



95-0014 User Guide- TD-GC-Lonestar: How To Run a Column Blank

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1 Introduction

The TD-GC-Lonestar system sold by Owlstone Medical Ltd gives the capability to analyse thermal desorption tubes using FAIMS on the Lonestar equipment.

The Gas Chromatograph (GC) system used is the Thermo Trace 1310 and the thermal desorption (TD) used is the Markes UNITY-xr.

This user guide gives guidelines to new users on how to run a GC column blank on the Thermo Trace 1310 GC and Lonestar FAIMS system.

2 Definitions

Abbreviation/Term	
OML	Owlstone Medical Ltd
CT	Cold Trap
CTB	Cold Trap Blank
VOC	Volatile Organic Compounds
TD	Thermal Desorption
UNITY-xr	Thermal desorption platform with a sorbent tube oven integrated in where sample tubes can be loaded and desorbed for VOCs injection onto the GC column.
GC	Gas Chromatograph. The GC integrated in the TD-GC-LNS system is the Thermo Trace 130 Gas Chromatographer
LNS	Lonestar System – its FAIMS chips enables to detect chemical species in gaseous state based on its characteristic ion mobility speed under an asymmetric electric field.
ATLAS	The name of the combined parts of the sampling unit supplied with Lonestar (Pneumatics Box, Heater Box, Split Flow Box, Sample Module)
MIC	Markes Instrument Control – TD sequence builder software
FAIMS	Field Asymmetric Ion Mobility Spectrometry.
He	Helium, acts as carrier gas in the TD-GC-LNS system
N2	Nitrogen, acts as purge gas in the TD-GC-LNS system

3 TD-GC-LNS system overview

The GC column, and its stationary phase, are responsible for the chromatographic separation. As the desorbed analyte particles are pushed through the column by a carrier gas, the different compounds are separated based on their different interaction with the stationary phase. This causes the different VOC's to elute out from the column separated from the others at different times, generating a signal proportional to its concentration in the mixture once they reach the detector.

A GC column blank consists of running a GC thermal cycle in absence of sample. The TD does not intervene in this process (Figure 1). This enables to define the background signal inherent to the instrumentation, as well as to evaluate column status.

GC column blanks should be run periodically to ensure correct GC performance.

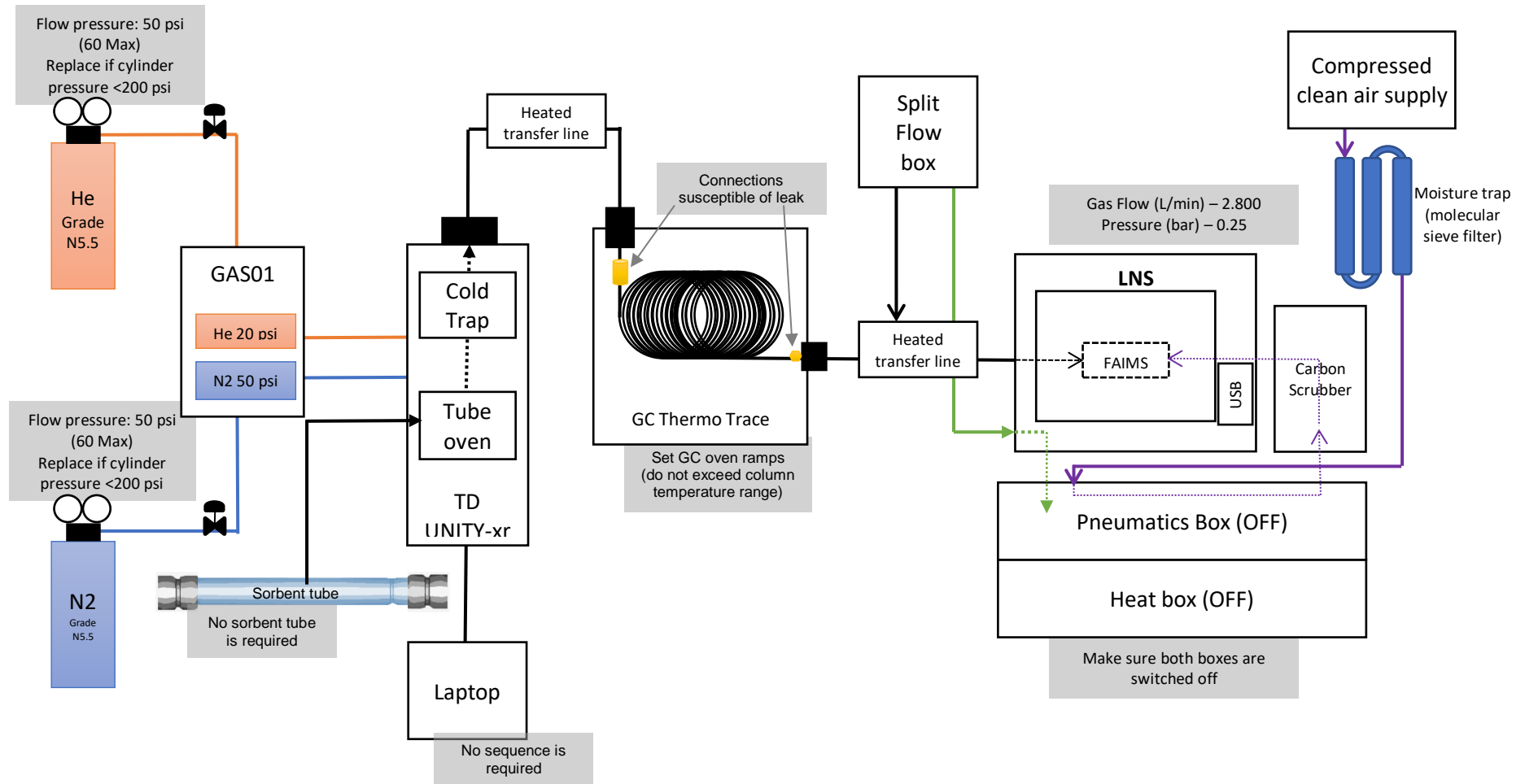


Figure 1. Schematic diagram of the TD-GC-LNS system.

4 Procedure

The TD does not require any preparation as there is no sampling during the GC column blank. However, the LNS must be set for analysis in order to acquire data.

4.1 GC-LNS system checks.

4.1.1 Ensure that the carrier (He) and purge (N2) gas cylinders are not empty and that the installation has been leak checked. Replace the cylinder if the pressure is less than 200PSI. Both gases should be 5.5 grade (i.e. 99.9995%). Check that the gas line toggle valves are opened. If a gas generator is feeding the system, ensure it is switched on and perform pertinent checks. The primary and secondary regulator pressures to be set are listed in Table 1.

	Cylinder (primary) regulator	GAS01 (secondary) regulator
Carrier gas pressure	50psi	20psi
Purge gas pressure	50-60psi	50psi

Table 1. Gas line pressure settings.

4.1.2 Check the LNS and ensure the ATLAS pneumatic and heat boxes are on. The gas flow and pressure parameters, displayed at the top of the LNS interface, should be oscillating around 2800mL/min and the pressure 0.25bar respectively.

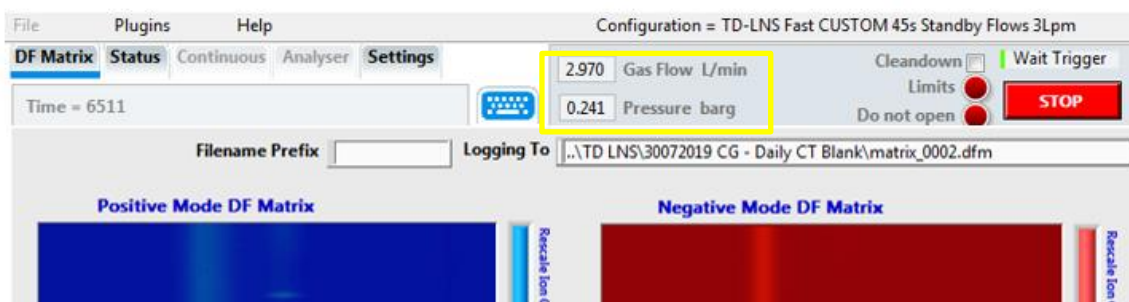
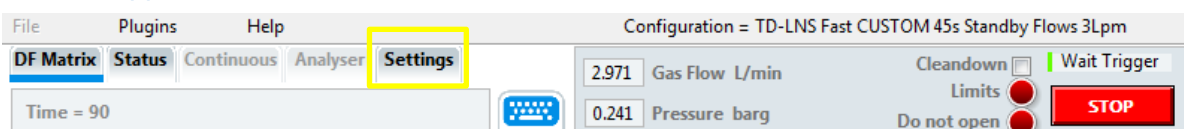


Figure 2. Location of the LNS gas flow and pressure parameters in the LNS interface.

4.1.3 If gas flow and pressure parameters are both zero, go to “Settings” and press the “COMM port” and “SFB settings” buttons, so that both display the message “Connect”, as shown in Figure 3.

Request technical support if the problem persists. For additional support, please visit www.owlstonemedical.com and click on [Support](#) or send an email to support@owlstone.co.uk.



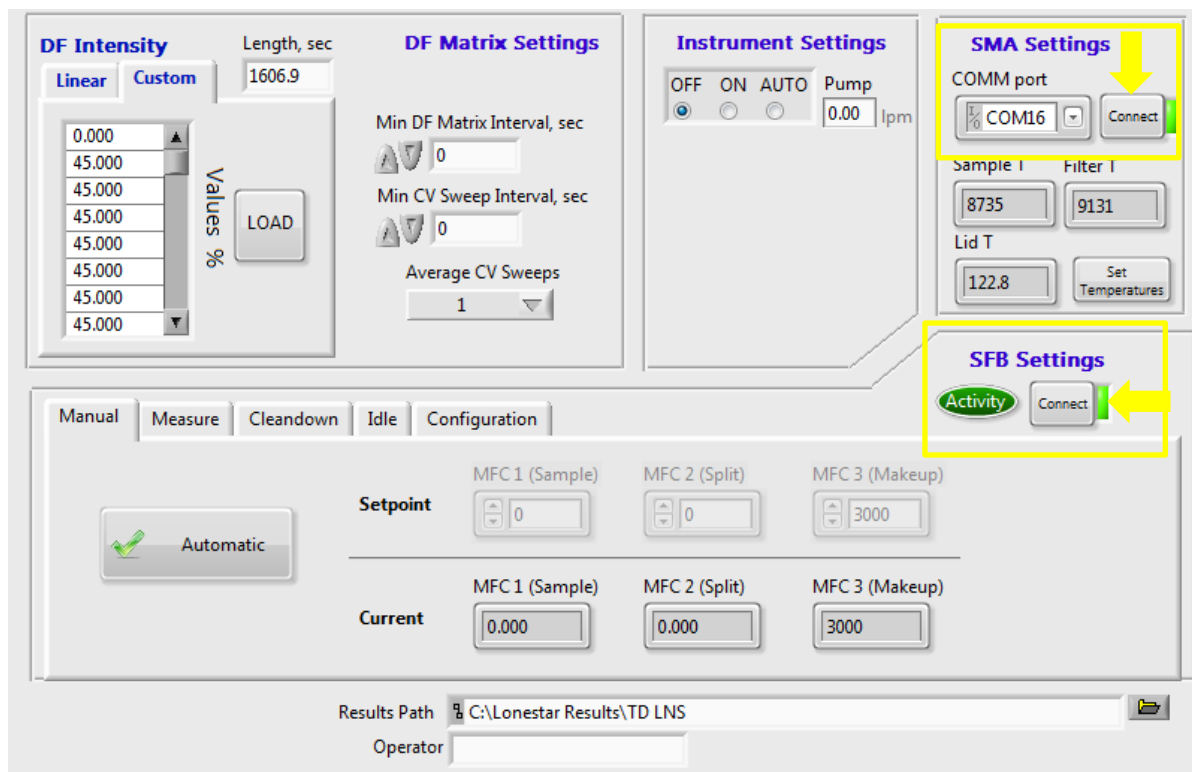


Figure 3. LNS interface screen. The yellow arrows point at the buttons that should be displaying “Connect”, press them if they are not.

4.2 Performing a GC column blank.

- 4.2.1 Log the data collected on the LNS system see 95-0012 User Guide: TD-GC-Lonestar: How to run a sample tube.).
- 4.2.2 Ensure the GC oven ramps settings coincide with those used when analysing samples. Adjust if required (see 95-0012 User Guide: TD-GC-Lonestar: How to run a sample tube)). GC column blanks are run under the same chromatographic conditions used for sample analysis. Do not exceed the GC column temperature ranges.

4.2.3 From the Thermo Trace 1310 interface, press “Status” in the main menu interface. Wait until the oven has reached the correct temperature. The green Start Button will appear (Figure 4) once the GC is ready to inject. Press the Start Button to begin the GC column blank.

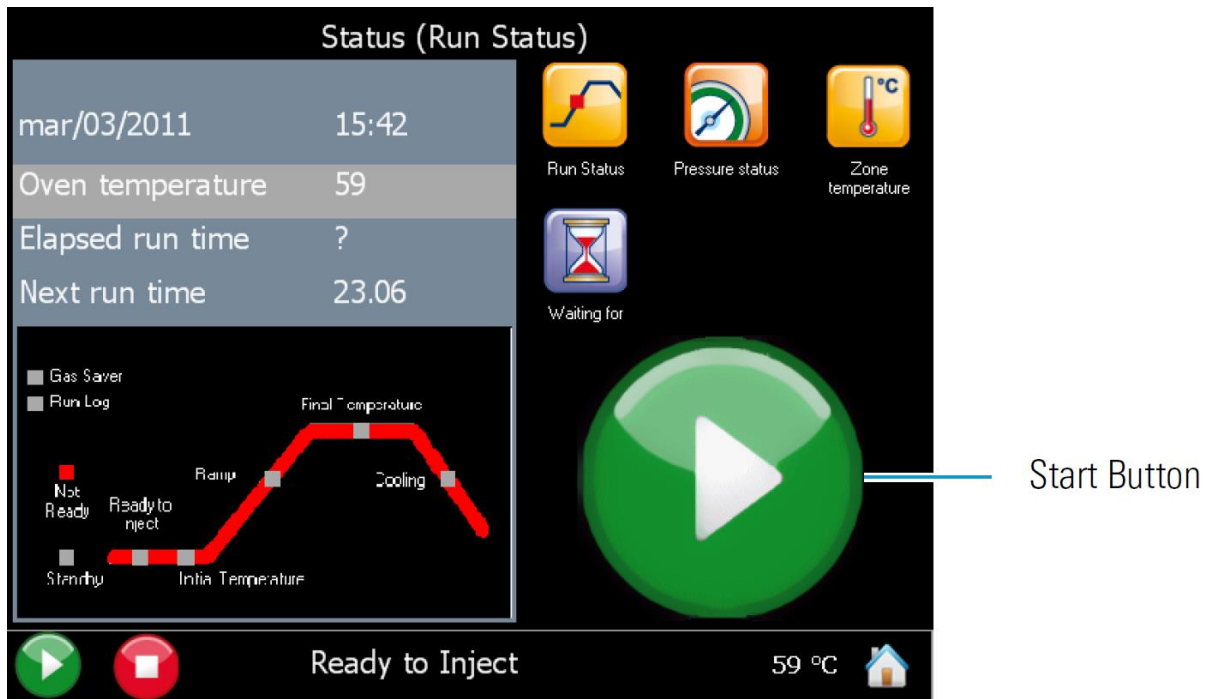


Figure 4. GC Thermo Trace 1310 Status screen. Wait until the oven is “Ready to Inject” and press the start button to begin the column blank.

4.3 GC column blank data evaluation.

- 4.3.1 Once the GC cycle and the DF matrix have been completed, load and process the data generated on FAIMS Viewer (see 95-0011 User Guide TD-GC-Lonestar: Data processing with FAIMS Viewer)
- 4.3.2 Demonstrate the GC column is blank – all background peaks should be $<2\text{pA}$ with no upwards baseline drift (Figure 5).

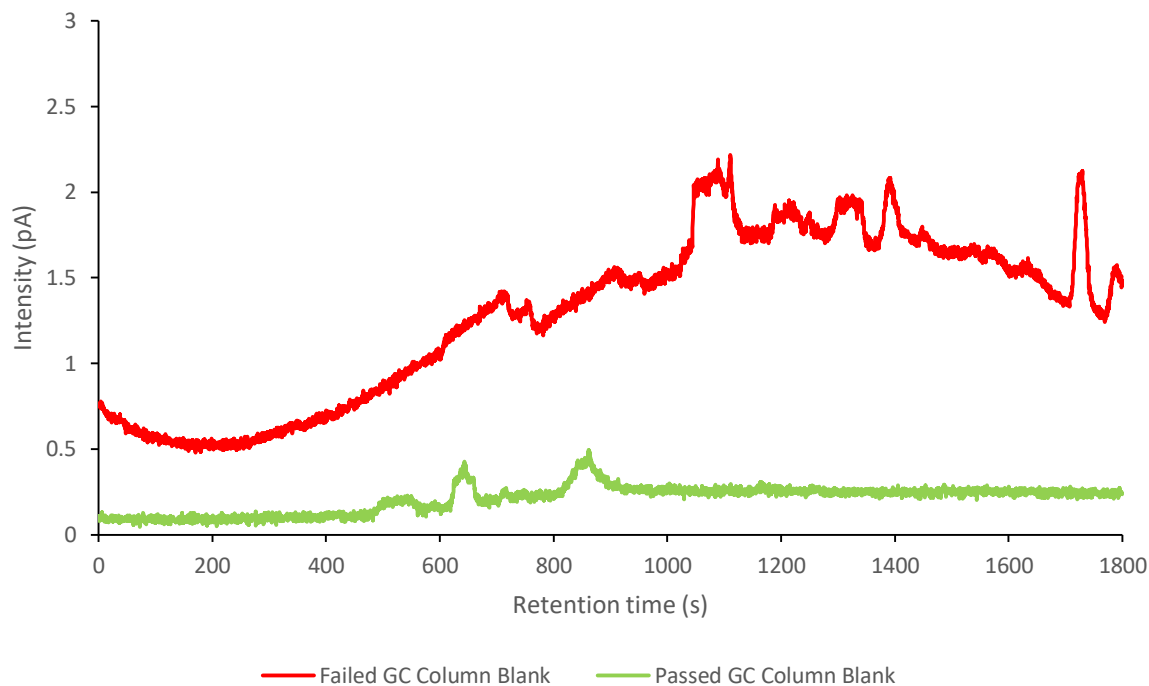


Figure 5. Example of a passed and failed GC column blank.

5 Contacts and support

The Owlstone Medical Ltd team is dedicated to providing excellent support. For all technical and safe use question relating to this manual, contact as at:

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Or email support at support@owlstone.co.uk