



7th August 2018

Ref: JP3632ZH – A1 CEM over 10 days invalid

Dear Toby Griffiths

We have recently had some issues with the CEM on A1 vent point. This CEM has now logged over 10 invalid days for the year so far (currently at 14). We have investigated this issue.

Findings

The EI engineer from Engie left on 28th February and did not transfer over to Dow Silicones. A new EI engineer started at the plant at the start of June and has been learning the plant. Periods of invalidation at the end of June indicated that the CO sensor might be reaching the end of its life. The sensor was showing periods of 30 minutes where it had one reading and then 30 minutes where it had a different reading. This is consistent with one of the sensors in this dual channel unit beginning to fail. An order for a new sensor unit was initiated on 3rd July. This was the first order placed with this vendor since changing over from the Dow Corning system to the Dow system. Unfortunately it took a number of days to get the sensor delivered. As soon as the new sensor arrived it was installed and the issue was resolved. Unfortunately in the time it took for the new sensor unit to arrive, a number of invalid hours were logged.

Actions to prevent this happening again

- Order a new sensor and replace - COMPLETE
- Communicate to the operators the importance of reporting issues that alarm on the DCS repeatedly as it may be an early warning of an instrument failure.
- Investigate feasibility of emailing specific (repeat) alarms to relevant personnel
- Amend the Vendor master data to prevent further delivery delays
- Order a spare CO, NO_x and O₂ sensor to be held on the shelf to allow an immediate changeover should a sensor failure be identified again - ORDERED
- Write a formal procedure and train some of the operators how to change the sensor, so as not to rely on one person being available to do it.

Appendix 1 contains the invalidation log (with reasons for each line)

Appendix 2 contains CEM trends for NO_x, CO and O₂ for all the invalid days

Appendix 3 shows the inside of the dual sensor CEM unit

If you require any further information, please contact me using the details below.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Judith Sartor".

Judith Sartor, Environmental Specialist

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Dow Silicones UK Ltd

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Appendix 1

Invalidation Log

CONTINUOUS MEASUREMENT SYSTEMS INVALIDATION LOG

QUARTERLY RETURN

Year: 2018

Operator: Dow Silicones UK Ltd

Form: IED CEM1

Monitor positioned on release point/LCP Number: A1 / LCP 60

Version/Date: V 3.1 31 Dec 2016

Permit/Variation Number: EPR/JP3632ZH

Barry Cogeneration Plant

Date	Period of invalidation (hours)	Invalidated days in year	Comments
20/03/2018 - 20/03/2018	3 hrs	1.	Higher NOx on one sensor for a short period
28/05/2018 - 28/05/2018	5 hrs	2.	Fluctuations in NOx sensors and one CO sensor reading zero
24/06/2018 - 24/06/2018	3 hrs	3.	Period where one CO sensor was reading zero
26/06/2018 - 26/06/2018	5 hrs	4.	Period where one CO sensor was reading zero
28/06/2018 - 28/06/2018	7 hrs	5.	Period where one CO sensor was reading zero
30/06/2018 - 30/06/2018	7 hrs	6.	Period where one CO sensor was reading zero
12/07/2018 - 12/07/2018	5 hrs	7.	Period where one CO sensor was reading zero
14/07/2018 - 20/07/2018	69 hrs	14.	Period where one CO sensor was reading zero

NOTES:

(a) Compliance in Chapter III of the IED is on the basis of validated hourly averages, measured by continuous monitors (except where discontinuous exemption applies). And confidence intervals are incorporated to convert the measured hourly value into a validated measurement for the purpose of compliance assessment. However, any day in which more than 3 hourly average values are invalid (due to malfunction or maintenance of the continuous measurement system) shall be invalidated for the purpose of compliance assessment. If more than 10 days are invalid over a year the operator shall, within 28 days of becoming aware of this fact, review the causes of the invalidations and submit to the Environment Agency for approval, proposals for measures to improve the reliability of the continuous measurement systems, including a timetable for the implementation of those measures; and implement the approved proposals.

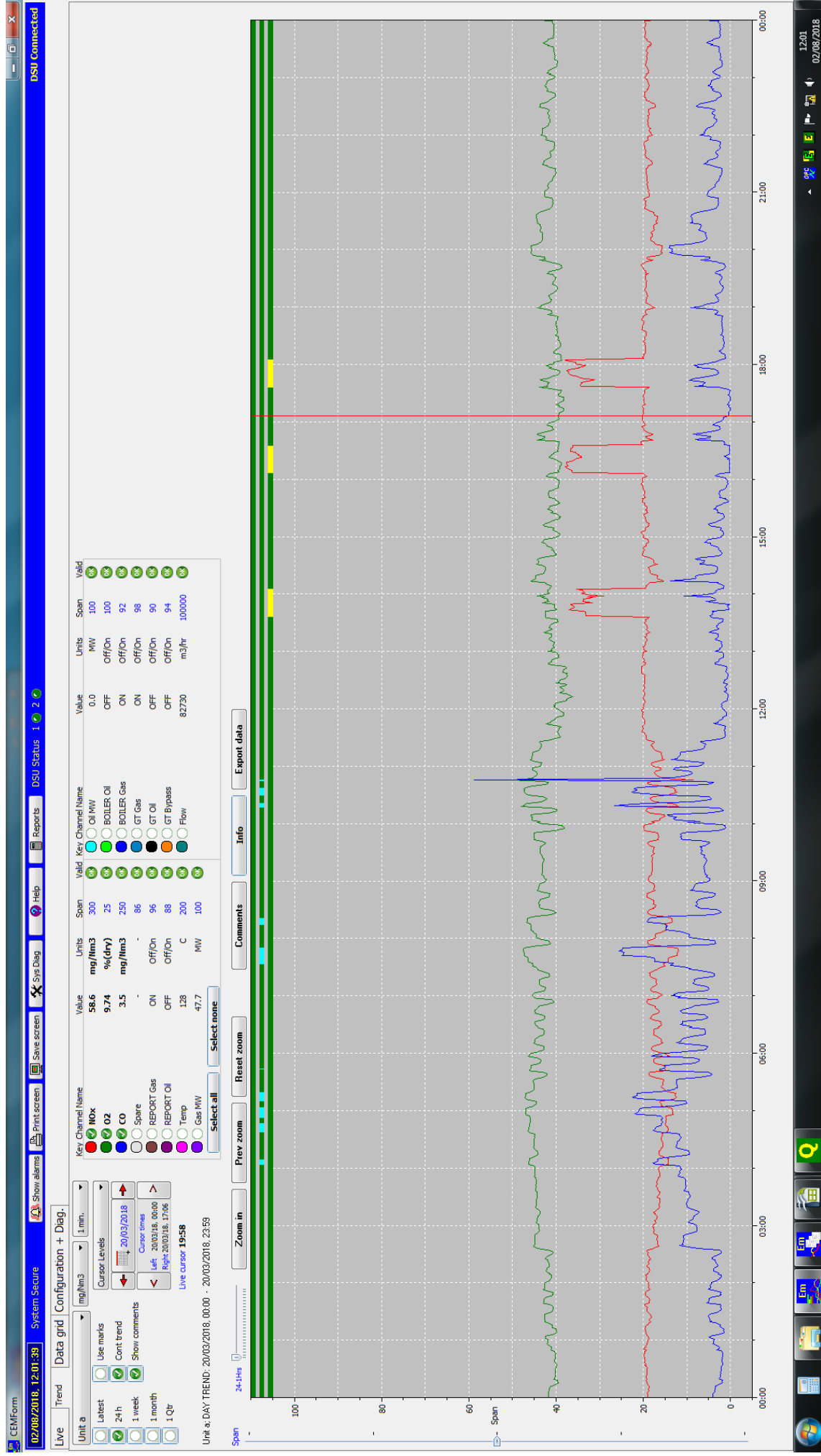
Signed on behalf of the Operator by:Jude Sartor.....

Date of return: ...2nd August 2018.....

Appendix 2

CEM trends for Invalid Days

20/03/2018



CEMForm
02/09/2018, 12:02:32 System Secure
DSU Connected
DSU Status: 1 2

Live Trend Data grid Configuration + Diag.

Unit a mg/m³ 1 min.

Latest 24-h 1 week 1 month 1 Qtr

Use marks Cont Trend Show comments

Cursor times
Left: 28/05/2018, 00:00
Right: 28/03/2018, 17:06

Live cursor 06:31

Unit a: DAY TREND: 28/05/2018, 00:00 - 28/05/2018, 23:59

Span 24-hrs

Zoom in Zoom out Prev zoom Reset zoom Comments Info Export data

Key Channel Name	Value	Units	Span	Valid	Key Channel Name	Value	Units	Span	Valid
NOx	101.4	mg/m ³	300	▲	Oil MW	0.0	MW	100	●
O ₂	10.54	% (dry)	25	▲	BOILER Oil	OFF	Off/On	100	●
CO	3.9	mg/m ³	250	▲	BOILER Gas	ON	Off/On	92	●
Spare	-	-	86	●	GT Gas	ON	Off/On	98	●
REPORT Gas	ON	Off/On	96	●	GT Oil	OFF	Off/On	90	●
REPORT Oil	OFF	Off/On	88	●	GT Bypass	OFF	Off/On	94	●
Temp	127	C	200	●	Flow	82730	m ³ /hr	100000	●
Gas MW	39.8	MW	100	●					

A set of small navigation icons typically found in Beamer presentations, including symbols for back, forward, search, and other slide controls.

10

1000

1000

10

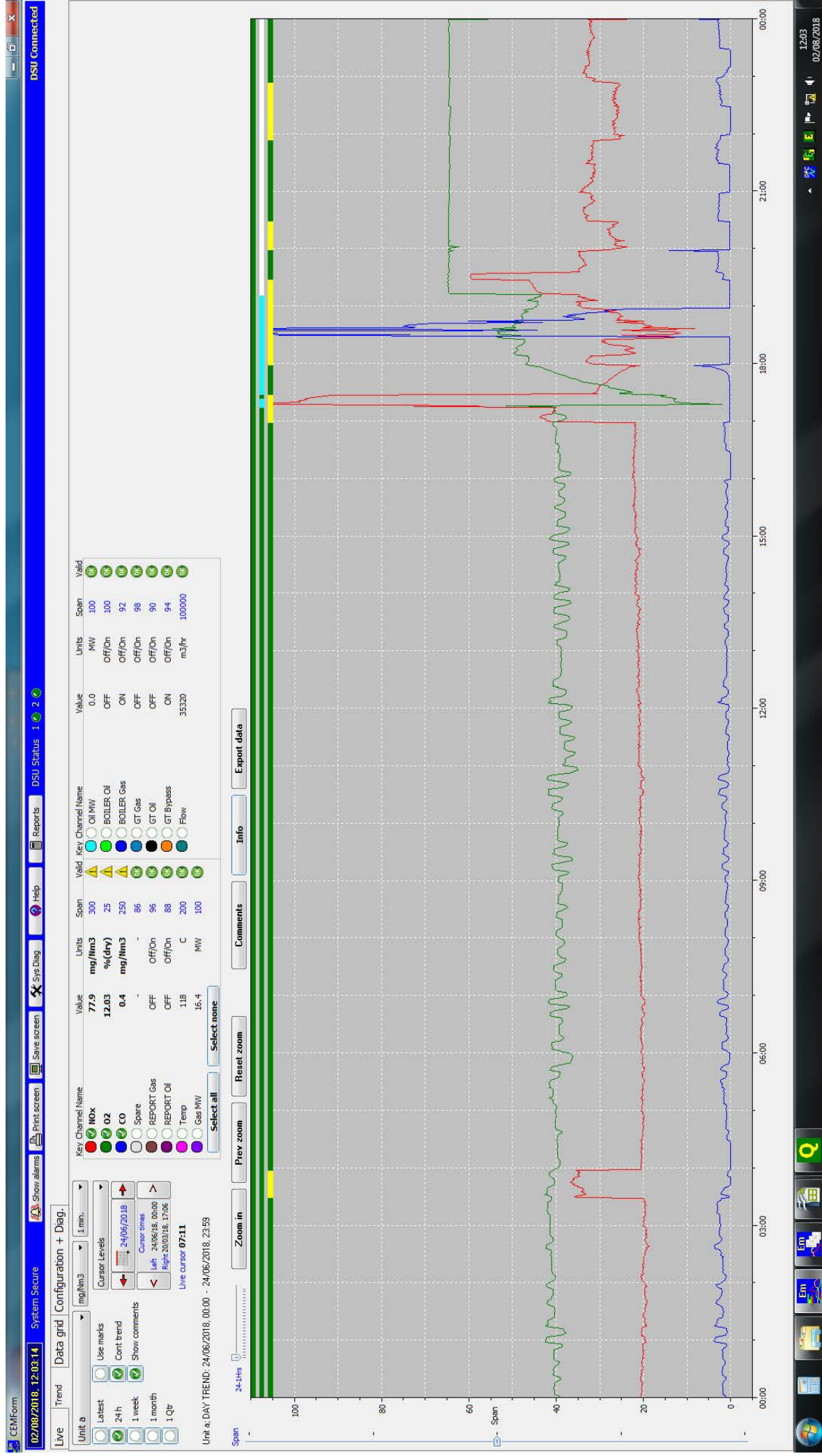
1000

100

10



24/6/18



CENForm | System Secure | 02/09/2018, 12:03:14 | DSU Connected

Live Trend Data grid Configuration + Diag.

Unit a mg/m³ 1 min. Cursor Levels: Latest 24 h 1 week 1 month 1 Qtr. Cont trend Show comments. Left: 26/06/2018, 00:00 Right: 20/03/18, 17:06 Live cursor 12:52

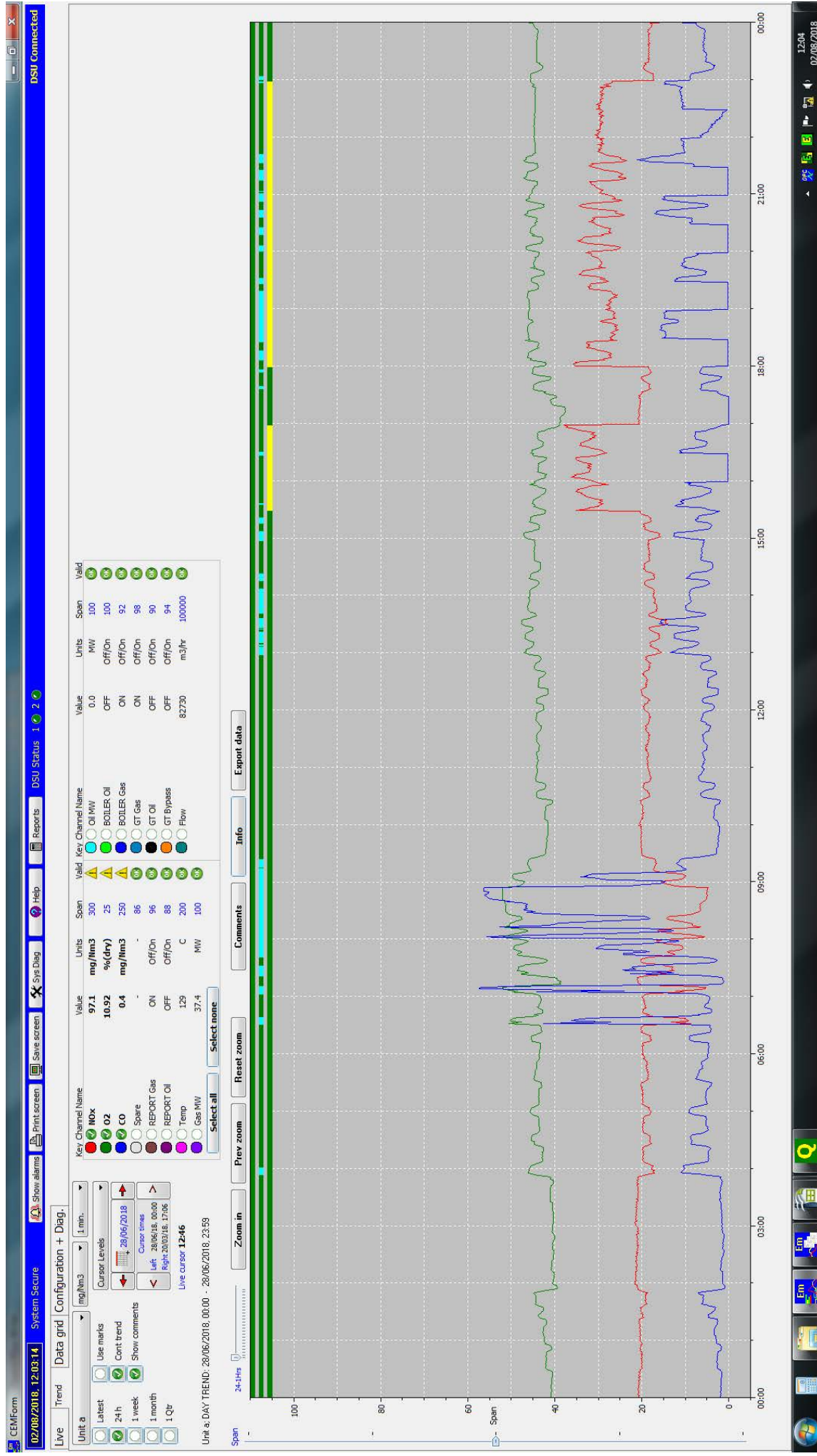
Unit a DAY TREND: 26/06/2018, 00:00 - 26/06/2018, 23:59

Key Channel Name	Value	Units	Span	Valid	Key Channel Name	Value	Units	Span	Valid
H0x	122.4	mg/lm3	300	▲	Oil MW	0.0	MW	100	●
O2	10.38	% (dry)	25	▲	BOILER Oil	OFF	Off/On	100	●
CO	0.4	mg/lm3	250	▲	BOILER Gas	ON	Off/On	92	●
Spare	-	-	86	●	GT Oil	OFF	Off/On	98	●
REPORT Gas	OFF	Off/On	96	●	GT Gas	OFF	Off/On	90	●
REPORT Oil	OFF	Off/On	88	●	GT Bypass	ON	Off/On	94	●
Temp	118	C	200	●	Flow	46050	m3/hr	100000	●
Gas MW	24.3	MW	100	●					

Select all Select none Prev zoom Reset zoom Zoom in Zoom out Comments Info Export data

Span 24-Hrs

28/6/18



CEMForm 02/09/2018, 12:04:49 System Secure DSU Connected

Live Trend Configuration + Diag.

Unit a mg/m³ 1 min.

Cursor Levels

24 h 1 week 1 month 1 Qtr

Use marks Cont trend Show comments

Cursor times

Left: 30/06/2018, 00:00 Right: 20/03/18, 17:06

Live cursor 15:54

Unit a, DAY TREND: 30/06/2018, 00:00 - 30/06/2018, 23:59

Key Channel Name	Value	Units	Span	Valid	Key Channel Name	Value	Units	Span	Valid
NOx	94.7	mg/m ³	300	▲	Oil MW	0.0	MW	100	●
O ₂	11.21	% (dry)	25	▲	BOILER Oil	ON	Off/On	100	●
CO	0.4	mg/m ³	250	▲	BOILER Gas	ON	Off/On	92	●
Spare	-	-	86	●	GT Oil	ON	Off/On	98	●
REPORT Gas	ON	Off/On	96	●	GT Gas	OFF	Off/On	90	●
REPORT Oil	OFF	Off/On	88	●	GT Bypass	OFF	Off/On	94	●
Temp	126	C	200	●	Flow	82730	m ³ /hr	100000	●
Gas MW	36.1	MW	100	●					

Select all Select none

24-Hrs

Zoom in Prev zoom Reset zoom

Comments Info Export data

Span

12/7/18



CEMForm
02/09/2018, 12:05:21
System Secure
DSU Connected

Show alarms
Print screen
Save screen
Sys Diag
Help
Reports
DSU Status
1
2

Live **Trend** **Data grid** **Configuration + Diag.**

Unit a

mg/m³ 1 min.

Cursor Levels

24 h

1 week

1 month

1 Qtr

Use marks

Cont trend

Show comments

Cursor times

Left: 15/07/18, 00:00

Right: 20/03/18, 17:56

Live cursor 09:39

Key Channel Name	Value	Units	Span	Valid	Key Channel Name	Value	Units	Span	Valid
NOx	60.6	mg/m ³	300	OK	Oil MW	0.0	MW	100	OK
O ₂	10.34	%(dry)	25	OK	BOILER Oil	OFF	Off/On	100	OK
CO	0.1	mg/m ³	250	OK	BOILER Gas	ON	Off/On	92	OK
Spare	-	-	86	OK	GT Gas	ON	Off/On	98	OK
REPORT Gas	ON	Off/On	96	OK	GT Oil	OFF	Off/On	90	OK
REPORT Oil	OFF	Off/On	88	OK	GT Bypass	OFF	Off/On	94	OK
Temp	127	C	200	OK	Flow	82730	m ³ /hr	100000	OK
Gas MW	-40.0	MW	100	OK					

Select all
Select none

Unit a, DAY TREND: 14/07/2018, 00:00 - 14/07/2018, 23:59

Span 24 hrs

Zoom in

Zoom out

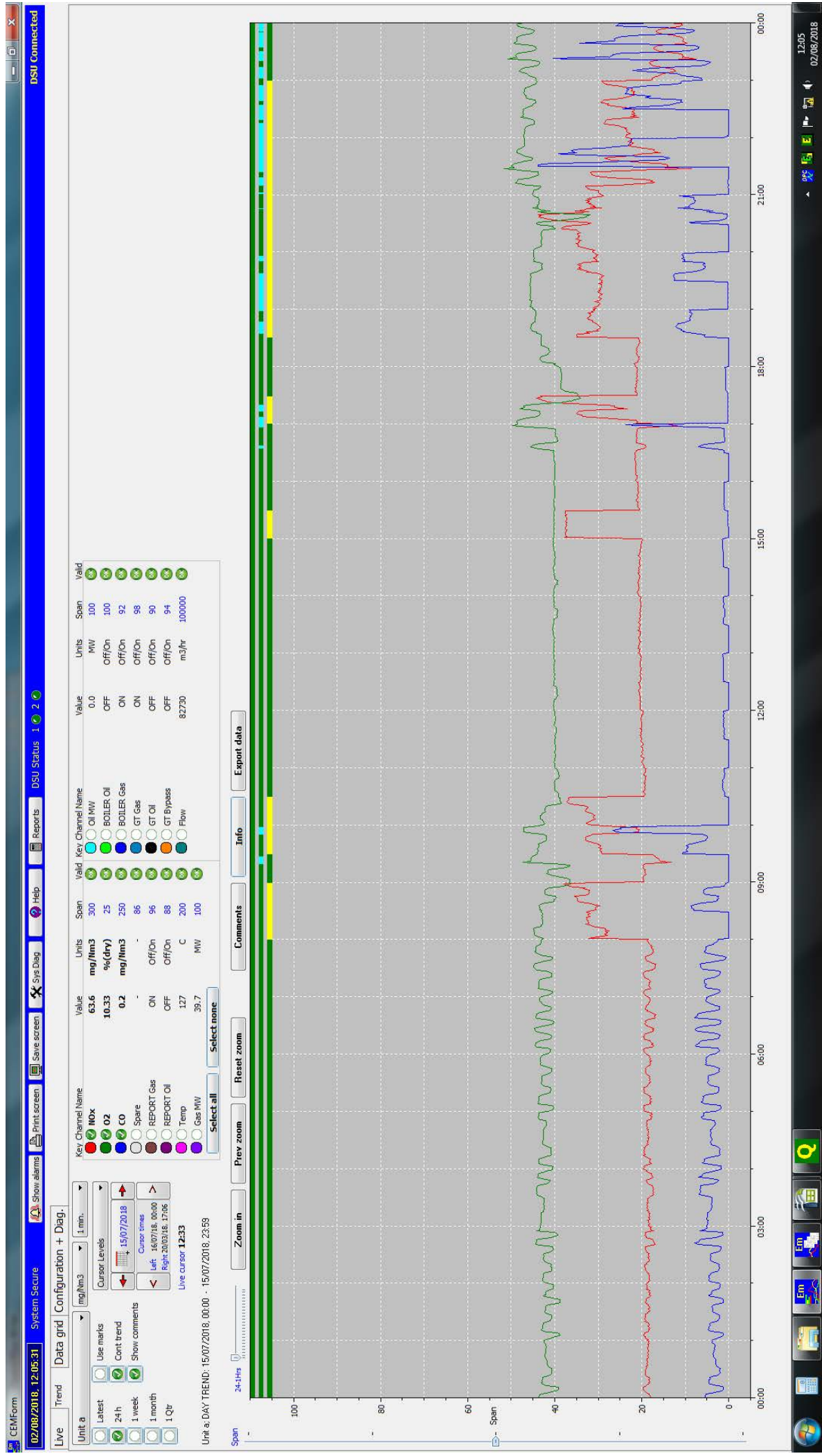
Reset zoom

Comments

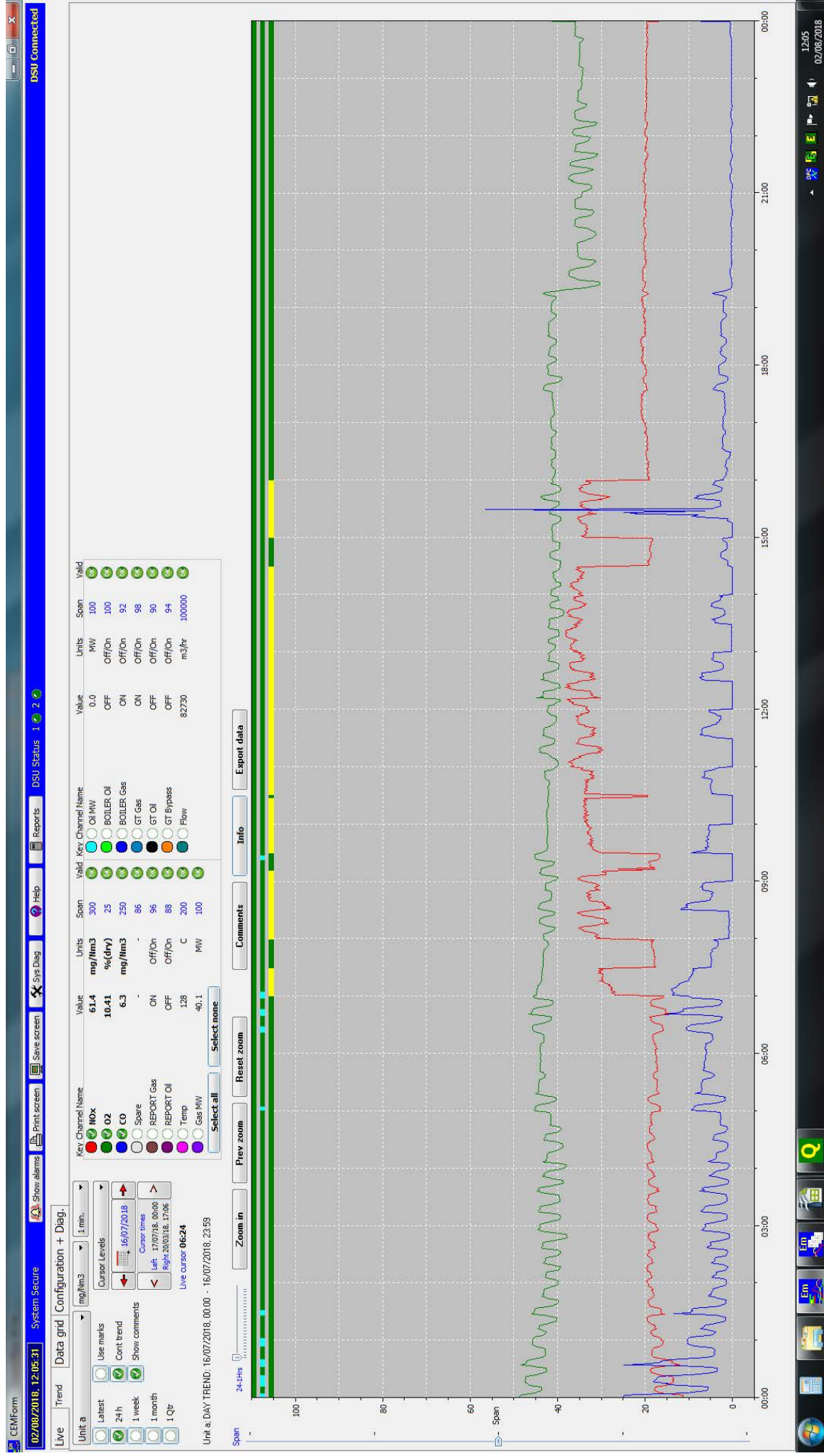
Info

Export data

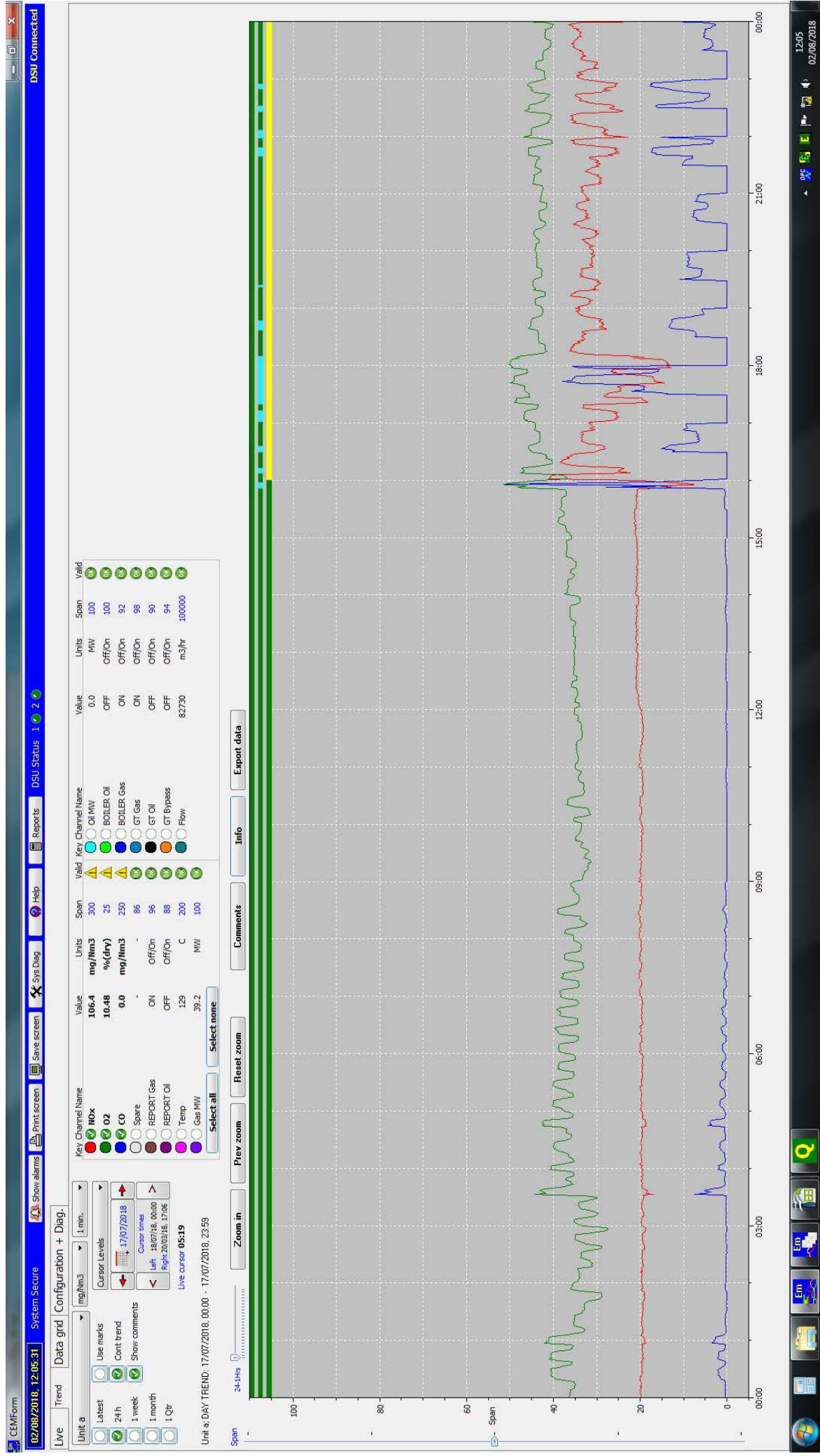
15/7/18



16/7/18



17/7/18



CEMForm

02/08/2018, 12:05:03 System Secure

DSU Connected

DSU Status 1 2

Live Trend Data grid Configuration + Diag.

Unit a

mg/m³ 1 min.

Cursor Levels

Latest

24h

1 week

1 month

1 Qtr

Use marks

Cont trend

Show comments

Cursor times

Left: 18/07/2018, 06:00

Right: 20/02/18, 17:05

Live cursor 12:46

Unit a DAY TREND: 18/07/2018, 00:00 - 18/07/2018, 23:59

Key Channel Name	Value	Units	Span	Valid	Key Channel Name	Value	Units	Span	Valid
NOx	77.9	mg/m ³	300	▲	Oil MW	0.0	MW	100	●
O2	11.76	% (dry)	25	▲	BOILER Oil	OFF	Off/On	100	●
CO	0.1	mg/m ³	250	▲	BOILER Gas	ON	Off/On	92	●
Spare	-	-	86	●	GT Gas	ON	Off/On	98	●
REPORT Gas	OFF	Off/On	96	●	GT Oil	OFF	Off/On	90	●
REPORT Oil	OFF	Off/On	88	●	GT Bypass	OFF	Off/On	94	●
Temp	130	C	200	●	Flow	82730	m ³ /hr	100000	●
Gas MW	34.7	MW	100	●					

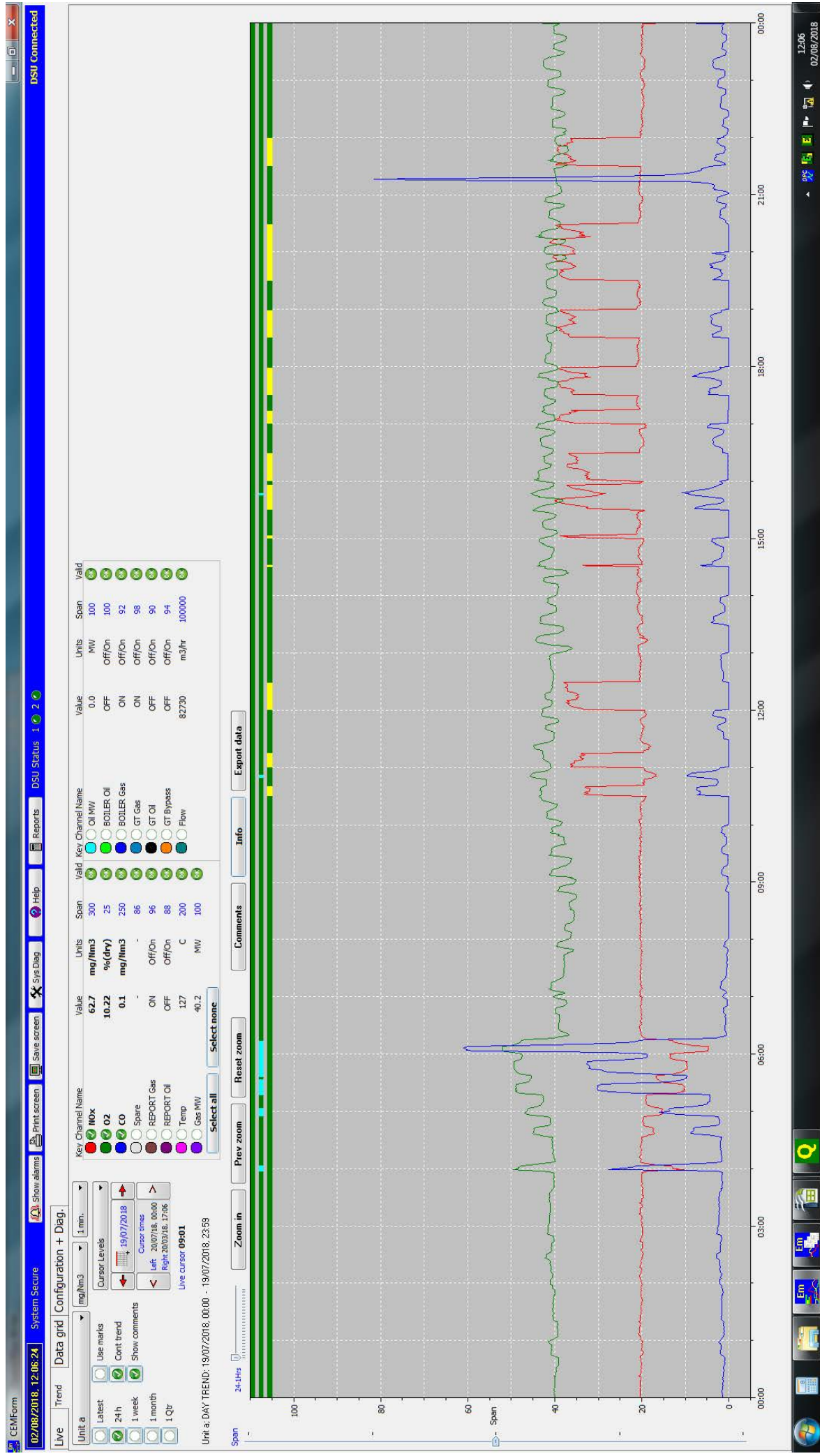
Select all Select none

Prev zoom Reset zoom

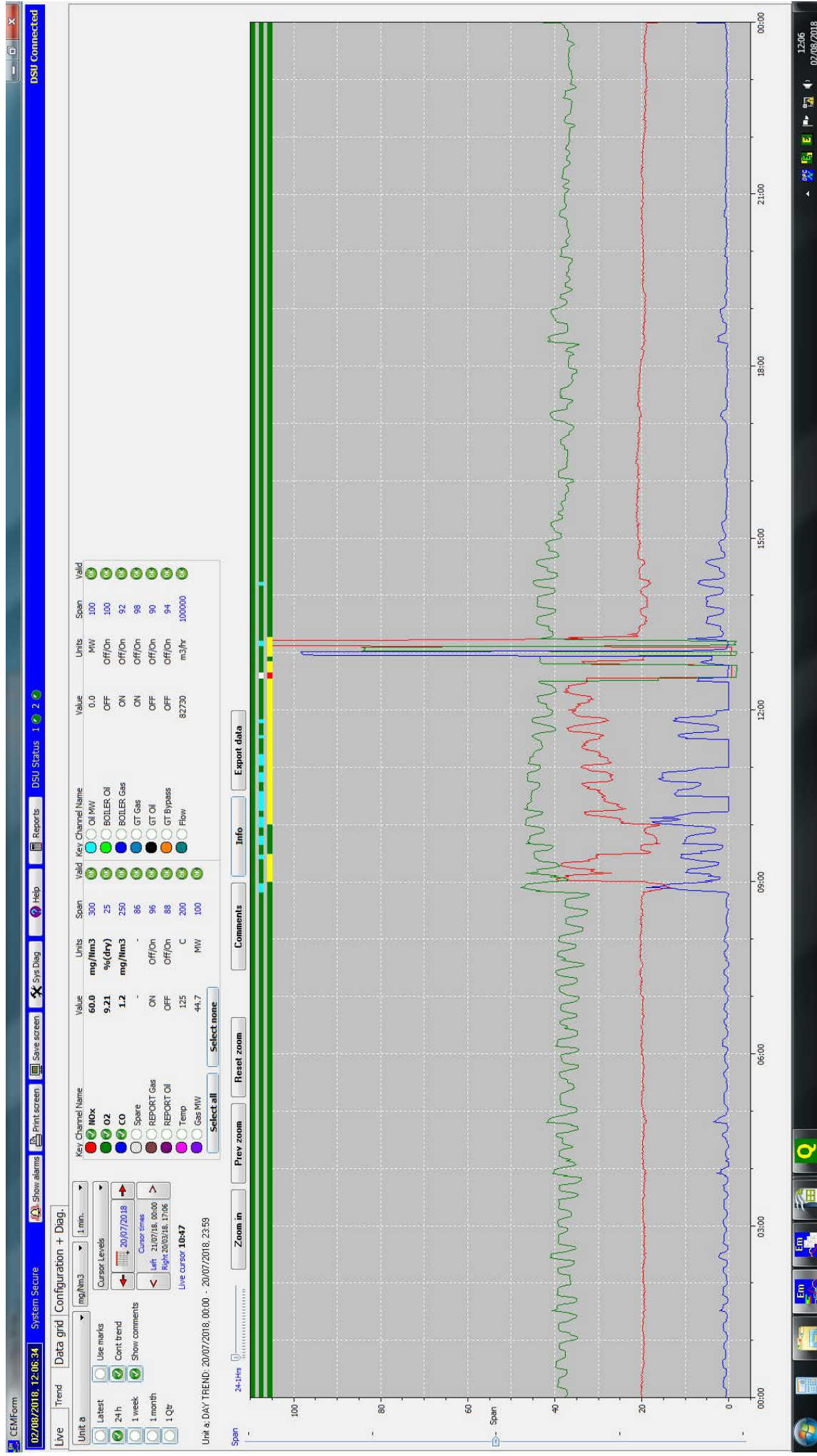
Comments Info Export data

Span 24-Hrs

19/7/18



20/7/18



Appendix 3

Inside of the CEM unit

