



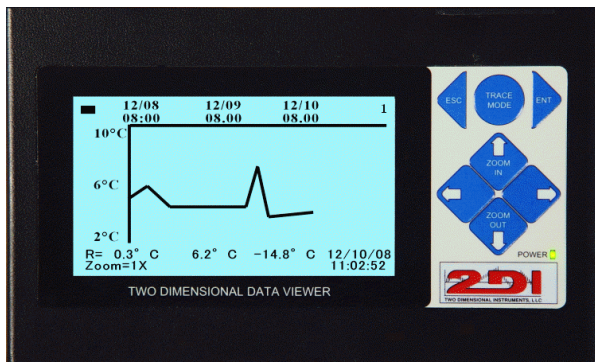
# APPLICATION NOTE: 10

## Wirelessly Monitoring Temperatures w thermocouples

Many manufacturing and research processes use external heat sources. It is important to monitor and document the temperature of this process over time for quality assurance. The ThermaViewer with its flexibility in sample rates, data logging and displaying data makes is ideally suited for this purpose.

It can be set to sample and store temperatures every 1 minute up to every 24 hours.

In most cases a thermocouple probe is used because of its ability to handle a wide range of temperatures and environments. Two K-type thermocouples can monitor temperatures between  $-250^{\circ}\text{C}$  and  $1250^{\circ}\text{C}$ . If you need a different type of thermocouple (E,J,T,S,R) please call for pricing.



Using a ThermaViewer is simple, with minimum set-up time required. It stores and display weeks, months, and even years of temperature history for each of its two probes. Because it doesn't need paper charts or pens to draw the graph, there is no ongoing labor or expense of replacing charts or pens. The graph, unlike the old paper charts, is very easy to understand, which means that every employee will become part of your quality assurance. Each time they glance at the ThermaViewer they see an exact history of the temperatures.

It needs no complicated programming or maintenance. Simply plug the ThermaViewer display unit into a wall socket and begin collecting and documenting temperature immediately.

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

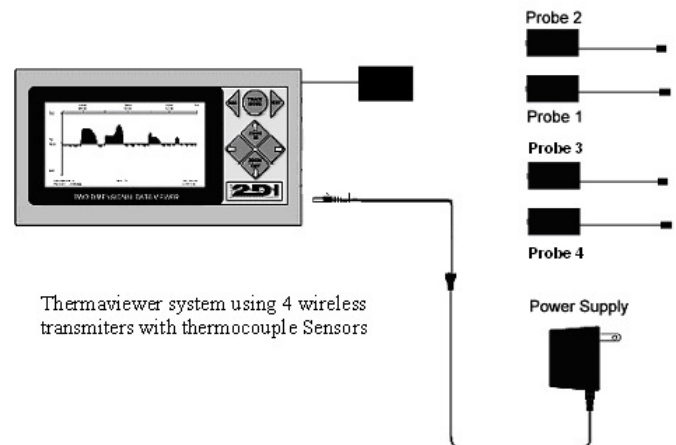
1. Plug the power adaptor into a wall socket and into the ThermaViewer.
2. Link the sensors to the base station if not already linked
3. Position the sensors
4. Attach the auto dialer (if purchased).
5. Set the time and monitoring frequency (see below for suggested settings).
6. Set the alarm parameters.

### What to Order:

- WSTDVD (Display with base station) \$ 540.00  
1-4 sensors
- WS4HKTC External Tcouples (K,T,E,J) \$ 165.00

### Optional Items:

- Auto-dialer with cable<sup>2</sup> \$ 189.00
- Serial to IP converter (1 port) \$ 139.00





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## Installation and Setup: Monitor, document and alarm

Mount the ThermaViewer display in an area that can easily be seen by everyone. The thermocouple itself plugs into the transmitter module and comes with a four foot TC wire. Position each thermocouple in the area to be monitored.

The following are suggested settings for a hypothetical example. We assume that we want to monitor an oven and a heated liquid: The oven is normally maintained at 55°C and the liquid at 300°C. We also want to be alerted if the oven rises to over 65°C for more than 30 minutes or falls below 35°C for more than 20 minutes. We want the heated liquid to maintain 300°C and want to be alerted if the temperature rises above 310°C for more than 30 minutes or falls below 280° for more than 20 minutes.

You should use the settings required by your standards based on your quality assurance plan.

### Suggested settings:

#### Probe #1

Sample data every 00:10:00 HHMMSS  
Type of averaging: Med

Maximum Display Temperature 75°  
Minimum Display Temperature 45°

#### Probe #2

Sample data every 00:10:00 HHMMSS  
Type of averaging: Med

Maximum Display Temperature 310°  
Minimum Display Temperature 290°

### Alarm Settings:

Sensor 1 – Temperature  
Relay: Enabled  
Trigger relay for 10:00 MMSS  
If temperature > 65° for more than 00:30:00 HHMMSS  
If temperature < 35° for more than 00:20:00 HHMMSS

Sensor 2 – Thermistor/RH  
Relay: Enabled  
Trigger relay for 10:00 MMSS  
If temperature > 310° for more than 00:30:00 HHMMSS  
If temperature < 280° for more than 00:20:00 HHMMSS

**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 thermocouple sensors can be calibrated and any corrections entered into a three-point calibration table. The base station carries the calibration corrections so that it can be moved from display to display without losing accuracy.

### 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 an auto-dialer wired to the relay. See application note 102

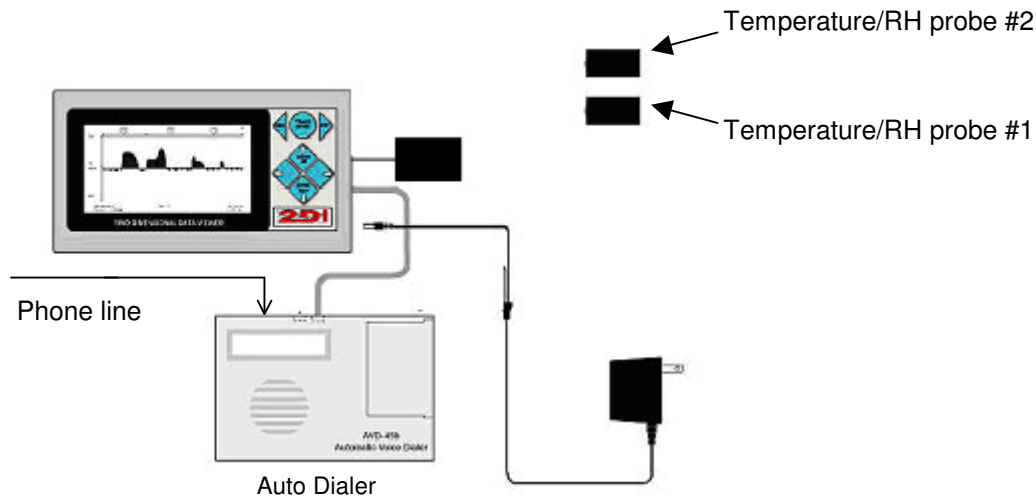
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## Optional Auto-Dialer

The ThermaViewer comes equipped with a N/C 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 60°C for more than 30 minutes or falls below 35°F for more than 20 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 60°F for more than 30 minutes or falls below 35°F for more than 20 minutes before the relay will be triggered again.

If you need faster response time you can decrease the delay time a temperature must be above your trigger point. However if you set the time less than the store rate you might not be able to see the actual temperature that triggered the alarm since the stored value is an average of all temperature taken within the interval whereas the alarm is measured on a different clock.

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.C. (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**