

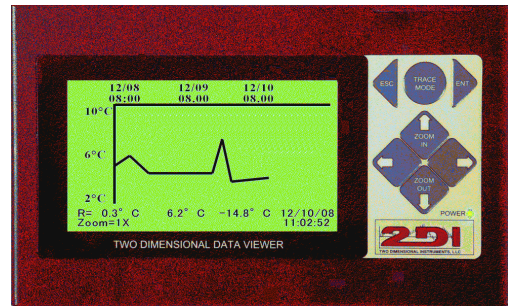


# APPLICATION NOTE: 202

## Monitoring Temperature/RH in Museums

It is critical that the temperature and humidity in museums be monitored and kept within a fairly narrow range. Historical works of art must be maintained at a constant temperature and RH level to prevent deterioration. Modern HVAC systems do a good job of this generally, but it is still necessary to check these conditions for two reasons. Pockets of humidity or warm air can occur where the air is not circulating properly, and secondly lending institutions require proof that the correct indoor environmental conditions are maintained before sending items from their inventory for display

The ThermaViewer is an ideal instrument for monitoring and documenting the temperature and humidity of enclosed spaces such as labs, clean rooms and computer rooms. It is equipped with two temperature/RH sensors ( $\pm 0.3^{\circ}\text{C}$  &  $\pm 2\%$ ), to monitor and document temp/RH in two different rooms or areas. It is accurate and automatic, providing continuous monitoring and indicating trends so that corrective action can be taken. It requires no special skills to read and interpret the data and comes equipped with a dry-contact relay to trigger an alarm or auto dialer if out-of-spec conditions occur.



**ThermaViewer**

Using a ThermaViewer is simple, with minimum set-up required. It needs no programming, maintenance, paper or computers to monitor and document temperature and humidity over time. Simply plug the ThermaViewer into a wall socket and begin collecting temperature/RH data immediately.

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

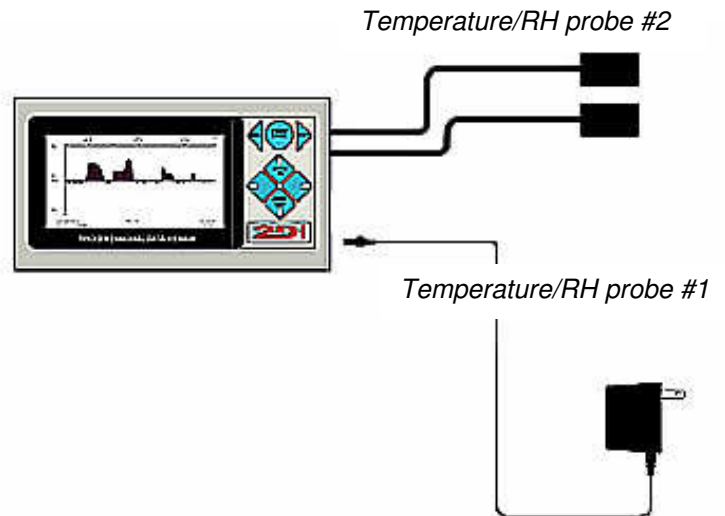
1. Position the sensors in each freezer and/or refrigerator
2. Route and Plug in the two 20 foot sensor wires (100 foot cables are available as an option).
3. Plug the power adaptor into a wall socket and into the ThermaViewer.
4. Attach the auto dialer (if purchased).
5. Set the time and monitoring frequency (see below for suggested settings).
6. Set the alarm parameters.

### What to Order:

- TDVDR-02 ( $\pm .3^{\circ}\text{C}$ )      \$ 779.00
- or
- TDVDR-02-1 (1 sensor)      \$ 709.00

### Optional Items:

- TDVDR-02A ( $\pm 0.2^{\circ}\text{C}$ )      \$ 829.00
- Auto Dialer      \$ 189.00
- 100 foot cable      \$ 50.00
- Calibrate temp/RH (2 sensors)      \$ 165.00
- Switching power supply (120-240vac)      \$ 30.00





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## Installation and setup

Mount the ThermaViewer display unit in the room or office area near the area to be monitored. Position each probe in a separate space and attach the auto dialer (if purchased) to the relay connection.

The following are **suggested** settings for a room maintained at 72 °F and 50% RH. You should use the settings required by your standards.

### Suggested settings:

<b>Room 1 Probe</b>	
Sample Data every 00:10:00 HHMMSS	
Type of Averaging: Med	
Maximum Display Temperature	80°
Minimum Display Temperature	60°
Maximum RH line	80%
Minimum RH line	20%

<b>Room 1 Probe</b>	
Sample Data every 00:10:00 HHMMSS	
Type of Averaging: Med	
Maximum Display Temperature	80°
Minimum Display Temperature	60°
Maximum RH line	80%
Minimum RH line	20%

### Suggested Alarm Settings:

Sensor 1 – Thermistor/RH Relay: Enabled
Trigger relay for 10:00 MMSS
If temperature >78° for more than 00:30:00 HHMMSS
If temperature <65° for more than 00:20:00 HHMMSS
If RH >65% for more than 01:00:00 HHMMSS
If RH <40% for more than 02:00:00 HHMMSS

Sensor 2 – Thermistor/RH Relay: Enabled
Trigger relay for 10:00 MMSS
If temperature >78° for more than 00:30:00 HHMMSS
If temperature <65° for more than 00:20:00 HHMMSS
If RH >65% for more than 01:00:00 HHMMSS
If RH <40% for more than 02:00:00 HHMMSS

**Averaging temperature:** Setting the sensors to use the 'Med' averaging will cause the sensors to sample data every 5 seconds and store data every 10 minutes. This causes the chart to more accurately reflect the internal temperature of the stored materials rather than the air temperature of the refrigerator or freezer. Momentary dips and rises of the air temperature, which occur when the door is opened are not enough to affect the actual stored materials and can safely be averaged over the 10 minute period between readings.

**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.

**Calibration:** The Thermistor, thermocouple and Thermistor/RH sensors can be calibrated and any corrections entered into a three-point calibration table. The sensor carries the calibration corrections so that it can be moved from display to display without losing accuracy. (The digital sensor used by the **TDVD-01 model cannot be calibrated.**)

### 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 graph with the same program that downloads data to your computer (TView). Access to the unlicensed TView software is provided with the ThermaViewer. It can be installed on multiple computers to download the stored data.<sup>1</sup> Enable the relay only if you have an alarm or the optional auto-dialer wired to the relay.

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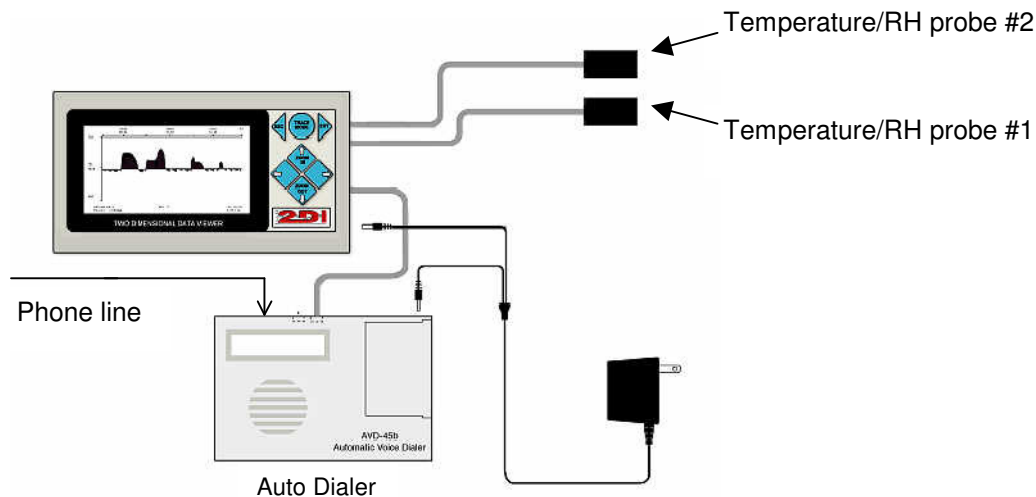
### Optional Auto-Dialer

The ThermaViewer is 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 temperature 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 amount of time a temperatures has to sense. Setting this value for 1 minute will result in triggering the relay if a high or low temperature is maintained for more than 1 minute. However, if you are sampling temperature every 10 minutes and the alarm is set for one minute you might not see what caused the alarm by looking at the chart due to the temperature averaging.

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 to trigger the auto dialer and 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**