

WinDataSoft 3.0 Manual

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WinDataSoft 3.0

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Installation

WinDataSoft is distributed as a downloadable file on the internet, or on a diskette. Follow the appropriate instructions below.

Downloaded File Installation

Download WinDataSoft from our website
Now locate the downloaded file and double-click on it
Follow the on-screen instructions

Disk Installation

Insert diskette in floppy drive
Click **Start** and choose **Run...**
Enter x:setup.exe (where x is the letter of you floppy drive)
Follow the on-screen instructions

Connecting Your Logger

The logger is connected to your PC using the 9 pin connection cable supplied with the WinDataSoft package. It connects directly between your PC's comm port (serial) and the logger. A 9 pin to 25 pin adapter may be needed if you don't have an available 9 pin port. You must connect this cable to a working serial port. If the port was used for another device (such as a mouse or modem) the port may still be configured for the device you removed and prevent WinDataSoft from accessing the port. When you remove a device, re-boot your system. You can test your port and cable using the Comm Test function built into WinDataSoft.

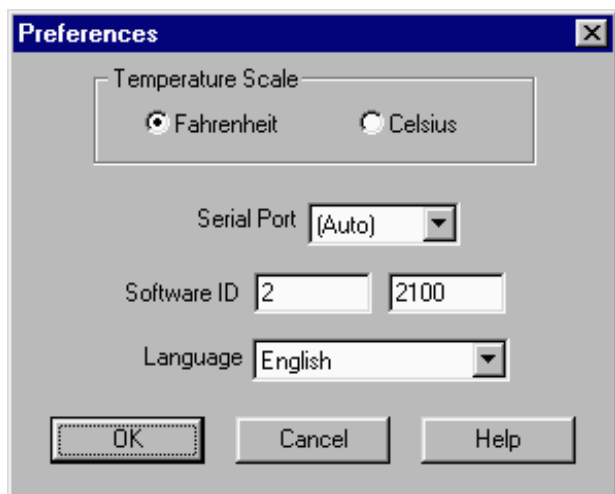
Quick Start

If you are not going to read this manual, we advise that you at least follow this procedure to get started.

- 1.) Connect the cable to an open comm port.
- 2.) Connect your logger to the other end of the cable.
- 3.) Click on the Setup Logger button on the main menu of WinDataSoft.
- 4.) The Logger Status screen will be displayed showing the current settings.
- 5.) Click on the Reset button to start a new logging session with the default interval and settings.
- 6.) Disconnect your logger. Press the Start button if your model has one. Let your logger collect data for a few samples.
- 7.) Connect your logger and click the Retrieve button in WinDataSoft's main menu.
- 8.) Enter a file name when requested, and click OK.
- 9) Click on the View button in the main menu, and select the file you just retrieved.
- 10) The graph will display your data. To look at a listing of the data, click on File...Browse detail...

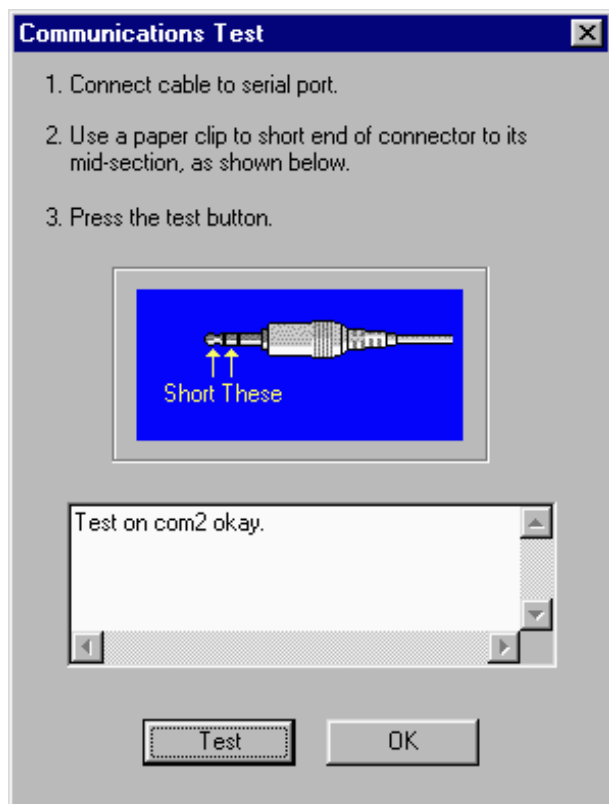
Preferences

The Preferences dialog allows you to select the default temperature scale, comm. port settings and select WinDataSoft's ID. To access the Preferences dialog, click on Options...Preferences... in the main menu. The scale selection insures that the proper conversion will automatically be made whenever temperature is referenced. The Auto serial port selection causes WinDataSoft to search all available comm ports for a logger. If you manually select a port, it will only attempt to connect to a logger on the selected port. You can modify the Software ID number that is stored in a logger when WinDataSoft Resets or Retrieves it. WinDataSoft is currently only available in English.



Testing Communications

If you get a "Cannot Connect with Logger" error message, you may have a bad cable, a defective comm port, or another device (or its driver) may be blocking access to the port. You can test the comm port and cable without connecting a logger. To do this, click on Help...Communications Test... in the main menu and follow the instructions on the dialog.



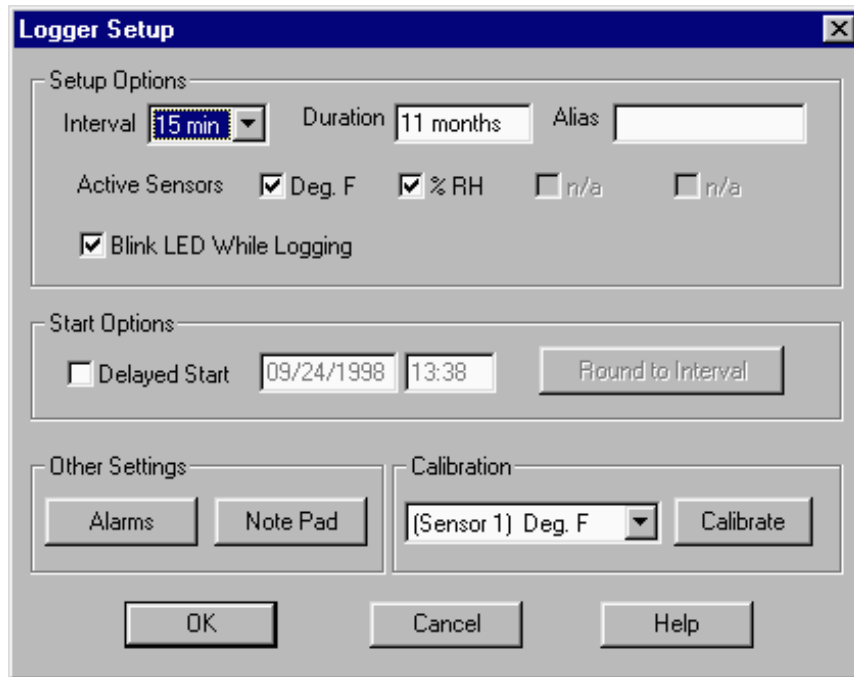
Starting a New Logging Session

Connect your logger to your PC and run WinDataSoft. Click on the Setup Logger button. After WinDataSoft has found your logger the Status screen will be displayed.

Sensor	(1) Deg. F	(2) % RH	(3) n/a	(4) n/a
Latest	77.5	50.0		
Min to date	64.5	35.5		
Max to date	96.0	64.5		
Min today	65.0	35.5		
Max today	77.5	64.5		

The Status Screen is read-only. It shows you the current state of some key settings for the attached logger. Most of these are self explanatory. The **Start Time** field displays the date/time the logger actually started recording data. The **State** represents what the logger is currently doing. Possible values for the state are: Sleeping, Waiting for the start button to be pressed, Delayed until a start date/time is reached, or Logging. The **Battery %** field is the useful battery life left. The **Remaining** field shows how much longer your logger will record data given the memory size and selected interval. Note that it does not take battery life into account. The **Alias** field displays the name that you can assign to the logger. The **Session Reset ID** field displays the serial number or ID of the Transporter or software that restarted this unit last.

To restart your logger with the current settings, click on the Reset button. All data currently stored in the logger will be erased! The Cancel button allows the current logging session to continue undisturbed. To change any settings, click on Edit button. The Logger Setup dialog will open and allow you to change the current settings.

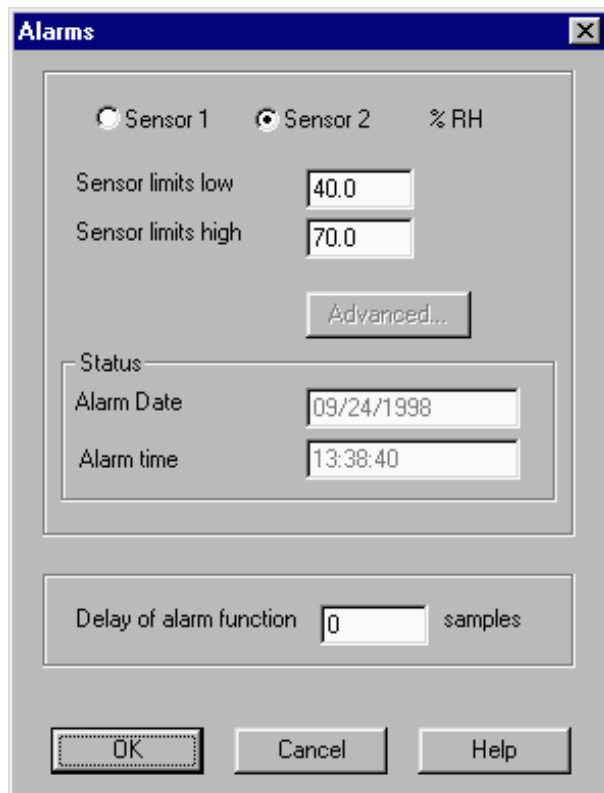


Referring to the Logger Setup screen; **Interval** allows you to change the selected interval. The **Duration** display shows how long the logger can record data given its memory size and the selected interval. If your logger has more than 1 sensor, use **Active Sensors** to select the sensors you want to log. If **Blink LED While Logging** is checked your logger will blink faintly every 2 seconds under normal conditions. If the battery becomes low, it will only blink every 4 seconds, both as an indication and to save battery life. If the blink is green, this means that there are no alarms, but red indicates an alarm has occurred on one of the active sensors. **Alias** allows you to name your logger using up to 16 characters.

The **Delayed Start** feature allows you set a date/time when your logger will begin to record data. If this box is checked and a future date is entered, the logger will automatically start recording at the entered date/time. The date and time must be entered in this format: 01/09/1998 13:30. The Round to Interval button will simply round the date/time you entered to match the Interval selected above.

The **Calibration** feature allows you to enter correction values for temperature sensors. Example: if your logger is reading 0.5 F low, enter +0.5.

Clicking on the Alarms button will open the Alarm dialog:



Use the radio buttons to selected the desired sensor (either 1 or 2). Sensor Limits allow you to define an acceptable range for each sensor by entering high and low values. If the value for a sensor goes outside this range, the date and time of the first alarm instance will be recorded. If **Blink LED While Logging** was checked in the Setup dialog, the blink will be red to indicate an alarm condition was recorded. The **Delay of Alarm Function** disables the alarm until the specified number of samples have been taken. This is useful for those occasions when your logger needs time to adjust to a temperature, such as in a refrigerator, and you still would like to use the alarm feature to alert you to a potential problem. Note that Alarms are only supported on sensors 1 and 2.

The Advanced button is only available when a logger that supports Advanced Alarms is attached to WinDataSoft.

Click on OK or Cancel to return to the Logger Setup dialog.

Clicking on the Notepad button will open a text entry box. You may store a note of up to 256 characters in your logger. This is useful for storing reminders about the logging session, sending notes along with the logger, etc.

Click on OK or Cancel to return to the Logger Setup dialog.

Click on the Reset button to start the new logging session with the new settings. Click on Cancel to allow the current logging session to continue.

Setting the Clock

Every time you Reset a logger, it's internal clock is reset to match the date and time of your computer. Make sure that your computer has the correct date and time.

Retrieving Data

Retrieved data is always saved to a file. Connect your logger to the computer and click on the Retrieve button in the main menu. In the file dialog, enter a file name or accept the default name and click OK. The data will be uploaded to your computer. A gauge indicates the data upload progress.

Viewing Retrieved Data

Click on the View button in the main menu. Select a file from the dialog and click OK. This data will be displayed as a graph. To zoom in on a portion of the data, click on the upper left point of interest, hold the mouse button down, and drag the cursor to the lower right. This will place a box on the screen defining the portion of the graph to be displayed. Release the mouse button to finish the zoom.

Viewing File Information

To view information for the currently graphed file, click File...Information. The information stored within the .PL2 file is the state of the logger when the file was retrieved. The information listed in this dialog is very similar to the Logger Status dialog. It also shows alarm information and the notepad stored in the file.

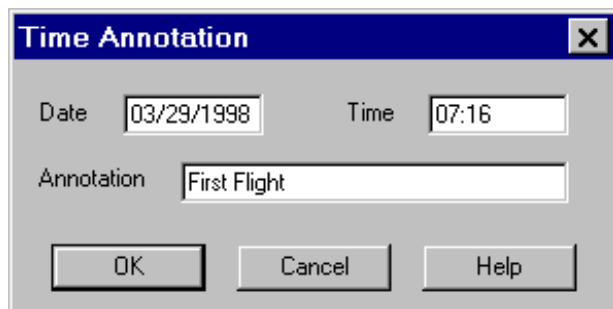
Alarm Lines

To display alarm lines on your graph, click Settings...Measurements and Edit either sensor 1 or 2. Check the **Display Alarm Limits** box.

Refer to Starting a New Logging Session for information on setting alarms.

Graph Annotations

Graph annotations are stored within the current .PL2 file. When you add an annotation, you are adding it to your data file (.PL2 file).



Adding Annotations

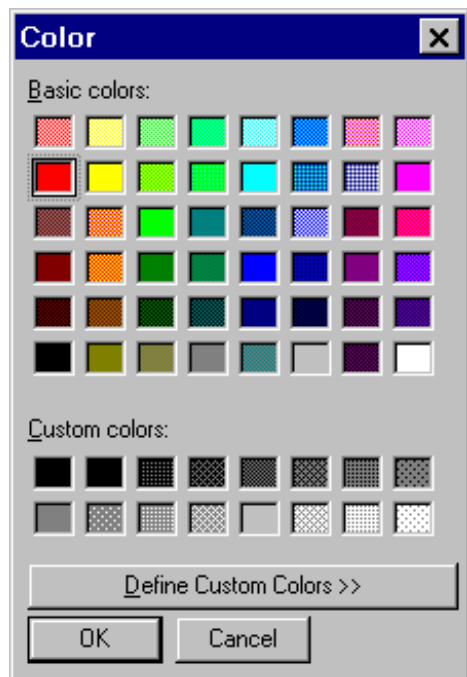
- 1.) click on File...Time Scale Annotations...Add
- 2.) A message will be displayed instructing you to click a location on the graph. Just click OK.
- 3.) When the cursor changes to a hand, select a location on the graph (Note: the cursor will only appear as a hand when the cursor is in a valid location).
- 4.) A dialog will display the date/time where you clicked and allow you to enter a annotation for that particular time. You may manually modify the date/time displayed within this dialog.
- 5.) When you click on OK, you will see your annotation added to the graph

Deleting Annotations

- 1.) click on File...Time Scale Annotations...Delete
- 2.) A message will be displayed instructing you to click on an annotation. Just click OK.
- 3.) Now move the cursor over the annotation you wish to delete and the cursor should change into a hand. Left-click on the annotation.

Modifying Line Color

To change the line color of a graphed measurement, click on Settings...Measurements and select the measurement from the list on the right (Display). Now click on the Color button. The following dialog will be displayed.



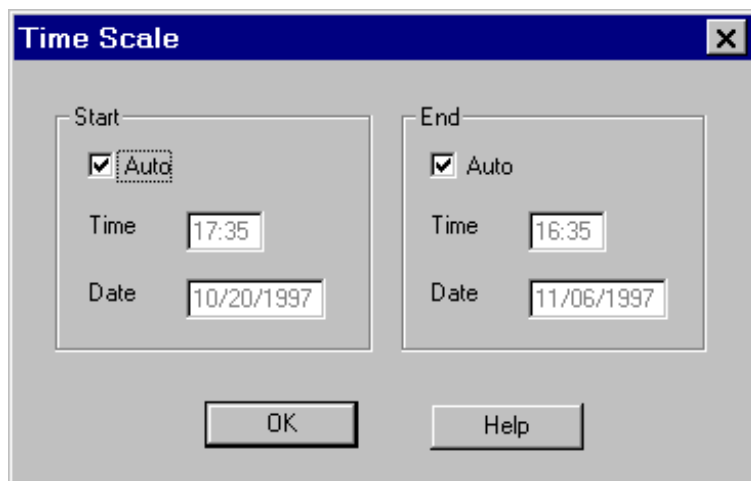
The currently selected color will have a selection box around it. Click on the color you want the measurement to appear in and click the OK button. Follow this procedure to change the color of any of the graphed measurements. Once you are happy with your color selections, click OK in the measurements dialog.

Note: Line colors are saved into configuration files (.CG2 files).

Manually Setting Graph Scales

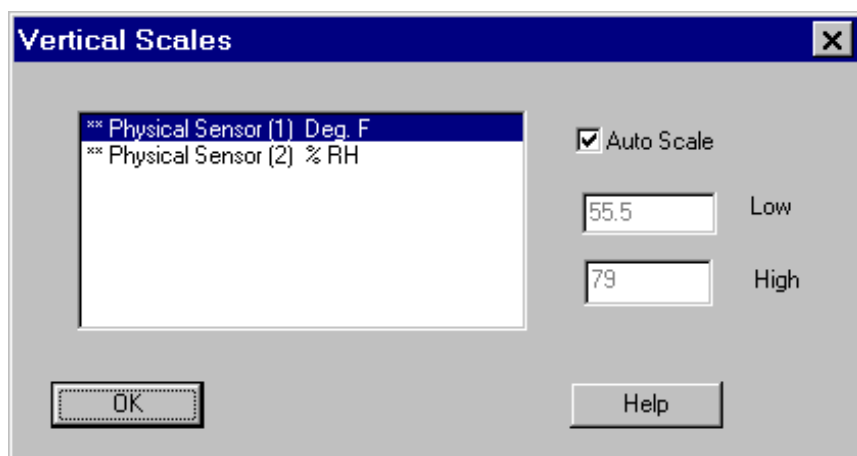
Time Scale

With the graph displayed, click on Settings...Scales...Time. From here you can select a portion of the data by entering time limits (horizontal scale). Note: If the **Auto** box is checked, WinDataSoft will automatically set scales for your graph. De-select **Auto** to manually enter start date/time and end date/time.



Vertical Scales

You can also set the vertical scale limits by selecting Vertical from the Settings...Scales menu. As you click on each measurement that is graphed, its current settings are displayed. By de-selecting the **Auto** checkbox, you can enter new Low/High limits for a given measurement.



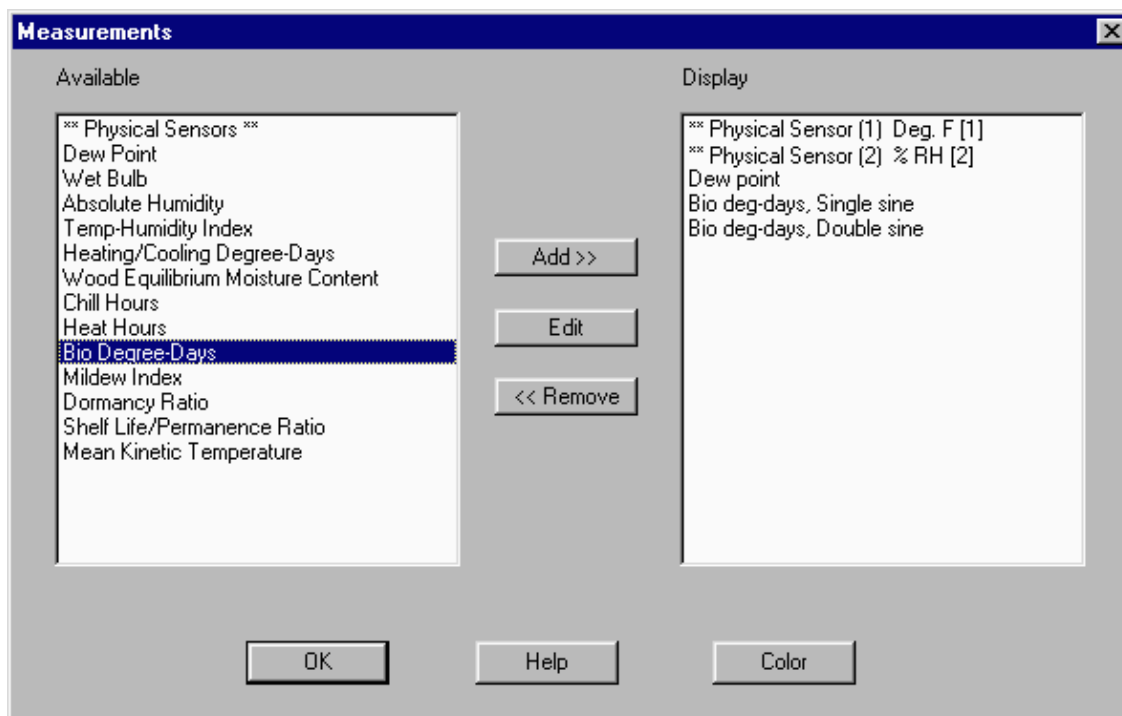
Graphing Multiple Measurements

WinDataSoft introduces the concept of “virtual” sensors. This allows calculations such as dew-point and degree-days, to be added to the graph and treated just as if they’re sensors. WinDataSoft calculations include such useful readings as; dew-point, biological degree-days, chill-hours, wet-bulb temperature, etc. Click on Settings...Measurements... while viewing a graph. The calculations that can be applied to the data you’re viewing will be displayed in the Available pick list.

Select the desired measurement then click on **Add** or double-click on the measurement to add it to the Display list on the right. If your selection requires additional information, such as the choice of methods, thresholds or the like, a dialog will be displayed prompting you for the required parameters.

If you wish to modify any parameters for a selected item, highlight the item on the right and click **Edit** or double-click on the item. When the Display list has the desired measurements, click OK to graph them.

You can also remove any sensor readings from the Display list by highlighting the item and clicking on **Remove**.



Calculated Measurements

Dew Point

Wet Bulb

Absolute Humidity

Temperature-Humidity Index

Heating/Cooling Degree-Days

Wood Equilibrium Moisture Content

Chill/Heat Hours

Bio Degree-Days

Mildew Index

Dormancy Ratio

Shelf Life/Permanence Ratio

Mean Kinetic Temperature

Dew Point

Summary:

The temperature to which air must be cooled in order for saturation to occur. The dewpoint temperature assumes there is no change in air pressure or moisture content of the air.

Method:

Dew Point

$$T := 22.5 \quad \text{temperature in degrees C}$$

$$RH := 27.5$$

$$E_s := 6.11 \cdot 10.0^{\left[\frac{7.5 \cdot T}{(237.7 + T)} \right]}$$

$$E := \frac{RH \cdot E_s}{100}$$

$$\text{Dew_Point} := \frac{-430.22 + 237.7 \cdot \ln(E)}{(-\ln(E) + 19.08)}$$

$$\text{Dew_Point} = 2.818 \quad \text{deg. C}$$

Wet Bulb

Calculation Parameters

In order to graph Wet Bulb, you must enter the barometric pressure where the data was collected. Pressure can be specified in one of three different units: Millibars, inches of mercury or kPa. The default pressure is sea level.

Summary:

The lowest temperature that can be obtained by evaporating water into the air at constant pressure. The name comes from the technique of putting a wet cloth over the bulb of a mercury thermometer and then blowing air over the cloth until the water evaporates. Since evaporation takes up heat, the thermometer will cool to a lower temperature than a thermometer with a dry bulb at the same time and place. Wet bulb temperatures can be used along with the dry bulb temperature to calculate dew point or relative humidity.

Method:

Wet Bulb (uses Dew Point calc. above)

T := 22.5 temperature in degrees C

RH := 27.5

p := 100 ambient barometric pressure in kPa

$$vp := \left(\frac{RH}{100} \right) \cdot 0.611 \cdot \exp \left[17.27 \cdot \frac{T}{(T + 237.3)} \right]$$
 calculate ambient vapor pressure in kPa

Td := Dew_Point

GAMMA := 0.00066 · p

$$DELTA := \frac{4098 \cdot vp}{(Td + 237.3)^2}$$

$$Wet_Bulb := \frac{(GAMMA \cdot T) + (DELTA \cdot Td)}{GAMMA + DELTA}$$

Wet_Bulb = 13.707 deg. C

Absolute Humidity

Summary:

The mass of water vapor in a given volume of air (i.e., density of water vapor in a given parcel, usually expressed in grams per cubic meter).

Method:

Absolute Humidity

T := 22.5 temperature in degrees C

RH := 27.5

Rw := 461.5 gas constant for water vapor (J/kg*Kelvin)

$P := RH \left[6.11 \cdot 10.0 \left[\frac{7.5 \cdot T}{(237.7 + T)} \right] \right]$ calc. vapor pressure in Pascals (Pa)

Tk := T + 273.0 convert temperature to Kelvin

$Absolute_Humidity := \left[\frac{P}{(Tk \cdot Rw)} \right] \cdot 1000$

Absolute_Humidity = 5.485 g/m³

Temperature Humidity Index

Calculation Parameters

In order to graph Temperature Humidity Index, you must enter the barometric pressure where the data was collected. Pressure can be specified in one of three different units: Millibars, inches of mercury or kPa. The default pressure is sea level.

Summary:

A measure of human comfort which takes into account the effects of temperature and humidity in an environment.

Method:

Temperature Humidity Index (uses Wet Bulb calc. above)

```
T := 72.5    temperature in degrees F
```

```
Tw := (Wet_Bulb·1.8) + 32.0    convert Wet Bulb to deg. F
```

```
Temperature_Humidity_Index := 0.4·(T + Tw) + 15.0
```

```
Temperature_Humidity_Index = 66.669
```

Heating/Cooling Degree-Days

Heating\Cooling Degree-Days

Reference Temperature

65.0 Deg. F [1]

11.18 deg-days Calculate

Graph

Accumulating Daily

Heating Deg-Days

OK Cancel Help

Calculation Parameters

- From the combo box, select either Heating or Cooling Degree-Days.
- Enter a Reference(base) Temperature to be used for the selected method.
- clicking the calculate button will display the degree-days based on the selections and entries in the dialog.
- Select Accumulating to display a cumulative graph of degree-days or Daily to display a bar style graph depicting daily degree-day values.

Summary:

The heating, ventilation and air conditioning industry uses heating degree days to calculate the amount of heat that must be added to a structure to maintain the temperature at a comfortable level, usually 65 degrees. Consequently heating degree days increase when the outside temperature is below the comfort temperature. Cooling degree days measure the amount of heat which must be removed from a structure to maintain the temperature at a comfortable level. Consequently cooling degree days increase when the outside temperature is above the comfort temperature.

Wood Equilibrium Moisture Content

Summary:

Moisture content of wood is defined as the weight of water in wood expressed as a fraction, usually as a percentage of the weight of oven-dry wood. Weight, shrinkage, strength, and other properties depend upon the moisture content of wood.

Method:

Wood Equilibrium Moisture Content

$$T := 72.5 \quad \text{temperature in degrees F}$$

$$RH := 27.5$$

$$RH := \frac{RH}{100} \quad \text{convert relative humidity to a percentage}$$

$$W := 330 + (0.452 \cdot T) + (0.00415 \cdot T^2)$$

$$K := 0.791 + (0.000463 \cdot T) - (0.000000844 \cdot T^2)$$

$$K1 := 6.34 + (0.000775 \cdot T) - (0.0000935 \cdot T^2)$$

$$K2 := 1.09 + (0.0284 \cdot T) - (0.0000904 \cdot T^2)$$

$$\text{Wood_EMC} := \frac{1800}{W} \left[\frac{K \cdot RH}{1 - K \cdot RH} + \left(\frac{K1 \cdot K \cdot RH + 2 \cdot K1 \cdot K2 \cdot K^2 \cdot RH^2}{1 + K1 \cdot K \cdot RH + K1 \cdot K2 \cdot K^2 \cdot RH^2} \right) \right]$$

$$\text{Wood_EMC} = 5.749 \quad \text{percent}$$

Shelf Life/Permanence Ratio

Calculation Parameters

- From the combo box, select either Shelf Life or Permanence Ratio. Note: if you select Permanence Ratio, the Rated Shelf Life field will be grayed out.
- Enter the Temperature and Relative Humidity where permanence is equal to one.
- Delta H is referring to enthalpy of activation and probably doesn't need to be changed. The default is 30 Kcal. This number can range between 25 and 35.
- If Shelf Life is selected, enter the Rated Shelf Life for the item.
- Clicking the calculate button will display either the Shelf Life or Permanence Ratio based on the selections and entries in the dialog.
- By checking the Graph Average checkbox, the values will be averaged across the graph. To see actual Shelf Life or Permanence Ratio, uncheck this box.

Summary:

Quantifies the effect of the environmental factors of temperature and relative humidity upon the anticipated useful life expectancy of paper-based collections.

Method:**Shelf Life/Permanence Ratio**

permanence measured
values values

RH1 := 50.0 RH2 := 27.5 deltaH := 30.0
T1 := 68.0 T2 := 72.5

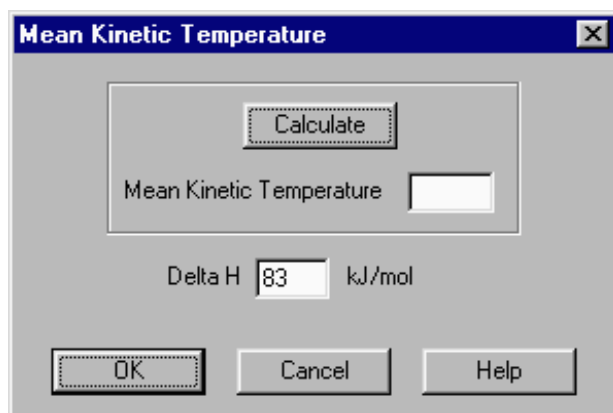
$$x := 10.0 \quad 394.0 \cdot \text{deltaH} \cdot \left[\left[\frac{1}{(T2 + 460)} \right] - \left[\frac{1}{(T1 + 460.0)} \right] \right]$$

$$\text{Permanence_Ratio} := \left[\left(\frac{\text{RH1}}{\text{RH2}} \right) \cdot \frac{T2 + 460.0}{T1 + 460.0} \right] \cdot x$$

Permanence_Ratio = 1.186

To find the shelf life of an item at this permanence ratio, simply multiply this value by the rated shelf life for the item.

Mean Kinetic Temperature



Calculation Parameters

- Delta H is referring to activation energy and probably doesn't need to be changed. The default is 83 kJ/mol. This number can range between 60 and 100.

Summary:

The MKT is the single calculated temperature at which the total amount of degradation over a particular period is equal to the sum of the individual degradations that would occur at the various temperatures. Thus, it may be considered as an isothermal storage temperature that stimulates the non-isothermal effects of storage temperature variations.

Method:**Mean Kinetic Temperature**

T := 22.5 temperature in degrees C

Tk := T + 273 convert to Kelvin

n := 1 number of temperature values used in accumulation

deltaH := 83 activation energy in kJ/mol

R := 0.0083 universal gas constant in kJ/mol-deg

$$\text{accum} := \left(\exp \left(-\frac{\text{deltaH}}{R \cdot T_k} \right) \right)$$

$$\text{Mean_Kinetic_Temperature} := \frac{\left(\frac{\text{deltaH}}{R} \right)}{-\ln \left(\frac{\text{accum}}{n} \right)} - 273.0$$

Mean_Kinetic_Temperature = 22.5 deg. C

Saving and Restoring Graph Properties

Saving Properties

By selecting Save Settings from the Settings menu, you can save your current graph properties, along with graphed measurements and scale settings into a configuration file (.CG2).

Restoring Properties

You can apply these configuration files to other data files (.PL2 files) by simply clicking on "Restore Settings" from the Settings menu and selecting the desired file.

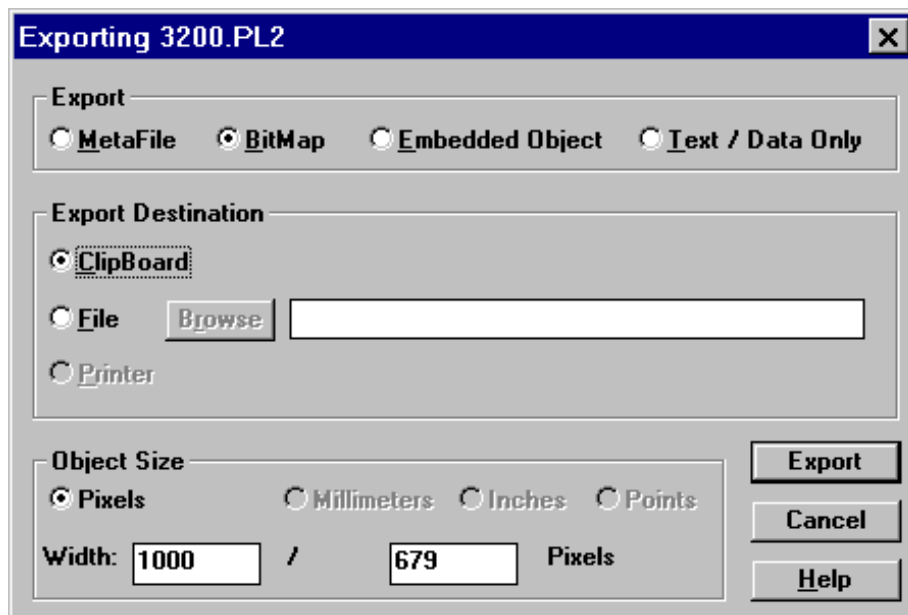
Printing Graphs

To print your graph, choose Print from the File menu. Select the desired printer and settings and then click OK. To use the default printer and settings, choose Print Default from the File menu.

Note: The print quality of the graph is dependent upon the color selections and your printers ability to reproduce them. You may get better results using monochrome with symbols. To select color or monochrome right-click on the graph and change the Viewing Style.

Copying a Graph

Double-click on the graph to open the customization dialog. Click on Export to open the graph export dialog. Select **Bitmap** and **Clipboard**, then click on the Export button. You may now paste a picture of the graph into another document or application.

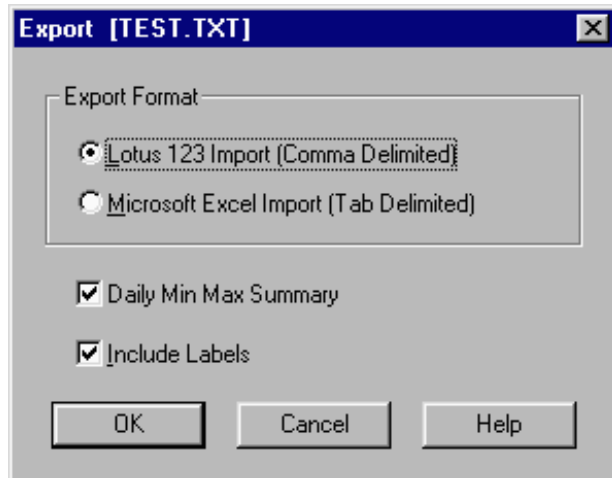


Browsing Data

When the graph is displayed, click on File...Browse Detail. A text file listing the data in the graph will be displayed in tabular form and the word processing program associated with the .TXT extension will be called. You can also click File...Browse Min/Max. This will show daily high/low for each day graphed. The data readings will be listed. You can save or print this information from within your word processing program.

Exporting Data

To export data, click on File...Export... while viewing a graph. Enter the name for the export file you wish to create and click OK. Select either Lotus or Excel for the export format. Check **Daily Min/Max Summary** if you want just the daily high/lows exported. Leave it unchecked if you want to export all the data. Click OK and the export file will be created.



Hotkeys

If you need to connect your logger in place of your mouse, you can still use all of WinDataSoft's features using hotkeys.

Menus

use Alt and the underlined letter in the menu

press the underline menu item or use the up/down arrow keys and Enter to select the desired item

Dialogs

Tab moves between items and groups

use the arrow keys to move within a group that has radio buttons or in list and combo boxes

press the spacebar to select or deselect a check box

Plotted Data

Rather than dragging a zoom box on the graph, you can use the Scales Dialog to set the horizontal or vertical extents of the graph.

Frequently Asked Questions

- 1.) What does the Delay of Alarm Function do? The Delay Alarm Function disables the alarm until the specified number of samples have been taken. This is useful for those occasions when your logger needs time to adjust to a temperature, such as in a refrigerator, and you still would like to use the alarm feature to alert you to a potential problem.
- 2.) What are "Active Sensors"? When you select a sensor in the Setup dialog, they become active sensors. This means that data will be recorded for these sensors each time the logger samples.
- 3.) Why doesn't the Status Indicator blink after I restart my logger? In order for the Status light to blink on a logger, you must select Blink LED While Logging from the Setup dialog and reset the logger.
- 4.) Do I have to setup my graph each time I load a new file? No. You can save and restore graph properties from the Settings menu while viewing a graph. This saves and restores currently graphed measurements, X & Y scales, graph annotations, colors, etc...
- 5.) How do I remove the alarm lines from the graph? To remove the alarm lines from the graph, select Measurements from the Settings menu, then double click either Sensor 1 or Sensor 2 from the Display menu. Now uncheck the Display Alarm Limits box.
- 6.) Is there any way to display temperature in degrees C? To change the temperature scale, select Preferences...Options from the main menu. Now select either Fahrenheit or Celsius.
- 7.) Is WinDataSoft available in languages besides English? WinDataSoft is under development, and will support other languages in a future release.
- 8.) Why are the printed graphs so hard to read? You probably need to print the graph in monochrome. If you have a problems printing color graphs refer to Printing Graphs.
- 9.) How can I make my logger stop logging? If you do not wish for your logger to log, you may put it in a sleeping state. To do this, enter Setup Logger, change the Interval to Sleeping and then reset it. The logger will not record data again until it is reset with an Interval other than Sleeping.