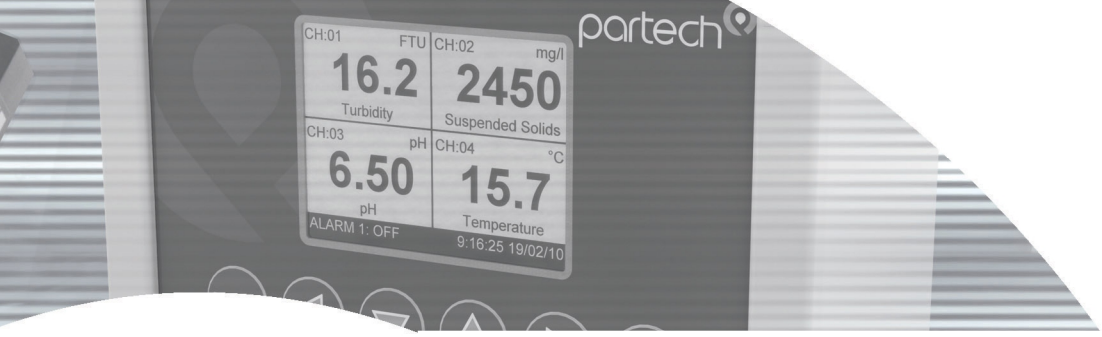

INSTRUCTION MANUAL

SludgeWatch 8200w²

Fixed Sludge Level Detector

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Table of Contents

1 Foreword

8200w² Monitor is another “Operator Interface” to the WaterWatch² family of measuring instruments and sensors, and has been developed to be the successor to the very popular 8100 & 8200 Monitors. Using the latest embedded processor technology, the 8200w² Monitor has been designed to encompass an easy to use and intuitive interface while providing advanced features and communication protocols to satisfy the most demanding of applications and environments.

The 8200w² Monitor is designed to interface with all members of the SoliTechw² IR Sensor family. The standard 8200w² Monitor provides connectivity for 1 or 2 sensors. It provides two alarm relay outputs (one for each channel) and a single fault relay output. The fault relay is used to indicate a fault on either input channel. The 8200w² Monitor has two pairs of set point and delay controls. The alarm set point and delay for each channel can be independently set and the status of each channel is indicated separately.

2 Introduction

2.1 Manual Conventions

All dimensions stated in this manual are in millimetres unless otherwise indicated.

The manual has been written assuming the user has a basic knowledge of instrumentation and an understanding of the type of measurements being made. Training in the use of the 8200w² Monitor and sensors can be provided, please contact Partech for further information.

Icons have been used throughout this manual to draw your attention to precautions and useful notes.

They are categorised in the following way:

NOTES: Specifications and general notes of interest to the user.

GENERAL CAUTION: Used where caution is required to prevent injury, damage, corruption of data, loss of calibration or invalidation of warranty etc.

INSTALLATION NOTES: General installation notes of interest to the installer.

ELECTRICAL CAUTION: Used where there is a danger of electric shock to the installer or end user, or where caution is required to prevent damage to the instrument.

MAINTENANCE NOTES: Used to highlight recommended maintenance procedures and help with fault finding.

ENVIRONMENTAL NOTES: General notes on environmental issues, waste and disposal.

2.2 WaterWatch² Trademark

WaterWatchw² is the family name for the w² range of monitors and sensors. Sensors and instruments designed for specific use with the 7300w² & 8200w² Monitors will be suffixed with the w² trademark.

2.3 Scope of Manual

This manual describes the installation, configuration, testing and operation of the 8200w² Monitor. While basic configuration of sensors is included in this manual, please refer to the specific user manual for each sensor for a comprehensive configuration set-up.

2.4 Options

Part No.	Description
229623	SludgeWatch 8200w² Fixed Sludge Level Detector (85 to 264VAC, 3 x Relay Outputs)
229624	SludgeWatch 8200w² Fixed Sludge Level Detector (9 to 36VDC, 3 x Relay Outputs)

2.4.1 Compatible Sensors

The 8200w² monitor can be used with the following Partech sensors:

Part No.	Description
223893	SoliTechw² IR Sensor (Range: 0-200 mg/l, Cable Length: 10 metres)
223895	SoliTechw² IR Sensor (Range: 0-1,500 mg/l, Cable Length: 10 metres)
223897	SoliTechw² IR Sensor (Range: 0-10,000 mg/l, Cable Length: 10 metres)
223899	SoliTechw² IR Sensor (Range: 0-30,000 mg/l, Cable Length: 10 metres)

All the above sensors are available with 20 metre options. Contact Partech for details.

2.5 Quick Overview

2.5.1 Fault Indication

Fault indication is via the main display clearly visible on the front panel of the monitor. When there is a fault present 'FAULT' is displayed and fault relay will enter into the alarm condition.

2.5.2 Alarm Activation

With the sensor(s) clear and not in a fault condition 'OK' is displayed next to associated sensor. If however, the sensor is obscured or blocked then the specific sensor relay will enter into the alarm condition and 'ALARM' will be displayed next to associated sensor.

2.5.3 Delay Operation

A delay can be introduced between conditions for an alarm turning on being met and the relay changing state. At any time during the selected delay, if the conditions for turning the alarm on are removed, then the delay will end and the alarm relay will not change state. Similarly a second delay can be introduced between conditions when an alarm turning off and the relay changing state.

These delays can be set between 1 & 90 seconds. The delay functions are in place to try to avoid the occurrence of false alarms that may be caused by suspended debris or conversely the clearing of alarms prematurely.

2.5.4 Alarm Relays

The alarm relays are internally configured for fail safe operation. When power is applied and the sensors are clear the relays will be energised, on alarm the relays are de-energised. Each alarm has normally closed and normally open contacts for external signalling, the normal condition is when the unit is powered and the alarm is off. There are two alarm relays each assigned to a sensor.

2.5.5 Fault Relay

The fault relay is activated in two instances: when there is a problem with a sensor or due to a failure in the power supply to the system. In the latter case, this will cause the relay to be de-energised, resulting in a fault state. The fault relay is common to both channels on the 8200w² and will be activated if one of the sensors fails or is removed. A sensor fault could be as simple as the sensor connector is unplugged or wire broken and the monitor can no longer communicate with the sensor.

The relay can be wired as normally closed or normally open on the output side depending on customer preference.

2.6 Applications

The 8200w² Monitor, when combined with a compatible sensor, is designed for use as a sludge blanket level detector, a sludge density switch, or as a suspended solids/turbidity switch. The 8200w² Monitor is therefore suitable for interfacing with automatic de-sludging control of primary and secondary settlement tanks, thickener control through high and low blanket level alarm, or as a simple alarm in a water/ waste water flow.

2.6.1 Sludge Blanket Level Detection

When used for this operation the monitor uses an SoliTechw² IR series sensor, which is suspended by its cable to the desired monitoring depth in the tank. When the settled sludge reaches the sensor then the alarm output is activated. This can then be used as an input to a process system to directly control pumps, bell mouths or simply to alert the operator. The same principle can be used to monitor when the sludge reaches a minimum point when it is being removed from the holding tank.

3 Safety Precautions

3.1 General

Read the safety precautions carefully.

Check the delivery of your 8200w² Monitor for damage. Any damage should be reported to your supplier as soon as possible.

Use care when unpacking the monitor. **NEVER** use sharp instruments to open the packaging, as this can cause damage to the membrane keyboard or display.

Only use sensors and accessories specifically manufactured by Partech for use with this monitor.

Read the operating instructions carefully before installing and operating this monitor.

Keep sharp instruments away from the keypad or display.

Keep the monitor dry and free from dust contamination during installation.

Keep the monitor out of direct sunlight and away from other heat sources.

Keep the monitor away from any other equipment that may radiate electromagnetic influences.

Keep the monitor and cabling away from high voltage cables.

3.2 Electrical Installation

Only suitably qualified personnel may install, operate or repair this equipment. The installer must ensure all electrical installations comply with local wiring regulations and standards (refer to BS7671 for UK installations).

Please check the correct voltage is applied to the monitor before making live. Incorrect supply voltage can cause damage to the 8200w² Monitor.

Only connect sensors from the w² range to this monitor, other Partech products without the w² reference are not compatible and may cause damage if connected. IF IN DOUBT, PLEASE ASK.

Never work on a live monitor. High Voltages may be present on the circuit boards.

Beware, even when the monitor is electrically isolated from the supply, there is still the possibility of live voltage on the telemetry terminals from the end user (relay outputs). Please ensure the end user has isolated any telemetry voltages before undertaking any work or testing.

3.3 Operating

The users must acquire the appropriate knowledge to use the equipment in their specific application, as this monitor can be used for a wide range of applications.

Partech are always available to provide advice and assistance with your application. Please contact Partech for further information.

Sensors attached to this monitor must be correctly calibrated. Please follow the procedures for installation and calibration as provided in the instruction manual for your Partech sensor.

3.4 Service and Maintenance

Before maintenance, this equipment must be isolated or disconnected from HAZARDOUS LIVE voltages before access.

Maintenance for the 8200w² Monitor should be carried out as specified in this instruction manual. Failure to carry out regular maintenance could invalidate the Warranty.

Services and repairs must be carried out by a Partech engineer. Partech can provide a service contract for your system. Please ask for details.

3.5 End of Life Disposal

This equipment should be recycled according to local regulations.

Partech can provide recycling and disposal of your old Partech equipment, and may also provide the same service for other manufacturers equipment when replaced with Partech equipment.

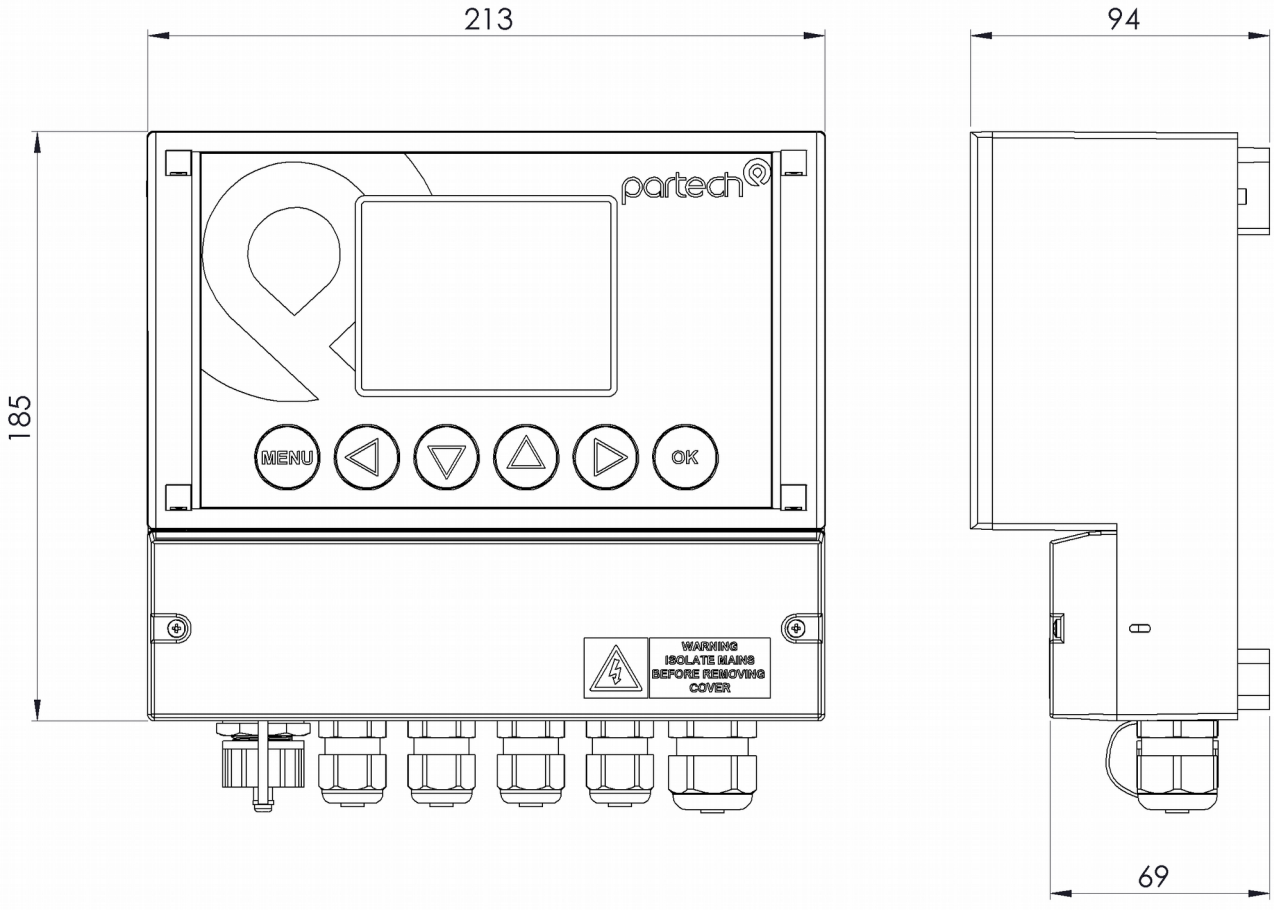
Partech may provide a trade-in option for old Partech equipment when upgrading your system. Please contact us for further information.

4 Installation

Whilst all attempts have been made to ensure that these instructions are correct, common sense and good engineering practice should always be used, as every installation can present a new set of challenges and difficulties. If you are in any doubt please contact Partech or your local distributor for further information.

4.1 Mechanical Installation

Monitor external dimensions.



4.2 Installation Considerations

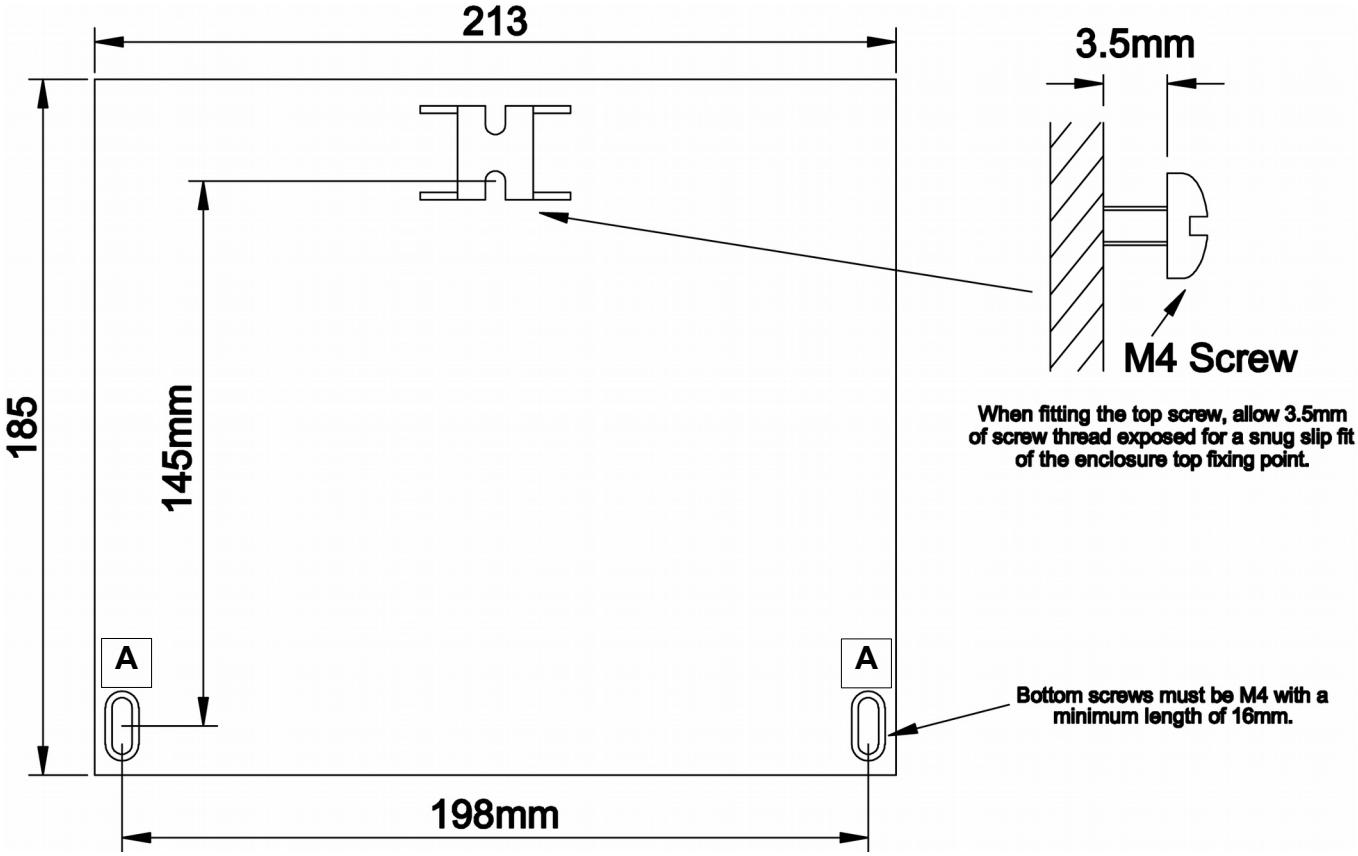
Below are a number of points to be considered when deciding on a final location to install or mount the 8200w² Monitor.

- If the monitor requires regular inspection or local reading of measurements, ensure the monitor is mounted in a position that allows for easy reading. Consider operators of all heights.
- If the sensor is to be calibrated by a single person, consideration should be paid to the proximity of the monitor to the sensor. Some sensors require constant monitoring or staged inputs during the calibration process. This could be difficult if the sensor is remote from the monitor.
- Keep the monitor out of direct sunlight. This can make the display difficult to read, and in extreme conditions could cause the monitor to overheat and fail.
- Keep the monitor away from other heat sources or electronics that may transmit or radiate electromagnetic influences.
- Keep the monitor away from mains power cables, variable speed drives and motor controllers.
- The monitor is suitable for the most demanding of environments. Where there is a likelihood of physical damage, salt-water spray or cleaning by high pressure hoses, we advise the monitor is installed inside an enclosure for added protection.

4.3 Fixings

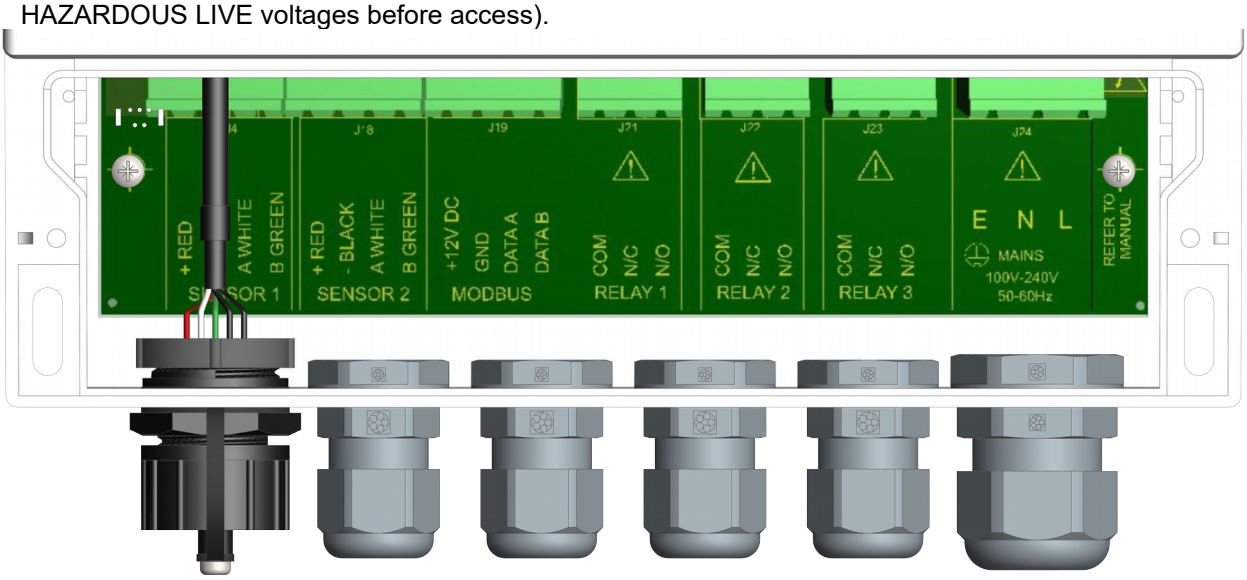
The 8200w² Monitor has 3 fixing points for mounting. Follow these instructions for easy installation and mounting.

- Offer the monitor up to the final mounting position. Mark the wall behind with a dot halfway along the top of the enclosure.
- Measure down from the dot 27mm and fit an M4 screw. Ensure the screw has 3.5mm of thread exposed for a snug fit.
- Hang the enclosure on the screw using the hanging bracket moulded into the back of the monitor (Loosen the screw if too tight to hang).
- Remove the lower terminal strip cover to reveal the two lower fixing slots (shown as A on the illustration below).
- Level the Monitor with a spirit level and mark the two lower slots.
- Remove the enclosure and fix drill/tap the above marks.
- Rehang the enclosure (Tighten the top screw if the enclosure feels loose) and fit the two lower screws. The enclosure has a 14mm shoulder so fixing screws must be at least 16mm long to penetrate beyond the back of the enclosure.
- Refit the lower terminal cover.



4.4 Electrical Installation

Unscrew the two cover screws on the lower panel of the 8200w² Monitor to reveal the Terminals. Each terminal strip is labelled as illustrated below. (This equipment must be isolated or disconnected from HAZARDOUS LIVE voltages before access).



The maximum size wire that can be terminated is 2.5mm² CSA. All the connections are via removable Plug/Socket terminals. To disengage the terminals, simply pull down to release.

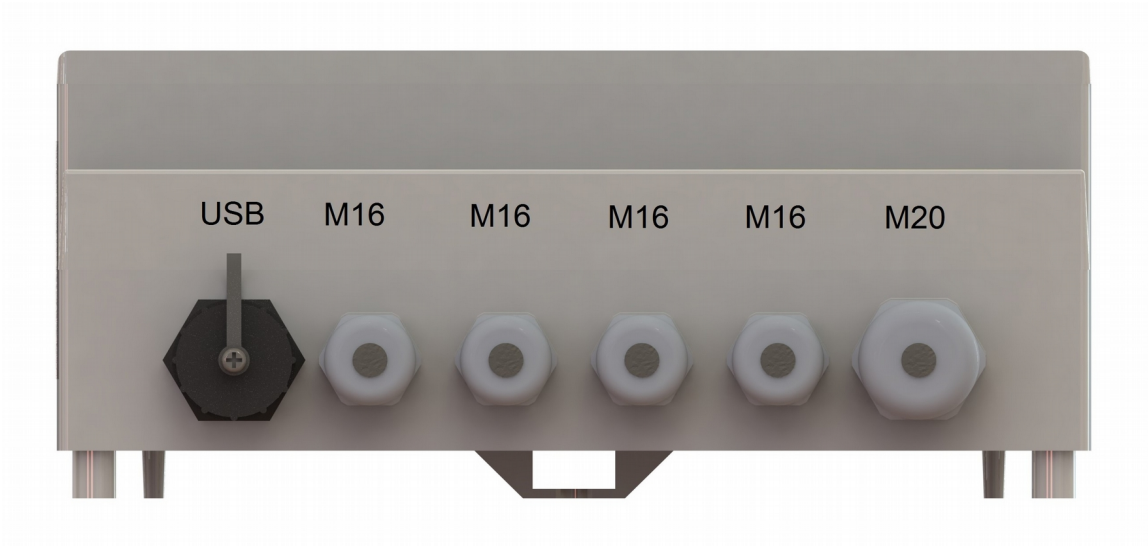
Two power options are available for the 8200w² Monitor, AC and DC. Apart from the supply voltage, all other connections are identical.

4.4.1 Gland Configuration

The 8200w² Monitor is supplied with IP68 Skintop Nylon glands with lock nuts in the following configuration:

- Left: 1 x USB connection
- Centre 4 x M16 glands (4.5-10mm Ø cable)
- Right: 1 x M20 gland (5-10mm Ø cable)

Gland holes are clearance, not tapped. Always blank unused glands to retain the IP rating of the enclosure Cabling

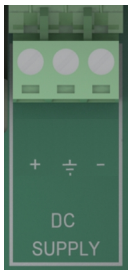


When selecting and calculating the mains power cable, please note, an ambient temperature of 60ºC may see a rise to 80ºC within the terminal compartment. This should be considered when making your calculations, therefore we recommend a power cable with a maximum rating no less than 80ºC. Recommended cables include H07RN-F, Steel Wire Armoured or YY, CY or SY types (always check cable data sheets for maximum temperature ratings, as this can vary between manufactures).

(Refer to BS7671, section 522 *"Selection and erection of wiring systems in relation to external influences"* for guidance).

Shrouded Bootlace Ferrules should always be used when terminating conductors.

4.4.2 DC Power Connections



The DC power connection is a 3 way terminal strip, located furthest right of the termination bank. The left terminal is the Positive (+) supply, the Right terminal is the Negative (-) or Zero voltage supply and the centre terminal is the Ground.

The power supply is galvanically isolated from all other terminals on the 8200w² Monitor. It is not necessary to connect a ground to the monitor,.This terminal has been provided for convenience.

The DC powered 8200w² Monitor is powered typically from a 12V to 24V DC supply.

Min/Max Voltages are 9V to 36V. We do not advise operating the monitors in the field at voltages approaching the Min or Max values as surges, dips or ripples in supply can fall outside the Max/Min limits and can cause damage or interruptions to the performance of the 8200w² Monitor.

It is recommended that a circuit protective device (5A Trip) or fuse (5A anti-surge fuse) is fitted to the supply voltage in close proximity to the monitor and located in a position where it is not difficult to operate, replace or reset the device. The monitor has an on-board 3.5A fuse for internal protection and is fitted with a reverse polarity diode.

In addition to the protective device, we advise a local isolator or disconnection switch is fitted in close proximity to the monitor to allow easy disconnection or isolation of the monitor. This switch should be in easy reach of the operator and clearly marked as the disconnection device for this equipment. This allows for easy power-down of the monitor during servicing or periods where the monitor is not being used.

NOTE: If the equipment is used in a manner not specified by this manual, the protection provided by the equipment may be impaired.

4.4.3 AC Power Connections

The AC power terminal strip is a 3 way connector, located furthest right of the termination bank.

The left terminal is the Earth (E), the Right terminal is the Live supply (L), and the centre terminal is the Neutral Supply (N).

The AC powered 8200w² Monitor is powered typically from a 100VAC to 240VAC 50/60Hz supply.

Min/Max voltages are 85VAC to 264VAC, 47Hz-63Hz. We do not advise operating the monitors in the field at voltages approaching the Min or Max values as surges, dips or ripples in supply can fall outside the Max/Min limits and can cause damage or interruptions to the performance of the 8200w² Monitor.

The supply voltage should be fitted with a 3A Type C MCB (the monitor is prone to inrush currents during initial power up, therefore a "Motor Rated" Type C MCB should be used to prevent nuisance tripping).

It is recommended that a circuit protective device or MCB is situated in close proximity to the monitor, and located in a position where it is not difficult to operate or reset the device.

In addition to the protective device, we advise a local isolator or disconnection switch is fitted in close proximity to the monitor to allow easy disconnection or isolation of the monitor. This switch should be in easy reach of the operator and clearly marked as the disconnection device for this equipment. This allows for easy power-down of the monitor during servicing or periods where the monitor is not being used.

The monitor should be adequately earthed. Circuit Protective Conductor (Earth conductor) Cross Sectional Area (CSA) should not be less than the CSA of the calculated phase conductors.
(Refer to BS7671, section 543 *"Protective Conductors"* for guidance).

NOTE: If the equipment is used in a manner not specified by this manual, the protection provided by the equipment may be impaired.

All external wiring should comply with local wiring regulations and standards.

The monitor has an insulation resistance of 3KV, however, care should be taken when conducting insulation resistance tests. We advise the AC terminal strip is disengaged from the circuit board before such tests are carried out.

4.4.4 Sensor Connections

When routing the sensor cables, please ensure all cables are separated from any mains cables. Although the WaterWatch² sensors have a high resistance to interference, separation of mains and data cables is always good practice and should be followed where practical.

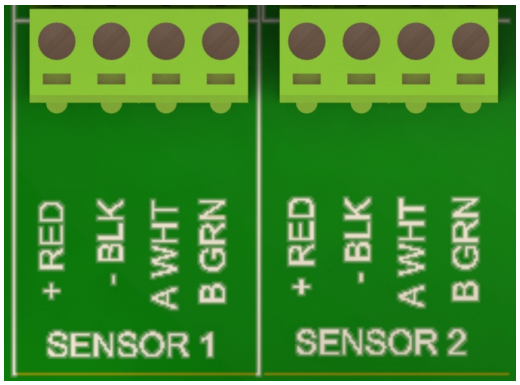
All WaterWatch² sensors and Expansion Boxes communicate with the monitor using the ModTechw² Protocol. This is a modified Modbus Protocol and has been specifically developed to take advantage of the advanced features and diagnostics designed into the w² range of sensors.

Note: These sensors can **NOT** be used with other monitors that are not included in the w² family.

All sensors within the w² family of instruments are connected to the 8200w² Monitor using the same 4 wire configuration, however some slight variations may occur with specific sensors. Always check the manual supplied with the sensor to ensure the correct termination is applied.

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

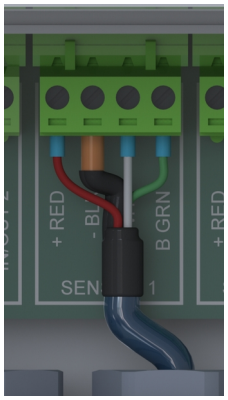
A maximum of two sensors can be directly connected to the standard 8200w² Monitor, however additional sensors can be added using optional Expansion Boxes available separately.



Remove the 4-way connector from the 8200w² 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 right 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.

4.4.5 Extending Sensor Cables

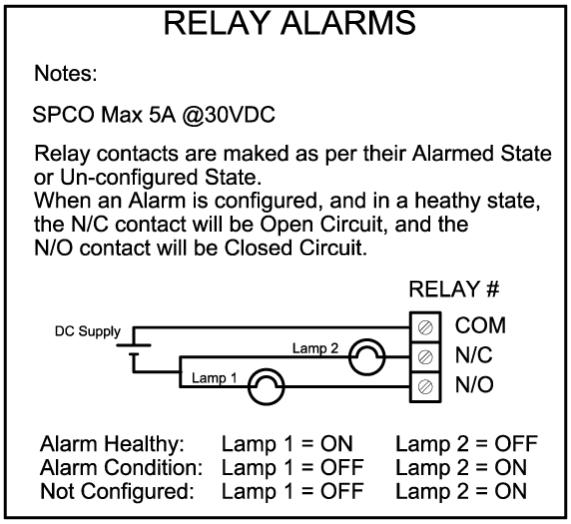
Sensors are usually supplied with 10m cables (longer cables can be provided on request). These cables can be extended to a maximum length of 100m. To ensure optimum performance, we advise the use of Partech ModTechw² cable for extensions. Partech can supply Junction Boxes to allow for easy termination of cable extensions. These should be used on all installations where the cable length from the sensor to the monitor exceeds 20M (Partech Junction Boxes include on-board filtering for long cable lengths). Junction Boxes are also useful for local connection of sensors close to the sample point. This permits easier replacement of sensors without the need to pull back cables to the monitor. The Junction Box has an on-board terminator switch that can be activated to terminate the network if the sensor is to be removed for long periods.

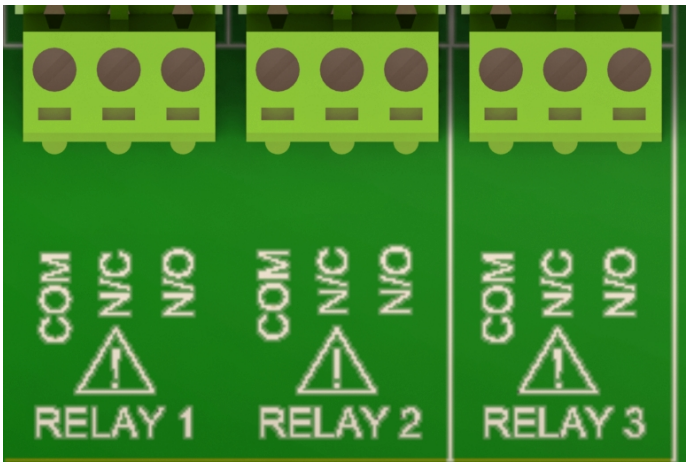
When joining cables, ensure the connection is fully waterproof. Any moisture ingress can effect the performance of the sensor and monitor. Always ensure the earth screen is continued when making joints.

ModTechw² Cable specification:

- 2 Twisted Pair: Red/Black (Power) and Green/White (Data) with Screen and Drain wire
- Cores 24AWG (0,22mm²) 7 x 0,20mm
- Outer Insulation: PUR Polyurethane Blue (RAL5003), Diameter – 5mmØ

4.4.6 Relay Outputs (Alarms)





The relay outputs are 3 way terminal strips, located in the middle of the termination bank. The 8200w² Monitor offers 3 SPCO relay contacts that are user configurable.

Please refer to the “Alarm Configuration” section of this manual for details of how to configure the relays for alarms or process control outputs.

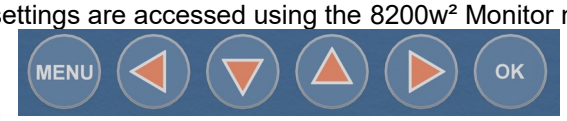
The relays can switch non-inductive loads up to a maximum of 5A, and withstand voltages up to 240VAC.

Please note, for “Alarm” applications the relays are fail safe. Once configured, the relays will remain energised in a non-alarmed state (Healthy), therefore N/C will be “Open Circuit”, and N/O will be “Closed Circuit”. During an Alarm condition, system fault or power failure the relay will de-energise, returning back to the state illustrated on the label. If the alarm has not been configured, the relay will remain de-energised.

5 Basic Operation

5.1 Keys and Screen Navigation

All menus and parameter settings are accessed using the 8200w² Monitor membrane keypad.



5.1.1 Menu Button

From the measurement display screen press MENU to show the Main Menu. While in sub menus, MENU acts as a return to the previous menu.

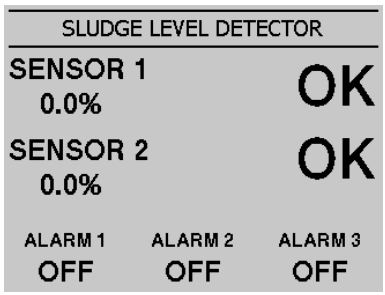
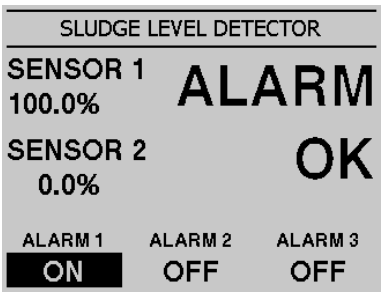
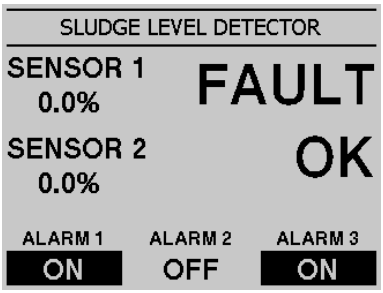
5.1.2 Navigation Buttons

Use the navigation buttons to move the cursor up, down or across menus. For example, when setting the "Time" press ◀ or ▶ to move the cursor over the number to be changed, and press ▲ or ▼ to change the number. These buttons can also be used to change the display screen for multi measurement displays.

5.1.3 OK Button

Press OK to accept a value or to select a sub menu.

5.2 Measurement Screen

		
Screenshot 1	**Screenshot 2**	**Screenshot 3**

The screen shots above show the 8200w² monitor main display in various conditions.

Screenshot 1 illustrates two sensors installed and no alarms asserted.

Screenshot 2 illustrates sensor 1 has detected the sludge blanket and alarmed. The associated alarm 1 relay will also activate in this example.

Screenshot 3 illustrates sensor 1 with a fault. The associated alarm 1 relay will activate as normal, but in addition the alarm 3 fault relay will activate

5.3 System Configuration.

From the Measurement Display press MENU to enter the "MAIN MENU". From this menu, all configurations and parameters are defined.

Setting up the monitor is a simple and intuitive process. The menu structure has been designed to lead the operator through the configuration process. Simply start with the menu at the top and work down through the menus.

Menu options are:

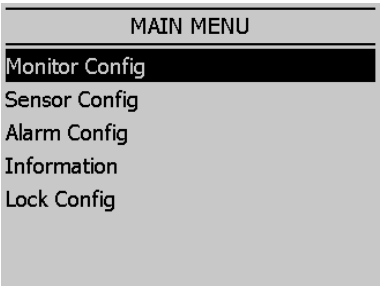
Monitor Config.

Sensor Config.

Alarm Config.

Information

Lock Config.



Press ▲ or ▼ to highlight the menu required, and press OK to select.

Press MENU at any time to return back to the previous menu.

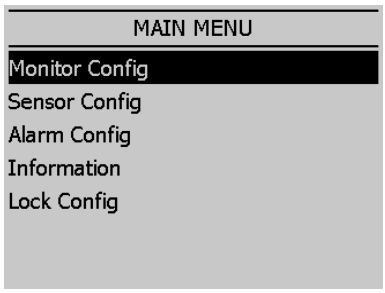
Note: If no key is pressed for 2 minutes, the monitor will default back to the measurement display screen.

5.4 Default Configuration

When the Monitor is powered up for the first time, the display will show 'NO SENSORS'. This indicates no sensors have been configured. Each sensor must be configured before a value is displayed.

6 Operational Menus

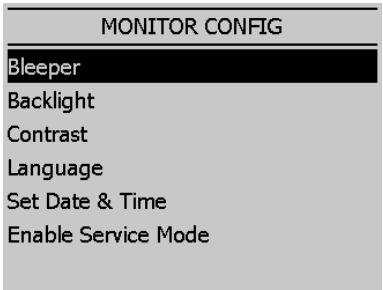
6.1 Monitor Config Menu

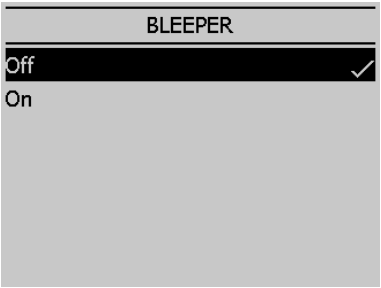


The MONITOR CONFIG menu is used to set up the core monitor functions, including backlight, bleeper function, time and date. This menu option also provides access to some advanced configuration and reset functions.

From the MAIN MENU, ensure MONITOR CONFIG is highlighted (if not, press ▲ or ▼ to highlight the option) then press OK. The six options of Bleeper, Backlight, Contrast, Language, Date & Time, and Service Mode are now available.

6.1.1 Bleeper





From the MONITOR CONFIG menu press ▲ or ▼ to highlight BLEEPER, and press OK to select.

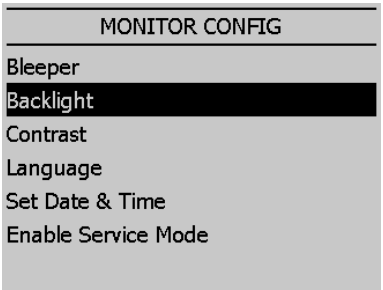
The bleeper (button pressed acknowledgement bleep) can be turned on or off as desired. Under normal circumstances it is preferable to leave the bleeper turned on as it provides an audible feedback of key presses and a triple bleep is confirmation that a function has been successfully changed or selected.

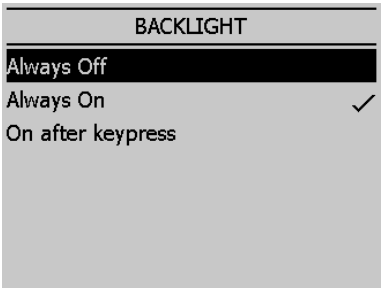
Press ▲ or ▼ to highlight the option required, and press OK to select. A tick will appear next to your selection.

Press MENU to exit this option.

6.1.2 Backlight

From the MONITOR CONFIG menu press ▲ or ▼ to highlight BACKLIGHT, and press OK to select.



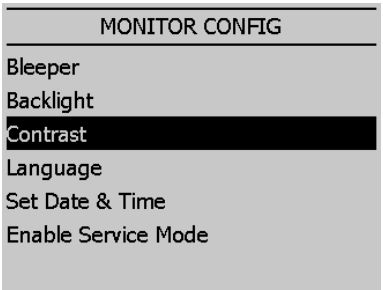


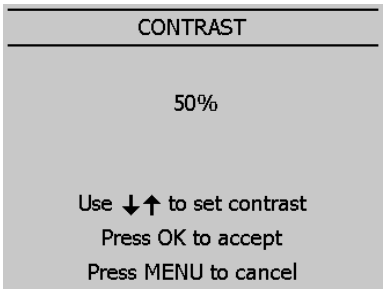
The backlight can be set to always ON, always OFF or ON after key press (backlight will switch off again after a period of inactivity). There is a marginal power saving by having the backlight switched off, otherwise this setting is down to user preference.

Press ▲ or ▼ to highlight the option required, and press OK to select. A tick will appear next to your selection.

Press MENU to exit this option.

6.1.3 Contrast





From the MONITOR CONFIG menu press ▲ or ▼ to highlight CONTRAST, and press OK to select.

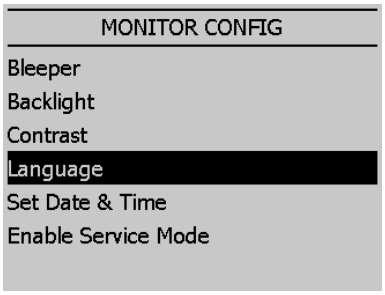
The factory setting of 50% should be sufficient for most ambient light conditions. For different conditions the contrast can be altered.

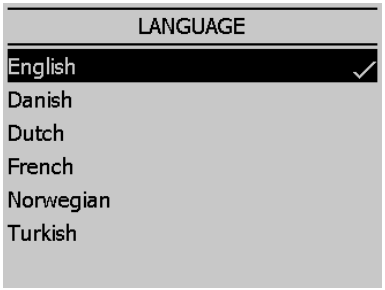
Press ▲ or ▼ to increase or decrease the Contrast by 5% (the screen contrast will react with each press of the buttons).

Press MENU to exit this option.

6.1.4 Language

From the MONITOR CONFIG menu press ▲ or ▼ to highlight LANGUAGE, and press OK to select.





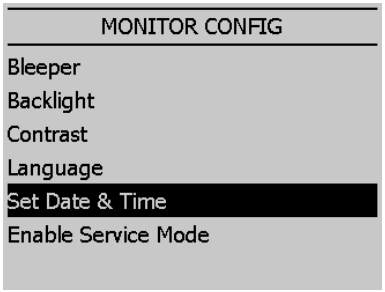
The factory default setting is English.

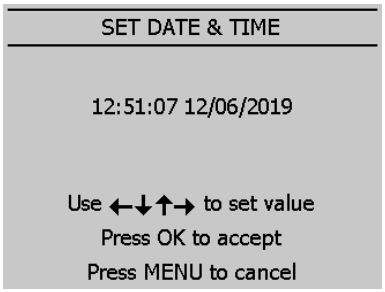
Press ▲ or ▼ to highlight the option required, and press OK to select. A tick will appear next to your selection.

Press MENU to exit this option.

6.1.5 Set Time/Date

From the MONITOR CONFIG menu press ▲ or ▼ to highlight SET TIME/DATE, and press OK to select.





Press ◀ or ▶ to move the cursor below the digit to be changed.

Press ▲ or ▼ to increase or decrease the digit.

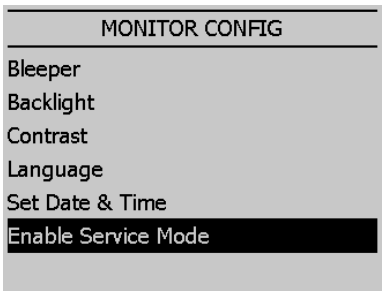
Press OK to accept.

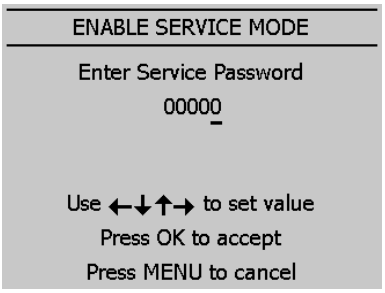
Daylight Savings: The monitor does not automatically update the time to take into account “Daylight Savings”.

Press MENU to exit this option.

6.1.6 Enable Service Mode

Service mode allows the user access to diagnostic information and detailed set-up parameters. This will normally be used under the guidance of a Partech engineer, see section 7.

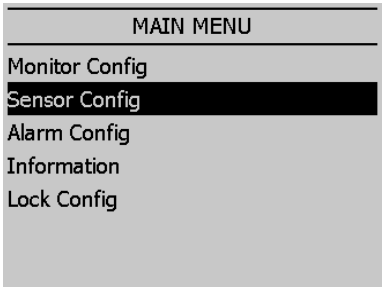




6.2 Sensor Config

The monitor leaves the factory with no sensors pre-installed. Before attempting to configure a measurement, the sensor must be installed. At this stage it is worth reviewing the contents of the sensor manual(s) to ensure each sensor has been mechanically and electrically installed correctly.

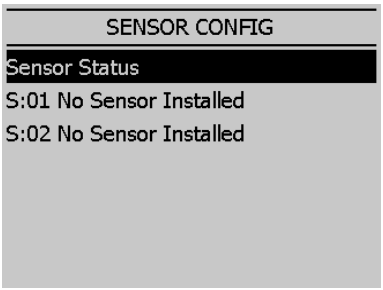
NOTE: Once the Sensors have been wired, unplug each 4-way connector from the 8200w² Monitor or Expansion Box before powering up the unit. The system must recognise each sensor in turn through the ModTechw² Protocol in the "Add Sensor Config Menu".

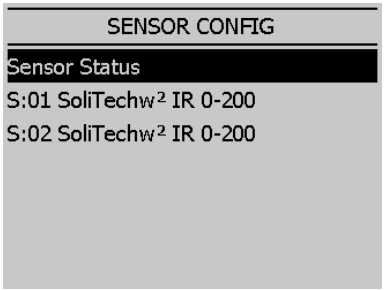


For further information on the configuration and operation of our sensors please refer to their relevant manuals supplied with the sensor, please read both manuals to ensure correct set up and operation. To access the **Sensor Config Menu**:

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

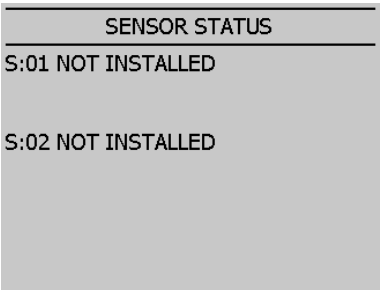
The SENSOR CONFIG menu should be displayed. The screen shot on the right, shows that no sensors have been installed. The screen shot on the far right shows both sensors installed.

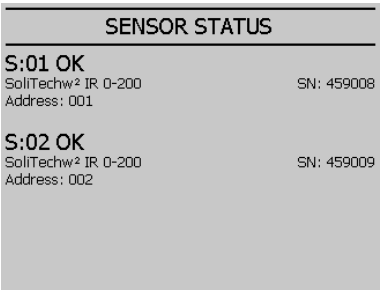




6.2.1 Sensor Status

From the SENSOR CONFIG menu press or to highlight, and press OK to select. This menu will display a which of the sensors are installed and will include the serial number for reference. Up to 2 sensors can be configured to a single monitor. If only one sensor is installed, the remaining sensor allocation will display 'NOT INSTALLED'. The first screen shot on the right shows the SENSOR STATUS menu with no sensors installed. The far right with both installed.





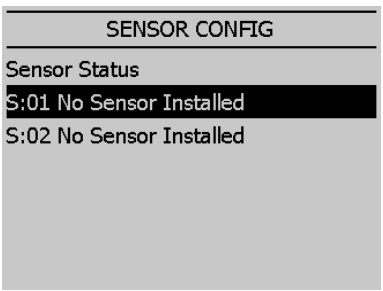
6.2.2 Add Sensor

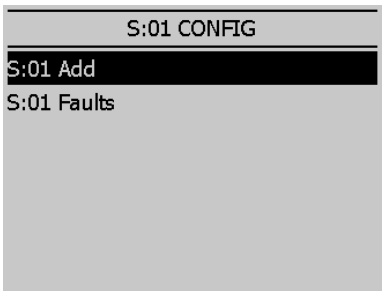
After power up, plug in the sensor(s).

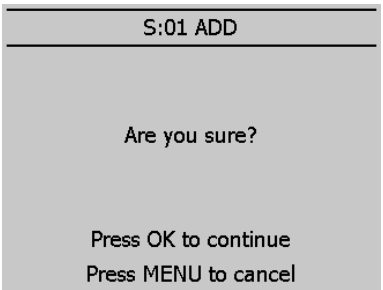
From the MAIN MENU screen, select SENSOR CONFIG by pressing or to highlight, and press OK.

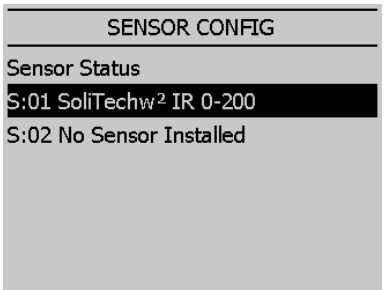
The SENSOR CONFIG menu should be displayed. Press to highlight the appropriate NO SENSOR INSTALLED channel and press OK.

The **S:0x Add** option will now be highlighted. Press OK and the 'Are you sure' page will be displayed. Press OK again and the monitor will now search for the plugged in sensor.









Once the search is complete, the Monitor will display the sensor found.

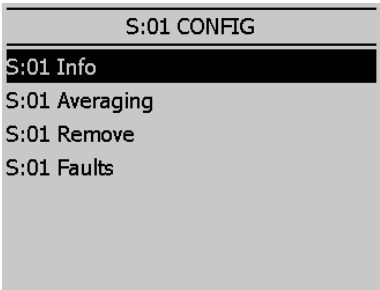
Repeat the addition process to install a second sensor. Sensor addition is now complete.

Press MENU to exit this option.

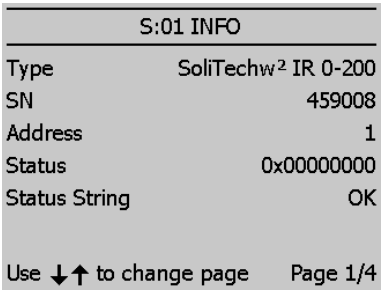
6.2.3 S:0x Info

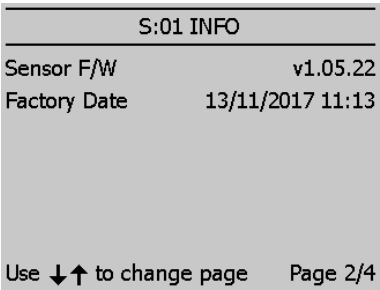
From the SENSOR CONFIG screen, use ▲ or ▼ to highlight the required sensor. i.e. 'S:01 SoliTechw² IR (0-200)', then press OK to select.

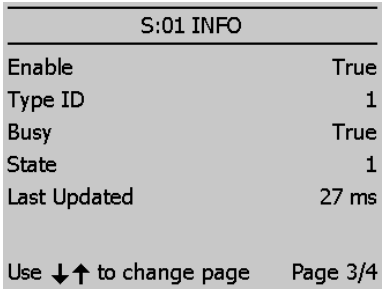
Use ▲ or ▼ to highlight S:0x Info and press OK .A tick will appear next to the identified fault if there is a sensor fault alarm. This function provides a range of diagnostic information that may be requested by Partech for fault finding

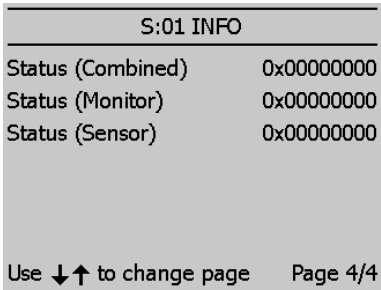


As can be observed from screenshots on the right, Page 1 displays sensor type and sensor serial number. Page 2 displays firmware version and date. The other two pages display various statuses.





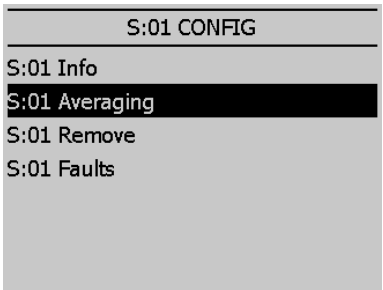


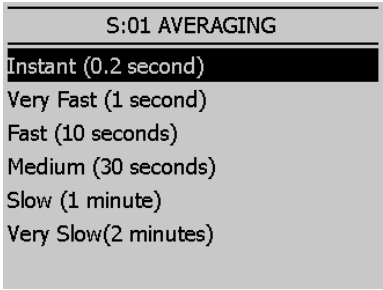


6.2.4 S:0x Averaging

In **SENSOR CONFIG** press ▼ to highlight the required title and press OK 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.



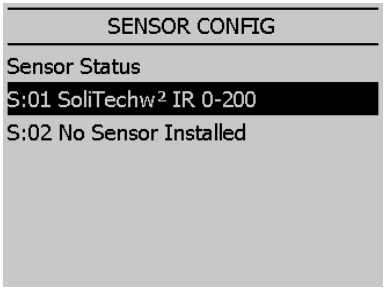


The following values are available for the user to select:

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

6.2.5 Sensor Removal

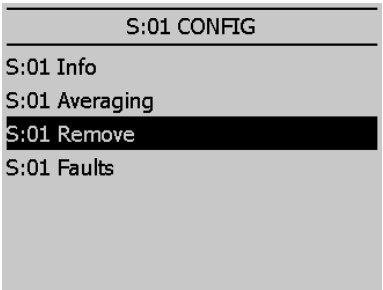
If a sensor is no longer required, the sensor configuration can be removed from the 8200w² monitor in the following way:

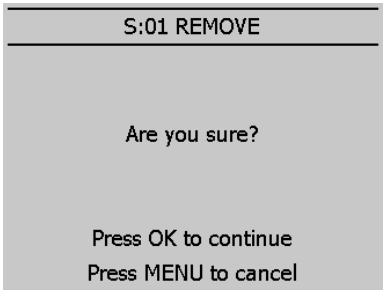


From the SENSOR CONFIG screen, use or to highlight the sensor to be removed; i.e. 'S:01 SoliTechw² IR (0-200)', then press to select.

Use or to highlight REMOVE and press .

Screen will display "Are you sure?". Press to remove or to exit without removing.

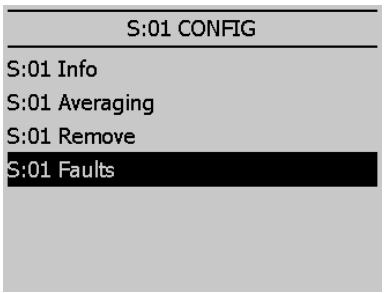


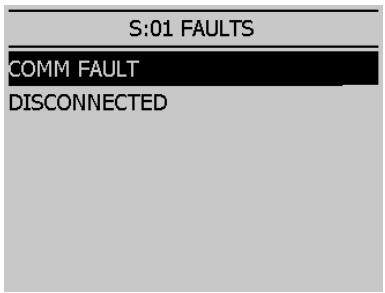


6.2.6 S0x Faults

From the SENSOR CONFIG screen, use or to highlight the required sensor. i.e. 'S:01 SoliTechw² IR (0-200)', then press to select.

Use or to highlight S:0x FAULTS and press .A tick will appear next to the identified fault if there is a sensor fault alarm.





6.3 Alarm Config (Relay outputs)

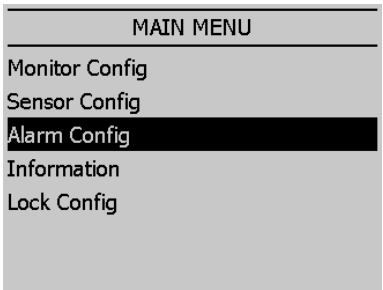
The 8200w² monitor leaves the factory with alarms configured but not active. Alarms will be active after installing the relevant sensor(s). The default condition is OFF.

The ALARM CONFIG menu defines the functions of the 3 relay outputs within the 8200w² monitor.

Alarm relays within the monitor will be shown as "ALARM # (M)", whereas # denotes relays 1 to 3 and (M) denotes the monitor.

Important: Alarms 1 & 2 have sensor 1 & 2 measurements allocated to them respectively. Alarm 3 is the sensor fault relay allocated to both measurement inputs.

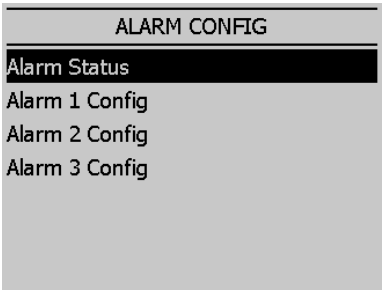
From the MAIN MENU, select ALARM CONFIG and press .

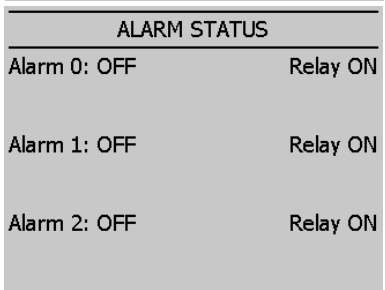


6.3.1 Alarm status

Highlight ALARM STATUS using or and press .

This screen will show the current status of the three relays, including type.





6.3.2 Alarm x Config

From the MAIN MENU, select ALARM CONFIG and press OK.

Highlight ALARM (X) CONFIG using ▲ or ▼ and press OK.

ALARM CONFIG
Alarm Status
Alarm 1 Config
Alarm 2 Config
Alarm 3 Config

ALARM 1 CONFIG
Alarm 1 Info
Alarm 1 Value
Alarm 1 Hysteresis
Alarm 1 Set Delay
Alarm 1 Reset Delay
Alarm 1 Test
Alarm 1 Test Cycle

A list will be displayed showing the available options to configure the alarm selected.

Highlight the required option and press OK.

Listed below are the descriptions of each option. Configure as required.

ALARM 1 CONFIG
Alarm 1 Info
Alarm 1 Value
Alarm 1 Hysteresis
Alarm 1 Set Delay
Alarm 1 Reset Delay
Alarm 1 Test
Alarm 1 Test Cycle

ALARM 1 INFO	
Type	Off
Status	Alarm On Relay Off
Press MENU to Exit	Page 1/1

Info

List configuration details for the alarm.

ALARM 1 CONFIG
Alarm 1 Info
Alarm 1 Value
Alarm 1 Hysteresis
Alarm 1 Set Delay
Alarm 1 Reset Delay
Alarm 1 Test
Alarm 1 Test Cycle

ALARM 1 VALUE
25 %
Use ←↓↑→ to set value
Press OK to accept
Press MENU to cancel

Value

The alarm set point; the alarm will activate at a measurement higher than the actual read sensor value.

The value can be set to a value from 5 to 95% of the sensor measurement range.

Hysteresis

The value entered for Hysteresis is the dead band where the Alarm will not reset on a falling value. e.g. A HIGH alarm value of 50% and a Hysteresis of 5% would trigger an alarm on a rising value of 50%, but will not reset the alarm until the reading falls below 45%.

ALARM 1 CONFIG
Alarm 1 Info
Alarm 1 Value
Alarm 1 Hysteresis
Alarm 1 Set Delay
Alarm 1 Reset Delay
Alarm 1 Test
Alarm 1 Test Cycle

ALARM 1 HYSTERESIS
0 %
Use ←↓↑→ to set value
Press OK to accept

Set Delay

The value entered for the Set Delay is used to filter spurious measurements and spikes from giving a false alarm. e.g. for a HIGH alarm value of 50% and a delay of 10 seconds, the alarm will not activate until the monitor has read a continuous measurement of 50% or higher for more than 10 seconds. If the measurement falls below 50% during the 10 seconds delay the timer will reset.

ALARM 1 CONFIG
Alarm 1 Info
Alarm 1 Value
Alarm 1 Hysteresis
Alarm 1 Set Delay
Alarm 1 Reset Delay
Alarm 1 Test
Alarm 1 Test Cycle

ALARM 1 SET DELAY
5 Seconds
Use ←↓↑→ to set value
Press OK to accept
Press MENU to cancel

Reset Delay

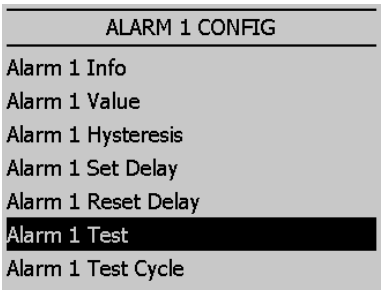
The reset delay is the opposite to the Set Delay, whereas the reading must remain below the set point value for the duration of the delay before the alarm will reset.

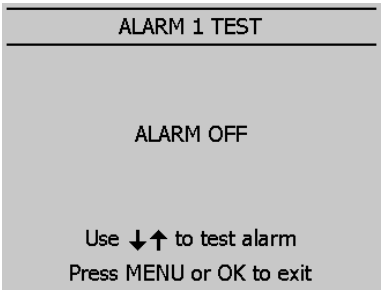
ALARM 1 CONFIG
Alarm 1 Info
Alarm 1 Value
Alarm 1 Hysteresis
Alarm 1 Set Delay
Alarm 1 Reset Delay
Alarm 1 Test
Alarm 1 Test Cycle

ALARM 1 RESET DELAY
2 Seconds
Use ←↓↑→ to set value
Press OK to accept
Press MENU to cancel

Test

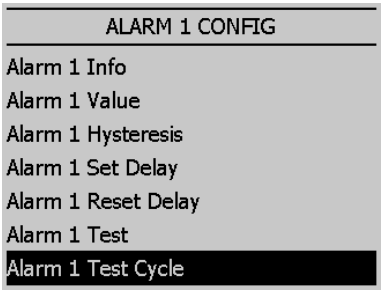
This menu option is for diagnostics use and allows the operator to test the alarm/relay by forcing the relay ON/OFF. Press ▼ or ▲ to switch the relay ON/OFF. Press OK or MENU to exit.

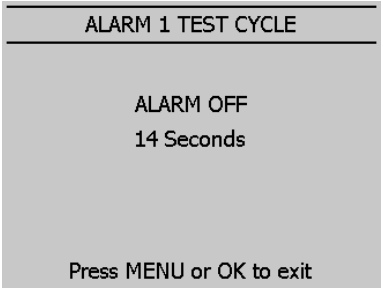




Test Cycle

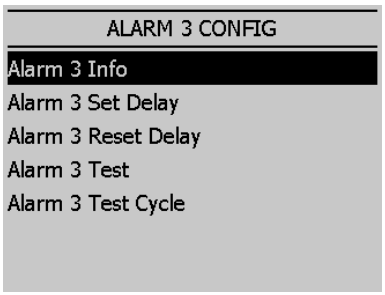
This menu option is for diagnostic use and will cycle the alarm relay ON/OFF every 15 seconds. Press OK or MENU to exit.





6.4 Alarm 3 (Fault Alarm)

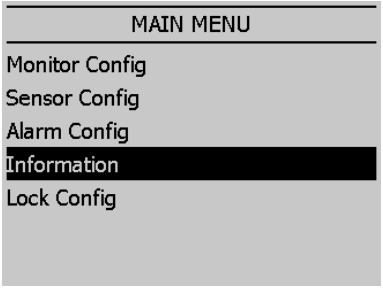
The menu structure for Alarm 3 is different to Alarm 1 & 2. Alarm 3 is the general fault alarm that triggers when there is a fault in either sensor 1 or 2. As there is no measurement associated with this alarm the Value and Hysteresis settings are missing from the menu choice.



6.5 Information

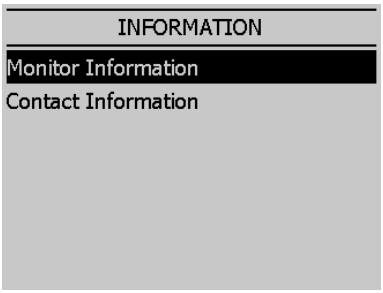
This section provides basic information about the equipment that you have purchased and contact details for Partech.

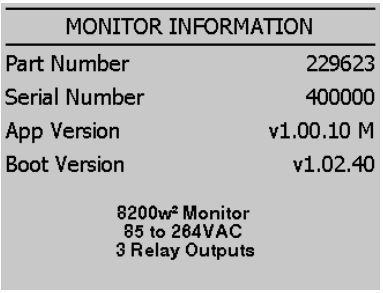
From the MAIN MENU, ensure INFORMATION is highlighted (if not, press ▲ or ▼ to highlight the option) then press OK.



6.5.1 Monitor Information

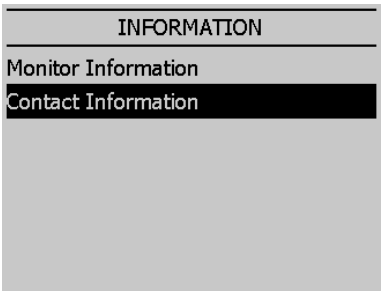
This function displays the installed software (firmware) versions and the monitor serial number. Please have this information available if you need to contact Partech about this product.



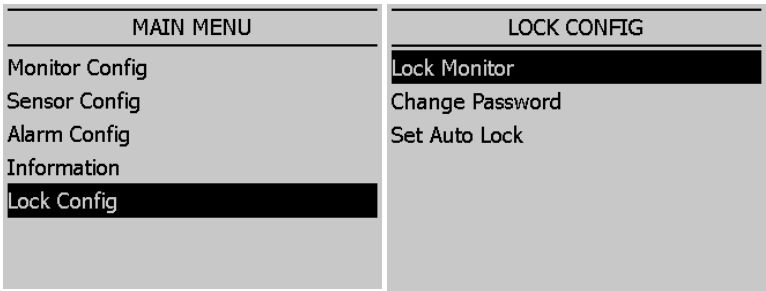


6.5.2 Contact Information

This displays Partech's address, phone number and website URL.



6.6 Lock Config

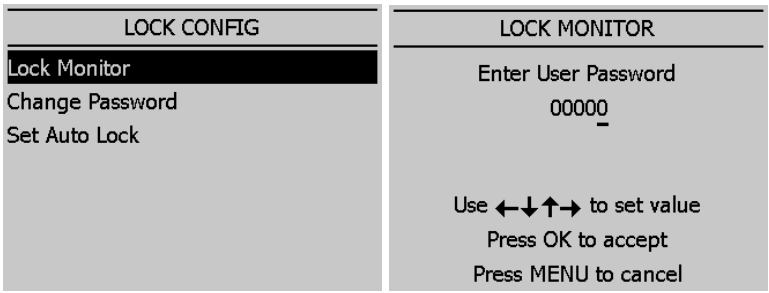


This function allows the user to restrict access to all configuration features of the monitor. This is useful in circumstances where unintended adjustment may occur.

From the MAIN MENU, ensure LOCK CONFIG is highlighted (if not, press ▲ or ▼ to highlight the option) then press OK.

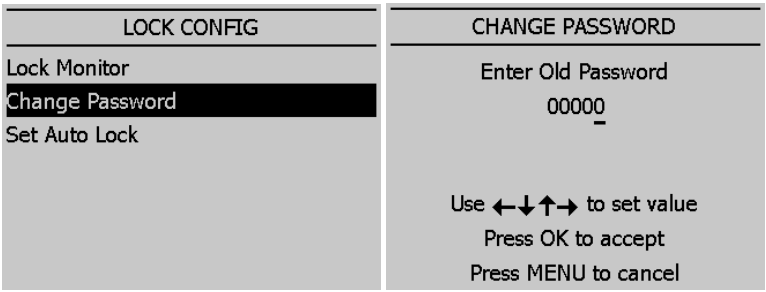
The keypads will allow access to top level functions such as INFORMATION and certain features such as BACKLIGHT but will not allow adjustment of any setting that effects the measurements being made. Users will also be able to use the arrow keys to scroll through the different display types.

6.6.1 Lock Monitor



Select LOCK MONITOR to lock. You will be prompted for a password. The factory default password is 1000.
Once entered, the monitor is locked.

6.6.2 Change Password



The CHANGE PASSWORD menu allows the operator to set a user defined password for menu access.
⚠ Care should be taken when changing the password. If the password is lost, it may be necessary for Partech to visit the instrument to unlock the monitor and reset the password.

From the LOCK CONFIG menu press ▲ or ▼ to select CHANGE PASSWORD and press OK.

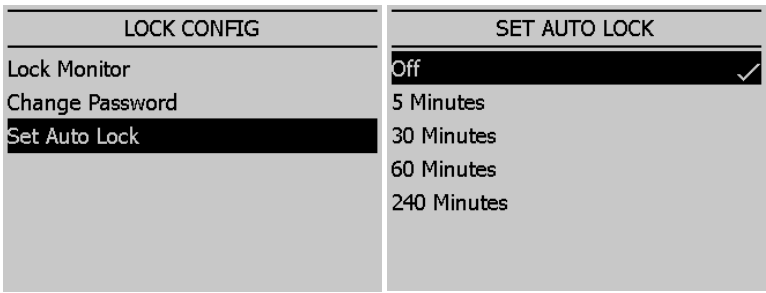
This screen requests the OLD password. The factory default setting is 1000.

Press the ◀ ▼ ▲ ▶ keys to change the password. Press OK to accept.

You will then be asked to enter the new Password. Repeat the above procedure to set the new password.

Password is now set.

6.6.3 Set Auto Lock



Two modes of “Lock Instrument” are available and are configured from this menu.

Mode 1: AUTO LOCK set to OFF. This is a “Once Only” lock. If any menu is accessed that has been locked, the operator will be required to enter the password. Once entered the LOCK MONITOR function will be permanently disabled. The monitor must be manually re-locked again in the LOCK CONFIG Menu if the function is still required.

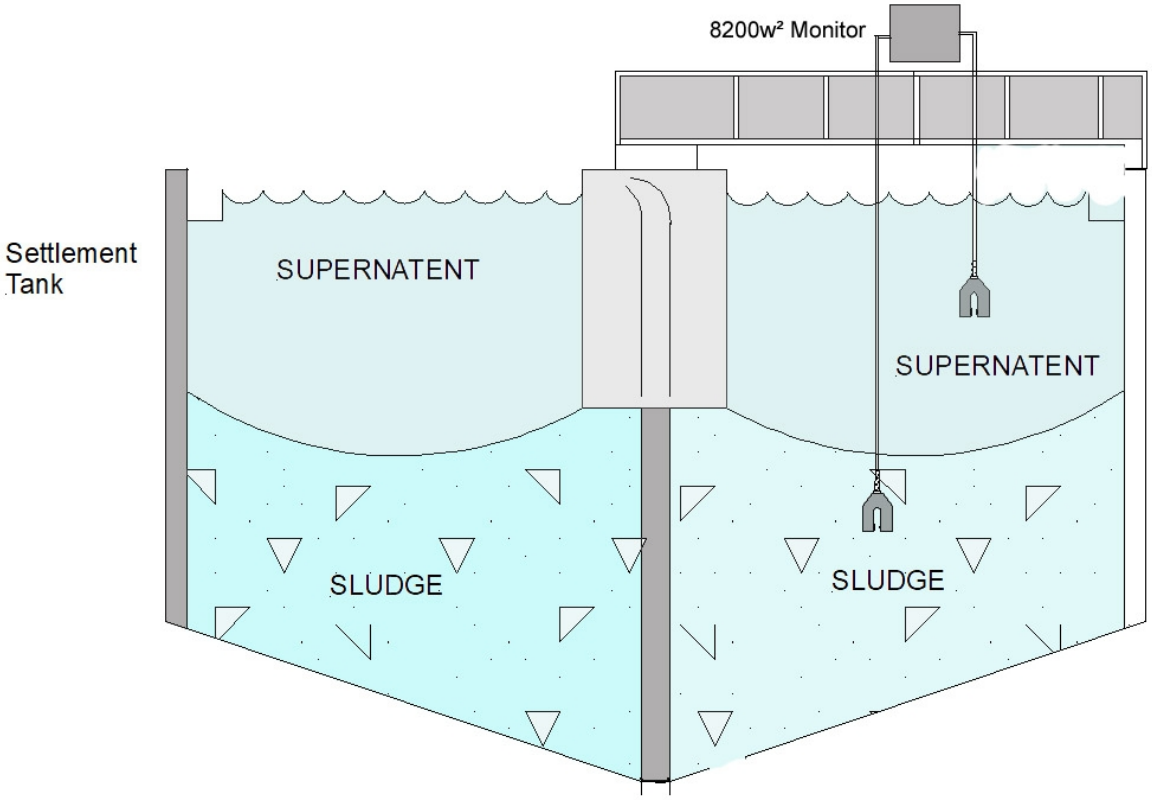
Mode 2: AUTO LOCK set to 5 mins, 30 mins, 60 mins or 240 mins. This is a temporary unlock function. If any menu is accessed that has been locked, the operator will be required to enter the password. Once entered, the LOCK MONITOR function will be temporally disabled for this specified time. Once this time has elapsed, the monitor will automatically lock again.

7 Sludge Blanket Level Detection

7.1 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.

7.2 Sensor Installation

Once the bracket/monitor has been attached to the handrail via the saddle clamps and U-bolts and the sensor has been connected to the monitor, it is then a matter of passing the cable through the various retaining clamps and lowering it into the settlement tank to the desired depth at which the sludge blanket is required to be detected. When assessing mounting options, attention should be paid to the accessibility of the sensor for maintenance, stability of the sensor in the flow conditions present on site and it must also be ensured that when mounting the sensor it is fully submerged at all times.

The sensor can be suspended by its cable, but the top end of the cable must be fastened to a fixed point. It should be noted that the sensor must not be allowed to hang direct from the cable gland at the bottom of the monitor.

7.3 Monitor Configuration

When supplied the factory settings may not be suitable for the required application. If this is the case then the following procedures should be undertaken. Before adjusting the Alarm value settings, ensure

the **Alarm x Set Delay** and **Alarm x Reset Delay** are set to zero so the current alarm status is accurately reported in real time.

7.3.1 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:

With the sensor in the sludge blanket, take note of the % solids value on the display. Enter the **Alarm Config** menu and choose the appropriate **Alarm x Config** option. Set the **Alarm x Value** to 5% less than the recorded value. This will ensure the alarm will trigger at the desired % solids. It may also be advisable to set the **Alarm x Hysteresis** value to about 5% in order to emphasise a clear boundary layer.

7.3.2 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:

With the sensor above the sludge blanket, take note of the % solids value on the display. Enter the **Alarm Config** menu and choose the appropriate **Alarm x Config** option. 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 % solids value on the display.

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

8 Menu Tree

Below is the menu structure of the 8200w² Monitor:

Main Menu

Monitor Config
- Bleeper
- Backlight
- Contrast
- Language
- Set Date/Time
- Enable Service Mode

Sensor Config
- Sensor Status
- *S:0x Sensor Type Option*
  - S:0x Info
  - S:0x Averaging
  - S:0x Remove
  - S:0x Faults

Alarm Config *(# = refers to 1 - 2)*
- Alarm Status
- Alarm # Config
  - Alarm # (M) Info
  - Alarm # (M) Value
  - Alarm # (M) Hysteresis
  - Alarm # (M) Fault Setup
  - Alarm # (M) Set Delay
  - Alarm # (M) Reset Delay
  - Alarm # (M) Test
  - Alarm # (M) Test Cycle
- Alarm 3 Config
  - Alarm # (M) Info
  - Alarm # (M) Set Delay
  - Alarm # (M) Reset Delay
  - Alarm # (M) Test
  - Alarm # (M) Test Cycle

Information
- Software Version
- Contact Information

Lock Config
- Lock Monitor
- Change Password
- Set Auto Lock

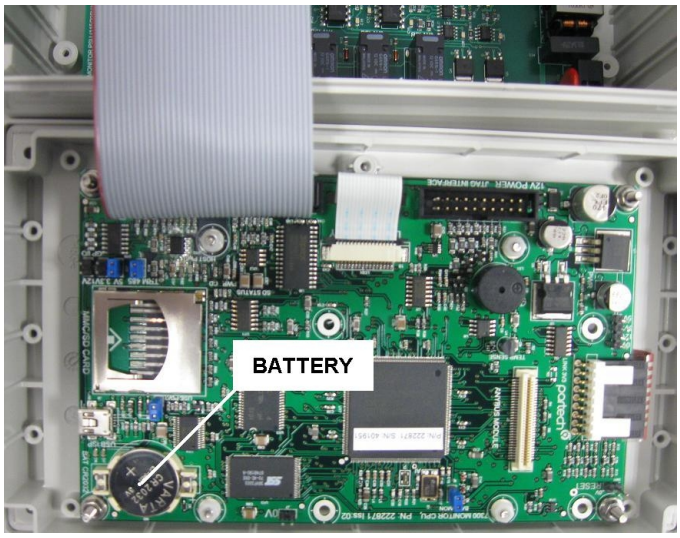
9 Maintenance

9.1 On-Board Battery Backup Replacement

The monitor is fitted with a battery backup for the real time clock function. Failure of the battery will only effect the time (all parameters, settings and process data are stored electronically and is not effected by a failed battery).

Fitted is a Lithium CR2032 battery. Under normal operating conditions, the battery should not require replacement for at least 5 years. However, we advise the battery is replaced if the monitor has been kept in storage or remained off power for more than 3 years.

The battery is located behind the main display panel. To access the battery, follow these steps.



1, Ensure the monitor is isolated or disconnected from HAZARDOUS LIVE voltages before access.

2, Remove the four plastic caps located on the corners of the display using a small flat bladed screwdriver to reveal the screws.

3, Unscrew the four screws and gently lower the panel. Take care as the display is connected to the back board via a ribbon cable.

4, With the display panel turned over and hanging upside-down by the ribbon cable (see photo right), the battery can be located on the bottom left corner of the display board. Disconnect the ribbon cable if this makes access easier.

5, Using a flat bladed screwdriver, gently prise out the battery and replace.

6, Return the display panel back to the enclosure (first reconnect the ribbon cable if disconnected), and screw back. Refit the screw covers.

7, Reset the Monitor time as described in section 6.1.4 of this manual.

10 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.
- Digital photos can also be useful to determine correct installation and suitability to the application.

10.1 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 sensor is clean and adequately protected for transportation (Advice on packing can be provided by our service department).

- Contact name and phone number of person authorising the repair
- Site details including application sample point
- Return address for equipment
- Description of fault or service required
- Any special safety precautions because of nature of application

11 Technical Specification

11.1 Physical

Dimensions .....213 x 185 x 95mm (HxWxD)
Enclosure Material.....Polycarbonate (PC)
Weight.....1.4Kg
Temperature.....-20 to +60° C, 0-95% Relative Humidity, Non-Condensing
Mounting.....Wall or Rail Mounting Bracket or Enclosure Option Available
Cable Entries.....1x M20, 4x M16, 1x M12

11.2 User Interface

Display .....Graphic LCD, Black on White, Transreflective
Viewing Area.....78 x 59mm
Backlight.....Always ON / OFF, User Adjustable ON/OFF after key press
Membrane Keypad.....High quality 6 key membrane with Pillow Embossed 20mm dia Buttons

11.3 Electrical

Operation Voltage: .....100 to 240VAC, 50/60Hz
or 12 to 24VDC
Power Rating.....0.8A AC, 30W DC (Power consumption may increase for 2 or more sensors)
Terminal Wire Size.....Max 2.5mm² cores
Digital/Relay Outputs.....3 (Reduced to 1 Relay for PROFIBUS)
Relay Type.....SPCO, Max 230VAC Switching Voltage
Relay Rating.....Max 5A @ 30VDC / 230VAC
Auxiliary Connections.....Configurable for remote Input, Output or 12VDC Aux Power

11.4 Sensors and Optional Interfaces

Sensor Communication.....ModTechw² Protocol (Specifically developed for w² range of sensors)
ModTechw² Cable Specification.....2 Twisted Pair (Red/Black, Green/White), 24AWG screened with drain wire

12 Declaration of Conformity

DECLARATION OF CONFORMITY

to EMC and Low Voltage Directives

We, Partech Instruments, Rockhill Business Park, Higher Bugle, St Austell, Cornwall, United Kingdom, declare under our sole responsibility that the product to which this declaration relates:

Product Name:	SludgeWatch 8200w² Detector
Model Number(s):	229623, 229624

Is in conformity with the standards noted below:

EN 61326:2013 – Electrical equipment for measurement, control and laboratory use – EMC requirements
IEC 61010-1: 2017 – Safety Requirements for electrical equipment, control and laboratory use
EN 50581: 2012 – Assessment of electrical and electronic products with respect to the restriction of hazardous substances

Following the provisions of European Directives:

2014/30/EU	EU EMC Directive
2014/35/EU	Low Voltage Directive
2011/65/EU	RoHS Directive

Roger Henderson, Joint Managing Director, 4th February 2020
for Partech Instruments, Rockhill Business Park, Higher Bugle, St Austell, Cornwall PL26 8RA, UK

partech

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