APPLICATON NOTE: 301

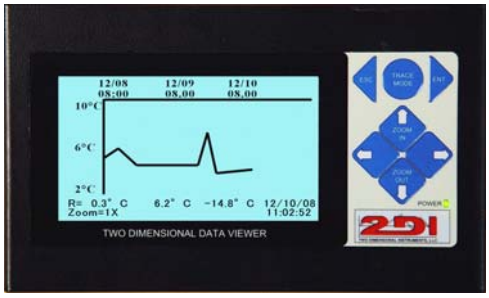
Monitoring –100°C Freezers with the ThermaViewer

–100°C freezers usually must be monitored and a printed record of the temperature history maintained. Many regulatory agencies require it and will ask to see it during audits.

Chart recorders and data loggers have done this job in the past but they each have drawbacks that make them a less than ideal solution.

Chart recorders require frequent changing of charts and pens. If the charts are not changed when they should be, the data becomes unusable with newer temperature lines on top of older temperature lines. Even when a 'clean' chart is produced with only one time temperature line it can be difficult and time consuming to interpret.

Data loggers have the advantage of being, more or less, maintenance free, but the data is not immediately accessible and in fact is invisible to the very people who should be looking at it every day. Employees who walk by the freezer a dozen times a day do not see what is happening to the temperature. The data will ultimately be downloaded to a computer but by then it is too late to correct a problem that might have been caught had the data been visible in chart form.

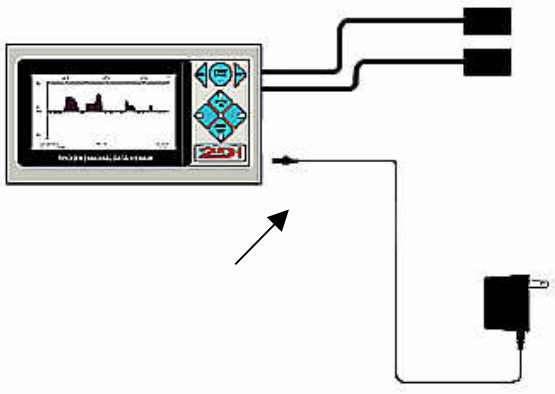


The **ThermaViewer** is an ideal instrument for monitoring and documenting –100°C freezers. It logs data **and** displays a temperature history graph that is easy to read and interpret. It is accurate and automatic. It also has a dry-contact relay that will trigger auto dialer in the event of an emergency.

No special training is required to use it and the set-up time is minimal. Simply plug the ThermaViewer into a wall socket, position the probes and begin documenting temperature immediately.

Installation of the ThermaViewer is a simple six-step process:

1. Position the two thermocouples in each freezer to be monitored.
2. Route and Plug in the two 20 foot cables (100 foot cables are available as an option).
3. Plug the power adaptor into a wall socket and into the ThermaViewer.
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:

- TDVD-05 (2-thermocouple probes) $ 679.00
  or
- TDVD-05-1 (1 probe) $ 609.00

Optional Items:

- APD-10 (Auto-dialer with cable) $ 189.00
- AV15 Local Alarm $ 50.00
- CL-100 (100 foot cable) $ 50.00
- International Power supply $ 30.00

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APPLICATON NOTE: 301

TWO DIMENSIONAL INSTRUMENTS, LLC

Installation and Setup

Mount the Easy Freezer Alarm display unit near the two freezers to be monitored. Position one probe in the each freezer. The probes 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 probe near the roof of the freezer. This is where the hot air accumulates during the defrost cycle. A probe in this area will give false measurements and could even give you a phone call in the middle of the night when the relay trips. (If your standards call for positioning the probes in other locations you should follow those guidelines.)

The following are suggested settings.

Sensor 1 setup: Thermocouple

Serial # xxxxxxxxxx
Calibrated 05/21/08

Sample data once every 0:10:00 HHMMSS
Thermocouple type: k
Type of averaging med

Maximum temperature line -20
Minimum temperature line -100

Sensor 1 setup: Thermocouple

Serial # xxxxxxxxxx
Calibrated 05/21/08

Sample data once every 0:10:00 HHMMSS
Thermocouple type: k
Type of averaging med

Maximum temperature line -20
Minimum temperature line -100

Note: The easy freezer alarm actually takes a sample every 5 seconds. You will filter out the drastic temperature swings that occur when the door is opened if the averaging is set to 'med'. If the averaging is set to slow and someone has opened the door for several minutes that actual air temperature of the freezer could be above freezing. This reading would not accurately reflect the temperature of the stored contents however. So setting the averaging to ***med*** buffers the temperature swings that can occur from normal use of the freezer during the day.

Alarm Menu

Sensor 1 Thermocouple Relay: Enabled
Trigger relay of 10:00 MM:SS
If temp > -50°C for 00:20:00 HH:MM:SS
If temp < -100°C for 00:10:00 HH:MM:SS

Alarm Menu

Sensor 2 Thermocouple Relay: Enabled
Trigger relay of 10:00 MM:SS
If temp > -50°C for 00:20:00 HH:MM:SS
If temp < -100°C for 00:10:00 HH:MM:SS

Downloading data:

The Easy Freezer Alarm will hold more than a year temperature data for each probe with the settings listed above. A regular schedule for downloading data from the Freezer Alarm should be established so that a back up copy of the temperature history of the freezer is maintained in your computer. You can also print out a copy of the graph with the same program that downloads data to your computer (TView).

[1] Enable the relay only if you have an alarm or the optional auto-dialer wired to the relay.

APPLICATON NOTE: 102

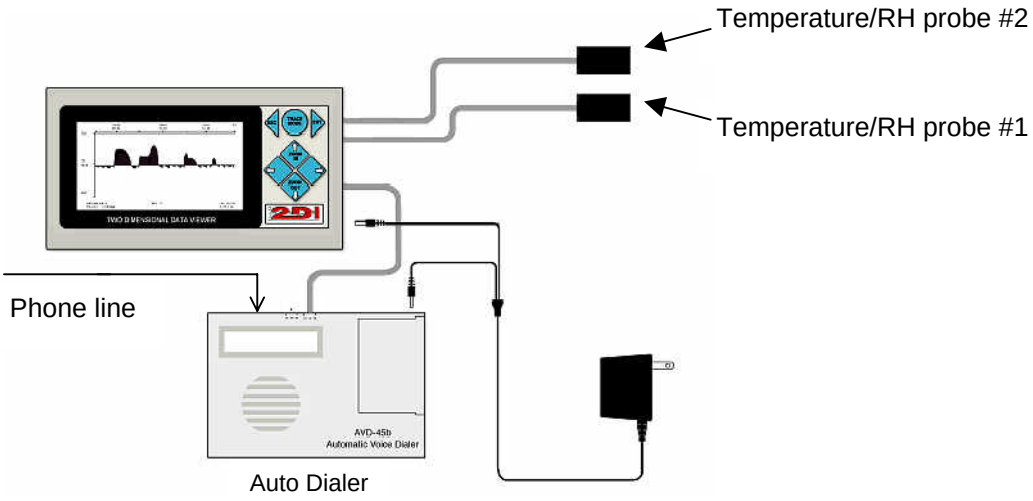
TWO DIMENSIONAL INSTRUMENTS, LLC

Optional Auto-Dialer

The ThermaViewer comes equipped with a dry-contact relay that can be used to trigger an alarm or auto dialer. Each probe has its own high and low trigger point. The relay will be closed when temperature rises above 80°F for more than 60 minutes or falls below 60°F for more than 40 minutes, if the suggested settings above are used. Once the relay has been triggered, the alert clock is reset. Therefore in this example, after the relay is triggered, the temperature will have to rise above 80°F for more than 1 hour or falls below 60°F for more than 40 minutes before the relay will be triggered again.

If you need faster response time you can decrease the number of stored temperatures in the probe menus. Setting this value for 1 instead of 6 will result in triggering the relay if one measurement is above or below the set values.

If an auto dialer is ordered with a ThermaViewer, a power supply with two leads is supplied to provide power for both the ThermaViewer and the auto-dialer. 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 activation from the relay 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 causes 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 you activate the relay.

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