INSTRUCTION MANUAL

SoliTechw² IR Sensor

Suspended Solids Sensor
For use with 7300w² Monitor

partech

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Table of Contents

1 Introduction

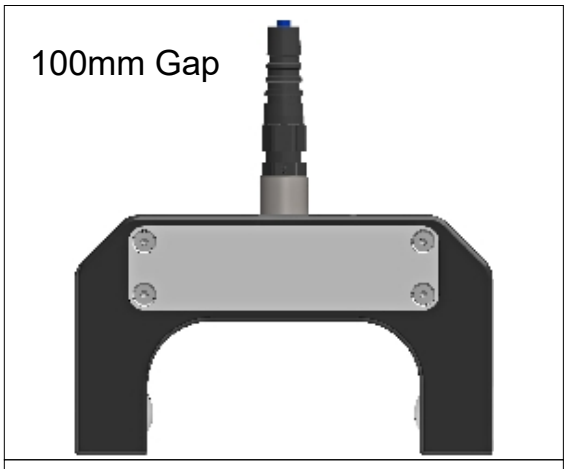
This manual covers the SoliTechw² IR range of sensors as used on the 7300w² monitor. For more extensive explanation regarding menus etc. the manual covering the 7300w² monitor should be referred to. For IR sensors used with 750w² hand-held monitor or either the ASLD2200, 7100, 7200, 8100 or 8200 monitors, please see appropriate instruction manual. The SoliTechw² IR sensors (as listed within the illustrations below) are not compatible with any platform other than the 7300w² monitor. Whilst every attempt has been made to ensure that the instructions are correct, common sense and good engineering practice should always be used to adapt to specific site details. If you are in any doubt, please contact Partech or your local distributor for further information.

1.1 SoliTechw² IR Sensors

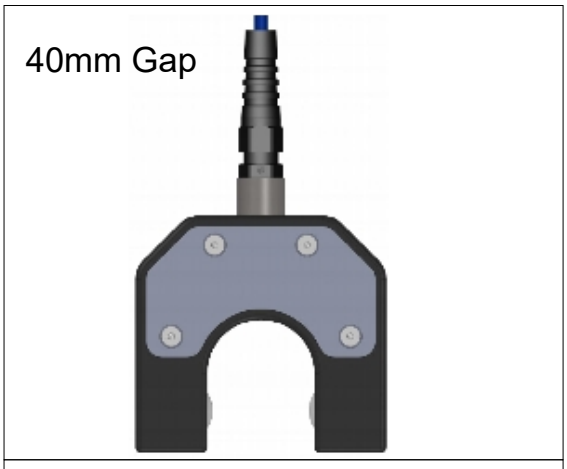
All SoliTechw² IR sensors use an infrared light source, which offers long-term stability, low maintenance and high reliability. The principle of operation is described below.

1.1.1 Light Absorption

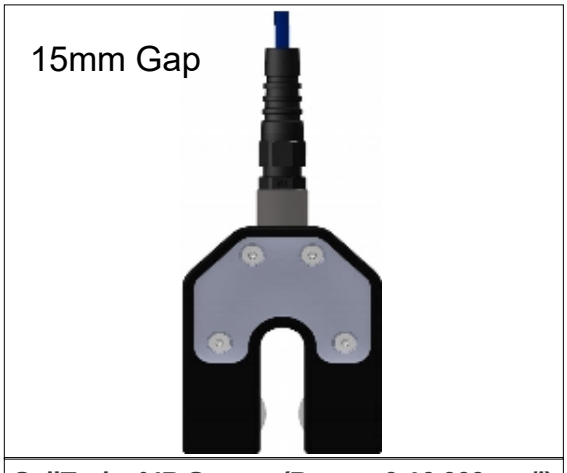
The SoliTechw² IR sensor family is intended to monitor suspended solids in four predetermined nominal ranges. Each sensor is available as a 10metre or 20metre option.



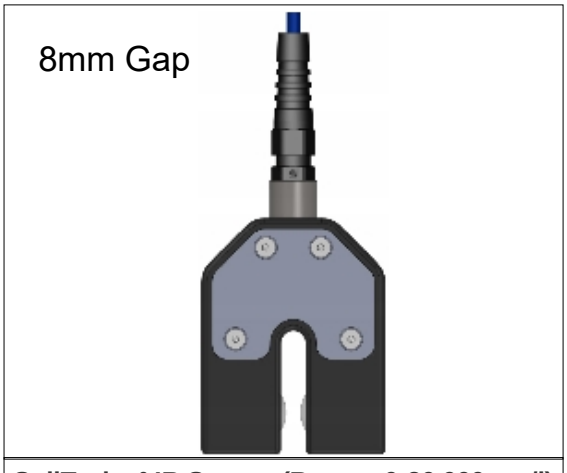
SoliTechw² IR Sensor (Range: 0-200 mg/l)
PN223893 – 10 metre cable
PN223894 – 20 metre cable



SoliTechw² IR Sensor (Range: 0-1,500 mg/l)
PN223895 – 10 metre cable
PN223896 – 20 metre cable



SoliTechw² IR Sensor (Range: 0-10,000 mg/l)
PN223897 – 10 metre cable
PN223898 – 20 metre cable



SoliTechw² IR Sensor (Range: 0-30,000 mg/l)
PN223899 – 10 metre cable
PN223900 – 20 metre cable

No internal adjustment is possible, but measurement outside these ranges is sometimes possible and maybe determined by experimentation. All range statements are based on solids present on a typical sewage treatment works, and although they are useful as guidance, the ranges will be affected by the nature of the solids being monitored.

The sensor uses the light absorption principle, with the light source an infrared LED operating at 950nm. In simple terms, the sensor detects solids by comparing the amount of light emitted by the LED with the amount received by the photo-diode. The amount of solids present is inferred from the reduction in received light.

The sensor has been designed to monitor Suspended Solids throughout the treatment process.

1.1.2 Mounting Options

A range of mounting options are available for the SoliTechw² IR sensors, which will allow the user to apply the sensor in a wide variety of locations. This manual addresses Suspended Solids Detection applications. Please contact Partech for other types of application. When assessing mounting options, attention should be paid to the accessibility of the sensor for calibration and maintenance, stability of the sensor in the flow conditions present on site and to ensuring the sensor is fully submerged at all times. It is recommended that the sensor is located in an area where there is sufficient movement to keep the solids in suspension and where any turbulence provides minimum impact on the sensors.

2 Mechanical Installation

2.1 Location

Reliable accurate measurement from any instrument can only be achieved by correct installation of the measuring device; in the case of suspended solids, this is particularly important. If you are in any doubt, contact Partech or your local distributor for advice.

Below are some points that should be considered before installing the SoliTechw² IR sensor, and if the sensor is failing to obtain the results expected.

- Avoid areas of extreme flow or turbulence; air bubbles will disturb the reading.
- The sensor should be mounted in such a way as to allow easy access for calibration and maintenance. It should be possible to remove the sensor from the process without the need to shut the process down.
- To allow a single technician to calibrate and maintain the system the sensor should be placed within sight of the monitor. Although cable runs of up to 100 metres are possible, operational problems can be caused.

2.2 Partech Brackets

Partech offer a mounting bracket, PN171290 for the installation of the SoliTechw² IR sensors which suits most applications.

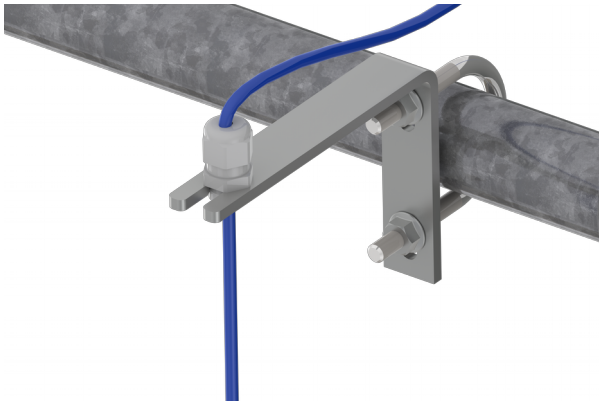


Fig 2 Handrail Bracket

2.3 Customer Supplied Brackets

When creating brackets to mount the SoliTechw² IR sensor, care should be taken to ensure that the following guidelines are observed:

- The bracket must be strong enough to support the sensor with minimum movement when installed into the sample.
- When attachments to the sensor are made, these should be done using the threaded area at the top of the sensor housing or by clamping around the sensor body.
- Consideration should be given to enable simple removal and replacement of the sensor for the inspection, calibration and servicing to be carried out.

3 Electrical Installation

The SoliTechw² IR sensor connects to the 7300w² monitor. The information below provides the physical installation instructions; please refer to the monitor instruction manual for complete setup details.

3.1 Cable Routing

Care should be taken to ensure that the cable routing does not cause problems with the sensor measurement; good engineering practice should be followed with particular attention being paid to the following points;

- The sensor cable should be kept to the minimum length possible.
- Sufficient spare cable should be provided to allow complete and easy removal of the sensor from the process.
- Any spare cable should be safely stored.
- The sensor cable should be kept separate form mains cable.

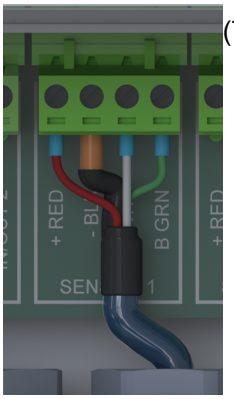
3.2 Connection Details

All sensors within the w² family of instruments are connected to the 7300w² Monitor using the same 4 wire configuration.

- RED and BLACK wires provide the 12VDC supply to the sensor and the communication ground.
- WHITE and GREEN provide data communication.

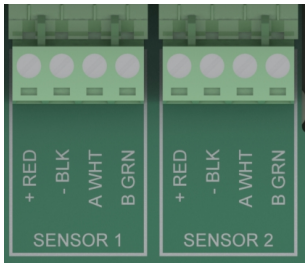
A maximum of two sensors can be directly connected to the standard 7300w² Monitor, however additional sensors can be added using the optional Expansion Boxes available separately.

Remove the 4-way connector from the 7300w² Monitor by pulling downwards to disconnect for easy access to the connections. Connect the sensor cores as follows:



(Terminals from left to right on the 4 way connector)

Term 1 (Left)	-	RED (+12V)
Term 2	-	Black (0V) and Drain
Term 3	-	White (Data A)
Term 4 (Right)	-	Green (Data B)

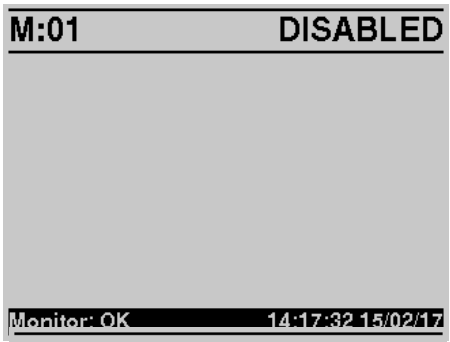


Always connect the screen drain wire with the Black (Term 2). Illustration Left shows drain wire and Black wire connected together, and covered in Black Heat shrink.

Always use Bootlace ferrules when terminating the sensors to ensure a good connection to the terminals.

1 SoliTechw² IR Sensor Configuration

Before attempting to configure the SoliTechw² IR sensor, please read the user manual that came with your monitor. The monitor manual will introduce you to the basic set-up of the monitor, and will familiarise you with the monitor menu structure and buttons.



The monitor leaves the factory with no sensors pre-installed.

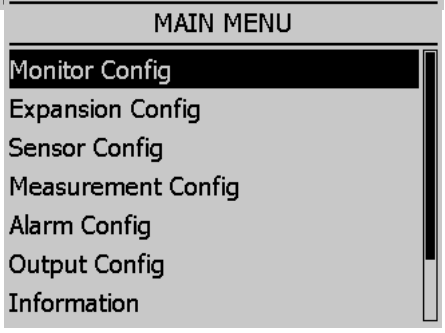
Assuming the monitor has been physically connected to a sensor, the next step is to register and configure the sensor before any measurements can be made. A single sensor may provide one or more measurements. We advise only adding one sensor at a time. Once the first sensor has been registered, connect the second and register again. Repeat for any additional sensors.

All sensors must be registered to the monitor in this way, even if they are different types.

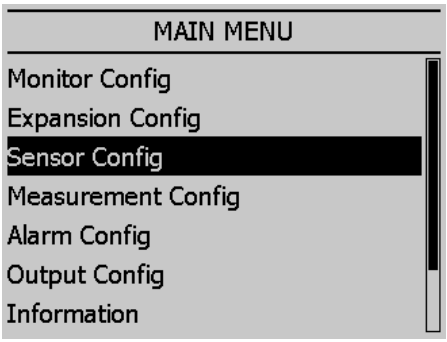
Please note that live measurements are not available until the sensor Configuration stage has been completed.

1.1 Sensor Config

From the Measurement screen press MENU to access the MAIN MENU.



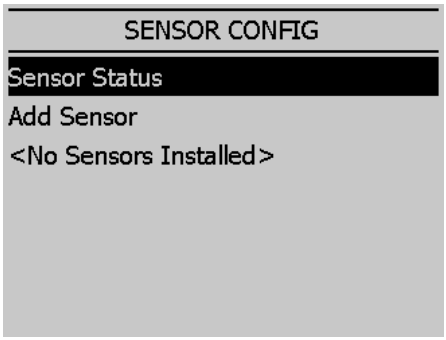
From the MAIN MENU screen, select SENSOR CONFIG by pressing ▼, and press OK to accept.

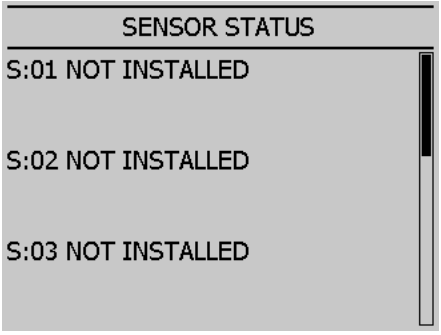


1.2 Sensor Status

This option allows the user to review the current status of the 8 sensor channels, these will all be set to disabled until a sensor is added.

Once a sensor has been installed the display will be updated to indicate the sensor type installed and it's status.

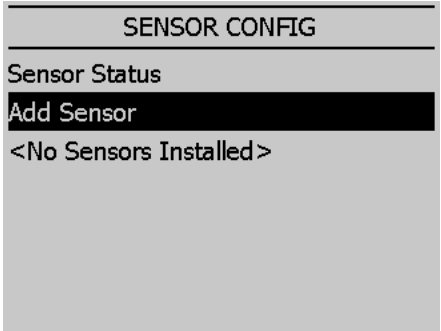




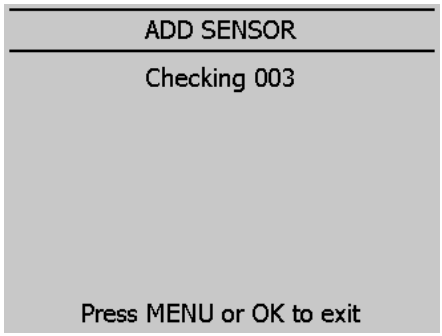
1.3 Add Sensor

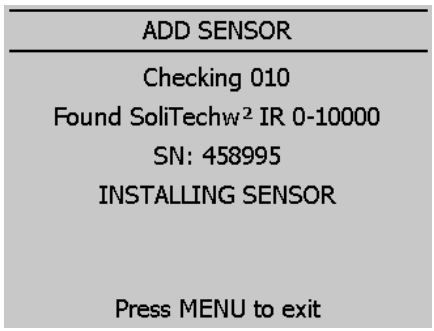
From the MAIN MENU screen, select SENSOR CONFIG by pressing ▼ and press OK.

The SENSOR MENU should be displayed. Press ▼ to highlight ADD SENSOR, and press OK.



The Monitor will now search all possible addresses (0 to 240) to find any attached sensors. During the search, any sensors found will be displayed momentary before continuing with the search.



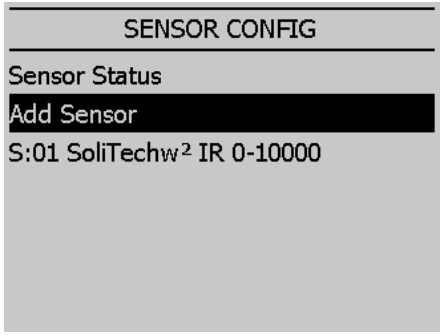


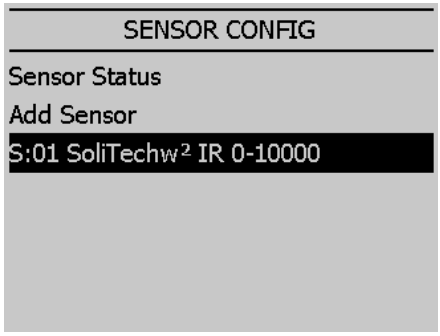
Once the search is complete, the Monitor will display a list of sensors found. Each sensor will be automatically allocated a new address from S:01 to S:08.

Repeat the above process to install a second, third or more sensors. A total of 8 sensors are possible (expansion box may be required to add additional sensors).

Sensor addition is now complete.

If a single or multiple sensors have been found the MENU can be pressed to escape from continuing the search.

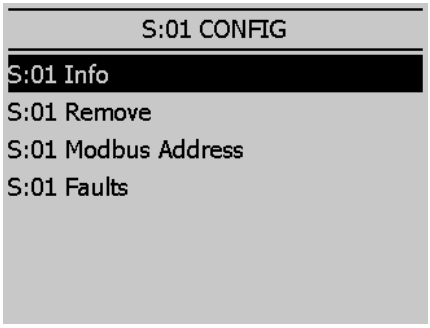


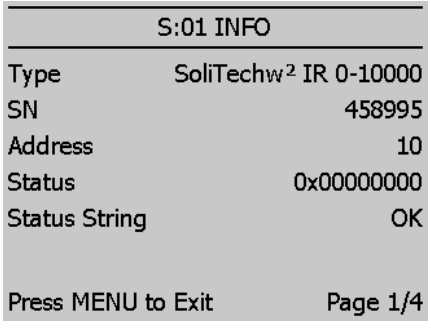


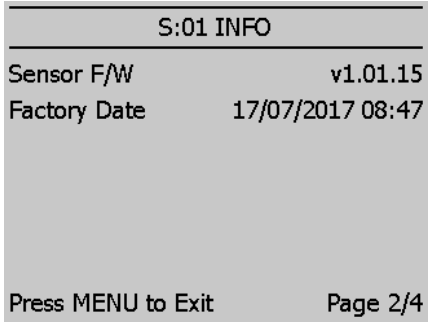
1.1 S:0x SoliTechw² IR 0-xxxxx

Once the sensor has been added and registered, the monitor will provide a list of functions specific to the sensor. Press ▲ or ▼ to select the sensor and press OK. The CONFIG MENU will display a list of sensor functions.

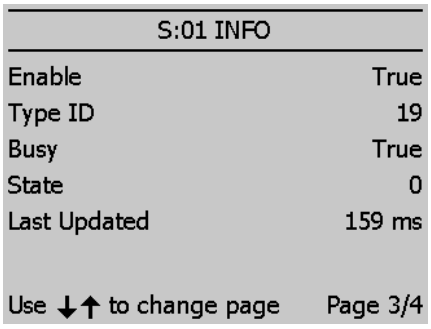
1.1.1 S:0x Info

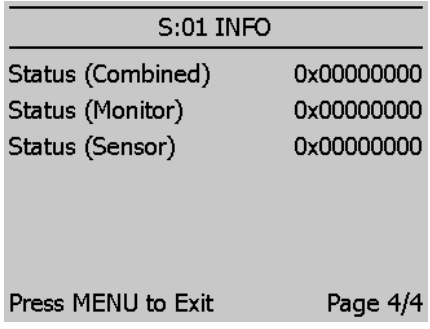






This function provides a range of diagnostic information that may be requested by Partech for fault finding

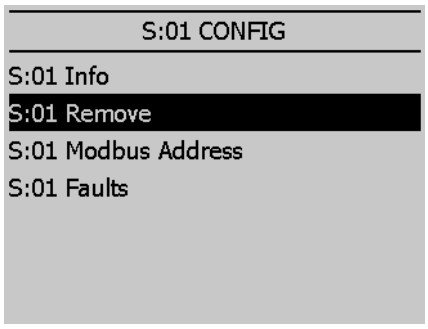


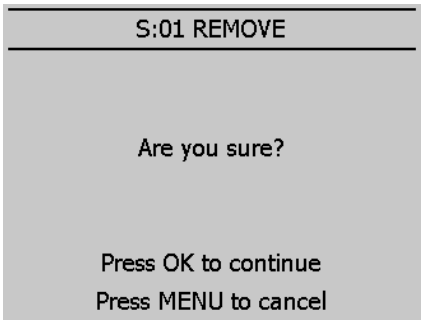


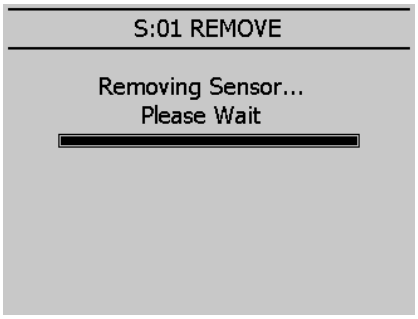
As can be observed from screenshots above, Page 1 displays sensor type and sensor serial number. Page 2 displays firmware version and date. The other pages display various statuses.

1.1.2 S:0x Remove

⚠ This allows the sensor to be removed for re-configuration of the monitor or if a sensor has been added on error. If a sensor has been replaced with a new sensors, the old sensor must be removed, and the new sensor installed.



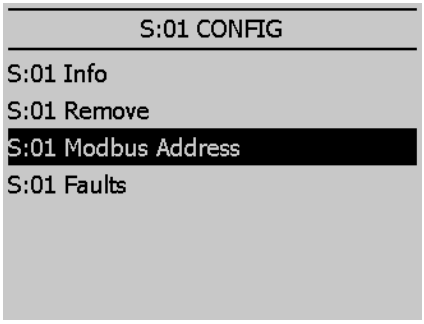


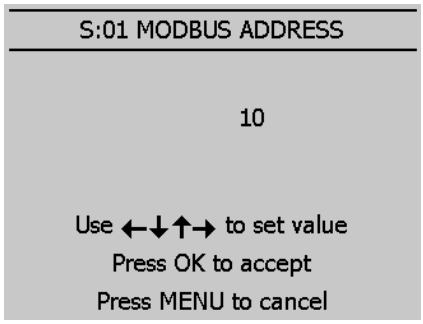


You will be prompted with *'Are you sure?'* before the sensor is removed. Press OK to accept and remove.

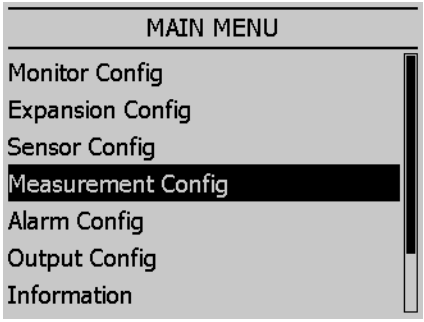
1.1.3 S:0x Modbus Address

This option allows manual adjustment of the ModTechw² address for the sensor, under normal circumstances this should not be changed. If there is same sensor type duplication within one monitor, then the modbus address will require changing to avoid conflict.





2 Measurement Configuration

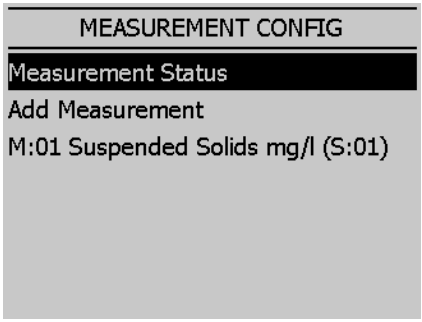


The monitor leaves the factory without any measurements configured. Measurements can only be added after installing the relevant sensor(s).

Once the sensor(s) have been registered with the monitor and installed, the measurements will now be available.

2.1 Measurement Config

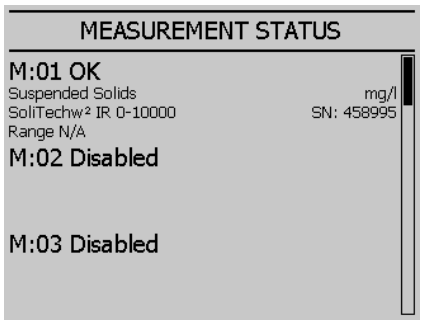
From the MAIN MENU screen, select MEASUREMENT CONFIG by pressing , press .

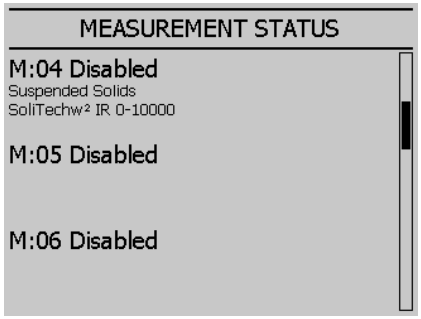


The screen shot to the left shows the default configuration after the installation of the SoliTechw² IR sensor on a single sensor configuration:

2.1.1 Measurement Status

This option allows the user to review the current status of the 16 measurement channels, these will all be set to disabled until a sensor is added. In the example above the first channel will be occupied.

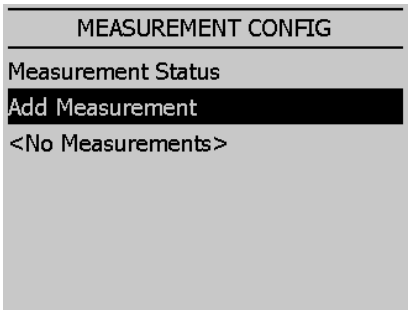


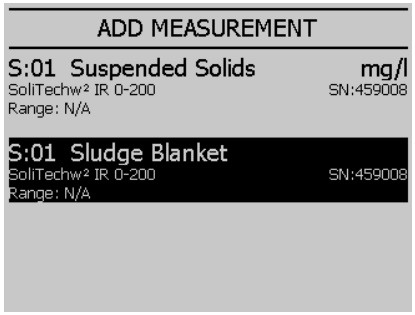


From the MAIN MENU screen, select MEASUREMENT CONFIG by pressing , press . On MEASUREMENT CONFIG screen the first option is MEASUREMENT STATUS: Press to select.

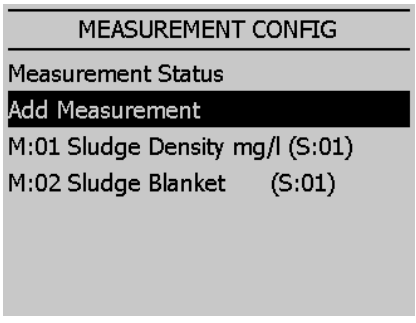
Once a measurement has been configured the display will be updated to indicate the measurement and it's status.

2.1.2 Add Measurement





The ADD MEASUREMENT option is required to include additional measurement types (usually alternate units) derived from the same sensor. The screenshots on the right show with the SoliTechw² IR sensor measurements removed. There is only one measurement option included with the SoliTechw² IR range of sensors.



The MEASUREMENT CONFIG menu should be displayed. Press to highlight ADD MEASUREMENT, and press .

All available measurements will be displayed in a list. Press or to select the required measurement. If the desired measurement is not listed it may be possible to add measurement anyway, which will result in a repetition of existing parameter, which can then be edited regarding title as described later.

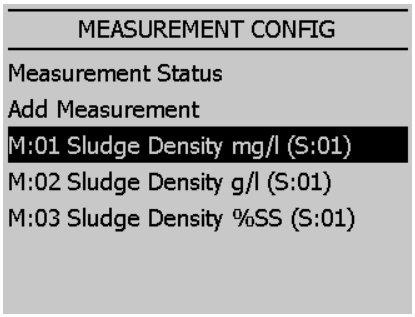
Press to select the measurement. Repeat the process if more measurements are required.

Each measurement will be allocated a measurement number from M:01 – M:16. A total of 16 measurements may be displayed.

Press to return back to the display screen. Your first measurement configured should now be displayed. If two measurements were configured, press to cycle through the display screens to show 2 measurements, 3 measurements etc.

The Measurement Menu will list all configured measurements in order M:01 to M:16 the list will also indicate the sensor number that is delivering the signal for the measurement.

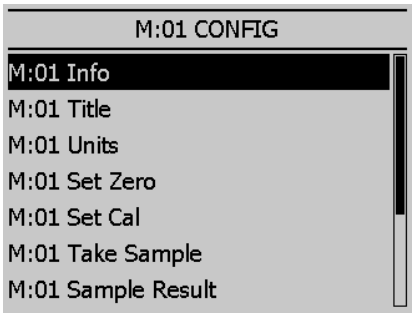
2.2 M:0x – Measurement Channel



Selecting a measurement channel will reveal a new sub-menu associated with that measurement. In **MEASUREMENT CONFIG** press ▼ to highlight the required measurement and press OK.

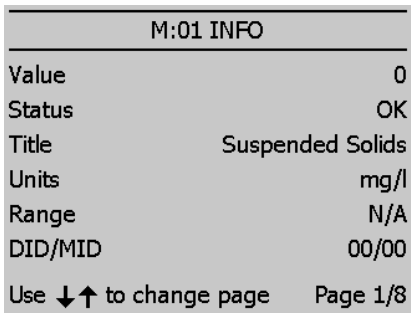
It is important to recognise that the first and primary measurement M:01 is the only channel that is used for sensor calibration and displaying of diagnostics data.

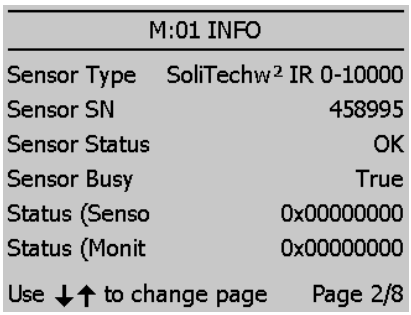
The sub-menu is as follows:

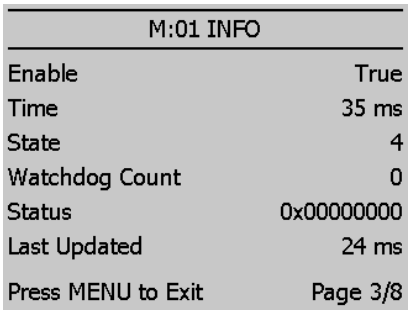


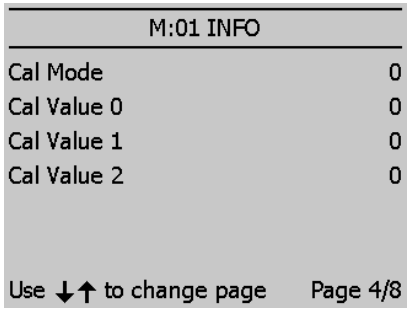
2.2.1 M:0x Info

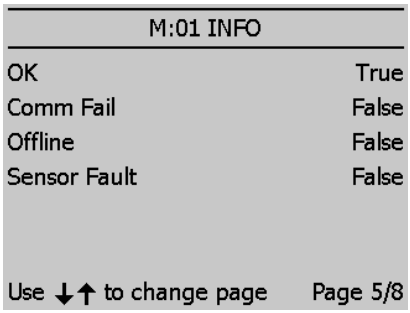
This option provides additional information on the measurement. This information will usually be required if a problem exists with the sensor performance. There are eight diagnostic screens under the 'INFO' menu which display parameters such as faults, timing, statuses etc.

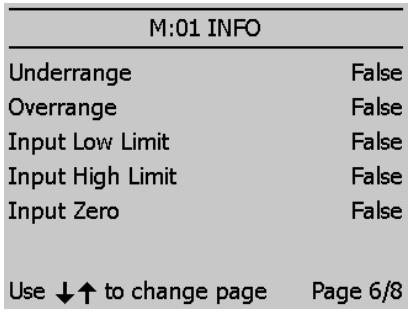


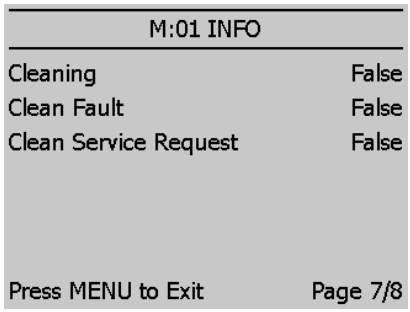


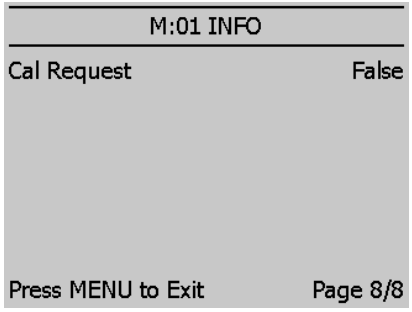




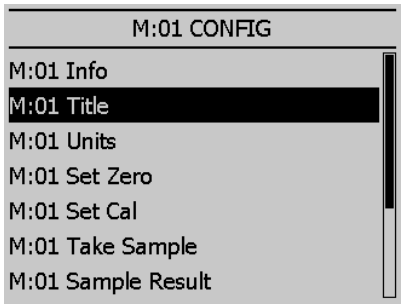


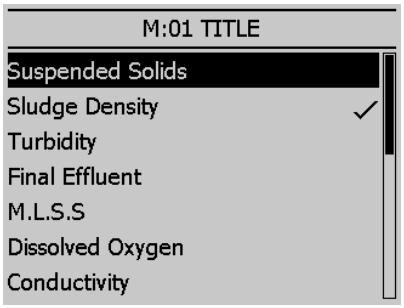






2.2.2 M:0x Title





This allows the title of the measurement to be changed from it's default, the measurement title is used in measurement mode to identify the measured value. A selection of standard terms are available along with a '**User Defined**' option that can be adjusted to suit your requirements. For example this could be changed to '**Solids Line 1**'. The maximum number of characters is 20.

In **MEASUREMENT CONFIG p**ress to highlight the required title and press to select. A tick will appear along side the accepted title.

2.2.3 M:0x Set Zero

The term relates to the calibration of the system and is covered in the Calibration section below.

2.2.4 M:0x Set Cal

The term relates to the calibration of the system and is covered in the Calibration section below.

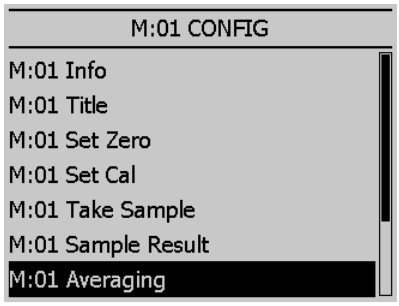
2.2.5 M:0x Take Sample

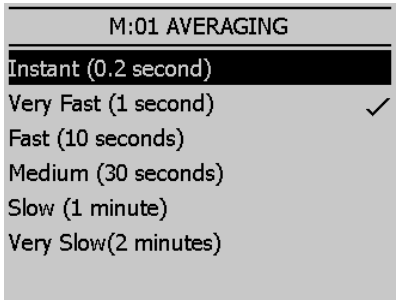
The term relates to the calibration of the system and is covered in the Calibration section below.

2.2.6 M:0x Sample Result

The term relates to the calibration of the system and is covered in the Calibration section below.

2.2.7 M:0x Averaging





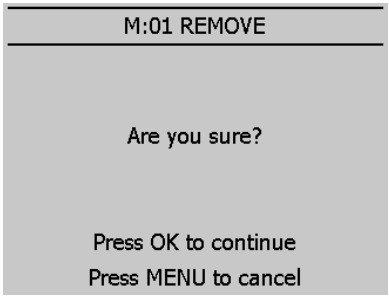
In **MEASUREMENT CONFIG p**ress to highlight the required title and press to select.

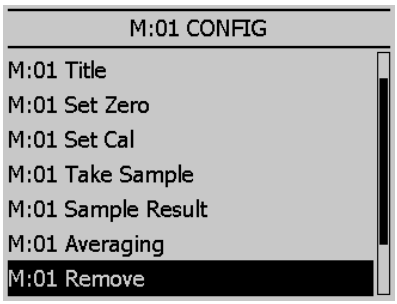
This allows the user to impose averaging on the measured value, this is used to reduce the speed of reaction to the process changes.

The following values are available for the user to select:

Damping Rate	Response Time (Seconds)	Typical Use
Instant	0.2s	Instrument demonstration and test
Very Fast	1s	Applications with dynamic solids changes
Fast	10s	Normal expected operational use
Medium	30s	
Slow	1m	
Very Slow	2m	Reduce spurious alarms from brief solids changes

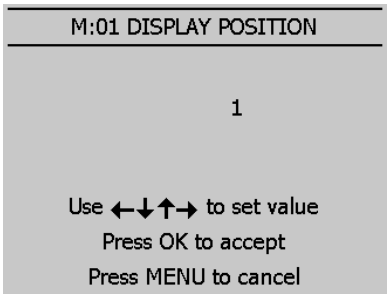
2.2.8 M:0x Remove

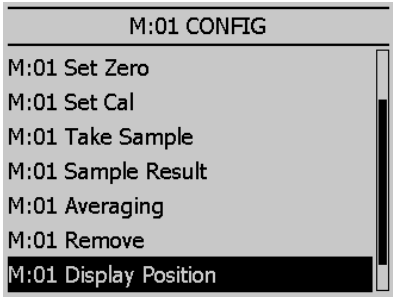




In **MEASUREMENT CONFIG p**ress ▼ to highlight the required title and press OK to select.
This option allows the user to remove a measurement that has been selected in error or to allow re-configuration of the system. Please use this option with care, all user settings for that measurement will be lost if the measurement is removed in error.
Press OK again to confirm operation.

2.2.9 M:0x Display Position

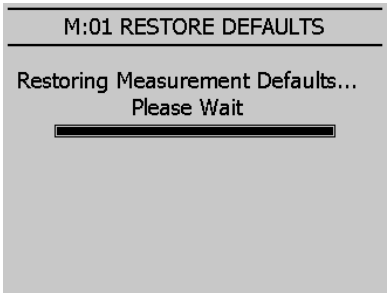


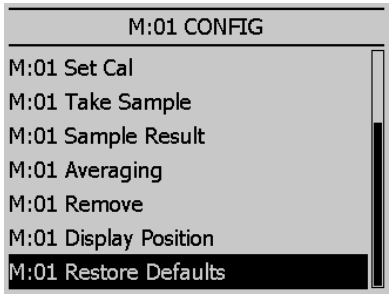


In **MEASUREMENT CONFIG p**ress ▼ to highlight the required title and press OK to select.

This option allows the position of the measurement to be moved. For example the suspended solids measurement can be changed from M:01 to M:02 so it will appear second on the list in MEASUREMENT CONFIG menu. Any associated alarms and outputs will automatically move with the renumbered measurements.

2.2.10 Restore Defaults





In **MEASUREMENT CONFIG p**ress ▼ to highlight the required title and press OK to select.

This option will restore the measurement fields for that particular measurement to the default values. For example; display position, averaging value etc.

3 Calibration

This section covers the operation and calibration of the SoliTechw² IR sensor.

3.1 Preparation for Calibration

When a new system is installed, a period of ½ hour should be allowed for the SoliTechw² IR sensor to stabilise before calibration commences. This is to enable the system to adjust to the “new” ambient conditions. This should not be considered as system warm up time from power up, but to acclimatise to the environment if the sensor has come from a warm store to a cold sample point.

The standard calibration procedure involves a two point calibration – zero and span, the process for calibration is described below. The sensors have linear responses to most the solids found in most applications, if a particular application has a non-linear response it is possible to adapt the response of the sensor to improve accuracy, this must be carried out in consultation with Partech.

Any containers used to store calibration samples should be cleaned prior to use. To ensure accurate calibration the sensor must be placed into the solution within the container for zero and span calibration.

3.2 Calibration Frequency

There is no absolute guide to the frequency of calibration. The user must make a judgement based on how critical the measurement is to the process, variability in the sample and standard practice within their organisation.

We recommend that calibration is carried out at commissioning stage and is then repeated within 4 weeks to ensure the instrument and process conditions are stable. After this a default calibration frequency is every 3 to 6 months.

3.3 Calibration Solutions

There is no absolute material that constitutes the ideal calibration solution. Although the sensor will have been factory calibrated using clean tap water for the zero, and fullers earth for the span (see section 10). These calibrations will have been carried out employing the following 'ZERO CALIBRATION' and the 'SPAN CALIBRATION' procedures. The former 'ZERO CALIBRATION' is the primary (and only) methodology employed to zero the sensor. The primary methodology for calibration of the measurement is the 'TAKE SAMPLE – SAMPLE RESULT' procedure. The 'SPAN CALIBRATION' has been included here for completeness.

3.4 Zero Calibration

From the 7300w² Monitor, navigate to the Calibration menu as follows-

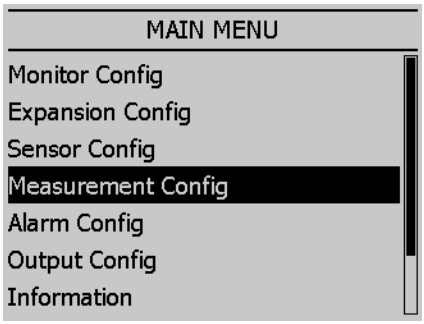
Press MENU to show the “MAIN MENU”.

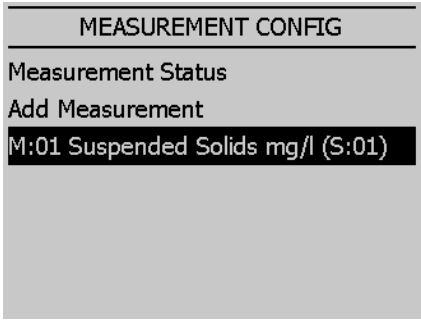
Select “MEASUREMENT CONFIG” by pressing ▼ and press OK to accept.

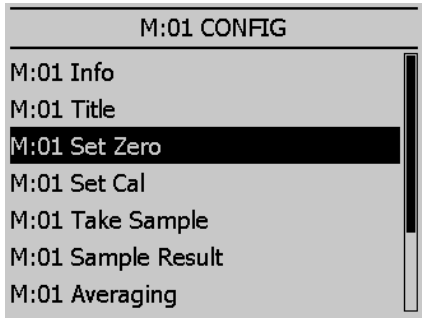
Select “Suspended Solids mg/l” by pressing ▼ and press OK to accept. (Ensure the measurement channel you have chosen has the same engineering units as the intended calibration solutions)

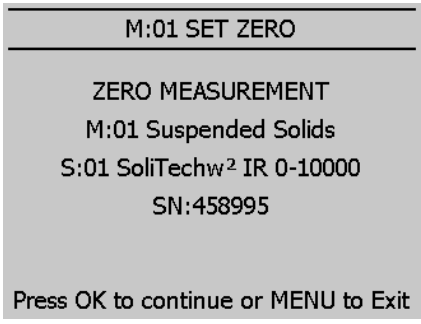
Select “SET ZERO” by pressing ▼ and press OK to accept.

The SET ZERO information screen will be displayed. Press OK to move on.







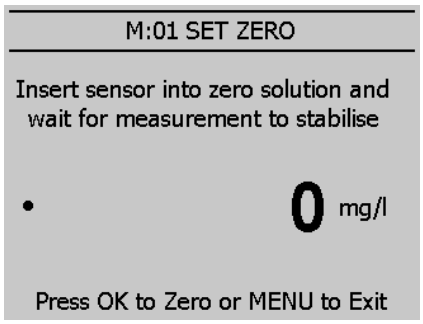


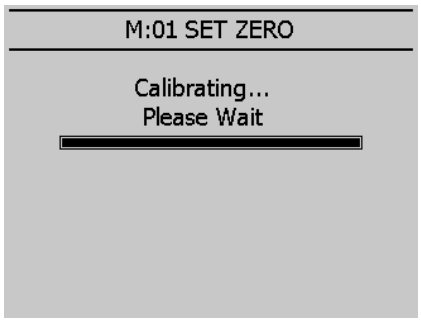
The ZERO Calibration screen will be displayed.

Wait for the value to stabilise, then press OK to accept. The calibrating progress bar will be displayed, followed by the CALIBRATION SUCCESSFUL screen.

Press MENU to return back to the MEASUREMENT CONFIG screen.

Zero calibration is now complete.



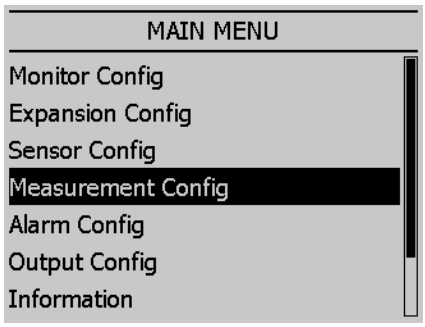


3.5 Span Calibration

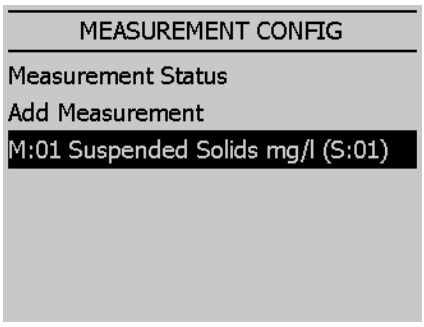
A representative sample from the application with a known value, or Fullers Earth can by used for the span calibration.

From the 7300w² Monitor, navigate to the Calibration menu as follows-

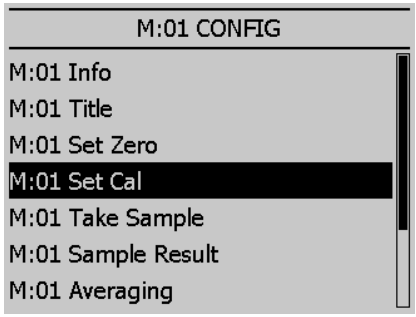
Press MENU to show the “MAIN MENU”.



Select “MEASUREMENT CONFIG” by pressing ▼ and press OK to accept.

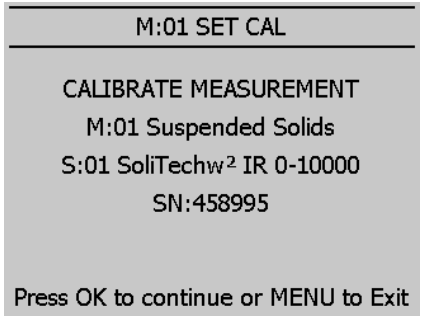


Select “Suspended Solids mg/l” by pressing ▼ and press OK to accept. (Ensure the measurement channel you have chosen has the same engineering units as the intended calibration solutions)

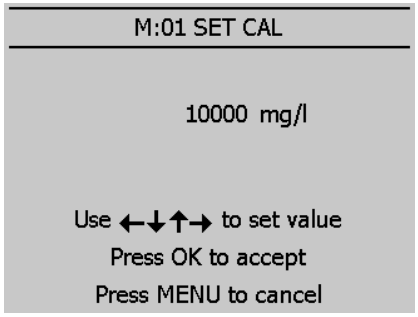


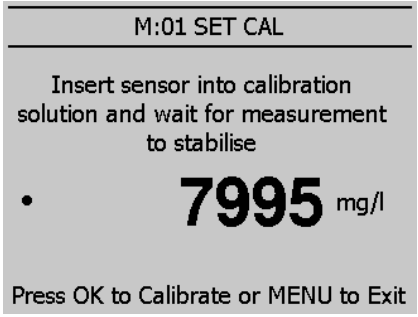
Select “SET CAL” by pressing ▼ and press OK to accept.

The SET CAL information screen will be displayed. Press OK to move on.



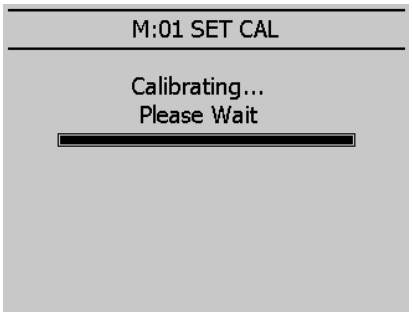
Enter the value for the calibration standard (Default is 50000mg/l). Press ▶ or ▶ to move the cursor below the digit to be changed. Press ▲ or ▼ to increase or decrease the digit, and press the OK to accept the value.



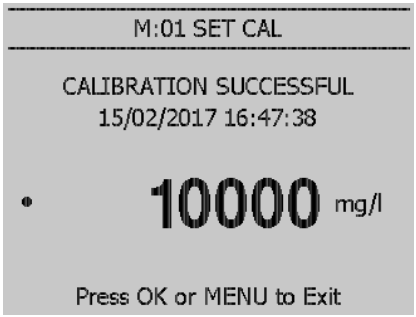


The SET CAL calibration screen will now be displayed.

Wait for the value to stabilise, then press OK to accept. Progress bar will be displayed followed by CALIBRATION SUCCESSFUL screen.



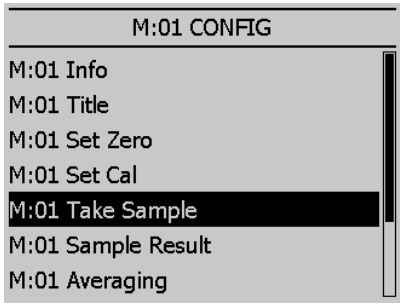
Press MENU to return back to the MEASUREMENT CONFIG screen.



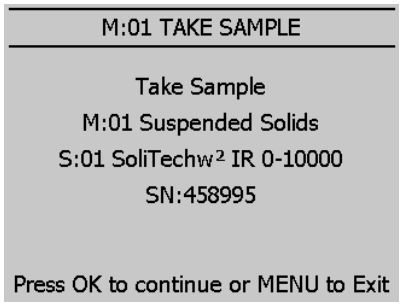
3.6 Take Sample

'Take sample' along with 'Sample Result' work in tandem to calibrate the sensor within the process it is deployed. This method should be viewed as the primary mode to validate readings from the sensor. The function will compensate for variances in particle size and density between different processes, materials and even within the same process if variable at different times of year.

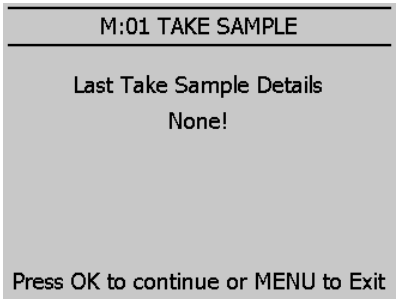
In **MEASUREMENT CONFIG p**ress ▼ to highlight 'TAKE SAMPLE' and press OK to select.

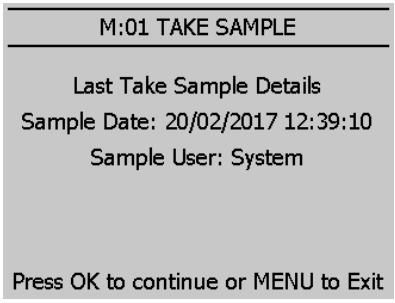


Press OK to select the next screen, which displays general sensor information: Serial number etc.



Press OK to progress to screen showing details of the previous 'TAKE SAMPLE' . If previously not undertaken, this will display 'None'. Otherwise the date and user title of that procedure will be shown.



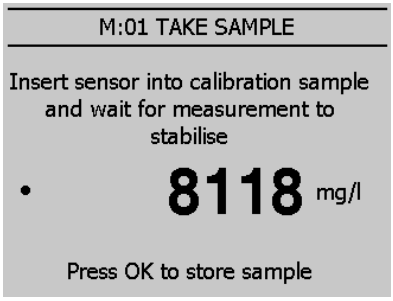


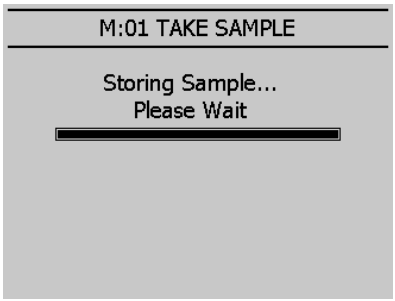
Press OK to select the next screen, which is the reading stabilisation page.

Insert sensor into calibration sample and wait for the measurement to stabilise.

Press OK to store sample.

A progress bar will be displayed followed by the SAMPLE SUCCESSFUL screen.





Press MENU to return back to the MEASUREMENT CONFIG screen.

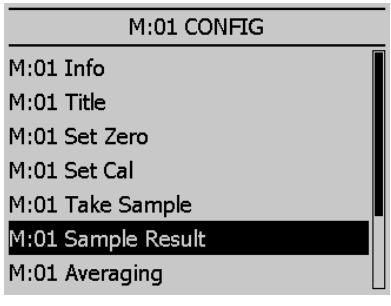
The Take sample procedure is now complete.

The sample used for this procedure can now be laboratory analysed to determine the exact weight of solids it contains. This result from analysis will be carried forward to the SAMPLE RESULT operation.

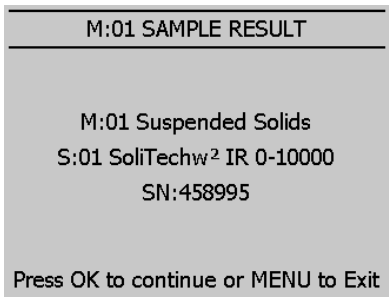
3.7 Sample Result

In order to utilise this function, a ‘TAKE SAMPLE’ operation must have previously been carried out.

In **MEASUREMENT CONFIG p**ress ▼ to highlight 'SAMPLE RESULT' and press OK to select.



Press OK to select the next screen, which displays general sensor information: Serial number etc.



Press OK to progress to screen showing details of the 'Last Take Sample Details'. This provides the details of the latest sample capture.

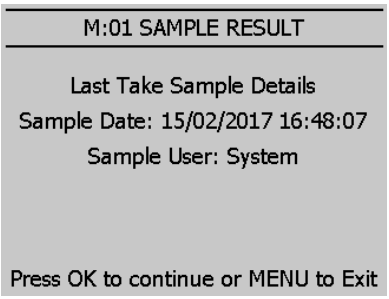
Press OK again to progress to value entry screen.

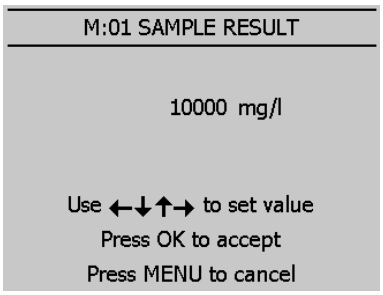
Enter the value for the laboratory result (Default is 40000mg/l). Press ▶ or ▶ to move the cursor below the digit to be changed. Press ▲ or ▼ to increase or decrease the digit, and press the OK to accept the value.

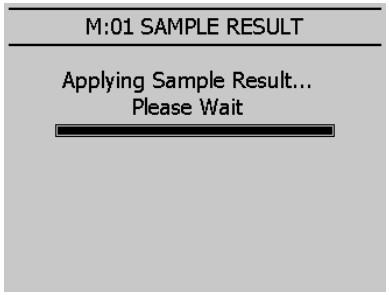
The 'Applying Sample Result' progress bar will display followed by a notification of success.

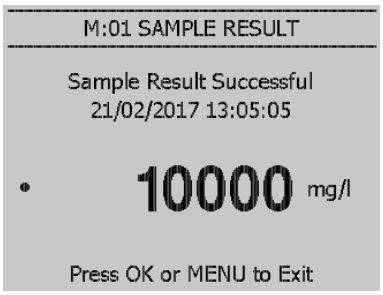
Press MENU to return back to the MEASUREMENT CONFIG screen.

Sample Result is now complete.









4 Sludge Blanket Detection

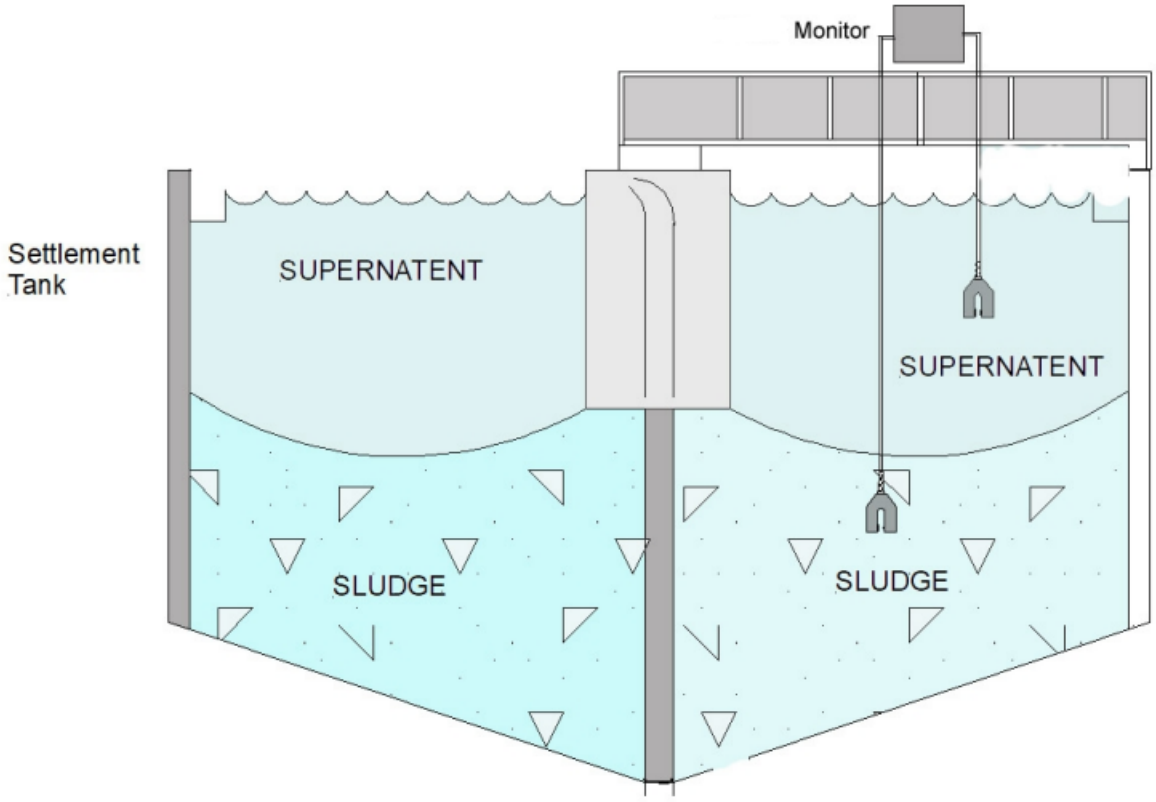
4.1 Compatibility

This measurement is not intended for use with Modbus Slave Monitors. - The Sludge Detection State cannot be read via Modbus.

This section covers the additional measurement and functionality of the Sludge Blanket Detection. **The Sludge Blanket Detection enables detection of the Sludge Blanket so that an appropriate plant action will be taken when the Monitor Relay indicates the Sludge Blanket has been detected. These actions could be any of the following:**

- **Alert operator**
- **Open valve**
- **Run pump**

Description The typical sludge blanket level detection installation is in a settlement tank. The system is made up of a single or dual sensor configuration and a monitor. There will also be associated mounting hardware, which is dependent upon the applications requirements. The monitor is typically mounted on a handrail on the bridge of a settlement tank. The sensor is suspended by its cable; though it should be noted that the sensor must be fastened to the fixing point provided by the mounting bracket and is not left to hang from the cable gland at the base of the monitor.



When mounting the monitor and sensor on a settlement tank with rotating bridge, the sensor should normally be located on the leading edge, approximately half way between the centre and outside edge of the tank, as shown above. Care should be taken when mounting the sensor to ensure that it does not trail into the scraper.

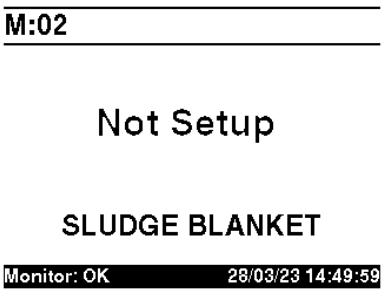
4.2 Adding Sludge Blanket Detection

See section **2.1.2** - Add Measurement.

By default when the measurement is added it will display “NOT SETUP” –

The Alarm must be configured so that the correct status of the Sludge Blanket can be displayed.

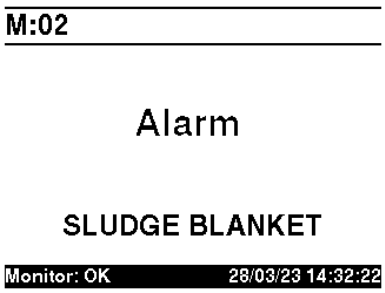
Refer to the 7300w² manual to assign the ‘sludge blanket’ to an alarm, and setup the High or Low alarm.

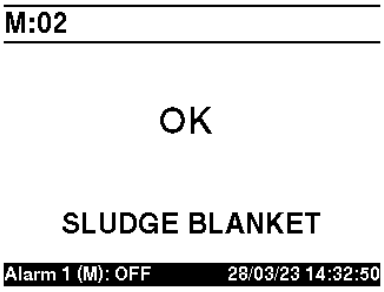


Once the Alarm has been configured, the screen will display:

‘**OK**’ when the sensor is NOT in an alarm state.

‘**ALARM**’ – when the sensor is in an alarm state





4.3 Configuring Sludge Blanket Detection

It is not possible to calibrate the Sludge Blanket Detection measurement

4.4 Blanket not detected

If the sensor is not detecting the sludge blanket and the OK status remains asserted when the sensor is in the blanket, take the following action:

1. With the sensor in the sludge blanket, take note of the % value on the Trend display.

2. Enter the Alarm Config menu and choose the appropriate Alarm x Config option.

3. Set the Alarm x Value to 5% less than the recorded value. This will ensure the alarm will trigger at the desired % solids.

Note: It may also be advisable to set the Alarm x Hysteresis value to about 5% in order to emphasise a clear boundary layer.

4.5 Blanket continually detected

If the sensor is continually detecting the sludge interface and the ALARM stays on when the sensor is above the sludge blanket the following action should be taken:

1. With the sensor above the sludge blanket, take note of the % value on the Trend display.

2. Enter the Alarm Config menu and choose the appropriate Alarm x Config option.

3. Set the Alarm x Value to 5% greater than the recorded value. This will ensure the alarm will clear at the desired % solids.

Note: If the Alarm x Value is set to 100% and the detector continually indicates the presence of the sludge blanket when the sensor is above the blanket, the sensor that is fitted is too sensitive and an alternative sensor will have to be fitted.

For an accurate adjustment of the Alarm x Value to a required level:

1. Immerse the sensor fully in a known sample of the required value.

2. Record the % value on the Trend display.

3. Enter the Alarm Config menu and choose the appropriate Alarm x Config option.

4. Set the Alarm x Value to 5% less than the recorded value.

The desired alarm point has now been set and the controller will now detect sludge blankets of this value or higher.

Note: In the event of the sensor being changed, it will be necessary to repeat the above alarm point adjustment in order to obtain accurate results

5 Spare Parts List

5.1 Sensors

223893.....SoliTechw² IR Sensor (Range: 0-200 mg/l, Cable Length: 10 metres)
223895.....SoliTechw² IR Sensor (Range: 0-1500 mg/l, Cable Length: 10 metres)
223897.....SoliTechw² IR Sensor (Range: 0-10000 mg/l, Cable Length: 10 metres)
223899.....SoliTechw² IR Sensor (Range: 0-30000 mg/l, Cable Length: 10 metres)
223894.....SoliTechw² IR Sensor (Range: 0-200 mg/l, Cable Length: 20 metres)
223896.....SoliTechw² IR Sensor (Range: 0-1500 mg/l, Cable Length: 20 metres)
223898.....SoliTechw² IR Sensor (Range: 0-10000 mg/l, Cable Length: 20 metres)
223900.....SoliTechw² IR Sensor (Range: 0-30000 mg/l, Cable Length: 20 metres)
Note: Other cable lengths for these four variants exist. Please refer to Partech's website for part number details.

5.2 Monitor

223160.....7300w² Monitor (85 to 264VAC, 2 x 0/4-20mA Output, 3 x Relay Outputs)
223161.....7300w² Monitor (9 to 36VDC, 2 x 0/4-20mA Output, 3 x Relay Outputs)
226974.....7300w² Monitor (85 to 264VAC, Modbus Slave, 1 Relay Output)
226975.....7300w² Monitor (9 to 36VDC, Modbus Slave, 1 Relay Output)

5.3 Mounting Accessories

171290.....Handrail Attachment

5.4 Miscellaneous

224081.....7300w² Monitor Instruction Manual
228655.....SoliTechw² IR Sensor Instruction Manual

6 Technical Support

Technical Support is available by phone, fax, or email, the details of which are shown below.

- Phone: +44 (0) 1726 879800
- Fax: +44 (0) 1726 879801
- Email: techsupport@partech.co.uk
- Website: www.partech.co.uk

To enable us to provide quick and accurate technical support please have the following information ready when you contact us:

- Serial Number or original purchase details
- Sensor Type, and Serial Number
- Application details
- Description of fault

6.1 Returning Equipment for Repair

If equipment needs to be returned to Partech for repair or service the following address should be used:

SERVICE DEPARTMENT

PARTECH INSTRUMENTS

ROCKHILL BUSINESS PARK

HIGHER BUGLE

ST AUSTELL

CORNWALL

PL26 8RA

UNITED KINGDOM

Please include the following information with the returned equipment. Also ensure that sensors are adequately cleaned and protected for transportation (Advice on packing can be provided by our service department).

- Contact name and phone number
- Return address for equipment
- Description of fault or service required
- Any special safety precautions because of nature of application

7 Technical Specification

7.1 General

Weight.....0.7 kg inc 5m of cable
Protection Class.....IP68
Enclosure Material.....Black Acetal Co-polymer
Cable Type.....4 core, 2 twisted pair 5mm O/D Polyurethane Coated
Cable Length.....10 metres standard, 100 metres maximum

Dimension (mm).....	*Height*	*Width*	*Depth*	*Optical Path*
Range 0-200.....	*95*	*160*	*25*	*100*
Range 0-1,500.....	*95*	*100*	*25*	*40*
Range 0-10,000.....	*95*	*75*	*25*	*15*
Range 0-30,000.....	*95*	*75*	*25*	*8*

7.2 Environmental Data

Operating Temperature Range.....0 to 60°C
Pressure Rating (Depth) Rating.....1 Bar

7.3 Measurements

	Limit of Detection	***Minimum Operating Range***
Range 0-200 mg/l	*1 mg/l*	*0 – 20 mg/l*
Range 0-1,500 mg/l	*7.5 mg/l*	*0 – 150 mg/l*
Range 0-10,000 mg/l	*50 mg/l*	*0 – 1000 mg/l*
Range 0-30,000 mg/l	*150 mg/l*	*0 – 3000 mg/l*

	Accuracy
Range 0-200 mg/l	*±5% of measured value or ±1 mg/l whichever is greater*
Range 0-1,500 mg/l	*±5% of measured value or ±7.5 mg/l whichever is greater*
Range 0-10,000 mg/l	*±5% of measured value or ±50 mg/l whichever is greater*
Range 0-30,000 mg/l	*±5% of measured value or ±150 mg/l whichever is greater*

Measuring Principle.....Light Absorption
Wavelength.....960nm
Measured Units.....mg/l, g/l %, NTU, FTU, FNU, FAU

**Suspended Solids Range is dependent on the sample being measured.*

Turbidity range is the same as that stated for mg/l

For the purposes of this manual: 1NTU = 1FTU =1 FNU = 1FAU

8 Appendix 1: Fuller's Earth

The Fuller's Earth is supplied in a sealed 20g package, the package contains sufficient to make a 20,000 mg/l (20 g/l) solution when combined with 1 litre of water. Alternate solutions can be obtained by increasing the amount of water used as shown in the table below.

Solution Required (g/l)	Add pack to water (litres)
2.5	8.0
5.0	4.0
10.0	2.0
20.0	1.0
40.0	0.5

The following points should be observed when preparing and using Fullers Earth solutions:

- The water used should be freshly distilled or de-mineralised.
- Ensure the container used for the solution is clean.
- During preparation and use, keep the solution covered to prevent contamination.
- When using the solution it must be continually stirred to ensure accurate and consistent measurements and to prevent settling.

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