

EfW QAL 3 Procedure

1. Summary

This procedure is to ensure consistency and accuracy when conducting QAL 3s on the EfW CEMS analysers limiting the downtime of analysers and ensuring no issues arise.

2. Scope

The QAL 3 procedure is mandatory and is to be conducted every 3 weeks, QAL 3s are to be completed by EC&I team members with guidance following this procedure.

3. Definitions

- QAL 3 – 3 Weekly checks conducted by the EC&I team to test all analysers using calibration gas.
- CBISS – The manufacturer of the CEM System.
- ENVEA – The manufacturer of the analysers.
- CDAS – CBISS Data Acquisition Software - Used by OPS to monitor and EC&I to conduct QAL 3s.
- Calcmnet – Software that controls the MIRFT Analyser.
- HMI – Human machine interface (Screen mounted on a panel to allow adjustments to be made to the configuration / settings of the panel).
- FID – Flame ionisation detector (Used to detect total hydrocarbons)
- MIRFT – Fourier transform infrared (Used to detect gases in complex mixtures)
- CEMS – Continuous emissions monitoring system.

4. Roles and Responsibilities

EC&I Team will be responsible for conducting the QAL 3 procedure, if any assistance is required or faults occur when conducting the QAL 3 the following can be contacted.

██████████ (C+I) ██████████

Any issues regarding the CEMS or CBISS Systems.

██████████ (██████████) ██████████

Any issues regarding the physical links between the CDAS and DCS.

5. Process

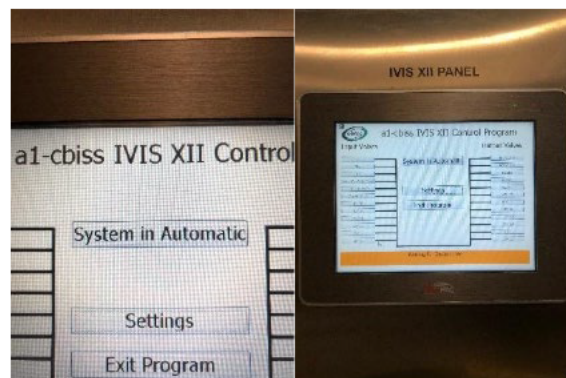
5.1. Preparation

To begin you must sign out the CEMS permit from the STL and inform the operators that QAL3s will be taking place. Ensure the operations team know how to get in contact with you in case any issues arise.

Next you must ensure that the gas bottles are fully open and the flow regulators are set to 2 Bars of pressure (The flow regulators should never need to be changed but may need to be looked at if any failures occur).



Following this you must check that the calibration panel is set to auto mode, the panel is mounted to the right of the main door on the wall of the cems enclosure.



Finally do a check of all the analysers to ensure they are in sample mode, showing the correct pressures, temperatures and that there are no outstanding alarms on the FID screens or the main analyser screens.

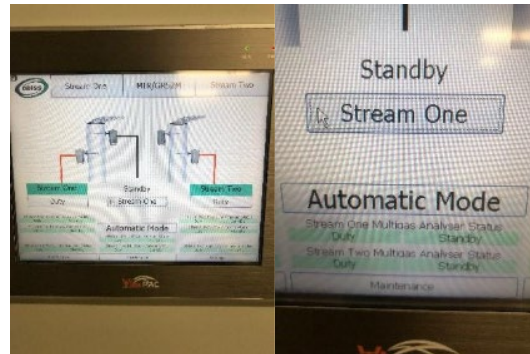
Fid readings: +185°C

180-260mBar

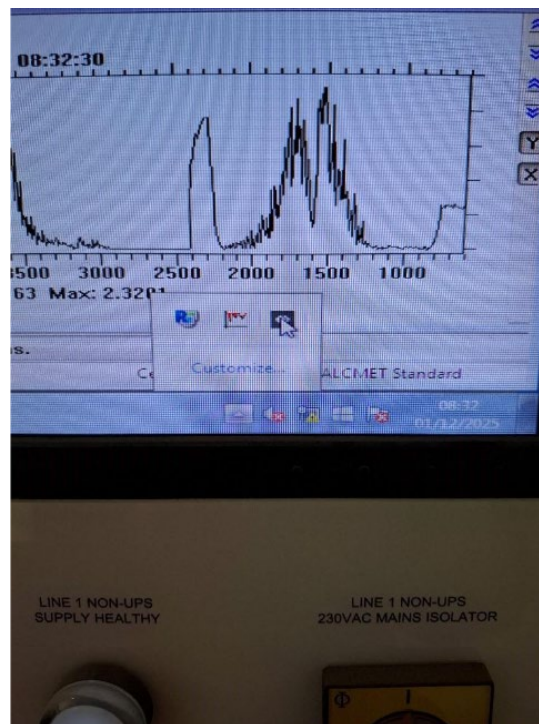
650-750mBar

350-420mBar

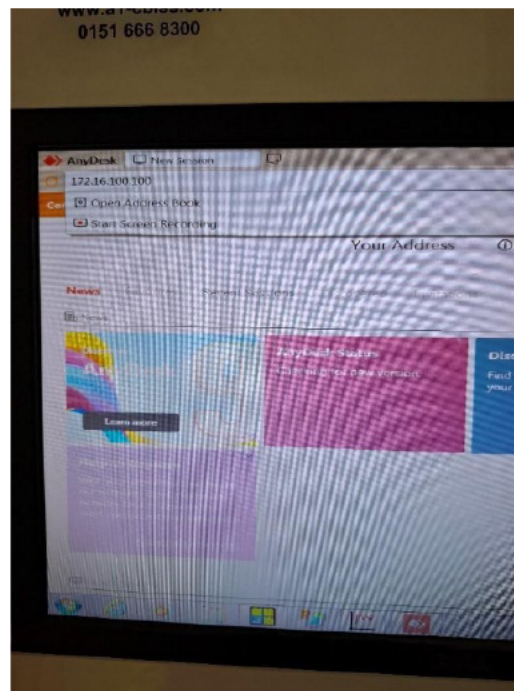
Once these checks have been complete you must change the system to manual mode, this is done via the HMI on the IO panel inside the CEMS shelter click the automatic mode box and click yes to swap over to manual.



From here you will be required to log into Anydesk on the Line 1 analyser PC screen, this is done by clicking the arrow at the bottom right of the screen and selecting the any desk icon as pictured below.



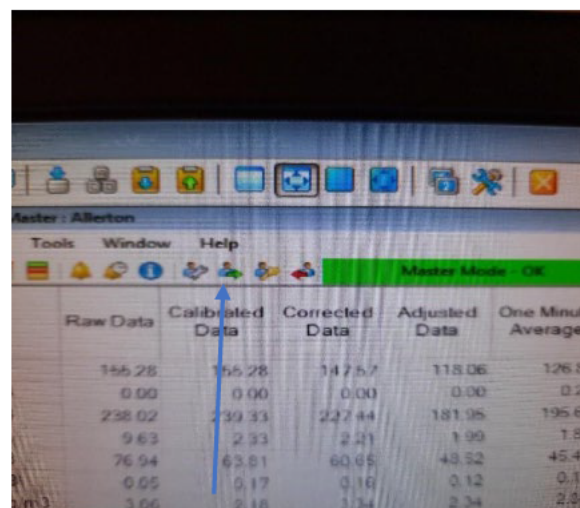
Once the any desk programme is open you must enter in the IP address of the CDAS system in the search bar.



IP Address : 172.16.100.100

The main CDAS screen should now load on the line one analyser screen, from here you can use the Log on icon to begin conducting QAL 3s.

Check the bell icon for alarms, if there are any alarms on the system do not attempt the QAL 3, investigate, fix and reset all alarms prior to commencing.



Login details

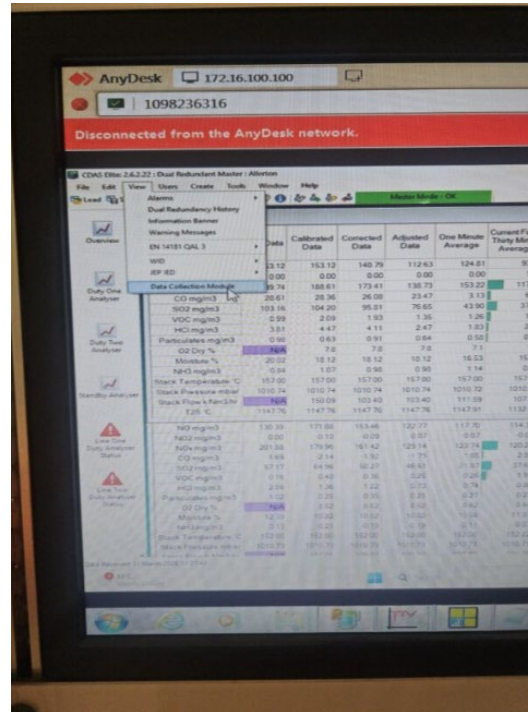
Username: [REDACTED]

Password: [REDACTED]

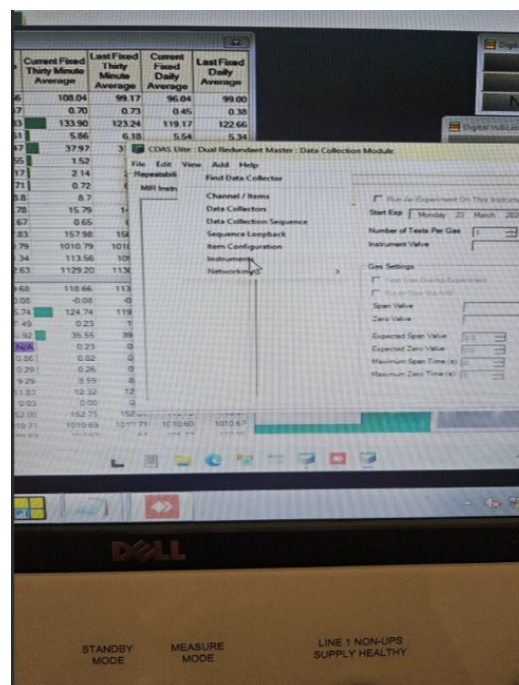
5.2. QAL 3 Procedure

QAL 3s can be conducted on the analysers by the following:

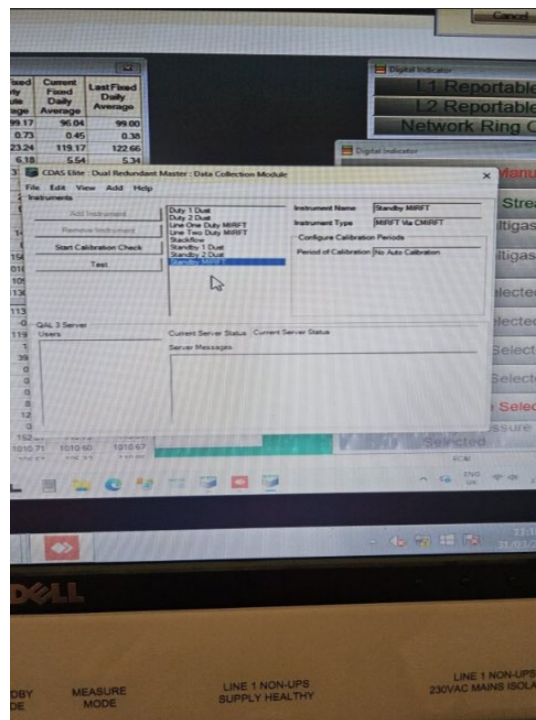
View>Data collection module.



View>Instruments



A dropdown list of instruments should appear, from the list we will need to do QAL3s on Line 1 Duty MIRFT, Line 2 Duty MIRFT and Standby MIRFT one analyser at a time.



Ensure the line you are doing a QAL 3 on is not in duty mode (It is recommended to start with the Standby analyser).

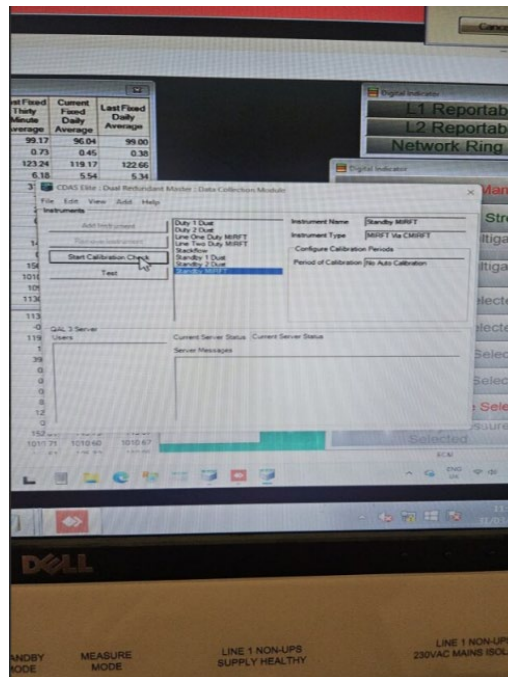
Check that the stream you are doing the QAL 3 on is blacked out on the IO Panel HMI.



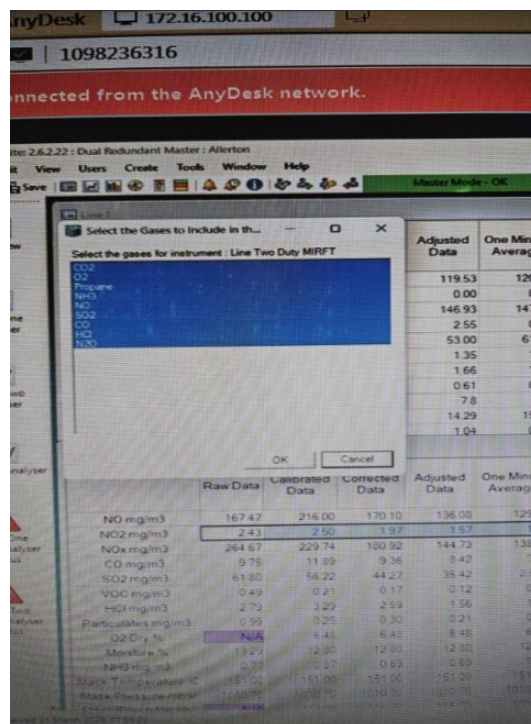
On the IO Panel HMI the red lines indicate the current analysers in use, with the blacked out one free to be tested.

5.2.1. Standby

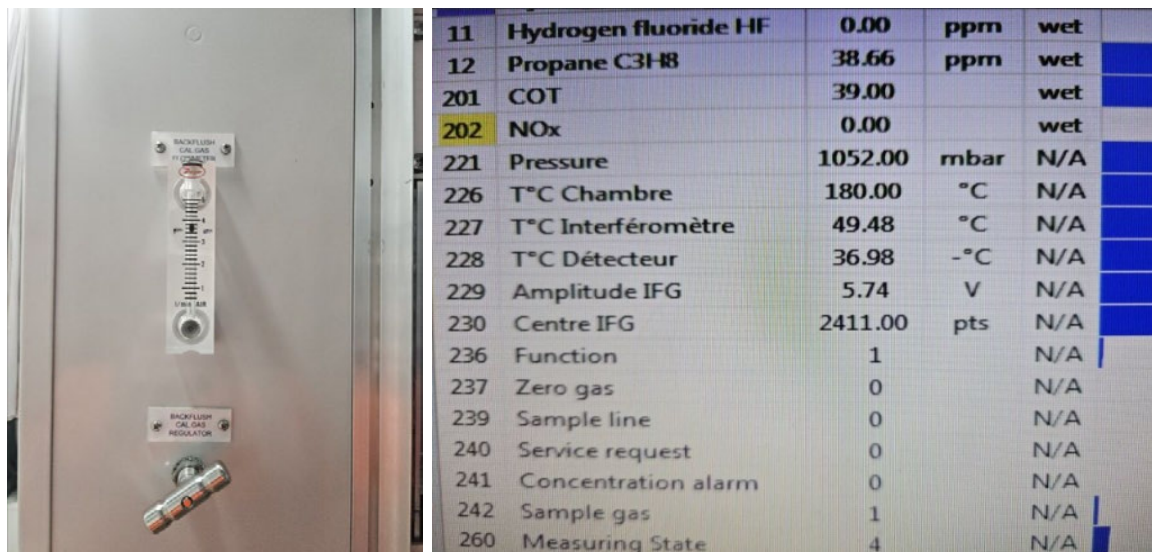
Double click the standby MIRFT on the Data Collection Module - Instruments Menu, so it is highlighted blue and click Start Calibration Check.



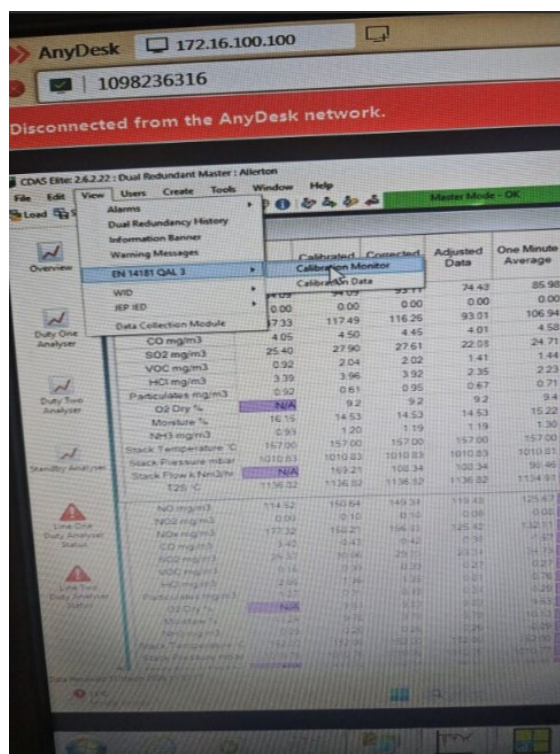
A list of gases will appear (Standby has 2 boxes for O2 so only one needs to be selected) ensure all gases are selected and press ok.



The check should begin and the backflush flowmeter ball should rise, the ball should be positioned around 3.5lpm to achieve around 1050mBar Pressure in Calcmeter. The pressure is crucial to getting a pass on the QAL3 – too low and the measured concentration will be low, too high and the concentration will be to high.



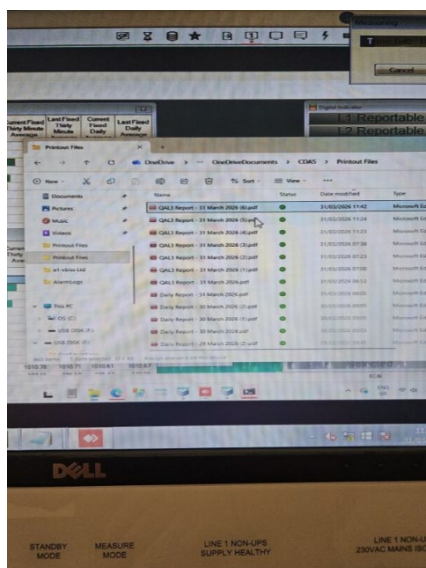
To keep track of the QAL 3 you can open the calibration monitor under View>EN 14181 QAL 3>Calibration Monitor



This will bring up a window showing the progress and current stage the QAL 3 is at.

The QAL 3 should take around 40 minutes per line to complete with monitoring of the CDAS needed to ensure there are no issues with the two duty analysers readings (Mainly high VOC as we have lost time with this in the past – If VOC is high on the readings check that the FID covering that line is in Sample mode).

On completion a certificate should pop up on the screen with the results of the QAL 3, if the certificate has been crossed off on the screen by OPS they can be found under Files>Printout Files and under the day of the test date (Number of test).



If there are any failures, complete the steps as above but only select the gas which has failed the QAL 3 as this will reduce the test time significantly.

5.2.2. Line 2

To do a QAL 3 on line 2 you must go back to the IO Panel HMI and put the standby analyser as the duty line to cover Line 2. This is done by ensuring the standby stream is pointing at Line 2 and clicking on the "Duty" button next to line 2 making the standby line turn red.



Monitor the CDAS screen for a couple of minutes to check for any alarms or high readings after swapping over.

Now you can repeat the above steps from 5.2.1 Standby but double-clicking Line 2 Duty MIRFT to start the QAL 3 on Line 2.

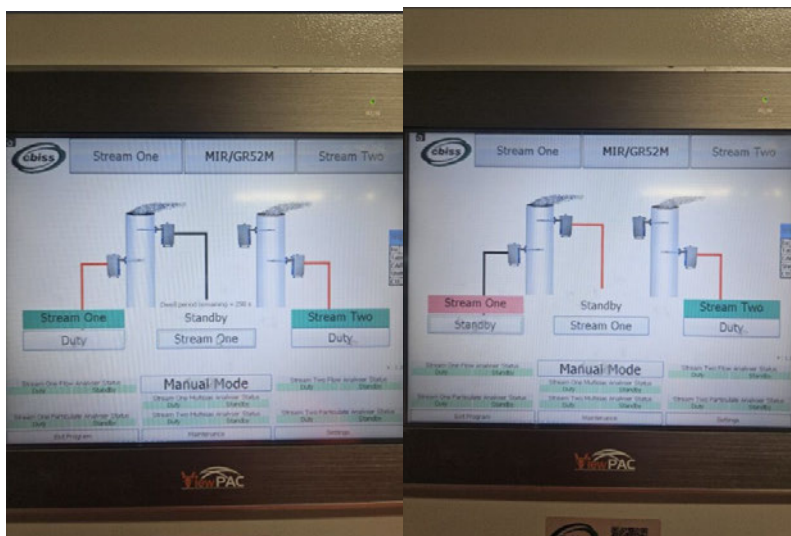
5.2.3. Line 1

Once the line 2 analyser has finished you must put Line 1 and Line 2 back in duty to allow standby to swap streams.



Monitor the CDAS screen for a couple of minutes to check for any alarms or high readings after swapping over.

Press the middle button, the black arm should move across, and a dwell timer should start (300 seconds), wait for this to finish and then select standby to take over line 1.



Follow the above steps from 5.2.1 Standby but double-clicking Line 1 Duty MIRFT to start the QAL 3 on Line 1.

5.3. Completion

On completion, set Line 1 and Line 2 analysers to duty and change the IO Panel HMI back to automatic.



Log out of any desk and close the programme.

Raw Data	Calibrated Data	Corrected Data	Adjusted Data	One Minute Average
155.25	155.28	147.57	118.06	126.86
0.00	0.00	0.00	0.00	0.22
238.02	239.33	227.44	181.95	195.66
9.63	2.33	2.21	1.00	1.82
76.94	63.81	50.65	48.32	45.43
0.05	0.17	0.16	0.12	0.13
3.06	2.18	1.74	2.34	2.94

Finally close off gas bottles in the gas bottle store leaving N2 on as this is always required by the system.

6. Associated Documents

Any repeat failures may be caused by an uncalibrated analyser, see recalibration procedure to resolve these issues.

[CEMS Fault Log.](#)

[CEMS Useful Links.](#)ef