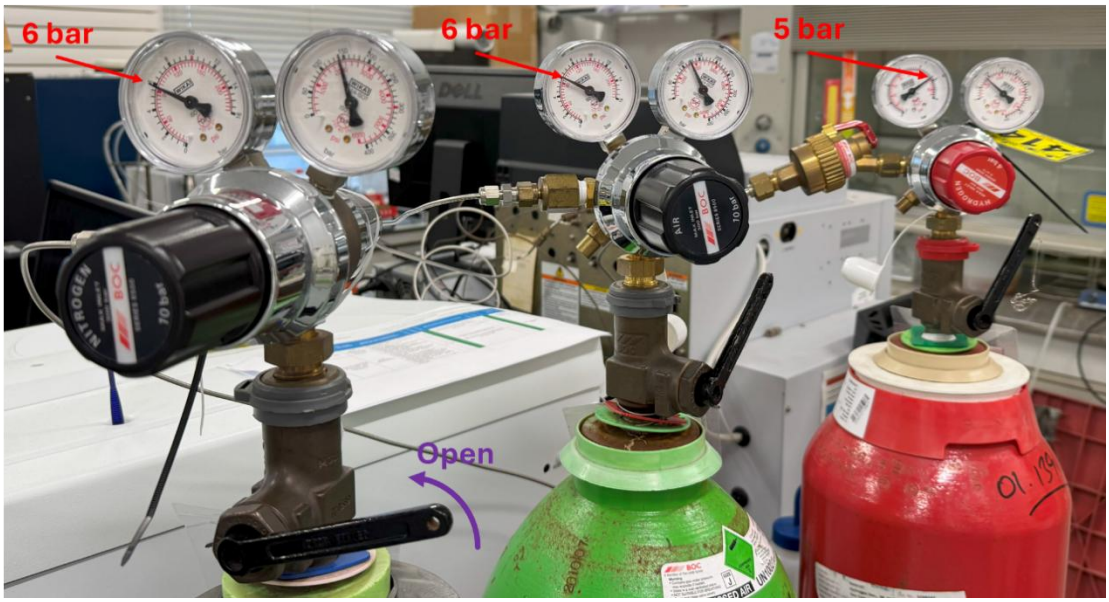
Clarus 590 GC – Standard Operating Procedure (01.003)

NOTE: Before reading this you MUST read the 'SOP - Energy and environmental impacts under normal, abnormal and emergency conditions' which is Mills group web site, https://www.profandrewmills.com/leaf-documents/. This addresses general energy and environmental impacts under normal, abnormal and emergency conditions considerations which you NEED to be cognisant of before conducting any experiment. If you identify anything in an SOP which can be improved, please contact the LO and PI to discuss the proposed change(s) before putting them into effect.

1. Before switching on the GC, open all three gas cylinders connected to the GC using the cylinder keys attached. The gauges will quickly move showing an applied pressure of ca. 6 bar for both nitrogen and air. The hydrogen regulator should read ca. 5 bar.

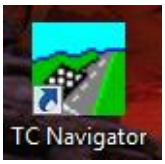


2. Switch on the PC and login on the 'Administrator' account (there should be no password).

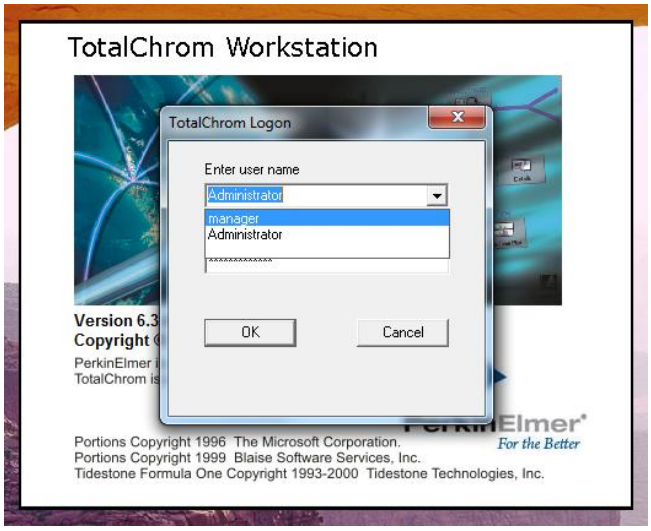
3. Switch on the GC using the switch at the bottom right hand side of the instrument.

4. Use the blue stylus to select 'Log In' on the GC's touchscreen display.

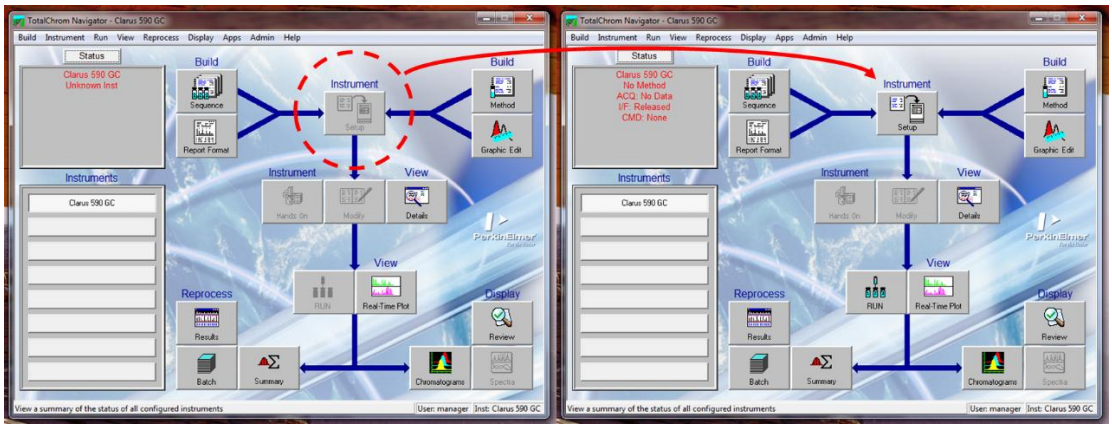
5. On the PC, double-click to open the 'TC Navigator' software.



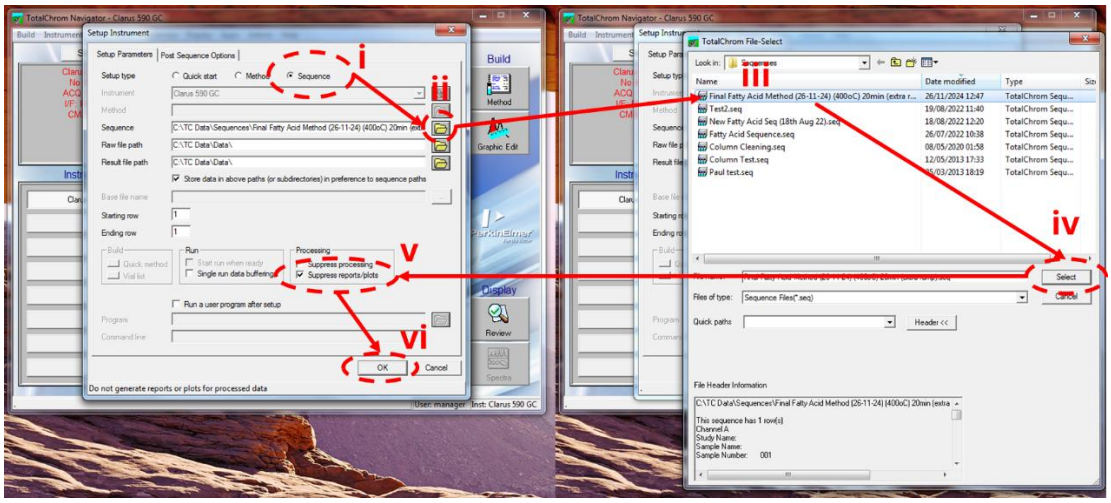
6. From the dropdown menu, select 'manager', and then type the password 'manager' (all lower case).



7. The TotalChrom Navigator window will now appear. Note: if the ‘Instrument’ button is greyed out, close the software and then log back in.



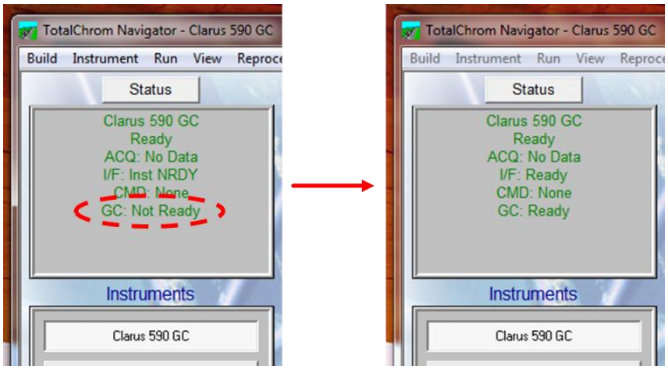
8. Click on the ‘Instrument’ button to bring up the following ‘Setup Instrument’ window. **(i)** Ensure that ‘Sequence’ is selected and then **(ii)** click on the folder button shown to choose the sequence file. **(iii)** Click to highlight the appropriate file and then **(iv)** click ‘Select’ to bring you back to the previous window. **(v)** Ensure that ‘Suppress reports/plots’ is checked and then **(vi)** click ‘OK’. **Note**: if unchecked the GC will try to connect to a printer, which will result in error messages after a sample is run.



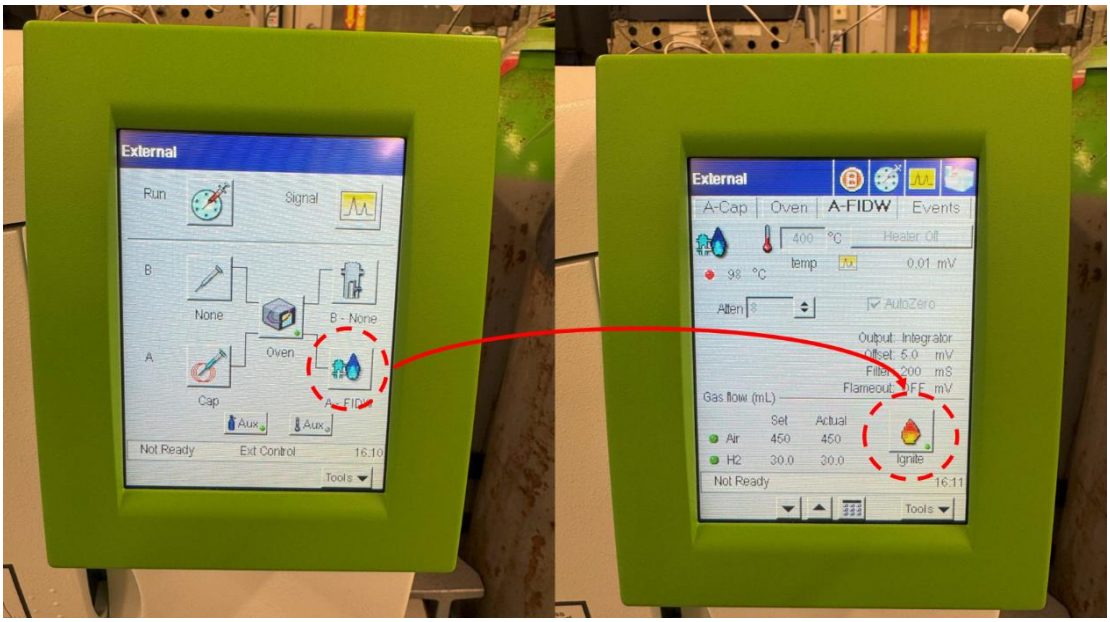
9. If a new method/sequence is required, either consult a PDRA or refer to the .pdf located on the desktop ‘GC (Method Change).pdf’.

10. The top left corner of the TotalChrom Navigator window will now display ‘Seizing’ as the software takes control of the instrument. The text will change green when successfully connected.

11. The heaters will now initiate in the GC, warming up the injector, the oven, and the detector. The top left of the TotalChrom Navigator window will display 'Not Ready' until all programed temperatures have been reached. This can take 10 – 15 min.

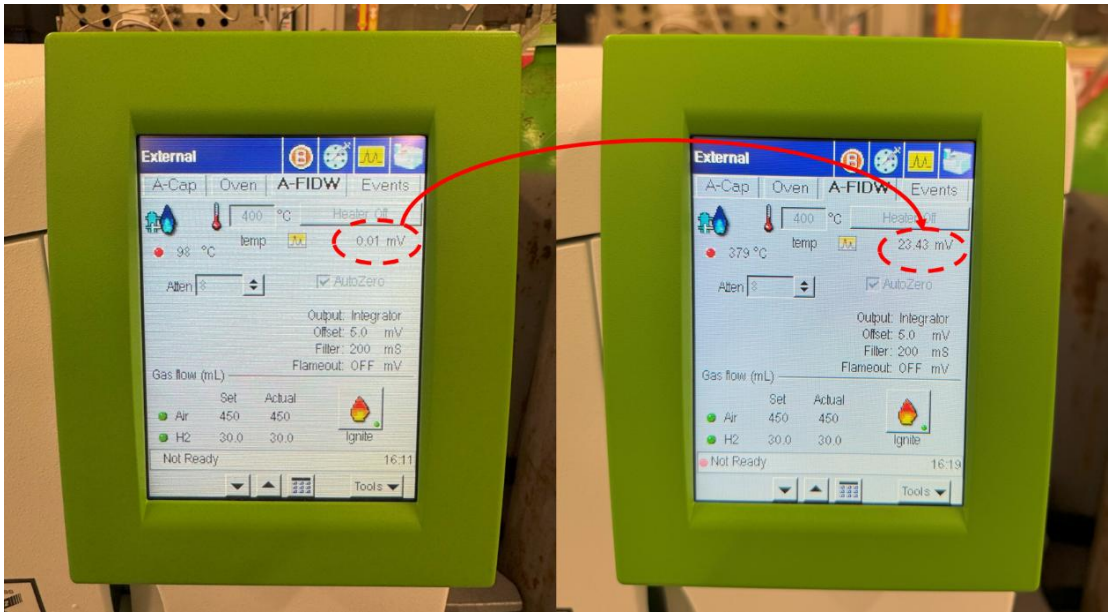


12. The flame of the FID detector has to be ignited manually. Using the touchscreen on the GC instrument, click on 'A – FIDW', and on the following screen, click on the 'Ignite' button. You should then hear a click/pop sound.



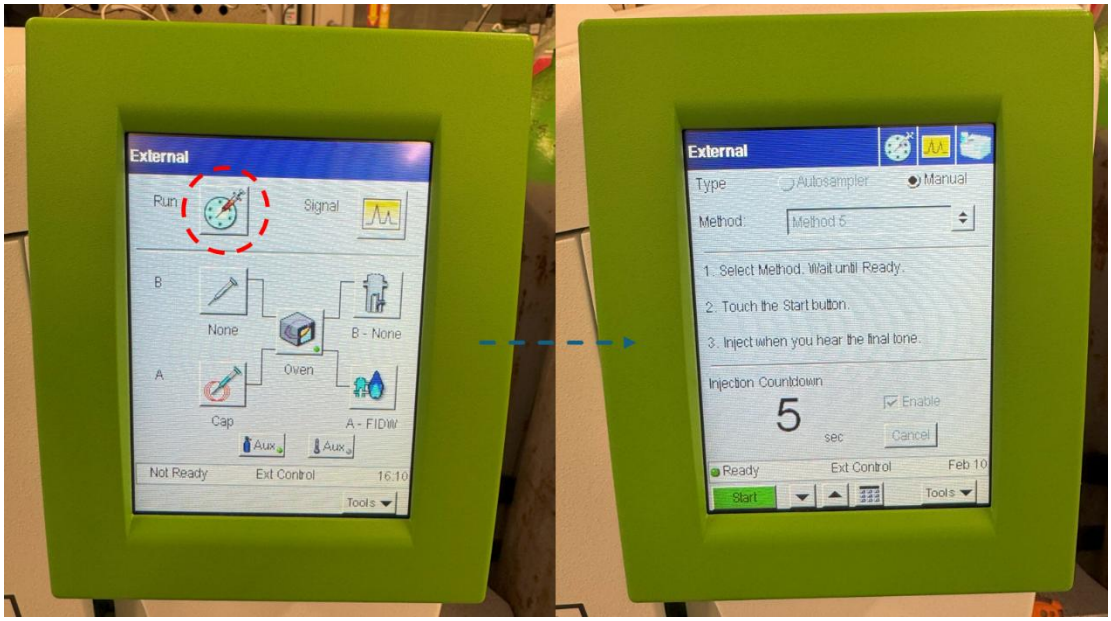
13. Check that the flame is definitely lit. The signal should increase from ca. 0.01 mV to > 20 mV. If the signal immediately drops back down to ca. 0.01 mV, after a few seconds, click

'Ignite' again. The signal should increase significantly and then start to slowly level off to ca. 0.5 mV.



14. When the signal has reached ca. 0.5 mV, return to the home screen by clicking the instrument icon on the top right of the screen. The instrument is now ready to run a sample.

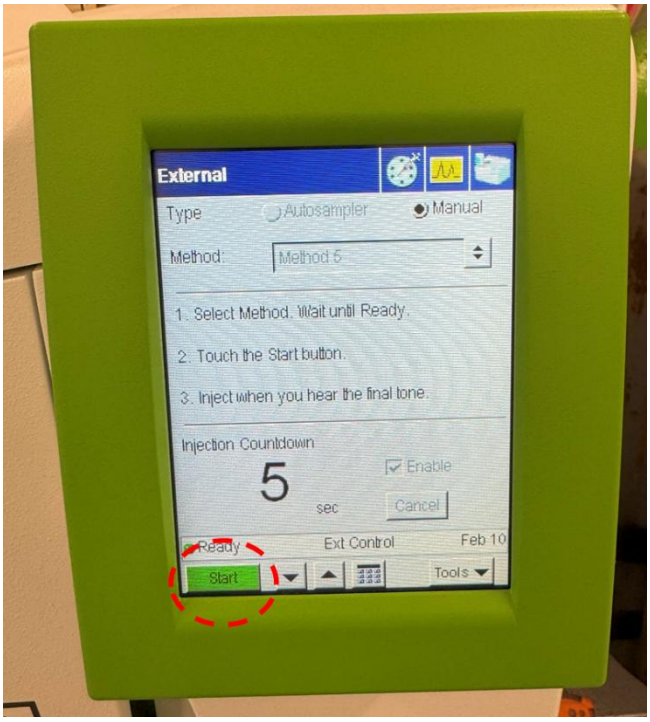
15. Using the GC touchscreen, click 'Run'.



16. Using the Hamilton 10 µL gastight syringe, draw up 10 µL of your sample. Empty this to a waste bottle and repeat 2 – 3 times to ensure the syringe has been thoroughly cleaned. **NOTE**: The plunger is very delicate, therefore, care should be taken not to apply too much force as this will result in the plunger bending. Draw up the final 10 µL of sample.

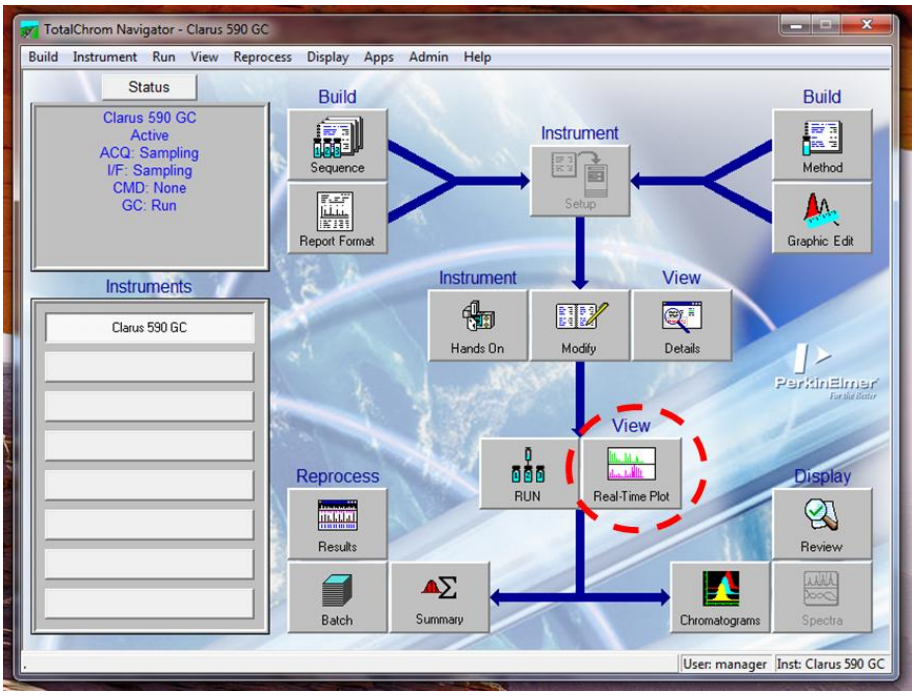
17. Carefully insert the needle into the injection port whilst using your index finger to apply slight pressure to the plunger. This stops the plunger from shooting into the air due to the fact that the needle is now inserted into a port held at ca. 230°C.

18. Whilst still supporting the syringe, click on ‘Start’ at the bottom left of the touchscreen. This will start a 5 second timer. The final beep of the countdown will be longer, this is when the sample should be injected. Once injected, the syringe can be removed immediately.

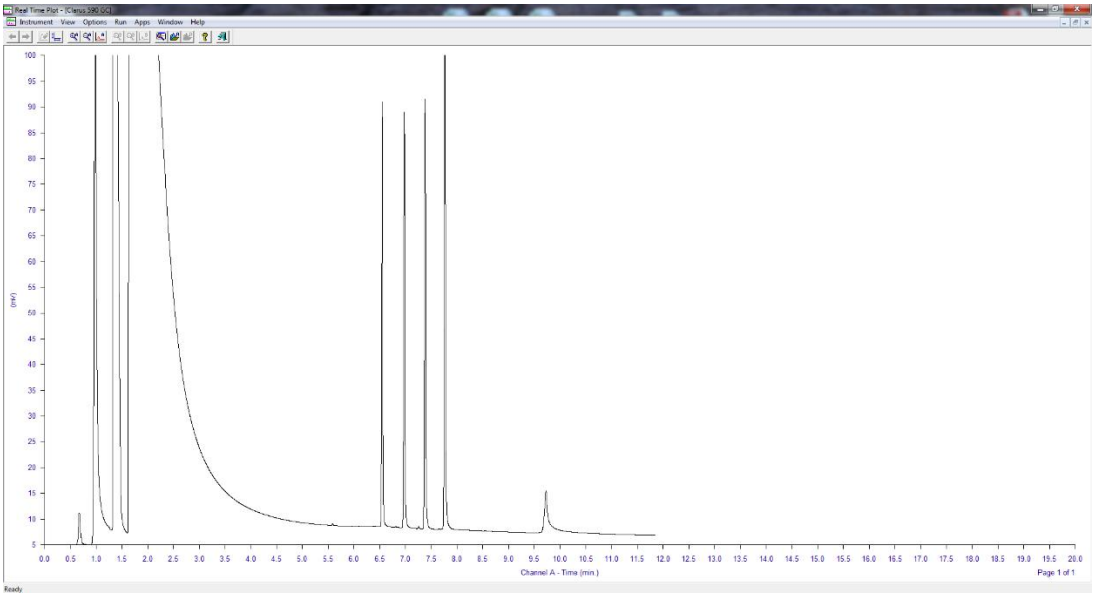


19. The display can be returned to the home screen by clicking the instrument icon in the top right corner.

20. You can view the data on the PC by clicking the ‘Real-Time Plot’ button in the TotalChrom Navigator.

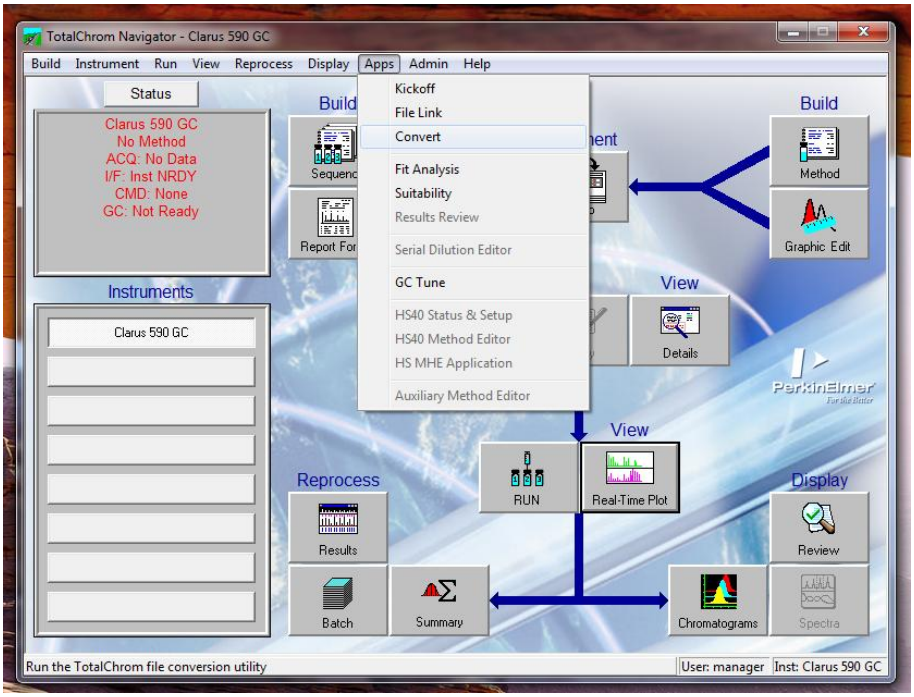


21. The following window will pop up and you will see your peaks start to appear.

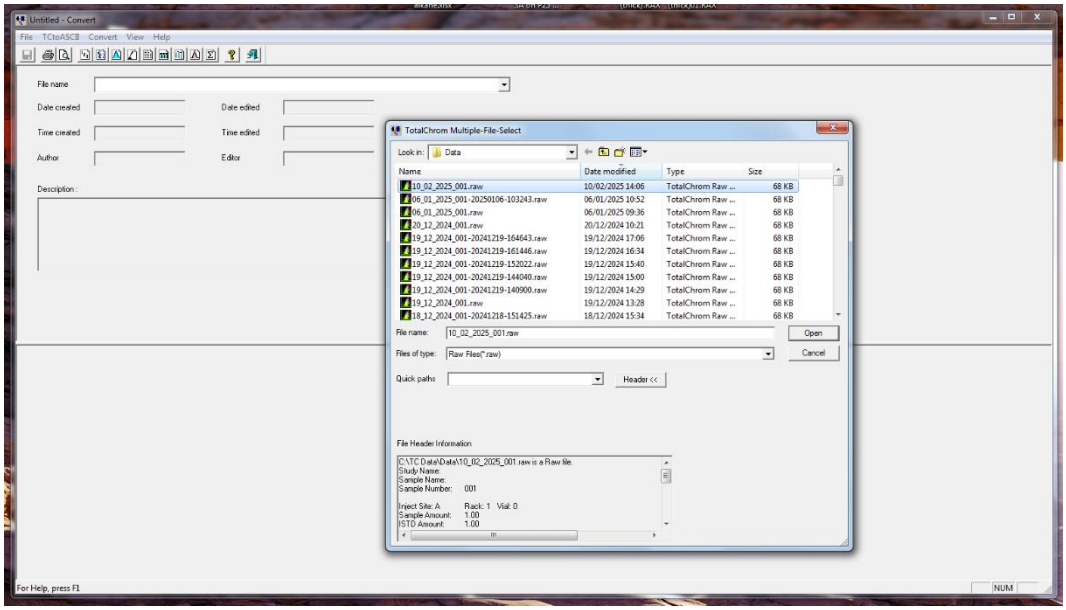


22. After the run is complete, the above window will go blank and display the text 'I/F Status: No Method'. The window can be closed down. The data is automatically saved.

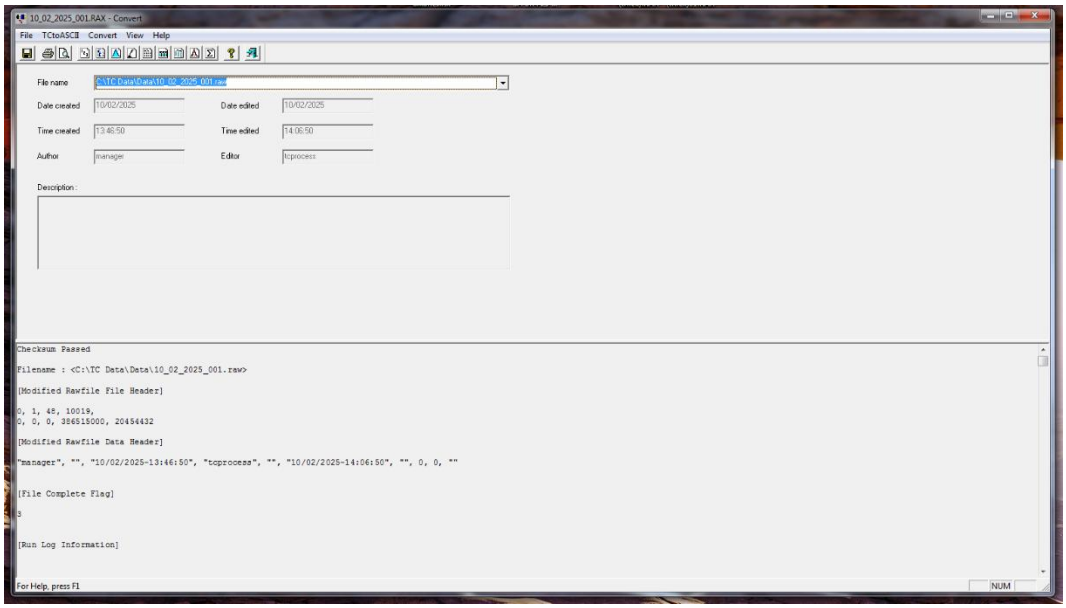
23. The data now has to be converted in order to open in Excel. In the TotalChrom Navigator, select 'Apps', and click on 'Convert'.



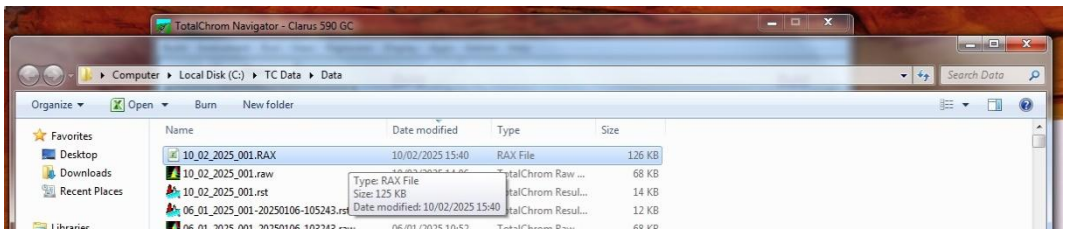
24. The last run should be at the top of the list. If not, use the 'Date modified' tab to sort the list. Click on the file and then click 'Open'.



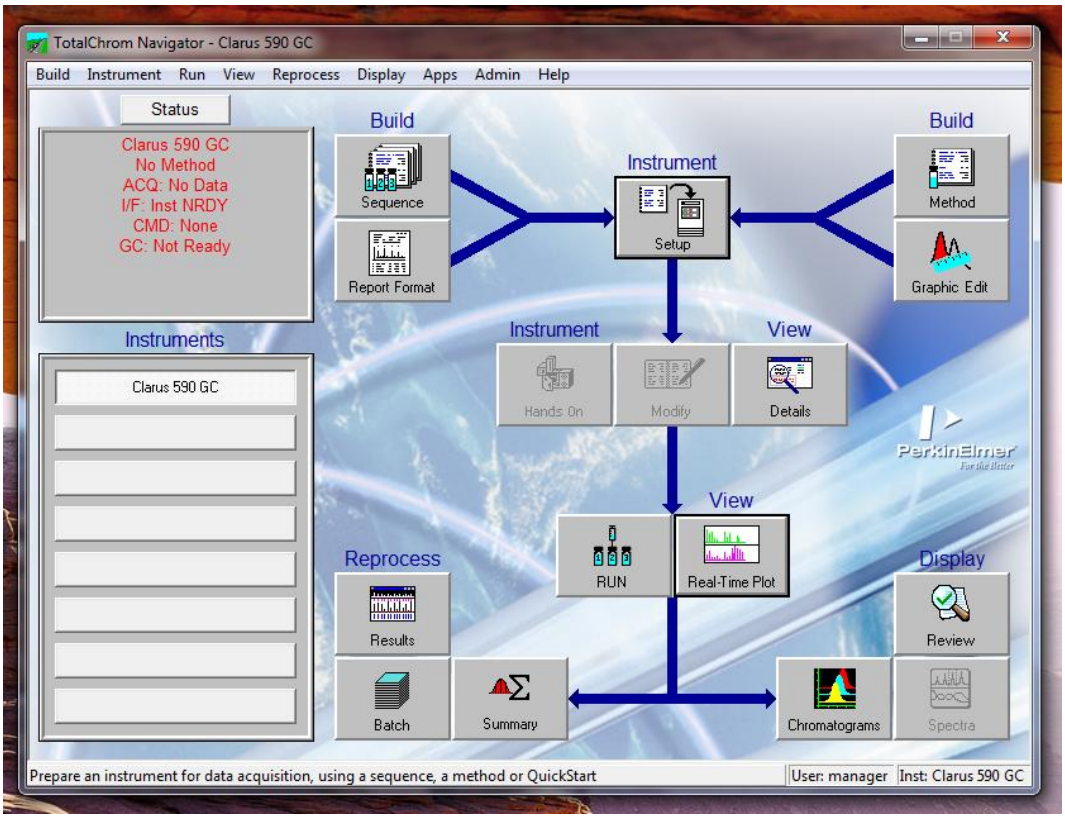
25. A screen similar to the one below will be displayed. This can be closed down as the conversion has been successful.



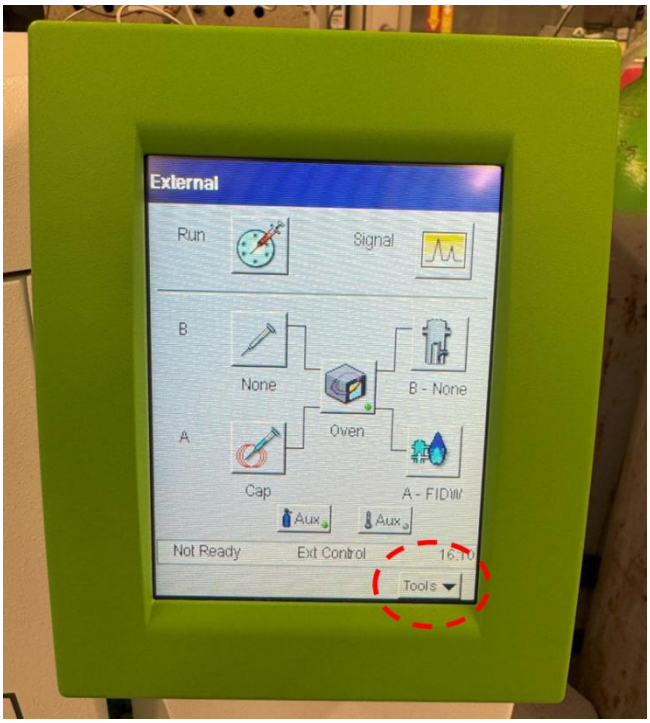
26. To find the data, double click on the shortcut on the desktop named ‘GC Data’. Again, the converted file should be at the top of the list. The file is in the form .RAX, however, this can be opened without any issues in Excel.



27. The status box in the TotalChrom Navigator will read ‘Not Ready’. If you wish to run another injection, you will have to load the sequence again, see step 8, and repeat all the following steps.



28. If you wish to switch off the instrument, you will have to release control from the PC. This is done using the touchscreen on the GC. Click on ‘Tools’ and choose ‘Release’. Confirm this by clicking ‘Yes’ on the next screen.



29. All the heating elements have to be switched off first to allow the instrument to cool down before switching off. On the GC touchscreen, first **(i)** select the 'Cap' button, **(ii)** click 'Heater Off', and then **(iii)** click the 'Oven' tab. **(iv)** Uncheck the box to switch the oven off, and then **(v)** click on the 'A-FIDW' tab. **(vi)** Switch of the heater for the detector. The broken black ellipse shows where the current temperature is displayed.

30. The GC should never be switched off if the temperature is still above ca. 80°C. This can cause damage to the FID detector. Once the temperature has dropped below 80°C, the GC can be switched off using the power switch at the bottom right of the instrument.

31. The gases should all be switched off last by turning the keys clockwise.