



## Lonestar Analyser Mode Software User Manual

Issue/Version	Date	Author	Details
OW-004125-TM	23/10/2012	Jonathan Angove	The Original,

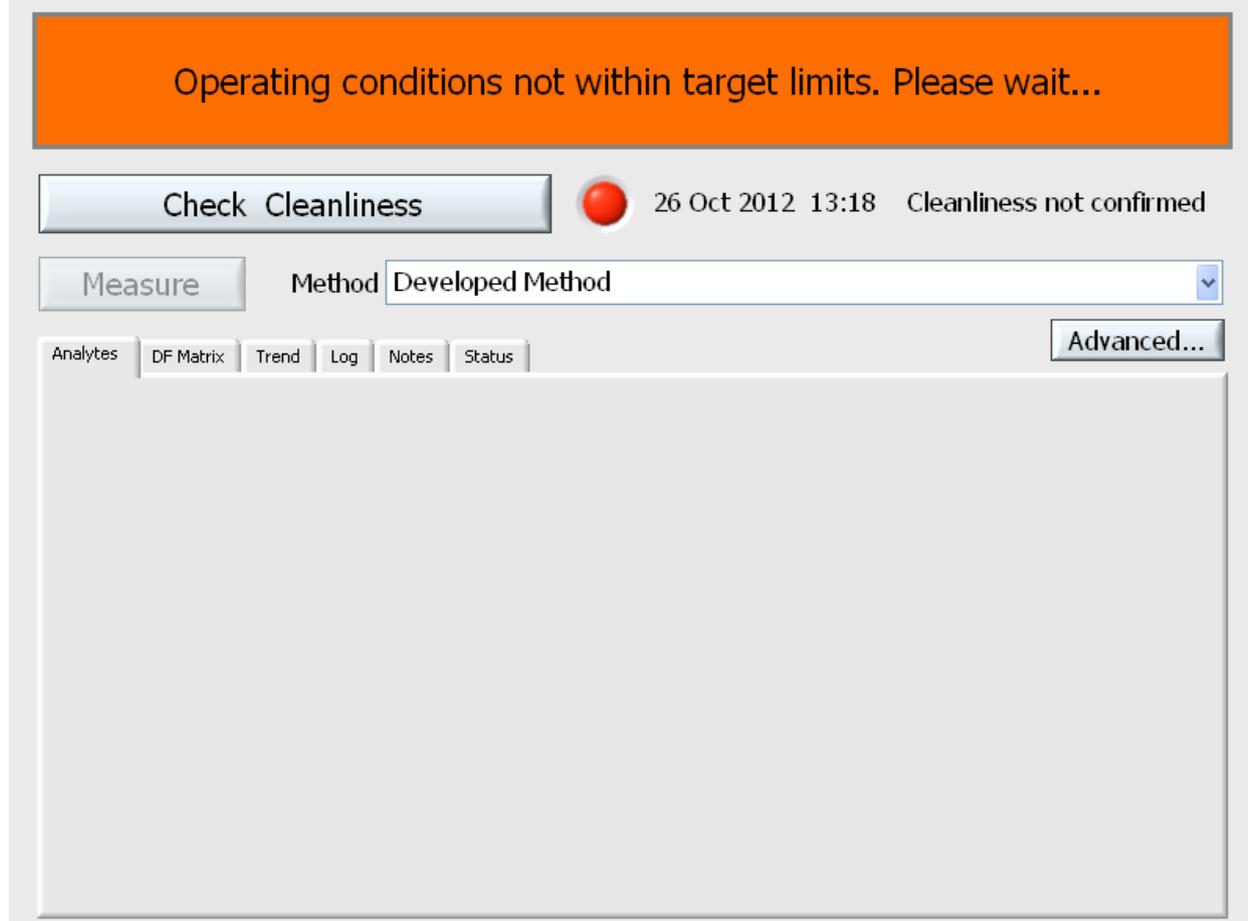
### Introduction

This manual details the use and functionality of the Lonestar software in Analyser Mode. This mode is used when a method has been fully developed and optimized, where a single DF Matrix is used to perform the sample analysis and the software automatically identifies the presence of an analyte, either qualitatively or quantitatively.

The Analyser Mode has been available since v4.2 of the Lonestar software. This document applies from this version of software to the present version of the software (v4.9).

### Starting the software

The software will load automatically when the Lonestar system has started up. If the software does not appear on your screen double click on the Lonestar software icon located on the Lonestar system desktop. The Lonestar software user interface is shown in Figure 1. The default behaviour is to always open showing the Analyzer screen.



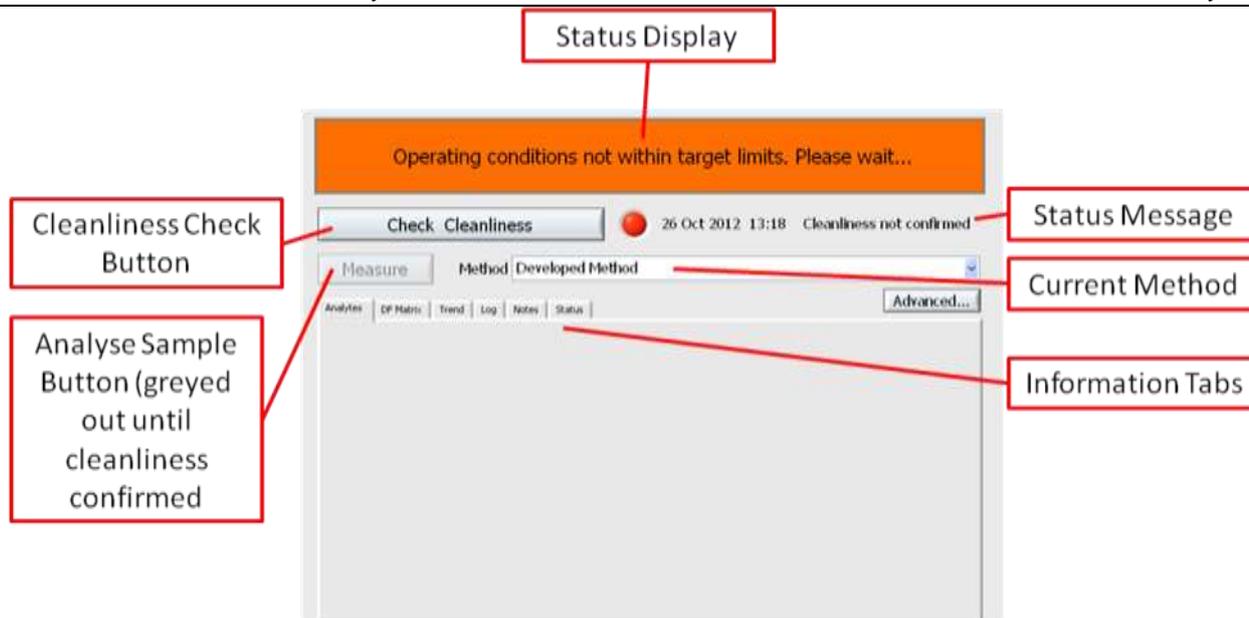
**Figure 1 the Analyser screen on system start-up**

A good understanding of what information can be gathered from this screen is important to determine if the system is operating within set parameters; or if not, how to troubleshoot the system. Users of the Lonestar are now expected to troubleshoot difficult problems with the Lonestar, but it is important that all users be able to troubleshoot simple issues e.g. the Sample Holder of the ATLAS not being sufficiently tightened to prevent a leak.

Parameters monitored by the Analyser Mode software tend to be system temperatures, the Lonestar flow rate and the Lonestar pressure.



It is essential for the user to know what the system pressure and flow is when working correctly. The Lonestar will inform a user that setpoints have not been reached, but not what the set value is.



**Figure 2 annotated Analyser screen**

## Status Display

This is a red/green display as to the overall Lonestar status. If the Lonestar system has suffered from an extended power failure, then the ATLAS and internal temperatures may require 30 minutes or more to achieve their setpoints, depending upon the set values.

When the sample data acquisition has been completed, the Status Display will be red as the system is reducing the pressure within the Lonestar in a controlled manner to prevent contamination within the Lonestar occurring.

## Check Cleanliness Button

Before a sample can be analysed, the Lonestar system must pass cleanliness checks to ensure that it is not contaminated, possibly from a previously analysed sample with a very high analyte concentration. It is suggested that if a sample has not been analysed within 4 hours of the previous cleanliness check, a second cleanliness check is performed immediately prior to analysing a sample. This is to ensure that a contamination event has not occurred between cleanliness checks e.g. the carbon in the Lonestar scrubber suffered analyte breakthrough from the compressed air supply.

## Status Message

This is a series of indicators; from red/green light, the date and then a short message. This date-stamp is useful if unsure what time the previous cleanliness check sample was analysed.

## Measure Button

Once the Lonestar cleanliness has been confirmed, this button will no-longer be greyed out (as seen in Figure 2). This button is pressed using the Lonestar mouse cursor

## **Current Method Dropdown**

The current method loaded into the Lonestar memory for sample analysis is displayed in the dropdown menu. This allows one of multiple methods stored on the Lonestar to be selected for sample analysis or to load a standby method if the Lonestar system is not going to be used for an extended time e.g. overnight to reduce the gas flows through the Lonestar system, but to maintain sufficient flows to ensure the Lonestar system is clean and ready for use when next required.

## **Information Tabs**

### **Analytes**

This tab displays the concentration of analytes in the last sample analysed using this method. At the end of data acquisition, this tab is automatically displayed.

### **DF Matrix**

This tab displays the DF Matrix for the current analysis, whether a sample or a cleanliness check. At the bottom of the screen is displayed the progress through the analysis. The scaling of the Ion Current can be adjusted using the vertical bars for both Positive and Negative Mode data.

### **Trend**

This tab displays a trend line for all recent analyses using this method. This gives a simple visual representation to see if the concentration of an analyte is increasing or decreasing over time.

### **Log**

This tab displays the log of cleanliness analyses and samples analysed using the current method. This may be used to determine when the last cleanliness check was performed if the user is unsure when the last cleanliness check was performed.

### **Notes**

This tab displays the messages encoded within the configuration file, specifically regarding loading the cleanliness check sample, the sample for analysis, specific messages regarding the quantitation and the duration of the cleanliness check analysis. This information can not be edited within this tab, the messages are displayed for information only.

### **Status**

This tab displays the Lonestar total flow (L/min), the pressure (bar<sub>g</sub>) and time that the current analysis has been running (s). If the Status Display states that the “Operating conditions are not within target limits” this tab is useful to view what the actual flow and pressure currently are within the Lonestar system. It is important to know what the Lonestar flow and pressure should be for your method, then you will know if the flow or pressure are lower or higher than expected. The system pressure should not be adjusted on the pneumatics box to remedy the situation; this tab is to assist in determining the cause of a problem. The most likely occurrence is for the pressure to be very low, but the flow to be within tolerance limits. If this is the case, it is likely that the o-ring has not been used on the VWR bottle or that the Sample Holder has not been secured sufficiently. If this is not the case, please contact your Site Technical Lead to troubleshoot the system before contacting the Owlstone Support team.

The other main use of the Status tab is when the system is venting to change samples. Only open the Sample Holder to access your sample when the Lonestar pressure is lower than 0.4bar<sub>g</sub>. The Lonestar system vents the pressure in a controlled manner to prevent splashing of the sample. Opening the Sample Holder at elevated pressures may cause the sample to splash, contaminating the dip-tube or splash plate. In extreme cases, sample may contaminate the ATLAS as far as the filter.



It is essential to open the Sample Holder when the system pressure is under 0.4bar<sub>g</sub>. Failure to follow this procedure may contaminate the ATLAS.

## Analysing a Sample

Prior to sample analysis, a cleandown sample must be analysed to confirm the cleanliness of the Lonestar system to prevent spurious results from being reported. If a cleandown sample is analysed and the system does not confirm cleanliness, the Measure button will remain greyed out to prevent sample analysis. If this occurs, replace the cleanliness sample with a fresh one (whether an empty bottle, or an aqueous blank sample depending upon your method) and re-analyse. If this second cleanliness sample still suggests contamination, please contact your Site Technical Lead to troubleshoot the contamination before contacting the Owlstone Support Team.

When the Lonestar system is between analyses, the flow rates are set to standby conditions to allow the system to vent in a controlled fashion; thus the Status Display will state that the “Operating conditions are not within target limits” as displayed in Figure 2.

Ensure that the desired cleandown sample is installed in the Sample Holder and press the Check Cleanliness button. A message screen will then be displayed to confirm that the correct cleanliness check sample is installed. Pressing Ok will then start the cleanliness check analysis automatically, as shown in Figure 3.

Figure 4 shows the Analyser screen during a cleanliness check sample. At the bottom of the screen is displayed the progress through the analysis. The scaling of the Ion Current can be adjusted using the vertical bars for both Positive and Negative Mode data.

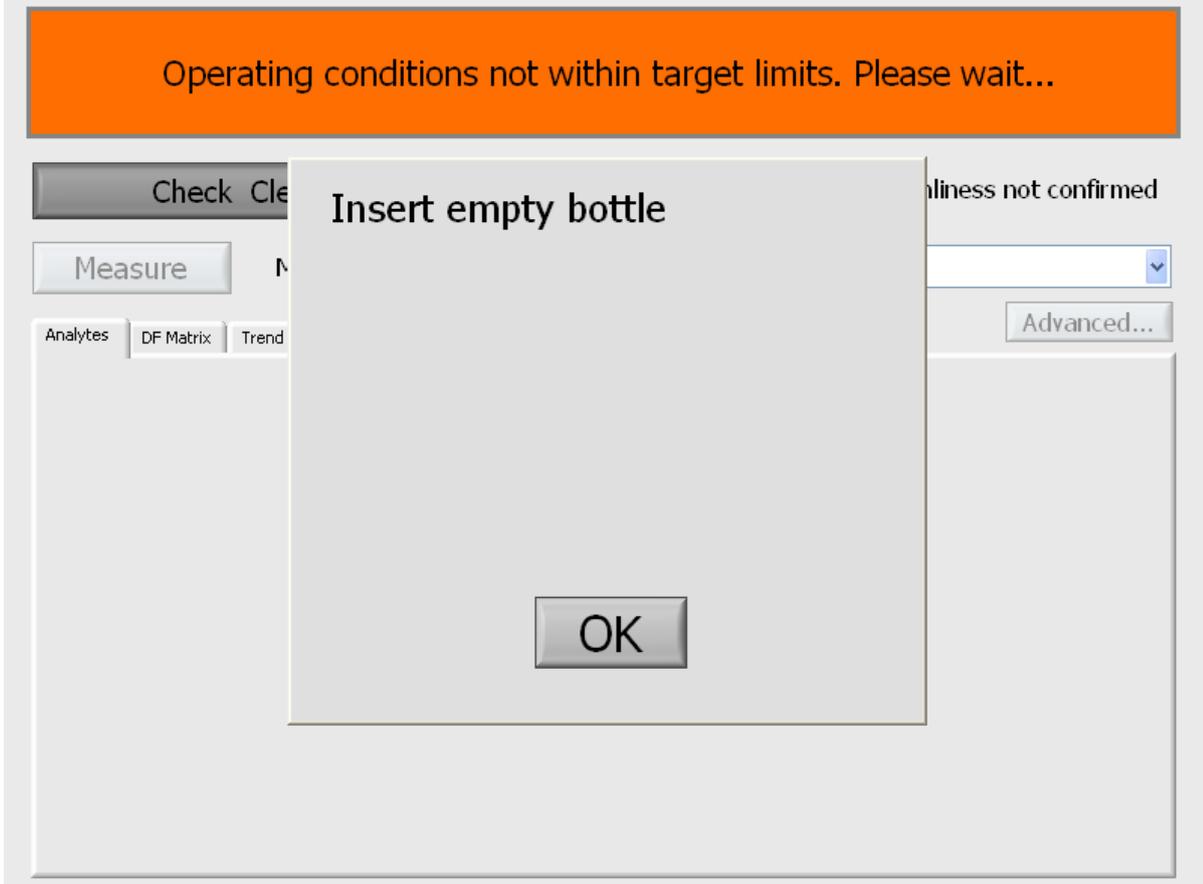


Figure 3 Message confirming correct cleanliness check sample is installed

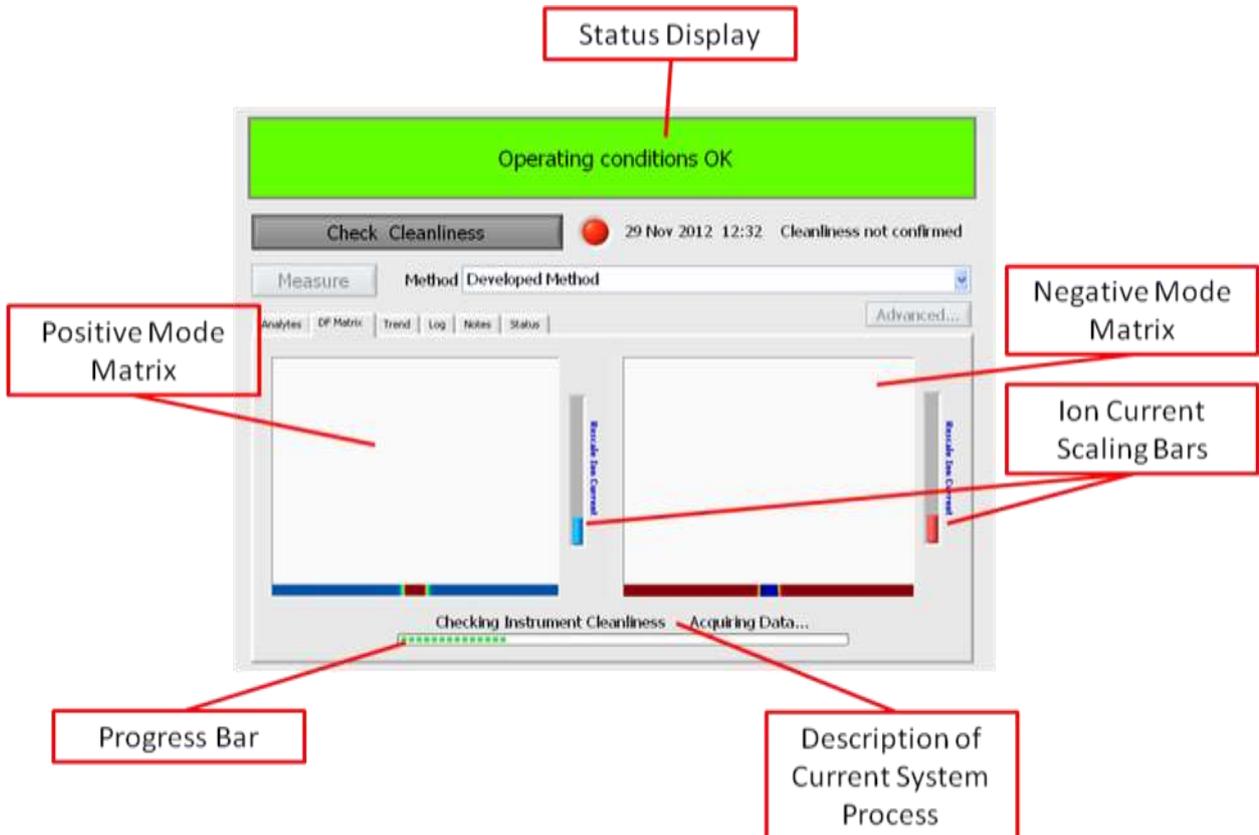
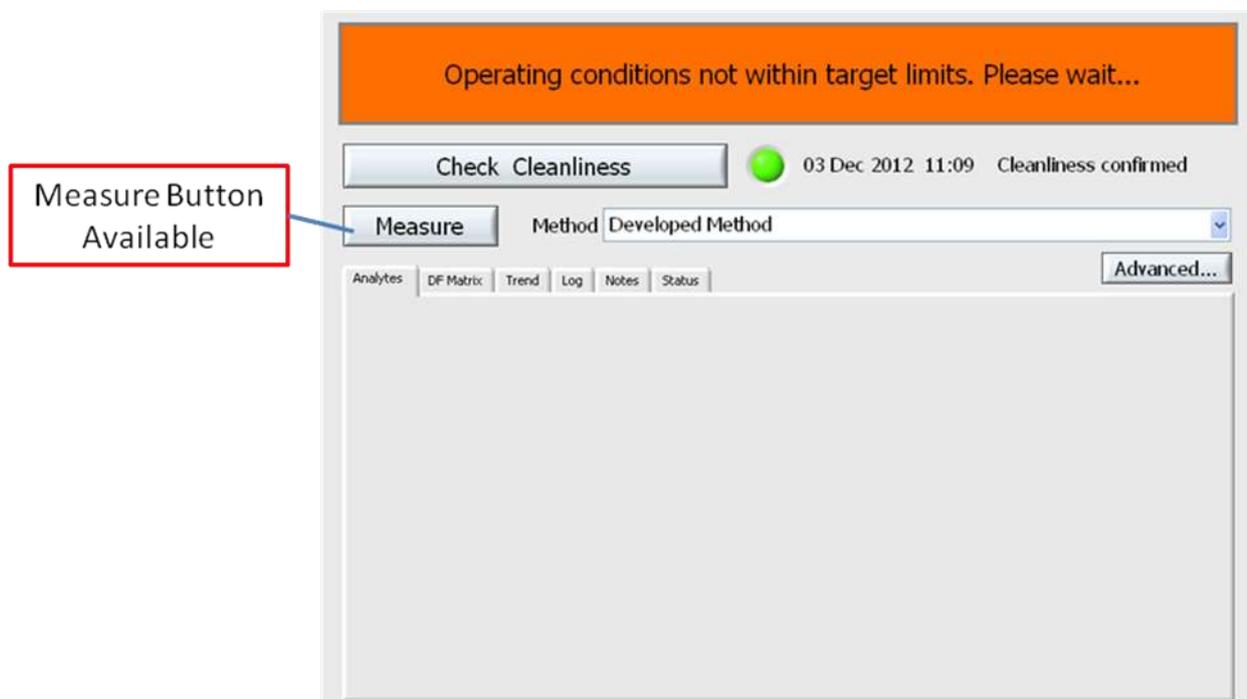


Figure 4 Analysis of a cleanliness check sample

Once the cleanliness check has been completed and the system has confirmed it is not contaminated, the Measure button is now available, as shown in Figure 5.



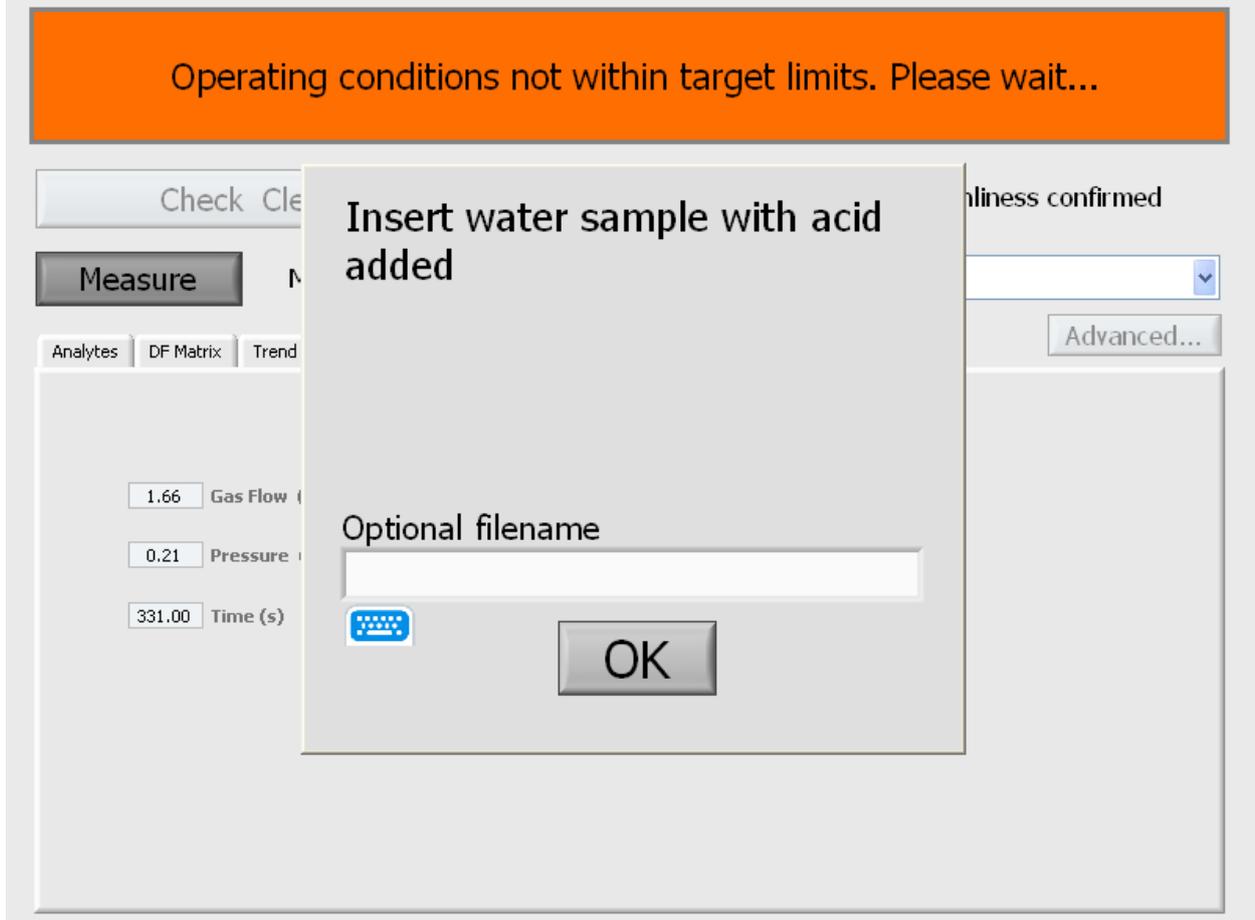
**Figure 5 Cleanliness has been confirmed, Measure button now available**

Ensure that the system pressure is below 0.4bar<sub>g</sub> as displayed in the Status tab before removing the sample from the Sample Holder.



It is essential to open the Sample Holder when the system pressure is under 0.4bar<sub>g</sub>. Failure to follow this procedure may contaminate the ATLAS.

Place your sample to be analysed in the Sample Holder, ensuring there is an o-ring in place, and tighten sufficiently to prevent a leak. Press the Measure button and a message screen will then be displayed to confirm that the correct type of sample is installed. Pressing Ok will then start the sample analysis automatically, as shown in Figure 6.



**Figure 6 Message after pressing Measure button to ensure correct sample type is loaded**

Once the sample analysis has been completed, the Lonestar system will begin its controlled venting cycle and the software will display the Analytes tab with the concentration of detected analyte displayed from the sample. The Measure button is now greyed out once more. Once the Lonestar pressure is below 0.4bar<sub>g</sub>, as displayed in the Status tab, replace the sample with the required cleanliness sample and repeat the cleanliness check procedure as detailed earlier in this procedure.