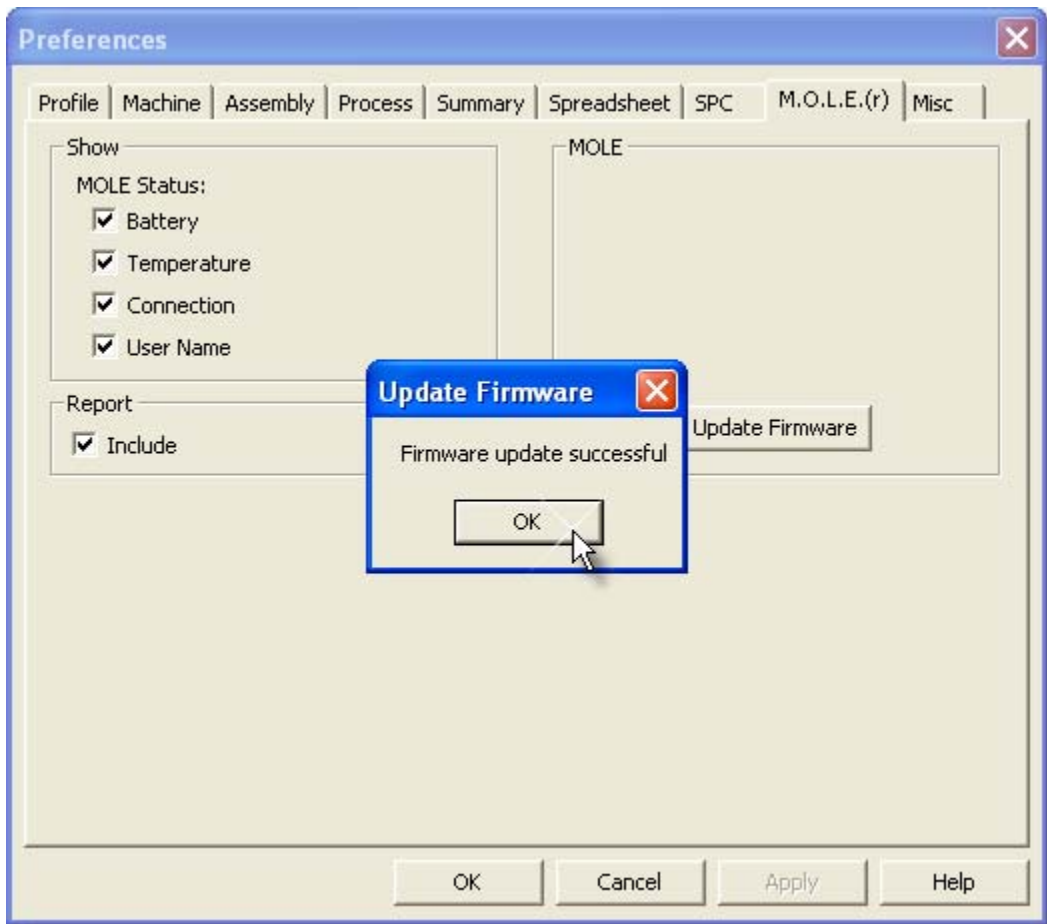


- 5) Select the firmware file.
- 6) Click the **Open** command button to start updating the firmware.

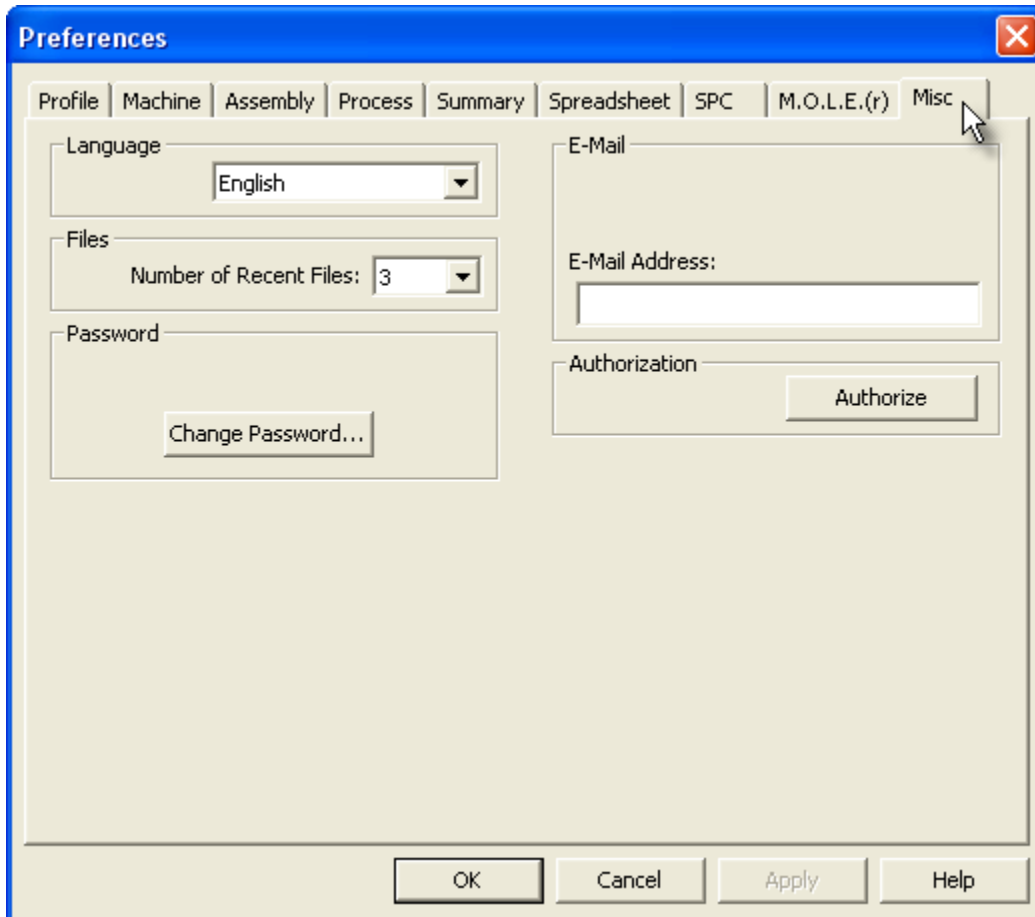


- 7) When the update firmware process is complete, select the **OK** command button.

5.5.1.6.9. Misc

To access misc preferences:

- 1) On the **File** menu, click **Preferences**, and then click the **Misc** tab.



Language

This is where the user can change all of the menus and commands to a different language.



If the language is changed it will require the software to be restarted.

To select a different language:

- 1) On the **File** menu, click **Preferences**, and then click the **Misc** tab.
- 2) Select a desired language from the **Language** drop-down box.
- 3) Restart the software program.

Files

The most recently selected working directories are displayed at the bottom of the File menu. The user can select how many recent directories to display.

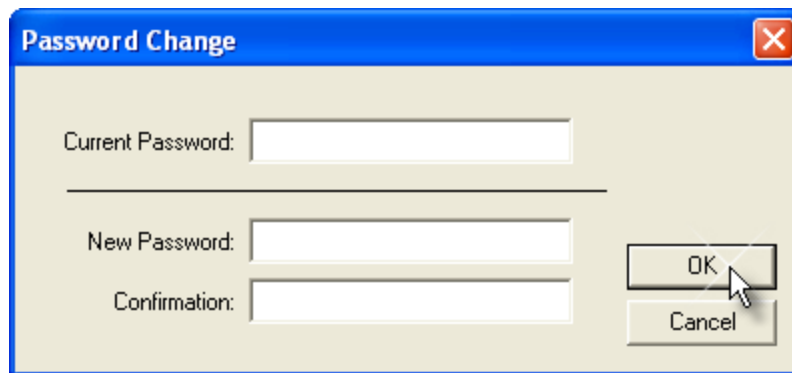
Password

The software has a password protection feature that uses case-sensitive text for securing access to a Page Tab and the associated preference tab. When password protection is used, the Page Tab will be highlighted in yellow and the user will not be able to access the protected worksheet without proper password privileges.

If there are password protected Page Tabs, the password protect command will not affect data when uploading from the M.O.L.E. profiler. The protected Page Tabs just cannot be viewed without the password.

To change a password:

- 1) On the **File** menu, click **Preferences**, and then click the **Profile** tab.
- 2) In the **Password** section, click the **Change Password** command button and the Password Change dialog box appears.



The software has a default password **Admin**. When the password is changed for the first time, **Admin** will need to be entered in the **Current Password** text box.

- 3) Enter current password in the **Current** Password text box.
- 4) Enter a new password in the **New** Password text box.



The software only accepts passwords with a minimum of 4 characters.

- 5) Enter the new password again in the **Confirmation** text box and then click the **OK** command button to accept or **Cancel** to not change the password.

Email

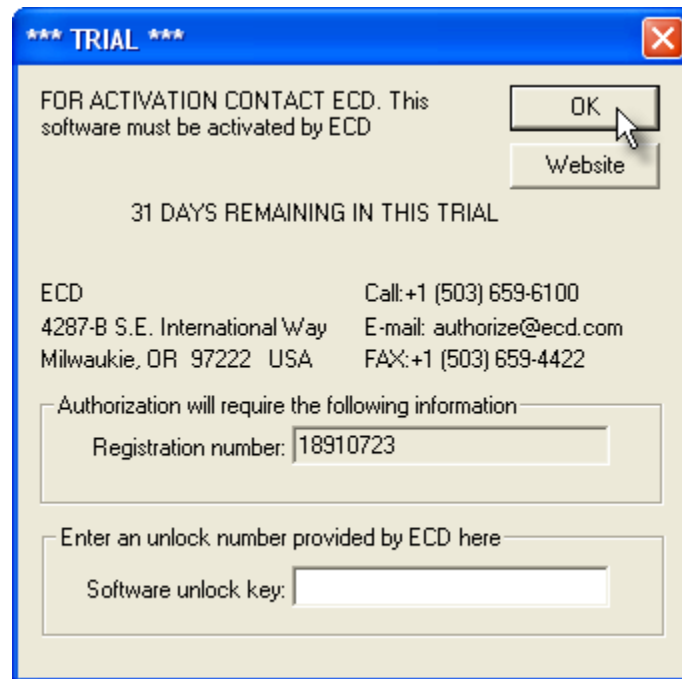
The user can send or save a Screen image (**.BMP**) or Data Run (**.XMG**) to an email recipient. The user can set a default email address to have the software automatically populate the Email recipient text box when using the **Send to** command.

Authorization

The software is a fully functional 30-day trial version. Once the trial period is over, you may purchase the software from an ECD Salesperson.

To authorize:

- 1) On the **File** menu, click **Preferences**, and then click the **Profile** tab.
- 2) In the **Authorization** section, click the Authorize command button and the Password Change dialog box appears.



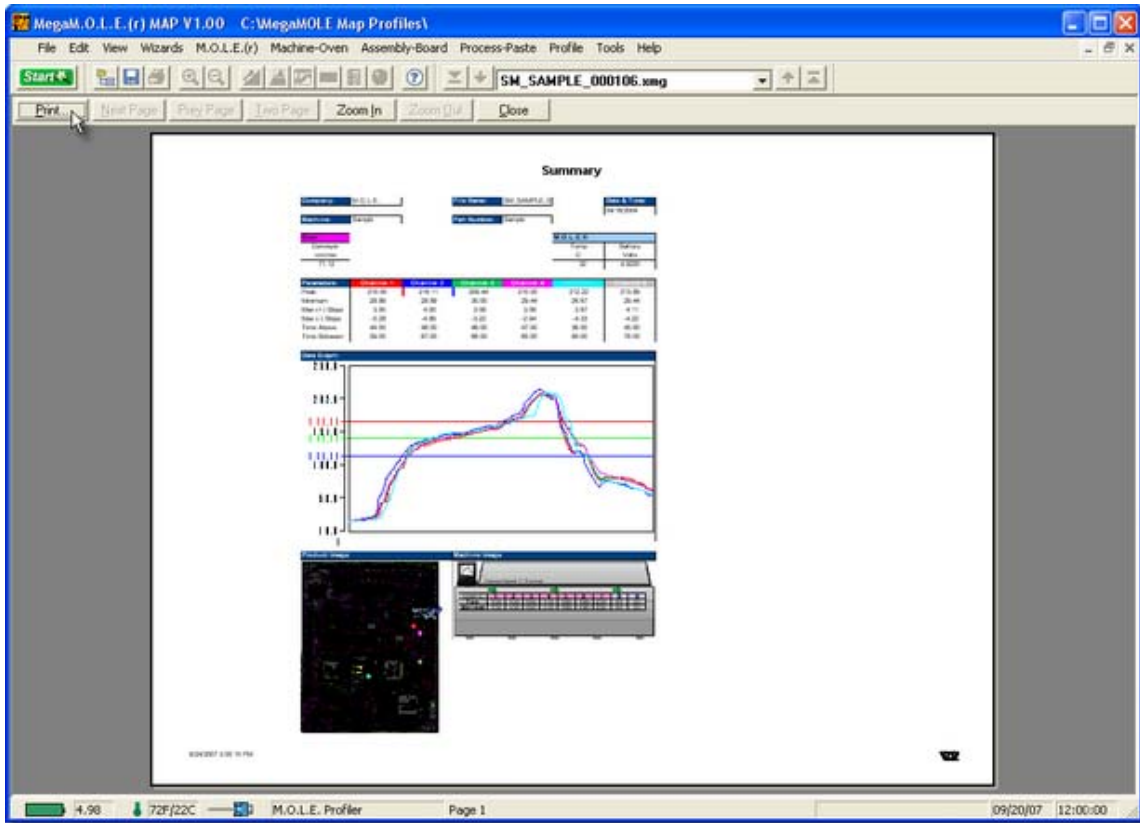
- 3) Enter the purchased Authorization key in the text box and click the **OK** command button.

5.5.1.7. Print Preview

The Print Preview command shows a preview of the page(s) to be printed. This command is useful when confirming print options.

To view a print preview:

- 1) On the **File** menu, click **Print Preview**.



- 2) Use the buttons on the toolbar to look over the page or make adjustments before printing.

5.5.1.8. Print Page Tab

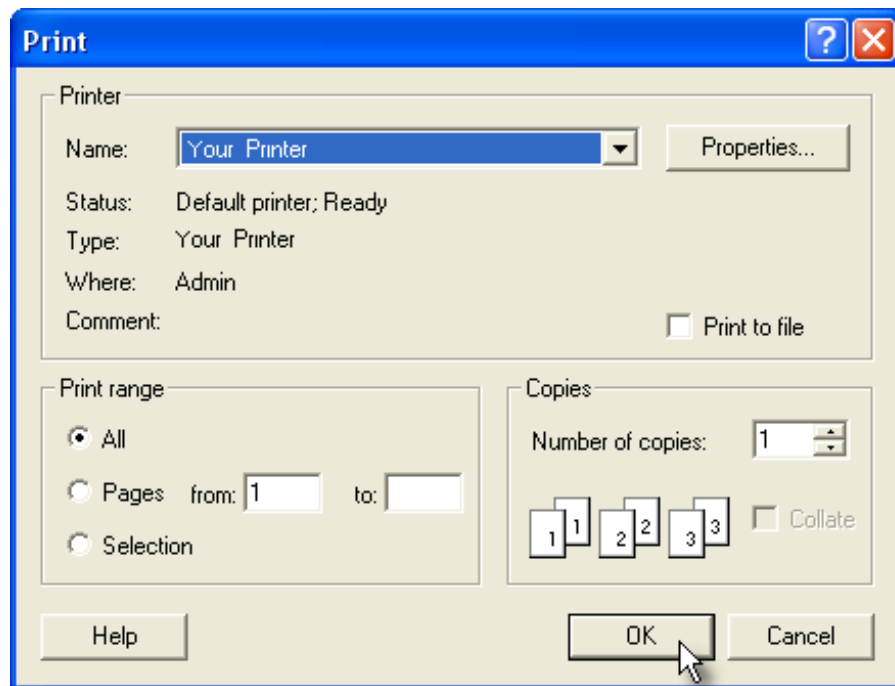
The Print Page Tab command prints the currently displayed Page Tab.



The options that appear on the Print dialog box will depend on the type of printer and the installed printer driver.

To print a page:

- 1) On the **File** menu, click **Print**.
- 2) Select desired print options.



- 3) Click the **OK** command button to close the Print dialog box and initiate printing or **Cancel** to quit the command.

This command can be accessed on the Toolbar and can also be used by pressing the shortcut keys **[CTRL + P]**.



Print Page Tab Button

5.5.1.9. Print Report

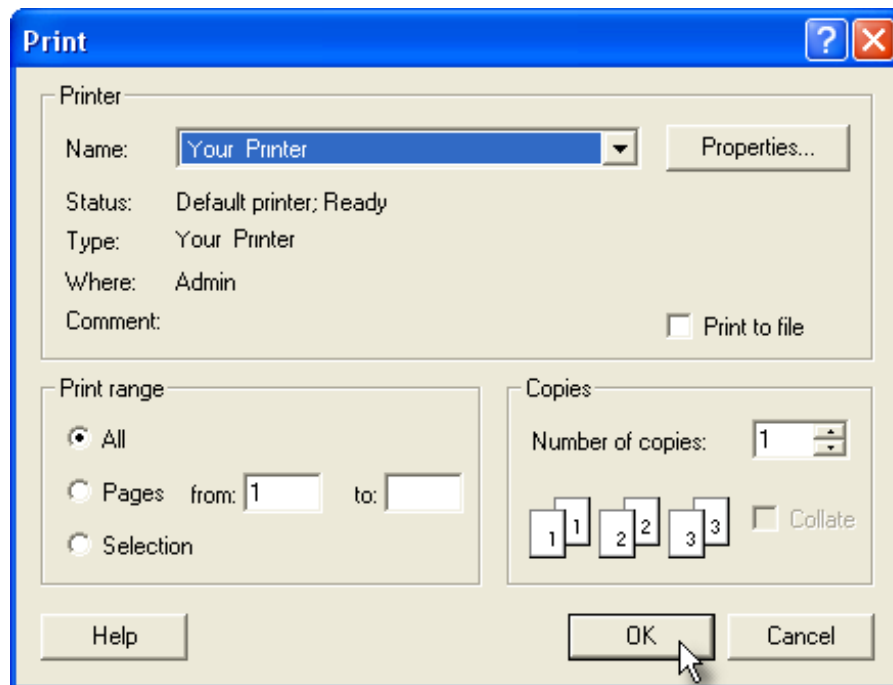
The Print Report command prints all of the individual Page Tabs in a report format. The Page Tabs included in the Print Report command can be configured on the associated Preference tab. Refer to topic [Software>Menus>File>Preferences](#) for more information.



The options that appear on the Print dialog box will depend on the type of printer and the installed printer driver.

To print a page:

- 1) On the **File** menu, click **Print Report**.
- 2) Select desired print options.



- 3) Click the **OK** command button to close the Print dialog box and initiate printing or **Cancel** to quit the command.

5.5.1.10. Send to

The Send to commands let the user send or save a Screen image (.BMP) or Data Run (.XMG) to an email recipient or file folder. This command is useful when the user would like to share profile data with other locations or when troubleshooting problems.



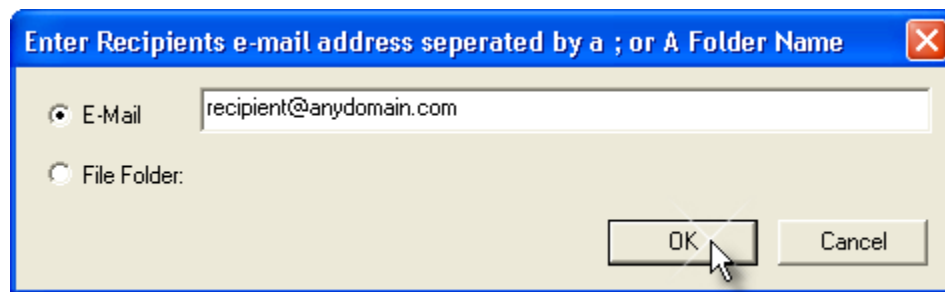
5.5.1.10.1. Screen Image

To send a screen image:

- 1) Launch an email program (i.e. Outlook, Firefox, Endora).
- 2) On the **File** menu, point to **Send to Mail Recipients** then select **Screen Image** to capture a bitmap (.BMP) image of the displayed Page Tab screen.
- 3) In the **Send to** dialog box select **Email** or **File Folder**.
- 4) Enter an email address or navigate to a file folder.



When sending a file to multiple recipients, all email addresses must be separated by a semicolon (;).



- 5) Click the **OK** command button to finish or **Cancel** to quit the command.



When sending files, the email program may display a message dialog that informs the user that it is sending the email.

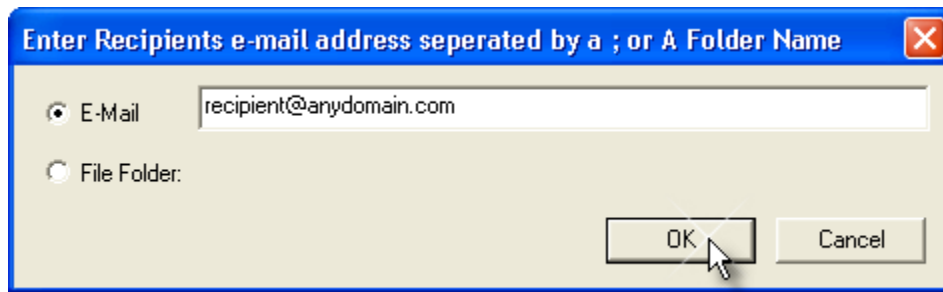
5.5.1.10.2. Data Run

To send a data run file:

- 1) Launch an email program (i.e. Outlook, Firefox, Endora).
- 2) On the **File** menu, point to **Send to Mail Recipients** then select **Data Run** to send or save the currently selected data run (.XMG).
- 3) In the **Send to** dialog box select **Email** or **File Folder**.
- 4) Enter an email address or navigate to a file folder.



When sending a file to multiple recipients, all email addresses must be separated by a semicolon (;).



- 5) Click the **OK** command button to finish or **Cancel** to quit the command.



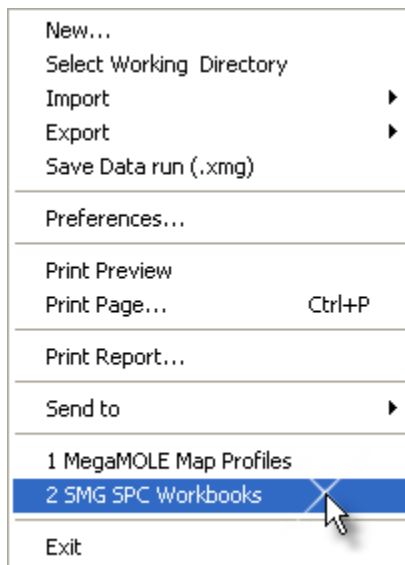
When sending files, the email program may display a message dialog that informs the user that it is sending the email.

5.5.1.11. Recent Working Directory

The most recently selected working directories are displayed at the bottom of the File menu.

To select a working directory:

- 1) On the **File** menu, click the name of the desired directory or press the appropriate number beside it.



5.5.1.12. Exit

The Exit command closes the software program.



When exiting the software, any changes made to the currently selected data run will automatically be saved.

To exit the program:

- 1) On the **File** menu, click **Exit** to quit the program.

5.5.2. Edit Menu

The Edit menu commands enable the user manage the data run set displayed on the Spreadsheet to so the most beneficial data is assembled in the working directory.

The screenshot shows the MEGAM.O.L.E. (r) MAP V0.00 software interface. The 'Edit' menu is open, showing options: Copy (Ctrl+C), Paste (Ctrl+V), Rename Data Run, Hide Data Run, and Remove Data Run. The spreadsheet below displays data for various samples and their parameters.

	B	C	D	E	F	G	H	I	J	K	L	
SPC												
2	Date	Time	User 1	User 2	User 3	User 4	User 5	Minimum Temperature	Maximum Profile Slope	Time Between Temperature	Battery	
3								Channel 1	Channel 1			
4								C	C/Soc	iso		
Filter Reset	All	All	All	All	All	All	All	All	All	All	All	
1	ecd_bch_sample4.xmlg	03/13/2008	12:44:15					226.67	3.94	90.00	4.92	
2	ecd_bch_sample3.xmlg	02/04/2008	15:42:50	1	2	3	4	5	211.11	3.72	75.00	4.92
3	ecd_bch_sample2.xmlg	02/04/2008	15:42:50						210.00	3.50	74.00	4.92
4	ecd_bch_sample1.xmlg	02/04/2008	15:42:50						226.11	4.30	86.00	4.92
5	ECD_20ch_Sample1.xmlg	02/04/2008	15:42:50						230.94	3.79	77.00	4.21
Sum									210.00	3.50	74.00	4.92
It								5	5	5	5	
Misc								210.000	3.500	74.000	4.92	
Max								230.940	4.390	90.000	4.92	
Avg								228.9660	3.8680	80.4000	4.77	
Std-De								9.69370	0.33207	7.16240	0.317	
USL								226.50		95		
LSL								215.00		85		

5.5.2.1. Copy

To copy data:

- 1) Select the Spreadsheet Page Tab.
- 2) Highlight a Spreadsheet data run row or individual cell.
- 3) On the ***Edit*** menu, click ***Copy*** to copy the data in the selected Spreadsheet cells for pasting into other user definable cells or different programs.

This command can also be used by pressing the shortcut keys [***CTRL +C***].

5.5.2.2. Paste

To paste data:

- 1) Select the Spreadsheet Page Tab.
- 2) Highlight a user definable cell.



User definable cells have label headers of User 1-5 and are colored green.

The screenshot shows the MEGAM.O.L.E. (r) MAP V0.00 software interface. The 'Edit' menu is open, and the 'Paste' option is selected. The spreadsheet displays data for various samples, with columns for Date, Time, User 1-5, Maximum Temperature, Minimum Positive Slope, Time Between Temperature, and Battery. The 'Paste' option is highlighted in the context menu.

	B	C	D	E	F	G	H	I	J	K	L	
SPC												
2		Date	Time	User 1	User 2	User 3	User 4	User 5	Maximum Temperature	Minimum Positive Slope	Time Between Temperature	Battery
3									Channel 1	Channel 1		
4									C	Obsc	sec	
Filter	All	All	All	All	All	All	All	All	All	All	All	All
Reset												
1	ecd_6ch_sample4.xmg	03/13/2008	12:44:15						226.67	3.94	90.00	4.92
2	ecd_6ch_sample3.xmg	02/04/2008	15:42:50	1	2	3	4	5	211.11	3.72	75.00	4.92
3	ecd_6ch_sample2.xmg	02/04/2008	15:42:58						218.00	3.50	74.00	4.92
4	ecd_6ch_sample1.xmg	02/04/2008	15:42:50						226.11	4.39	86.00	4.92
5	ECD_20ch_Sample1.xmg	02/04/2008	15:42:50						230.94	3.79	77.00	4.21
Stat												
Mean									210.00	3.50	74.00	4.92
StDev									5	5	5	5
Min									218.000	3.500	74.000	4.2
Max									230.940	4.390	90.000	4.9
Avg									226.9660	3.8600	86.4000	4.77
Std-De									9.69370	0.33207	7.16240	0.317
USL									226.50		95	
LSL									215.00		85	

- 3) On the **Edit** menu, click **Paste**, to paste the data in the selected Spreadsheet cells.

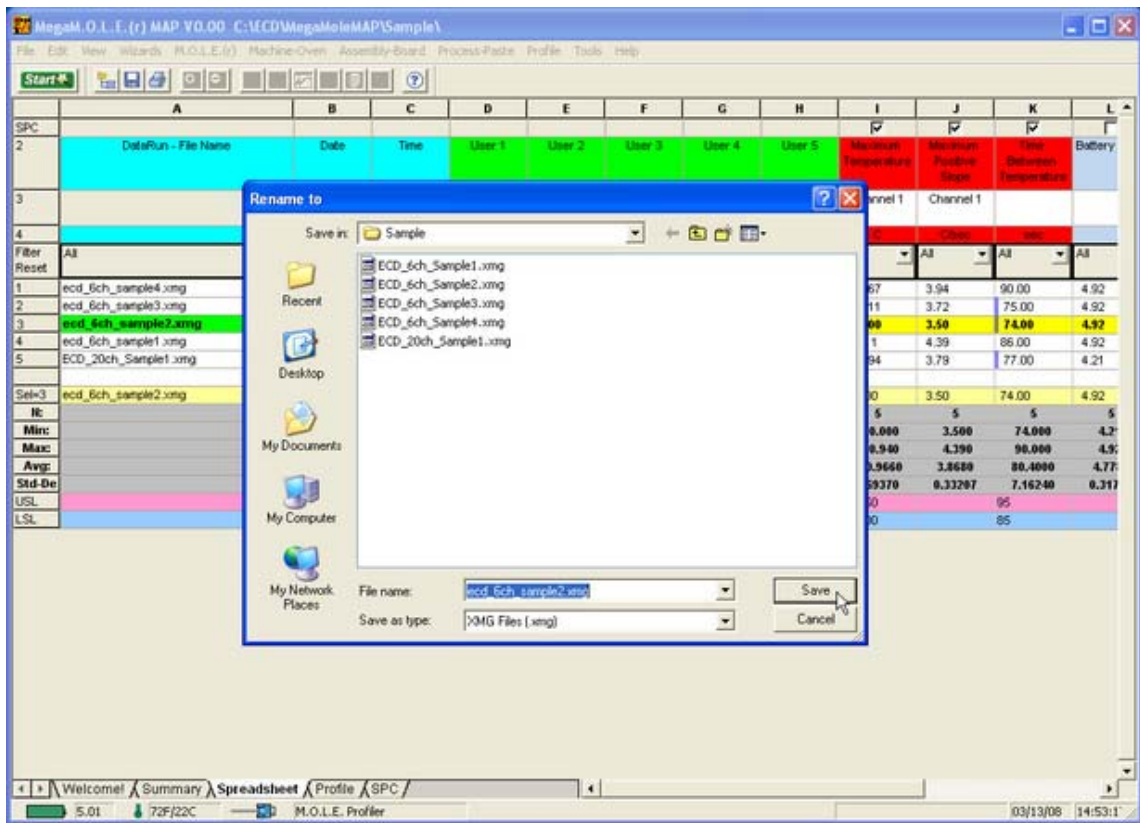
This command can also be used by pressing the shortcut keys [**CTRL +V**].

5.5.2.3. Rename Data Run

Since the software is a data run manager, the user can rename the data run files displayed on the Spreadsheet Page Tab.

To rename a data run:

- 1) Select the Spreadsheet Page Tab.
- 2) Highlight a Spreadsheet data run.
- 3) On the **Edit** menu, click **Rename Data Run** and the software will prompt the user to specify a new data run file name.



- 4) Rename the data run file.
- 5) Click the **Save** command button to rename the file or **Cancel** to quit the command.

5.5.2.4. Hide Data Run

The Hide Data Run excludes a data run row without eliminating it completely from the working directory. This command is similar to the filter function, and is helpful when data runs may not be beneficial to the data run set statistics.

To hide a data run:

- 1) On the **Edit** menu, click **Hide Row**.

The data run is now excluded from the data run set without eliminating it completely from the working directory.



To restore hidden data set row(s) click the Red **Filter Reset** button located on the Spreadsheet Page Tab. Refer to topic [Software>Page Tabs>Spreadsheet>Filters](#) for more information.

5.5.2.5. Remove Data Run

Since the software is a data run manager, the user can remove data runs selected working directory displayed on the Spreadsheet Page Tab.



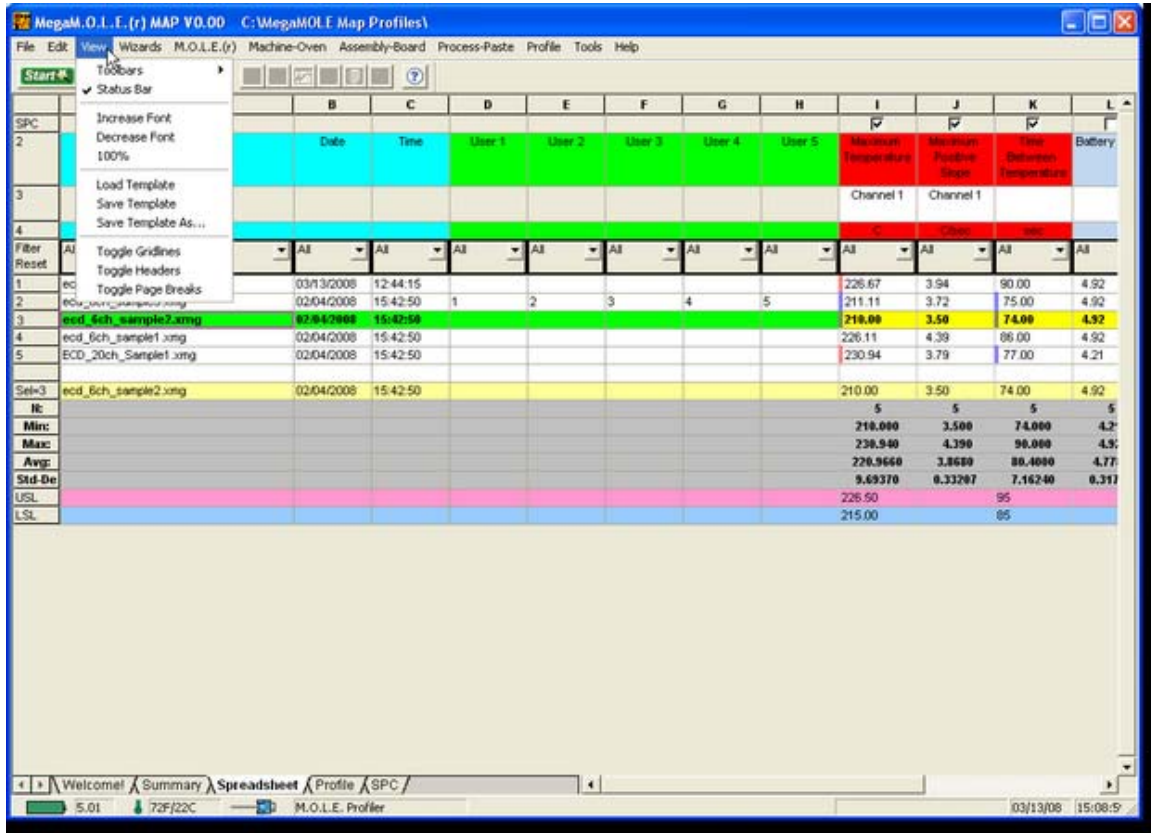
When a data run is removed the software automatically creates a backup (.BAK) file of the removed data run. To restore, navigate to the working directory, rename the (*.BAK) file extension to the MAP software (.XMG) file extension.

To remove a data run:

- 1) On the **Edit** menu, click **Remove Data Run** to remove a data run that is not wanted. This command is helpful when data has been collected and the user feels it is not beneficial to the data run set or is corrupted.

5.5.3. View Menu

The View menu commands enable the user to manipulate which areas are viewed on the standard Page Tabs and Templates.



5.5.3.1. Toolbars

By default, the Standard and Navigate toolbars appear docked on a single row, showing the toolbar buttons that are used most often. When there is a check mark beside the toolbar command it indicates that that it is displayed.



The toolbars can be moved to other edges of the program window. To move, drag docked toolbar until the toolbar snaps into place on the desired edge.

To hide a toolbar:

- 1) On the **View** menu, point to **Toolbar** then select the desired toolbar to display or hide.

5.5.3.2. Status Bar

By default, the Status bar appears along the bottom of the program window. When there is a check mark beside the toolbar command it indicates that that it is displayed.

To display the status bar:

- 1) On the **View** menu, click **Status bar** to display or hide the Status bar.

5.5.3.3. Increase Font

The Increase Font command has the capability to zoom the current Page Tab in multiple times.

To Increase Font:

- 1) On the **View** menu, click **Increase Font** to make the current Page Tab view larger. When the maximum Increase Font level has been reached the command will be dimmed.



The Increase Font command can be accessed on all Page Tabs excluding the Profile Page Tab.

5.5.3.4. Decrease Font

The Decrease Font command has the capability to zoom the current Page Tab out multiple times.

To Decrease Font:

- 1) On the **View** menu, click **Decrease Font** to make the current Page Tab view smaller. When the maximum Decrease Font level has been reached the command will be dimmed.



The Decrease Font command can be accessed on all Page Tabs excluding the Profile Page Tab.

5.5.3.5. 100%

The Zoom 100% command restores the current Page Tab to the default view level.

To zoom 100%:

- 1) On the **View** menu, click **100%** to restore current Page Tab view to the default.



The 100% command can be accessed on all Page Tabs excluding the Profile Page Tab.

5.5.3.6. Load Template

When a template data calculation has been changed or a new one has been added, the user can use the load template to refresh the default template specified in [Software>Menus>File>Preferences](#).

To load a template:

- 1) On the **View** menu, click **Load Template** to load the default template.



This command can also be accessed by right-clicking over a template.

5.5.3.7. Save Template

When a template data calculation has been changed or a new one has been added, the user can save the calculations to the default template specified in [Software>Menus>File>Preferences](#).

To save a template:

- 1) On the **View** menu, click **Save Template** to save the default template.



This command can also be accessed by right-clicking over a template data calculation.

5.5.3.8. Save Template As...

When a template data calculation has been changed or a new one has been added, the user can save the calculations to a new template file. This is useful when the user would like to customize a template leaving the default template the same. The user can load this new template by changing the default template specified in [Software>Menus>File>Preferences](#).

To save a new template:

- 1) On the **View** menu, click **Save Template As** and the Save Data Calculation Template dialog box appears.
- 2) Specify a new file name.
- 3) Click the **Save** command button to save the new template file or **Cancel** to quit the command.



This command can also be accessed by right-clicking over a template.

5.5.3.9. Toggle Gridlines

The Summary and Spreadsheet Page Tabs are built with cells that are organized into columns and rows. The software allows the user to show and hide the cell gridlines as needed. This command is particularly helpful when customizing the Summary Page Tab template.

To toggle gridlines:

- 1) On the **View** menu, click **Toggle Gridlines** to show or hide cell gridlines.



This command can also be accessed by right-clicking over the Summary or Spreadsheet templates.

5.5.3.10. Toggle Headers

The Summary and Spreadsheet Page Tabs are built with cells that are organized into columns and rows. These columns and rows include row headings which are numbers that appear on the left of each row, and column headings which are the letters that appear at the top of each column.

To toggle headers:

- 1) On the **View** menu, click **Toggle Headers** to show or hide column and row headers.



This command can also be accessed by right-clicking over the Summary or Spreadsheet templates.

5.5.3.11. Toggle Page Breaks

As data calculations get added to the Spreadsheet Page Tab, it may increase the amount of pages when printing. The software includes a preview of where page breaks occur.

To toggle page breaks:

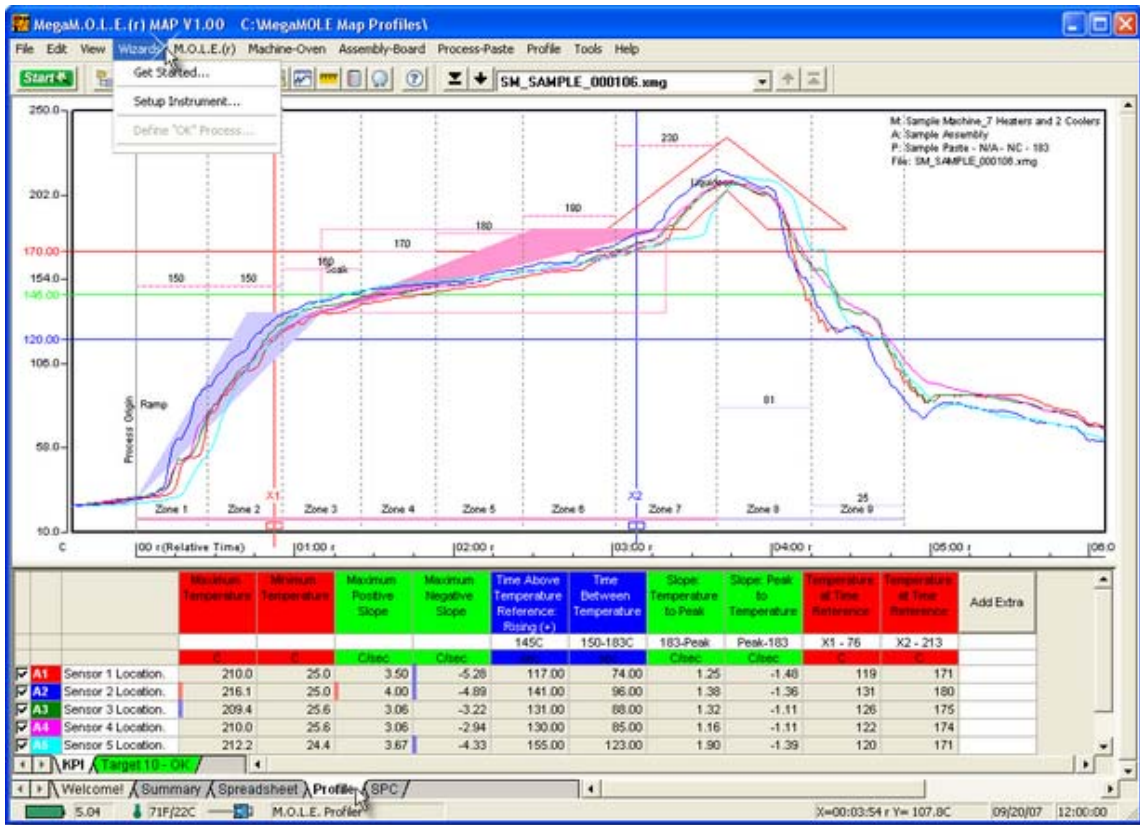
- 1) On the **View** menu, click **Toggle Page Breaks** to show or hide the page break lines.



This command can also be accessed by right-clicking over the Spreadsheet template.

5.5.4. Wizards Menu

MAP software wizards help guide the user through the most common multi-step tasks.



5.5.4.1. Get Started

This command activates the Get Started dialog box for access to the New (Start) command.

To activate the Get Started dialog box:

- 1) On the **Wizards** menu, click **Get Started** and a dialog box appears with the New (Start) command button.



5.5.4.2. Setup Instrument

This Wizard guides the user through a typical process on how to set a M.O.L.E. Profiler up for performing a data run.

- 1) Connect the M.O.L.E. to the PC. Refer to [Basics>Setup>Communications Setup](#) for more information.
- 2) On the **Wizards** menu, click **Setup Instrument** and the workflow wizard appears.



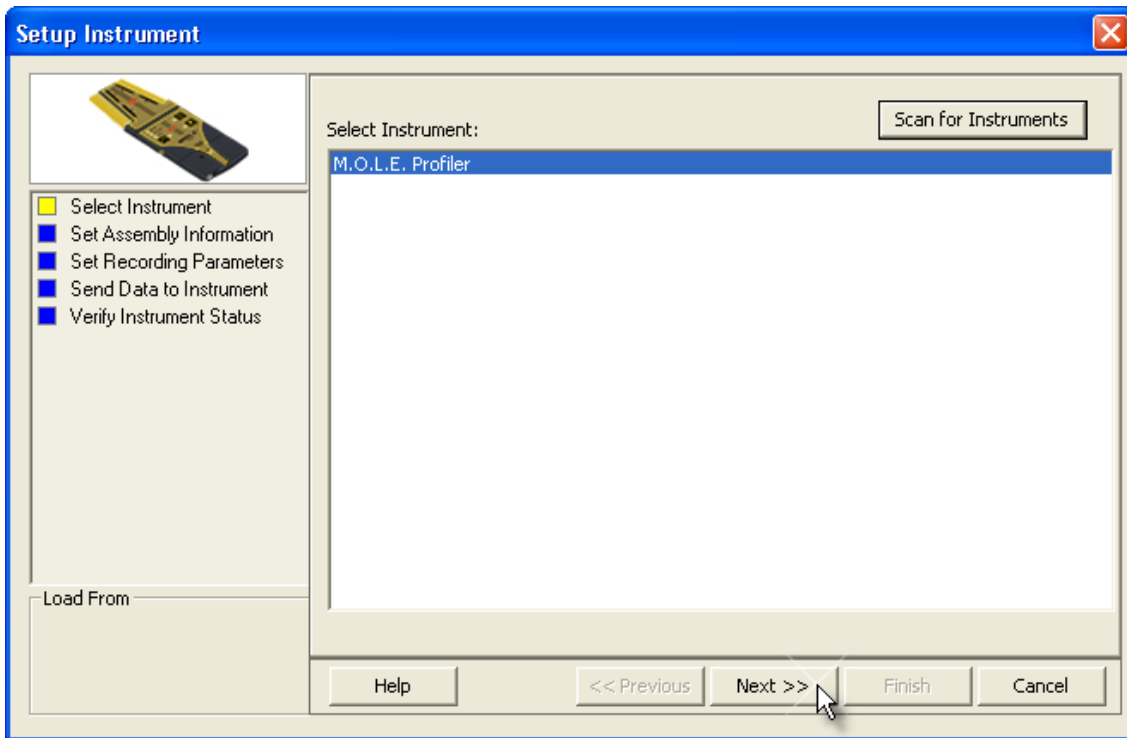
When navigating through the wizard, the step list on the left uses a color key to inform the user of the current step, steps that have been completed and remaining steps.

■ Current ■ Completed ■ Remaining

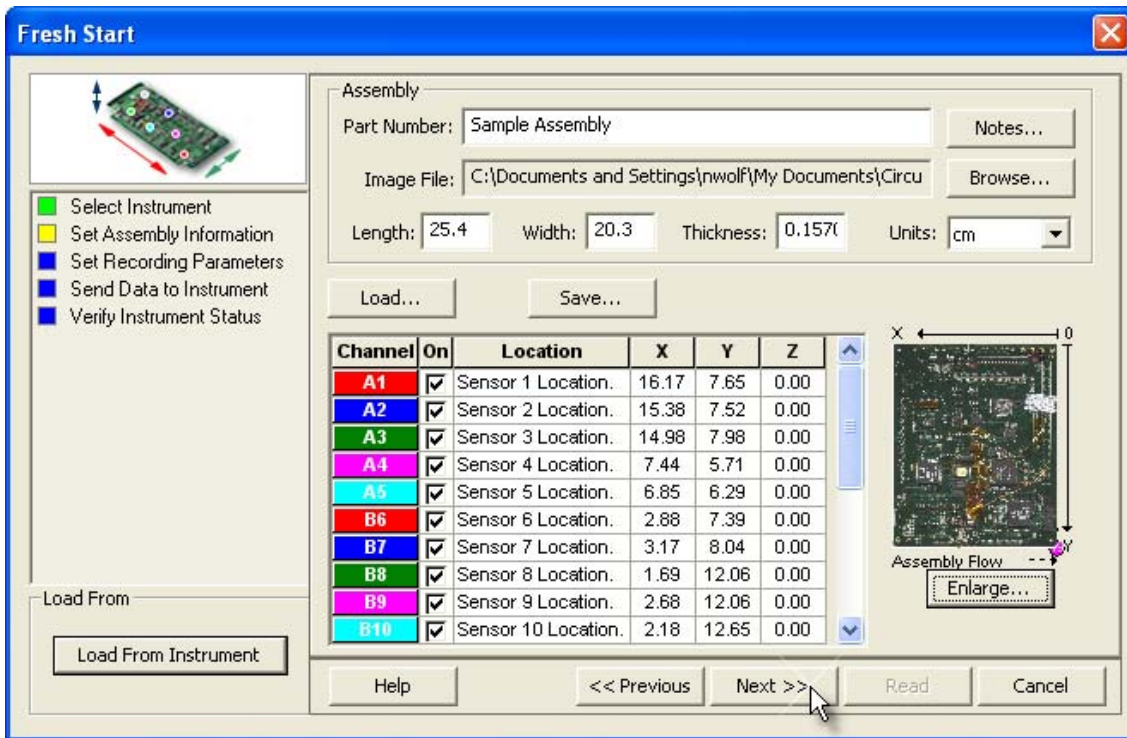
- 3) Select the desired instrument from the list box. If there is none listed, select the **Scan for Instruments** command button to detect all connected instruments.



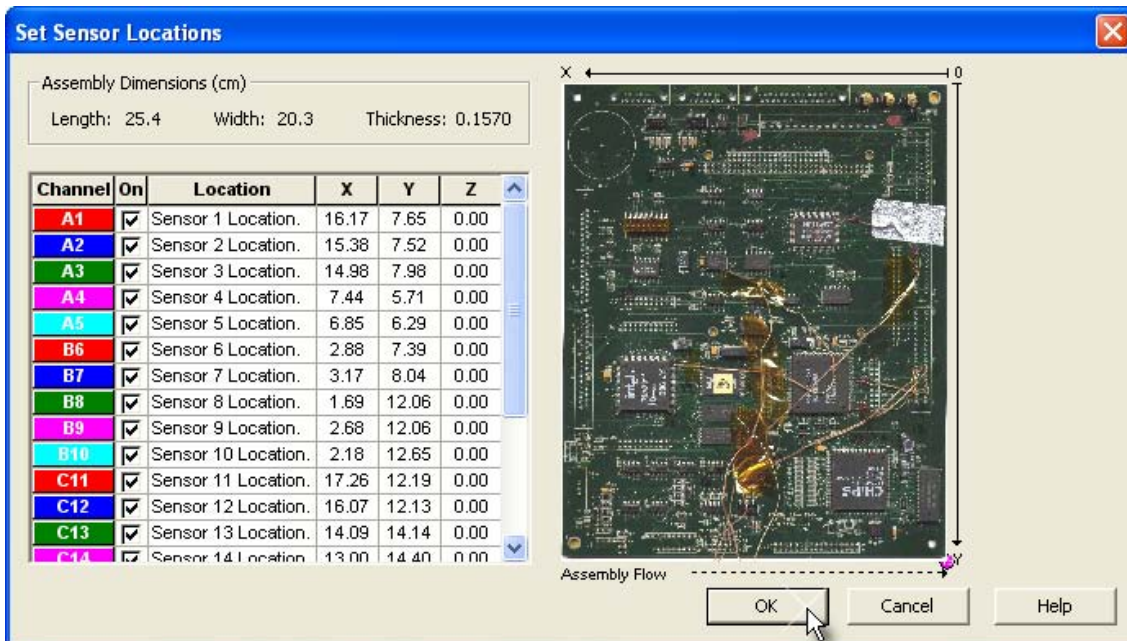
MAP software allows multiple instruments to be connected to a computer at one time. Selecting the **Scan for Instruments** command button will detect all instruments and display them in the list. If no instrument is detected, the default Demonstration MEGAM.O.L.E.® profiler is displayed.



- 4) Select the **Next** command button.
- 5) Set the assembly information such as part number, board size, sensor locations and a product image.

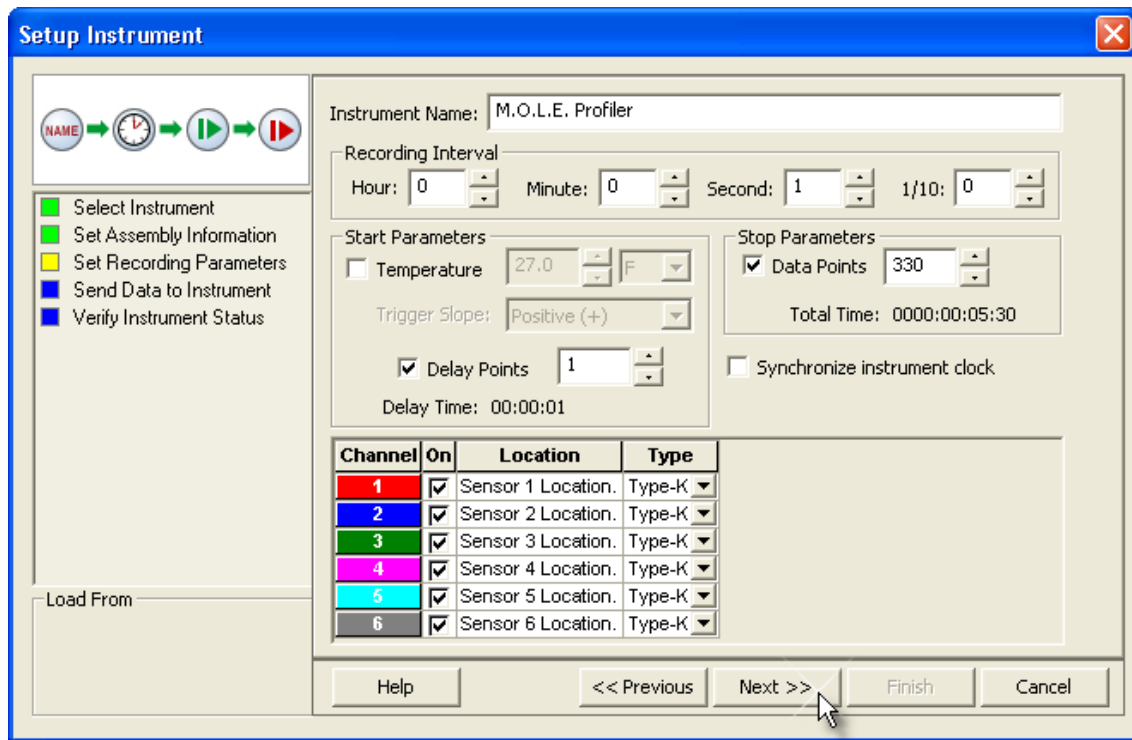


If the user specifies a product image, clicking the **Enlarge** command button displays the Set Sensor Locations dialog box where the user can specify the locations of each sensor. To move sensor locations, drag the sensor markers to the approximate location where the sensors are attached.

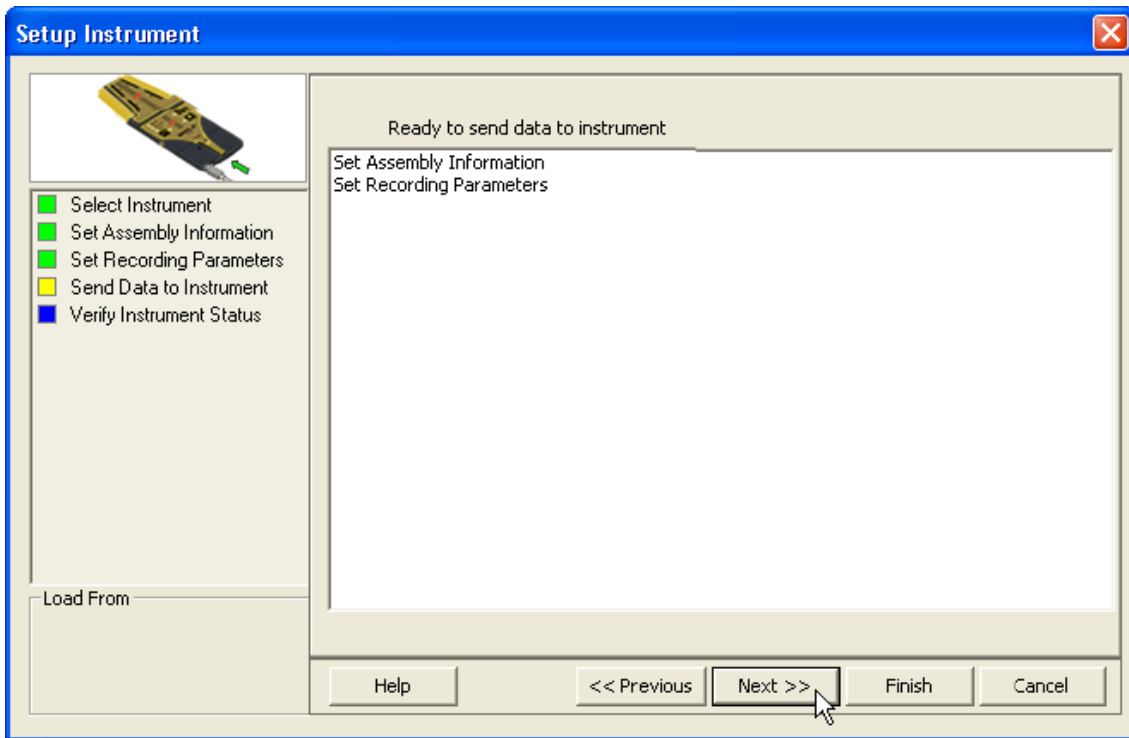


6) Click the **Next** command button.

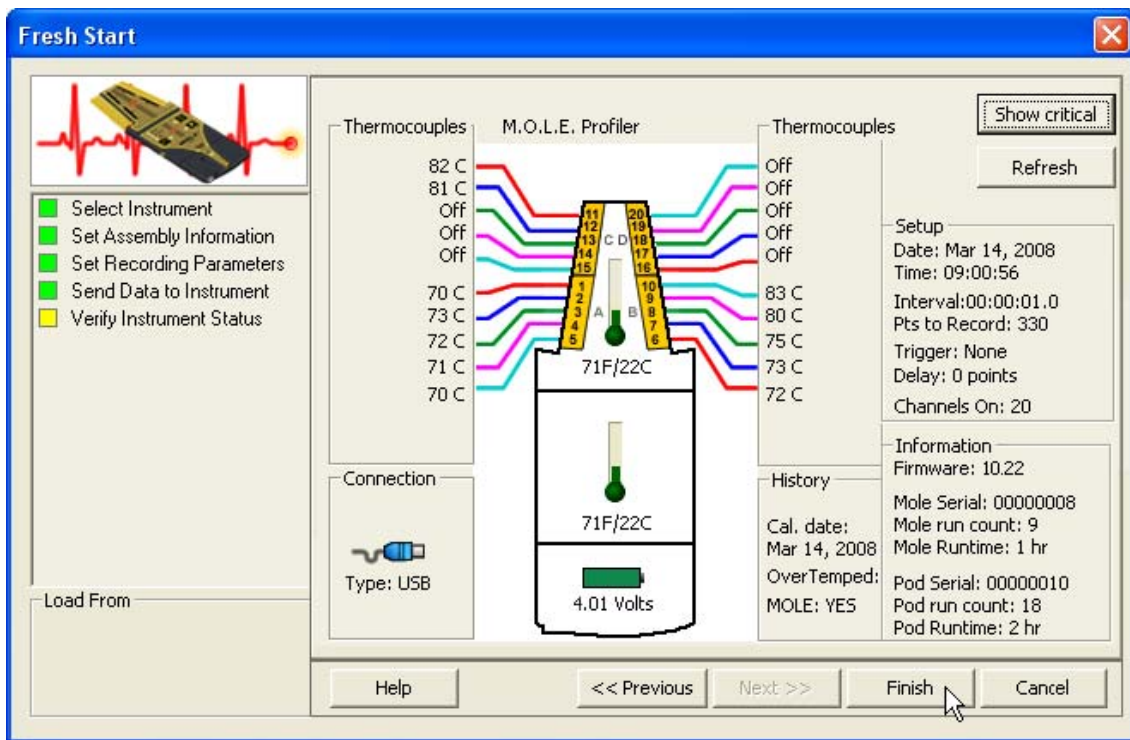
- 7) Set Recording Parameters such as the instrument name, recording interval, start parameters and stop parameters. This step is where the user can also turn a sensor channel ON or OFF, set the sensor location description and sensor type. Refer to section [Software>Menus>MOLE>Set Recording Parameters](#) for detailed information for each setting.



- 8) Select the **Next** command button.
- 9) Select the **Next** command button to send the data listed in the dialog box to the instrument.



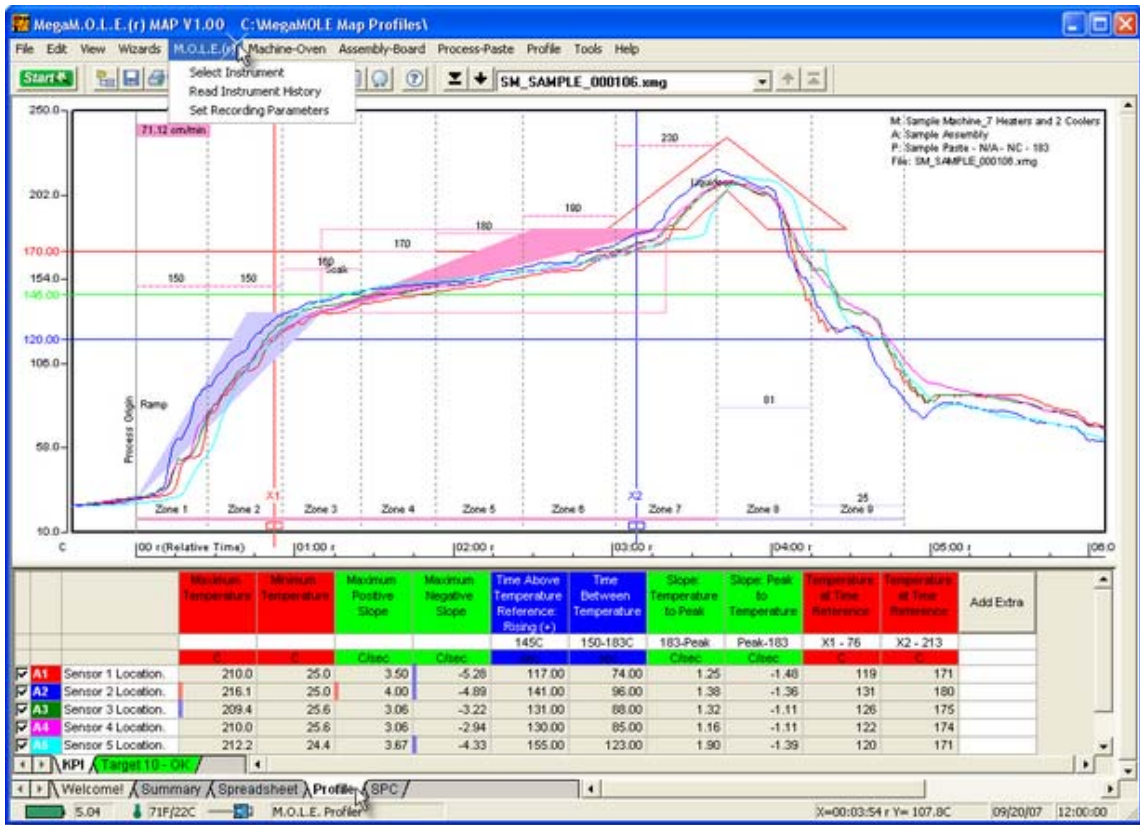
- 10) Verify the instrument status. This dialog box displays the health of the M.O.L.E. Profiler such as battery charge, internal temperature, thermocouple temperatures. If the user selects the **Show Critical** command button the dialog box will only display items that will prevent the user from completing a successful data run.



11) Select the **Finish** command button to complete the Setup Instrument wizard.

5.5.5. M.O.L.E. Menu

The M.O.L.E. menu commands configure a M.O.L.E. Profiler for collecting process data.



5.5.5.1. Select Instrument

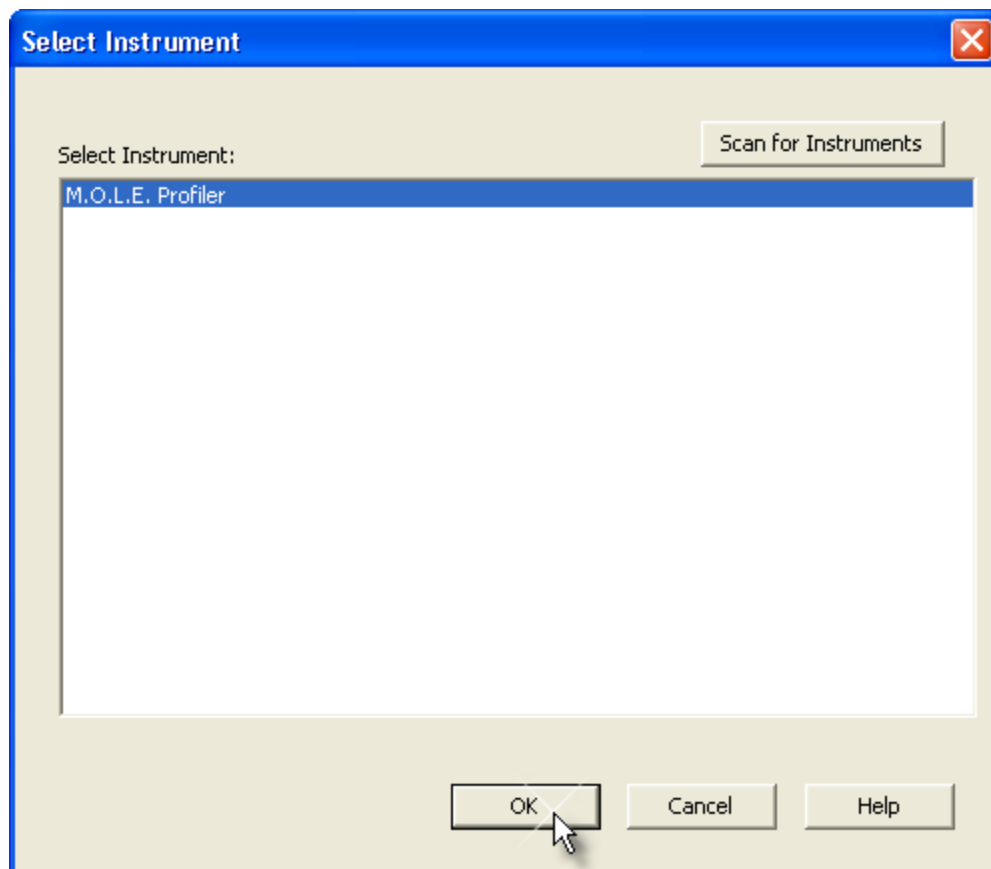
The Select Instrument command allows the user to select an available M.O.L.E. Profiler to make active so it can interface with the software.

To select an instrument:

- 1) Connect the M.O.L.E. to the PC. Refer to [Basics>Setup>Communications Setup](#) for more information.
- 2) On the **M.O.L.E.** menu, click the **Select Instrument** command.
- 3) Select the desired instrument from the list box. If there are none listed, click the **Scan for Instruments** command button to detect all available instruments.



MAP software allows multiple instruments to be connected to a computer at one time. Selecting the **Scan for Instruments** command button will detect all instruments and display them in the list. If no instrument is detected, the default Demonstration MEGAM.O.L.E.® profiler is displayed.



- 4) Click the **OK** command button to accept or **Cancel** to quit the command.

5.5.5.2. Read Instrument

The **Download Data** workflow is a wizard that starts a new profile (data run) by **downloading** the M.O.L.E. Profiler. Once the data run is downloaded, the user can then choose to apply Machine (Oven), Assembly (Board) and Process (Paste) information.

The Download Data workflow:

- 1) Connect the M.O.L.E. to the PC. Refer to [Basics>Setup>Communications Setup](#) for more information.
- 2) On the **M.O.L.E.** menu, click **Read Instrument**.



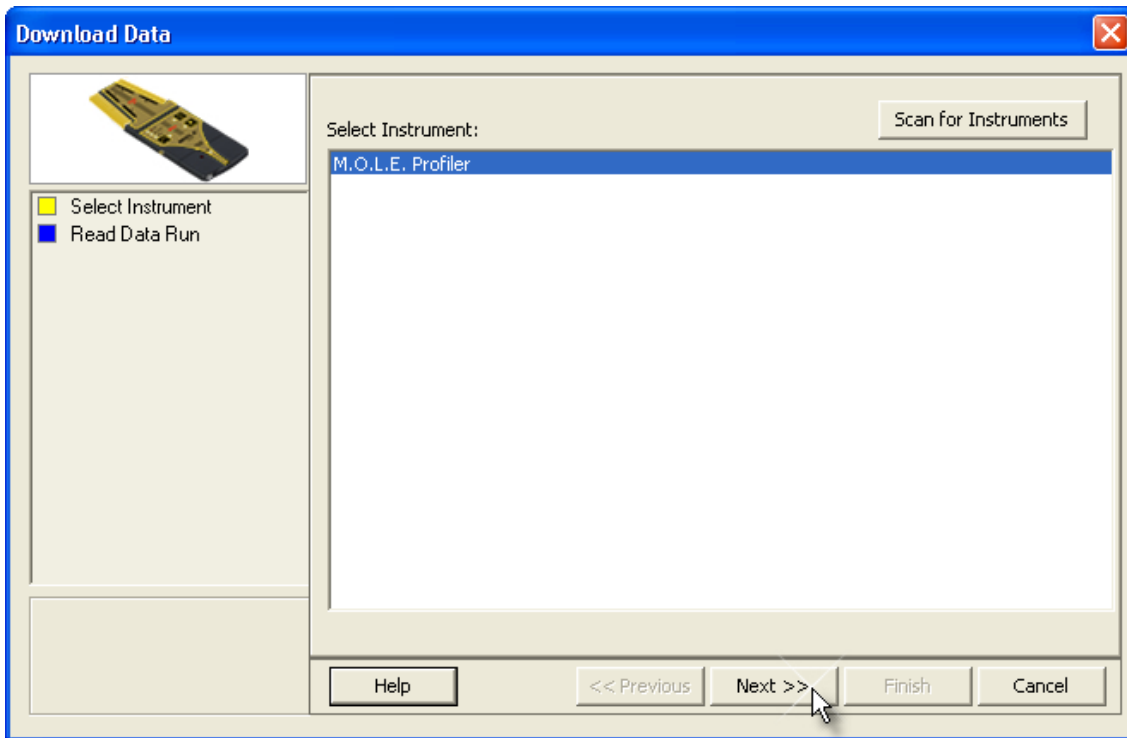
When navigating through the wizard, the step list on the left uses a color key to inform the user of the current step, steps that have been completed and remaining steps.

■ Current ■ Completed ■ Remaining

- 3) Select the desired instrument from the list box to make active. If there are none listed, click the **Scan for Instruments** command button to detect all available instruments.

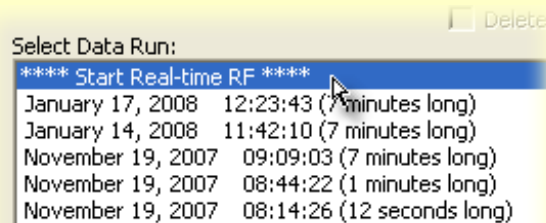


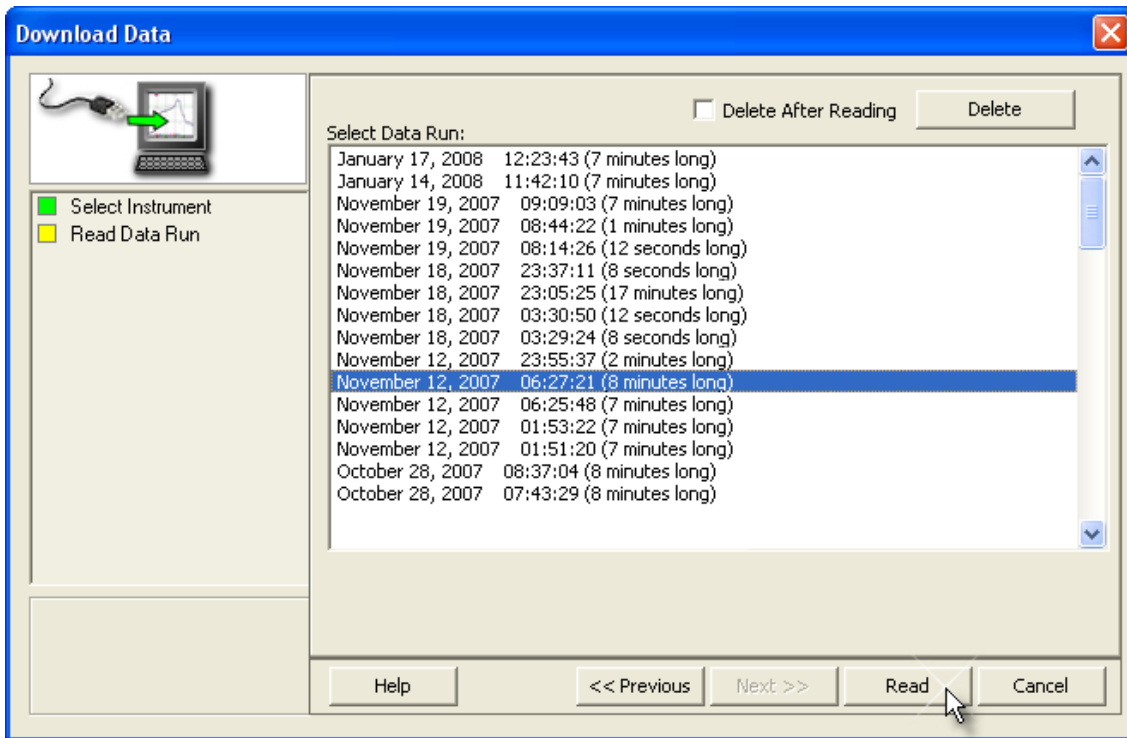
MAP software allows multiple instruments to be connected to a computer at one time. Selecting the **Scan for Instruments** command button will detect all instruments and display them in the list. If no instrument is detected, the default Demonstration MEGAM.O.L.E.® profiler is displayed.



- 4) Click the **Next** command button.
- 5) Select the desired data run and then click the **Read** command button to read the data run from the M.O.L.E. Profiler.

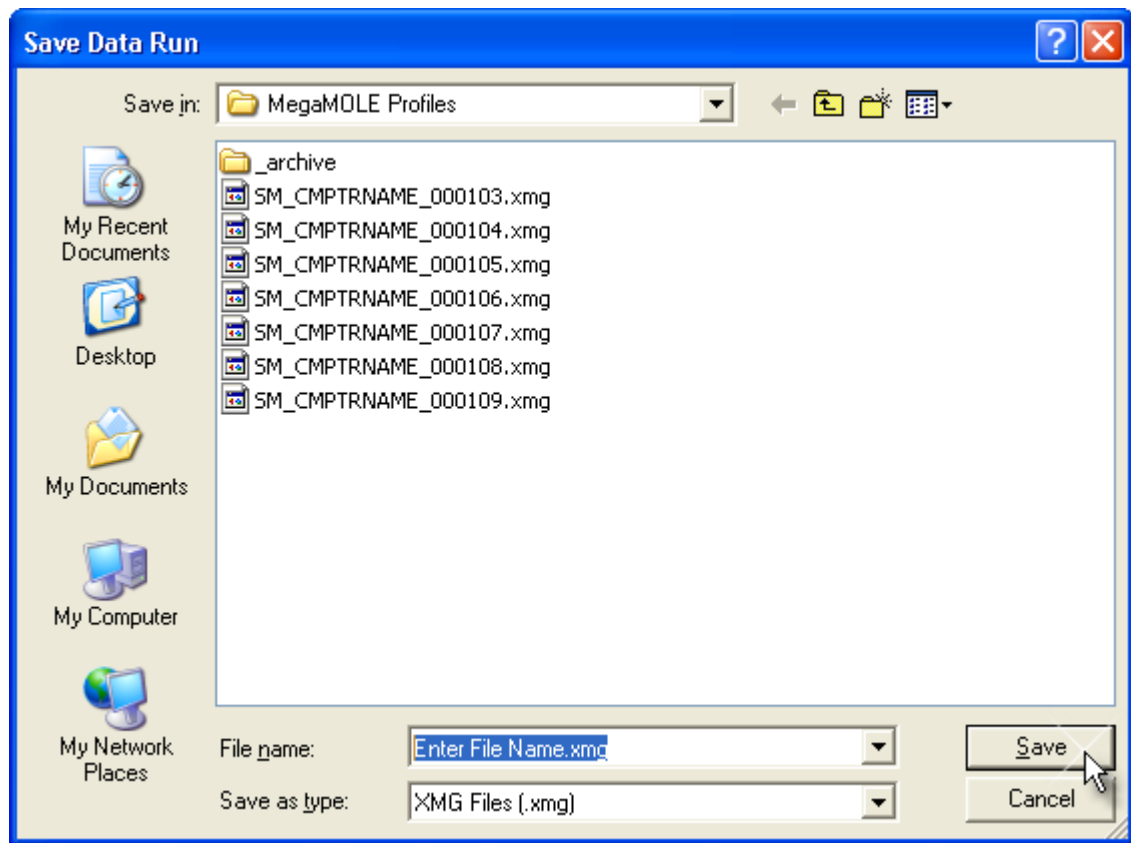
If the user has selected to use the Wireless RF option, select **Start real-time RF** on the top of the data run list.





On this step of the wizard, the user has the ability to remove a selected data run from the M.O.L.E. profiler by either selecting the **Delete After Reading** check box or selecting the **Delete** command button and removing it before downloading.

- 6) When the data run has been downloaded, the software will prompt the user to specify a new file name.




7) When finished, click the **Save** command button.


5.5.5.3. Instrument Status

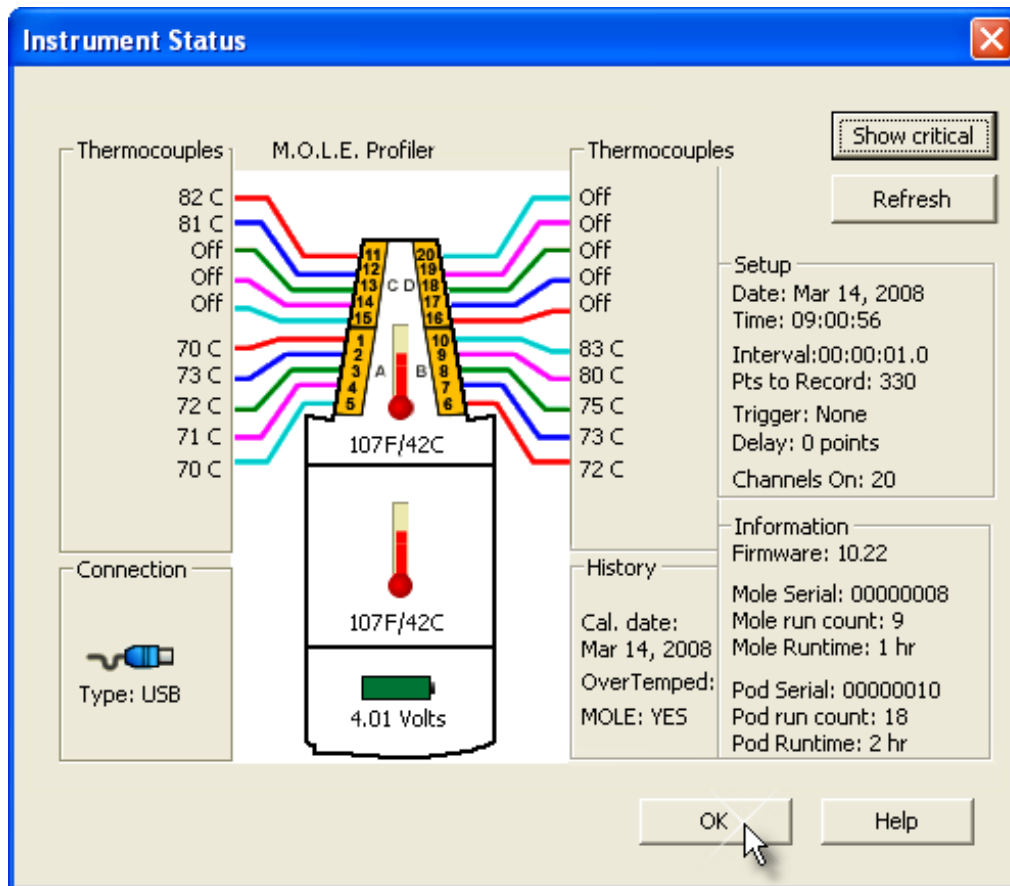
This command displays the health of the M.O.L.E. Profiler such as battery charge, internal temperature, thermocouple temperatures. This command also allows the user to display items that will prevent the user from completing a successful data run.

To display the instrument status:

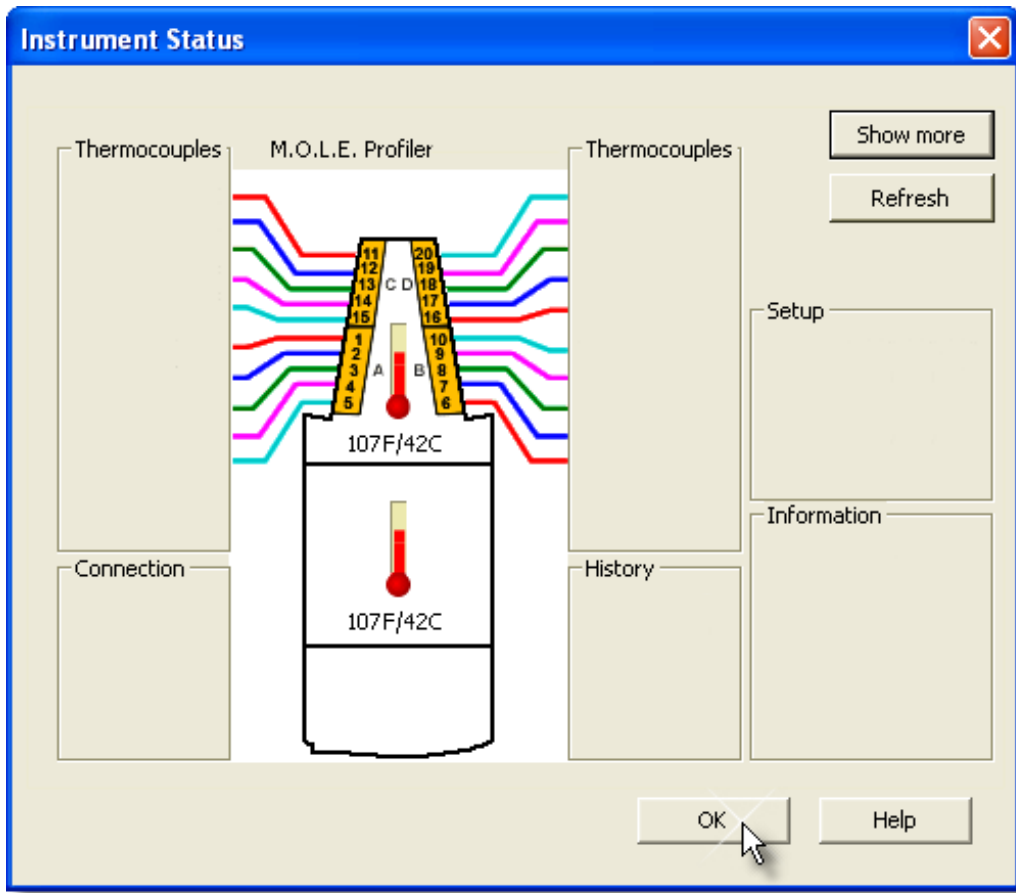
- 1) On the **M.O.L.E.** menu, click **Instrument Status** and the dialog box appears.

 If an instrument is not currently connected to the computer, the default Demonstration MEGAM.O.L.E.® profiler will be displayed.

 If the I/O module is not connected to the MEGAM.O.L.E.® Profiler, the software will display a warning message that the instrument is not communicating.



- 2) Click the **Show Critical** command button to filter the acceptable status items and only display critical problems that may prevent the user from completing a data run. In the example, the internal temperature reported is higher than the recommended operating specification.



3) Click the **OK** command button to close the dialog box.

5.5.5.4. Set Recording Parameters

The Set Recording Parameters command configures how the M.O.L.E. profiler records data during a data run.



The Start and Stop Parameters are optional settings and do not require configuration.

Channel	On	Location	Type
1	<input checked="" type="checkbox"/>	Sensor 1 Location	Type-K
2	<input checked="" type="checkbox"/>	Sensor 2 Location	Type-K
3	<input checked="" type="checkbox"/>	Sensor 3 Location	Type-K
4	<input checked="" type="checkbox"/>	Sensor 4 Location	Type-K
5	<input checked="" type="checkbox"/>	Sensor 5 Location	Type-K
6	<input checked="" type="checkbox"/>	Sensor 6 Location	Type-K



If an instrument is not currently connected to the computer, the default Demonstration MEGAM.O.L.E.® profiler will be displayed.

To set recording parameters:

- 1) Connect the M.O.L.E. to the PC. Refer to [Basics>Setup>Communications Setup](#) for more information.
- 2) On the **M.O.L.E.** menu, click **Set Recording Parameters**.
- 3) In the **Instrument Name** text box, type a company, operator, or M.O.L.E. Profiler name.
- 4) Enter the Recording interval at which the M.O.L.E. profiler records data points.

- 5) If desired, configure a Start Parameter such as a threshold temperature or Delay Points by selecting the associated check box and entering the proper values.



Specifying a threshold temperature “triggers” the recording process when any active channel reaches the specified temperature and Data Points “trigger” the M.O.L.E. profiler to start recording when the specified data point is reached in the process. The actual delay is equal to the *Interval* times the *Pts Dly*.

- 6) If desired, configure a Stop Parameter by selecting the associated check box and entering the proper value. This parameter is a number of data points the M.O.L.E. profiler will record during the data run. The maximum number is dependent on the number of channels turned on.



If a no stop parameter is specified, the M.O.L.E. Profiler will log continuously and will require the user to manually stop the recording process.

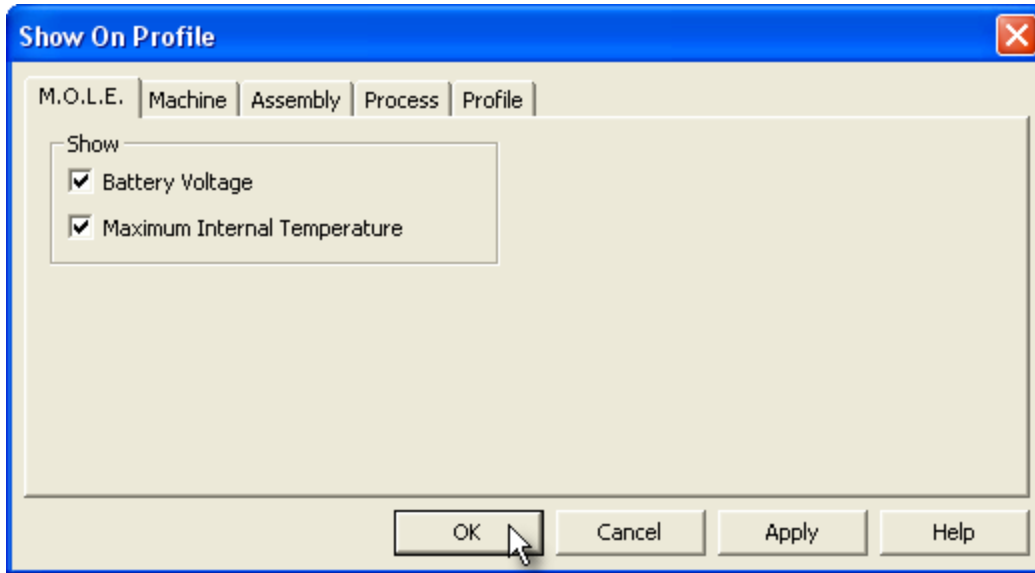
- 7) Configure sensor information by turning the amount of channels **ON** or **OFF**, set the sensor location description and sensor type.
- 8) Click the **OK** command button to send the data to the instrument or **Cancel** to quit the command.

5.5.5.5. Show on Profile

M.O.L.E. status information can be displayed or hidden on the Data Graph.

To show machine information on the Data Graph:

- 1) On the **M.O.L.E.** menu, click **Show on Profile**.
- 2) Select or clear the associated machine characteristics to display or hide on the Data Graph.



- 3) Click the **OK** command button to accept, or **Cancel** to quit the command.

5.5.6. Machine-Oven Menu

The Machine-Oven menu include options to design specific machine models. Creating an machine model allows the user to visualize it on the Data Graph along with the associated data run profile.



5.5.6.1. Set Machine Information

This command allows the user to set machine information and display it on the Data Graph so the user can visually see how the data run profile lines up with the machine.



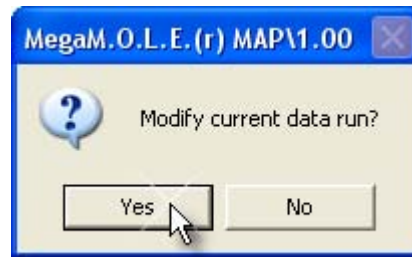
When setting machine information, this data will be applied to the currently selected data run only. Existing defined machine models may not accurately reflect your machine and are used as a starting template.

To set machine information:

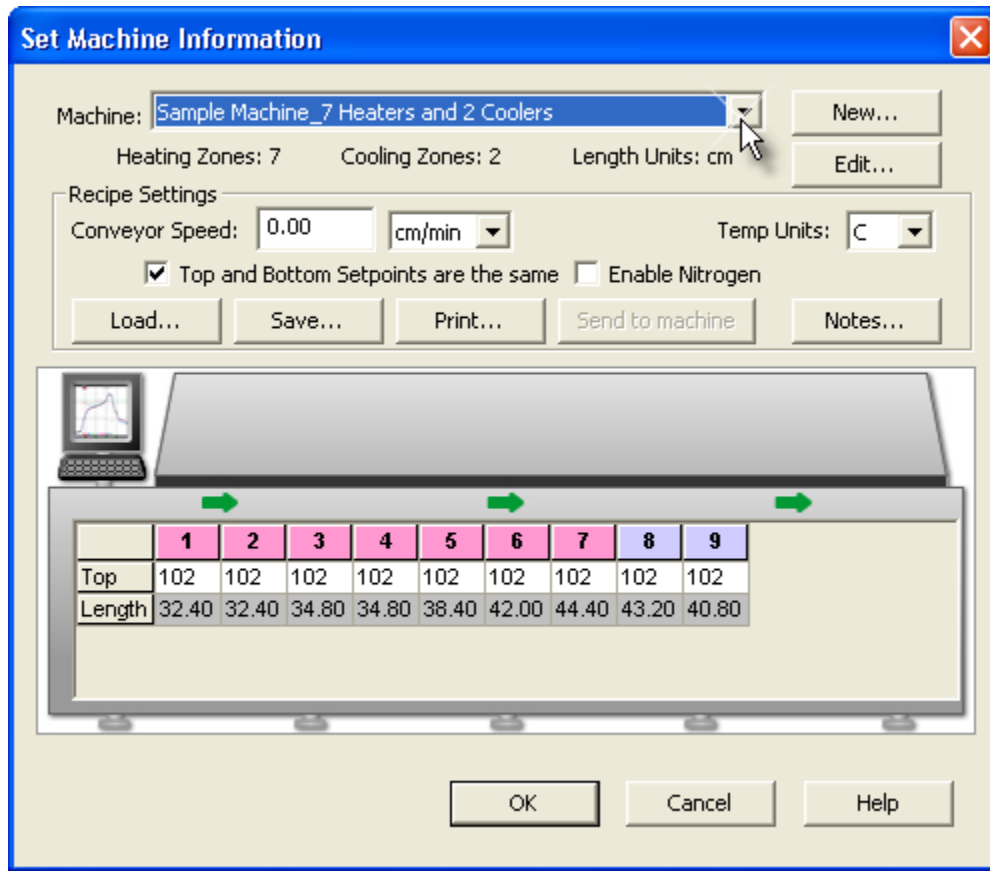
- 1) On the **Machine-Oven** menu, click **Set Machine Information**.



If a setting is already selected for a data run, the software will prompt the user to decide if they wish to modify the current data run. Click the **Yes** command button to continue or **No** to quit the command.



- 2) Select your machine from the **Machine** drop down list. If it does not appear in the list click the **New** command button to create a new one. Refer to topic [Software>Menus>Machine>Create new Machine](#) for more information.

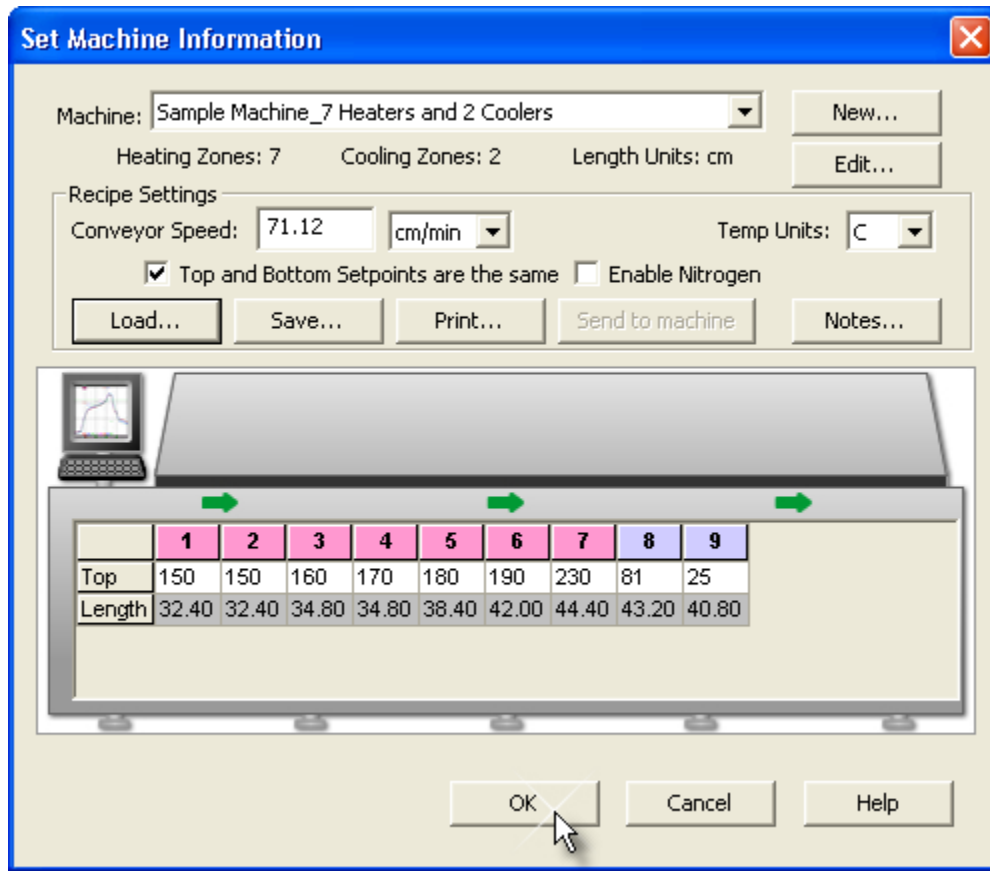


- 3) Set the machine conveyor speed. The software uses this value to calculate the Time (X) Scale values when **Distance** units are displayed. This number is also used as the actual conveyor speed when prediction data lines are added. Refer to topic [Software>Menus>Tools>Prediction Tool](#) for more information.



To properly display a machine model on the Data Graph, a conveyor speed must be set. If you do not know what the conveyor speed is, the software allows you to estimate it based on the machine information and the data run profile. Refer to topic [Software>Menus>Machine>Estimate Conveyor Speed](#) for more information.

- 4) Set the machine temperature units.
- 5) Set the Zone Temperatures in the zone matrix. These temperatures could be the upper and lower thresholds of acceptable temperatures to meet process standards or temperature settings of upper and lower heat sources. Upper zone temperatures appear as solid lines and lower zones appear as dotted lines on the Data Graph.



- 6) Click the **OK** command button to set the machine information, or **Cancel** to quit the command.



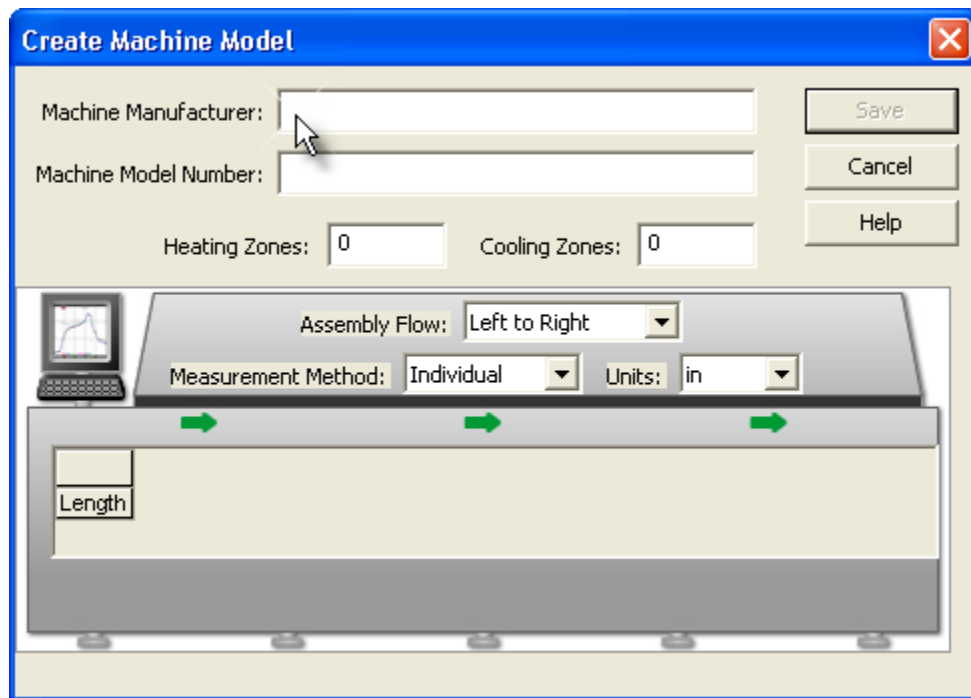
To view the machine information on the Data Graph, the **Show on Profile** settings must be enabled. Refer to topic [Software>Menus>Machine>Show on Profile](#) for more information.

5.5.6.2. Create New Machine

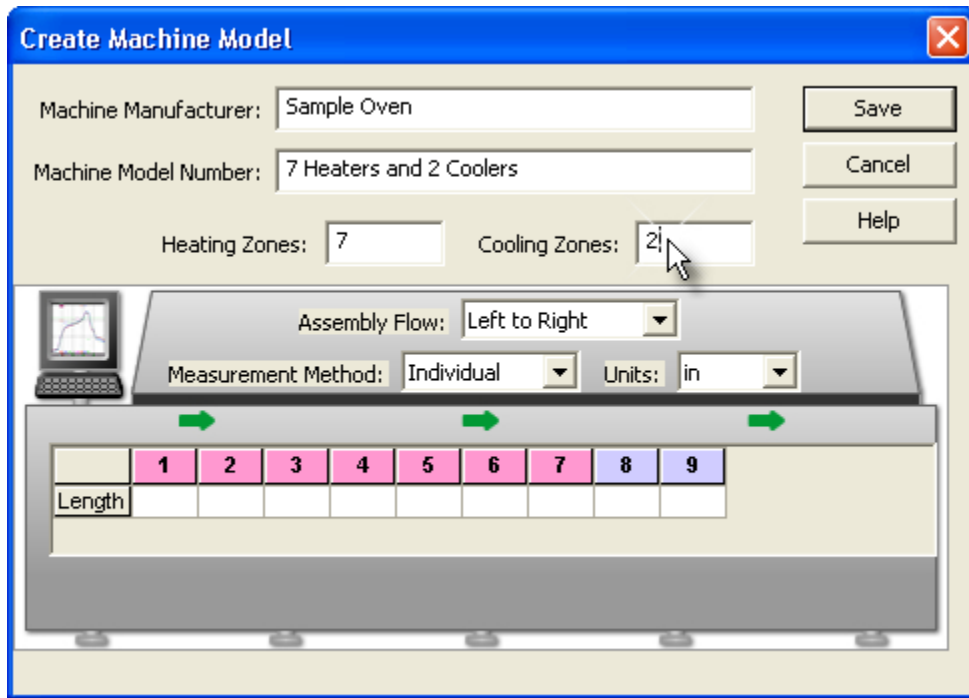
When setting machine information, the user is required to select a machine. The software includes basic machine models for the user to select from. If your machine model does not appear in the list the software has the ability for you to create a new machine model.

To create a new machine:

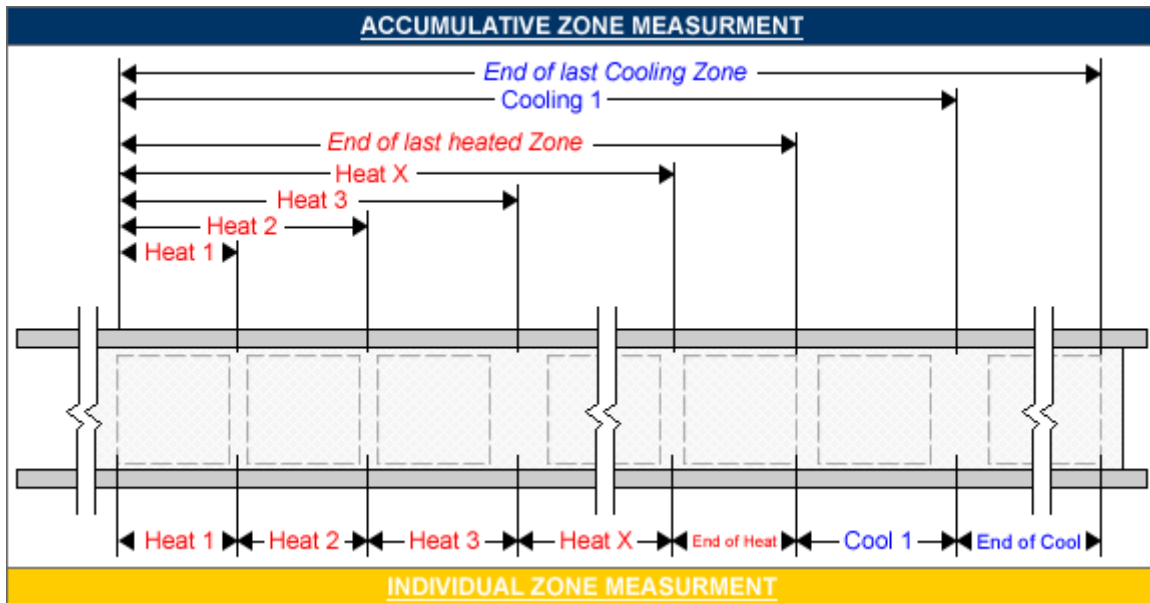
- 1) On the **Machine-Oven** menu, click **Create New Machine**.
- 2) Enter the machine manufacturer and model number.



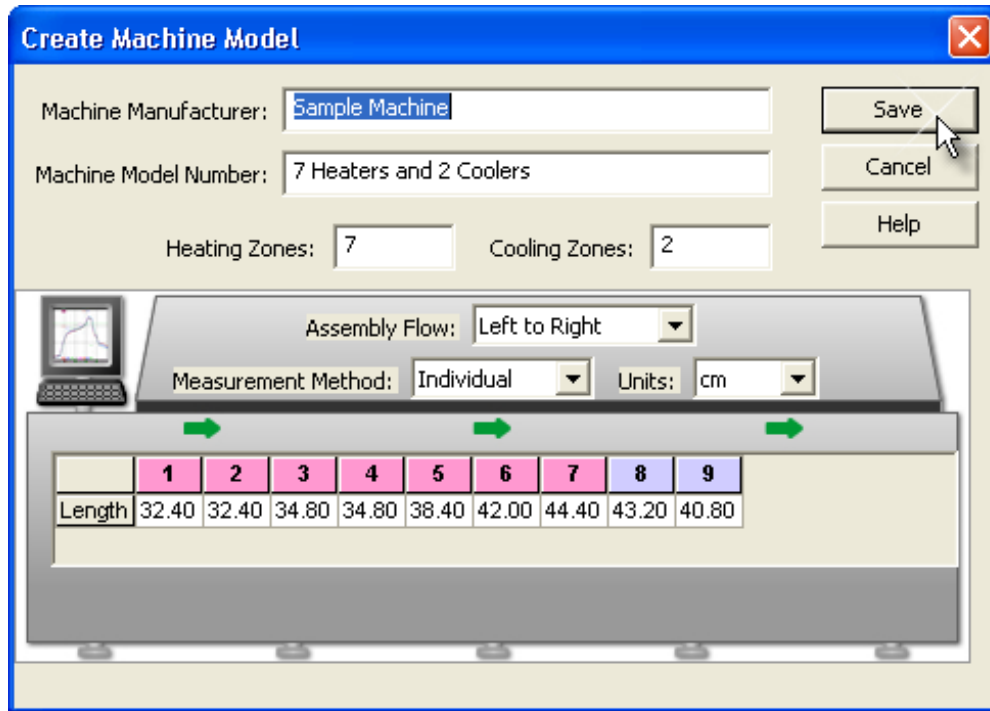
- 3) Enter the amount of heating and cooling zones. As zones are specified the zone matrix will automatically grow to allow you to enter zone measurements.



- 4) Select the assembly flow (left to right or right to left), zone measurement method (individual or accumulative) and units of measurement. Refer to the illustration below for proper measurement methods.



- 5) Enter the zone measurements in the zone matrix.



6-) Click the **Save** command button to save the new machine, or **Cancel** to quit the command.



The new machine will now appear in the Machine drop-down list on the **Set Machine Information** dialog box. Refer to topic [Software>Menus>Machine>Set Machine Information](#) for more information.

5.5.6.3. Adjust Zones

This command allows the user to manually adjust the displayed machine zones on the Data Graph. To use this command a machine must be selected and displayed. Refer to topic [Software>Menus>Machine>Set Machine Information](#).

To adjust zones:

- 1) On the **Machine-Oven** menu, click **Adjust Zones** to activate. A check mark appears to the left of the command indicating the software is in Adjust Zones mode.
- 2) Position the mouse pointer over a desired machine zone line.
- 3) Click and hold the left mouse button to drag it left or right releasing the mouse button when the machine zone line is at the desired location.



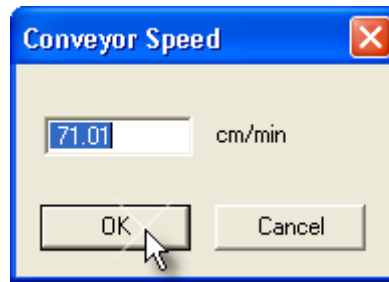
- 4) Lock the settings by selecting the **Adjust Zones** command again. This removes the check mark next to the command indicating the software is not in Adjust Zones mode.

5.5.6.4. Estimate Conveyor Speed

To properly display a machine model on the Data Graph, a conveyor speed must be set. If you do not know what the conveyor speed is when setting machine information, the software allows you to estimate it based on the machine information and the data run profile.

To estimate conveyor speed:

- 1) On the **Machine-Oven** menu, click **Estimate Conveyor Speed**. and the estimated conveyor speed automatically is displayed in the text box.



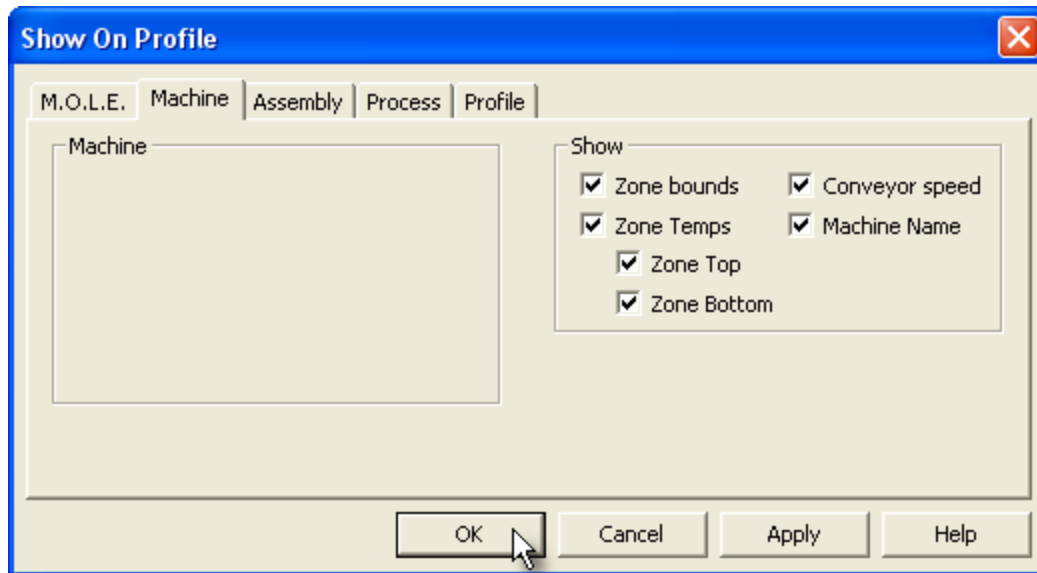
- 2) Click the **OK** command button to accept the estimated conveyor speed, or **Cancel** to quit the command.

5.5.6.5. Show on Profile

Machine information can be displayed or hidden on the Data Graph.

To show machine information on the Data Graph:

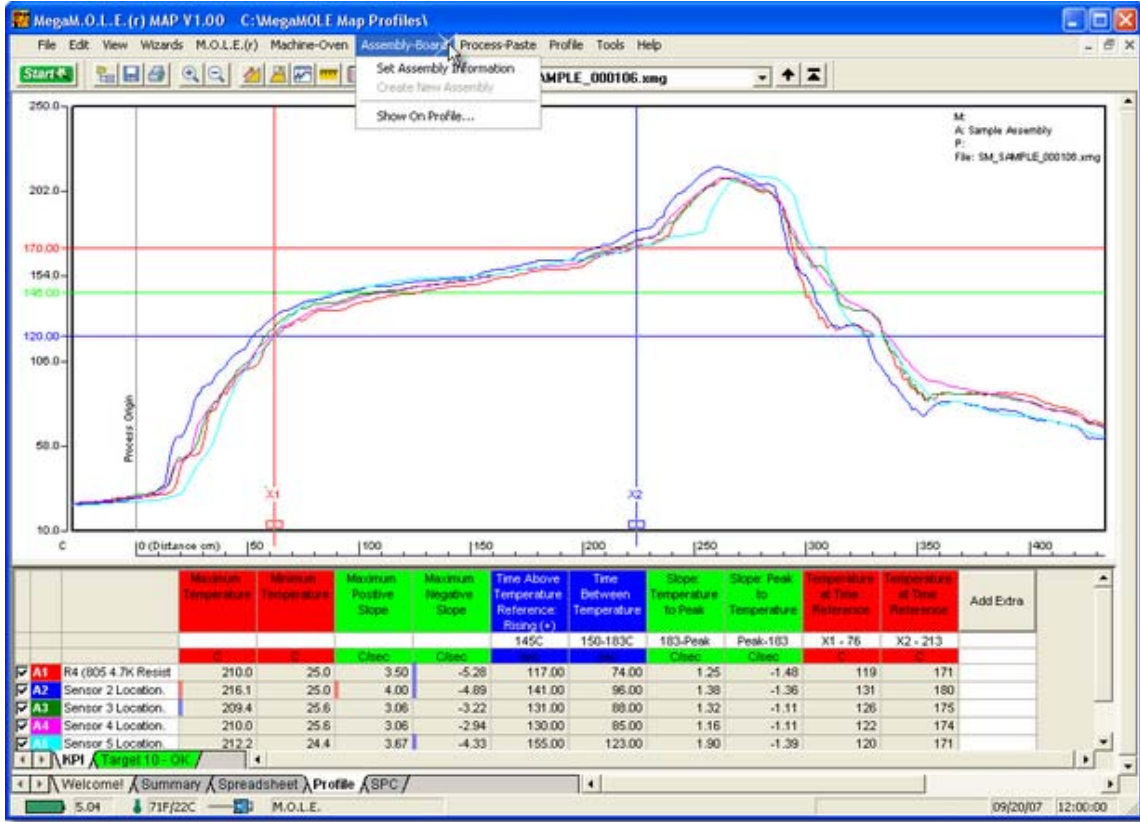
- 1) On the **Machine-Oven** menu, click **Show on Profile**.
- 2) Select or clear the associated machine characteristics to display or hide on the Data Graph.



- 3) Click the **OK** command button to accept, or **Cancel** to quit the command.

5.5.7. Assembly-Board Menu

The Assembly-Board menu includes commands that enable the user to set and edit experimental assembly documentation.



5.5.7.1. Set Assembly Information

This command allows the user to set assembly information associated with the selected data run profile.



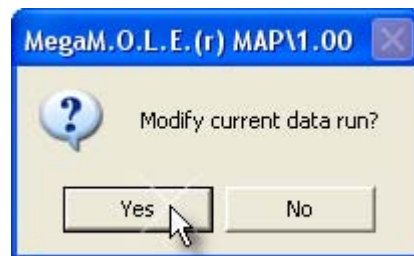
When setting assembly information, this data will be applied to the currently selected data run only.

To enter sensor information:

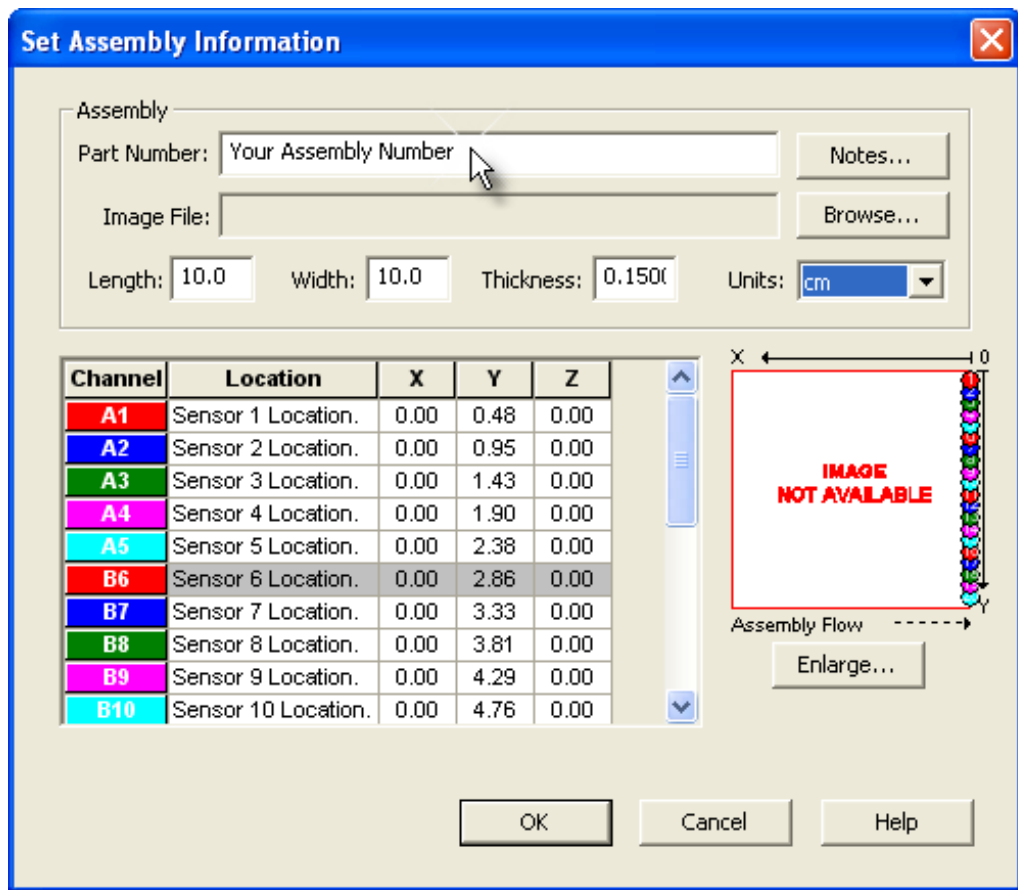
- 1) On the **Assembly-Board** menu, click **Set Assembly Information**.



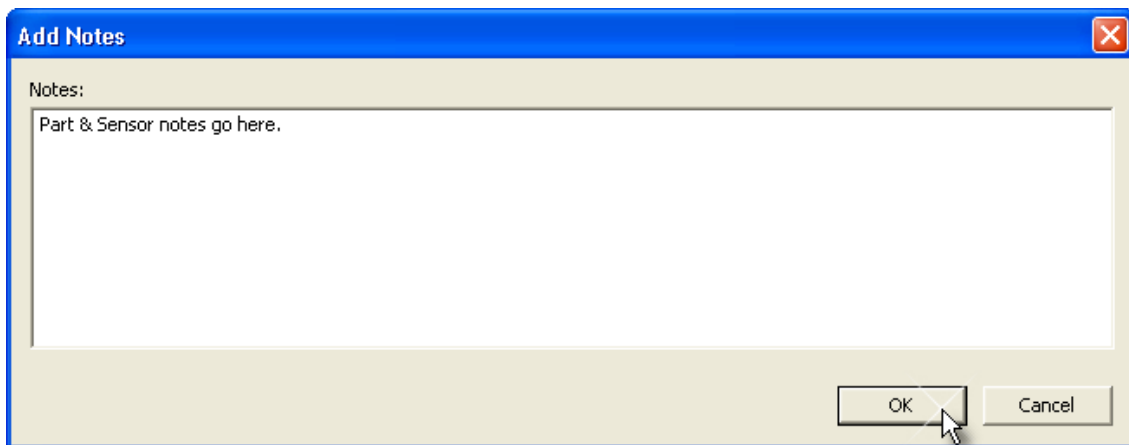
If a setting is already selected for a data run, the software will prompt the user to decide if they wish to modify the current data run. Click the **Yes** command button to continue or **No** to quit the command.



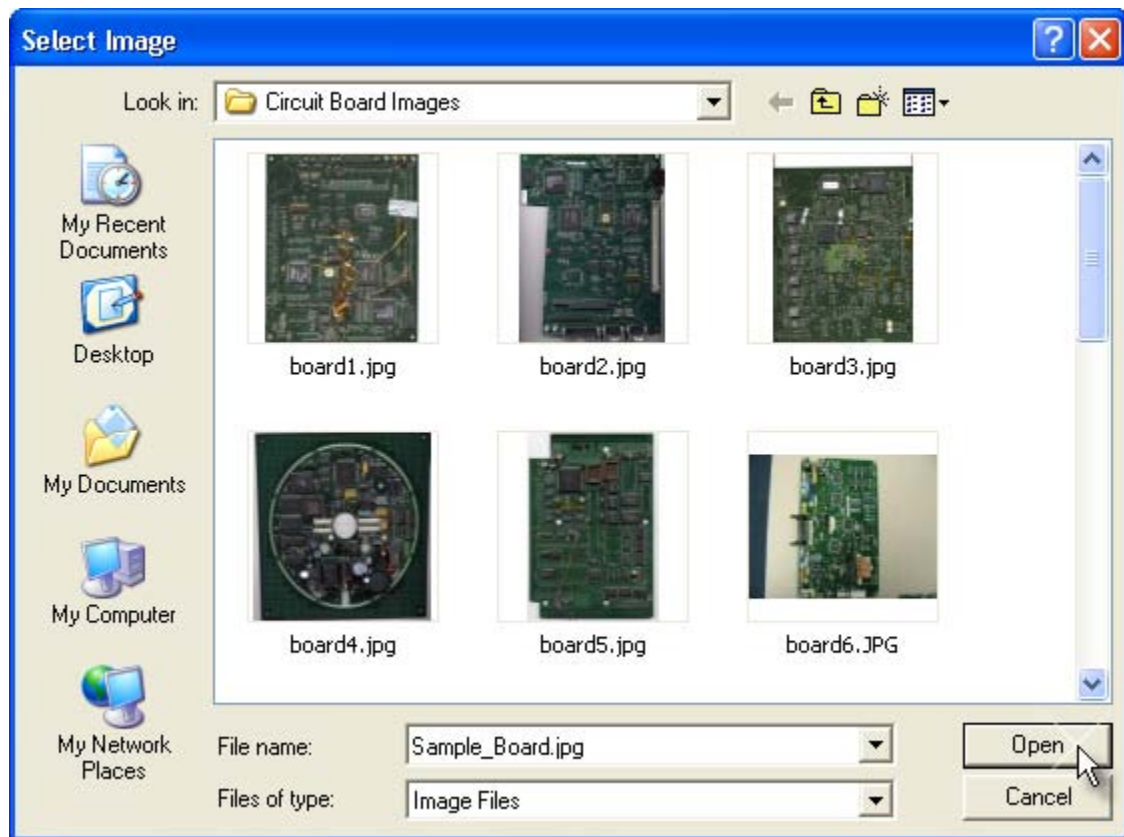
- 2) Enter an assembly part number.



- 3) Click the **Notes** command button if you would like to enter part documentation about the test assembly being profiled.



- 4) Click the image file **Browse** command button to select a product image. Image files supported by the software are Dib- (.dib), Gif (.gif), Pcx (.pcx), Tiff (.tif), Targa (.tga), Bitmap (.bmp) and Jpeg (.jpg).



- 5) Enter the test assembly board length, width and thickness.
- 6) Enter the sensor location descriptions. These descriptions can be the location where each sensor is connected to the test product. The channel color associated with the description indicates which Data Plot on the Data Graph it represents.



Thermocouple placement information entered in the sensor location matrix are also displayed as the **Sensor Locations** in the Data Table.

- 7) Enter sensor location dimensions. Sensor Locations can also be set by dragging sensor location markers on the selected image. To move the markers, click the **Enlarge** command button below the assembly image and the **Set Sensor Locations** dialog box appears.



Specified X-dimensions may be altered when using the **Align Profile Peaks** command to align the data run profile lines. Refer to topic [Software>Menus>Profile>Align Profile Peaks](#) for more information.

Set Sensor Locations

Assembly Dimensions (cm)
 Length: 25.4 Width: 20.3 Thickness: 0.1570

Channel	Location	X	Y	Z
A1	Sensor 1 Location.	4.74	7.76	0.00
A2	Sensor 2 Location.	0.00	5.82	0.00
A3	Sensor 3 Location.	1.19	17.11	0.00
A4	Sensor 4 Location.	3.56	8.66	0.00
A5	Sensor 5 Location.	13.04	13.72	0.00
B6	Sensor 6 Location.	0.00	12.00	0.00
B7	Sensor 7 Location.	5.78	8.27	0.00
B8	Sensor 8 Location.	2.42	6.17	0.00
B9	Sensor 9 Location.	0.78	6.13	0.00
B10	Sensor 10 Location.	3.32	7.57	0.00
C11	Sensor 11 Location.	8.87	8.56	0.00
C12	Sensor 12 Location.	5.63	9.20	0.00
C13	Sensor 13 Location.	1.52	9.27	0.00
C14	Sensor 14 Location.	0.00	12.00	0.00

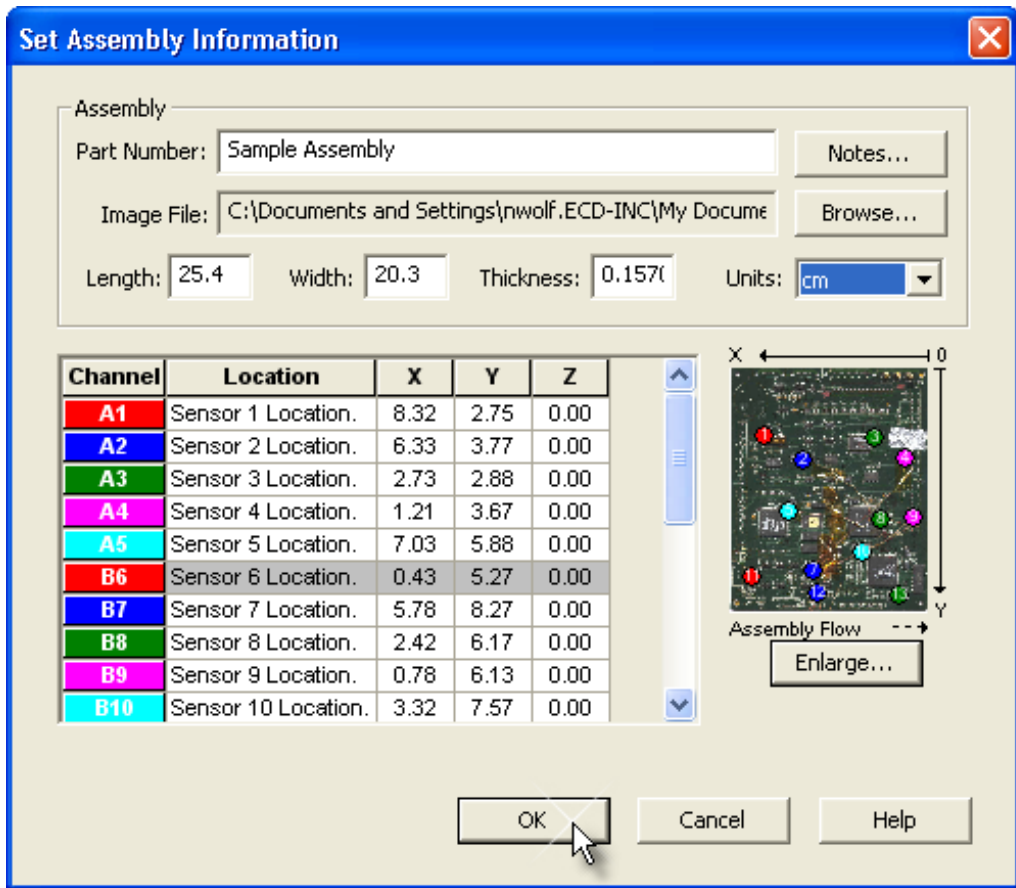
Assembly Flow

OK Cancel Help



X-dimensions are measured from the leading (right) edge or the first edge to enter the process, and Y dimensions are from the top down.

- 8) Select which sensor channels to display in the Data Table. Excluding a sensor channel does not delete channel data and can be turned back on at any time. This is helpful when data has been collected and it may not be beneficial to the data run profile.



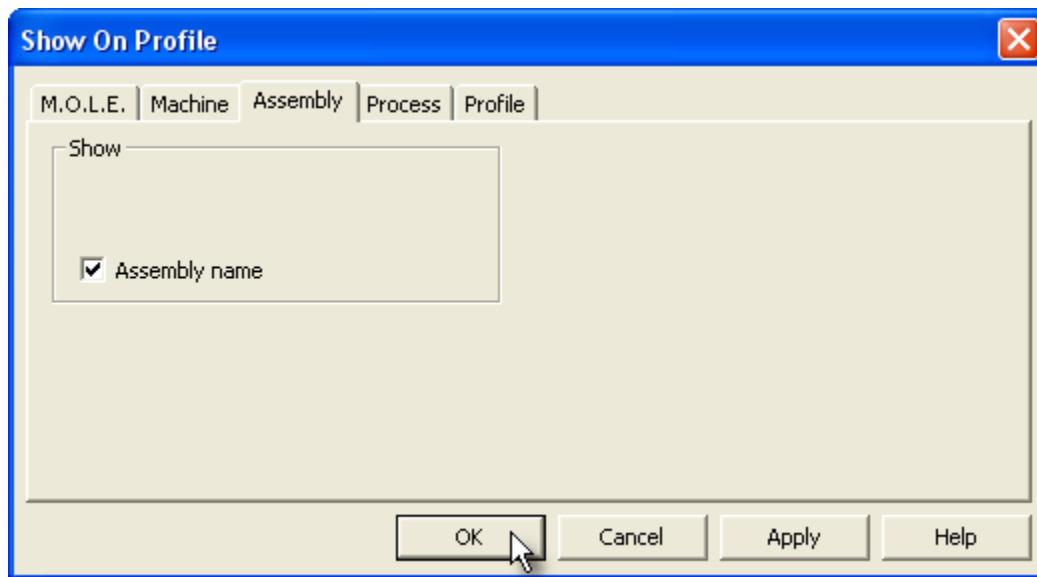
9) Click the **OK** command button accept or **Cancel** to quit the command.

5.5.7.2. Show on Profile

Assembly name can be displayed or hidden on the MAP data section of the Data Graph.

To show assembly information on the Data Graph:

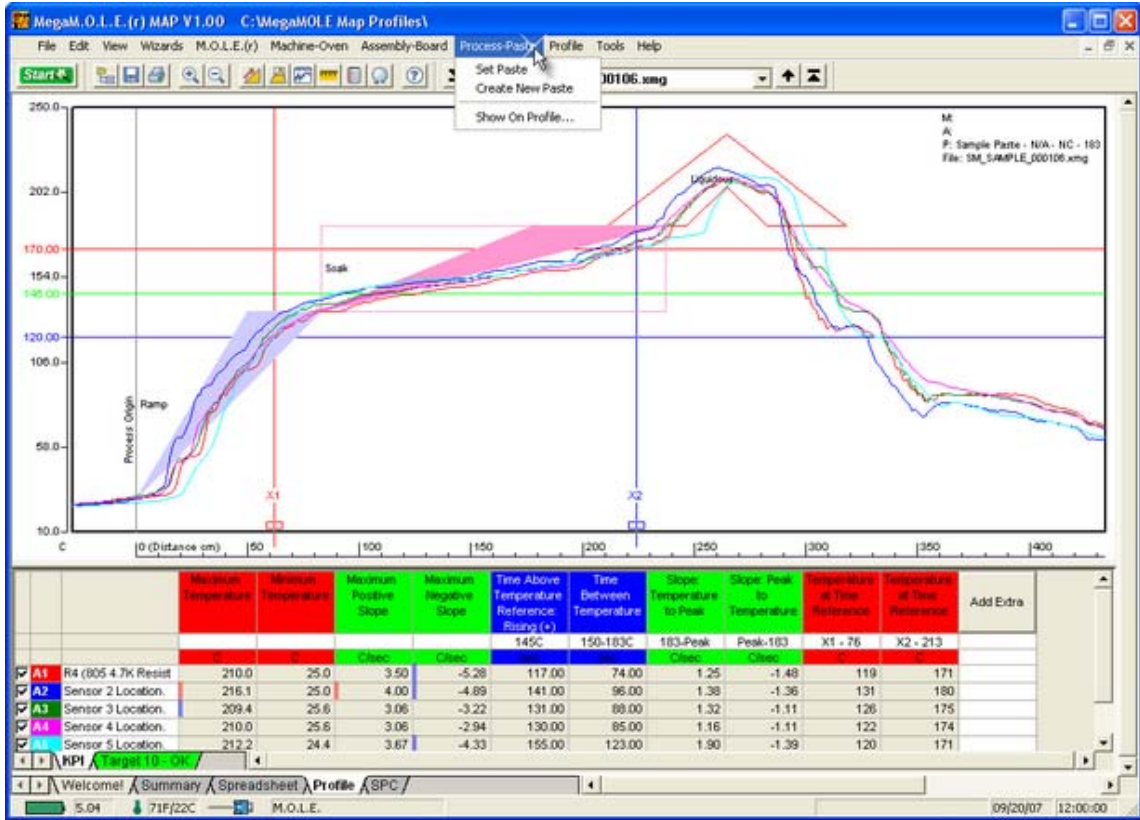
- 1) On the **Assembly-Board** menu, click **Show on Profile**.
- 2) Select or clear the **Assembly name** check box to display or hide it on the Data Graph.



- 3) Click the **OK** command button to accept, or **Cancel** to quit the command.

5.5.8. Process-Paste Menu

The Process-Paste menu include options to select or design a process paste. Creating an process paste allows the user to visualize it on the Data Graph along with the associated data run profile.



5.5.8.1. Set Process

This command allows the user to set a process paste and display it on the Data Graph so the user can visually see how the data run profile lines up with the process specification.



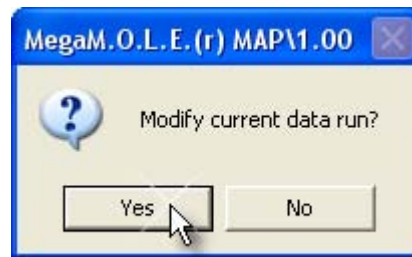
When setting a process, this data will be applied to the currently selected data run only. Existing defined machine models may not accurately reflect your machine and are used as a starting template.

To set a process:

- 1) On the **Process-Paste** menu, click **Set Process**.



If a setting is already selected for a data run, the software will prompt the user to decide if they wish to modify the current data run. Click the **Yes** command button to continue or **No** to quit the command.

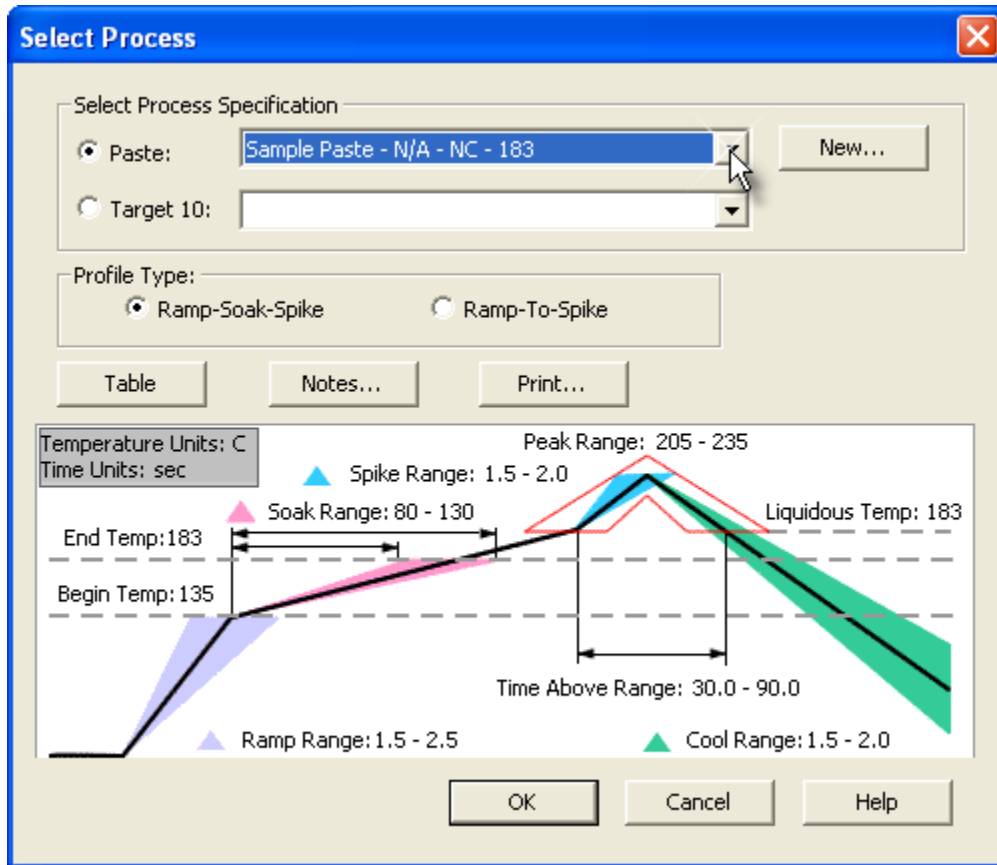


- 2) Select your process specification. The user can select a **Paste** from the database or a pre-defined **Target 10** file. If the desired paste does not appear in the database list click the **New** command button to create a new one. Refer to topic [Software>Menus>Process>Create new Paste](#) for more information.

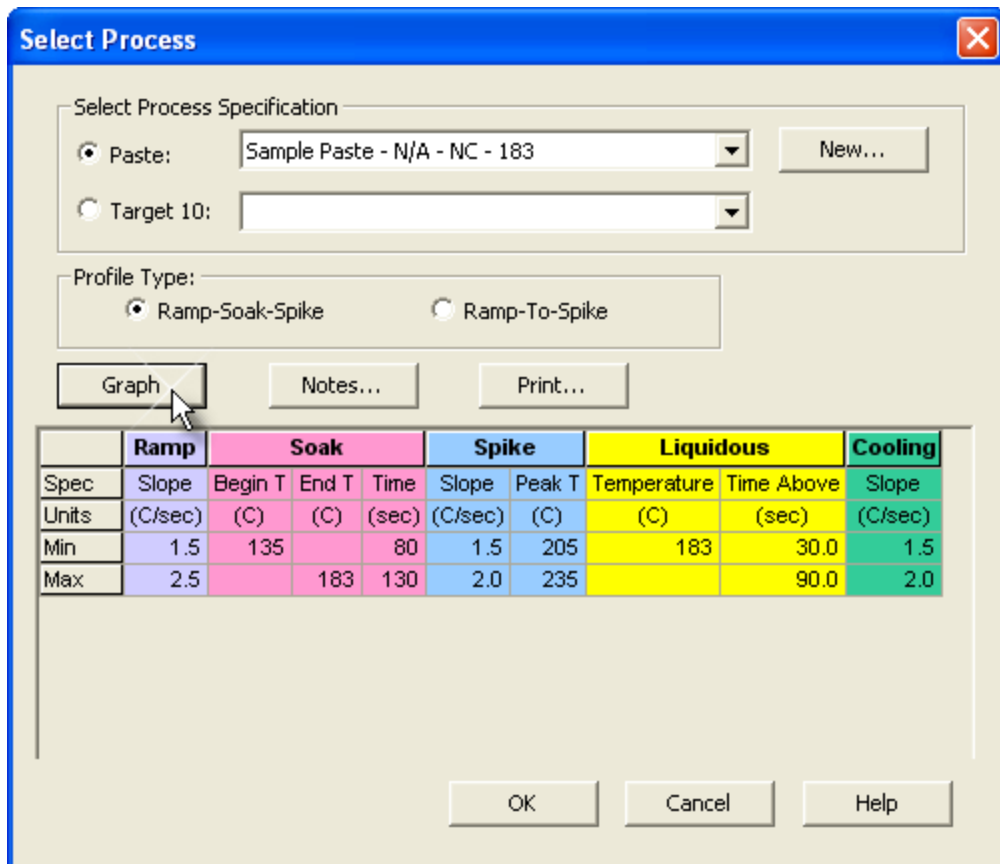


When a paste specification is selected, the software automatically creates a Target 10 specification file for future use.

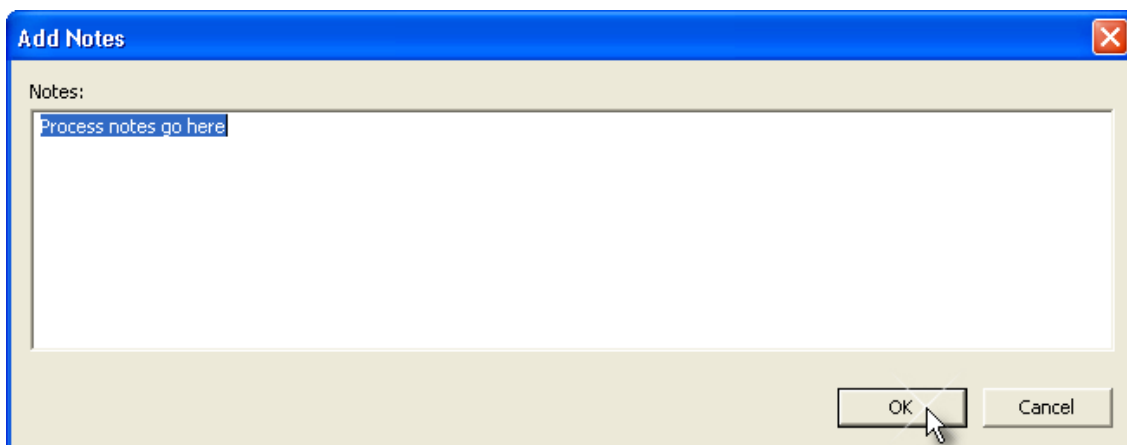
3) Choose the **Profile Type** (Ramp-Soak-Spike or Ramp-to-Spike).



Once a process is selected, the specifications are displayed on the graph. The software also allows paste specification data to be viewed in a table view by clicking the **Table** command button.



- 4) Click the **Notes** command button if you would like to enter process paste documentation.



- 5) Click the **OK** command button to set the process, or **Cancel** to quit the command.



To view the process on the Data Graph, the **Show on Profile** settings must be enabled. Refer to topic [Software>Menus>Process>Show on Profile](#) for more information.

5.5.8.2. Create New Paste

When setting machine information, the user is required to select a machine. The software includes basic machine models for the user to select from. If your machine model does not appear in the list the software has the ability for you to create a new machine model.

To create a new paste:

- 1) On the **Process-Paste** menu, click **Create New Paste**.
- 2) Enter the required information and select the **Next** button.

Signature - General Information

Basic information

Paste Manufacturer

Manufacturer's Part Number

Liquidous Temp in C

Paste Type

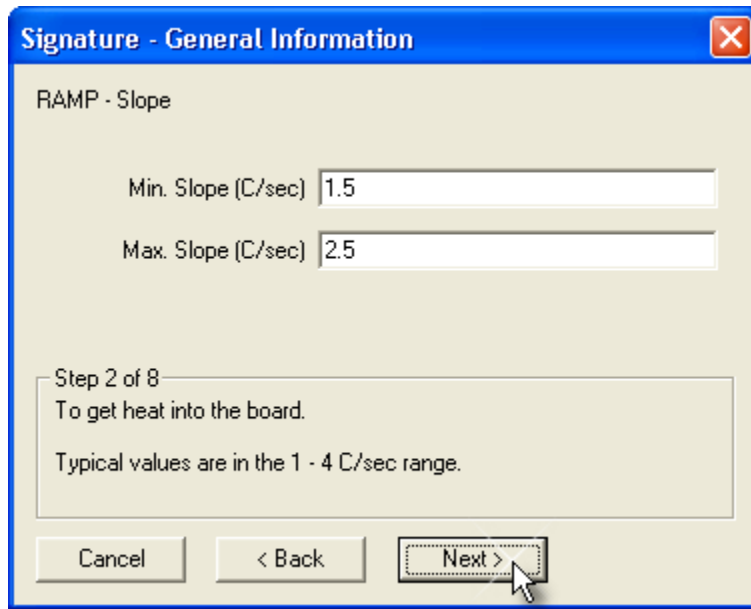
Step 1 of 8

Liquidous is when the solder experiences a state change from solid to liquid.

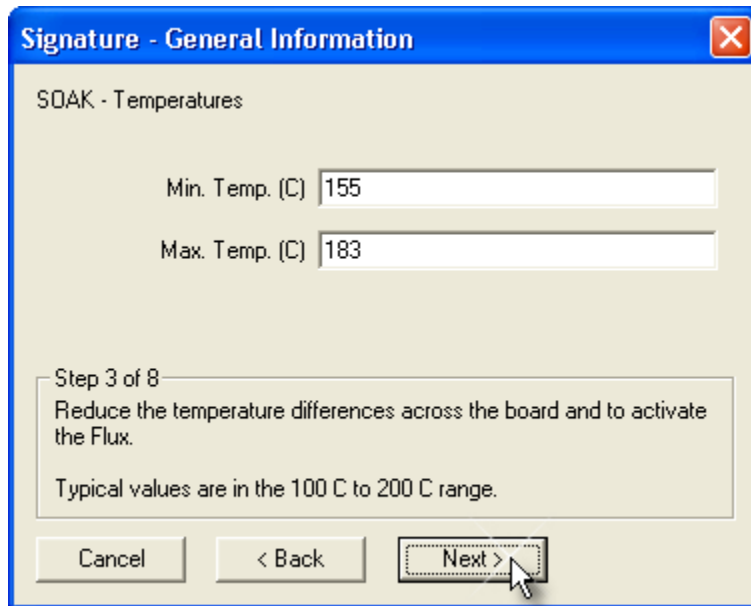
Typical values are in the 179 - 223 C range.

Cancel Next >

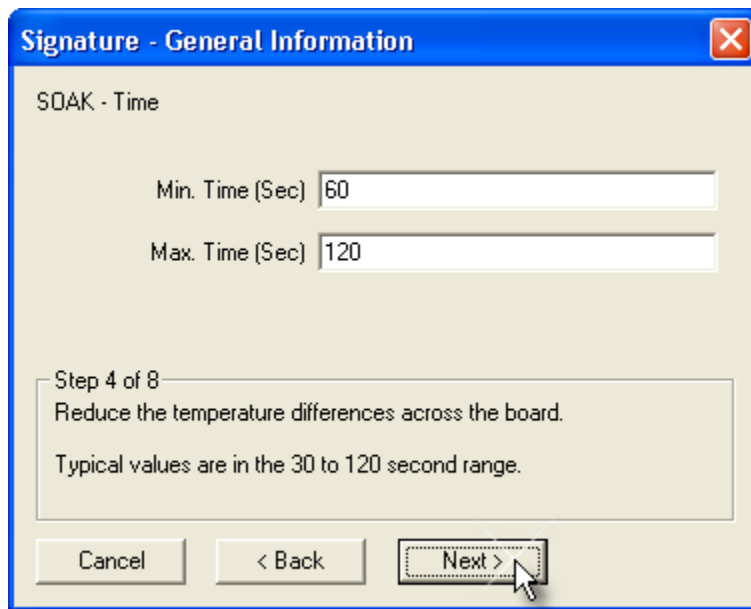
- 3) Enter the RAMP – Slope information and select the **Next** button.



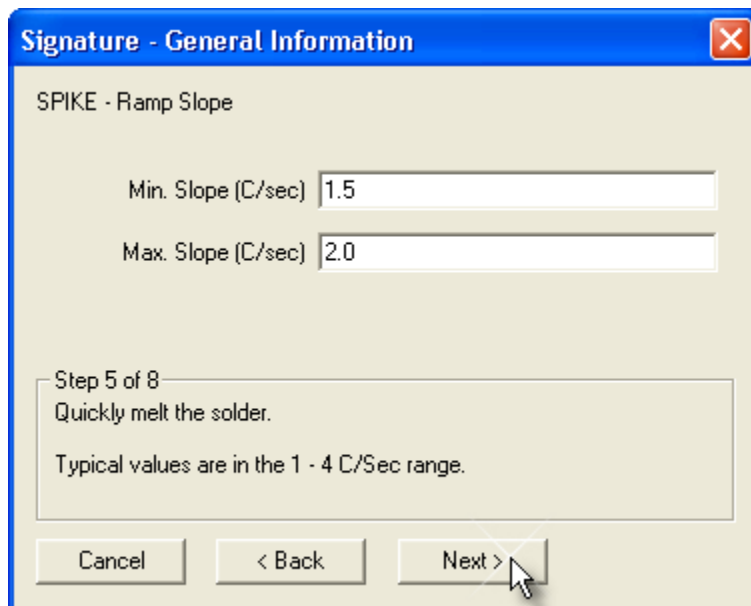
4) Enter the SOAK –Temperatures information and select the **Next** button.



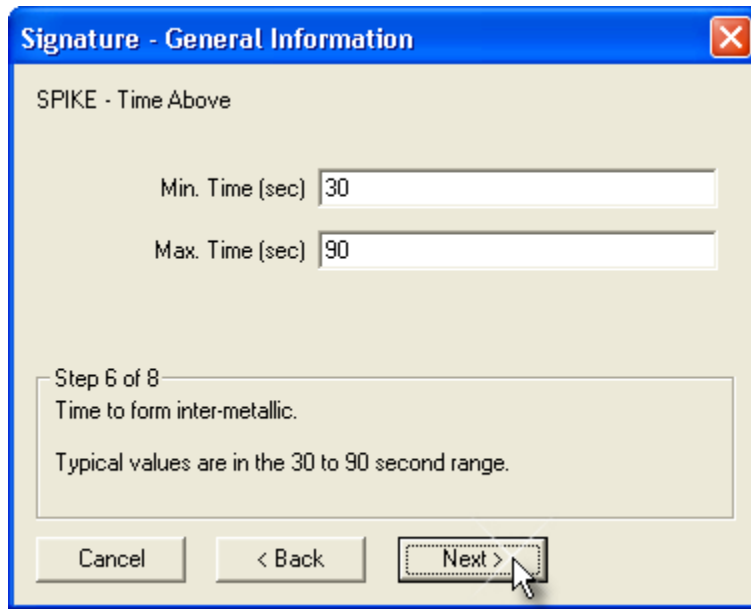
5) Enter the SOAK –Time information and select the **Next** button.



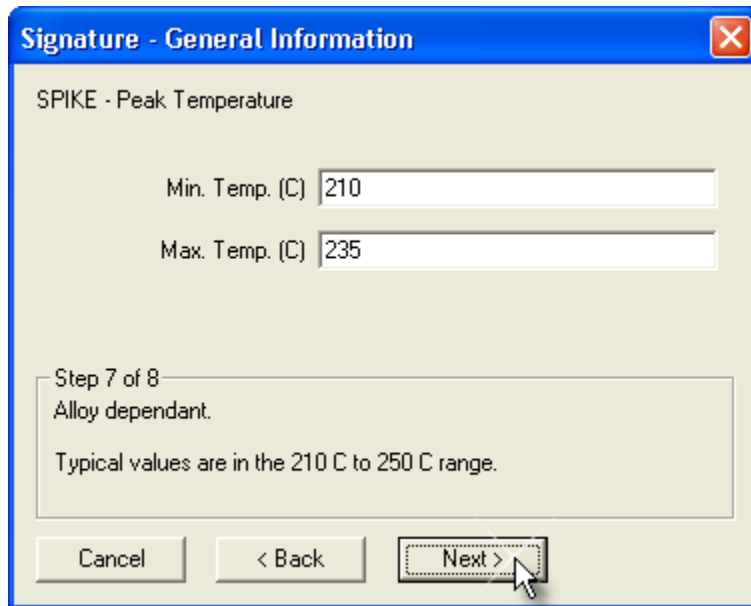
6) Enter the SPIKE – Ramp Slope information and select the **Next** button.



7) Enter the SPIKE – Time Above information and select the **Next** button.



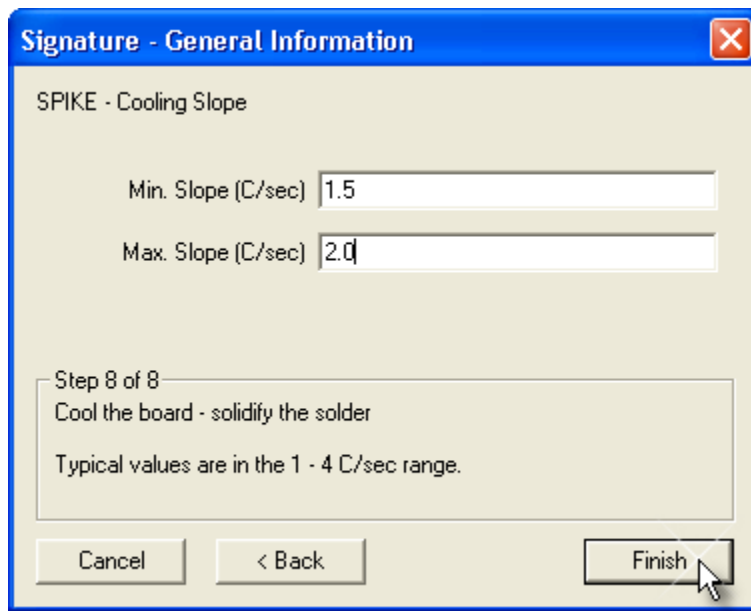
8) Enter the SPIKE – Peak Temperature information and select the **Next** button.



9) Enter the SPIKE – Cooling Slope information and select the **Finish** button to create the new paste and return to the Paste Specification database dialog box.



Once the user proceeds to each Step, the Back button can be selected to confirm or modify previously entered information.



10) Click the **Finish** command button to accept, or **Cancel** to quit the command.



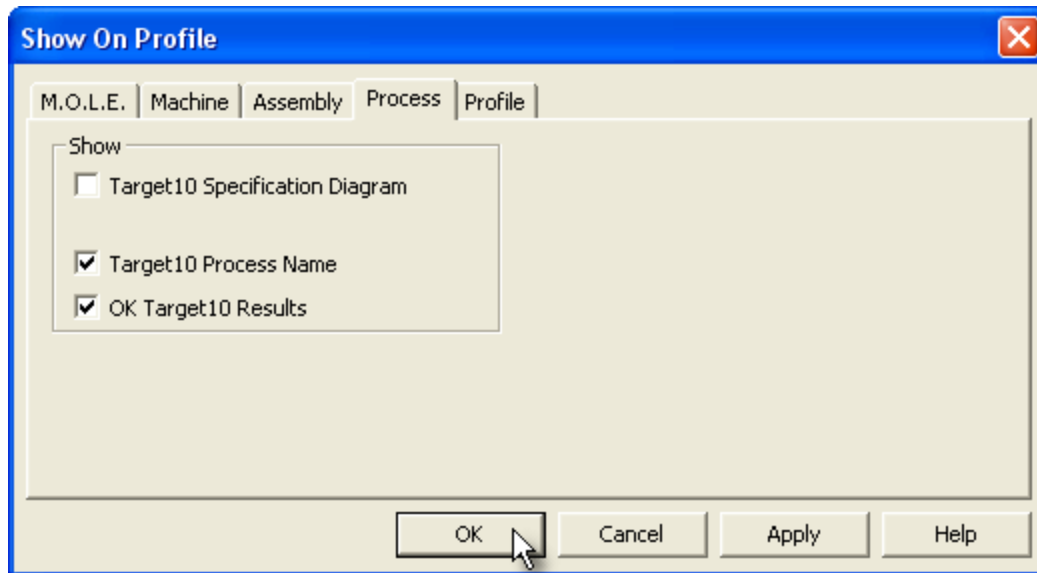
The new process paste will now appear in the Paste drop-down list on the **Set Paste** dialog box. Refer to topic [Software>Menus>Process>Set Paste](#) for more information.

5.5.8.3. Show on Profile

Process Paste specification can be displayed or hidden on the Data Graph.

To show the process paste specification on the Data Graph:

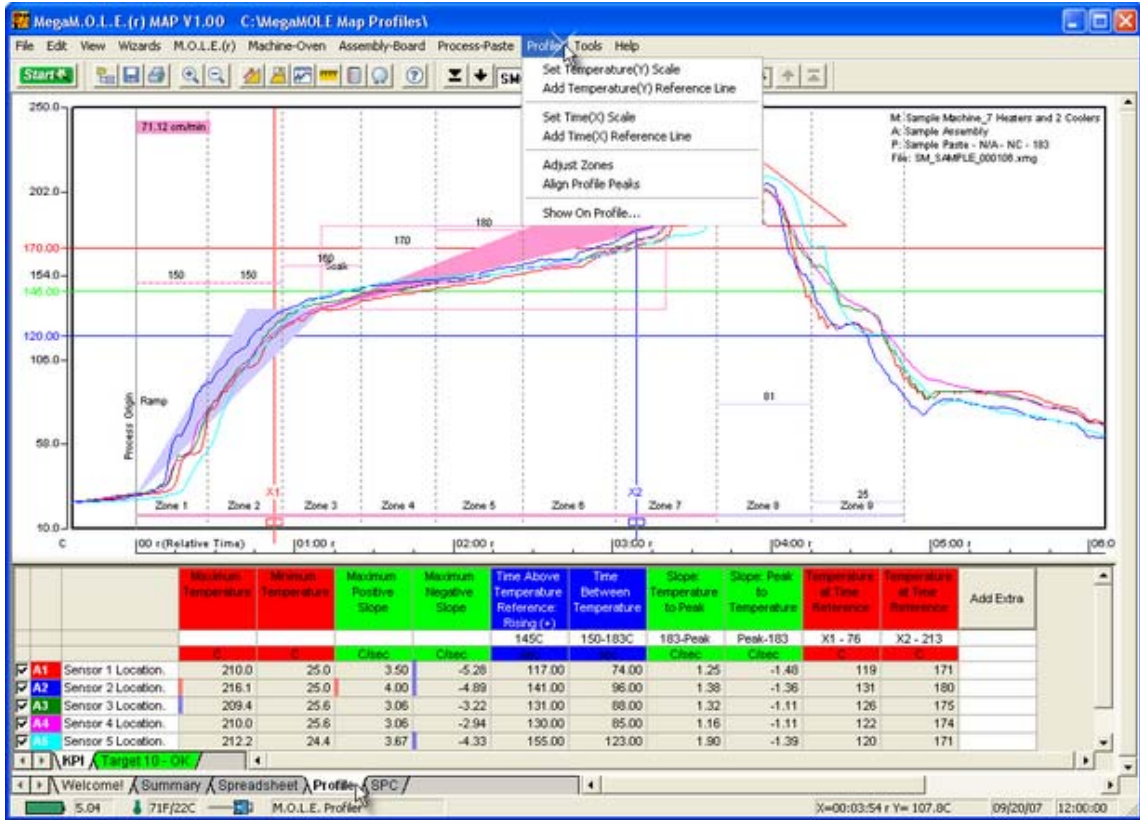
- 1) On the **Process-Paste** menu, click **Show on Profile**.
- 2) Select or clear the associated process paste options to display or hide on the Data Graph.



- 3) Click the **OK** command button to accept, or **Cancel** to quit the command.

5.5.9. Profile Menu

The Profile menu includes special commands specifically used on the Profile worksheet. Commands in this menu enable the user to view and edit data run documentation, change the appearance of the Data Graph and design experiments.

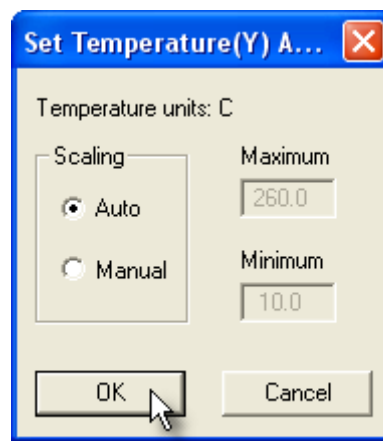


5.5.9.1. Set Temperature (Y) Scale

This command controls the scale of the Temperature (Y) axis on the Data Graph.

To use the scaling command:

- 1) On the **Profile** menu, click **Set Temperature (Y) Scale**. This dialog box identifies the current settings of the displayed units and the maximum and minimum values.
- 2) Select between **Auto** or **Manual** mode. In Auto mode, the software selects the scale of the Y-Axis to ensure all Data Point values and the highest Zone temperature settings are visible in the Data Graph. In Manual mode, the range of values must be manually set.



- 3) Click the **OK** command button to use the settings or **Cancel** to quit the command.



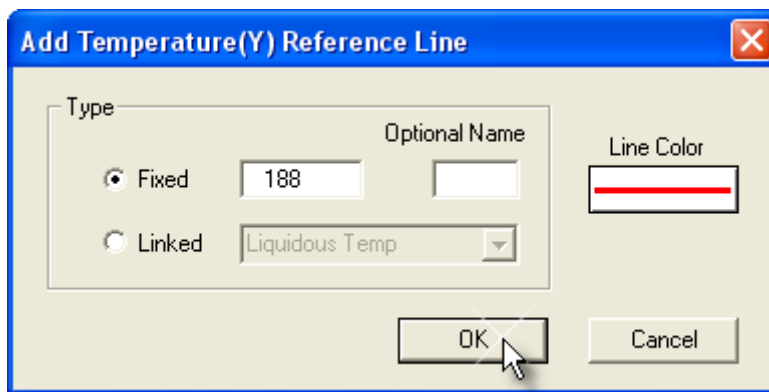
This command can also be accessed by double-clicking the scale on the Data Graph.

5.5.9.2. Add Temperature (Y) Reference Lines

Temperature Reference Lines are colored horizontal lines and can be positioned anywhere within the range of Y-values in the graph. They are used for analysis when the Temperature (Y) parameter calculations are displayed in the Data Table.

To add Temperature Reference Lines to the Data Graph:

- 1) On the **Profile** menu, click **Add Temperature (Y) Reference Line**.
- 2) Choose the reference line Type (Fixed and Linked). If **Fixed** is selected, enter a fixed Temperature value. If **Linked** is selected, select a portion of the profile to link it to.

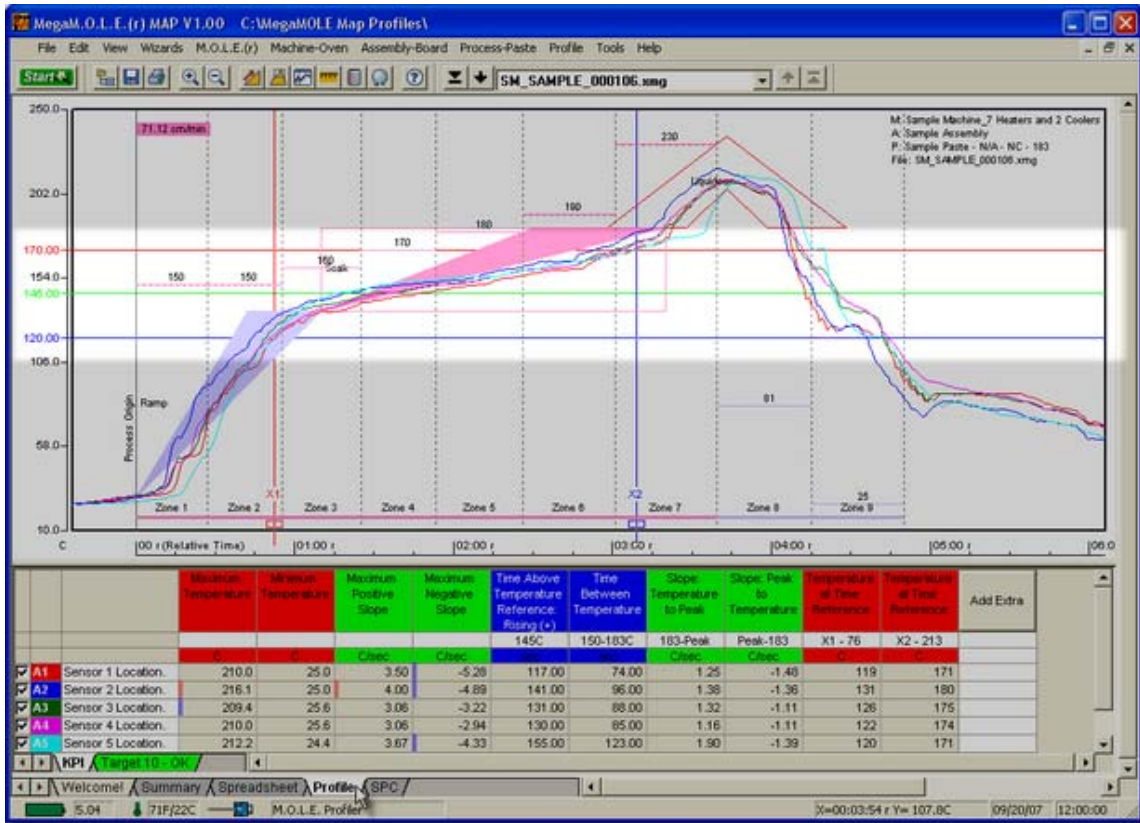


- 3) Select the line color by clicking the line button below the label.



When an reference line is displayed on the Data Graph, the default label is the specified temperature. The software allows the user to rename the line by using the **Optional Name** text box.

- Click the **OK** command to accept the new settings or **Cancel** to quit the command.



This command can also be accessed by right-clicking the scale on the Data Graph and select **Add Temperature (Y) Scale** from the shortcut menu.

To move an Temperature (Y) Reference Line:

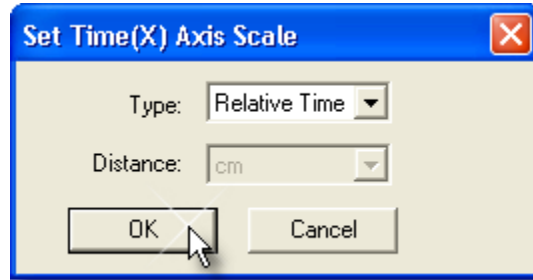
- Position the mouse pointer over the desired reference line.
- Double-click the reference line and the **Add Temperature (Y) Reference** line dialog box appears.
- Edit the reference line settings and click the **OK** command to accept the new settings or **Cancel** to quit the command.

5.5.9.3. Set Time (X) Scale

This command controls the scale of the Time (X) axis on the Data Graph.

To select a Time (X) scale:

- 1) On the **Profile** menu, click **Set Time (X) Scale**.



- 2) Select the scale **Type** and **Distance units**.
- 3) Click the **OK** command button to accept the changes, or **Cancel** to discard any changes.



Relative Time Scale

Distance Scale



Points Scale

Absolute Time Scale



This command can also be accessed by right-clicking the scale on the Data Graph and select **Set Time (X) Scale** from the shortcut menu.

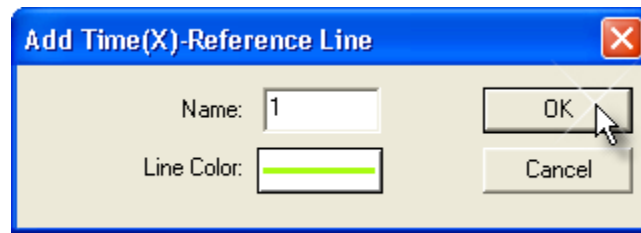
5.5.9.4. Add Time (X) Reference Lines

Time Reference Lines are colored vertical lines that can be positioned anywhere within the range of X-values on the Data Graph.

These reference lines indicate the temperature values at the intersection of a Data Plot with each displayed reference line.

To add Time Reference Lines to the Data Graph:

- 1) On the **Profile** menu, click **Add Time (X) Reference Line**.



- 2) Select the line color by clicking the line button below the label.

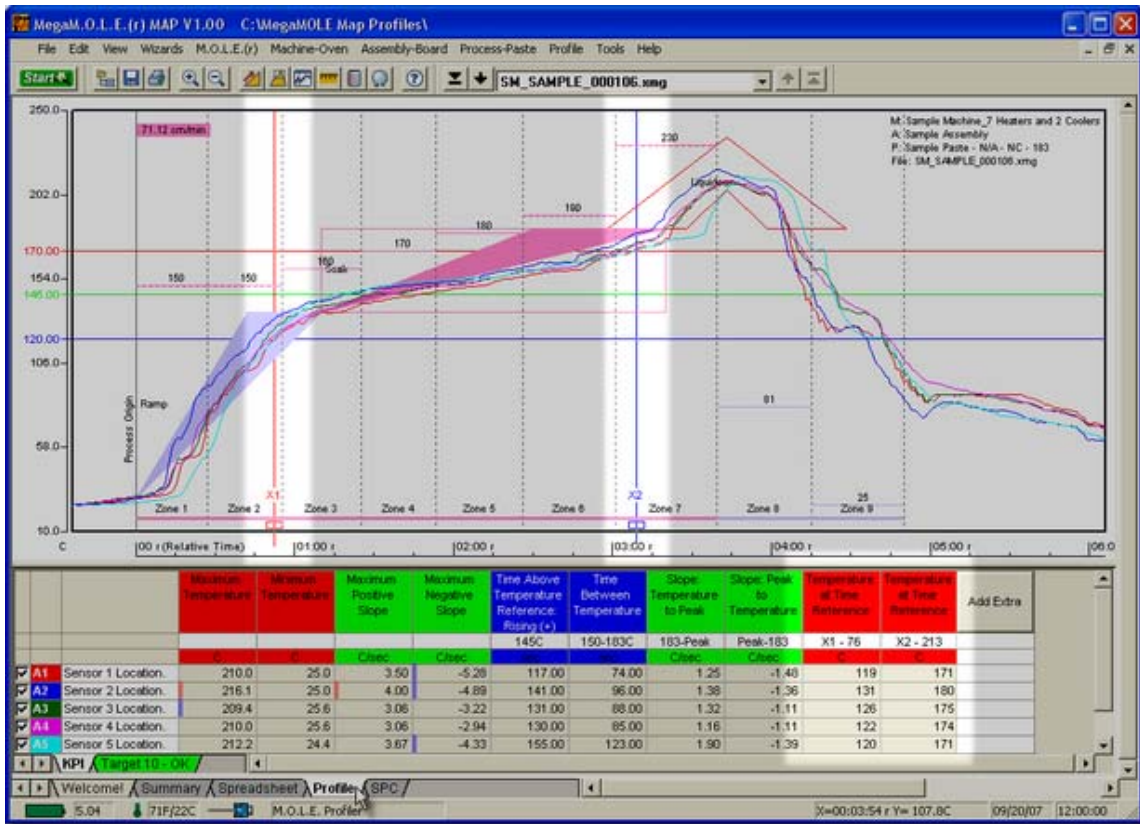



When a reference line is displayed on the Data Graph, the default label is the next number of reference line. For example if there is two reference lines displayed, the next default label will be 3. The software allows the user to rename the line by using the **Name** text box.

- 3) Click the **OK** command to accept the new settings or **Cancel** to quit the command.





If a reference line is used in a Data Table calculation, the name of the reference appears in the header along with the parameter value.



 This command can also be accessed by right-clicking the scale on the Data Graph and select **Add Time (X) Reference** from the shortcut menu.

To move an Time (X) Reference Line:

- 1) Position the mouse pointer over the a Time (X) Reference line.
- 2) When the mouse pointer becomes a , click and hold the left mouse button to drag it left or right releasing the mouse button when the Time (X) Reference line is at the desired location.

 When moving the selected Time (X) Reference line, it can be moved past other cursors to any location on the Data Graph.

When a Time (X) Reference line is moved to a new position, it snaps to the closest real Time (X) value. Notice on highly magnified graphs that the line jumps from point to point. The values in the Data Table are automatically updated to reflect the new position.

5.5.9.5. Align Profile Peaks

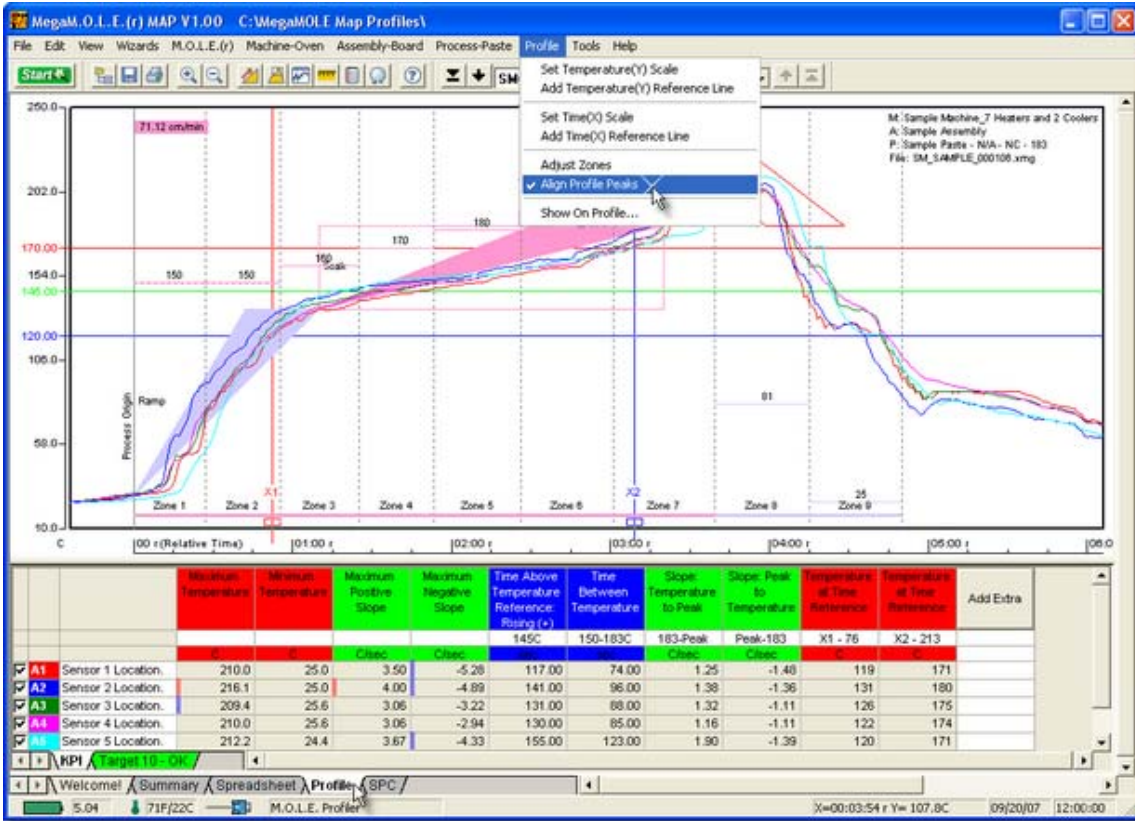
If sensors are placed along a line parallel to the direction of flow in a conveyORIZED process so they enter and exit oven zones at different times, the resulting Data Plots lag behind one another. The Align Profile Peaks command automatically aligns the Time (X) axis maximum peak values for each Data Plot so the results can be easily compared during analysis.



A conveyor speed must be set to properly use this command. Refer to topic [Software>Menus>Machine>Set Machine Information](#) or [Software>Page Tabs>Profile>Data Graph>Conveyor Speed Indicator](#) for more details.

To align profile peaks:

- 1) On the **Profile** menu, click **Align Profile Peaks** the channel lag values are automatically calculated, and the Data Plots adjust to reflect them. A check mark appears to the left of the command indicating the software is in Align Profile Peaks mode. Repeat this step to disable the command.



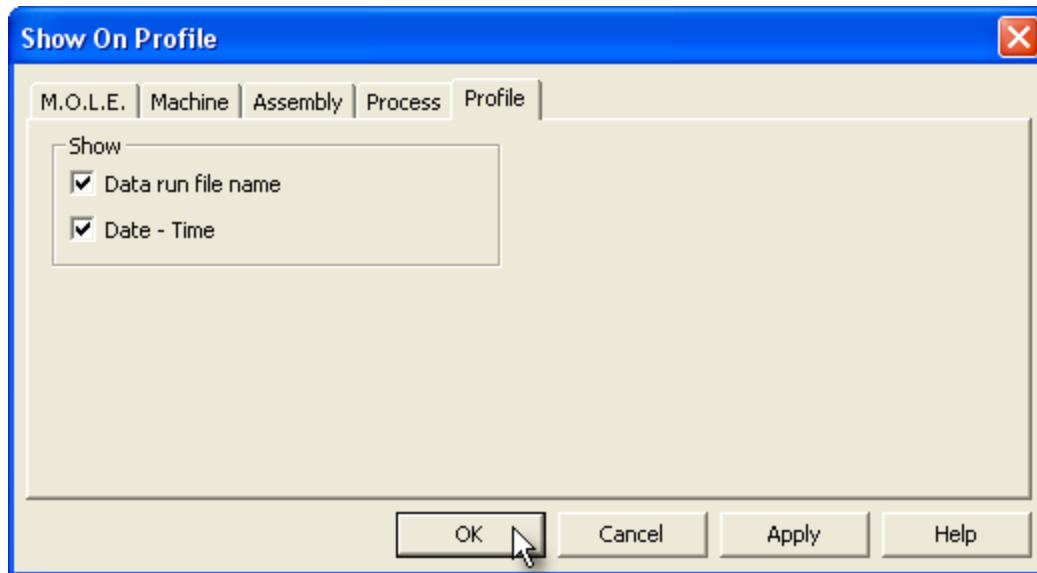
If sensor X-dimension values were previously entered in the **Set Assembly Information** dialog box, Align Profile Peaks will automatically overwrite the current values. Refer to topic [Software>Menus>Assembly>Set Assembly Information](#) for more information.

5.5.9.6. Show on Profile

The data run file name can be displayed or hidden on the MAP data section of the Data Graph.

To show profile information on the Data Graph:

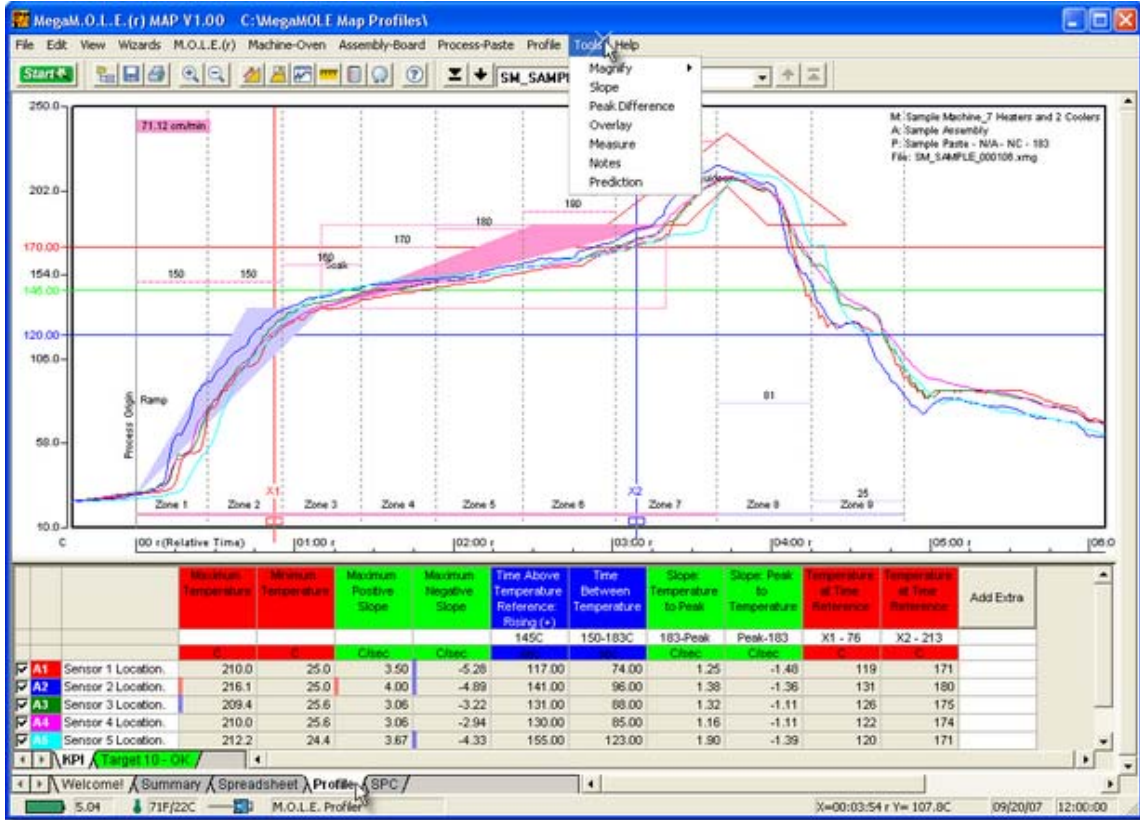
- 1) On the **Profile** menu, click **Show on Profile**.
- 2) Select or clear the **File Name** check box to display or hide it on the Data Graph.



- 3) Click the **OK** command button to accept, or **Cancel** to quit the command.

5.5.10. Tools Menu

Options in this menu help the user manipulate and analyze the data run profile displayed on the Data Graph.



5.5.10.1. Magnify

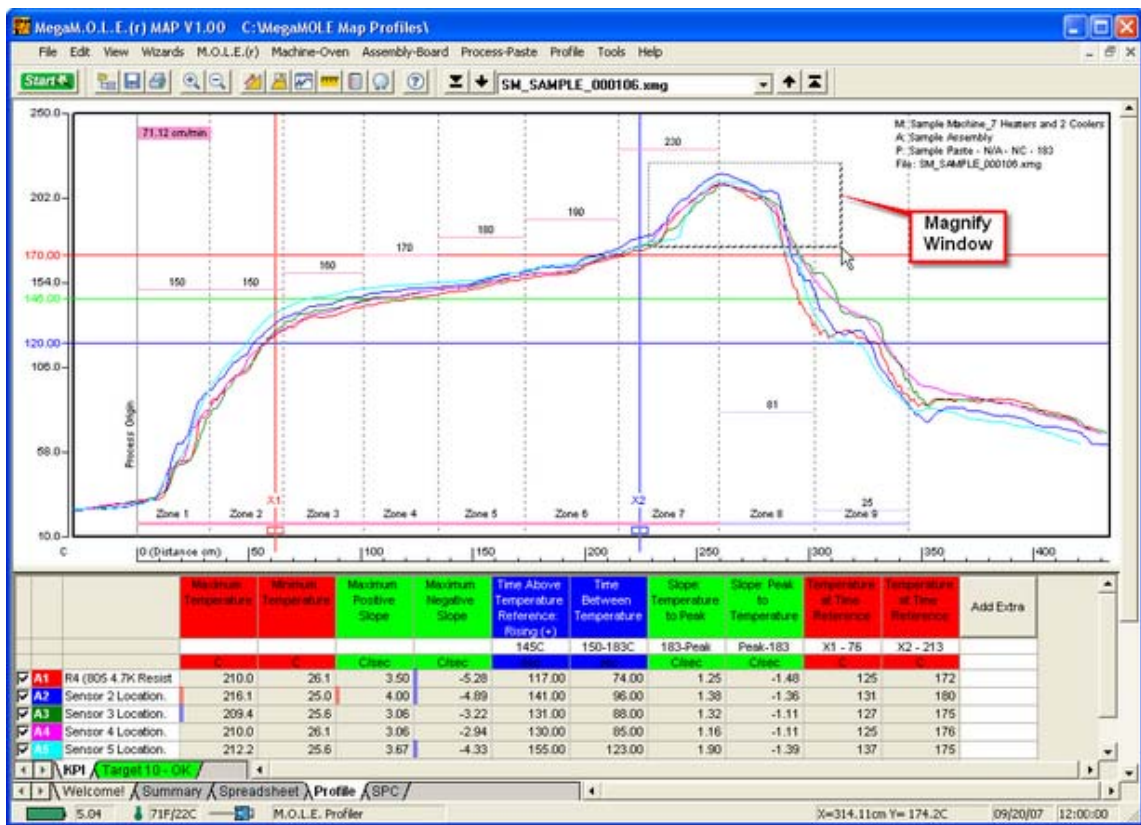
The Magnify tool enlarges any selected area of the data graph for easy visual examination.



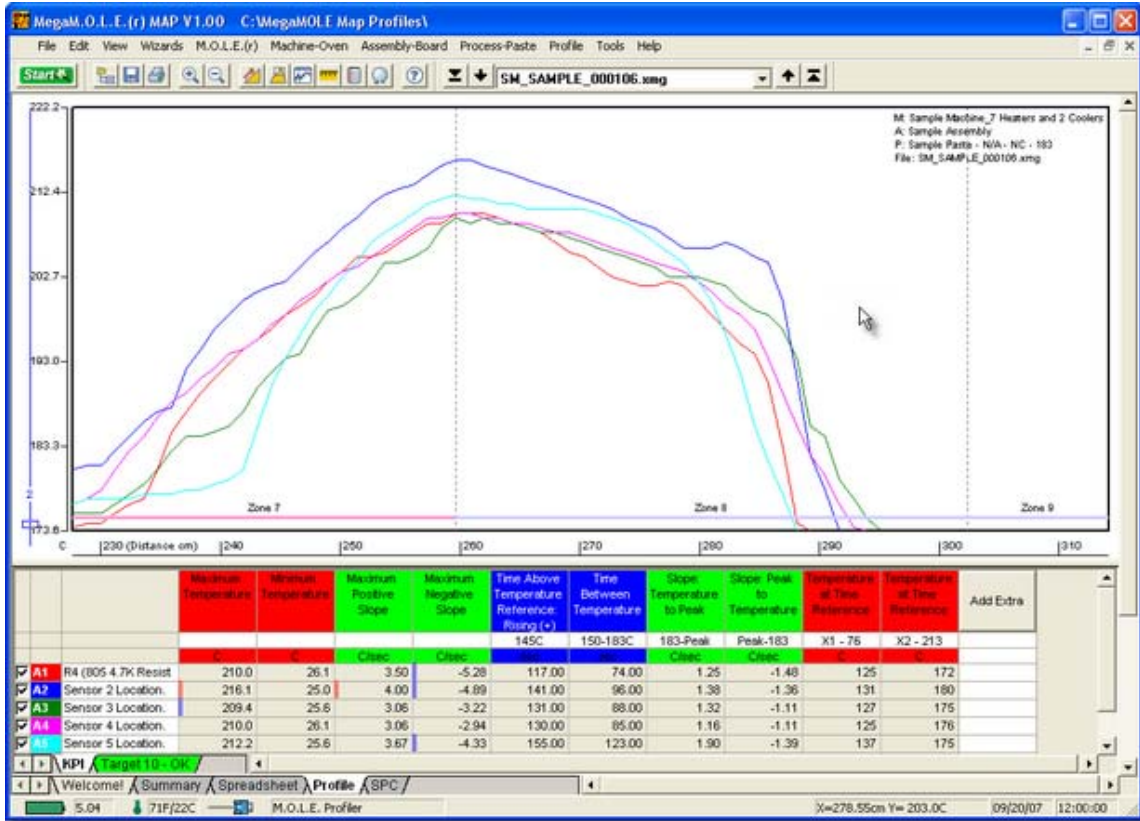
When a Magnified Window constraint is applied to a parameter in the Data Table, the Magnify tool is used to enlarge a portion of the Data Graph, and the values within the magnified area are displayed in the Data Table.

To magnify a portion of the Data Graph:

- 1) On the **Tools** menu, point to **Magnify** then select **Select Area**.
- 2) Position the mouse pointer on a corner of the area to enlarge.
- 3) Press the left mouse button and drag the pointer diagonally to the opposite corner to form a box around the area to be magnified. An outline of the box appears as you drag.



- 4) Release the left mouse button when the outline of the area to be magnified is visible. The area inside the box is then magnified to fill the entire Data Graph.



To show even more detail in the Data Graph, Magnify can be performed multiple times. If the Magnify tool reaches the maximum zoom capability the software will display a message box informing that the user has “Zoomed to Tight”.

This command can be accessed on the Toolbar when the Profile Tab is active.



Magnify Button

5.5.10.2. Slope

The Slope tool finds the average slope between any two points in the Data Graph.

To find the average slope of a line:

- 1) On the **Tools** menu, click **Slope**.
- 2) Position the mouse pointer at a point on the curve.
- 3) Press and hold the left mouse button.
- 4) Drag the pointer to the end of the desired slope line.
- 5) Release the left mouse button when the pointer is at the desired location. The software will draw a slope line on the Data Graph, and label the slope value.



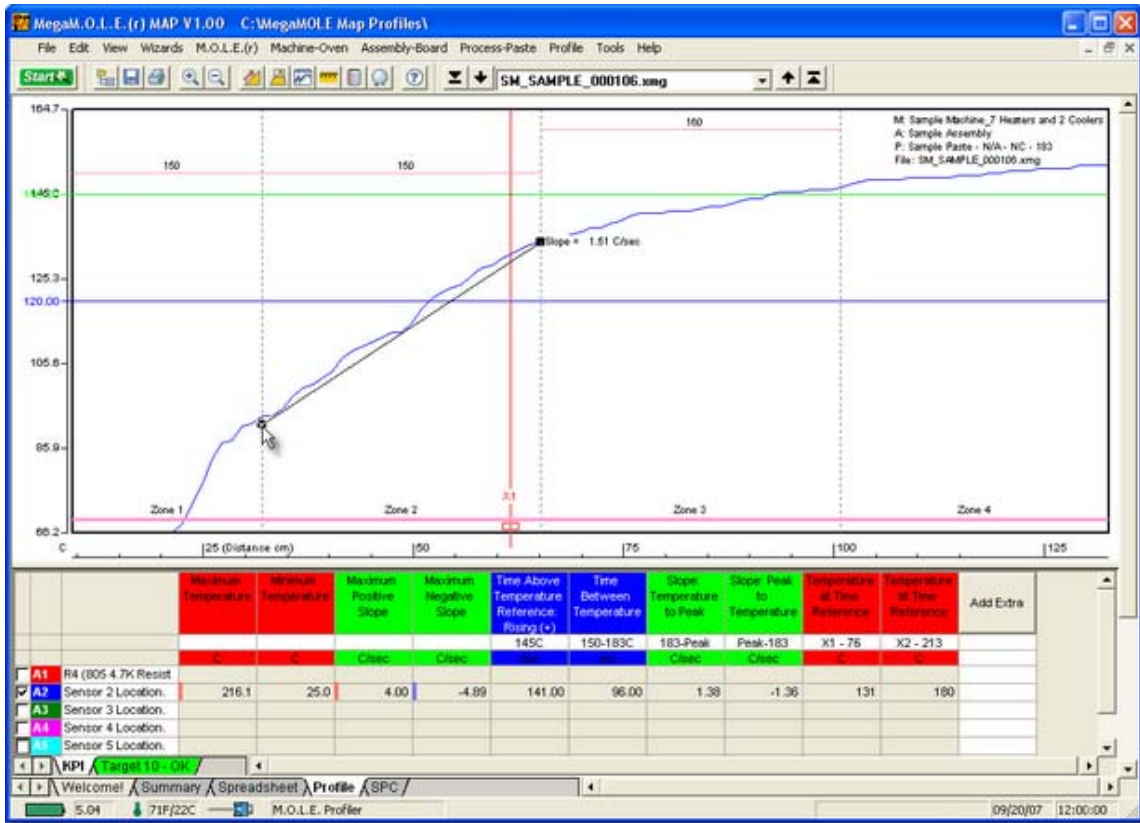
To obtain more accurate slopes:

- 1) On the Tools menu, click Magnify to magnify a portion of the Data Graph
- 2) Repeat the Slope command.



To remove a slope line from the Data Graph:

- 1) Using the mouse pointer, select the object on the Data Graph by clicking it once. The object trackers will then become bold indicating that it has been selected.
- 2) Press the [Delete] key on the keyboard to remove the object.



Slope Applications

- Use the Slope tool to find the average slope between any two points on the graph. Longer slope lines tend to produce more accurate slope calculations.
- The Slope tool can be used to compare actual data with ideal conditions by drawing a line with a known slope (to represent the ideal condition) beside a portion of a Data Plot.

Slope Limitations

- Slope calculations are based on logged points connected by the slope line. Points occur only at the exact time intervals used to record data.
- The Slope tool cannot measure slopes when the line is vertical.

This command can be accessed on the Toolbar when the Profile Tab is active.



Slope Button

5.5.10.3. Peak Difference

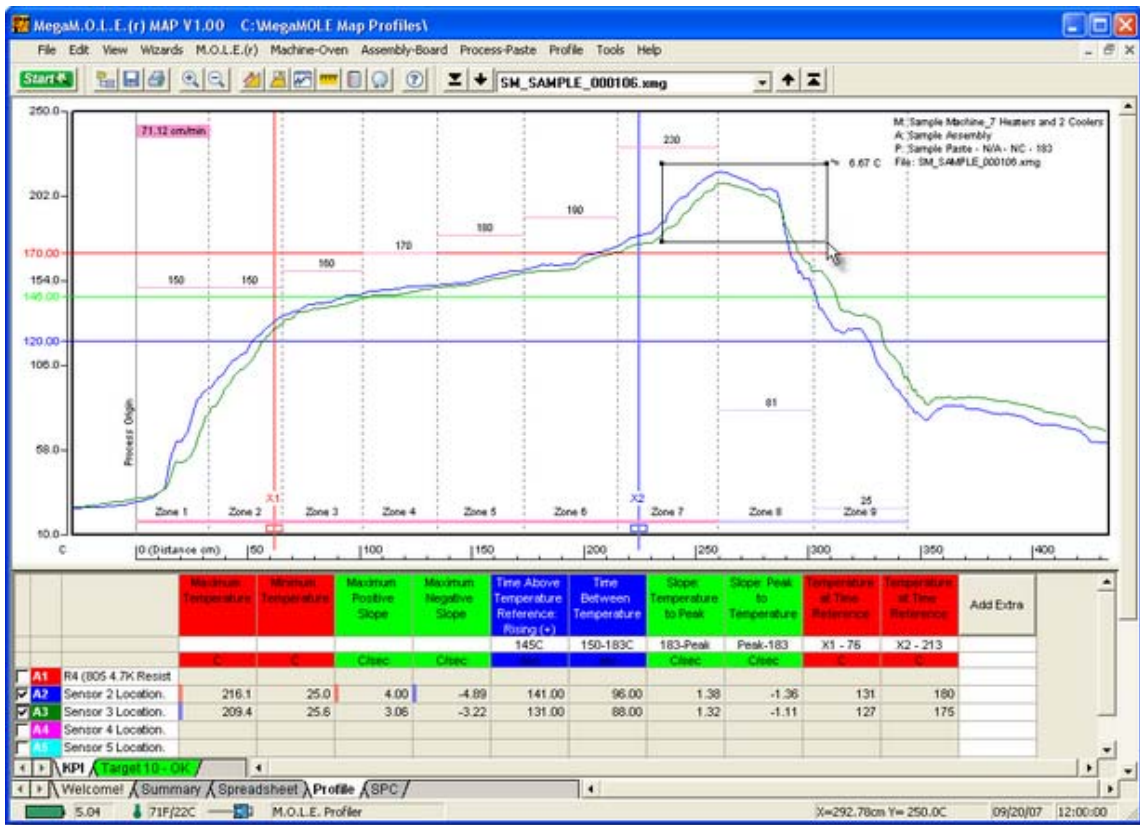
This command displays the difference in value between the peak of the maximum Data Plot and the peak of the minimum Data Plot in any location of the Data Graph. This command is especially useful for measuring side-to-side heating differences in ovens.



The peak difference is calculated as the maximum difference between the highest peak and the lowest peak within the rectangle.

To display the peak difference between Data Plots:

- 1) On the **Tools** menu, click **Peak Difference**.
- 2) Position the mouse pointer on a corner of the area you want to analyze.
- 3) Press the left mouse button and drag the pointer diagonally to the opposite corner to form a Peak difference box. An outline of the box appears as you drag.



To remove the peak difference:

- 1) Using the mouse pointer, select the object on the Data Graph by clicking it once. The object trackers will then become bold indicating that it has been selected.
- 2) Press the [Delete] key on the keyboard to remove the object.



This command can be accessed on the Toolbar when the Profile Tab is active.



Peak Difference Button

5.5.10.4. Overlay

The Overlay tool displays a second data run profile over the currently displayed profile on the Data Graph for comparison.

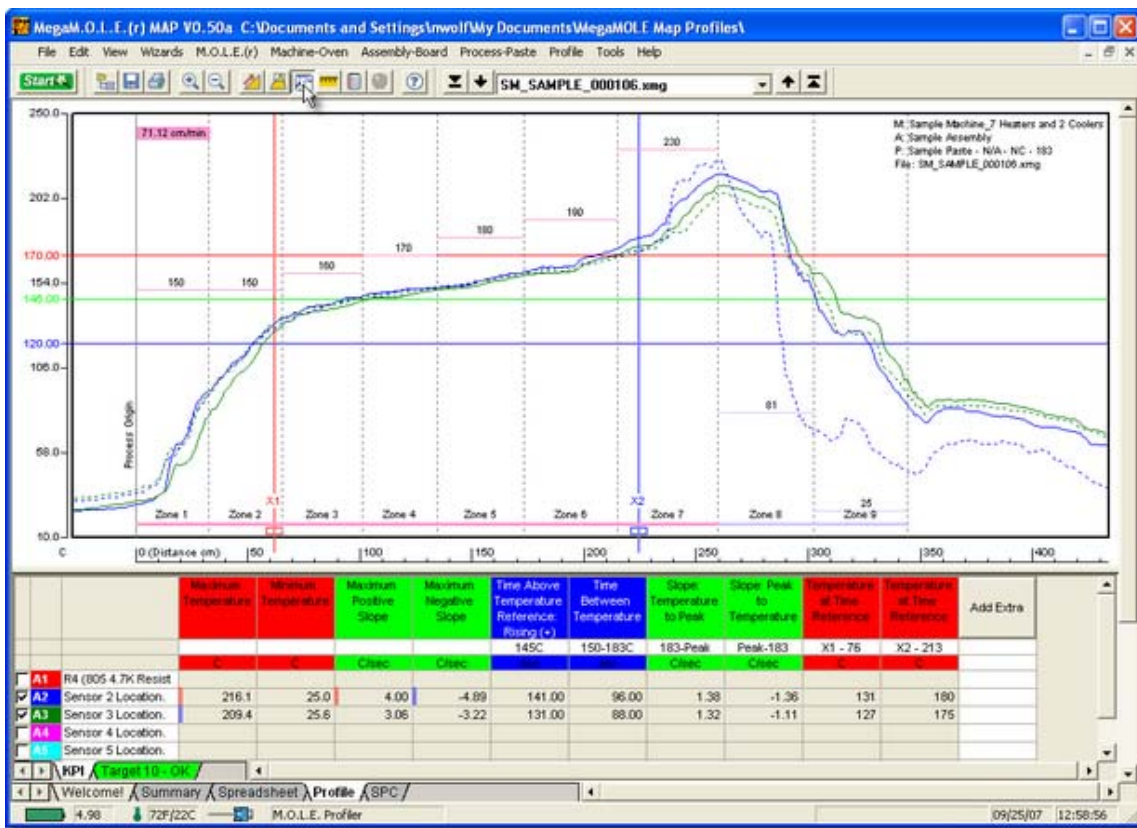
To overlay two Profiles:

- 1) On the **Tools** menu, click **Overlay**. A list box of data run files (.XMG) in the currently selected working directory appears.
- 2) Select a data run file (.XMG) to overlay on the original.

The profile will be inserted at the same process origin and automatically scaled to the same Temperature (Y) axis. The original Data plots remain as solid lines while those added for comparison are dashed.



The dashed "Overlay" Data Plots are the same color as the original Data Plots.



To remove the overlaid Data Graph:

- 1) Select the Overlay command again.

Overlay Applications

- The Overlay and Magnify tools can be used together to overlay and compare ideal reference profiles and magnified portions of the two data files. They can have different but overlapping Time (X) values (times, point numbers, logging intervals) or temperatures.

Overlay Limitations

- If the Data Plots are too numerous to clearly see the information of interest, they can be suppressed by turning the desired channel in one or both files "OFF". This must be done to the overlaid data run file prior to using the Overlay tool. Save that data run file and use the Overlay tool again.

This command can be accessed on the Toolbar when the Profile Tab is active.

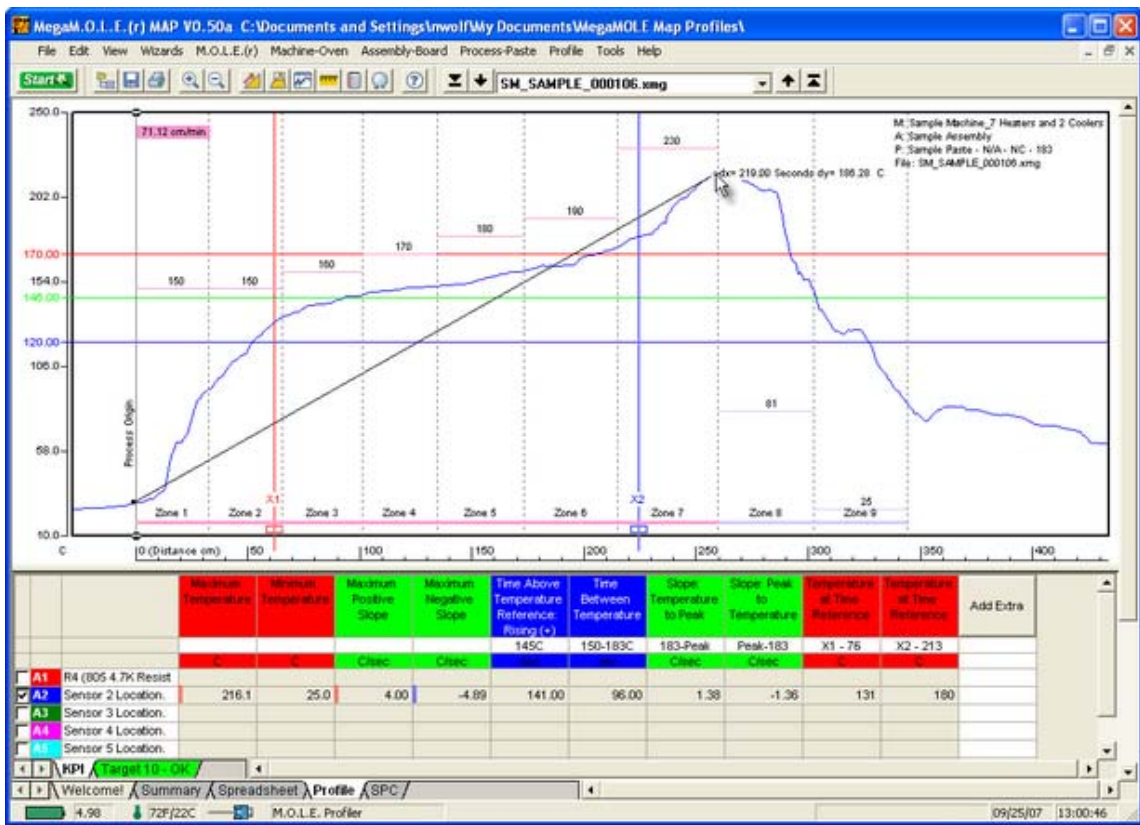


5.5.10.5. Measure

The Measure tool is similar to the Slope tool except it measures the distance between any two points on the Profile worksheet Data Graph. This tool adds a line labeled with the distance values to the graph, and notes the change in X and change in Y (Delta X and Delta Y) instead of the slope. »

To find the distance between two points:

- 1) On the **Tools** menu, click **Measure**.
- 2) Position the mouse pointer at a point on the curve.
- 3) Press and hold the left mouse button.
- 4) Drag the pointer to the end of the desired point on the curve.
- 5) Release the left mouse button when the pointer is at the desired location and a slope line labeled with the change in X and Y appears on the Data Graph.



To obtain more accurate distances:

- 1) Magnify a portion of the Data Graph using the Magnify tool and repeat this procedure.

To remove the annotated distance:

- 1) Using the mouse pointer, select the object on the Data Graph by clicking it once. The object trackers will then become bold indicating that it has been selected.
- 2) Press the [Delete] key on the keyboard to remove the object.



This command can be accessed on the Toolbar when the Profile Tab is active.



5.5.10.6. Notes

The Notes tool adds a leader with text to any portion on the Data Graph to label special points of interest.

To add notes to the Data Graph:

- 1) On the **Tools** menu, click **Notes**.
- 2) Position the mouse pointer at the desired location to start the note leader, click and drag the mouse pointer to the desired location for the note text and release the mouse button.
- 3) A dialog box appears allowing the user to enter a note by typing it in the text box. There also are options to customize the color and font size.



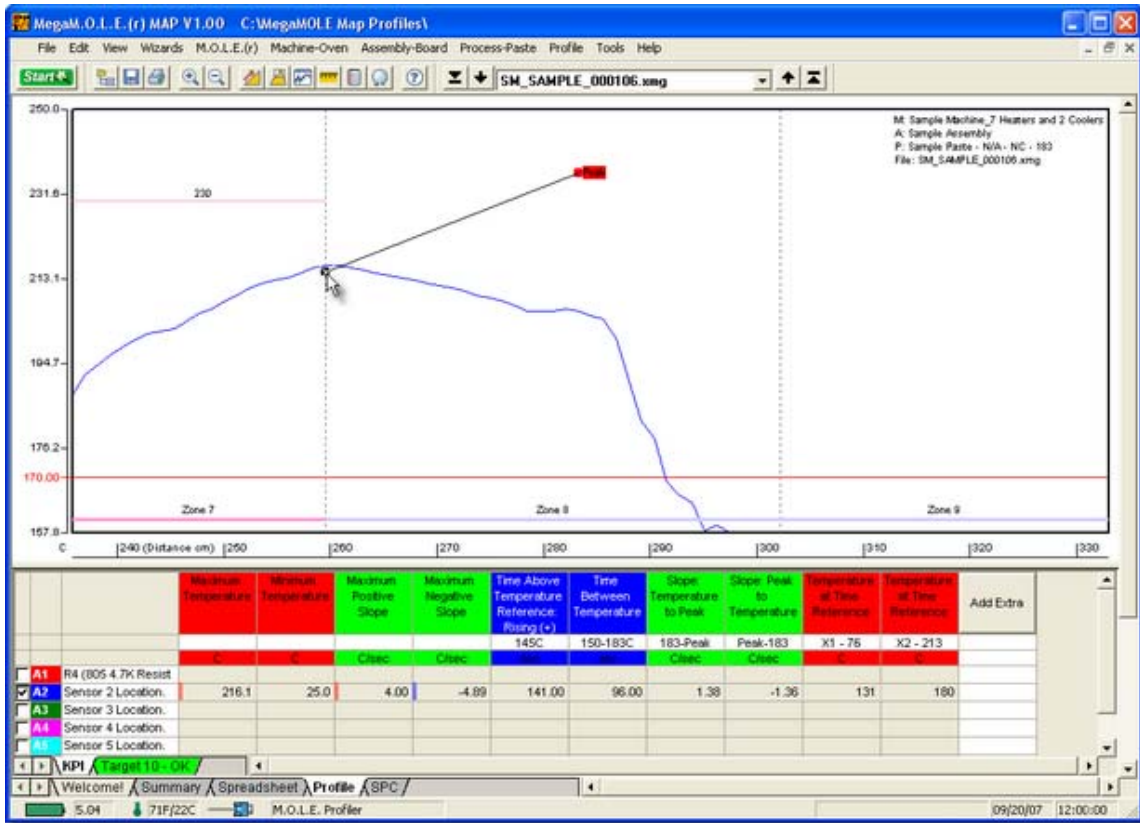
- 4) Click the **OK** command button or **Cancel** to quit the command.

To move notes:

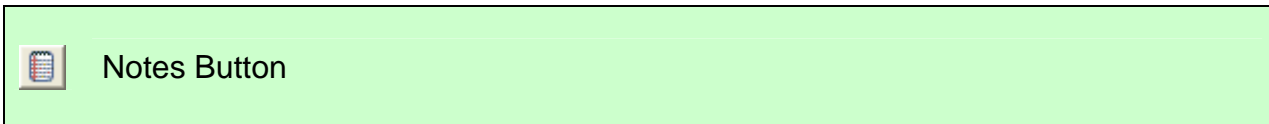
- 1) Select a note leader, click and drag the mouse pointer to the desired location for the note and release the mouse button.

To remove notes:

- 1) Using the mouse pointer, select the object on the Data Graph by clicking it once. The object trackers will then become bold indicating that it has been selected.
- 2) Press the [Delete] key on the keyboard to remove the object.



This command can be accessed on the Toolbar when the Profile Tab is active.



5.5.10.7. Prediction

One of the most impressive software features is the Prediction tool. This tool enables the user to change a zone temperature value or the conveyor speed and predict the outcome of that change. Prediction is easy to use and a valuable command that quickly defines process parameters.

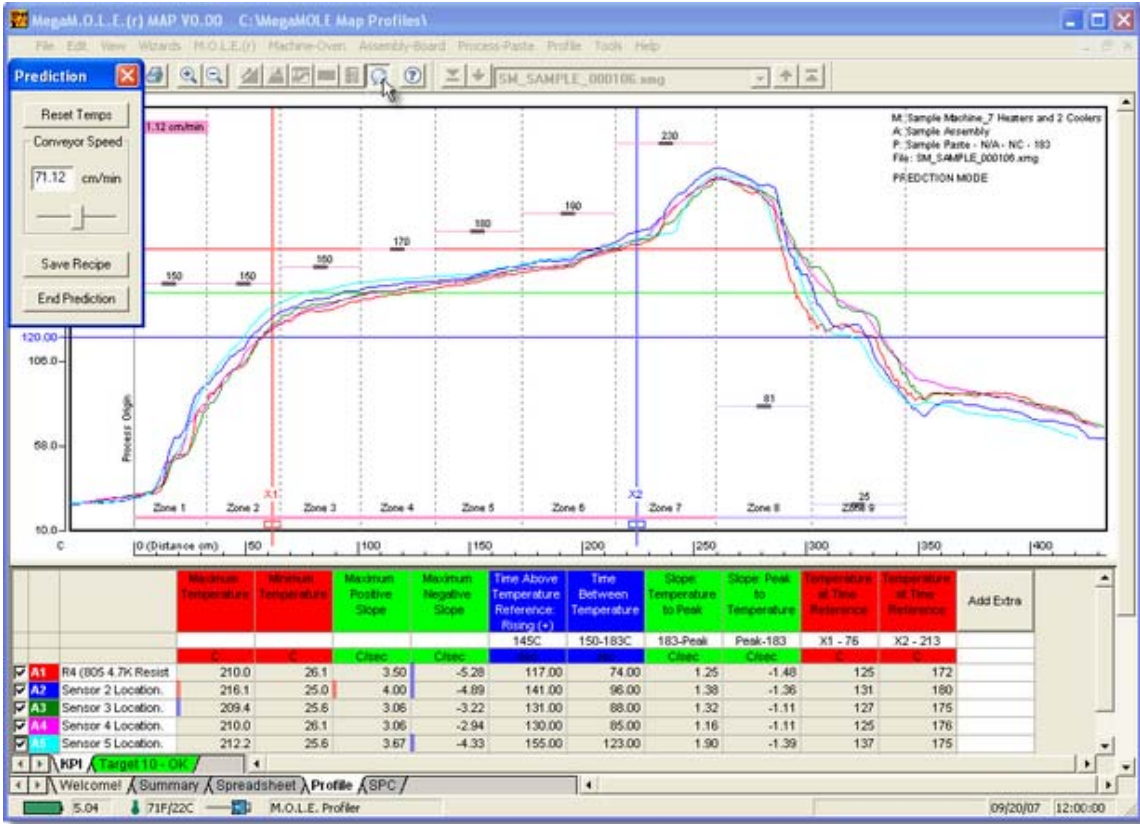
To use the Prediction Tool machine information must first be set to build an accurate “model” of an oven environment. As experience with modeling grows, the first values selected may need to be modified accurately reflect the process. Refer to topic [Software>Menus>Machine>Set Machine Information](#).

To predict results:

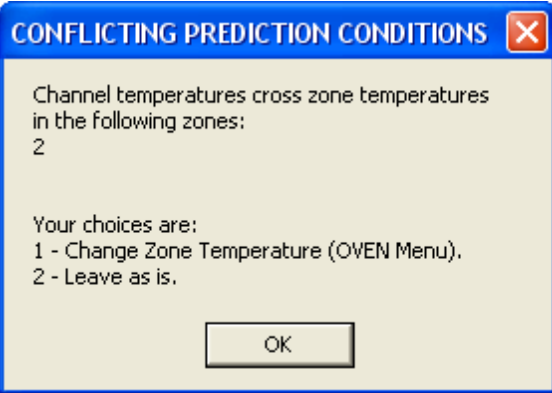


If Zone temperatures are not set, the Prediction tool will not work.

- 1) On the **Tools** menu, click **Prediction** and the Prediction pallet appears.

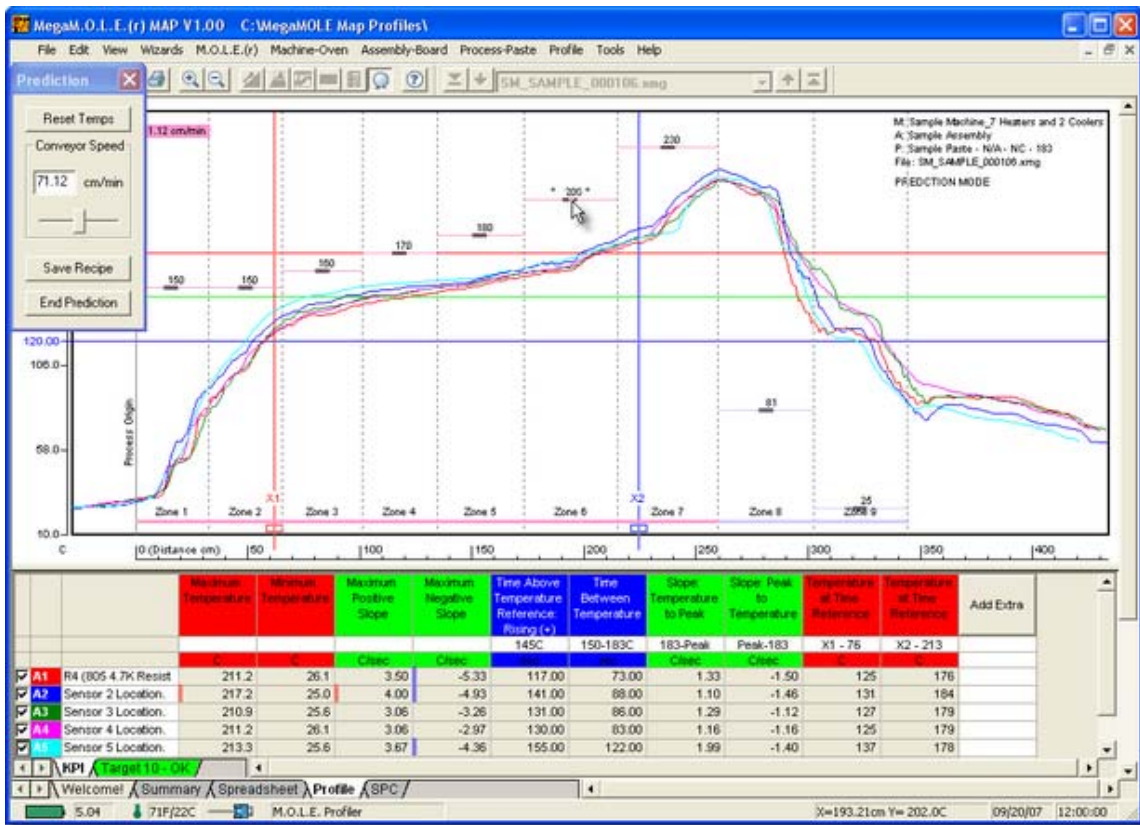


If sensor temperatures are inconsistent with zone temperature settings, a message box with an explanation appears. The explanation appears only once for all zones, each time Prediction is used. After that, the software assumes the user is aware of the potential problem.

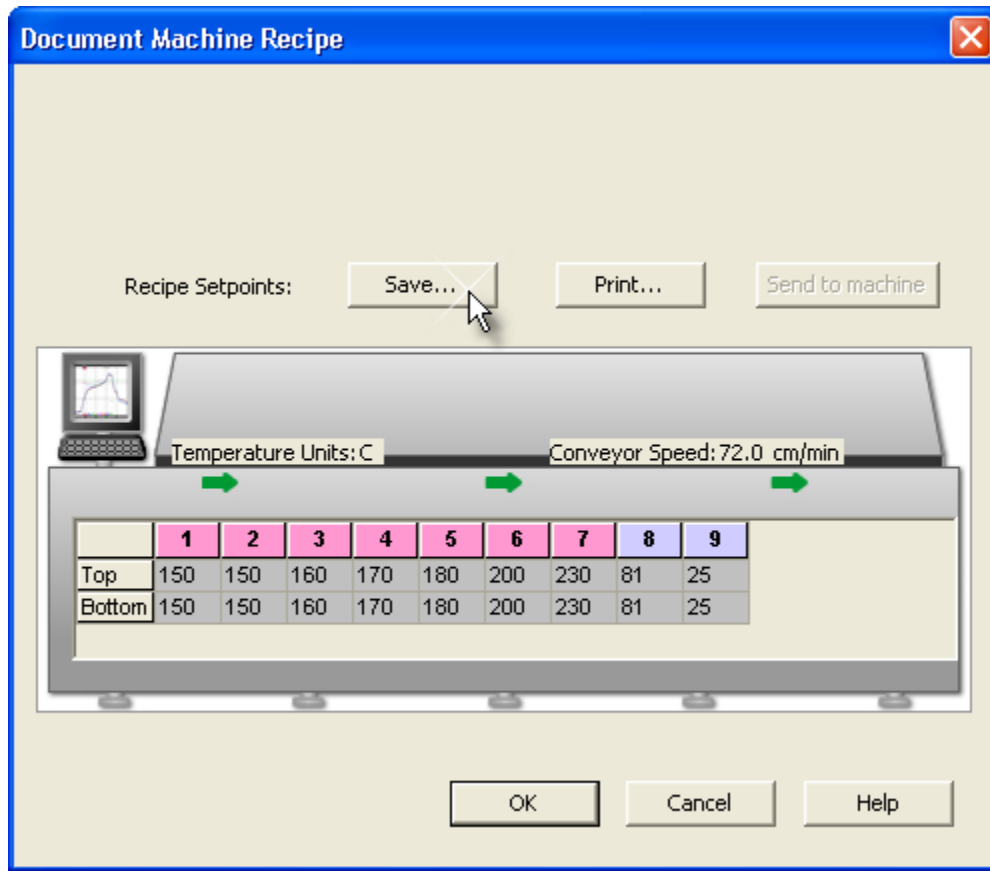


The inconsistent setting does not prevent the software from making a prediction. It makes a rational assumption about what is happening. In addition to the explanation, several logical ways are displayed to correct the conflicting conditions at the bottom of the dialog box.

- Experiment by making “what if” changes to the conveyor speed and sliding Zone Temperature Prediction Handles up or down to the preferred prediction temperature.



- Once the predicted machine recipe is at the desired settings, the user can save them to a recipe file (.XMR) or print them by selecting the **Save Recipe** command button.



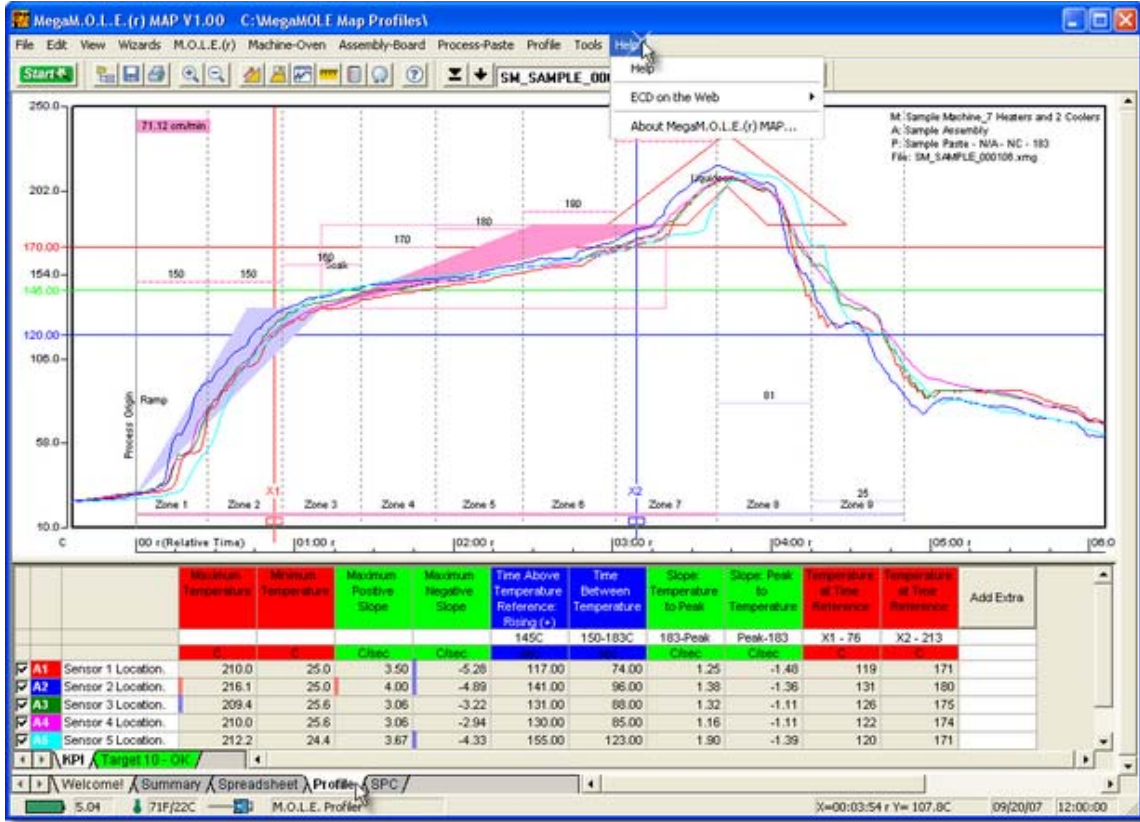
- Once the machine recipe is saved, set the machine to the final prediction values, let it stabilize and then perform another data run to check if the process has been optimized.

This command can be accessed on the Toolbar when the Profile Page Tab is active.



5.5.11. Help Menu

The Help menu commands are useful when information is needed quickly or when this Users guide is not available.

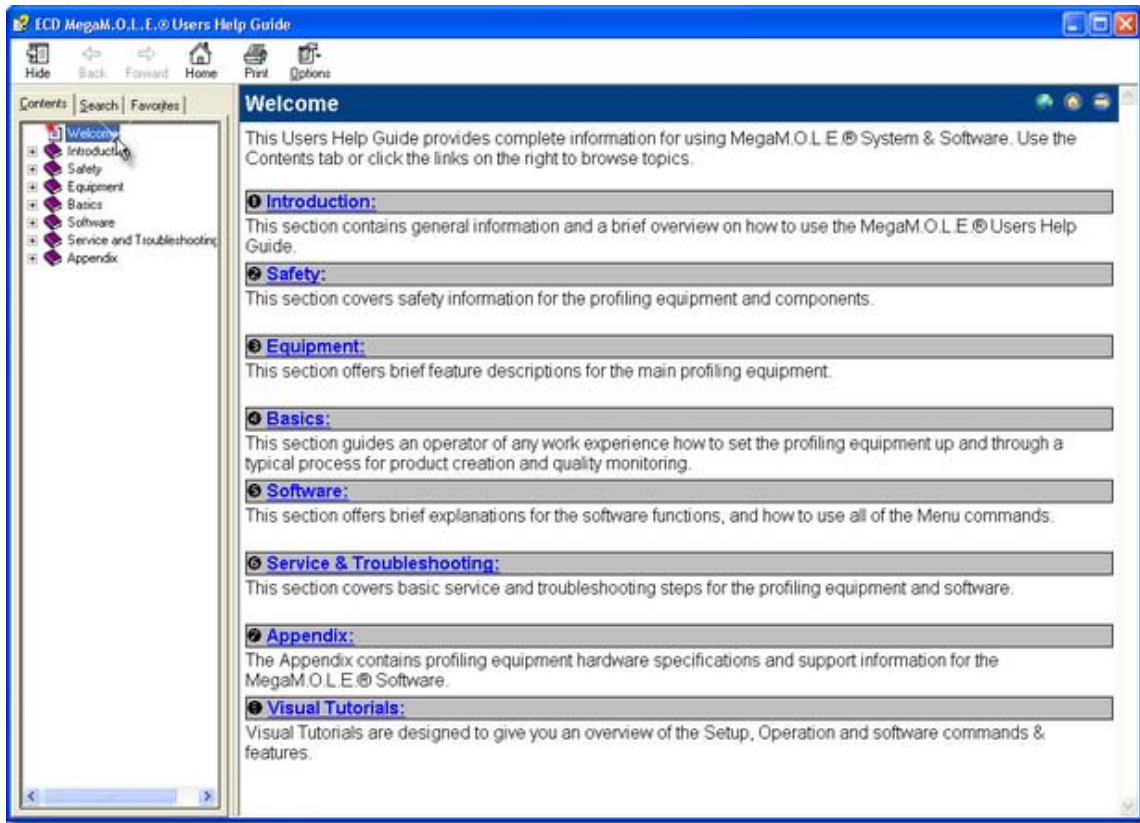


5.5.11.1. Help

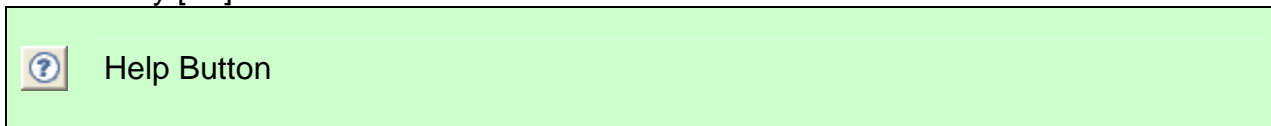
The Help Index is a complete reference tool that can be used at any time.

To launch the help system:

- 1) On the **Help** menu, click **Help** to launch the user's help guide. You may now search for the help topic of your choice.



This command can be accessed on the Toolbar and can also be used by pressing the shortcut key [F1].



5.5.11.2. ECD on the Web

You can access more help by using ECD web commands. Let us help you by using the linked commands to the ECD Web site.



5.5.11.3. About MEGAM.O.L.E.® MAP

The About command displays the software version, release date and company information.

To view About information:

- 1) On the **Help** menu, click **About MEGAM.O.L.E.® MAP**.



6.0 Service and Troubleshooting

6.1. General Service Information

This section covers maintaining and troubleshooting a M.O.L.E., Thermocouples, Power Pack battery, Software, Wiring, and other parts of the system.



The following service and calibration instructions are for use by qualified personnel only. Refer to the [Safety>Operators Safety Information](#) prior to performing any service.

Service Troubleshooting:

Decide if the problem is with the M.O.L.E. profiler Hardware, Communications, or Software.

- If the problem occurs while attempting to log data, the Hardware may be faulty.
- If the problem occurs while attempting to communicate between M.O.L.E. profiler and the computer, the Communications links may be faulty.
- If the problem occurs while attempting to use a software function, the software may be faulty.

Once it has been determined what item is causing the problem, refer to the appropriate service section. Start at the top of the list and work your way down. If the problem is still unresolved go to [Service>How to Get Additional Help](#).

6.2. MEGAM.O.L.E.®

This section describes problems that can occur with M.O.L.E. profiler hardware.

Hardware Problems:

Wrong or erratic temperature readings:

- **Open or intermittent thermocouple, cable, or connector:** Individual channels being detected as “Open” on the profile plot will indicate this. Check thermocouple wires and insulation. Also, check the connectors visually for damage or loose connections. Tighten all the connections and check with an ohmmeter or millivolt meter if available or substitute a thermocouple that you know works properly.
- **Shorted thermocouple, cable, or connector:** This is harder to find. A shorted thermocouple connector or cable creates a new thermocouple junction at the location of the short; therefore, actual temperatures are recorded, but not the ones desired. If the short is intermittent, the recorded temperatures may jump between that of the thermocouple and that of the shorted location. Visually check for shorts inside of connectors and for damaged insulation on the wires. Repair or replace any suspicious components.
- **Wrong type thermocouple, connector, or wire:** Wrong thermocouple types will give consistently wrong readings, either always high or always low. Wrong connectors or wrong wire types (used as an extension) create extra thermocouple junctions and uncontrolled temperature offsets. Use only Type K thermocouple wires, and connectors.
- **Thermocouple connector wired backwards:** Typically causes high temperatures to read as negative (e.g., -150°F.). Should be Yellow=Ch, Red=Al.
- **Low power pack charge:** Charge the power pack.
- **Conductive contamination inside the M.O.L.E. profiler or I/O Module:** Although unlikely, this is known to cause “spikes” (abrupt jumps in value) in the recorded temperatures. Other kinds of errors are also possible.
- **Incorrect calibration:** If the recorded temperatures for all of the active channels are wrong in the same direction (e.g., all too high), then possibly the I/O Module has incorrect calibration. Refer to topic [Service>MEGAM.O.L.E.>Calibration Information](#) for cautions and procedures, or return the M.O.L.E. profiler to ECD for re-calibration.
- **Internal temperature effects:** If the M.O.L.E. profiler and it's components has been subjected to an internal temperature in excess of the published specifications. Temperatures outside the specified operating range may cause incorrect readings and shorten Power Pack life. [Internal temperatures in](#)

excess of the absolute maximum warranted internal temperature may cause permanent, irreparable damage to your MEGAM.O.L.E. profiler.

- **M.O.L.E. profiler never turns on, but the software can read and write the hardware configuration:** The start switch is possibly defective, return to ECD for service.

6.2.1. Communications Problems

“Instrument not responding” error message:

- Try triggering the M.O.L.E. profiler with the switch. If you cannot get the light to flash, you have a hardware problem with the M.O.L.E. profiler itself.

If you can activate the M.O.L.E. profiler with the switch, check for the following:

- **Wrong computer communication port:** Cable must be connected to which is selected using the *Select Instruments* command in the software.
- **Conflicting use of COM port:** Perhaps some other software, such as a mouse driver, communications programs, or PDA is trying to use the same COM port.
- **Computer Interface cable defective:** Order spare or replacement cables from ECD, refer to [Service>How to Get Additional Help](#) for contact information.

6.2.2. Calibration Information

Because the *MEGAM.O.L.E.* profiler and I/O Module are made with precision components with high temperature stability and tight tolerances; the analog-to-digital converter remains stable for years. High quality components together with software algorithms based on the ITS-90* standard for Type K thermocouples have been provided to yield specified accuracy and long-term stability. Each unit has been tested at the factory before it is shipped.



ECD recommends the *MEGAM.O.L.E.* profiler I/O Module is factory re-calibrated every 6 months when it is being used constantly. If the use is occasional, a period of no greater than 12 months between calibrations is recommended.

Depending on use, however, temperature accuracy should be periodically verified using a suitable temperature standard. Any observed inaccuracies are probably not caused by calibration error but by any one of a number of other sources, primarily the following:

- 1) Poor thermocouple connectors or open thermocouples.
- 2) Using a temperature standard that is inaccurate or is not traceable to the National Institute of Standards and Technology (NIST, formerly the Nation Bureau of Standards).
 - Check the accuracy of your temperature standard and that it is traceable to NIST. Be sure that you're using Type K wire connected to the standard. Be sure that your temperature standard is cold-junction compensated, or use an ice point reference.
- 3) Extremely low Power Pack battery charge.
 - Recharge the Power Pack battery. Refer to topic [Basics>Setup>Charging the Power Pack Battery](#).
- 4) Sudden changes or excessive ambient temperatures.
 - Allow *MEGAM.O.L.E.* profiler temperature to stabilize for 1/2 hour before calibration.

If after checking these possible sources of inaccuracy the *MEGAM.O.L.E.* profiler I/O Module still needs to be calibrated, contact ECD for the proper calibration procedure P/N A47-6342-05.

If you need to return the *MEGAM.O.L.E.* profiler I/O Module for re-calibration, contact ECD and request an RMA (Return Merchandise Authorization). Refer to section [How to Get Additional Help](#) for contact information.

***ITS-90 (International Temperature Scale of 1990)**

6.2.3. Constructing a Thermocouple

The following procedures describe how to construct a nano thermocouple and a protective plug.

Thermocouple construction:

The following items will be needed to construct a Thermocouple:

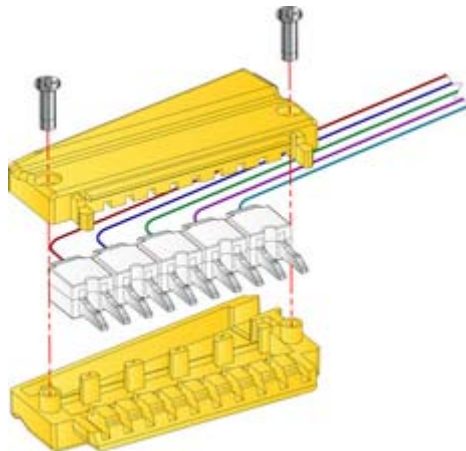
- 1 nano thermocouple housing and 2 hardware screws.
- Up to five Thermocouples.
- Phillips (Crosshead) screwdriver

Construct a thermocouple as follows:

- 1) Disassemble the thermocouple housing by unscrewing the 2 Phillips hardware screws.
- 2) Remove the existing thermocouple(s).
- 3) Insert the new thermocouple(s) in the top half of the thermocouple housing until they are fully seated. Be careful to place them in the proper color arrangement per the table below.

Channels:	1/11	2/12	3/13	4/14	5/15	6/16	7/17	8/18	9/19	10/20
Color:	Red	Blue	Green	Violet	Cyan	Red	Blue	Green	Violet	Cyan

- 4) Route the wires through the housing exit.
- 5) Carefully place the two halves of the thermocouple housing together. Verify that the wires are not pinched and that the wire positions are correct.



- 6) Replace the hardware screws.

Protective plug construction

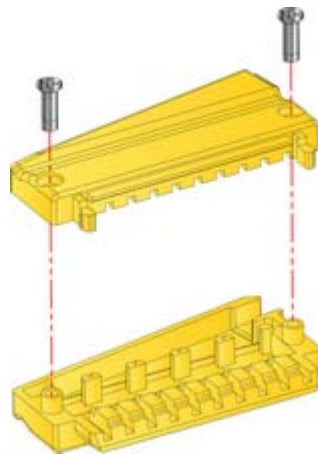
If fewer than four nano connectors (20 sensors) are used in your application, a protective plug may be used for each of the unused I/O Module channel banks.

The following items will be needed to construct a Thermocouple:

- 1 nano thermocouple housing and 2 hardware screws.
- Phillips (Crosshead) screwdriver

Construct a protective plug as follows:

- 1) Carefully place the two halves of the thermocouple housing together.



- 2) Replace the 2 hardware screws.

6.3. How to Get Additional Help

If you still have problems, let us help you. We offer many ways to service your problems. You can call our Service/Test technicians, visit our web site to view our FAQ section (Frequently asked Questions) or send us e-mail explaining your problem in detail.

When calling our Service/Test technicians or sending us e-mail, please include the following information:

- Product Description (i.e. *MEGAM.O.L.E.*)
- Product Serial Number
- Software Version

Here is how to contact ECD:


Telephone: +(1) 800.323.4548
 +(1) 503.659.6100
 FAX: +(1) 503.659.4422
Technical Support: +(1) 800.323.4548
Email: ecd@ecd.com
Internet: <http://www.ecd.com>

Appendix


A: Specifications

MEGAM.O.L.E. 20 Profiler

I/O Module:

INPUTS:	Up to 20 type K ECD Nano-Thermocouples
PHYSICAL DIMENSIONS:	63.5mm x 75.4mm x 7.2mm (2.50" x 2.97" x 0.28")
TEMPERATURE MEASUREMENT RANGE:	-129°C to +1272°C (200°F to +2322°F)
INTERNAL OPERATING TEMPERATURE RANGE:	-40°C to 85°C (-40°F to 185°F)
Absolute Maximum Warranted Internal Temperature:	82°C (180°F)* MEGAM.O.L.E. I/O Module automatically stops operating when the internal temperature exceeds 85°C (185°F)
	*WARNING: Exceeding this temperature may permanently damage the equipment!
ACCURACY:	±1°C. Channel to channel compliance within 1°C.
PROGRAMMABLE SAMPLING PERIOD:	0.1 seconds to 24 hours
OPEN THERMOCOUPLE DETECTION.	All 20 channels
NUMBER OF SAMPLES PER CHANNEL	100,000 total for 20 channels

Main Module:

PHYSICAL DIMENSIONS:	63.5mm x 63.5mm x 7.2mm (2.50" x 2.50" x 0.28")
INTERNAL OPERATING TEMPERATURE RANGE:	-40°C to 85°C (-40°F to 185°F)
Absolute Maximum Warranted Internal Temperature:	82°C (180°F)* MEGAM.O.L.E. Main Module automatically stops operating when the internal temperature exceeds 85°C (185°F)
	*WARNING: Exceeding this temperature may permanently damage the equipment!
HARDWARE REAL-TIME CLOCK/CALENDAR:	±1 minute/month at 25°C

Power Pack Battery:

PHYSICAL DIMENSIONS:	63.5mm x 38.2mm x 7.2mm (2.50" x 1.50" x 0.28")
POWER PACK CHARGE:	Typical 50 ten-minute profiles.
CHARGE TIME:	8 hours (a 15 min. charge allows one 10min. data run)
EXPECTED POWER PACK LIFE:	300-400 charging cycles.
OPERATING RANGE:	4.2V to 3.0V

Power Pack Battery Charger:

INPUT:	Voltage Rating: 100 to 240 VAC Current: 200mA(RMS) max. @ 115VAC 80mA(RMS) max. @ 230VAC Frequency: 50/60Hz
OUTPUT:	5V DC, Load 0A MIN. 1A MAX.
Mains Voltage Fluctuations:	+ 10%

Wireless RF Option:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Thermocouple Specifications:

Thermocouples: Type K, Micro-Connector, Teflon insulated. (Other insulation types available.)			
<u>THERMOCOUPLE RESPONSE TIME</u>			
Wire Size	Still Air 800/100°F	60 Ft./Sec. Air 800/100°F	Still H2O 200/100°F
.005 in.	1.0 sec.	0.08 sec.	0.04 sec.

Environmental Limitation Specifications:

MegaMOLE Profiler:

- Maximum relative humidity 80% RH from 0°C to 31°C, decreasing linearly to 17% RH at 50°C.
- Pollution Degree 2 (Normally only dry pollution, but with temporary conductivity caused by condensation)

Power Pack Charger:

- Temperature: (Operation) 0 to +45°C (32 to 113°F)
- Temperature: (Non-Operation) -20 to +75°C (-4 to 167°F)
- Humidity: (Operation) 20 to 90%

NOTE: Tests have shown that because of the sensitive nature of the measurement and logic circuits, the following precautions must be observed:

- **Minimize exposure to ESD Events.** If the M.O.L.E. profiler or one of the thermocouples receives an 8kV electrostatic discharge during the data collection sequence, the M.O.L.E. profiler may switch itself "OFF". To retrieve the data, simply upload the data that was recorded prior to the event. If a new data collection sequence is started without uploading first, the existing data stored in the M.O.L.E. profiler will be lost.
- **Keep strong electromagnetic fields away.** The thermocouple wires serve as an antenna for electromagnetic radiation. If field strength of 3 volts per meter is present (usually due to close proximity of radio transmitters) while the M.O.L.E. profiler is collecting data, the accuracy of the data may be compromised. This interference is compounded by using long thermocouple wires, as well as the effect of the thermocouple wires acting as a "tuned" antenna.

B: Statistical Process Control (SPC) Background Information

This appendix deals with the subset of SPC that is incorporated into MAP Software. It does not address general SPC principals. A working knowledge of general statistical principals and SPC terms is assumed and is not addressed here. There are many good basic SPC books where this information may be obtained.

Reflow and Wave Solder operators, engineers and production managers are expected to understand their soldering process so as to deliver quality products cost effectively. This is a continuous process.

First, the machine must be checked for consistency. A standard or typical set up should be routinely checked prior to any process set point determinations, or actual production run machine checks. Only after the machine has been determined to be operating correctly and not experiencing abnormal variation, should data from the machine be utilized. SPC is all about identifying common or normal variation from abnormal variation.

Second, the correct process set points must be determined for a particular product. Utilizing the M.O.L.E. profiler, the correct set points for a particular product may be determined. These set points, if selected correctly and followed, should deliver the maximum throughput of quality product.

Third, the machine must consistently deliver the correctly determined set points. SPC will help identify common or normal variation from abnormal variation. Checking the machine using your M.O.L.E. profiler and the MAP Software with its SPC capability will help ensure that the machine is consistently performing to its set points and your expectations.

Fourth, repeat the above three steps. Continuous improvement is a never-ending cycle. Check the long-term variation of the machine by graphing typical set point samples. Using the M.O.L.E. profiler, recheck/adjust part number specific set points to maximize your quality throughput. Check the machine during a part number run to control the machine variation from that part number's actual ideal set points. While SPC had its start in high volume repetitive operations, SPC is applicable to many other types of operations as well. However, SPC can be difficult to apply to short runs. Short runs may be runs that take a long time to process, runs in which multiple samples are difficult to collect, and runs where samples are difficult to place into subgroups or runs where small quantities are run.

The MAP Software charts will be more meaningful to the user if SPC charts are generated based on data sets that have the same set points each time.

There are several basic short run SPC techniques:

1. Nominals Charts
2. Individuals/Moving Range Charts
3. Moving Average/Moving Range Charts
4. Standardized Formula Charts

The Moving Average/Moving Range Chart technique is particularly well suited for situations where control information is desired as soon as possible and there is a relatively long time between sample collections. After considering the nature of solder operations and the machine sampling process, the Moving Average/Moving Range Chart technique was incorporated into MAP Software.

Moving Average/Moving Range Chart Technique:

MAP Software utilizes the standard Moving Average/Moving Range Charting technique with a subgroup size of 2-6 that is selected by the user. The following steps and figure illustrates the Moving Average/Moving Range calculations (using a group size of two) that are used to construct the SPC chart.

Steps for Creating a Moving Average Moving Range Control Chart:

1. Select the key variable to monitor.
2. Select the moving average group size. (We will use two in our example.)
3. Obtain your first sample and record it as sample 1 (X1).
4. Obtain your second sample and record it as sample 2 (X2).
5. Determine the x-bar and R values.



Moving Average formulas:

$$\bar{X} = \frac{X_1 + X_2}{2} \quad (\text{Range})R = X_H - X_L$$

6. Plot this value on the chart as subgroup 1.
7. Carry forward sample 2 into subgroup 2's calculation. Obtain your third sample and record it as sample 3. The averages of sample 2 and sample 3 form subgroup 2.
8. Plot this value on the chart as subgroup 2.
9. Repeat for all the samples.
10. Calculate control limits using standard x-bar and R formulas for the appropriate sample sizes. MAP Software uses range-based calculations for LCL and UCL.

11. Continue monitoring the process.

SAMPLE #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SAMPLE MEASUREMENTS	3	4	5	3	2	9	5	2	6	8	4	8	5	6	3	3
SUBGROUP VALUE	x	3.5	4.5	4	2.5	5.5	7	3.5	4	7	6	6	6.5	5.5	4.5	3
	R	1	1	2	1	7	4	3	4	2	4	4	3	1	3	0

Moving Average/Moving Range Subgroup Size 2 Calculations Chart

Process Capability

A process capability index is a standard measure of how a process compares with its specification limits—how a process **is** performing relative to how **it is supposed to** perform. As opposed to the control chart, which shows detailed information about how the data compares with control limits, a capability index is a summary of how the data compares with the specification limits.

Two common capability indicators are Cp and Cpk. These values are shown in the Statistics Box on the SPC Page Tab.

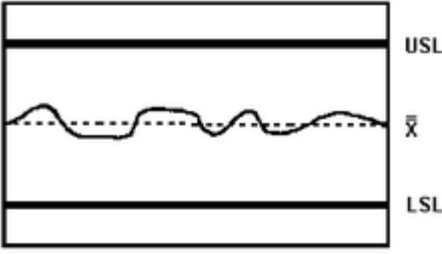
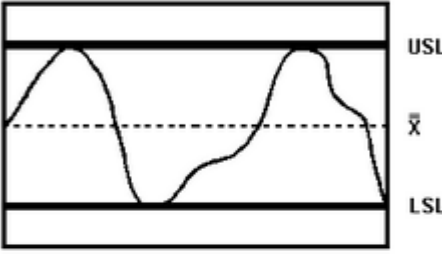
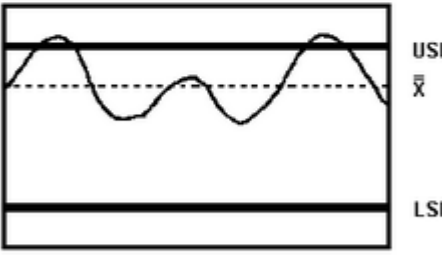
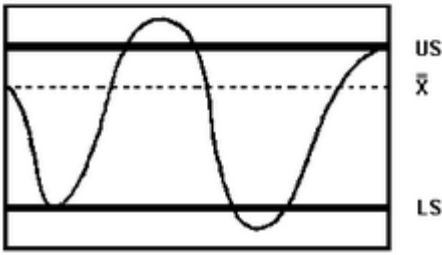
Samples Per Sub-Group = 2

Channel 1	
Time Above:	Sec
N:	9
Min:	22.0
Max:	50.0
X-2Bar:	37.6
Std-Dev:	8.61
Cp:	0.97
Cpk:	0.87

For both of the index values, the data used to determine them is dictated by the subgroup size (N) chosen by the user. In the case where N=1, individual data is used—for N>1, average data is used (x bar).

The charts on the next page give a graphical representation of the concept of Cp and Cpk. Notice that in each graph, the same upper and lower specification limits (USL, LSL) are used. The values of Cp and Cpk will differ according to the data that is compared with those specifications.

Depending on the particular process being monitored, the desired value for Cp and Cpk may differ. In general, however, a Cp and Cpk of 1.33 or above is desired. This assures that the process is not only capable of meeting the required specification limits, but also has a built-in margin for error that may be needed in special circumstances. In addition to targeting a certain minimum Cp and Cpk, it is also desirable to have these two values equal one another. This indicates that the process is well-centered between the specification limits.

	<p>Cp ≥ 1.33: Data tightly distributed.</p> <p>Cpk ≥ 1.33: Data well inside spec limits.</p>
	<p>Cp = 1.00: Data fills entire spec range.</p> <p>Cpk = 1.00: Data fills entire spec range.</p>
	<p>Cp > 1.00: Data tightly distributed. If it were centered between the spec limits, no data would lie beyond those limits.</p> <p>Cpk < 1.00: Some data is outside the spec limits.</p>
	<p>Cp < 1.00: Data not tightly distributed. If it were centered between the spec limits, some data would still lie outside those limits.</p> <p>Cpk < 1.00: Some data is outside the spec limits.</p>

The equations used to calculate the index values are as follows:



$$Cp = \frac{USL - LSL}{6 * (Std.Dev.)}$$

$$Cpk = \frac{USL - \bar{x}}{3 * (Std.Dev.)} \quad \text{OR} \quad Cpk = \frac{\bar{x} - LSL}{3 * (Std.Dev.)}, \text{ whichever is less}$$

As can be interpreted from the above equations, Cp gives an indication of how narrow the data distribution is relative to the width of the specification limits. Essentially, it

indicates how well the process would be able to stay within the specified limits if the data were perfectly centered between those limits.

Cpk compares the widest half of the data distribution to the appropriate specification limit. It indicates whether the process is capable of meeting the specification as indicated by the “worst half” of the measurements. Unlike Cp, the Cpk index measures process capability without assuming the data is well-centered.

C: Pull Down Menus & Toolbar Buttons

Menus:



The dimmed menu commands are used in other Page Tabs.

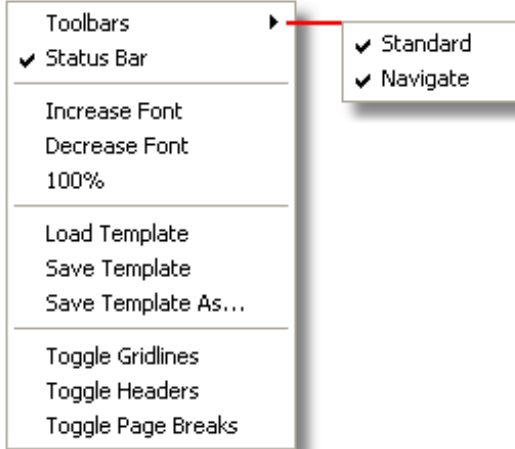
File Menu

New...	
Open Working Directory	
Import	▶ .MDM ▶ .TXT
Export	▶ .TXT ▶ Excel
Save Data run (.xmg)	
Preferences...	
Print Preview	
Print Page...	Ctrl+P
Print Report...	
Send to	▶ Screen Image (.BMP) ▶ Data Run (.XMG)
1 MegaMOLE Map Profiles	
Exit	

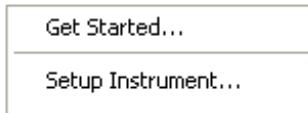
Edit Menu

Copy	Ctrl+C
Paste	Ctrl+V
Rename Data Run	
Hide Data Run	
Remove Data Run	

View Menu



Wizards Menu



M.O.L.E. Menu

- Select Instrument
- Read Instrument
- Instrument Status
- Set Recording Parameters

Machine-Oven Menu

- Set Machine Information
- Create New Machine

- Adjust Zones
- Estimate Conveyor Speed

- Show On Profile...

Assembly-Board Menu

Set Assembly Information

Create New Assembly

Show On Profile...

Process-Paste Menu

Set Paste

Create New Paste

Show On Profile...

Profile Menu

Set Temperature(Y) Scale
Add Temperature(Y) Reference Line

Set Time(X) Scale
Add Time(X) Reference Line

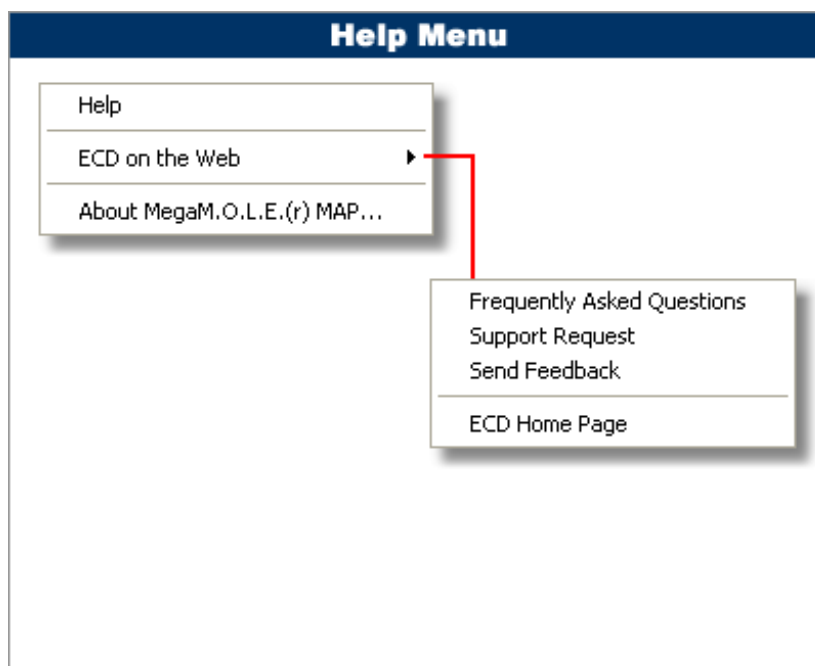
Align Profile Peaks

Show On Profile...
















Tools Menu

Magnify
Slope
Peak Difference
Overlay
Measure
Notes
Prediction

Select Area
100%



Toolbar buttons:

-  Back (To Previous Data Run)
-  First (Data Run)
-  Help
-  Last (Data Run)
-  Magnify Window
-  Magnify 100%
-  Measure
-  Next (Data Run)
-  Notes
-  Open Working Directory
-  Overlay
-  Peak Difference
-  Print Page Tab
-  Prediction
-  Save Data Run



Slope



Start/New