

## Patch notes of labCONSOL v1.2

The premise of labCONSOL v1.2 was to implement two key pieces of functionality; Calibration Tools and Pause Terminations.

### Calibration Tools

Having all the right software tools at your fingertips is necessary to run your H.E.L systems effectively. This first iteration of the Calibration Tools allows users to define operational parameters of their system and perform some calibrations. This is accessed via the new App “Calibration Tools.” This App is available for all H.E.L systems.



Calibration Tools: Click to open, or drag in to place

This App display’s all the properties within a system that an end-user can edit. It can be sized and located like any other labCONSOL App. To ensure our parallel system users don’t have to repeat the same process multiple times, we allow changing these operating parameters on multiple systems simultaneously.

Edit Properties

	Kp	Ti	Td	MaxOut	MinOut
<input type="checkbox"/> All					
Reactor1	6	200	20	100	0
Reactor2	6	200	20	100	0
Reactor3	6	200	20	100	0
Reactor4	6	200	20	100	0

DISCARD CHANGES SAVE CALIBRATION

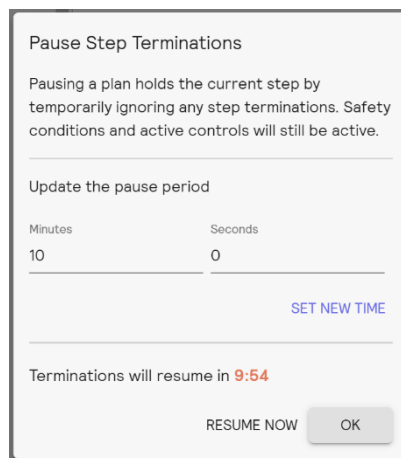
This is just the beginning for calibration tools! Even more valuable tools will be implemented with future releases.

More details on this functionality control is covered in the labCONSOL v1.2 manual.

## Pause Terminations

The end-user might need to make physical changes to equipment mid-test on some of H.E.L's process safety equipment, such as the Phi-TEC II. An example of this is injecting a liquid into the test cell. This could cause a software step in a plan to terminate prematurely, possibly ruining an experiment.

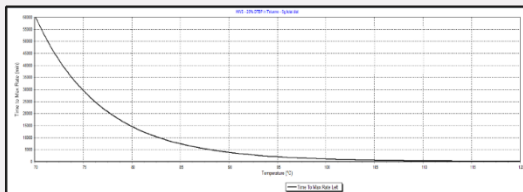
Pause Terminations allows the end-user to tell labCONSOL to ignore the termination conditions for a certain period of time. The default is ten minutes, but this can be adjusted by the end-user. The termination conditions will then re-start after the time has passed, or the end-user manually resumes the termination conditions. This means our Phi-TEC I and Phi-TEC II systems are now fully supported by labCONSOL.



## Updated TMR and MTSR Calculations in iQ

T (C)	dT/dt (C/min)	Days	Hours	Minutes
60.0	0.000	197	0	0.0
70.0	0.000	42	17	0.0
80.0	0.000	10	7	0.0
90.0	0.001	2	17	0.0
100.0	0.003	0	19	56.4
110.0	0.011	0	5	57.9
120.0	0.032	0	2	0.9
130.7	0.063	0	1	0.0
140.0	0.096	0	0	42.6
150.0	0.137	0	0	28.9
160.0	0.211	0	0	14.7
180.0	0.442	0	0	4.1
190.0	0.723	0	0	0.3

Image 1 - The TMR at various temperatures for 20% DTBP in Toluene



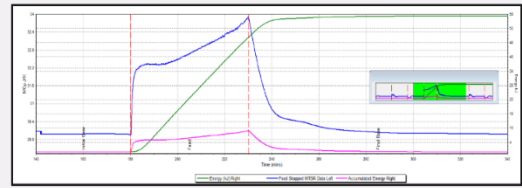
Graph 1 - TMR plot for 20% DTBP in Toluene

The TMR<sub>24</sub> of a chemical that undergoes thermal decomposition is a critical parameter for process safety engineers. It is a vital indicator of a process's criticality and can be evaluated with the Phi-TEC I or Phi-TEC II.

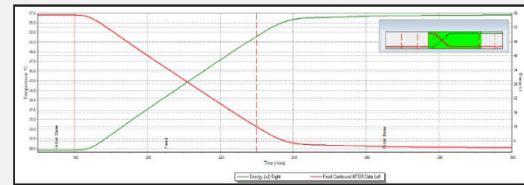
However, TMR<sub>24</sub> is not the only time nor temperature that a process safety engineer would be interested in. As well as always providing TMR<sub>24</sub>, TMR<sub>8</sub>, and TMR<sub>1</sub>, the iQ software will allow users to define their own time or temperatures of interest.

Visualizing these results is also essential. The graph displaying these results has been modified, and now shows the complete profile from the TMR calculations.

Reactant accumulation in industrial processes can be a hazard that needs to be identified, mitigated and monitored. Various operational conditions will change the amount of accumulation within any process. The Similar can help measure these hazards. The ideal scenario is to achieve a dose-controlled process when the reaction stops when the feed is stopped. A process safety chemical engineer will need to know the level of accumulation at any point in a reaction should the cooling fail. There will then be two situations, one where the feed continues and one where the feed stops.



Graph 2 -  $T_{max}$  values and energy accumulated if cooling failed and feed stopped



Graph 3 -  $T_{max}$  values for if cooling failed and feed continued

This is the purpose of Semi-Batch MTSR calculations. By knowing experimental parameters and the total energy of reaction, the iQ Software can now calculate the adiabatic temperature rise ( $\Delta T_{ad}$ ) at any point of the process, should the cooling fail. This is described as the  $T_{max}$  value. The software will plot these possible temperature increases if the feed continued and if the feed stopped.

## More minor improvements and bug fixes

- Multiple files can now be removed from the Datable Manager at once via selecting and holding “Ctrl.”
- Configurable plans now open their modal when loading the plan into the System Viewer.
- Fixed a bug with incorrect timestamps being applied to datapoints when using a high save rate.
- Automatically directed to select a parameter when adding a warning condition or shutdown state.
- Automatically update xml files when exiting EnduEdit, with success/fail message.

## Future developments

V1.3 development work has already begun. The main deliverables will be linear calibration tools, and some form of Mimic App to graphically represent the system. Smaller improvements are continuously being made to ensure the operator has the highest quality user experience.