the ESC button. The timer is now reset to 15 minutes. Only if the temperature remains or again rises above 5.5°C degrees for another 15 minutes, will the alarm be triggered again.

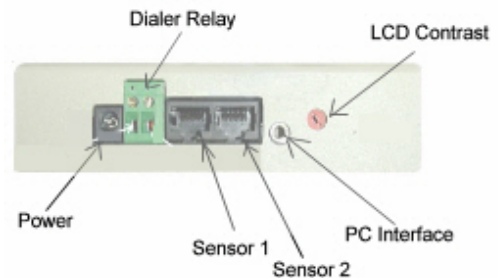3) The alarm trigger timer expires.

Assume that an alarm is set to trigger for 30 minutes when the temperature rises above 5.5°C for 15 minutes. If the temperature does not drop below 5.5°C the alarm will sound for 30 minutes and then stop. If the temperature is still above 5.5°C fifteen minutes after it stops it will begin again.
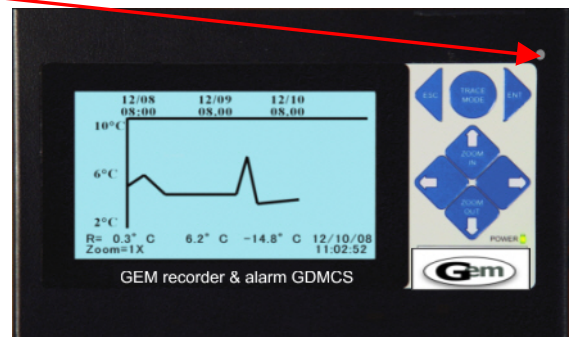
Power, Sensors, and Data Connections

The end view shown here is hidden behind the top panel of your refrigerator/freezer. If you look over the top of the panel you will see these connections.

1. **PC Interface -** PC interface cable socket for downloading data.

2. **Sensor one socket** (closest to the green relay)

3. **Sensor two socket** (closest to the top of the unit).

4. **Power Receptacle -** Wall adapter supplies 15vac 700mA *or* 15vdc 700mA.

5. **Reset Switch -** The reset switch may be pushed with a straightened-out paper clip to correct the following problems.

> a. If the Gem Recorder and Alarm is unplugged from power and the 9vdc battery is allowed to discharge below 6 volts, the display may not wake up when wall power is restored or a new 9vdc batter is inserted. Replace or remove the 9vdc battery first before pressing the reset switch.

b. If a power spike occurs it may 'scramble' the displayed data. Pushing the reset button will often repair this.

6. **External Relay –** The relay can be used to trigger an external alarm, an auto dialer, a light or any other separate alarm component. It is a dry contact relay and does not supply any power. It is protected by a 0.5 amp fuse, so should never be exposed to more than 1/2 of an amp (100 mA) current. This relay has two parts. One part is permanently affixed to the board inside the Gem Recorder and Alarm. The other part can be unplugged by pulling outward for easier access.

The screw-type connectors should be tightened down on the wire that connects an alarm or auto dialer to the relay to insure a good connection.

User Controls

The Gem Recorder and Alarm is equipped with seven buttons for User Controls, with which the user interfaces with the Gem Recorder and Alarm. Each of the seven buttons performs some function depending on which mode or menu is active (see page 14 for an explanation of the modes).

For example, if the cursor is positioned over a setting on a menu push the **UP** arrow button to increase the value of the setting. Holding the **'UP'** arrow button down causes the setting to scroll faster.   If you continue to hold the button after the first speed increase, the scroll rate will speed up again so that you are scrolling through 10 numbers at a time.
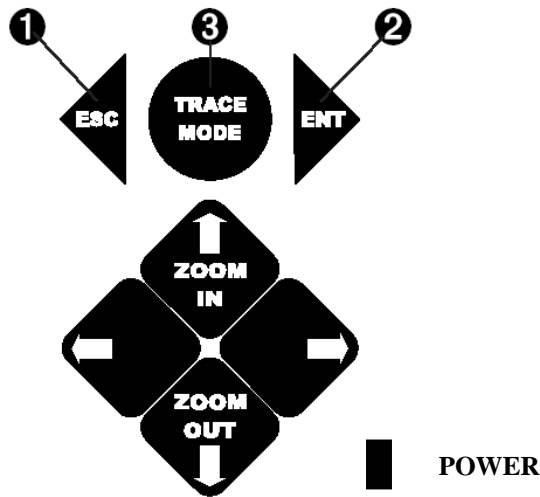
i.e. If you are trying to enter 200°C as the maximum chart display line on a sensor menu, you could either push the **UP** *arrow button 200 times or you could hold down the button for several seconds while the temperature scrolls to 200°.*

Likewise is you are trying to enter 2000° continue to hold down the button until the temperature begins to scroll much more rapidly. As you continue to hold down the button the temperature setting will begin to scroll 10 degrees at a time.
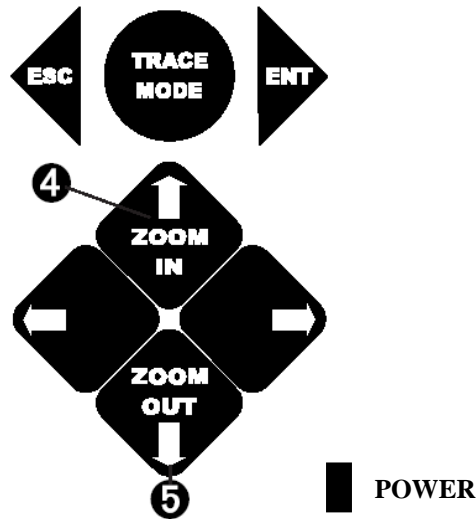
Each button performs multiple functions depending on what is displayed on the screen. These are explained in detail on the pages that follow.

Operational Tip: *Holding down the 'UP ARROW' or "DOWN ARROW" button causes the scroll rate to increase.*

1. The **ESC** key performs several functions depending on the Gem Recorder and Alarm mode.
   a. In the *Active Mode* the **ESC** key toggles the display mode between different displays.
   b. In the *Menu Mode* the **ESC** key exits the current menu.
   c. In the *Trace Mode*, the **ESC** key exits the *Trace Mode*.
   d. In the *Sleep Mode* the **ESC** key is inoperable and does nothing.
   e. During an *Alarm* condition the **ESC** key will shut off the alarm and open the relay.

2. The **ENT** key performs several functions depending on the Gem Recorder and Alarm mode.
   a. In the *Active Mo*de the **ENT** key causes the unit to enter the Menu Mode.
   b. In the *Menu Mode*, the **ENT** key moves the cursor to the next field **and saves** the setting just entered.
   c. In the *Trace Mode* the **ENT** key brings up the main menu.
   d. In the *Sleep Mode* the **ENT** key awakens the display for 20 seconds.

3. The **TRACE MODE** key is only active during the *Active Mode*.
   a. In the *Active Mode* the **TRACE MODE** key enters the *Trace Mode*.
   b. In the *Menu* Mode the **TRACE MODE** is disabled.
   c. In the *Trace Mode* the **TRACE MODE** is disabled.
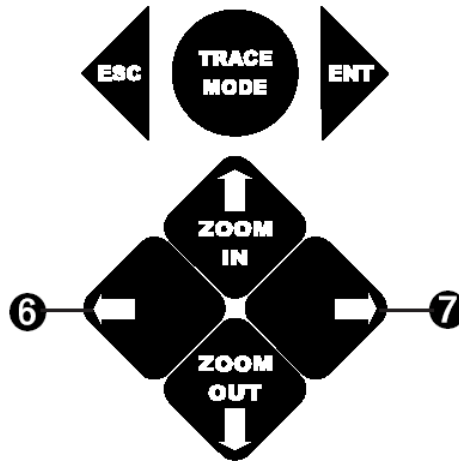   *d.* In the *Sleep Mode* the **TRACE MODE** is disabled.

4. **UP** arrow or **ZOOM-IN** key
   a. In the *Active mode* the **UP** arrow zooms into displayed data causing the amount of displayed data to be cut in half. For example, if the current chart was showing 9 days and the **UP** arrow key is pushed once the chart will show 4.5 days (See FAQ on page 30 for more information).
   b. In the *Menu Mode* the **UP** arrow scrolls through choices for a highlighted field.
   c. In the *Sleep mode* the **UP** arrow is disabled.

5. **DOWN** arrow or **ZOOM-OUT** key
   a. In the *Active Mode* the **DOWN** arrow doubles the amount of displayed data when pressed. For example, if the current chart was showing 9 days and the **DOWN** arrow key is pushed once the chart will show 18 days. (See FAQ on page 29 for more information).
   b. In the *Menu Mode* the **DOWN** arrow scrolls through choices for a highlighted field.
   c. In the *Sleep mode* the **DOWN** arrow is disabled.

6. **LEFT** arrow key
    a. In *Active Mode* the **LEFT** arrow scrolls one screen to the left, displaying older data.
    b. In the *Menu Mode* **LEFT** arrow moves the cursor to the preceding field. Note: The entry is not saved. If you have changed the value displayed in a field, pressing the **LEFT** arrow will move the cursor to the next field but the changed value will not be saved. To save a changed value you must use the **ENT** key to move to the next field.
    c. In the *Sleep Mode* the **LEFT** arrow is disabled.
    d. In the *Trace Mode*, pushing the **LEFT** arrow key causes the vertical line on the display to move to the left to highlight a different measurement.
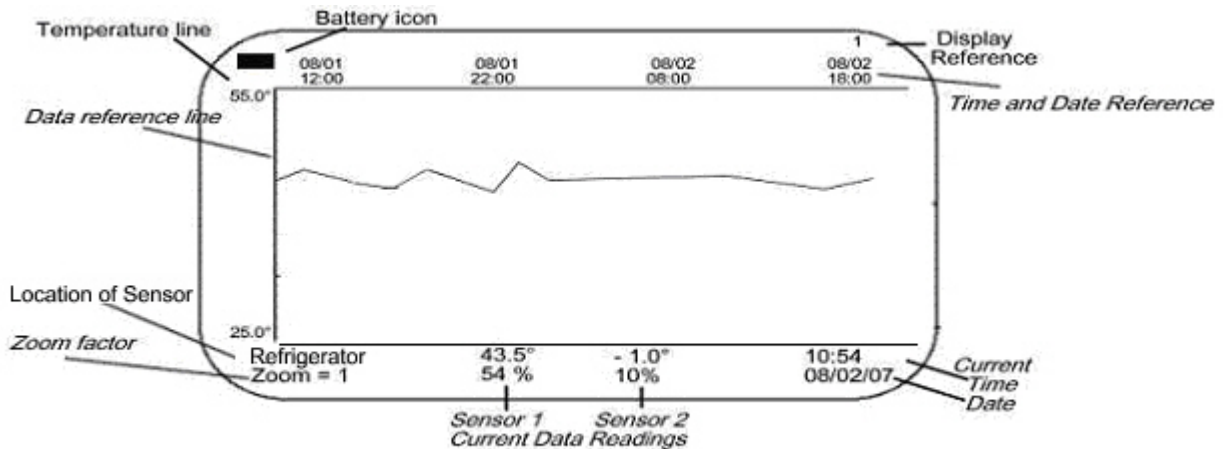

7. **RIGHT** arrow key
    a. In the *Active Mode* the **RIGHT** arrow scrolls one screen to the right showing newer data.
    b. In the *Menu Mode* the **RIGHT** arrow causes the cursor to move to the next field. Note: The entry is not saved. If you have changed the value displayed in a field, pressing the **RIGHT** arrow will move the cursor to the next field but the changed value will not be saved. To save the changed value use the **ENT** key to move to the next field.
    c. In the *Sleep Mode* the **RIGHT** arrow is disabled.
    d. In the *Trace Mode*, pushing the **RIGHT** arrow key causes the vertical line on the display to move to the right to highlight a different measurement.

Operational Modes

The Gem Recorder and Alarm has four operational modes: *Active; Menu; Sleep; and Trace.*
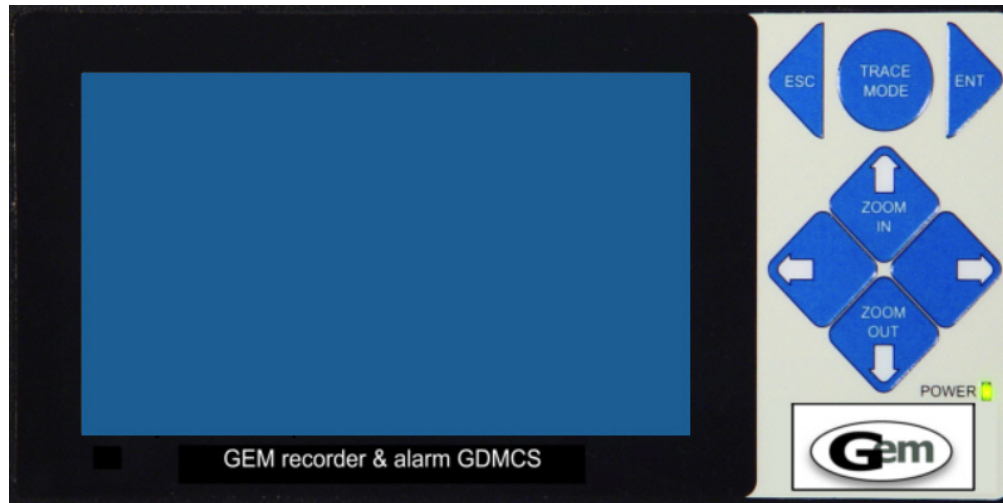

Active Mode

1. A chart is displayed on the LCD.

2. The temperature line is the Maximum temperature displayed on the chart and can be set in each Sensor's Setup Menu. (There could be recorded temperatures above this line).

3. The Battery Icon indicates the amount of charge in the 9-volt battery. The battery should be replaced at least annually or whenever the icon shows ½ full. The display will begin to blink when the battery is in danger of being fully discharged and therefore not capable of protecting your data.

4. The display reference shows the sensor number and variable being monitored (i.e. 1T for temperature sensor #1, 2T for temperature sensor #2.

5. The time and date reference lines refer to the date and time the data was recorded.

6. The bottom two rows of the display show the chart legend, the current sensors readings along with the current date and time. (See FAQ on page 29 for an explanation of the Zoom feature)

Note: *Newly collected data rolls over older data so that only the latest measurements for each sensor are displayed and stored in the Gem Recorder and Alarm. If you are sampling data every 10 minutes the last 1.5 years of data will be stored and can be viewed.*
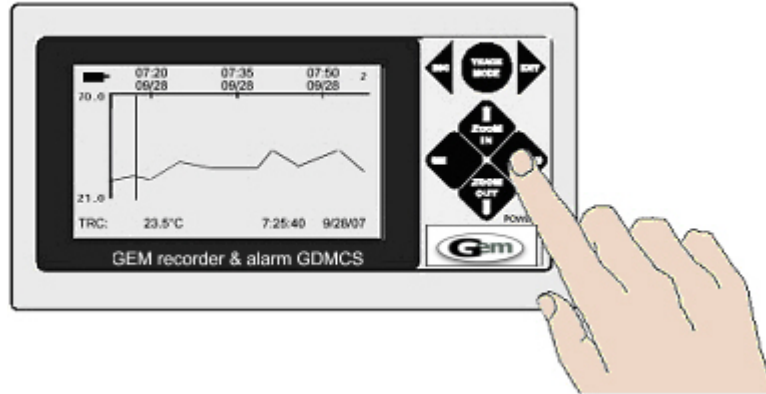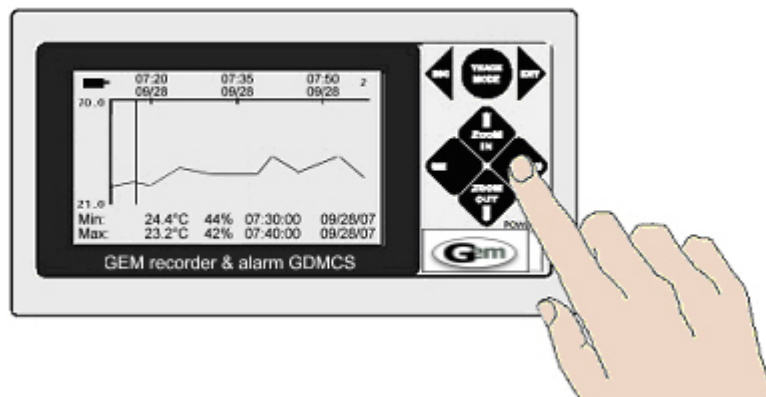
Sleep Mode

1. In the *Sleep Mode* the display (LCD) is asleep (blank). The Gem Recorder and Alarm automatically enters this mode if normal power is missing for 20 seconds to conserve your battery and maximize the time it will continue to operate the system. *The Gem Recorder and Alarm will still collect data during the sleep mode* and the display can be 'awakened' for twenty seconds by pressing the **ENT** key.

2. Only the **ENT** button is active in this mode. None of the other buttons will respond during the sleep mode. If the display is left asleep the 9vdc battery will power the Gem Recorder and Alarm for several hours (up to 48 hours depending on the user settings).

3. Alarms will still be triggered during the sleep mode and any visual warnings will display as normal.

Trace Mode

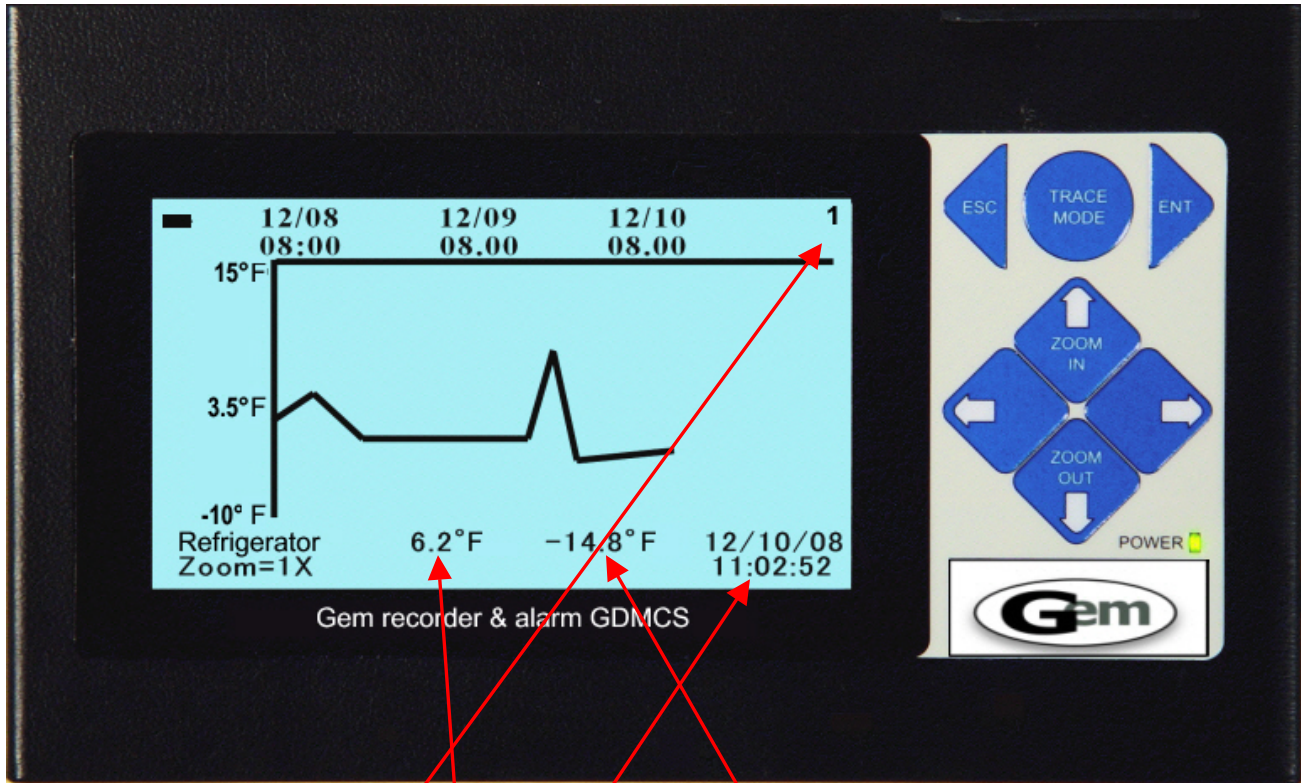*1X Trace Mode*

2x – 10x Trace Mode

1. *Trace Mode* allows the user to see any recorded temperature with the time it was recorded. When '**TRACE MODE'** is pressed a vertical line appears on the display. The **LEFT** and **RIGHT** arrow keys will move the vertical line left or right to highlight any recorded temperature and the time it or they were recorded. The recorded temperatures are shown on the bottom line of the display along with the times they were recorded.

    There are two different modes in the Trace Mode.

    a. Zoom = 1X (see top photo above) the temperature indicated by the vertical line will be shown along with the day and time that the temperature was recorded, on the bottom line of the display.

    b. If the display is zoomed out to Zoom=2X (see bottom photo above) or more, the maximum, and minimum temperature displayed in the column indicated by the vertical line will be shown with the date and time each was recorded. (See FAQ on page 29 for more information).

Viewing the chart on the LCD display

Display Reference (upper right corner of the display)

The small letter and/or number in the upper right hand corner of the LCD indicates what data is being displayed.

To change to a different display, press **ESC**. The display will flip back and forth between your refrigerator and freezer.

Current Date and Time
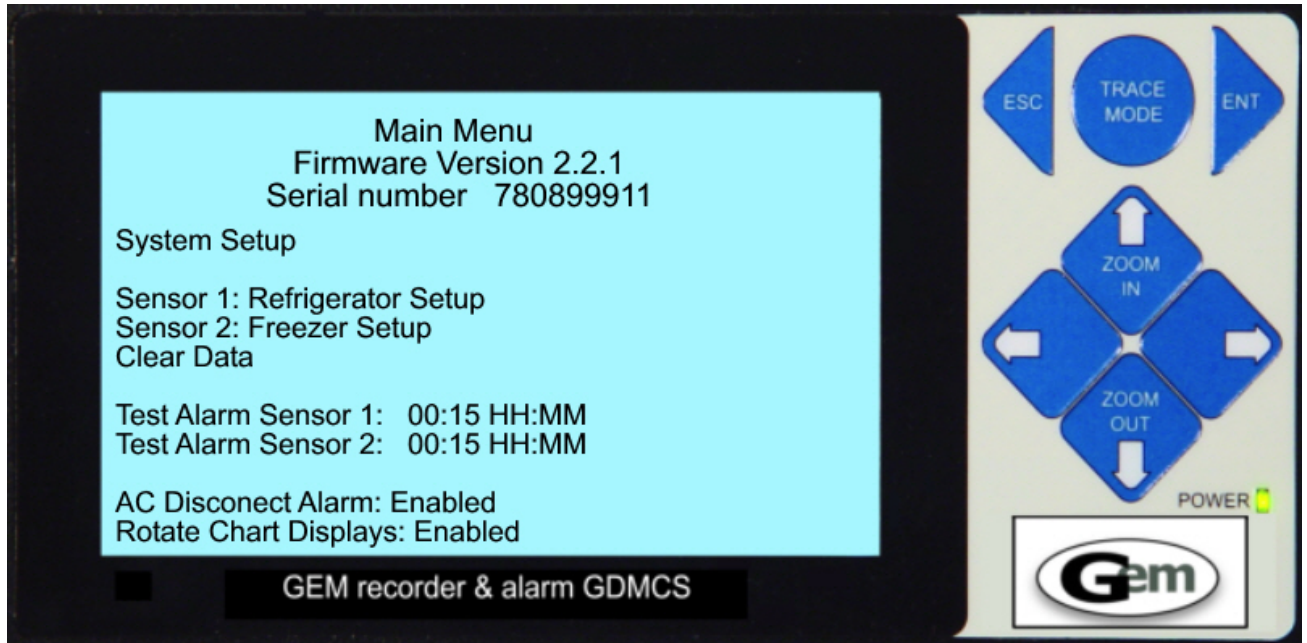
Current temperature of sensor 1   Sensor 2 current temperature

Display Reference	What is being shown
1	Sensor 1–temperature
2	Sensor 2-Temperature

Menu mode

Main menu

Main Menu Firmware Version x.x.xx	
Field	*Select to*
System Setup	Open the System Parameter Menu
Sensor 1: Setup	Open the setup menu for #1 sensor
Sensor 2: Setup	Open the setup menu for #2 sensor
Clear Data	Clear all stored data for both sensors and the charts
Test Alarm Sensor 1: 00:00 mm:ss Begin	Puts a "T" and a "t" on the #1 sensor chart, indicating a test was being conducted between this time.
Test Alarm Sensor 2: 00:00 mm:ss Begin	Puts a "T" and a "t" on the #2 sensor chart, indicating a test was being conducted between this time.
AC Disconnect Alarm: Enabled	Turns on the alarm to alert the user if AC power is missing
Rotate Chart Displays: Enabled	The display rotates back and forth between the refrigerator and freezer every 60 seconds. This feature can be turned off with this selection

System Parameters

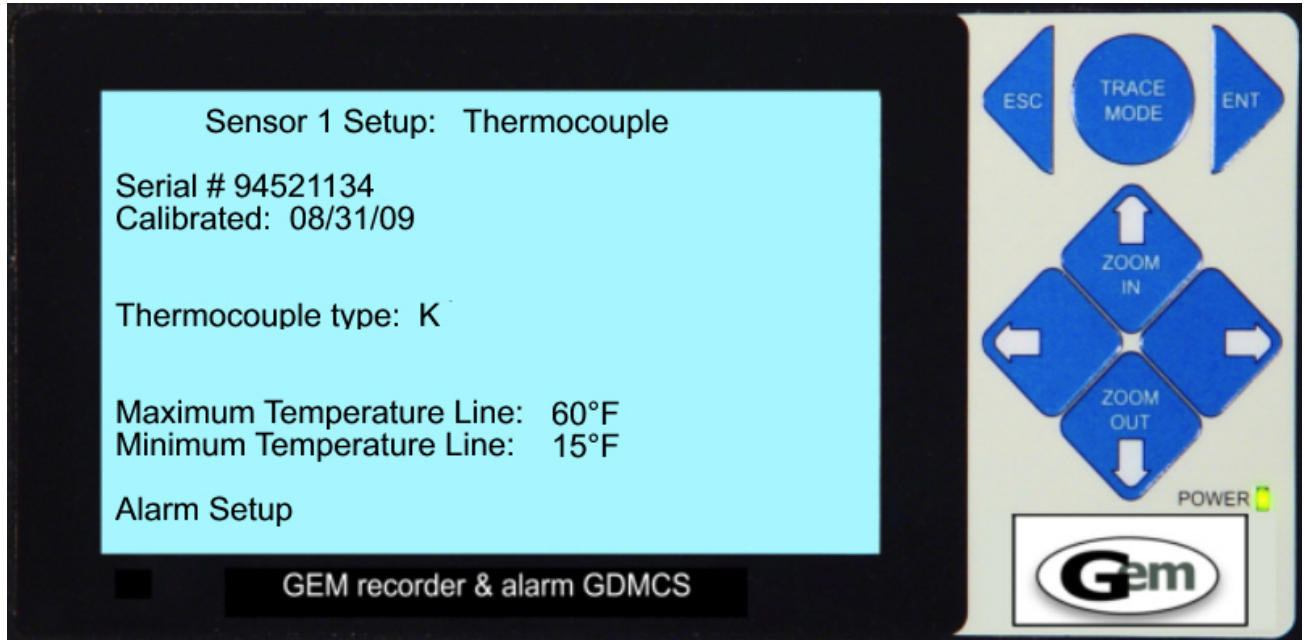

<table>
<tr><th colspan="3">System Parameters
Firmware Version x.x.xx</th></tr>
<tr><th>Setting</th><th>Choice</th><th>Impact on Gem Recorder and Alarm Operation</th></tr>
<tr><td>Language</td><td>English | French | Spanish</td><td>Selects the language for all menus and displays</td></tr>
<tr><td>Show temperature in</td><td>°C | °F</td><td>Selects the scale for all temperatures for all menus and displays</td></tr>
<tr><td>Date Format</td><td>mm/dd/yy | dd/mm/yy | yy/mm/dd</td><td>Selects the date format for all menus and displays</td></tr>
<tr><td>Date Time:</td><td>xx/xx/xx   xx:xx</td><td>***Sets the system clock***</td></tr>
<tr><td>Password</td><td>0000   Enable | disable</td><td>Creates a password and enables it to protects the menu system</td></tr>
<tr><td>Test alarm & relay for 10 sec</td><td>(Highlight and press **ENT**)</td><td>Closes relay and sounds the buzzer</td></tr>
<tr><td>Reset to factory defaults</td><td>(Highlight and press **ENT**)</td><td>Resets all menu settings to default and erases all stored data.</td></tr>
<tr><td>Sensor 1: Calibration Menu</td><td>(Highlight and press **ENT**)</td><td>To enter calibration table for sensor 1</td></tr>
<tr><td>Sensor 2: Calibration Menu</td><td>(Highlight and press **ENT**)</td><td>To enter calibration table for sensor 2</td></tr>
</table>

Operational Tip: *In order for a change to take effect, the **ENT key** must be pressed.*

Sensor Setup Menu

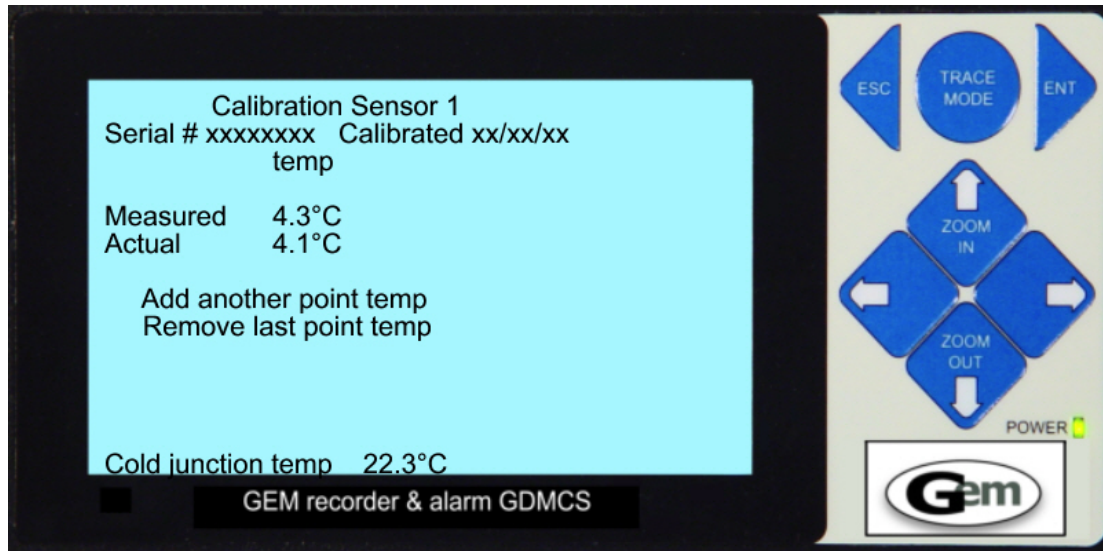Changes the way temperatures are displayed on the chart display.

Sensor X Setup: Temperature		
Setting	*Choice*	*Impact on Gem Recorder and Alarm Operation*
Thermocouple type	J,K,E,T,R,S	Your thermocouple is type K. This must not be changed unless a different type of thermocouple is substituted.
Maximum Temperature line	(-) xxxx°F/°C	Sets the top line on the display chart
Minimum Temperature line	(-) xxxx°F/°C	Sets the bottom line on the display chart
Alarm Setup	ENT or skip	Used to set the alarm parameters for this sensor

Operational Tip: *Changing the type of sensor will cause any data already collected and stored in RAM memory to be erased.*

Calibration Menu

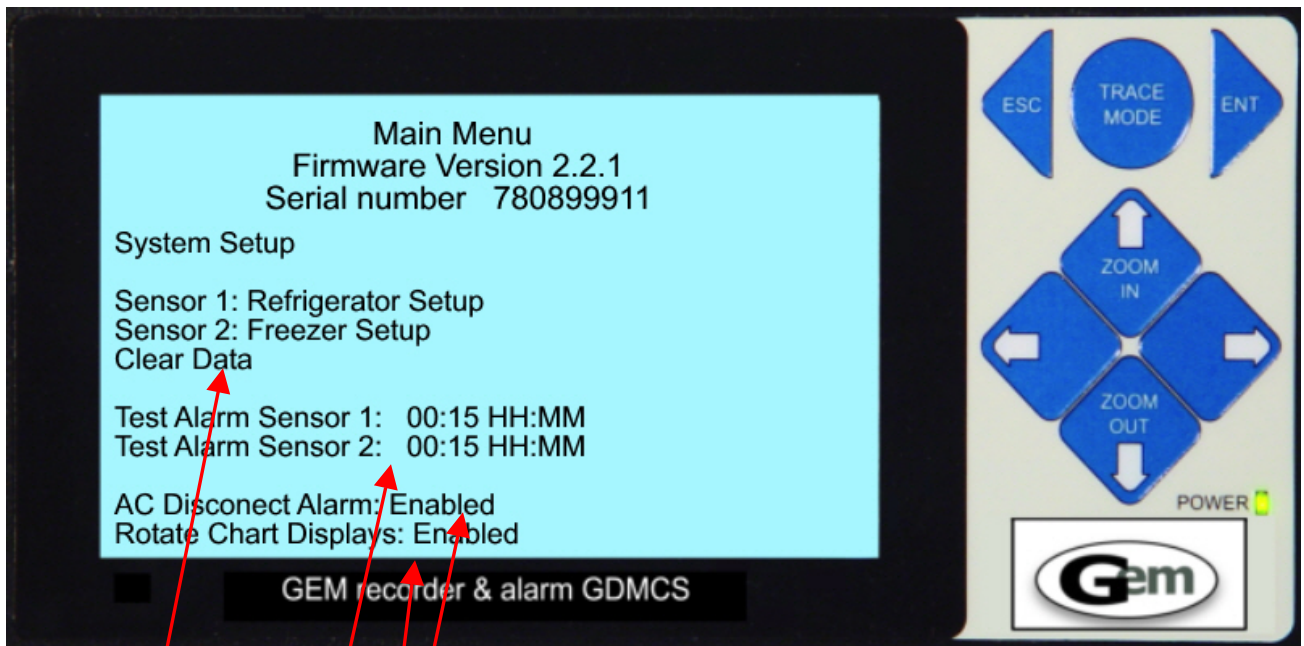| Calibration Menu:		
Setting	*Choice*	*Impact on Gem Recorder and Alarm Operation*
Measured	The temperature shown on the recorder	Adds or subtracts the difference between the measured and actual values entered here.
Actual	The temperature measured by the Standard	
Add another point Temp	Highlight and press **ENT**	Adds an additional measured and actual point
Remove last point Temp	Highlight and press **ENT**	Removes the last measured and actual point
Cold junction temp	No user input	Used for technical support

Calibration data is stored on sensor I/O module (identified by its serial number) and may consist of :

1.   One point – Every measurement will be corrected for difference between the measured value and the actual or standard value

2.   Two Points – Any measurement will be adjusted by the offset equal to the point on a line drawn between the two points.

3.   Three Points – Any measurement between two point will be adjusted by the value on a line drawn between those two points.

Note: *Suggested calibration procedures can be downloaded from the support page on our web site or the disc that came with the Gem Recorder and Alarm.*

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Additional Settings on the Main Menu

Clear Data – This setting will clear all of the stored data for both sensors. You will receive a warning message and be required to select YES before the data is actually cleared from memory, but **once it is cleared it is gone and cannot be recovered**. It is a good idea to download data before clearing it out of the RAM memory of the Gem Recorder and Alarm.

Test Alarm Sensor 1/2: xx:xx mm:ss   Begin – This places a "T" on the chart indicating that a test is being conducted. When the test concludes after the allotted time a small "t" will be placed on the displayed chart to indicate that the test is over. The default is for a test of 15 minutes but you can set it to any duration up to 23 hours and 59 minutes

> The purpose of this is to allow the user to trigger the alarm by raising or lowering the temperature to verify that the alarm function is actually working ***and*** have that test noted on the Gem Recorder and Alarm display. So, if your procedures require an alarm test every month you will see a set of Ts on the display flanking the rising and/or falling chart caused by changing temperatures during the test. This indication will also appear on a chart that is downloaded to a PC.
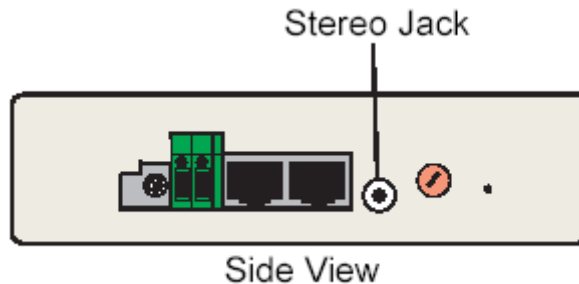
AC Disconnect Alarm – This is enabled by default so that the buzzer will sound intermittently and the relay will close anytime the AC power is disconnected. The buzzer will beep at 1-second intervals for 2 minutes and then again after two hours has elapsed. This will continue until power is restored. If you have an auto dialer attached to the Gem Recorder and Alarm you will get a phone call any time the power fails if this alarm is enabled.

Rotate Chart Displays: The display will show the refrigerator for 1 minute and then show the freezer sensor for 1 minute, etc… This can be disabled if desired.

TView Software Operation

Downloading data

Stereo Jack
Side View

Downloading data to a computer requires the PC interface cable. It connects the Gem Recorder and Alarm to a USB serial port of a computer. The PC download cable is behind the header on top of the refrigerator/freezer unit. It is 12 feet long so you can 'fish' it out of the header and plug it into your laptop.

PC Interface Cable –The first time you plug the cable into your laptop your PC will identify new hardware and assign a virtual serial port address to the cable. Remember what the address is. It will say something like COM 8 or COM 10. To download data you must setup the PC software for COM 8 or COM 10 or whatever virtual com port was assigned. The 'install new hardware' routine may ask for the small CD that came with your unit.

Note the comport assigned so that you can enter it into the setup for the TView software

The downloading process requires the TView software program. This can be installed from the included CD or downloaded from the Technical Support page on the Gem web site. Install this software on the desktop of your laptop. (not some other directory. On the desktop).

To download data from the Gem alarm:
1. Click on the TView icon.
2. After the software opens click on 'Setup'
3. Click on 'serial port'
4. Click on the serial port that was assigned by the USB driver
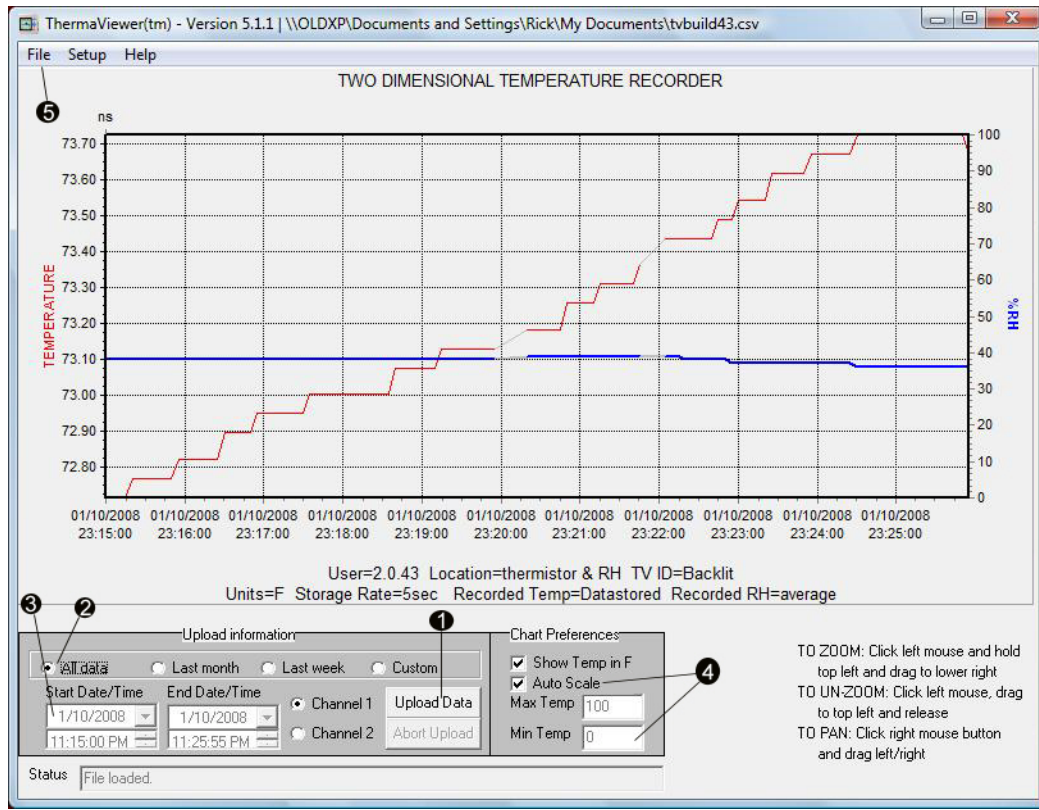5. Click on the 'apply' button.

You are now ready to download the temperature history of your Gem alarm. To do so click on the 'upload data' button after setting the values you desire. (See page 24 of this guide for help).
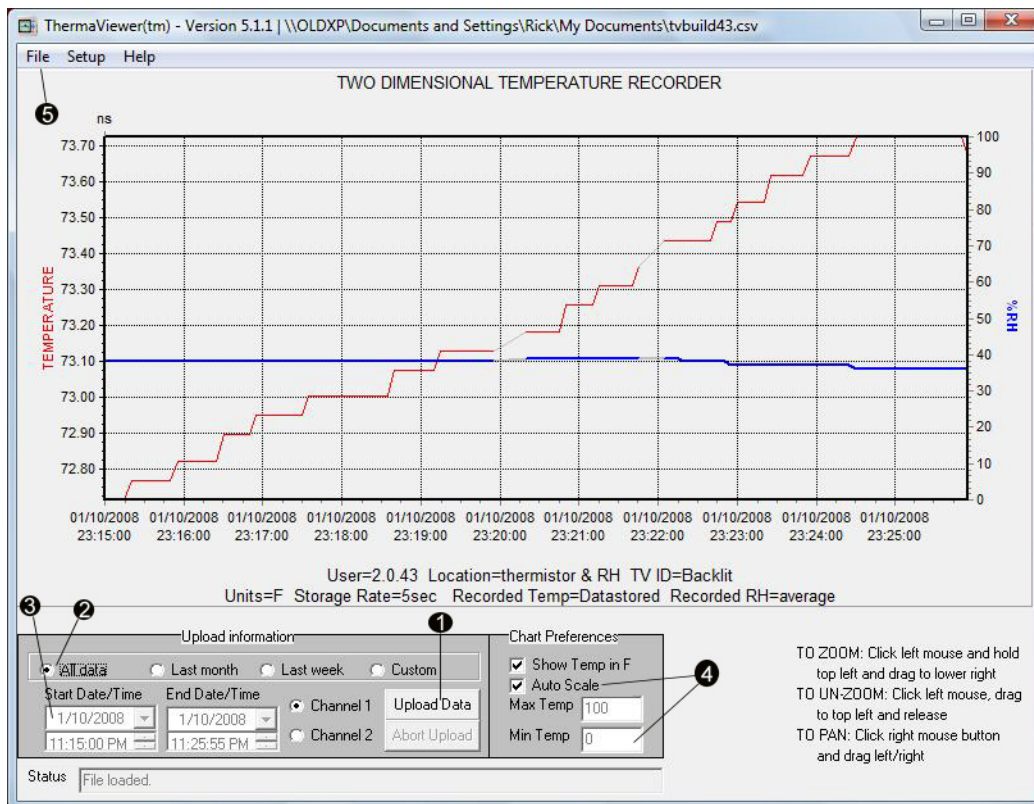
Operational Tip: *Once the software is installed on your computer it must be run from the directory in which it is installed the first time it is run. Do not create a shortcut pointing to a different directory to run the program the first time you run it.*

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TView Software

1. To copy data from the Gem Recorder and Alarm click on the *Upload Data* button (#1 above). To upload the information collected from sensor #2 first click the Channel 2 button and then click the *Upload Data* button.

2. The autorange button is checked by default so that **all stored data** for the selected sensor will be uploaded to the PC and displayed.

3. Clicking on last month, last week, or custom and setting a date range (see 3 above) will cause only that data to be uploaded to the PC and displayed.

4. By default, the TView will scale the display so that the highest value uploaded will be at the top of the chart and the lowest value uploaded will define the bottom of the chart. If the *Auto Scale* button (#4 above) is unchecked, the chart will be redrawn with the Max and Min temperatures that appear in the temperature boxes as the upper and lower limits of the display. Each time this check box is checked or unchecked the temperature chart will be redrawn.
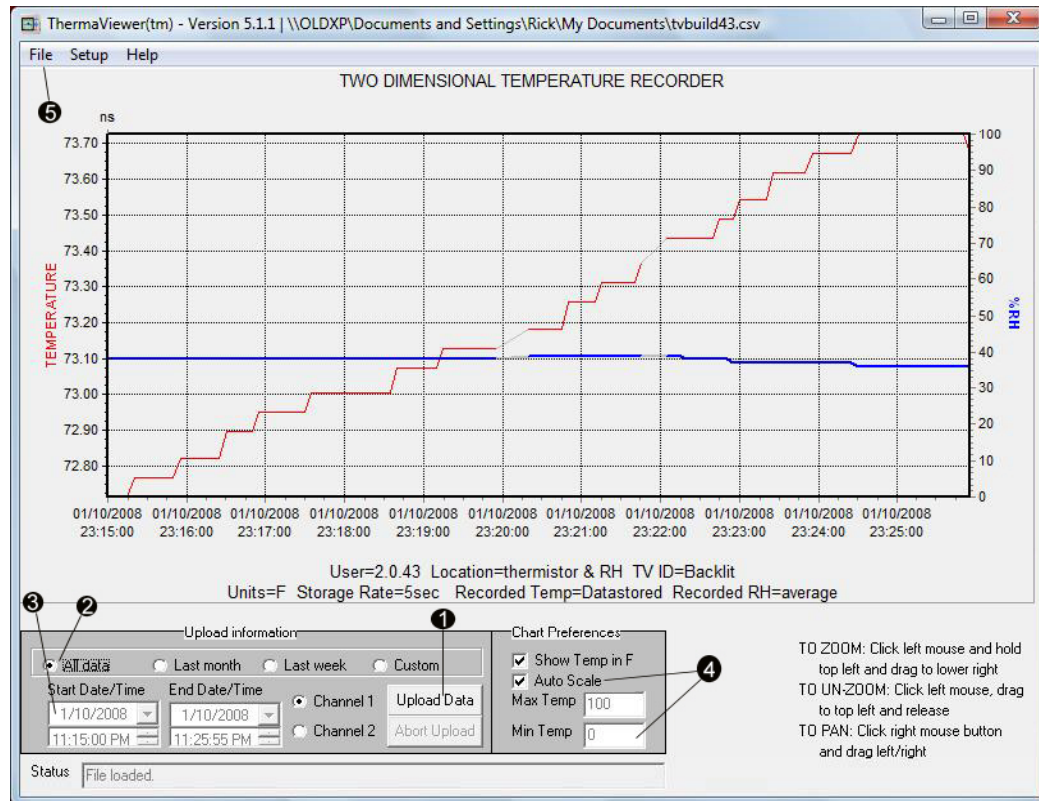
Once the chart has been downloaded to your computer the chart can be moved around or zoomed into to highlight a particular measurement with the computer's mouse.

To highlight a particular set of temperatures draw a box with the mouse. Position the cursor at the top left hand portion of the area you want to zoom into and while holding down the left mouse button draw a box toward the lower right hand corner. When the mouse button is released the chart will be rescaled to highlight the temperatures within the box. To return to a full chart draw a box from the lower right corner to the upper left corner and release.

Drop-down menus

1. The 'File', 'Setup', and 'Help' menus:

   a. File menu
      i. Data displayed on the monitor can be saved to a file on your computer by selecting "Save Chart". <u>If the data is encrypted</u> two files will be saved. One of them will be a CSV file that can be opened with Excel, Word or other program. The 2nd file will be an encrypted file that **<u>cannot</u>** be opened with any program other than the TView program.
      ii. A previously saved file can be loaded into the TView program for viewing by selecting "Load Chart".
      iii. A chart displayed on the computer monitor can be printed with "Print Chart". Only the data displayed on the computer screen will be printed. So if you have zoomed into just one day of temperature that is all that will be printed.

<u>Operational Tip:</u> Files are always saved as CSV files <u>and may</u> also be saved as encrypted files with a TVX extension (see ii security below). CSV files can be loaded into Excel, Word, Notepad, etc… and viewed as a table of data points. Files with the TVX extension can only be opened, viewed, and or printed with the TView program.

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b. Setup menu:

   i. Port: The user selects the COM port to download through. i.e. Com5, Com8…Com10. Insure that the correct virtual COM port is selected so the TView program can see the Gem Recorder and Alarm. If you do not know what COM port the USB cable is set for you can use your 'My Computer' icon to find out: Select 'System Properties' and then 'Device Manager'. Click on the 'Ports' icon and you should see a list of COM ports and what they are assigned to. Note the one to which the USB cable has been assigned and enter that into the setup menu of the download software.

   ii. Security: If the encrypted button is checked, the TView program will save an encrypted file with a TVX extension in addition to a CSV file when data is saved to disk. A file with the TVX extension cannot be read, written to, or printed except with the TView program. This insures that data **cannot** be changed once it is downloaded from the Gem Recorder and Alarm and saved as a file. This satisfies the requirements for the 21 CFR 11 standard. An encrypted file **can only** be loaded into TView for viewing or printing.

   iii. Auto Download: If the TView program is running on the PC it can automatically download data at user-specified intervals. This downloads data from both ports and writes the information to at least two different files on the computer. The file names are prefaced with the month and year of the download with a new file starting automatically at the beginning of each month.

   iv. Date Format: The user can select the format for the date to match that used by his computer or country.

   v. Edit user information: Header information is stored with downloaded data when it is saved as a file. This includes user name, location and Gem Recorder and Alarm id. Filling this out is strictly optional. You can use this for not as you desire.

c. Help: This menu gives access to a diagnostic mode for troubleshooting purposes, which displays the raw data as it is downloaded from the Gem Recorder and Alarm. It is generally only used at the request of a 2di technician.
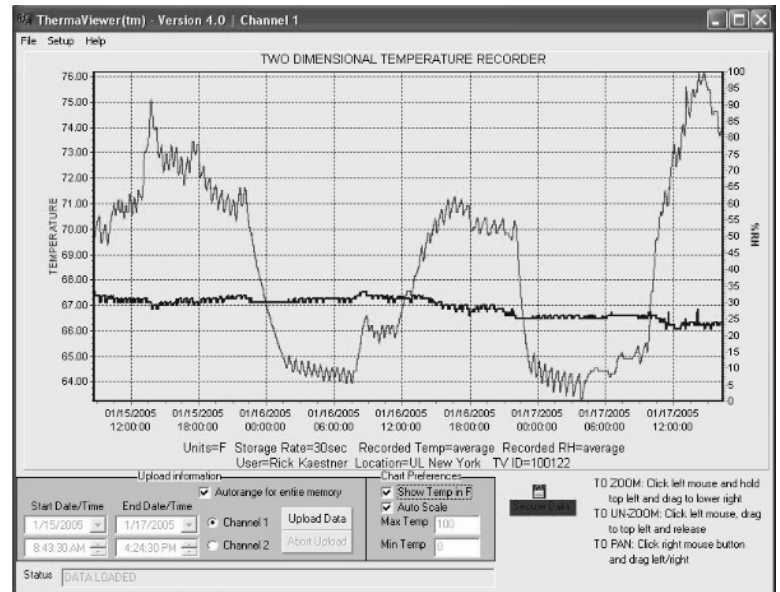
Operational Tip: *Set the date format under the 'setup' menu to agree with the date format being used by the computer for proper downloading.*

The Display

Temperature data displayed in Excel   Temperature and Humidity displayed in TView

You may see one or more red vertical lines on the chart displayed on your PC. The lines are marked

NS: New sensor (A new sensor was plugged in and the new data was added to the old data)

TAS: Temperature alarm start

TAE: Temperature Alarm End

TB: Test period begin

TE: Test Period End

Note: If you see a lot of NS lines it indicates the sensor has a questionable connection. Check both ends of the sensor cable to determine if one of them is loose.

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FAQ

1. Can I tell if an alarm was triggered by looking at the display?
   a. Yes – Any time an alarm was triggered a large "A" is placed on the chart at the time the alarm begins and a small "a" at the time the alarm was silenced or expired.

2. Can alarms be triggered during the test mode?
   a. Yes – The purpose of the test mode is to demonstrate that the alarms are working correctly. When a test mode begins, a large "T" is placed on the chart of the sensor being tested. A small "t" appears when the test concludes. If an alarm was triggered while in Test Mode the T t set will bracket the A and a of the alarm indication.

3. Is there a calibration procedure available?
   a. Yes – the calibration procedure can be downloaded from our web site or from the CD that came with your Gem Recorder and Alarm, so that your metrology department or outside calibration service can characterize any sensor.

4. What do the Zoom-out and Zoom-in buttons do?
   a. The amount of data displayed in the chart on the Gem Recorder and Alarm display unit differs according to the Zoom setting. A data point is plotted in each column if the chart is zoomed in completely (Zoom =1X).
   b. The '**ZOOM-OUT'** key causes more than one data points to appear in each column. The data on the LCD can be zoomed out 10 times (Zoom =10X). This means that the user can see between 4 months and 256 years on one chart depending on how often the sensor is collecting data. **In any zoomed-out mode more than one collected measurement appears in each column**. The recorded measurements are displayed as a high-low vertical bar.
      1. So, for example, if the Gem Recorder and Alarm is set to Zoom=2X then each column will show two measurements connected with a vertical line whose top is the higher temperature and whose bottom is the lower temperature.
      2. Further, if the chart is zoomed out to Zoom = 6X, the measurements (in this case all 32 of them) will appear as a single vertical high-low line with the highest of the 32 temperatures being the top of the line and the lowest of the 32 temperatures as the bottom of the line. The Gem Recorder and Alarm can display between 1 and 512 measurements in each column. The **ZOOM-OUT** button can be pressed ten times (Zoom=10X) to show the maximum amount of data. This method of displaying multiple measurements in the same column allows the Gem Recorder and Alarm to display a very large amount of data in the same way that stock prices are displayed with high-low bars covering each hour of an eight hour trading day.

5. Can I change the date and time without loosing saved data?
   a. If you are move the date or time backwards, old data will be cleared (You will be given a warning before any data is actually cleared). You can move the time forward 1 hour or less without losing data. If you move the time forward more than one hour the old data will be cleared.

6. Error message when loading a downloaded data file into Excel
   a. When you open a file in Excel that has been saved from the Gem Recorder and Alarm with more than 65000 data points, Excel will only load the first 65000 data points. (This is a limitation of the Excel program). You can load the downloaded file in a text editor and split it into two files to get a numeric list of all the data points. The TView program, of course, has no such limitation and will display all data in the file.

7. Troubleshooting.
   a. If your Gem Recorder & Alarm is not downloading properly you can call GEM and we can email you a software program, which when run will capture a set of parameters that will enable our personnel to diagnose problems.

8. **Backup Battery -** A backup 9vdc battery provides temporary backup power during a power outage. If a power outage occurs, the display will go to sleep after 20 seconds to decrease the load on the battery. A fully charged battery will operate the Gem Recorder and Alarm in sleep mode for at least 48 hours, depending on how often you are sampling data. While the display is asleep pressing **'ENT'** will 'wake' it up for 20 seconds.

Frequent power outages can quickly drain the 9vdc battery. The small icon in the upper left hand corner of the display indicates the remaining battery life. If the icon is less than ½ full the 9vdc battery should be replaced.

If the battery voltage drops below 6 volts the **screen will sleep** and **cannot be awakened** even with the reset switch.
   Should this happen follow the following procedure:
   a. Insure that normal power is present.
   b. Insert a new 9 volt battery.
   c. Press the reset switch (see illustration on next page).

The 9vdc battery can be changed by pressing in and pushing forward on the battery door. (see page 6 of this guide). Snap a new battery onto the red and black wire connector and replace the battery door.

Operational Tip: *If normal power is interrupted, the green power light on the front of the Gem Recorder and Alarm will dim so that only a faint glow is evident, the missing AC alarm will begin beeping (if set) and the display will sleep after 20 seconds. Once wall power is restored, the green power light will be fully illuminated and the display will 'wake-up'.*

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Warranty

The Gem Recorder & Alarm line of instruments is warranted by the manufacturer to be free from defects in material and workmanship for a period of twelve months after delivery. In the event of a claim under this warranty, the product or part must be returned to the factory for repair or replacement (shipping prepaid) with a Return Authorization Number. It will be repaired or replaced at the factory's option without charge to the user. Any freight charges incurred may, at the factories option, be passed on to the user.

This warranty does not cover routine calibration or battery replacement. The forgoing warranty and remedy are exclusive and in lieu of all other warranties either expressed or implied.

The manufacturer shall under no circumstances, be liable for consequential or incidental damages resulting from failure or malfunction of its products. The manufacturer makes no warranty for products not manufactured by itself or for any products modified by the buyer or subjected to misuse or neglect.

Under no circumstances shall the manufacturer be liable for consequential or incidental damages to any other products or inventory as the result of the use or misuse of its products.

FCC and CE Mark Verifications

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

This equipment conforms with the Australian and New Zealand EMC requirement for generic products to be used in residential, commercial and light industrial environments. AS/NZS 4251.1.1:1999 (AUS/NZ Class B verified)

This equipment is CE mark-Verified as Class B using EN 61326:1997 +A1:1998 + A2:2001, EN61000-3-2:200 Class A and EN 61000-3-3:1995 +A1:23001 standards.

Declarations of Conformity and Certificates of compliance can be download from our web site at: http://www.e2di.com/doc.htm

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