

SuperM.O.L.E.[®]

THERMAL



Gold
2

PROFILER



QUICK REFERENCE GUIDE



SINCE 1964

INTRODUCTION

This procedure guides you through a typical collection process. If you need additional detail, consult the Users Help Guide in the software.

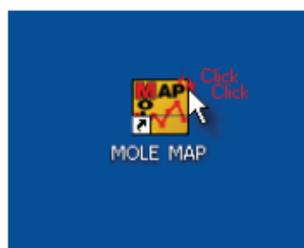
The M.O.L.E.[®] Thermal Profiler depends on the MAP (Machine-Assembly-Process) software to control how it collects and interprets data. Several kinds of data runs may need to be performed to achieve desired information, or the same data run may be performed repeatedly over time to monitor one process. Either way, each data run must be set up at least once.

The MAP software includes wizards that help you get started quickly, even if you are a beginner or infrequent user. With settings for the five likely reflow workflows, you can get up and running in no time. This Guide documents the process used with the **Fresh Start** workflow wizard.

OPERATION - FRESH START

Step I: Set MAP information

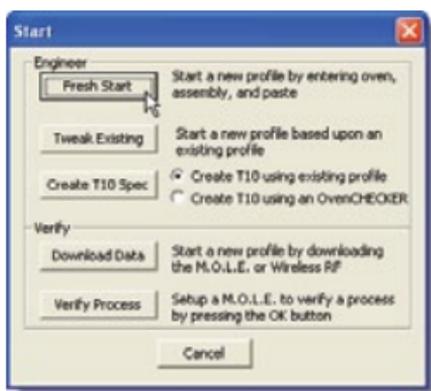
1) Double-click the M.O.L.E.[®] MAP application icon to start the software.



2) Plug in the M.O.L.E.[®] Thermal Profiler.

3) Make sure the M.O.L.E.[®] Power Pack battery is fully charged. When a M.O.L.E.[®] Thermal Profiler is selected, the software status bar displays the current battery voltage.

4) On the **File** menu, click **New**. The Start dialog box appears with the five workflow wizard options.





When navigating through the wizard, the step list on the left of the dialog box uses a color key to inform the user of the progression through the wizard.



Current



Completed



Remaining

5) On the **Start** dialog box, click the **Fresh Start** command button and the workflow wizard appears.

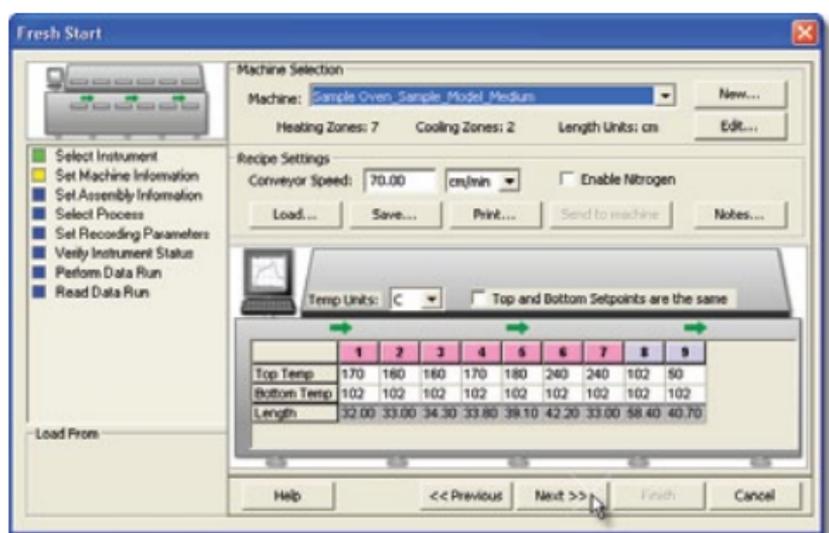
6) Select the desired M.O.L.E.[®] Thermal Profiler from the dialog box. If a M.O.L.E.[®] Thermal Profiler has already been selected during a different process, the software automatically selects the M.O.L.E.[®] Thermal Profiler connected to the COM port previously used.



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

8) Select a machine from the drop-down list. If the desired machine does not appear in the list, click the **New** command button to create a new machine.

9) Set the machine recipe settings such as Conveyor Speed, Zone Temperatures and Temperature units.



The screenshot shows the 'Fresh Start' software interface. On the left is a sidebar with a tree view containing the following items: Select Instrument, Set Machine Information, Set Assembly Information, Select Process, Set Recording Parameters, Verify Instrument Status, Perform Data Run, and Read Data Run. The main area is divided into sections: 'Machine Selection' with a dropdown menu set to 'Sample Oven_Sample_Model_Medium', 'Heating Zones: 7', 'Cooling Zones: 2', and 'Length Units: cm'; 'Recipe Settings' with 'Conveyor Speed: 70.00 cm/min', an 'Enable Nitrogen' checkbox, and buttons for 'Load...', 'Save...', 'Print...', 'Send to machine', and 'Notes...'; and a temperature control section with 'Temp Units: C' and a checkbox for 'Top and Bottom Setpoints are the same'. Below this is a table with 9 columns representing zones and 3 rows representing 'Top Temp', 'Bottom Temp', and 'Length'. The table data is as follows:

	1	2	3	4	5	6	7	8	9
Top Temp	170	180	180	170	180	240	240	102	50
Bottom Temp	102	102	102	102	102	102	102	102	102
Length	32.00	33.00	34.30	33.80	38.10	42.20	33.00	58.40	40.70

At the bottom of the window are buttons for 'Help', '<< Previous', 'Next >>', 'Finish', and 'Cancel'.

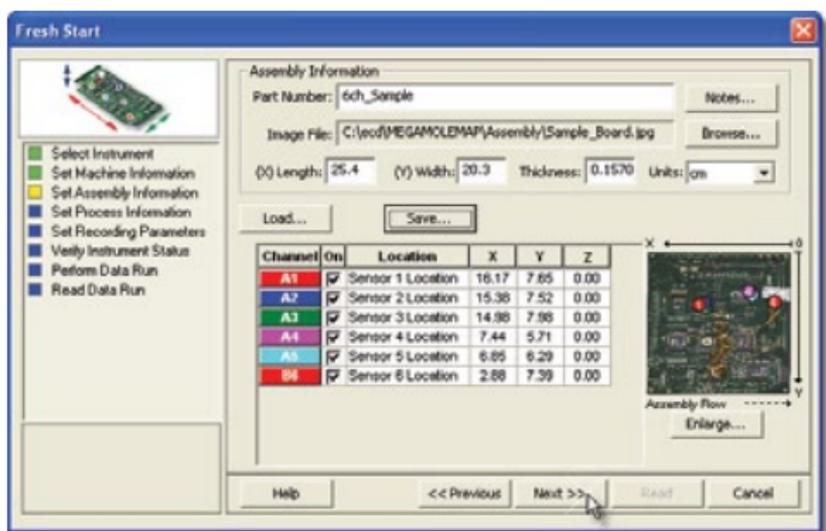


The software includes features to save and load machine recipe setting files (*.OVS) These files are helpful so the user can quickly recall machine information and ensure it is always the same.

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

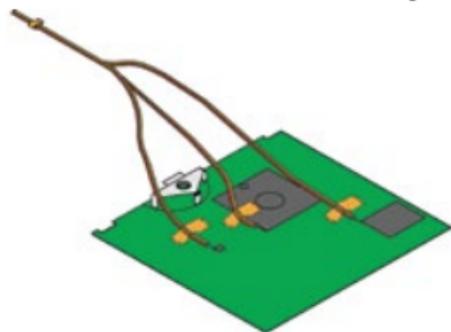
OPERATION - FRESH START

11) Enter the assembly information such as part number, board size, sensor locations and a product image.



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

13) Attach the required thermocouple sensors to a test assembly.



OPERATION - FRESH START



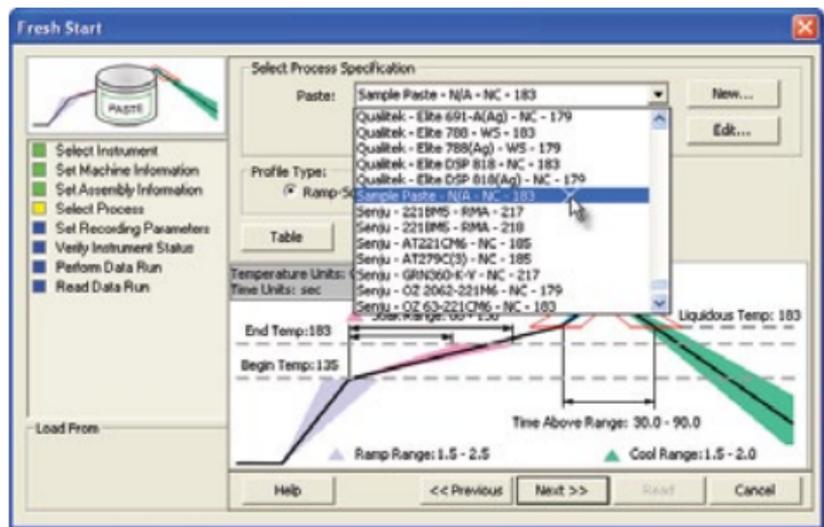
When soldering a thermocouple sensor to a component with high temperature solder, use Kester SN10 (or equivalent) for 183°C eutetic solder or Kester SN5 (or equivalent) for lead free soldering.

Kapton® tape, aluminum tape and Temprobe™ may also be used to hold T/C wire to the test assembly.

14) Unwind the sensor leads and attach the connectors to the M.O.L.E.® Thermal Profiler. Make sure to connect them to the same channel(s) that were configured in the wizard workflow. For example, if configuring the M.O.L.E.® Thermal Profiler to have Channels 1 through 5 active, be sure the sensors are attached to the same five channels.

OPERATION - FRESH START

15) Select your process specification. The user can select a standard or user created **Paste** from the database. Then choose the **Profile Type** (Ramp-Soak-Spike or Ramp-to-Spike). Ramp-Soak-Spike profile types are the only type allowed to be edited. If your Paste does not appear in the database list click the **New** command button to create a new one.

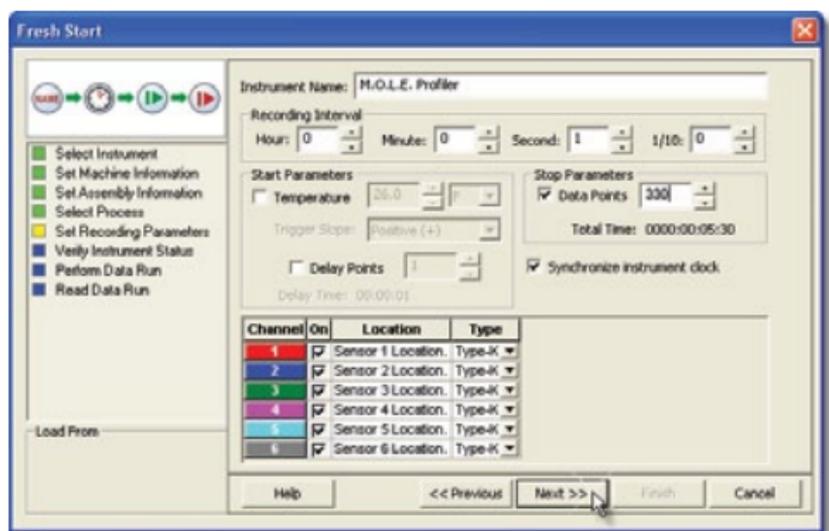


When the user selects a paste from the database, they can use the radio buttons below the drop down box to filter the user created pastes from the master paste specifications.

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

OPERATION - FRESH START

17) 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.



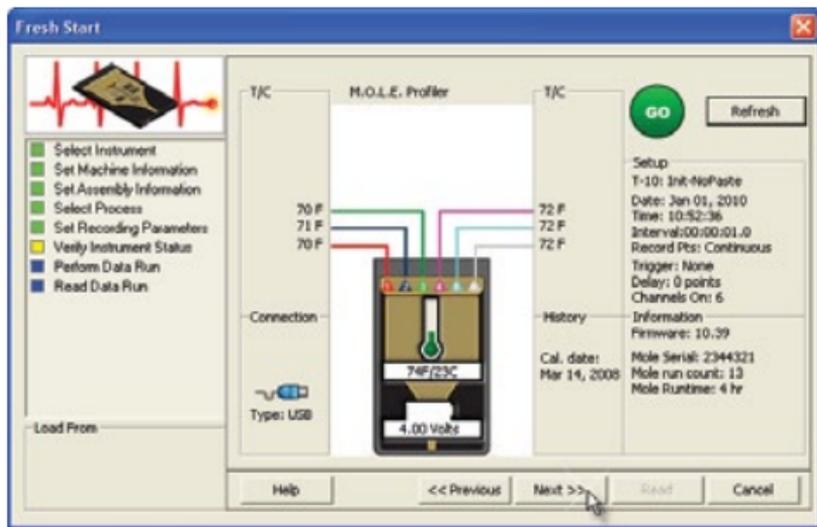
18) Click the **Next** command button.

OPERATION - FRESH START

19) Verify the instrument status. This dialog box displays the health of the M.O.L.E.[®] Thermal Profiler such as battery charge, internal temperature, thermocouple temperatures.



If everything is **OK**, the dialog box displays a **GREEN** sign. If there are any items that may prevent the user from collecting good data, they are highlighted and a **RED** sign is displayed.



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

21) Review the oven settings and click the **Next** command button to continue.

OPERATION - FRESH START

Step 2: Perform Data Run

1) Place the M.O.L.E.[®] Thermal Profiler in the appropriate thermal barrier making sure the Thermocouple and/or Sensor wires are not damaged.



Never permit the M.O.L.E.[®] Thermal Profiler to exceed the absolute maximum warranted internal temperature, as permanent damage may result. The warranty will not cover damage caused by exceeding the maximum specified internal temperature.



2) After the oven stabilizes:

- Place the M.O.L.E.[®] Thermal Profiler in the required thermal barrier as shown.
- Press the **ON/OFF** button.
- Press the **Record** button.

OPERATION FIRESTART



The **Record** button will need to be pressed even if the M.O.L.E.[®] Thermal Profiler is configured to start if the start parameters **Trigger Temperature** or **Points Delay** are configured.

3) Pass the thermally protected M.O.L.E.[®] Thermal Profiler and test assembly through the machine.



It is highly recommended that protective gloves are used when retrieving the thermal barrier from the oven and when opening the thermal barrier.

4) As the test assembly and M.O.L.E.[®] Thermal Profiler emerge from the machine, carry the test assembly with thermocouple sensors attached and the M.O.L.E.[®] Thermal Profiler in the Thermal barrier to a table or flat surface.



If a thermocouple sensor is removed before the M.O.L.E.[®] Thermal Profiler has stopped recording data, the data for that channel will show as OPEN T/C.

OPERATION - FRESH START

5) Open the thermal barrier and if the **Record LED** is still flashing this means the M.O.L.E.[®] Thermal Profiler is still recording and it must be stopped by pressing the **Record** button.



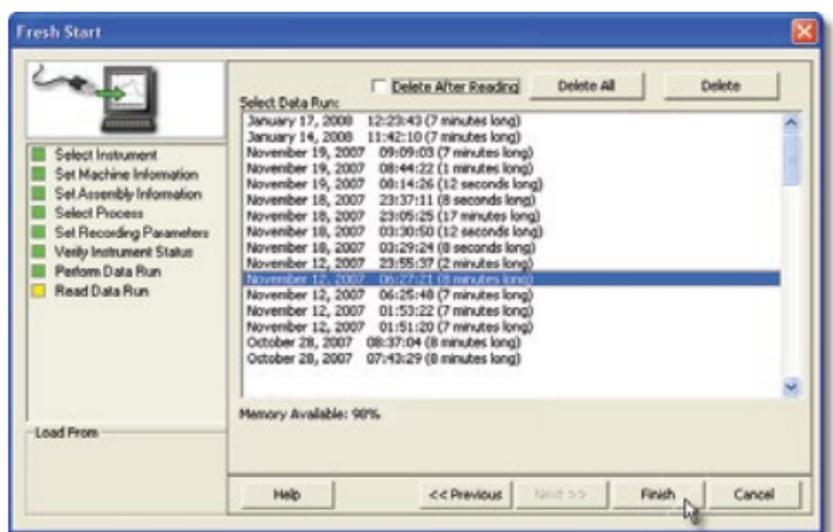
6) Remove the M.O.L.E.[®] Thermal Profiler from the thermal barrier. Handle it carefully, as the case may still be warm.

7) Disconnect the thermocouple sensors from the M.O.L.E.[®] Thermal Profiler.

OPERATION - FRESH START

Step 3: Read Data Run

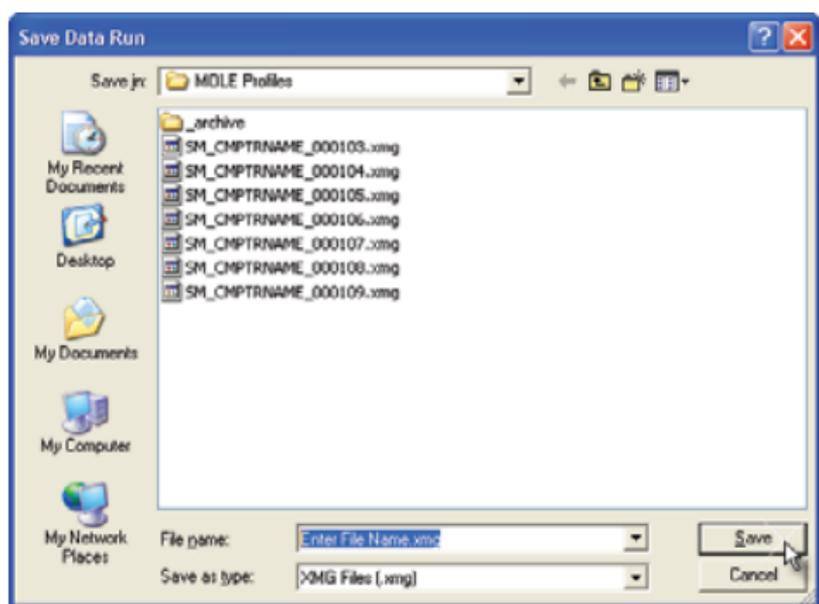
1) Restore the software and click the **Finish** command button to read the data run from the M.O.L.E.[®] Thermal Profiler.



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

OPERATION - FRESH START

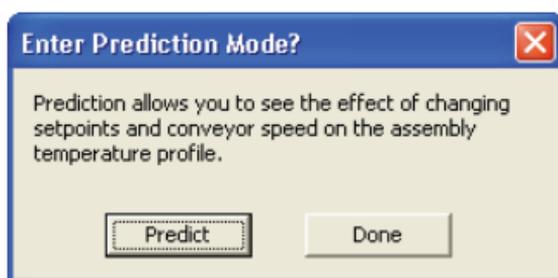
2) When the data run has been downloaded, the software will prompt the user to save the data run file (*.XMG).



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

OPERATION - FRESH START

4) The software then prompts the user if they want to enter Prediction mode. Entering prediction mode enables the user to change a zone temperature values or the conveyor speed and predict the outcome of that change on the data run profile.



5) Click the **Predict** command button to enter Prediction mode or **Done** to complete the workflow wizard.

The information is automatically saved in the data run file (*.XMG) and the experiment data can now be analyzed with the software tools.

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SINCE 1964

 World Headquarters

North & South America, Europe

4287-B SE International Way

Milwaukie, Oregon 97222-8825 U.S.A.

Tel: +(1) 503.659.6100 | +(1) 800.323.4548

Fax: +(1) 503.659.4422

E-Mail: ecd@ecd.com | ecd.europe@ecd.com

Website: www.ECD.com

 Asia

ECD Asia/Pacific

Singapore

Mobile: +(65) 9692.6822

Email: ecd.asia@ecd.com

Website: www.ECD.com

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