

Running a temperature profile

See the *Oven Tracker XL2 User Manual*, and *Insight's Help system*, for full details of these procedures.

1 Charge MemoryPaq battery

See last page.



2 Reset the MemoryPaq

Resetting empties the logger's memory and prepares it to receive fresh data. NB This is not necessary if:

- You previously selected **single-run mode** and wish to use the **same collection parameters**, or
- You previously selected **multiple-run mode** and have performed **nine or fewer runs**.

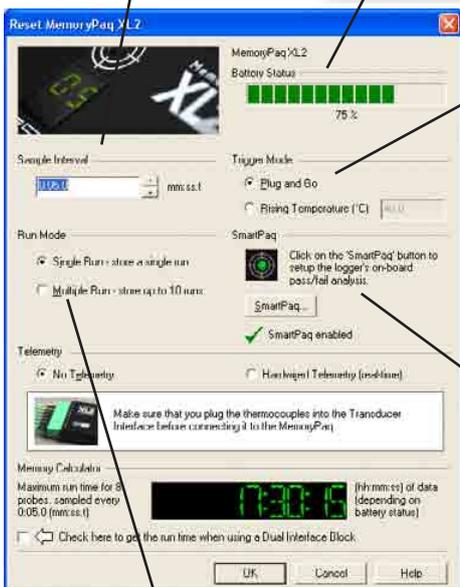


Connect the logger to the PC and **reset the logger with Insight**.

Check **battery status**.



Select **sample interval**.



Set data-recording to start when **Transducer Interface is plugged into MemoryPaq**, or when **temperature rises to a given level**.

SmartPaq gives **instant quality assurance** on removal from the oven. Click to enable and to set pass/fail criteria.

You may download after each profile run (**single-run mode**) or perform up to 10 runs before downloading them all (**multiple-run**).

3 Assemble the system

- **Connect all thermocouples** to the Transducer Interface.

- **Plug Transducer Interface into the MemoryPaq**, and check the status LEDs (see last page).



WARNING
All thermocouples **must** be plugged into the Transducer Interface **before** the Transducer Interface is attached to the MemoryPaq.

- Place logger into heatsink in the **thermal barrier**.



- Fit the **barrier lid** and secure its catches with the locking pins, if fitted.

4 Collect data

- **Attach probes** to the product or test-piece.

- **Send the system through the oven** and collect at exit.

WARNING
Wear heat-resistant gloves.

- **Remove logger from the barrier** and leave to cool.
- **Disconnect** the Transducer Interface and MemoryPaq, and check **SmartPaq LED** for pass/fail.

If using **multiple-run mode**, repeat steps **3** and **4** to perform a maximum of 10 runs.

5 Download data

- Attach logger to the PC and select **download**.



- If using a **process file**, select one when prompted.
- **Save** the data and **print** a report.



Key functions of Insight Oven Tracker

Oven zone markers

Memos Add comments: select Edit > Memos.

Tolerance curve Provides an envelope of acceptability against which to compare the temperature profile (see Help).

Oven bar and mimics Display a distance axis and summary of the oven's features: select View > Graph Options.

Analysis Window Analysis modes selected by tabs (see opposite). Data in red cells is out of tolerance.

Paqfile tabs Open multiple profiles, and switch between them.

Probe toolbar Click probes to remove them from the display and from the analysis.

Alarms A 'fail' indicates out-of-tolerance analysis data (see opposite) or problems during the run.

Mouse-operated zooming Drag out an area to zoom into. The data grid and analysis then apply to that section of the data alone.

Movable splitter bar Choose how much of the screen to devote to the graph or to the data.

Probe Window Display a picture of your product, showing probe positions: select Process > Process Details.

See Insight's **Help system** for full details of these and many other functions.

Profile	Maximum (°C)	Min. Reached (minutes:00)	Mean (°C)	Deviation From 0.0°C	Standard deviation	Minimum (°C)	Min. Reached (minutes:00)
#1 (°C)	152.0	15:53:00	115.1	+182.0	54.0	18.0	22.5
#2 (°C)	152.0	15:58:00	114.2	+182.0	56.0	20.5	22.5
#3 (°C)	152.0	15:57:00	113.2	-182.0	58.0	20.4	22.5

Reset the logger
Before a profile run, set the data-collection parameters: **sample interval**, multiple- or single-run mode, telemetry, trigger mode and SmartPaq operation.

Download data
After a profile run, transfer collected temperature data from the run to the PC.

Wizards
Select a wizard to guide you, step by step, through various operations.

- Open a **Paqfile**.
- Setup a new **process**, or a new oven, product or recipe.
- Create a new **tolerance curve** to compare with your data.
- **Reset** the logger.
- **Download** data.
- Use **Statistical Process Control** to identify trends in your profile results.
- Setup **Datapaq Value** analysis (see opposite).

Statistical Process Control
Identify trends in your analysis results over time.

Save the results
For future use, save the results of your profile run as a **paqfile**.

Email the results
Send the profile results as an email. In case the email recipient does not have Insight, the email contains a link to download free **Paqfile Viewer** software with which to view the temperature profile.

Print report
Print a comprehensive report of the data and its analysis. To customize the report, select File > Print Options.

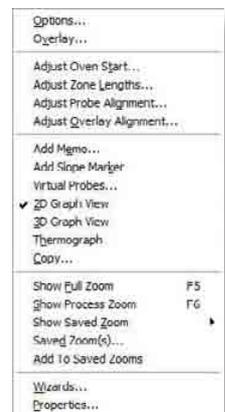
Mouse right-click
Right-click on the graph to show a menu of commonly used options, including:

Overlay Overlay different temperature profiles and/or tolerance curves on the same graph for direct comparison.

Adjust Oven Start Reposition the markers for oven start and process end in a paqfile.

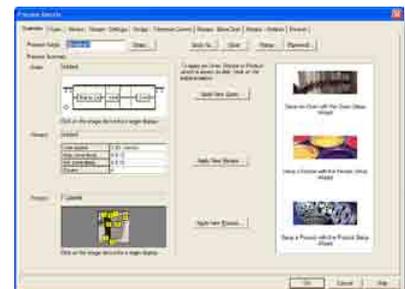
Copy Exports a paqfile's data to the Windows clipboard – as text or as spreadsheet data.

Zoom Zoom into different parts of the temperature profile.



Process files*

Create template files that specify the details of your process. Apply them to your data to permit rapid interpretation and analysis.



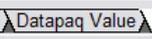
Help
In any dialog, press the **Help button** for information specific to the operation you are performing.

* Feature available in Oven Tracker Professional only.

The analysis options

See Insight's **Help system** for full details of using the analysis modes.

Datapaq Value

 Insight compares the coating manufacturer's recommended curing time/temperature with the actual time/temperature values experienced by the product and generates an **index of cure** which indicates the degree of compliance.

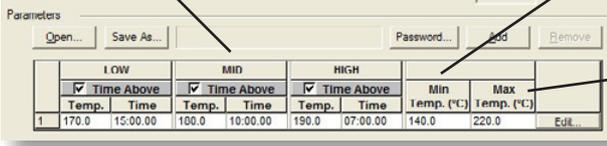
- Input cure-schedule information from your coating supplier: click the Options button , or use the Wizard .

Assess the Datapaq Value obtained during a profile run:

- Generally, **near 100** indicates **cure OK**
- Significantly **less than 100** indicates **under-cure**
- Significantly **greater than 100** indicates **over-cure**

From quality-assurance tests, find the range of Datapaq Values (e.g. 80–140) which gives you acceptable coating cure-quality. Datapaq Value then becomes

Three coating cure schedules (low, mid and high Time at Temperature settings).



	LOW		MID		HIGH		Min	Max	
	Temp.	Time	Temp.	Time	Temp.	Time	Temp. (°C)	Temp. (°C)	Edit...
1	170.0	15:00:00	190.0	10:00:00	190.0	07:00:00	140.0	220.0	

Temperature at which curing (cross-linking) starts.

Temperature above which coating damage is possible.

a rapid means of ensuring that the process is in control.

The **Datapaq Value Data*** tab shows the Datapaq Value for every data point in the profile run, in both in numerical and graphical form.

 For each analysis mode, click on the **Options button** in the Analysis Window to **select parameters** for that analysis.

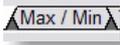
 Click button to **edit the probes' names**.

Bakechart*

 A **graphical alternative to Datapaq Value**, comparing the cure results with an envelope of acceptable time/temperature values.

The **BakeChart Data tab** shows the data as a table.

Maximum/Minimum

 Analyse the **maximum and minimum temperatures** achieved by each probe.

Time at Temperature

 Calculate the time at which a specified temperature is reached, and the time for which the product was at, or above, that temperature.

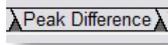
Ramp Up*

 Calculates the **profile slope over a given time range**, and gives the **time taken** to reach a given cure temperature.

Rise/Fall and Slopes*

 Calculates and analyses the **rates of heating and cooling** for each probe.

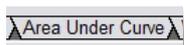
Peak Difference

 Data for the **two probes which recorded temperatures with the biggest difference** at any single point in the profile.

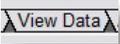
Temperature Difference Data*

 Display the **difference in temperature between any two probes** throughout the temperature profile.

Area Under Curve

 Calculates the area which lies **below the temperature profile curve** but above a threshold temperature.

View Data

 Display the **raw temperature data for any point** in the profile.

- Click on the probe-trace of interest.
- Drag the vertical bar to the appropriate position and read time and temperature information.

Alarms

 See when and why an **alarm condition** is triggered, caused by out-of-tolerance analysis results or by (e.g.) logger going over temperature, low battery or invalid measurements.

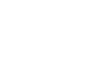
* Feature available in Oven Tracker Professional only.

XL2 status displays

Alphanumeric display

Display	Meaning
 Number (e.g. 0.5, 50)	Sample interval (in seconds). Sample intervals up to 9.9 s are shown to one decimal place.
	Sample interval too long to fit on display.
	One Transducer Interface connected (displayed briefly on connection).
	Two Transducer Interfaces connected (displayed briefly on connecting to Dual Interface Block).
 Flashing	Memory full, or contains data from 10 runs. Data must be downloaded before logging can resume.

Display	Meaning
 Flashing alternately	Logger communicating with PC.
 Snaking lights	SmartPaq calculation in progress.
	Internal error: perform a hardware reset to reboot logger with default parameters (see <i>User Manual</i>). Contact Datapaq if problem persists.

Display	Meaning
	Error – Logger is hotter than 45°C (see <i>User Manual</i>).
	Error – At least one probe is hotter than trigger temperature; thus data-recording cannot be triggered by rising temperature.
	Error – All thermocouples are open circuit, or no thermocouples connected.
	Error – MemoryPaq and Transducer Interface not communicating properly when connected together. Connect them again.
	Error – Disconnect and re-connect communications lead.

Alphanumeric display
(see above)



SmartPaq LED

If SmartPaq parameters have been setup for a pass/fail analysis on removal from the oven (see p. 1), the LED shows **green** for pass, **red** for fail.

Battery status LED

When flashing **yellow** once per second, battery is at 20% or less of maximum charge. Battery must be recharged.

Logger status LEDs

Red	Green	Meaning
Flashes 5 times (once per second), then stops	Off	Communications lead has established connection between logger and powered-up PC, or Logger has been reset with default reset parameters (see <i>User Manual</i>).
Flashing together with green LED (once per second)	Flashing together with red LED (once per second)	Awaiting connection to Transducer Interface after being reset.
Flashing, alternating with green LED, at sample interval *	Flashing, alternating with red LED, at sample interval *	Logger awaiting trigger (i.e. after Transducer Interface has been connected, if temperature trigger has been set).
Off	Flashing at sample interval *	Logger acquiring data.
Flashing every 5 seconds	Off	Logger has data in memory which has not been downloaded.
Double flash together with green LED (every 5 seconds)	Double flash together with red LED (every 5 seconds)	In multiple run mode, MemoryPaq is awaiting connection to the Transducer Interface to start the next run.

* Flashing interval will actually fall in range 0.5–5 s.

To conserve battery, the logger will **power-off** temporarily (LEDs will stop operating) if it is inactive for 5 minutes.

Battery charging

1. Plug the charger into the electricity supply.
2. Connect the charger lead to the charging socket on the MemoryPaq.



Battery charging LED (next to charging socket) shows **red** when charging is in progress, **green** when charging is complete. A full charge is delivered within 2 hours.

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