Sampler Module

Operation Manual

Document Ref: SL-065 v1.2

2-Wire
Addressable

2-WIRE SYSTEMS
SAMPLER MODULES

INVESTORS IN PEOPLE

bsi. ISO 9001 Quality Management FS646773 ISO 14001 Environmental Management EMS696504

internationalgasdetectors.com
+44 (0)161 483 1415
sales@internationalgasdetectors.com
/international-gas-detectors-ltd

Triton House
Crosby Street
Stockport
SK2 6SH

Standard Specifications

Power	24V DC
Construction	ABS Enclosure
Outputs	4 off SSR Outputs (Switched Neg 24V DC, Common 200mA load shared across all O/P's) OP1 Dedicated to Low Flow
Comms	IGD Sentinel+ 2-Wire Protocol
Temperature	-5 to 55 Deg C Full Specification.
Humidity	0-95% RH Non-Condensing
Pressure	Samples From Ambient Pressure to 10mBar Depression, Low Flow Indication at 23mBar Depression
Sealing	IP54
Mounting	Wall Mount
Weight	TOC-750S-CO2 (typical) 0.85Kg

Standard Features

Auto Zero / Cal

Constant Flow Monitoring With Low Flow Protocols

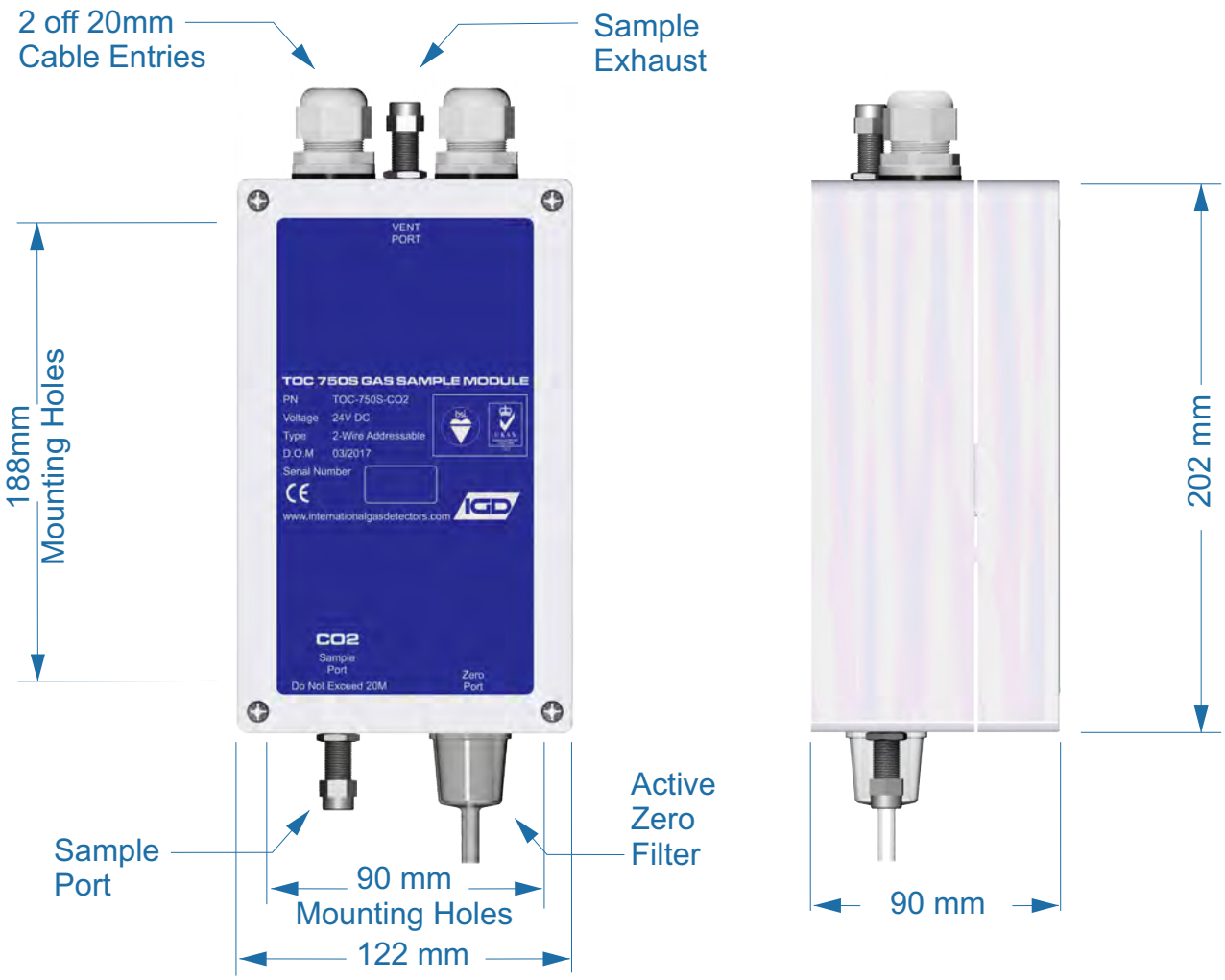
1.0 to 1.5L/Min Sample Rate

4 off SSR Outputs

Sample Module Order Codes

Order Code	Description
TOC-750S-CO	Carbon Monoxide Sampler Standard range 0-100ppm
TOC-750S-CO2	Carbon Dioxide Sampler Standard Range 0-5000 ppm
TOC-750S-FIL	Standard End Of Line Filter Assy
TOC-750S-H2	Hydrogen Gas Sampler Standard Range 0-2000ppm
TOC-750S-IRF	Flammable Gas Sampler Standard Range 0-100% LEL
TOC-750S-N20	Nitrous Oxide Sampler Standard Range 0-1000ppm
TOC-750S-NH3	Ammonia Gas Sampler Standard Range 0-500ppm
TOC-750S-O2	Oxygen Sampler Standard Range 0-25% Vol
TOC-750S-PN1	Luer Lock Thro' Wall Sample Point M20
TOC-750S-TBE	20m Reel Sample Tube 6mm X 4mm Polyurethane
TOC-750S-PN2	Low Maintenance End of Line Filter Assy
TOC-750S-CBF	Replacement Carbon Zero Filter
TOC-750S-SLF	Replacement Soda Lime Filter
TOC-750S-PCF	Replacement Standard Particulate Filter
TOC-750S-INF	Replacement Internal Protection Filter (Pack of 5)

Physical Details



Sample and exhaust ports suit 6mm OD x 4mm ID Soft tubing. IGD Part Number TOC-750S-TBE supplied as 20M coils.

Samplers are designed for ambient sampling only

Only use conduit/cable entries provided, drilling the enclosure will void any warranty

It may be necessary to vent spill gases to a safe area

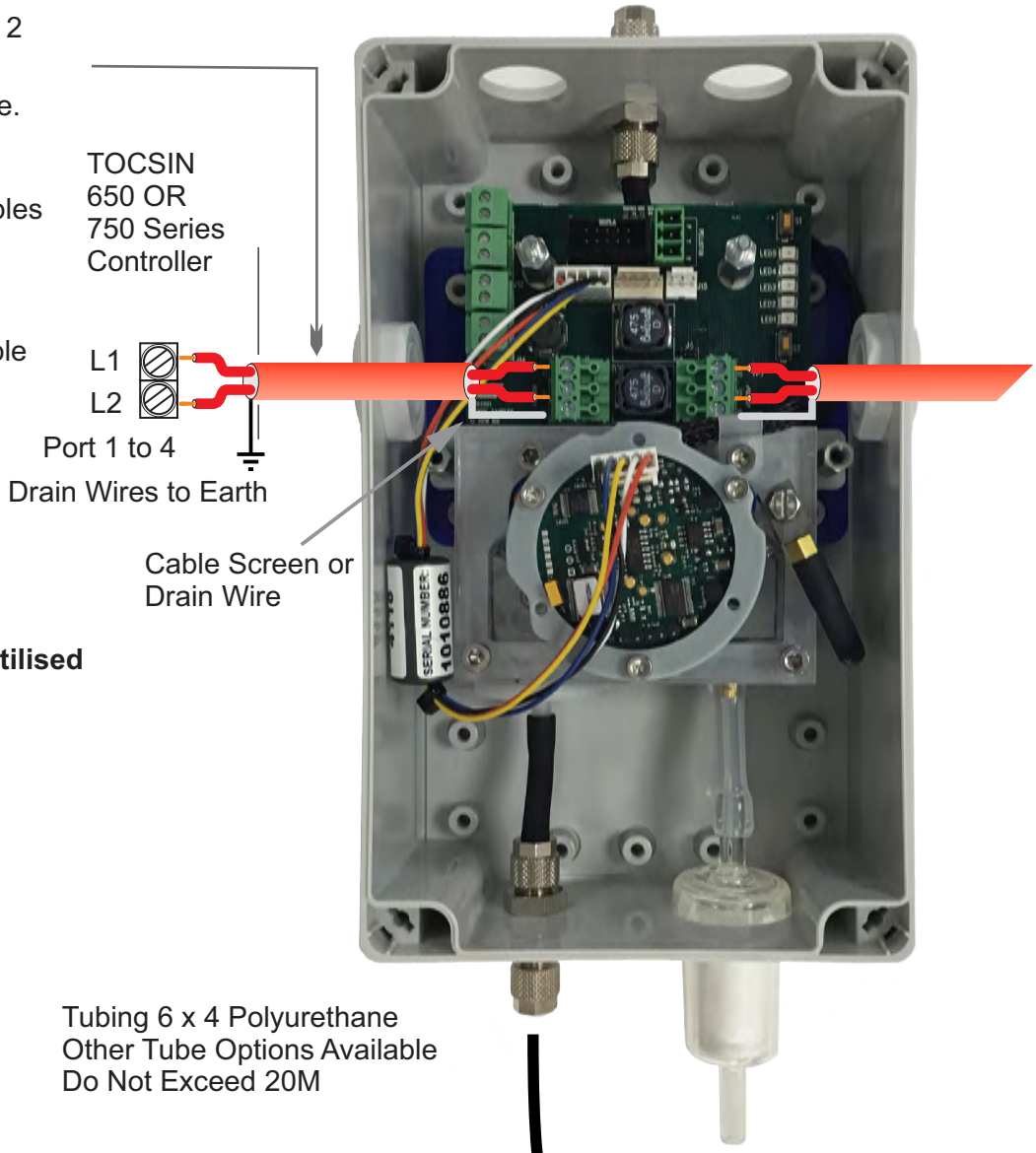
Installation Requirements for Samplers

Interconnecting Highway Cabling
For 2-Wire Addressable Systems:

For Safe Area Detectors Use 2 Core Cable 1.0 to 2.5mmSQ Cable Depending on Distance.

Ensure Cable Screens are Correctly Terminated and cables are stripped to the enclosed guide.

See Cable Calculator for Cable Core Size vs Distance VS Number of Devices



Ensure screened cable is utilised

Tubing 6 x 4 Polyurethane
Other Tube Options Available
Do Not Exceed 20M

Tube work should not allow condensing liquids to trap in the pipework. Where a large amount of condensation may occur consider fitting line traps. Contact IGD for further advice.

A variety of End of Line Termination Points Are Available Contact IGD For Further Details

TOCSIN 750 Sampler End of Line Filter Assembly Deployment

Tocsin 750 Series Addressable Sample Modules are designed to sample using 6mm OD x 4mm ID tubing from locations up to 20M distant from the module. IGD provide EOL (End Of Line) filter modules to prevent dirt and debris from being drawn into the system.

Part Number TOC-750S-FIL

There are two methods to deploy the EOL assembly. Under ideal circumstances the assembly should be fitted as indicated in fig 1 at the very end of the sample tube. This provides best protection.

In some circumstances this option may not be possible, for example access to the filter may be limited or the nature of the environment may prohibit. In this case the filter can be fitted at a convenient position in the tube run as close to the end of the sample line as possible to protect as much of the tubing as possible. This is indicated in fig 2

Note that the stainless steel housing is designed to be mounted to a suitable surface. The cover then provides mechanical protection for the filter whilst still being able to view its condition. Note correct orientation of the filter.

Note Correct Orientation of Filter. In this orientation dirt collects on the outside of the filter and will be visible through the cover window

Replacement Filter Part Number TOC-750S-PCF

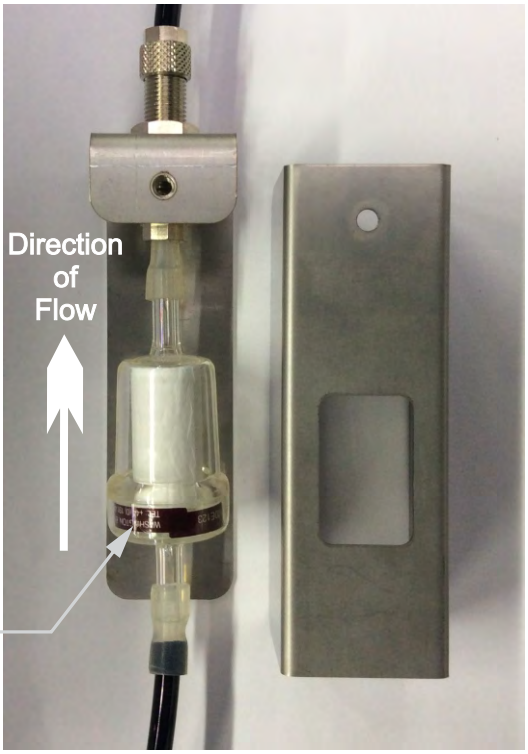


Fig 1. Filter Installed End of Sample Line Picture Shows Cover Fitted

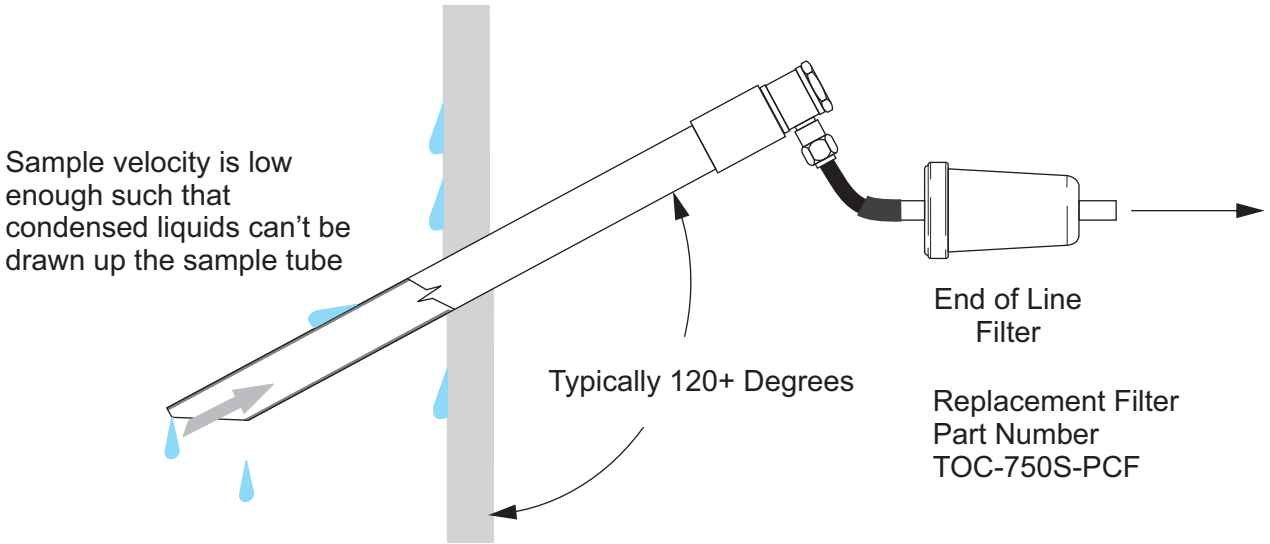
Fig 2. Filter Installed ‘into’ The Sample Line Run. Note Picture Shown Cover Removed.

TOCSIN 750 Sampler End of Line Filter Assembly Deployment Part Number TOC-750S-PN1

This style EOL module is designed to terminate through composite walls or ceilings. The bulkhead will clamp up to 50mm to provide a thro' wall termination. The bulkhead can be fitted with an optional luer lock style disk filter. If this is a requirement contact IGD for advise for suitable filters to match the environmental condition.

TOCSIN 750 Sampler End of Line Filter Assembly Deployment Part Number TOC-750S-PN3

Where termination is required through into cold stores or wet environments IGD advise use of this part number. The rigid tube assembly passes through the wall of the process at an angle. The diameter and angle are chosen to ensure condensed liquids cannot be drawn up into the sampler assembly. A cartridge filter is provided for further protection.



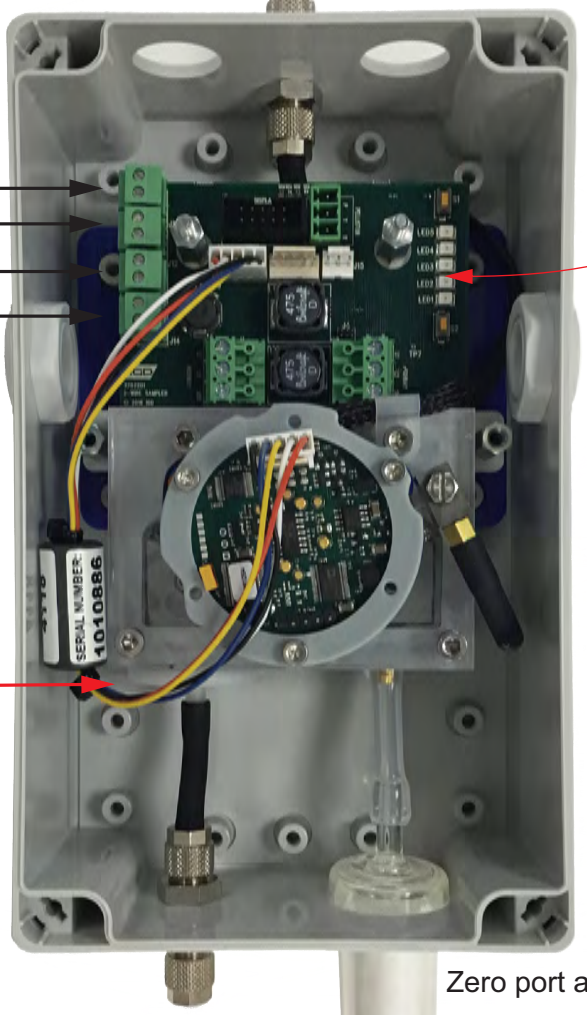
Overview

Vent Port, Do Not Block
Note depending on the nature of the sample it may be necessary to vent the spill gases to a safe location.

Function Buttons and LED's

UP 1 2 3 4 5 DOWN

SSR 1 Dedicated Fault
SSR 2
SSR 3
SSR 4



Sample modules should be fitted vertically

Internal Hydrophobic protection filter
Replacement Part Number
TOC-750S-INF

Sample Port

Zero port and protection filter.

Note the sampler can be set to periodically zero itself by drawing a clean air sample through its zero port.

Depending an the gas to be sampled the zero port can be fitted with air scrubbers to remove any traces of the target gas from the zero air stream.

For example :

Ammonia, LPG Fit activated Carbon Filter PN TOC-750S-CBF

CO2 fit Soda Lime Filter Part Number TOC-750S-SLF

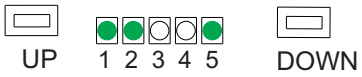
For Oxygen detectors that will auto calibrate through this port fit particulate filter TOC-750S-PCF (as picture)

Typical flow rate is 1L/Min with clean filters. Each 1M length of sample tubing will add an approximate 1s delay to the sample time.

Note filters should be changed at each service interval

Addressing the Assembly Using the Function Buttons and LED's

The TOC-750 Module PCB is an Addressable Device and Comes Equipped With a Simple Interface to Allow the Base Address to be Set. To Set The Set Address,



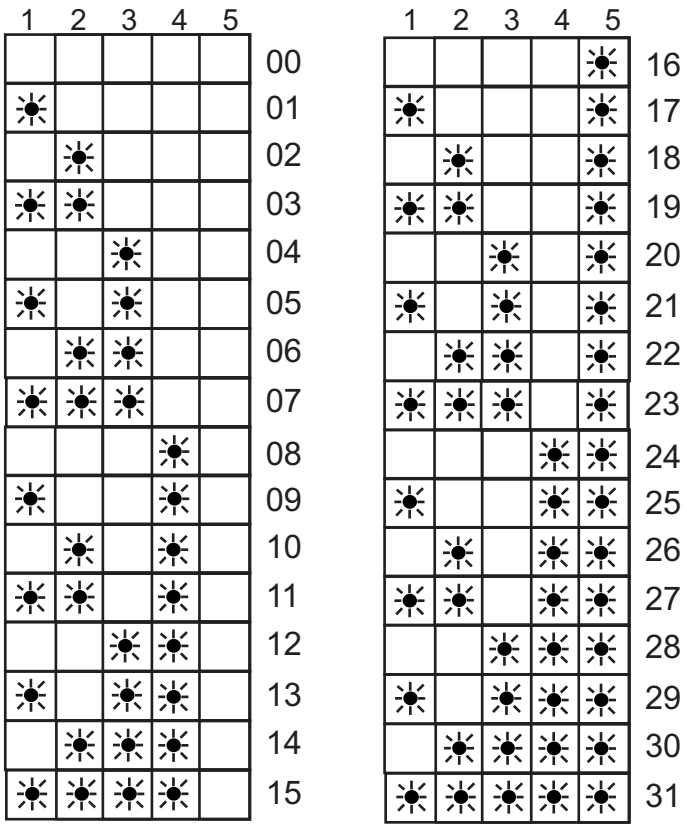
Press and hold the Down button for >2s

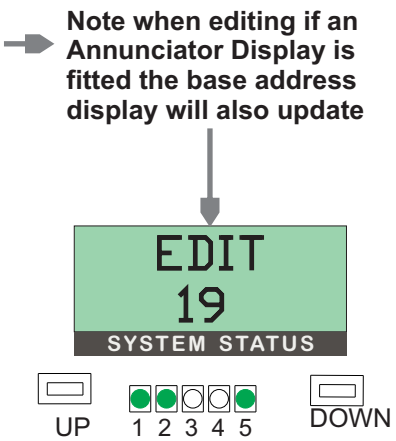
Release Button the Light Pattern Will Now Indicate the set Address as Shown in the Table Below.

With the Set Address Lit, the UP and DOWN buttons can now be used to alter the address if required

With the Required Address lit, Press and Hold the DOWN Button Until the LED's go out. Release the DOWN button and the new Base Address is Now Set.

Note That with the base address set the LED's revert to showing what options are active and which of those options are communicating, see previous section on 'Module Indications'.





Setting the base address using the button interface sets the address for all other active options on the module as follows:
For a Base Address Set of 01:

Pellistor Input = Base Address = 01
02 = IR/PID/Toxic or Oxygen Sensor
03 = T102 Port 2

05 = E-Stop
06 = Key Switch

101 = SSR 2
102 = Display Sounder
103 = SSR 3
104 = SSR 4

Anything turned off is ignored. Addresses are allocated in the sequence shown above.

NOTE: WHEN SETTING ADDRESSES YOU CANNOT HAVE TWO DEVICE ADDRESSES SET THE SAME ON THE SAME ADDRESSABLE HIGHWAY or DEVICE.

IGD provide a range of Android based Apps for use with suitable tablets and mobile phones. For control panels these connect directly using bluetooth. For addressable devices it is necessary to make a direct USB cable connection using IGD's interface cable as indicated below. Apps can be downloaded from the App store.

NOTE:

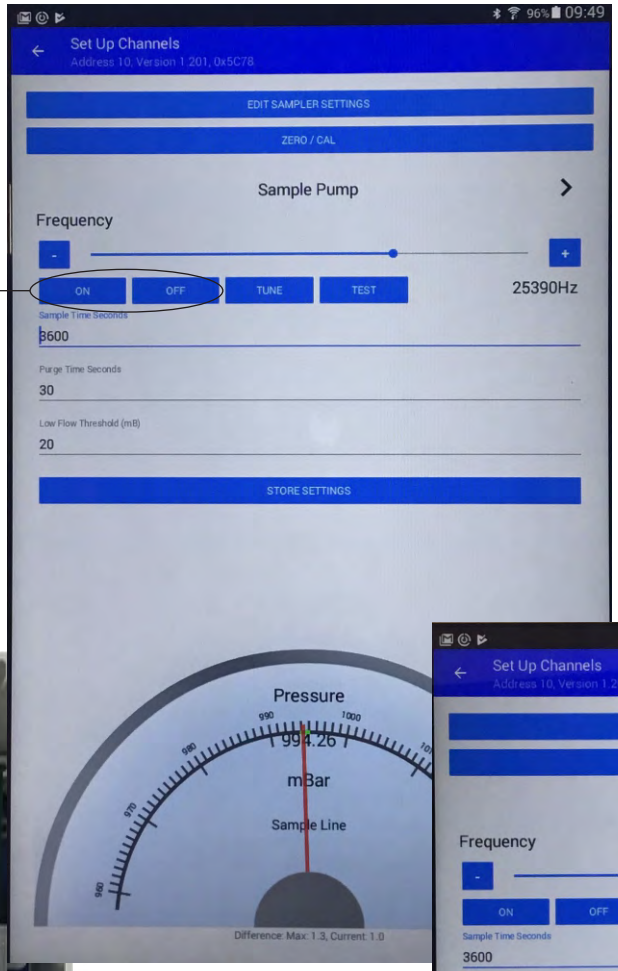
When undertaking work with a connected tablet ensure the system controller is placed in INHIBIT mode. Failure to do so may result in system errors.

Setup Channels Option

This menu selection gives access to pump settings as follows:

Use to turn pump on/off
Use to view pump running pressure difference on to off and to ensure pump starts correctly after tuning

Tune function will automatically set the pump optimum operating frequency.

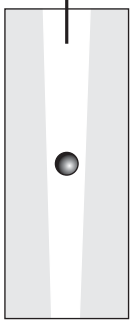


Manual pump adjustment to fine tune using attached flowmeter. Use test or On/Off buttons to ensure pump reliably starts after tuning.

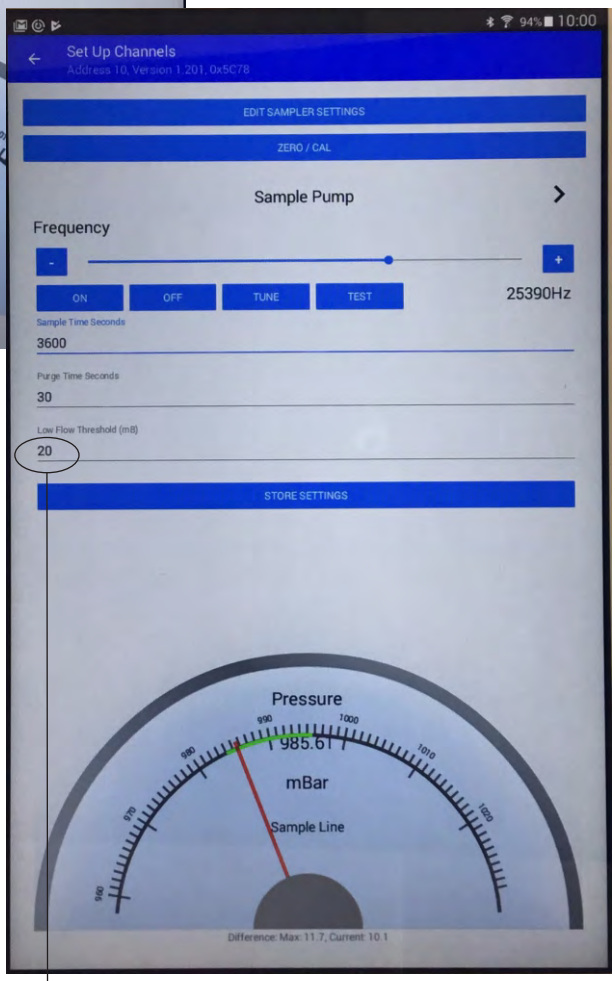
Use the pressure indication to:

1. Check pump suction performance by blocking the inlet line. Minimum should be a 25mBar pressure drop.

2.Use to observe the system running pressure, typically 10mBar Pressure drop with new filters.



Ideal Typical Flowrate 0.8 to 1.2L/Min



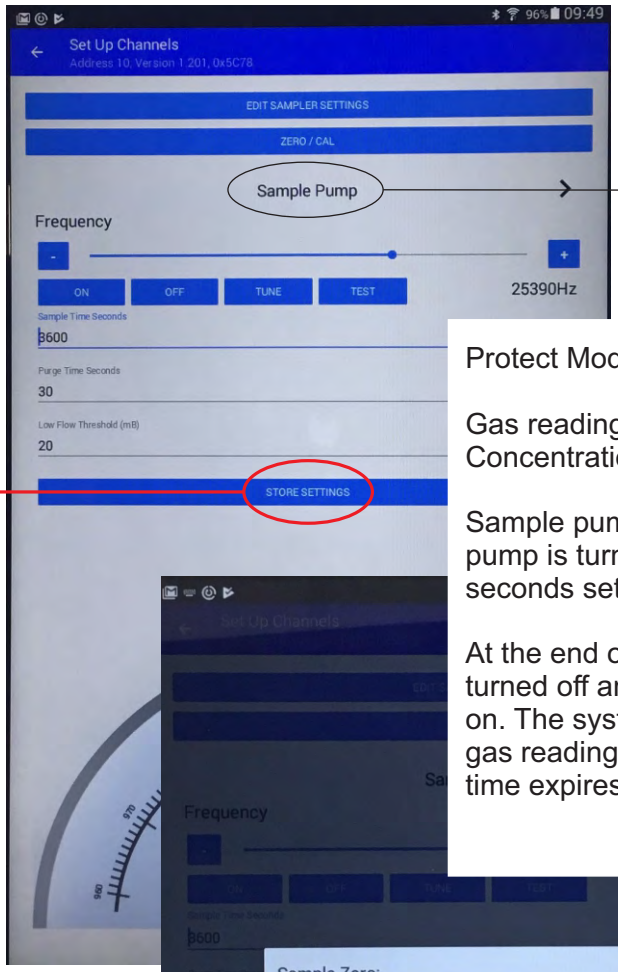
Sampler low flow threshold. Set this to be 5mBar below maximum pump suction pressure with the sample line blocked. For example with new internal and EOL filters fitted the running pressure is 990mBar. With filters removed the running pressure is 1002 mBar. So the filters and sample line impose a 12mBar pressure drop. The maximum pump suction performance with the line blocked is 967mBar indicating a 25mBar max suction pressure. In this case set the low flow threshold to 20mBar.

Sample time is the period in seconds that the system runs for before either:

Running an auto zero [1]

Running an auto calibration (Oxygen samplers) [2]

Turning pump off for 10s for the system to check ambient pressure **



Note there are selections mentioned against both the sample and zero pumps, ensure correct pump is selected.

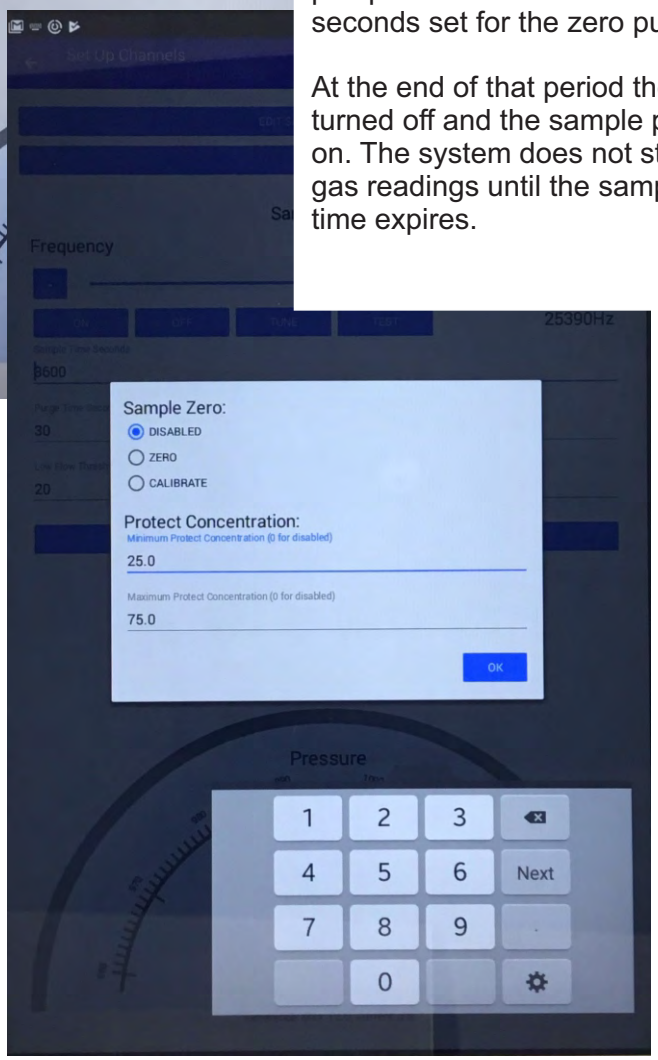
Note:
Any changes to Settings Must be Stored

Protect Mode

Gas reading is withing Min to Max Protection Concentration.

Sample pump is turned off and the zero air pump is turned on for the sample time seconds set for the zero pump.

At the end of that period the zero pump is turned off and the sample pump turned back on. The system does not start updating the gas readings until the sample pump purge time expires.



Note 1.

Most detectors can be set to auto zero. Ensure either an appropriate scrubber is fitted to the zero port or the zero port is tubed away to a ‘clean air’ location. Do not exceed 20M of tubing.

Note 2.

Oxygen detectors are normally expected to read 20.9% and so in their case the sampler can be set to auto-calibrate on air drawn from a ‘safe’ location. This could be the sampler location if the sampler is drawing for example from another room via its sample tubing. Alternately the zero port could be tubed away to a ‘clean air’ location

Zero and Calibration

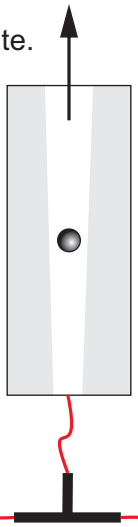
The following diagram shows the preferred method to introduce zero and calibration gases to the sampler.

The sampler must not be over or under pressurised during the zero or calibration process.

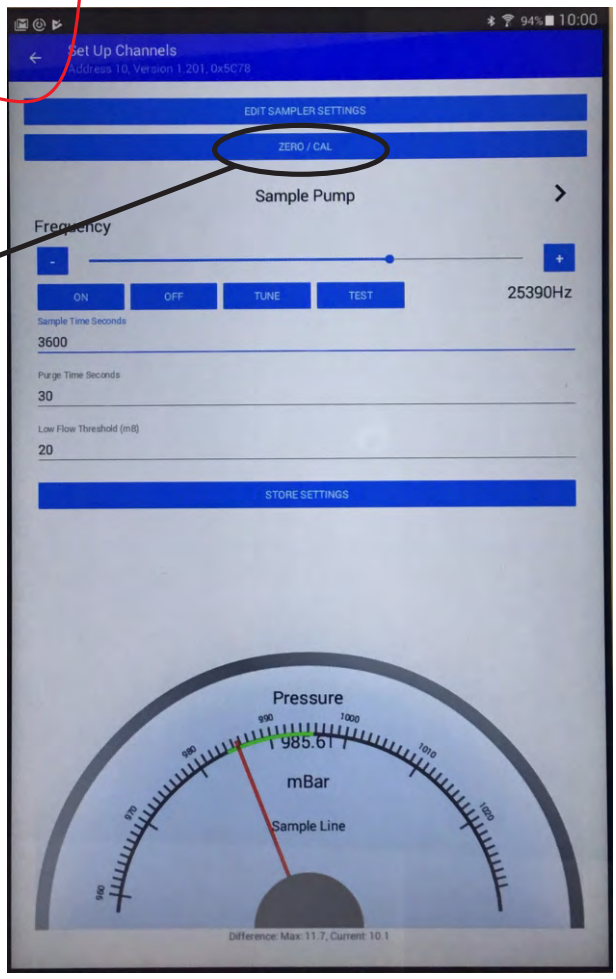
With this arrangement set the flow rate from the gas cylinder such that the flowmeter shows 0.5L/Min of gas flow spilling off.

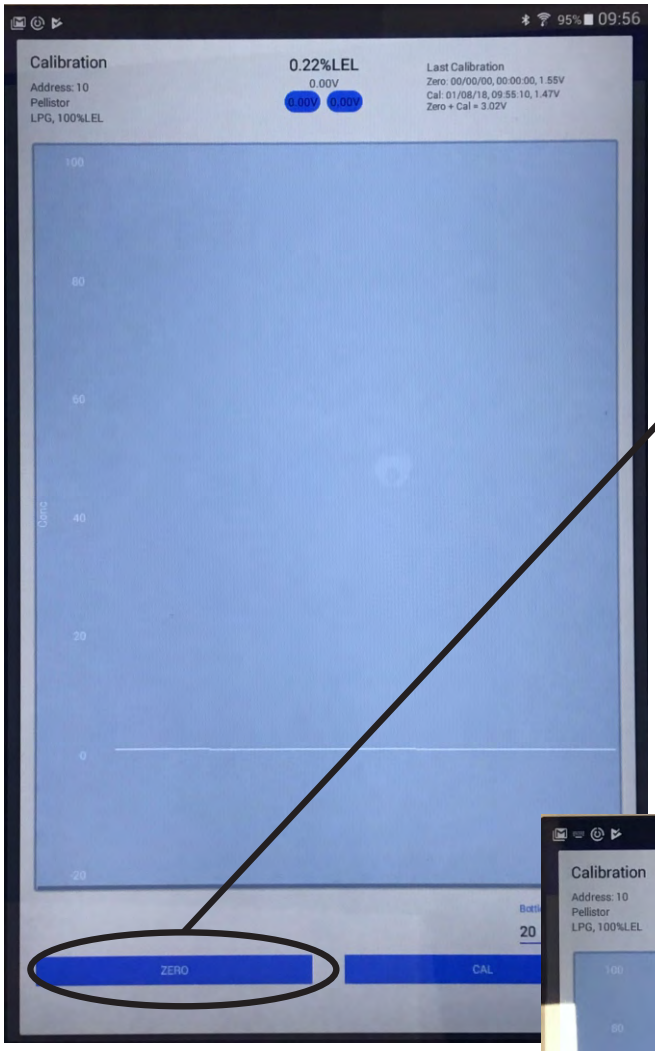
This arrangement allows the sampler to take its required flow rate at close to atmospheric conditions allowing excess gas to spill off.

Always zero first and then calibrate.

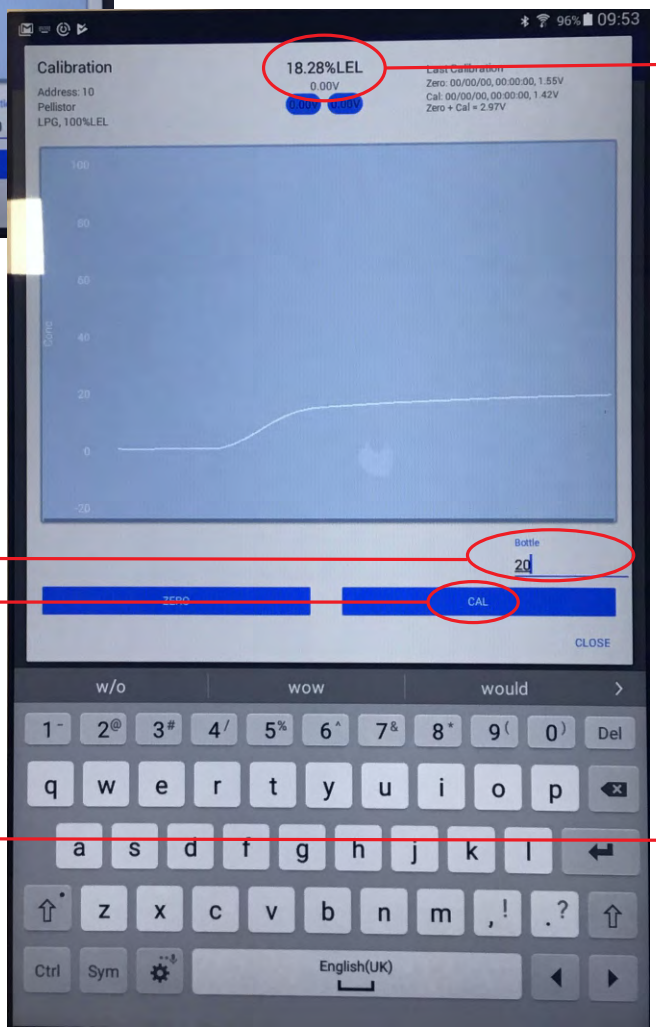


With the Android device connected to the sampler comm port as previously indicated select the Zero/Cal option





Flow a suitable zero gas (usually Nitrogen) allow the graph/reading to settle (usually 60-90 seconds) and select ZERO to zero the detector



Now apply calibration gas as indicated.

The graph should show the signal rise as the detector responds to gas and gives a visual indication to show when the reading has stabilised.

Once the graph shows a flat line and the reading is stable.

1. Check and enter the calibration gas value.

2. Select to calibrate

3. Observe the result is within tolerance