APPLICATON NOTE: 402

TWO DIMENSIONAL INSTRUMENTS, LLC

Monitoring and documenting the cool down process

To monitor the cool-down process during food manufacturing, a stainless steel probe is placed in the food product and temperature is monitored and documented as it cools down over a period of time, which can range from several minutes to many hours. The ThermaViewer is ideally suited for this purpose.

In a typical installation where the user is monitoring and documenting the cool down process of meat, a sample piece of meat is placed in a 21°F cooler after the internal temperature has been raised to 145°-160°F. A stainless steel probe wired to the ThermaViewer is placed in the meat sample and the sample rate is set for every 15 seconds. The ThermaViewer is mounted in a dry room and connected to the probes with a cable and to a computer via the serial port. The ThermaViewer displays a temperature chart during the cool-down process. Once the internal meat temperature has stabilized a printed record of the chart is generated from the computer.

Using a ThermaViewer is simple, with minimum set-up time required. The date and time is set if not already done and any old data is cleared from the system by resetting it to factory defaults. Lastly the sample rate is set for 15 seconds and the chart parameters are set for: Maximum 160°F, and Minimum 15°F. The ThermaViewer immediately begins recording and displaying temperature data.

Once the cool-down process is completed the temperature chart is uploaded to the computer with the TView program. Once it is running click on the 'upload' button on the TView program and the data is transferred to the computer screen, from which it can be saved to a file or printed. Header information is included which shows batch number and any other information the manufacture needs to add.

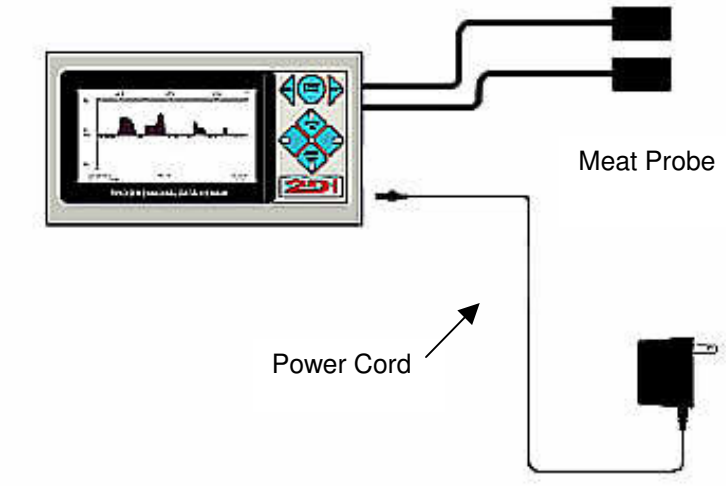
The auto-download function of the TView program can be used to automatically pull data from the ThermaViewer on a timed interval. For example, it can be set to automatically download temperature data every 5 minutes from each of the two probes and save it in a file on the computers hard drive.

What to Order:

- TDVD-02 (2 K-type TC probes) $ 649.00
- Stainless steel probes (2) 130.00

Optional Items:

- Auto-dialer with cable[2] $ 189.00
- 100 foot cable (ea) $ 50.00



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Installation and Setup

Mount the ThermaViewer display in a dry room. Run the probe cables into the coolers where the meat will be placed after it is cooked. A 20' molded plastic cable is supplied with each probe and it should be used within the cooler itself. If a longer cable is needed the plastic cable can be extended with normal telephone cable (8 conductor silver satin cable). This extension should **not** be placed in coolers as it will, over time, oxidize and cause inaccurate readings.

The following are suggested settings for this example. We will assume that we want to monitor two pieces of meat that have been cooked to 160°F and are being cooled to 21°F over 5–10 hours.

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

Suggested settings:

1 Probe	
Sample Data every	15 seconds
Store Data every	15 seconds
Recorded Temperature	Average
Temperature Scale	F°
Maximum Display Temperature	170°
Minimum Display Temperature	15°
Reference Line	15°
Relay	Enabled[1]
Activate Relay for	0:10 (min:sec)
When Temp > 180°	for 30 stored temperatures
When Temp< 100°	for 40 stored temperatures

Probe 2	
Sample Data every	15 seconds
Store Data every	15 seconds
Recorded Temperature	Average
Temperature Scale	F°
Maximum Display Temperature	170°
Minimum Display Temperature	15°
Reference Line	15°
Relay	Enabled[1]
Activate Relay for	0:10 (min:sec)
When Temp > 310°	for 60 stored temperatures
When Temp< 280°	for 10 stored temperatures

Setting the probes to sample data every 15 seconds and store data every 15 seconds insures that the temperature will be constantly recorded with no temperature averaging. Setting the minimum and reference line will cause the temperature chart to display a filled in line graph and be very visible.

The ThermaViewer logs 43000 temperature samples for each probe, which means that with the 'Store Data Rate' set for 15 seconds it will store and display 7.5 days of temperatures. If a longer cool down period is anticipated, a longer 'Store Data' period should be used.

Downloading data:
To copy the logged data to a computer and print out a chart, the TView program is run on the computer and the ThermaViewer is plugged into a serial port. Data can be downloaded either 'on demand' or automatically.

[1] Enable the relay only if you have an alarm or the optional auto-dialer wired to the relay. See application note 102