

# APPLICATION NOTE: 10

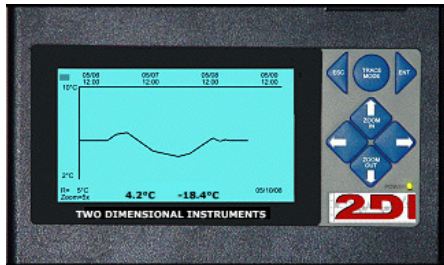
## Monitoring, Documenting and Alarming Refrigerator/Freezers



Hospitals, laboratories, doctor's offices, pharmacies, and even National Guard Units storing vaccines and other materials must be able to insure that they are stored safely. The temperature must be maintained to guarantee the effectiveness of the materials. Often these materials are stored in home type refrigerators and freezers because they are inexpensive and readily available. These units are not built to maintain the close temperature tolerances of expensive laboratory units, but they can be used effectively if the temperature is monitored continuously and a means exists to notify someone if the temperature becomes unsafe.



The time-honored method of manually monitoring the temperature with a piece of paper stuck to the side of the unit is not adequate. It is necessary to continuously monitor and keep a permanent record of the temperature twenty-four hours a day, seven days a week. It is all too easy for a unit to malfunction, warm up and then cool down while no one is around. Were this to happen, it wouldn't be noticed with the manual system where temperature is recorded only once a day. And, of course, with the manual system there is no way to tell what happened over the weekend.



The Easy Freezer Alarm is an ideal instrument for monitoring the temperature of the refrigerator/freezer. It is accurate and automatic, providing continuous monitoring, even indicating trends so that corrective action can be taken. Its **one or two sensors** create a temperature history for the refrigerator and/or freezer, which is displayed on the large LCD display. **No special training is required** to read or interpret the graph and a trace mode lets you highlight individual temperatures and zoom in for a closer look if something does not look quite right. Data can be downloaded to your computer for printing or archiving on the hard disk with the free PC software.

### Installation of the ThermoViewer is a simple six-step process:

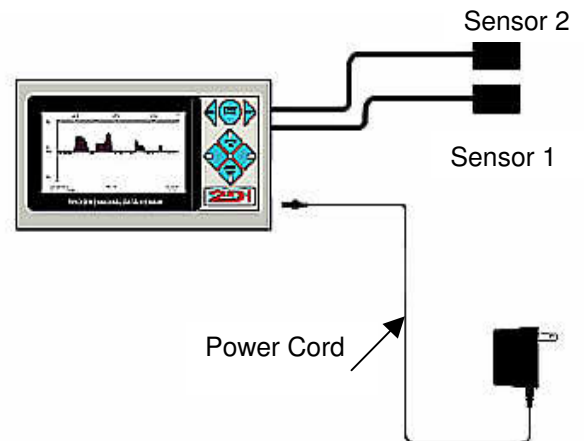
1. Position each of the sensors inside the refrigerator and/or freezer to be monitored.
2. Route and Plug in the two 20-foot sensor wires (longer wires are available as an option).
3. Plug the power adaptor into a wall.
4. Attach the auto dialer (if purchased).
5. Set the time and monitoring frequency (see below for suggested settings).
6. Set the Alarm (if needed)

### What to Order:

• TDVD2	Display, relay & software	399.00
<b>Add one or two sensors listed below</b>		
• T2	Thermistor sensor ( $\pm 0.3^{\circ}\text{C}$ )	\$ 69.00
• TC-x	Thermocouple Stainless steel sensor (specify type)	\$ 169.00

### Optional Items:

- Auto-dialer with cable \$ 189.00
- Local alarm (siren & strobe) \$ 50.00
- Sensor wire extension 100' \$ 50.00
- Serial to IP converter \$ 169.00





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## Setup

Mount the ThermaViewer display near the refrigerator and freezer to be monitored. Position one sensor in each unit. The sensors are normally placed about ½ way up from the floor and about ½ way back inside the unit to monitor the average temperature maintained within that appliance. Do not place the sensor near the roof of the freezer. This is where the hot air accumulates during the defrost cycle. If the sensor is in that area you will get false measurements and could even get a phone call in the middle of the night when the relay trips. (If your standards call for positioning the sensors in other locations you should follow those guidelines.)

The following are suggested settings.

### Suggested settings for -20°C Freezer and a 4°C refrigerator:

<b>Sensor #1 (freezer)</b>	
Sample data every 00:10:00 HHMMSS	
Type of averaging: Med	
Maximum Display Temperature	5°C
Minimum Display Temperature	-25°C

<b>Sensor #2 (refrigerator)</b>	
Sample data every 00:10:00 HHMMSS	
Type of averaging: Med	
Maximum Display Temperature	15°C
Minimum Display Temperature	-10°C

### Alarm Settings:

<b>Sensor 1 – Temperature</b> (enable/disable) Alarm & relay Trigger relay for 01:00 MMSS If temperature > 5° for more than 00:30:00 HHMMSS If temperature < -30° for more than 00:20:00 HHMMSS
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<b>Sensor 2 – Thermistor</b> (enable/disable) Alarm & relay Trigger relay for 01:00 MMSS If temperature > 8° for more than 00:30:00 HHMMSS If temperature < 2° for more than 00:20:00 HHMMSS
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**Alarm Delay:** Setting the sensors with a delay eliminates false alarms that might be caused by opening and closing the door or loading 'warm' product into the unit. So the freezer, in this case, will only alarm if the temperature rises above -5°C for more than 30 minutes. If you feel the delay is too long you can set it to a shorter time.

**The alarm:** In addition to the temperature alarm, the power failure alarm will also sound (if enabled) and close the relay if the unit is operating on battery power.

**Relay:** The ThermaViewer has a relay, which can be used to trigger the auto-dialer, external alarm or tie into a building alarm. Any time the alarm is triggered the relay is closed.

**Calibration:** The sensors can be calibrated and corrections entered into a three-point calibration table. *The sensor carries the calibration corrections so that if you moved it to a different display it would still be within calibration.*

### Downloading data:

The ThermaViewer will hold and chart approximately 1.5 years of temperature history for each sensor with the above settings. A regular schedule for downloading data from the ThermaViewer should be established so that a back up copy of the data is maintained in your computer. You can also **print out a copy of the chart** with the same program (TView) that downloads data to your computer. Access to the unlicensed TView software is provided with the ThermaViewer. It can be installed on multiple computers to download the stored data.

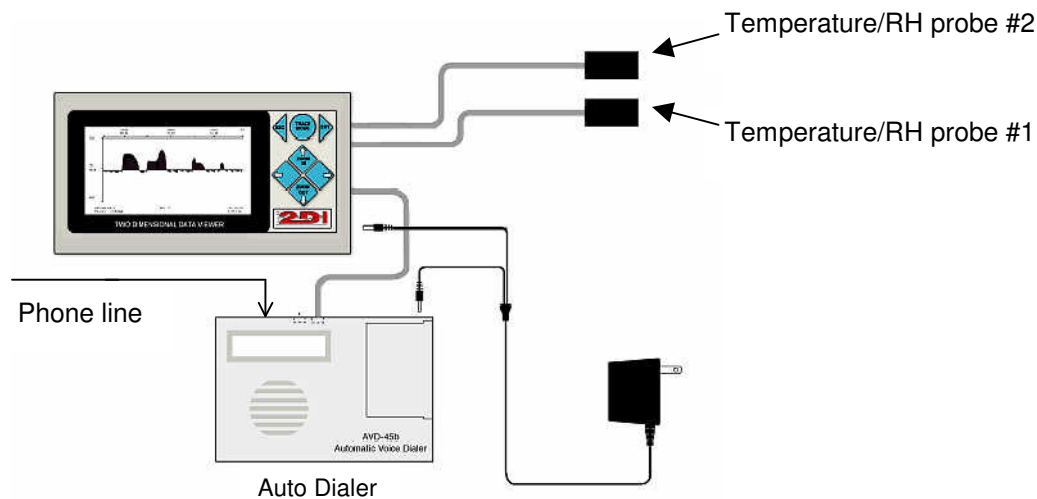
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### Optional Auto-Dialer

The ThermaViewer comes equipped with a dry-contact relayed to trigger an alarm or auto dialer. Each sensor has its own high and low trigger point. The relay will be closed when temperature rises above or falls below your alarm points. Once the relay has been triggered, the alert clock is reset

If you need faster response time you can decrease the number of length of time for the alarm points.

The auto dialer will call four phone numbers (i.e. phone, pager, answering machine or service) and leave a 16 second message when triggered by the ThermaViewer. It will keep calling the four numbers until someone picks up and the message is delivered.



The auto dialer should be set as follows:

- 60-second exit delay
- 20-second entry delay
- N.O. (Meaning that the relay is normally open).
- MOM (meaning that it only takes a momentary relay closure to trigger the dialer).

A relay test function on the System Parameter of the ThermaViewer causes the relay to be immediately triggered. Entering 'yes' in this field causes the ThermaViewer to trigger the auto dialer to immediately call the four phone numbers stored in its memory. Allow 90 seconds to elapse between the time you exit the programming mode of the auto dialer and when you activate the relay.

***Technical support for Auto Dialer only (858) 413-0149***