



Siloxane Monitor Operators MANUAL

SILOXANE MONITOR MANUAL
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1.0 STS SILOXANE MONITOR



2.0 MANUAL GUIDE

2.1 DOCUMENT VERSION

Issued by	Author	Issue Date	Revision Number
STS	Jim Ward	19/10/2016	1.0
STS	Jim Ward	20/10/2016	1.1 Final
STS	Jim Ward	26/05/2017	1.2 4-20 Error codes P20
STS	Jim Ward	26/05/2017	1.3 Nitrogen connection info P7

2.2 SYMBOLS USED

	Safety Warning	Identifies potential hazards to either	Failure to follow this information may result in physical injury that in some
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		the user or the installation.	cases could be fatal, cause irrevocable damage to the instrument or damage to the environment.
	Electrical Hazard	Identifies specific electrical hazards to the user.	Failure to follow this information may result in physical injury that in some cases could be fatal or may cause irrevocable damage to the instrument.
	Notes	Identifies areas where clarification may be required.	

3.0 INTRODUCTION

3.1 COMPANY INFORMATION

STS Instruments have 25 years of experience in designing, developing, manufacturing and selling scientific instruments for sale in the UK and for export.

The STS Siloxane Monitor has been designed to continuously monitor the gas stream on biogas and landfill gas generation systems to quantify the level of potentially engine damaging Siloxanes in the Gas. In particular, the application of the instrument is for the monitoring of protective filtration devices and regenerative filtration systems in order to maximise the useful lifetime of the filter and to ensure timely replacement before Siloxane saturated gas can damage CHP engines.

The system is designed to be low maintenance, simple to use and provides clear and understandable data.

The following manual describes the instrument, its operation and installation and how it should be maintained and serviced.



Should at any point you require additional help or information on the use or installation of the system please contact STS directly at: sales@safetrainingsystems.com or +44 (0) 1344 483563

3.2 SAFETY INFORMATION



The STS Siloxane Monitor operates from a 110V mains supply, the instrument case should not therefore be opened without having first isolated the power supply and disconnected the kettle lead from the rear of the instrument. The high voltage section of the instrument is protected by clear cover - this should not be removed unless necessary- having followed the above instructions. **FAILURE TO ISOLATE THE SUPPLY MAY RESULT IN ELECTRIC SHOCK.**

It is the responsibility of the owner of the instrument to complete a risk assessment on its installation, operation and servicing before being commissioned for use.

Inhalation of gases may be harmful to health, it is the responsibility of the operator to ensure they have adequate training in the safety aspects of handling biogas/landfill gas and that they follow appropriate procedures at all times. The vent/exhaust from the instrument must be piped to an area designated safe to discharge to atmosphere- a flame arrestor may be required to be fitted.

Installation and Maintenance of the unit should only be carried out by suitably trained personnel according to the applicable code of practice.

Maintenance should be carried out only using STS approved replacement parts and components - use of substitutes will invalidate the warranty and may be hazardous to both operator and instrument.

No alterations should be made to the instrument or its ancillary components.

Failure to comply with the instructions in this manual could result in injury to the user.

The instrument captures fuel gas any work associated with the instrument must be carried out by a class of person competent and certified to do so.



Should at any point you require additional help or information on the safe installation or use of the system please contact STS immediately at: sales@safetrainingsystems.com or +44 (0) 1344 483563

3.3 RECOMMENDED HANDLING PROCEEDURE

The siloxane instrument is a bulk item that weighs 12Kg that may exceed the manual lifting ability for a one man lift. Installers are required to perform a manual handling risk assessment before lifting the instrument. Lifting operations should be carried out in accordance with the Manual Handling Operations Regulations 1992.

Where the instrument is supplied complete with sampling apparatus and installed in a kiosk the combined item is considered too bulky for a safe one man lift, and mechanical means or team lift is considered necessary. The supervisor of the lift should perform a risk assessment prior to performing any lifting operation and take account of the legal requirements Manual Handling Operations Regulations 1992 and the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

The equipment is delicate electronic equipment and should as far as is practicable be protected from jolting or impacts during handling.

3.4 ENVIRONMENTAL PARAMETERS

- The Siloxane Monitor is not weatherproof and must be housed in a suitable kiosk or cabinet if sited outside of a building
- If siting inside a building consideration should be given to the local conditions as regards to dust, moisture and ventilation the Monitor is available supplied in a 19" rack case suitable for indoor use with inbuilt thermostatically controlled extraction fans.
- The monitor is suitable for use between 5C and 45C without additional cooling/heating required.
- Gas supply to the instrument should be at a minimum of 200mbar
- Adequate ventilation/air passage around the instrument should be provided.

3.5 INSTRUMENTATION SAFETY SYMBOLS

	Caution
	Electrical Hazard
	Earth Point
	Hot Surface

4.0 OVERVIEW

4.1 STANDARD INSTRUMENT FEATURES

- Membrane Keypad suitable for gloved use
- Clear large LCD display
- Internal datalogging with on screen recall
- Removable SD data card for data download
- Shock mounted feet to prevent vibration effects
- 3 pin kettle lead
- Temperature controlled operation

4.2 THE INSTRUMENT

4.2.1 MONITOR & KIOSK



4.3 SD CARD



The SD card is located on the front panel of the instrument. The card stores all the data created by the instrument.

The Instrument will not correctly run without this SD card and will CRASH upon starting a Logging Cycle.

4.4 NITROGEN CONNECTION

Before operation the Nitrogen cylinder must be connected and turned on. The Nitrogen is required to be set to 1.0 Bar.

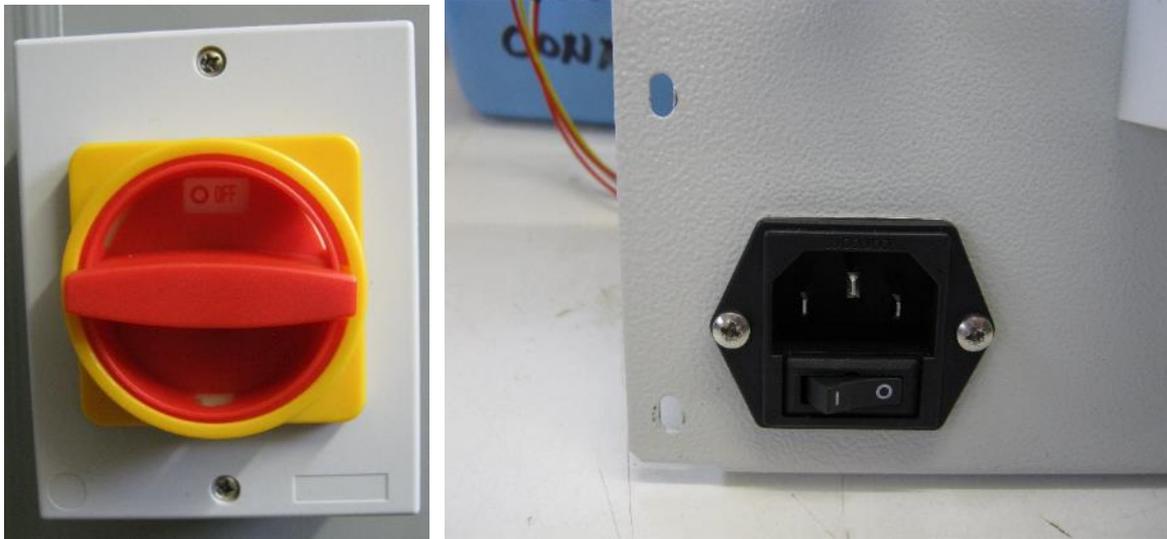
Nitrogen should be of Technical Grade 99.999% purity. A standard N₂ regulator should be fitted to the cylinder and the Special adaptor fitting supplied by STS used to connect the ¼" pipe.



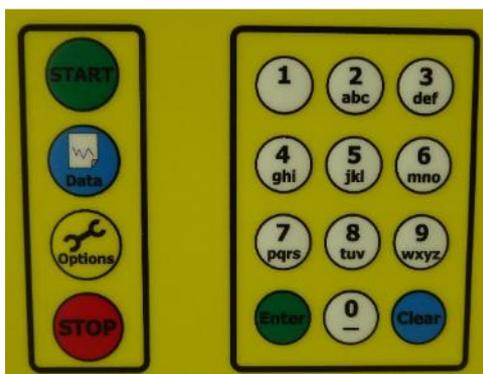
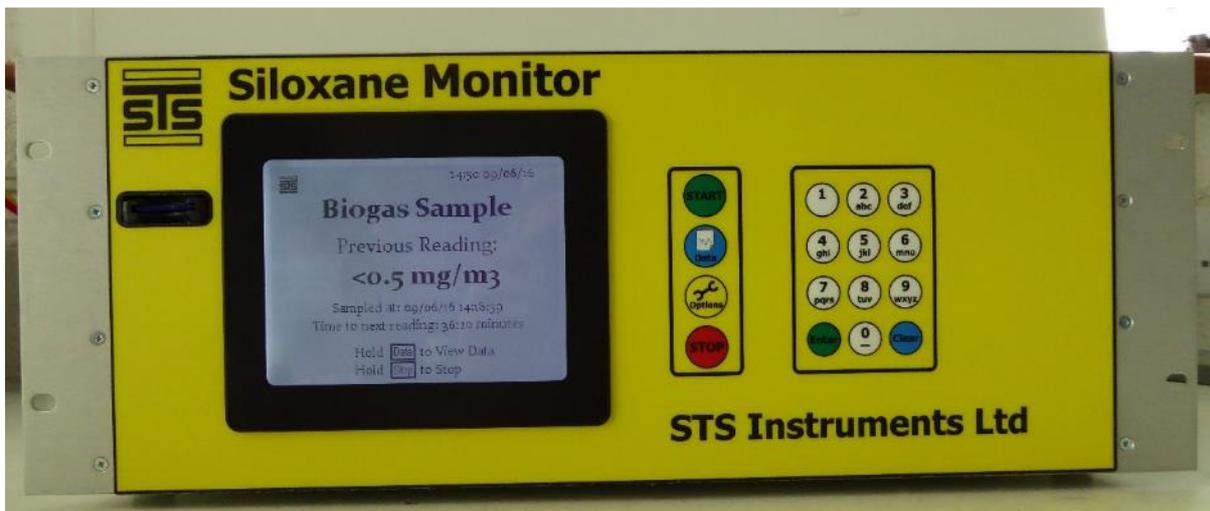
5.0 OPERATION

5.1 TURN ON

The instrument is powered from the kiosk - there is an external switch which should be in the ON position and a switch on the rear panel of the instrument where the kettle lead is connected.



If the instrument is currently logging the screen below is displayed.



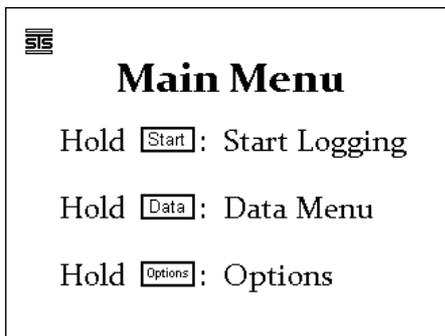
If not the screen will display the main menu. To start the logging cycle hold the Start Button to begin. The instrument will depressurise and then commence its sampling routine - the instrument will display the time left until the next reading will be displayed.

5.2 MENU OPTIONS

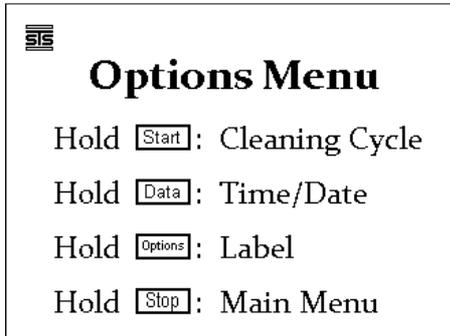
5.2.1 SET DATE AND TIME & LABEL

Once commissioned the instrument should have already had the date and time set and also the data label. If, however this needs to be changed then follow the procedure below.

From the Main Menu Select the Options Menu.

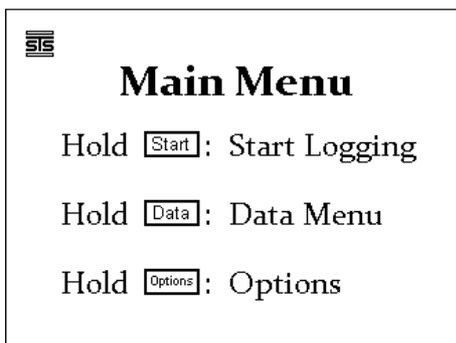


Enter the Options menu:



Select Time/Date and enter using the keypad. Once entered hold start to confirm.

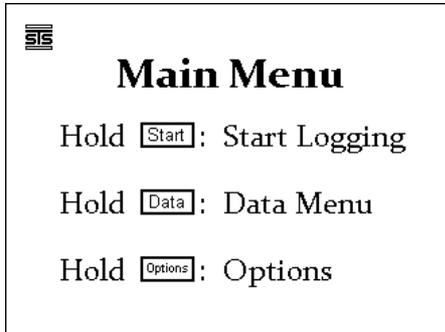
Hold stop to return to the Main Menu screen.



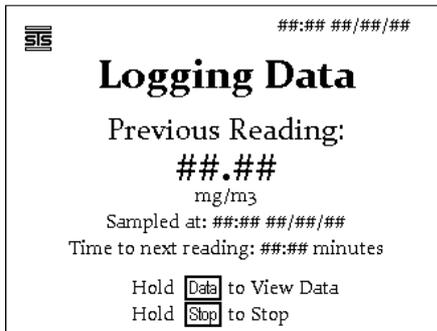
The instrument is now in a standby mode ready for the next stage.

5.2.2 STARTING & STOPPING A READING CYCLE

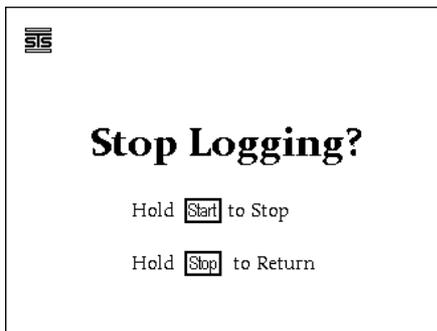
To start continuous Biogas sampling, press START on the main menu:



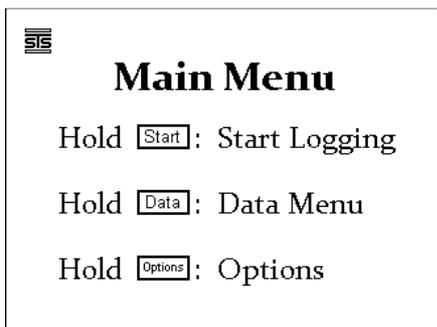
To stop the instrument during a measurement cycle. Hold STOP, this will bring up a confirmation screen:



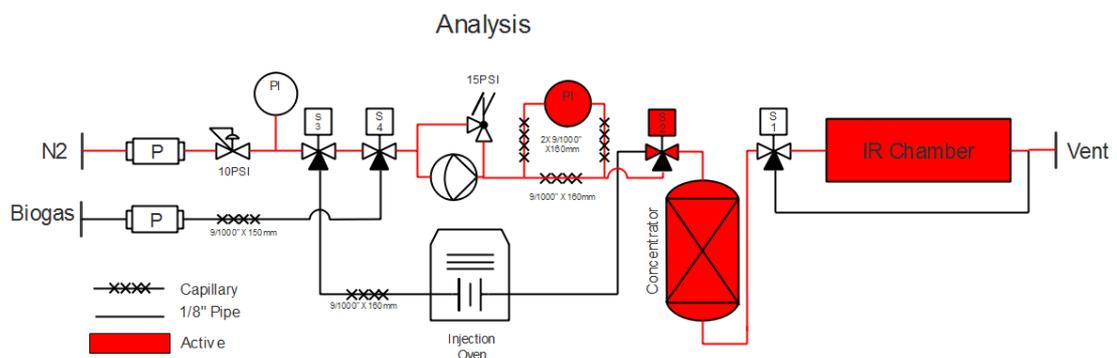
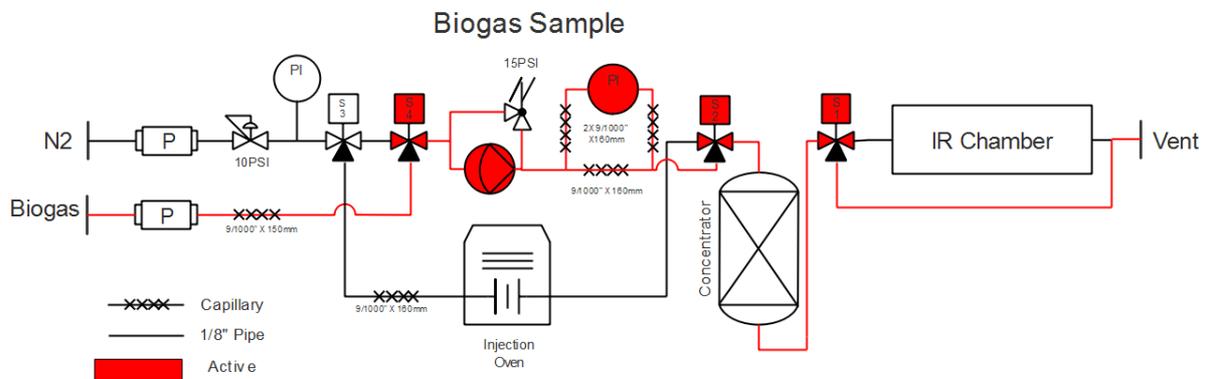
Hold START to confirm:



This will then return the instrument to the main menu:



The instrument is now in a standby mode ready for the next stage.



5.2.3 CLEANING CYCLE

If the readings on the instrument appear to be continually increasing or the instrument does not return to the expected baseline after a filter change it may be prudent to run a cleaning cycle to ensure there are no contaminants lodged in the instrument.

To run a cleaning cycle:

To do this the cleaning cycle should be run from the main menu:

SIS

Main Menu

Hold **Start**: Start Logging

Hold **Data**: Data Menu

Hold **Options**: Options

Enter the Options menu:

SIS

Options Menu

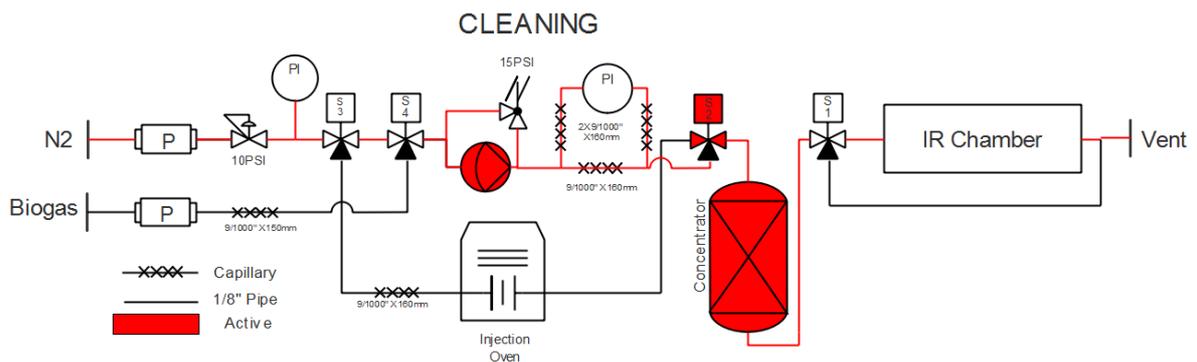
Hold **Start**: Cleaning Cycle

Hold **Data**: Time/Date

Hold **Options**: Label

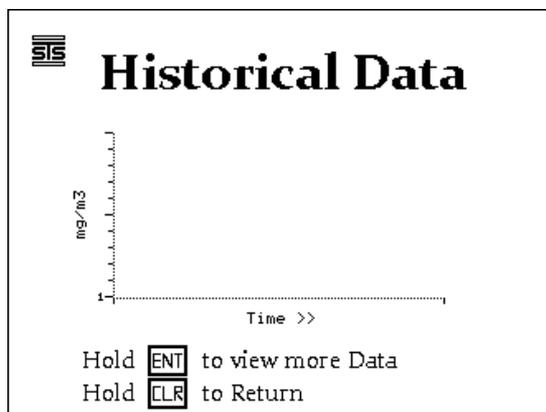
Hold **Stop**: Main Menu

Hold Start to commence the cleaning cycle. This cycle will continuously repeat until stopped. The instrument is clean, once it records a concentration reading of <math><0.5\text{ mg/m}^3</math>.



5.2.4 VIEWING DATA ON SCREEN

Holding **DATA** will display a Bar Graph of the last 200 readings since powered, auto scaled to the highest concentration or 5mg/m³, whichever is higher.



Hold **DATA** again to view these concentrations and their timestamps. Holding **ENTER** will cycle through pages, **CLEAR** will return to Main Menu.

Historical Data

ID#	Conc.(mg/m ³)	Date/Time

Hold **ENT** to view more Data
Hold **CLR** to Return

5.2.5 DATA DOWNLOAD VIA SD CARD

DATA MENU: Inside this menu you can view the previous 200 readings since powered and put the instrument into a state ready for SD Card removal.

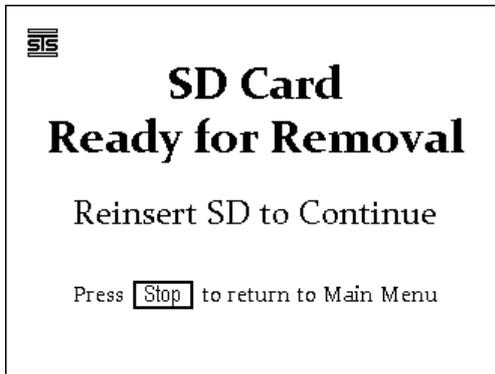
Data Menu

Hold **Start**: View Data

Hold **Data**: Remove SDCard

Hold **Stop**: Main Menu

- Holding **START**: Will take you to the data displays covered previously.
- Holding **DATA**: Prepare the instrument for SD Card removal. Hold **STOP** to return.



1. The Card will contain the stored data under the folder **/RESULTS**.
2. In this folder there will be a .CSV file, titled with the ID label, which can be opened with **MS EXCEL**.
3. These files will have a numerical subscript, increasing as the data accumulates. Each .CSV file contains 99 data reading.
4. This .CSV file contains detailed variables of the instrument operation. The values of Concentration, Final Mass, and Sample Volume will be the most relevant. Other values are valuable for STS analysis, but can be switched off if necessary
 - a. Additional optical Bench data is logged in the **/GRAPHS** folder.
5. It is recommended that the SD card Data is removed and backed up into external storage. **As data is accumulated onto the card, the speed at which the Data can be written decreases.**



The instrument will not run without the SD card being inserted - please insure it is re-inserted correctly after data download.

6.0 REMOTE DATA COMMS USE

Logon to data site - www.metronview.com

Metron VIEW
Telemetry that makes sense
The world of advanced telemetry at your fingertips

Fit a Metron and enjoy the benefits right away...

Welcome to Metron VIEW!

Log In
User Name:
Password:

[Forgot your password?](#)

Site version 1.32 of 2015-09-24. © 2010-2015 Powelectrics Limited. All rights reserved.

Powelectrics

Input login and password as provided separately to this document.

The home screen will then display all the devices to which you have viewing rights.

Dashboard | Devices

Welcome to Metron VIEW!

Through this browser based interface you can view and export data from M2M & telemetry devices.

- View devices that have not communicated recently
- View check results

A summary of your devices can be seen below and by using the devices option from the menu. If you have administration rights you will be able to manage your devices from the relevant menu item.

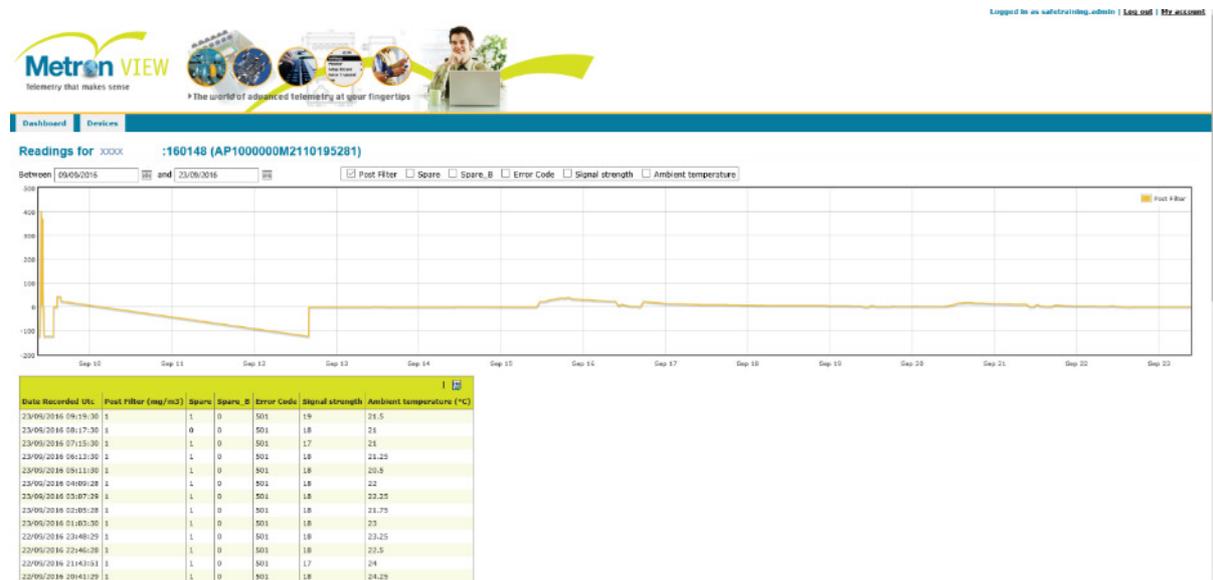
	Name	Last comms	Value 1	Value 2	Value 3	Value 4	Value 5	Value 6	Ambient temp.	Carrier	Signal	Status
View	AP1000000M2110195281	02/08/16 15:17	500	-122	-122	0			27.25	vodafone UK	14	Live
View	AP1000000M2110195743	12/08/16 10:37	-24	-24	-24	-24			22.5	EE	14	Live

Site version 1.32 of 2015-09-24. © 2010-2015 Powelectrics Limited. All rights reserved.

Powelectrics

Click on the view icon on the left hand side of an entry to see the data for that device.

Select the data date range from the calendar icons at the top of the graph. The selected data is then displayed as a graph and a table as below.



To download the data as a csv file click on the csv file icon on the top right hand corner of the data table

	t3 (%)	t4 (%)	Signal strength	Ambient temperature (°C)
	-122	0	14	27.25
			15	26.25
			16	26
			16	26
			16	26.25
			14	26.25
			14	26
			14	26
			15	26
			15	26

The data is downloaded as a csv file in this format:

A	B	C	D	E	F	G	H	I
Date Recorded Utc	t1 (%)	t2 (%)	t3 (%)	t4 (%)	Signal strength	Ambient temperature (°C)		
02-08-16 15:17	500	-122	-122	0	14	27.25		
02-08-16 15:10	500				15	26.25		
02-08-16 15:07	500				16	26		
02-08-16 15:04	500				16	26		
02-08-16 14:59	500				16	26.25		
02-08-16 14:57	500				14	26.25		
02-08-16 14:53	500				14	26		
02-08-16 14:51	500				14	26		
02-08-16 14:48	500				15	26		
02-08-16 14:45	500				15	26		
02-08-16 14:42	500				11	26		
02-08-16 14:39	500				9	26		
02-08-16 14:36	500				12	26		
02-08-16 14:33	500				13	26		
02-08-16 14:29	500				14	26		
02-08-16 14:27	500				13	26		
02-08-16 14:24	500				15	26		
02-08-16 14:20	500				12	26		
02-08-16 14:18	500				12	26		

7.0 USER MAINTENANCE

7.1 ROUTINE OPERATOR CHECKS

Operators should check on the instrument weekly giving a visual inspection of the kiosk, Nitrogen supply bottle, sample line, nitrogen supply line, vent line and drain line. The kiosk should be checked for any damage to fittings, integrity of seals and security. The instrument and ancillaries should be visually checked for any damage, water ingress and loose pipework/fittings. Any defects should immediately be notified to the instrument maintainer.

7.1.1 AUTOMATED WATER TRAP

The automated water trap is designed to remove excess moisture form the gas stream before entering the instrument.



The automated trap will activate when the internal float rises sufficiently to trigger the solenoid valve to be opened. The trap should therefore always be empty, if it is not and there is water present in the trap please inform your instrument maintainer Urgently. Water being taken into the instrument could cause terminal failure.

7.1.2 COALESCING FILTER

The coalescing trap is designed to remove very fine water particles from the gas stream, it should be situated in line between the water trap and the flame arrestor. This trap does not drain and should not have any visible water inside. If there is water present, the filter element should be changed immediately and the auto drain trap should also be checked to ensure its correct function.



The Coalescing filter should be changed annually - once replaced ensure that the vessel is pressure tested for leaks before setting the system live.



If you are unsure who your maintenance contract is with - or if there is one in place please contact STS Instruments on 01344 483563, sales@safetrainingsystems.com for advice.

8.0 FAULT IDENTIFICATION

8.1 INSTRUMENT ERROR CODES

All Faults will cause instrument to enter a Safe Mode Configuration. In Safe Mode the instrument disables the heaters and the biogas input into the system.

- Fault# 1: Communications Error. Board Faulty.
- Fault# 2: Low Nitrogen Error. Check supply pressure, if empty -Replace Supply. If there is still an error, internal Plumbing is Faulty.
- Fault# 4: High Nitrogen Error. Internal Plumbing is Faulty.
- Fault# 8: Sample Volume Low Error. Internal Pump Faulty.
- Fault# 10: Sample Volume High Error. Internal Pump Faulty, or Biogas Pressure too high.
- Fault# 20: Concentrator Oven Low Error. Oven Heater is Faulty or Board.
- Fault# 40: Concentrator Oven High Error. Oven Heater is Faulty or Board.
- Fault# 80: Calibration Oven Low Error. Oven Heater is Faulty or Board.
- Fault# 100: Calibration Oven High Error. Oven Heater is Faulty or Board.
- Fault# 200: Internal Temperature High Error. Internal temperature is >60degreesC. Installation error or Oven Heater error.
- Fault# 400: CH4 High Error. Instrument CH4 threshold has been exceeded. Installation error, or internal plumbing.
- Fault# Optical Signal: Instrument analytical system or board faulty.
- Fault# Fans Faulty: Instrument purging system or board faulty.
-

Instrument will need resetting via the mains power upon a fault however an Internal Temperature error will automatically reset once the internal temperature has dropped below the threshold.

To reset the instrument at the error screen, Hold STOP.

8.2 4-20MA REMOTE DATA ERROR CODES

Error line 4-20mA reading:

0: Standby

25: Communications Fault

50: Fan Fault

75: CH4 High Fault

100: N2 Fault

125: Internal Temp Fault

150: Biogas Volume Fault

175: Concentrator Temp Fault

200: Logging Normally

9.0 WARRANTY & DECLARATIONS

9.1 MANUFACTURERS WARRANTY TERMS & CONDITIONS

Warranty Information

This instrument is guaranteed, to the original purchaser, against defect in materials and workmanship for a period of 12 months from the date of the shipment to the user.

During this period, STS will repair or replace defective parts on an exchange basis.

The decision to repair or replace will be determined by STS.

To maintain this warranty, the purchaser must perform maintenance and calibration as prescribed in the operating manual.

Normal wear and tear, and parts damaged by abuse, misuse, negligence or accidents are specifically excluded from the warranty.

If you have any questions relating to the warranty, please contact STS.



EU Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer:

Safe Training Systems Ltd
Holly House
Maidenhead Road
Wokingham
Berks
RG40 5RR
UK

Product: STS Instruments Siloxane Monitor



Equipment type: Fixed landfill & Biogas Analyser

The STS Siloxane Monitor as described in the Full Manual is in conformity with the relevant Union Harmonisation Legislation:

2014/30/EU: Electromagnetic Capability (EMC)

EN6100-6-4:2007 inc A1:2011

EN55011:2009 inc A1:2010

EN6100-3-2:2014

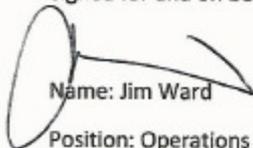
EN6100-3-3:2013

EN50270:2006

2014/35/EU: Low Voltage Directive

EN 61010-1:2010

Signed for and on behalf of:


Name: Jim Ward

Position: Operations Director

Company: Safe Training Systems Ltd

Date: 12/10/2016

Safe Training Systems Ltd – Holly House, Maidenhead Road, Wokingham, Berkshire RG40 5RR
Tel: +44 (0)1344 483563 Fax: +44 (0)1344 485175 Email: sales@safetrainingsystems.com
Web: safetrainingsystems.com Registered In England No.2654899 VAT no. GB572853808

9.3 WEEE COMPLIANCE INFORMATION

The wheelie bin symbol now displayed on equipment supplied by STS signifies that the apparatus must not be disposed of through the normal municipal waste stream but through a registered recycling scheme.

The Waste Electrical and Electronic Equipment directive (WEEE) makes producers responsible from July 1st 2007 in meeting their obligations, with the fundamental aim of reducing the environmental impact of electrical and electronic equipment at the end of its life.

STS is now registered with the Environmental Agency as a producer. Our Producer Registration Number is WEE/GF0727WW

If you wish to dispose of your instrument, please contact STS who will advise you on the next step in order to help us meet our obligations.