

INSTRUCTION MANUAL

8100 & 8200 Monitor
Version 3



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1 Introduction

1.1 Manual Conventions

This manual covers the 8100 & 8200 Version 3 Monitors

The manual describes the configuration and operation of the 8100/ 8200 Monitor and includes information regarding sensors. All dimensions stated in this manual are in millimetres unless otherwise stated.

The manual has been written on the basis that the user has a basic knowledge of instrumentation and an understanding of the type of measurements being made. 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 requirements. Training in the use of the 8100/ 8200 Monitor can be provided by Partech, please contact sales for further information.

1.2 Product Description

The 8100 Monitor is a single channel instrument for use with one sensor. It provides a single alarm relay output and a single fault relay output. The alarm set point and delay are configured using controls mounted on the front panel. The status of the input channel is indicated by three LED's.

The 8200 Monitor has two input channels for use with two 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 8200 Monitor has two pairs of set point and delay controls and two sets of status LED's. The alarm set point and delay for each channel can be independently set and the status of each channel is indicated separately.

The 8100/ 8200 Monitor has an IP65 rated enclosure and is suitable for outdoor use, however, a protective cover or outer enclosure is recommended to further protect the instrument from harsh environmental conditions.

1.2.1 Options

<i>Part Number</i>	<i>Description</i>
163600	8100 Monitor Version 3 (115/230VAC)
171370	8100/8200 Monitor 12VDC Supply Option
171360	8100/8200 Monitor 24VDC Supply Option

1.2.2 Compatible Sensors

The 8100/ 8200 monitor can be used with the following Partech sensors:

IR Series	IR8, IR15, IR40, IR100
ST Series	0 –1500mg/l, 0 – 10000mg/l, 0 – 30000mg/l

1.2.3 Fault Indication

Fault indication is via the illumination of a status LED that is clearly visible on the front panel of the monitor. When there is a fault present the orange FAULT LED illuminates.

1.2.4 Alarm Activation

When the sensor is clear and not in a fault condition then the green OK LED is illuminated. If however, the sensor is obscured or blocked then the relay will enter into the alarm condition and the red ALARM LED will become illuminated.

1.2.5 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 a delay, if the conditions for turning the alarm on are removed, then the delay will end and the alarm relay will not change state. The delay can be set between 1 & 90 seconds. The delay function is in place to try to avoid the occurrence of false alarms that may be caused by suspended debris.

1.2.6 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.

1.2.7 Fault Relay

The fault relay is utilised when there is a problem with the sensor or alternatively there may have been a power failure to the system and in this instance the relay will be de-energised and therefore send the monitor into a fault state

1.3 Applications

The 8100 & 8200 Monitors, when combined with a compatible sensor, are designed for use as a sludge blanket level detector, a sludge density switch, or as a suspended solids/turbidity switch. The 8100 & 8200 Monitors are therefore suitable for interfacing with automatic de-sludging control of primary and secondary settlement tanks, thickener control and high and low blanket level alarm, or as a simple alarm in a water/ waste water flow.

1.3.1 Sludge Blanket Level Detection

When used for this operation the monitor uses an IR or ST 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.

1.3.2 Suspended Solids Switch

The 8100/8200 Monitor can be used as a suspended solids switch when used in conjunction with the IR and ST series sensors. The sensor can be installed in an effluent channel to detect a value of suspended solids and give a high alarm.

2 Installation

2.1 Location

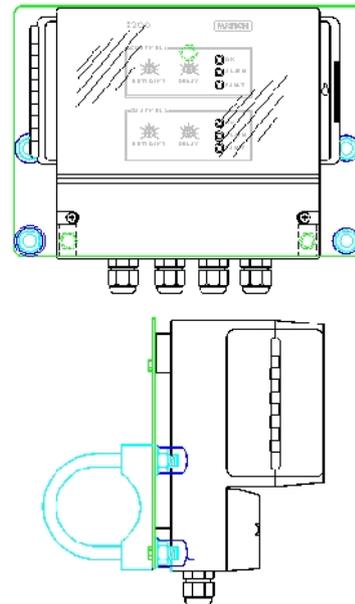
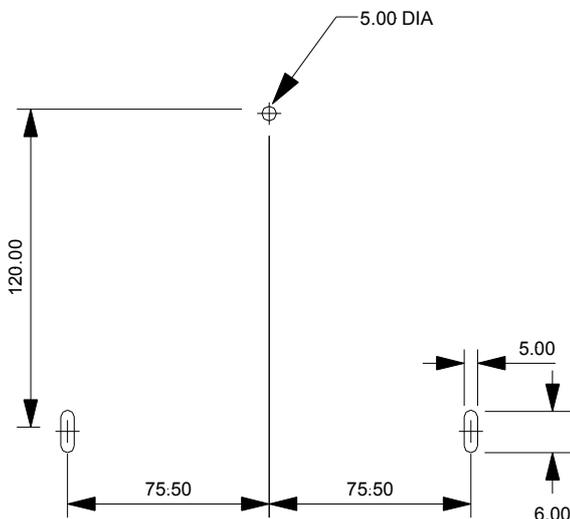
The 8100/8200 Monitor is housed in an IP65 enclosure and is therefore suitable for field mounting. It is advisable to mount the monitor in a location that has some protection from the environment; this could be a GRP/metal cabinet, in a central room or the use of a protective shield. Suitable enclosures can be provided by Partech.



2.2 Mounting Options

A range of mounting options are available for the 8100/8200 Monitors, which will allow the user to install the sensor in a wide variety of locations.

The 8100/8200 Monitor is designed so that it can be surface mounted, the hole positions required for this are shown below.



Mounting hardware such as handrail brackets, protective hoods and sensor brackets are available from Partech. The 8200 Monitor using the standard bracket (Part Number 171280) is shown above.

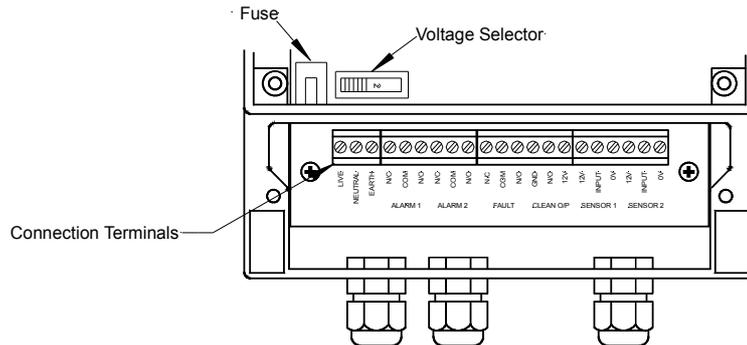
When mounting the sensor and monitor it is recommended that the two entities be kept as close together as possible so that the calibration process is simplified. The sensors are supplied with a standard length of 10 metres of cable, though this can be increased on request to a maximum of 100 metres. The cable can be extended using a junction box and good quality instrument cable (3-core minimum).

3 Electrical Connections

WARNING: DISCONNECT THE MAINS SUPPLY BEFORE REMOVING THE TERMINAL COVER

Removing the terminal compartment cover, which is located at the base of the front panel, gives access to the 8100/8200 Monitor electrical connections. Before removing the terminal cover make sure that the electrical supply to the instrument is disconnected.

When the instrument is installed, it is essential to check that the supply voltage selector switch position is correct for the intended supply voltage. If this is not checked the instrument could be damaged. The voltage selector is shown below



The electrical supply to the unit should be installed such that there is a means of isolating the supply to the unit and the supply is protected with a fuse or trip. The instrument has a supply fuse fitted internally.

The 8100 monitor is supplied with three PG11 cable glands fitted and has provision for a further PG11 gland, whereas the 8200 comes with four fitted cable glands. If any fitted cable glands are not being used then the glands must be sealed to prevent the ingress of moisture into the unit.

Shown below are the terminal connections for the 8100/8200 Monitor.

LIVE NEUTRAL EARTH	N/C COM N/O	N/C COM N/O	N/C COM N/O
POWER	ALARM 1	ALARM 2	FAULT
			GND N/O 12V
			12V SENSOR I/P 0V
			12V SENSOR I/P 0V
			SENSOR 1 SENSOR 2

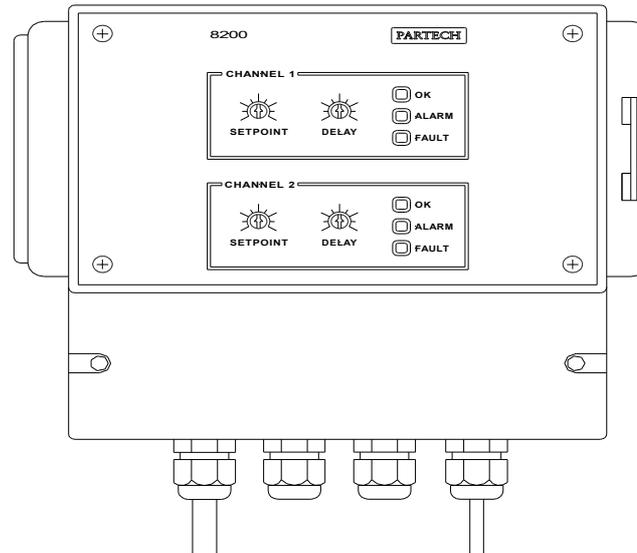
Terminals	Sensor Type	
	IR Series Sensor	ST Series Sensor
Sensor I/P	White	White
Sensor 12V	Red	Red
Sensor 0V	Black/ Blue	Black/ Blue

3.1 Supply Voltage

The supply voltage for the 8100/8200 Monitor is available in 115/230VAC (switchable), 12VDC or 24VDC versions.

The voltage can be selected between either 115VAC or 230VAC by switching the selector switch, located behind the front cover. To gain access to the voltage selector remove the four black screws from the blue front panel. The voltage selector switch is then visible in the bottom left corner, located alongside the fuse.

4 Configuration



Setpoint Delay Controls and status indicators are situated on the front panel of the 8100/8200 Monitor (front panel of 8200 monitor shown above). To access the adjustment dials then the outer cover must be opened. The front panel has a setpoint and a delay adjustment control and also on the front panel are the three status indicators:

OK – Green LED

ALARM – Red LED

FAULT – Orange LED

4.1 Setpoint

The type of sensor used determines the measurement/detection range of the system. It is however possible to do some field adjustment and fine tuning of the system once installed.

By turning the setpoint control from fully anti-clockwise to fully clockwise it is possible to alter the setpoint from 5 - 95% of the range of the sensor.

4.2 Delay

The delay control is used to alter the length of time after an alarm condition occurs that the alarm relay is activated. Once an alarm condition ends, the delay will also determine how long the alarm relay remains in the alarm condition before deactivating. The delay can be set between 1 and 90 seconds and is used to prevent false alarms being indicated. For example when the sensor signal momentarily goes above the alarm value due to unrepresentative debris.

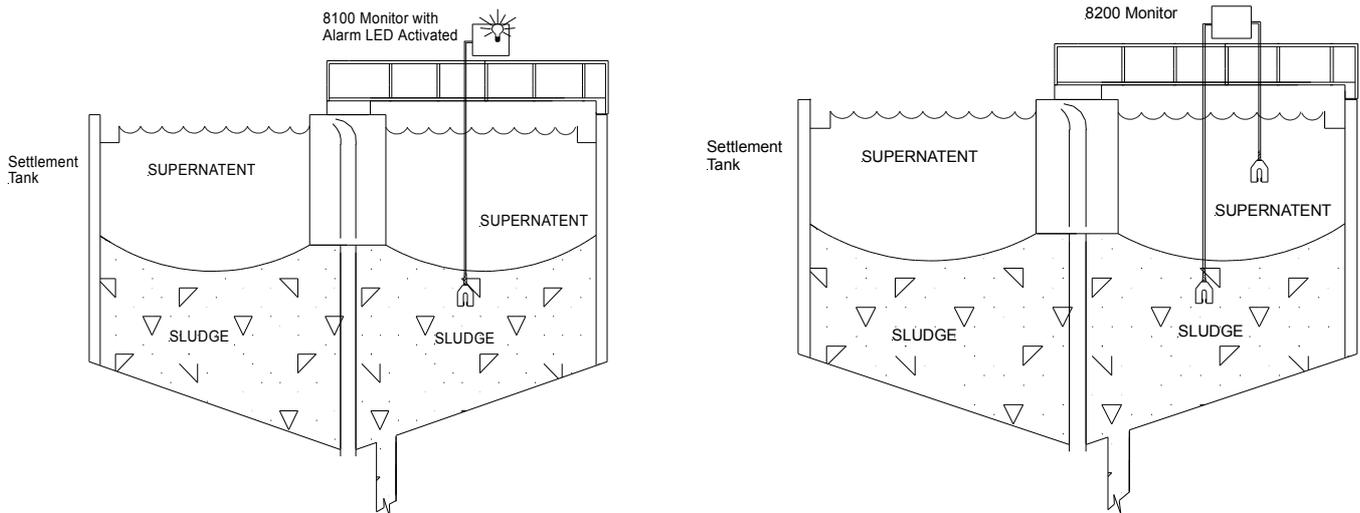
To increase the length of delay the control marked DELAY on the front panel of the 8100/8200 Monitor should be turned clockwise. When turned fully clockwise the delay is set at 90 seconds.

5 Sludge Blanket Level Detection

5.1 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.

5.2 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 calibration and 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.

5.3 Monitor Configuration

When supplied the factory mid-point settings may not be suitable for the required application. If this is the case then the following procedures should be undertaken

5.3.1 Blanket not detected

If the sensor is not detecting the sludge blanket and the green OK light remains on when the sensor is in the blanket, take the following action:

- With the sensor in the sludge blanket, the setpoint control should be turned anti-clockwise slowly until the red ALARM LED illuminates. This indicates that the sensor has detected the sludge blanket.

5.3.2 Blanket continually detected

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

- With the sensor above the sludge blanket, set the delay to the minimum, then the alarm point control should be slowly turned clockwise until the green OK LED illuminates. This indicates that the sensor is correctly, not detecting the sludge blanket.

Note: If the setpoint control is turned fully clockwise 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 accurate adjustment of the setpoint to a required level:

1. Immerse the sensor fully in a known sample of the required value.
2. Turn the alarm point control fully anti-clockwise; the green OK LED should illuminate.
3. The alarm point control should be turned clockwise until the red ALARM LED illuminates.

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

6 Maintenance

To maximise the operational life of the monitor and sensor, regular inspection is recommended. The frequency of this is dependent on the specific operation of each site, however an initial weekly inspection to observe the characteristics of the application is recommended, long term operational practice can be decided from these inspections.

The manual clean system requires the physical removal of the sensor from the application for the cleaning of the lenses to be carried out.

It is advisable that at regular intervals the sensor is removed from the application and both the lenses and the sensor body are cleaned along with the mounting brackets.

6.1 Inspection

It is envisaged that an inspection of the monitor and sensor will include the following:

- Check security of brackets
- Removal of the sensor from the application.
- Checking for damage to cables.
- Cleaning of the sensor using a suitable detergent and removal of all ragging.
- Inspection of the glass lenses for staining, scouring, cracks or chips.
- Checking for moisture/signs of leakage inside the sensor and monitor.

6.2 Fault Finding

The following can cause a false alarm or fault signal:

- Material (rag, weed, etc) caught on the sensor and affecting the measuring system - remove sensor, manually clean and re-install.
- Turbulence (caused by high flow, aeration etc) in the solution being measured – position the sensor so turbulence has as minimal effect as possible on the sensor.
- Bad connection of the sensor cable - check all connections are securely fastened

7 Technical Support

Technical Support is available by phone, fax, or e-mail, 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 our Customer Support Manager:

- Monitor type, serial number, and software version number.
- Sensor type, and serial number.
- Application details.
- Description of fault.

7.1 Returning Instruments for Repair

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

SERVICE DEPT.
PARTECH (ELECTRONICS) LTD
CHARLESTOWN
ST AUSTELL
CORNWALL
PL25 3NN
UNITED KINGDOM

Please include the following information with the returned equipment. Also ensure that sensors 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.

8 Technical Specification 8100/8200 Monitor

8.1.1 General

Operation Voltage: 115/230 VAC 50/60Hz +10%/-15% (Voltage Selector)
 Nominal 12VDC..... 9 – 18Vdc
 Nominal 24VDC..... 18 – 36Vdc
 Power Consumption..... 8VA
 Supply Fuse..... 100mA Anti surge 20mm x 5mm (fitted internally)
 Operating Temperature Range..... 0 to 50°C
 Storage Temperature Range..... -20 to +60°C

8.1.2 Alarm Outputs

Number of Outputs..... 8100 - 1 alarm , 1 fault
 8200 – 2 alarms, 1 fault
 Alarm Type..... SPCO
 Operation..... Fail Safe (De-energised in alarm condition)
 Relay Rating..... 5A @ 230Vac, 5A @ 30Vdc

8.1.3 Enclosure

Enclosure Material..... ABS
 Cable Glands..... PG11
 Terminals..... Max conductor cross section 2.5 mm²
 Environmental Rating..... IP65
 Weight..... 1 Kg
 Dimensions..... 160 x 195 x 105 mm (h x w x d)

8.1.4 EMC

EMC..... EN 50081-1 (1992), EN 50082-1 (1994)

