LECO (TruSpec CN) - Quick Reference Guide

Logging On (if necessary)

Coming soon

Items to check prior to beginning analysis

Gases
Compressed Air should read 40psi.
Helium and Oxygen should read 35psi on the left gauge. If the pressure on the Oxygen or Helium tanks is less than 300-400 psi (gauge closest to the tank), check with Dan or Colin. If you run out of oxygen, the LECO will simply stop running samples. If you run out of helium, you can cause expensive damage to the TCD element.

Counters
To access the counter window, select **Configuration** from the menu bar, then click on **Counters...** The *Warn* column indicates the maximum number of samples that should be run before that item needs replacement or maintenance. The *Count* column will increase by 1 each time you run a blank and/or standard and sample. Make sure that the Count column will not exceed the Warn value during your run. (*Note: This is especially important for the crucible, as overfilling the crucible can result in expensive damage to the machine and considerable downtime*.) For **plant** material the **Warn** value should read **200**, for **soil** material the **Warn** value should read **65**, (change the Warn values if necessary; *Do not change the values in the Count column*). Please check with Dan or Colin, if you are unsure whether or not to replace the crucible before running your samples.

Resetting the Counters (if necessary)
After changing the crucible or performing other maintenance please reset the Count to 0. To access this window, select **Maintenance**, then click **Login…** Select the item that maintenance has been performed on, click **OK**. Click *Yes* if maintenance was performed; click *No* if maintenance was not performed. Return to the Counter window to ensure that the proper item was reset.

Furnace Temp - should be close to **950 °C** (bottom of spreadsheet screen)

Check to see if a crucible is in the furnace (same procedure used to replace crucible)
(Note: failure to ensure a crucible is in place can result in costly repairs that may be charged to your account)

1. Carefully lift off sampler carousel and gently set aside
2. Loosen the 3 main screws on the loading head – *very carefully* remove the loading head and set on it's side on top of the machine

3. Screw the lance extractor tool into the lance tube, carefully remove the tube and place in the tray next to the machine
4. Replace crucible with tongs if necessary – don't forget to reset counter if you replace the crucible
5. Replace the lance tube, use your finger wipe any grit from the O-ring
6. Replace the loading head by *very carefully* lining up the connecting pins and stems – NOTE: if seated properly you will hear the compressed gas, this is normal and will stop once the loading head is tightened
7. Carefully push down on the loading head; tighten the bottom right-hand screw first, by turning until you feel resistance, move onto the other 2 screws and stop when you feel resistance – then turn each screw roughly ¼ turn, alternating among the screws until they are all tight

Balance
Turn on if necessary; use the 42g/205g button to switch display to 0.0000 g if necessary.

Leak Checks
Before running any samples it's in your best interest to check for leaks. Select **Diagnostics** from the main menu, then click **Leak Check**. Select **Whole O2**, click *Start*, wait until *Passed* or *Failed* appears in the Results column. Select the **Whole He** button, click Start, wait until *Passed* or *Failed* appears in the Results column. Please note: the software considers any leak smaller than 5 mm Hg to have passed. This is not correct: any leak greater than 2 mm Hg is failing. If either of the leak checks fails, contact Dan or Colin.

Calibration

Running the initial Blanks
First, make sure the next available (i.e. empty) cell on the spreadsheet has been selected. Select **Samples** from the main menu; click **Login**. From the *Sample* window use the drop down arrow next to *Sample Name* to select **Blank**. The *Mass* must be 1.0000 (which is the default), select **6** repetitions. Using the drop down arrow at the end of the *Method* line select the appropriate ***method:***

Use **Plant 10ml Loop** for plant samples or samples with a large amount of carbon and/or nitrogen. Use **Soil 10ml Loop** for soil samples or samples with low carbon and/or nitrogen (Note on Methods – check the C/N values on the blackboard and/or check with Dan or Colin if you're not sure which method to use. **Do not use any other method unless told differently by** Dan or Colin**.**

Enter supervisor's name or project name on the comment line and enter your name on the operator's line. The other *Attributes* should be left blank in most cases. Click **OK** to add the Blanks to the sample list. Click **Cancel** if necessary to close the *Sample* window. Four blanks should have been added to the sample list. To help keep track of your samples, change the numbers in the *Location* column to match the numbers on the sample carousel.

Running the initial Standards

Select **Samples** from the main menu; click **Login Drift Samples**. Select the appropriate method using the drop down arrow; the associated calibration standard will appear in the *Drift Standards* box, along with the weight range (your standards must be within this range). Select **4** repetitions. The standards should appear after the blanks on the spreadsheet. Note: The weights in the *Mass* column for the standards will appear with a **~** symbol, this is just to remind you of the approximate weight you should use, the actual weights will replace the reminder weights as you enter them using the **Print** button on the balance.

To start the analysis, click on the **Analyze** button or press **F5** to start analyzing the blanks and standards. To halt the machine after the blanks (in order to run the blank calibration), first left-click on the row containing the first standard, then right-click; select **Pause** from the **Samples** menu, choose **Manually** from the drop down list. A red stop sign should appear next to the first standard. This acts as a Halt on the old machine and will stop the analysis temporarily after the last blank has run.

Blank Calibration

If the carbon values vary less than 0.04 and the nitrogen values vary less than 0.02, you may proceed with the calibration. If not, continue running blanks until the values stabilize. After the blanks have finished running (and the machine is in pause mode), choose the blanks you wish to use for the blank calibration by highlighting the appropriate group of blanks (left-click and drag, or left-click and use control to select individual blanks). Select **Configuration** from the main menu, click **Blank**. From the *General Blank* window, *Include* both Nitrogen and Carbon if necessary, using the *Include/Exclude* button. Click **OK**. Note, unlike the old machine we have noticed that the blank values (especially for Carbon) may not appear to change (and may even be higher that 0.04); this is fine, as the blank values are automatically subtracted from the standards and samples.

After the blank calibration restart the analyses by clicking the Analyze button or pressing F5.

Standard calibration
Select the appropriate standards (analyze additional standards if necessary in order to achieve precise values). Select **Configuration** from the main menu, click **Drift**, from the next menu click **Drift** again. *Include* both Nitrogen and Carbon if necessary, using the *Include/Exclude* button. Click **OK**.

Running Samples

* Run one blank and one standard immediately after calibration to ensure the values are correct; if they are out of range, run a few more blanks and/or standards, checking to see if they stabilize in the correct range; if the values are still in question, see Colin or Dan. Insert a **Pause** at the beginning and end of the calibration check.

The quickest way to enter a sample is to simply type the sample name in the **Name** column, you can hit Enter to proceed to the next line, or wait until you have weighed out the sample and pressed the Print button on the balance.

* Run a blank and/or a standard approx. every 10 samples to insure the machine is running properly.
* At the end of your run, **do not** shut off the machine, do not close the software - change the crucible if necessary, select and download your data, and fill out the log book.

Exporting Data

Select the samples you want to download by clicking and dragging in the row column. Goto **Samples** on the main menu bar and click on Text Export Data. Enter a filename and the appropriate drive, click **Save**. You can use either a 3.5" floppy or jump/flash USB memory stick (the USB port is in the front of the machine under the gray Dell panel). Your data is in comma delimited format, which seems open nicely in Excel.

Printing data

Select the rows containing the samples you want to print.
Select **Samples** on the main menu bar, click **Print**, click **OK**.

Updated 9-26-2011 (Colin Pinney)