



INSTRUCTION MANUAL

SoliTechw<sup>2</sup> IR  
for 750w<sup>2</sup> Monitor

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## **1 Introduction**

### **1.1 General**

Partech's range of SoliTechw<sup>2</sup> IR infrared sensors can be used for the measurement of suspended solids, sludge density, and turbidity in a wide range of applications, which includes Mixed Liquor (MLSS), Total Suspended Solids (TSS) and Sludge Blanket Detection.

The sensor has been designed as a robust and accurate method of portable detection. The machined housing provides excellent resistance to impact, temperature & chemical attack and the only maintenance required is periodic cleaning of the optical surfaces.

The SoliTechw<sup>2</sup> IR sensors are connected to the 750w<sup>2</sup> Monitor unit via a high quality IP68 connector. The sensors are interchangeable, allowing a customer to use the same 750w<sup>2</sup> Monitor unit at different locations with different sensors.

The SoliTechw<sup>2</sup> IR Sensors come in 4 different ranges to maximise accuracy over a diverse range of applications. The 750w<sup>2</sup> and SoliTechw<sup>2</sup> IR combination make this the most flexible Suspended Solids, Turbidity and Sludge Density portable product range available on the market.

### **1.2 Manual Conventions**

This instruction manual describes the configuration and operation of the SoliTechw<sup>2</sup> Sensor and where required includes some information regarding the 750w<sup>2</sup> Monitor. It is therefore very important that it is used in conjunction with the 750w<sup>2</sup> Monitor instruction manual.

The manual has been written on the basis that the user has a basic knowledge of instrumentation and an understanding of the type of measurement being made. Training in the use of the SoliTechw<sup>2</sup> Sensors and 750w<sup>2</sup> Monitor can be provided by Partech, please contact Partech for further information.

## 2 Calibration

### 2.1 Set Zero

The Set Zero function is used for calibration. Allows a zero calibration value to be stored. The terms relate to the calibration of the system and are covered in the section below. Set Zero by pressing the **OK** key in Measurement Config. (Figure 1)

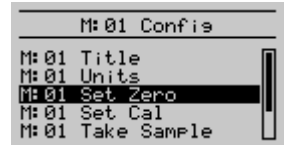


Figure 1

To zero the system, immerse the sensor in clean water (Use a black or dark container for the calibration solutions to restrict external light effecting the calibration).

From the 750w<sup>2</sup> Monitor, navigate to the Calibration menu as follows:

- Press **MENU** to show the “MAIN MENU”.
- Select “MEASUREMENT CONFIG” using **↓↑** to highlight and press **OK**.
- Select the measurement to be calibrated using **↓↑** to highlight and press **OK**.
- Select “SET ZERO” using **↓↑** to highlight and press **OK**.
- The SET ZERO screen will be displayed, press **OK** to accept. The ZERO Calibration screen will be displayed.
- Wait for the value to stabilise, then press **OK** to accept.
- Zero calibration is now complete.

### 2.2 Set Cal

The Set Cal function is used for calibration. Allows a span calibration value to be stored. The terms relate to the calibration of the system and are covered in the section below. Set Cal by pressing the **OK** key in Measurement Config. (Figure 2)

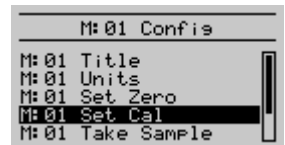


Figure 2

The span point needs to be selected to be representative of the process being monitored with due regard to the normal operating conditions. For a Final Effluent monitoring application where the discharge consent is 30 mg/l we would suggest the calibration is carried out at around 30 mg/l. For an Activated Sludge Application with a Suspended Solids control band of 1,500 to 3,000 mg/l we would suggest calibration at 3,000 mg/l.

## 2.3 Calibration Using Formazin

For Turbidity monitoring it is often preferable to use a secondary calibration solution, this allows comparison to other part of a process or across different sites. Care needs to be taken if the measurement is being taken for regulatory purposes and due regard must be paid to the requirements to regulator.

Formazin is a widely accepted secondary standard and can be purchased from laboratory suppliers prepared at defined values. Please note that 2 litres of the solution is required to carry out the calibration.

Calibrating with Formazin allows the use of FTU, FNU and FAU as the units of measurement. The units on the 750w<sup>2</sup> Monitor should be changed to reflect this. It should be noted that there is no universal relationship between FTU's and mg/l, although it may be possible to derive a relationship by experimentation for a particular application.

If preferred a stock solution of Formazin can be prepared on site. Please note that the stock solution needs to be prepared at least 24 hours before use. Once a Formazin stock solution has been prepared, it can be diluted to the required value.

Once the Formazin solution is available use the Calibration Process below.

## 2.4 Calibration Using Fuller's Earth

The use of Fuller's Earth is an alternative method of calibrating the SoliTechw<sup>2</sup> Sensor. It should be noted that this would produce only an indication of the value being measured. Fuller's Earth has fallen out of common use, however, is included to give an alternative method of calibration if gravimetric analysis is not possible.

Once the Fuller's Earth solution is available use the Calibration Process below.

## 2.5 Calibration Process

To set the span calibration point for the system, immerse the sensor in the sample/solution described above (use a black or dark container for the calibration solutions to restrict external light effecting the calibration).

From the 750w<sup>2</sup> Monitor, navigate to the Calibration menu as follows:

- Press **MENU** to show the "MAIN MENU".
- Select "MEASUREMENT CONFIG" using **↓↑** to highlight and press **OK**.
- Select measurement to be calibrated using **↓↑** to highlight and press **OK**.

- Select “SET CAL” using **↓↑** to highlight and press **OK**.
- The SET Cal screen will be displayed, press **OK** to accept. The SPAN Calibration screen will be displayed.
- Wait for the value to stabilise, then press **OK** to accept.
- Span calibration is now complete

## 2.6 Take Sample

The Take Sample and Sample Result menus are provided to allow calibration to be carried out retrospectively based upon stored information. An example of this is where the value of the calibration solution is not known at the time of calibration and an estimated value was used to set the instrument span. The take sample menu is used to store the sensor signal of the calibration solution for later use. The Set Zero process described above should be carried out before using the Take Sample routine.

The Sample Result function is used for calibration. Allows a sample value to be stored and results entered later. The terms relate to the calibration of the system and are covered in the section below. Take sample by pressing the **OK** key in Measurement Config. (Figure 3)



Figure 3

## 2.7 Take Sample Process

Immerse the sensor into a black or dark container, containing a sample representative of the normal operating conditions expected from the sample point.

For some applications it is preferable to place the sensor directly in its normal location. A sample must be taken from immediately next to the sensor to be analysed, to determine the Suspended Solids content. Care is also needed to ensure that air bubbles are not causing a calibration error.

From the 750w<sup>2</sup> Monitor, navigate to the Take Sample menu as follows:

- Press the **MENU** to show the “MAIN MENU”
- Select “MEASUREMENT CONFIG” using **↓↑** to highlight and press **OK**.
- Select measurement to be calibrated using **↓↑** to highlight and press **OK**.
- Select “TAKE SAMPLE” using **↓↑** to highlight and press **OK**.
- The TAKE SAMPLE screen will be displayed, press **OK** to accept.

- Wait for the value to stabilise, then press **OK** to accept the current reading. The sample value will now be stored in the sensor.
- Take Sample is now complete. The sensor will continue to measure using the original calibration values, however the sample value, time and date will be stored until required.
- The sample must now be analysed by a laboratory to establish the Turbidity or Suspended solids present. Once this information is attained, the value of the sample can be entered into the sensor using the SAMPLE RESULT menu.

## 2.8 Sample Result

The Sample Result function is used for calibration. Allows a known Turbidity or Suspended Solid sample value to be assigned to the Take Sample stored value previously taken. The terms relate to the calibration of the system and are covered in the section below 'Sample Result'. (Figure 4)

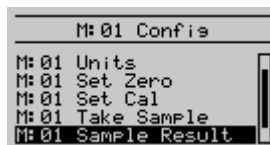


Figure 4

Once the sample result has been established, the result can be entered into the sensor in the following way:

- Press to show the "MAIN MENU".
- Select "MEASUREMENT CONFIG" using  $\downarrow\uparrow$  to highlight and press **OK**.
- Select measurement to be calibrated using  $\downarrow\uparrow$  to highlight and press **OK**.
- Select "SAMPLE RESULT" using  $\downarrow\uparrow$  to highlight and press **OK**.
- The SAMPLE RESULT screen will be displayed, press **OK** to accept.
- The time and date of the last Take Sample will be displayed for the users reference. Press **OK** to accept.
- Press  $\leftarrow\rightarrow$  to move the cursor below the digit to be changed.
- Press  $\downarrow\uparrow$  to increase or decrease the digit. Enter the known value of the sample.
- Press **OK** to accept the new calibration value.
- The sensor is now calibrated. The sensor will now measure using the sample value you have stored, time and date will also be stored.

### 3 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](mailto:techsupport@partech.co.uk)
- Website: [www.partech.co.uk](http://www.partech.co.uk)

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

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

#### 3.1 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 products are adequately 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



## 4 Technical Specification

### 4.1 Physical

Weight .....0.7kg inc 5m of cable  
 Protection Class .....IP68  
 Enclosure Material .....*Black Acetal Co-Polymer*  
 Cable Connection .....*4 Way Lemo Circular Plug*  
 Cable Type .....*4 core. 2 twisted pair 5mm O/D Polyurethane*  
 Service Requirement .....*No routine servicing*

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

### 4.2 Environmental Data

*Operating Temperature .....0 to 60°C*  
*Storage Temperature .....-20 to 60°C*  
*Pressure (Depth) Rating .....1 Bar*

### 4.3 Measurements

<i>Range*</i>	<i>Typical Application</i>	<i>Minimum Detection</i>
0-30,000	Primary Settlement Tanks Membrane Reactors	500mg/l
0-10,000	Activated Sludge Plants Mixed Liquor (MLSS)	50mg/l
0-1,500	Final Effluent Environmental/River	3mg/l
0-200	Final Effluent Environmental/River	0.5mg/l
<i>Accuracy</i>	±5% of reading or 10mg/l whichever is greatest	
<i>Measurement Principal</i>	Light Attenuation	
<i>Wavelength</i>	960nm	
<i>Measured Units</i>	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 = 1FNU = 1FAU

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