INSTRUCTION MANUAL

740 Monitor
Portable Suspended Solids

partech

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1 Introduction

1.1 General

The 740 Monitor is used for processing and displaying the output signal from a Partech sensor. It combines a clear display of the measured parameter, a simple user interface, with good flexibility to enable configuration to satisfy the users needs.

1.2 Display

The 740 display indicates the measured value with large numerals for good visibility with an additional status line that shows the current settings, battery status and any faults that are present. The display has a backlight to enable use of the monitor in low light conditions and also has automatic contrast settings.

The measurement title, units and display range can all be user set to suit the sensor being used and the application being monitored.

1.3 Key Pad

A six key tactile membrane keypad is used for all configuration and operation of the 740 Monitor; each key has a very positive operation enabling use even whilst wearing gloves.

1.4 Sensors

The 740 Monitor can be used with the Partech Soli-Tech 10 (ST10).

1.5 Manual Conventions

This instruction manual describes the configuration and operation of the 740 Monitor and where required includes some information regarding sensors. It is therefore very important that it is used in conjunction with the relevant sensor instruction manual. 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 measurement being made. Training in the use of the 740 Monitor can be provided by Partech, please contact Partech for further information

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SUSPENDED SOLIDS

1500 mg/l

Battery = 75%

740

MENU

ON
OFF

OK

PARTECH

CHARGE

ON/OFF Key

Charge LED

Charger
Socket

Sensor
Connection
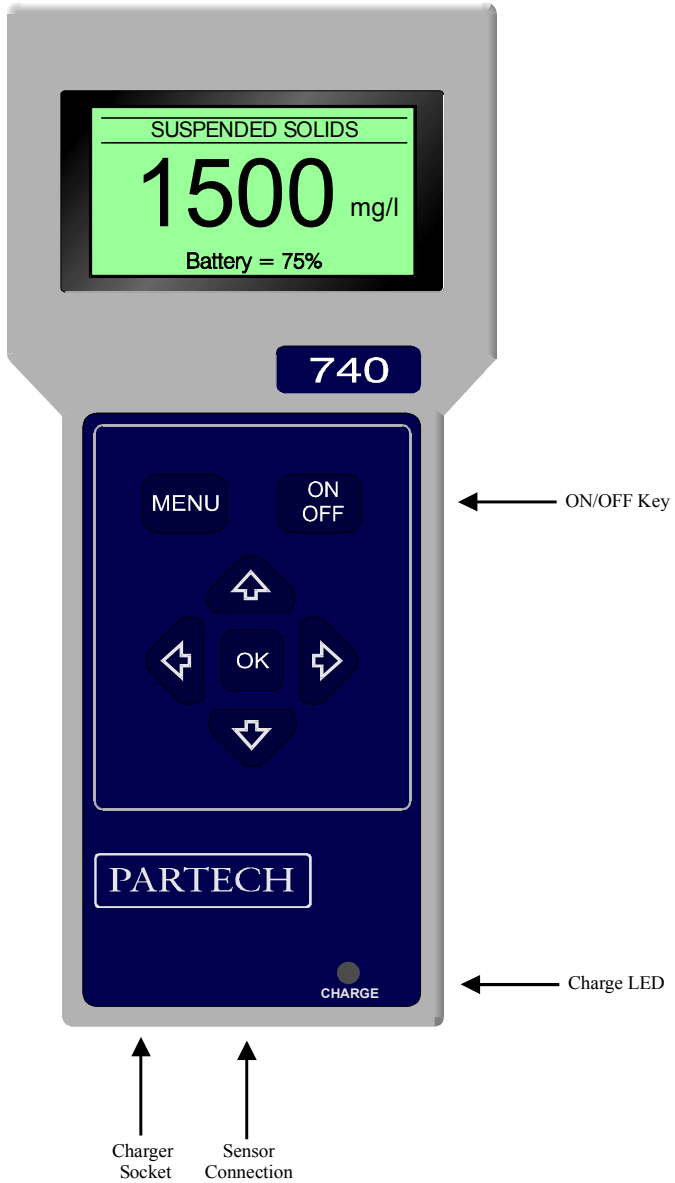
Figure 1 740 Monitor

2   Basic Operation

2.1   Switching On and Off

The 740 Monitor can be turned on and off using the **ON/OFF** key. When the monitor is turned on it displays a start-up screen prior to entering Measure Mode. The instrument can be switched off at any time by pressing the **ON/OFF** key.

2.2   Measure Mode

The normal operating mode for the 740 Monitor is measure mode and this is active when the measured value is displayed in large numbers. Whilst in measure mode the display value is continually updated based upon the current sensor input signal.

The display in measure mode also includes a status bar that scrolls through the status of the battery, details of the instrument settings and if the instrument is locked. The status bar is also used to indicate any instrument faults that are present.

SUSPENDED SOLIDS — Measurement Title
1500 — Display Value
mg/l — Units
Battery = 75% — Status Text
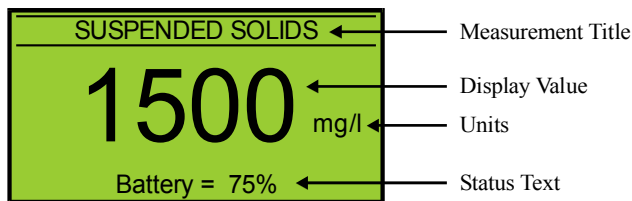
Figure 2 Measure Mode Display

2.3   Measurement Cycle

The measurement cycle is carried out in the background at all times when the instrument is switched on regardless of whether the instrument is in measure mode or not. The monitor performs five measurement cycles per second enabling a response time of one fifth of a second (with damping rate set to Instant – see damping).

2.4   Display

The resolution of the displayed value is determined by the sensor range setting, such that only sensible display values are indicated; the same range also determines the calibration value range.

The display units and measurement title are user selectable and should be chosen to suit the parameter being monitored and sensor being used.

2.5   Profiles

The 740 Monitor allows the user to define up to 10 Profiles, each profile will be based on a preset configuration which can be modified to suit the actual measurement required.

3 Configuration

3.1 Menu Mode

To access the main menu, press the **MENU** key when the instrument is in measure mode. Pressing the **MENU** key when the main menu is displayed will return the instrument to the measure mode. When the main menu is displayed, the ↓↑ keys can be used to move the selection bar. Pressing the **OK** key will activate the selected item.

If the instrument is left in any display other than measure mode, it will automatically return to measure mode after one minute has passed with no key presses. When a sub menu is displayed, pressing the **MENU** key will exit the current menu and return to the previous menu. If a menu consists of more than six items, **UP** and **DOWN** arrows will appear to indicate if there are menu items above or below those displayed.
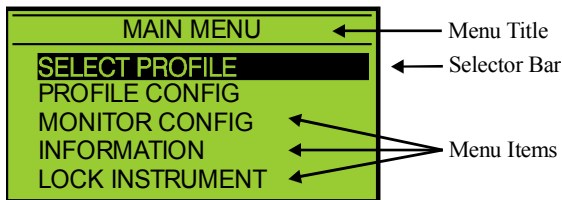
Figure 3 Menu Display

3.2 Data Entry

To provide the user with a simple interface, the 740 uses three methods of data entry for the setting of all the user configurable parameters. The various methods of user data entry used on the 740 are described below:

3.2.1 User List Selection

This method of user data entry is used when a selection from a predefined list of option is required such as sensor type, display range and backlight mode. The list of possible selections will be displayed and a small tick will identify the current setting. If the list contains more than five items, small **UP** and **DOWN** arrows will appear on the display to indicate there are more items than that displayed. To make a selection, the selector bar can be moved using the ↓↑ keys, to select the required item. Pressing the **OK** key will select the highlighted item and a small tick will appear next to it. Pressing the **MENU** key will exit the list selection menu.
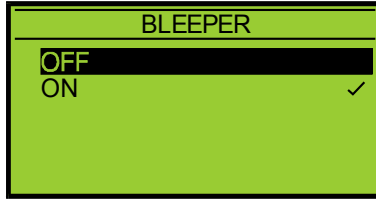
Figure 4 List selection Display – note tick indicating current value

3.2.2   User Value Entry

When a numerical value is to be set, the current value will be displayed with a flashing cursor. The range of adjustment of the value is predefined and therefore only values within this range can be entered. To adjust a value, the ←→ keys are used to select a digit and the ↓↑ keys are used to increment/decrement the digit. When the new value has been set pressing the **OK** key will store it and exit from the value adjustment display. To exit without saving changes press the **MENU** key.
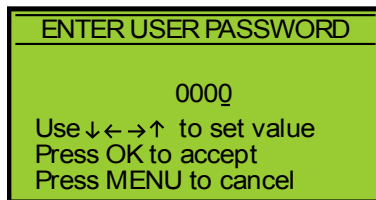
Figure 5 Value Entry Display

3.2.3 User Text Entry

Using this method of data entry, the user is able to enter or edit text and is used for the user defined measurement title and units. The text string is displayed with a flashing cursor indicating the selected character. The ←→ keys are used to select a character, and the ↓↑ keys to change the selected character. When all changes are complete press the **OK** key to store the text string. To exit without saving changes press the **MENU** key.

```
┌──────────────────────────────┐
│      EDIT USER TITLE         │
│                              │
│       Aeration Lane 1        │
│  Use ↓←→↑  to set value      │
│  Press OK to accept          │
│  Press MENU to cancel        │
└──────────────────────────────┘
```
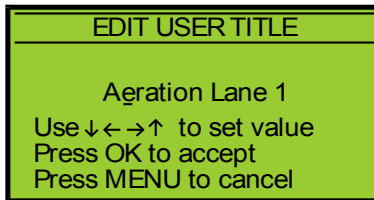
Figure 6 Text Entry Display

4   User Profiles

Understanding the concept of profiles is key to the successful operation of the 740 Monitor. A profile is used to store the configuration and calibration data for a particular measurement. The 740 Monitor is capable of storing up to ten profiles, the actual number required will depend upon the number of different measurements to be made. Normally a separate profile is required for each different measurement to be made, for example final effluent suspended solids and mixed liquor suspended solids.

4.1   Presets

To reduce the setup time of the 740 Monitor, several preset measurements are available that the user can choose from when creating a new profile. Each of these presets contains configuration and calibration data for commonly made measurements.

Note: The presets provide a fast route to completing the instrument setup. However as they use calibration data established from reference measurements, it may be necessary to carry out calibration to improve upon the measurement accuracy.

4.2   Example Profile Configuration

Mr Bill Smith has a 740 Monitor which he uses at Charlestown Waste Water Treatment Works to measure the mixed liquor suspended solids and the final effluent.

The monitor has been set up with two profiles (the remaining profiles are unused) as shown below:

Profile 1 - Mixed Liquor Suspended Solids

Parameter	Value	Comment
Profile Name	Charlestown MLSS	
Profile User	Bill Smith	
Profile Date	25/12/2001	Date profile created
Measurement Title	Suspended Solids	
Display Units	mg/l	
Display Range	0 - 20000	Typical value 3500mg/l
Damping Rate	Medium	

Profile 2 - Final Effluent Suspended Solids

Parameter	Value	Comment
Profile Name	Charlestown F.E.	Can't fit "Final Effluent"
Profile User	Bill Smith	
Profile Date	25/12/2001	*Date profile created*
Measurement Title	Suspended Solids	
Display Units	mg/l	
Display Range	0 - 200	*Typical value 25mg/l*
Damping Rate	Medium	

5   Select Profile

To choose which profile to use, the Select Profile option is selected on the main menu. The ten profiles are listed, if a profile has been setup the profile name is displayed otherwise the profile is indicated as empty.

The active profile is indicated with a tick. To select another profile use the ↓↑ keys to move the highlight bar then press the **OK** key. Information about the profile will be displayed with a prompt to use the selected profile.

Note: If a profile name was entered at the time the profile was setup this will be shown, if a name was not entered the default name will be displayed e.g. Profile One. Only the first fifteen characters of a user entered profile name are displayed.

```
         MAIN MENU
1. Charlestown STW
2. St Austell STW
3. < Empty>
4. < Empty>
5. < Empty>
```

Figure 7 Select Profile

```
       SELECT PROFILE
Charlestown STW MLSS
Bill Smith
22/08/2001
Press OK to accept
Press MENU to cancel
```
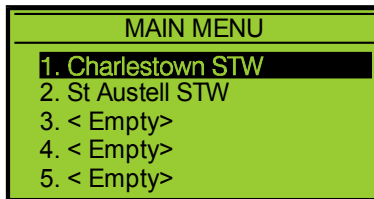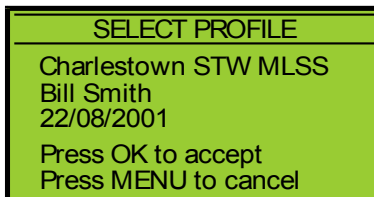
Figure 8 Selected Profile Information & Confirmation

6   New Profile Wizard

740 PROFILE WIZARD

Use the 740 profile wizard
to guide you through the
setting up of a profile.

NEXT Y

Figure 9 Profile Wizard

When the New Profile Wizard is selected you will be taken through a series of display screens that will prompt you to select the correct configuration for your application. The selections can be modified after creation by editing the profile.

6.1   New Profile Wizard Keys

Once the Create Profile feature has been entered, the **MENU** key can be used to exit at any time. Pressing the ➜ key moves forward to the next step and pressing the ⬅ moves back to the previous step. Pressing the **OK** key will activate the displayed function.

740 PROFILE WIZARD

The wizard can be exited
by pressing the menu key.

NEXT Y
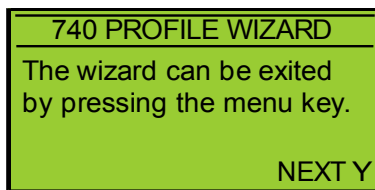
Figure 10 Profile Wizard

6.2   New Profile Wizard Stages

The Create Profile feature guides the user through the configuration of the following items, for more information about the item, refer to the applicable section of this manual. (* These stages are shown if the User Defined preset was selected)

1. Select Preset
2. Profile Name (up to 21 characters)
3. Profile User (up to 21 characters)
4. Profile Date (dd/mm/yyyy)
5. Measurement Title*
6. Display Units*
7. Display Range*
8. Damping*

On successful completion of the new profile wizard, the calibration of the profile should be checked, it may be necessary to calibrate the profile. (See Profile Calibration). It may be necessary to amend some parameters to suit the application.

7   Profile Config

7.1   Profile Name

This menu is used to set/edit the profile name. The profile name should be set to describe the measurement that the profile has been set up for. For example "Charlestown STW MLSS".

To edit the profile name, use the ←→ keys to select a character, and the ↓↑ keys to change the selected character. When all changes are complete press the **OK** key to store the measurement title. To exit without saving changes press the **MENU** key. The profile name can be up to 21 characters long.

Note: If the profile name is not set during the creation of the profile it will be automatically named "Profile x" where x is the profile number.

7.2   Profile User

This menu is used to set/edit the profile user. The profile user can be used to record the name of the person who set up the profile.

To edit the profile user, use the ←→ keys to select a character, and the ↓↑ keys to change the selected character. When all changes are complete press the **OK** key to store the measurement title. To exit without saving changes press the **MENU** key. The user name can be up to 21 characters long.

Note: If the profile user is not set during the creation of the profile it will be automatically named "User x" where x is the profile number.

7.3   Profile Date

The profile date can be set/changed using this menu. The profile date can be used to record when the profile was created or when the profile was last calibrated.

To edit the profile date, use the ←→ keys to select a digit, and the ↓↑ keys to change the selected digit. When all changes are complete press the **OK** key to store the measurement title. To exit without saving changes press the **MENU** key.

Note: The profile date will be set to a default value if it is not set when the profile is created. It is possible to enter non-calendar dates - however this will have no effect on the instruments operation.

7.4   Measurement Title

This menu is used to select the measurement title displayed in measure mode. The user can select from a list of predefined titles or enter a custom title. To select a measurement title, use the ↓↑ keys to highlight the required title and press the **OK** key. If a predefined title is selected, a small tick will appear next to the selected title. If the user defined option is selected, a new screen will be displayed which allows editing of the user defined title.

7.4.1   User Defined Title

To edit the user defined title, use the ←→ keys to select a character, and the ↓↑ keys to change the selected character. When all changes are complete press the **OK** key to store the measurement title. To exit without saving changes press the **MENU** key. The user measurement title can be up to 21 characters long.

7.5   Display Units

The measurement units displayed in measure mode can be selected using this menu such that they are appropriate for the measurement being made. The user can select units from a predefined list, enter custom units (user defined) or switch off the display of units.

To select the measurement units, use the ↓↑ keys to highlight the required title and press the **OK** key. If a predefined title is selected, a small tick will appear next to the selected title. If the user defined option is selected, a new screen will be displayed which allows editing of the user defined units.

7.5.1   User Defined Units

To edit the user defined units, use the ←→ keys to select a character, and the ↓↑ keys to change the selected character. When all changes are complete press the **OK** key to store the new units. To exit without saving changes press the **MENU** key. User units can be up to 4 characters long.

Note: There is no mathematical relationship between FTU and mg/l or g/l. If FTU are used, Formazin should be used for calibration.

7.5.2   Linked Units

The m/g and g/l units are linked such that changing from one to the other will cause a change in the display range such that the display value is appropriate for the units selected. The linked relationship between units and ranges is shown in the table below.

Old Range	Old Units	Units Changed To:	New Range
0 – 20000	mg/l	g/l	0 – 20.00
0 – 20.00	g/l	mg/l	0 – 20000

Note: Changing from/to any units other than those shown will not effect the display range.

7.6   Set Damping Range

The 7200 Monitor has the ability to apply damping to the incoming sensor signal such that a stable measurement value can be displayed. This is essential in applications where the effluent being monitored produces a fast varying sensor signal such as in an aeration process.

The response time quoted for each damping rate is indication of the monitor's performance when a step change of 0 to 100% occurs on the sensor input. This can be useful when selecting the damping rate to be used for a particular application.

Note: Pressing the OK key whilst in measure mode causes the display value to be immediately updated (bypassing damping) - this is very useful when high levels of damping are used.

Damping Rate	Response Time (Seconds)	Typical Use
Instant	0.2	Instrument Demonstration
Very Fast	1	
Fast	10	Final Effluent
Medium	30	
Slow	60	Aeration Lane
Very Slow	120	

8   Profile Advanced Config

The advanced sensor menu allows the user adjustment of important profile related settings. These settings can have a major impact on the operation/configuration of the instrument and should only be altered by experienced users or under the supervision of Partech.

8.1   Lookup Table Mode

This option is used to set whether the display value lookup table is used. The lookup table is used to improve the linearity when the characteristics of the effluent being measured cause the sensor output to be non-linear.

8.2   Adjust X Values

These values along with the Y values are used to perform linearisation on certain sensor types by means of a lookup table. The X values represent the input values to the table and the Y values are used to determine the linear output values. For further information on the use of lookup table linearisation please contact Partech.

8.3   Adjust Y Values

See Adjust X values above.

8.4   Constant A, B, C

Constants A, B and C are used in the calculation of the displayed measurement value. These values are very important to the operation of the instrument and should only be changed following advice from Partech.

9   Monitor Config

9.1   Bleeper

This option allows the bleeper to be turned on or off, a small tick indicates the current setting. To change the bleeper setting, use the ↓↑ keys to select the required setting and press **OK**. Press **MENU** to exit the bleeper menu.

9.2   Backlight

The backlight can be set to one of two modes, On after key press (the backlight stays on for 5 seconds after a key is pressed) or Off. The current backlight mode is indicated by a small tick, to change the backlight mode, use the ↓↑ keys to select the required mode and press **OK**. Press **MENU** to exit the backlight menu.

9.3   Auto Shutdown

The Auto Shutdown menu allows the user to set whether the instrument automatically switches itself off. When set to On, the Auto Shutdown feature switches the instrument off 5 minutes after the last key press thus prolonging battery life. When set to Off, the instrument will continue operating until switched off by the user or the battery is fully discharged.

Note: If the instrument has switched off automatically, the user can restore operation by pressing the ON/OFF key.

9.4   Language

This facility is used to select the operating language of the instrument and is configured using the list select method of data entry. The 740 Monitor is supplied with a choice of English and one other language.

9.5   Change Password

The user password used when the instrument is locked and unlocked can be adjusted using this menu. The first stage in changing the password is to enter the existing password, which is done using the ↓←→↑ keys. Once the old password has been entered, press the **OK** key to proceed to the next stage, which is the entry of the new password. The new password can be entered using the ↓←→↑ keys and pressing the **OK** key will store the new password. At any stage whilst the password is being changed, pressing the **MENU** key will exit the menu and the old password will be unchanged.

Note: The factory default password is 1000, if the user password has been forgotten please contact Partech technical support.

9.6   Monitor Adv Config

9.6.1   Factory Cal Values (1 to 5)

These values are used to store the factory calibration data of the attached sensor. The only time that these values will need to be accessed is when a replacement sensor is fitted to the monitor. The new sensor will be supplied with a set of calibration values that must be entered - failure to do so will affect the calibration and measurement accuracy of the instrument.

9.7   Load Monitor Defaults

It is sometimes necessary to restore the default values for all the user configurable parameters such that the instrument is in a known state. To load the monitor defaults, select Load Monitor Defaults and press **OK**. To prevent accidental use, the user password must be entered prior to confirming the operation.

10   Profile Calibration

10.1   Calibration – General

Calibration of the 740 Monitor is very important, errors in the calibration process will effect the measurement performance of the instrument. The following section describes the various aspects of calibrating the 740 Monitor and has been written with the understanding that the user has knowledge of the measurement being made.

Any containers used to store calibration samples should be cleaned prior to use. This is particularly important when performing the zero point calibration on a low range application.

The most accurate method of calibration is using a primary standard, i.e. calibration in the actual solution against a laboratory result. Where this is not possible or where the trend of the reading is necessary rather than an absolute value it is acceptable to use a secondary standard.

Note: Each profile must be separately calibrated, ensure that the required profile has been selected prior to calibration.

10.2   Methods of Calibration

10.2.1   Primary Standard

This method of calibration will give the best results however it does require the use of a laboratory to carry out a gravimetric analysis of the calibration solution. The result of the gravimetric analysis is used as the calibration value.

10.2.2   Secondary Standard

In cases where it is not possible to carry out calibration using a primary standard, secondary standards such as Fullers Earth or Formazin can be used. It is important to remember however that instruments calibrated in this way will give results based on the secondary standard used and this will differ from the results of a gravimetric analysis.

A guide to the preparation of Fullers Earth and Formazin solutions is located at the back of this manual.

10.2.3   Using a Calibration Cell

The calibration cell has been designed to provide the operator with a system performance check once the system has been calibrated satisfactorily. The role of the cell is to create a consistent input to the sensor such that the correct and consistent operation of the system can be established.

When using a calibration cell it is very important that the sensor is clean and dry prior to its fitting and the cell is correctly aligned. It has been found that the best results are achieved if the same orientation is used each time the cell is fitted.

For further information on the use of calibration cells, refer to the appropriate sensor instruction manual.

10.2.4   Calibration Intervals

The 740 Monitor and Sensor combination once calibrated will require calibration checking/re-calibration at 3-6 monthly intervals, however this does depend on the application. The calibration of the instrument can be effected by seasonal variations in the measured effluent, however only knowledge of the application can determine the re-calibration interval required.

10.3   Preparing for Calibration

To ensure that calibration will be as successful as possible the following should be observed:

1. Clean the whole sensor and at least 1 metre of cable.

2. The zero solution should be clean settled tap water for high range measurements and freshly distilled or de-mineralised water for low range measurements.

3. A calibration solution will be required, ideally this should be greater than 75% of the intended measurement range.

10.4   Calibration Wizard

```
┌─────────────────────────────┐
│      740 CAL WIZARD         │
├─────────────────────────────┤
│ The 740 Cal wizard          │
│ takes you through the       │
│ calibration process.        │
│                    NEXT →   │
└─────────────────────────────┘
```
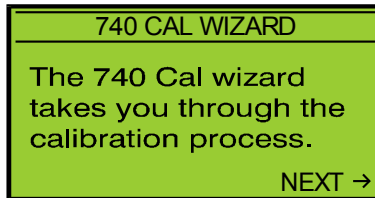
Figure 11 Calibration Wizard

The 740 Calibration Wizard guides the user through the important process of calibrating the instrument. Once the setup wizard has been completed, the instrument should respond to changes to the sensor signal (for example placing the sensor into the zero solution and then into the calibration solution). Although the instrument is responding, the factory default calibration values are used until user calibration is carried out.

Before using the calibration wizard, the guideline described in the preparation for calibration section above should be observed. Also ensure that the correct display range and units have selected.

10.4.1   Cal Wizard Keys

Once the calibration wizard has been entered, the **MENU** key can be used to exit at any time. Pressing the ➔ key moves forward to the next step and pressing the ← moves back to the previous step. Pressing the **OK** key will activate the displayed activity.

10.4.2   Cal Wizard Stages

The Cal Wizard guides the user through the process of setting the instrument zero and span. For more information about setting zero and span, refer to the applicable section of this manual.

10.5   Set Zero

This menu is used to set the instrument display zero for the attached sensor. To zero the instrument, go to the Calibration menu, select Set Zero and press the **OK** key. Immerse the sensor into the zero solution and press the **OK** key. The 740 Monitor collects data for the zeroing operation for approximately 5 seconds to ensure that the

zero is set accurately. During this period do not move the sensor, as this could effect the zero operation. If the zeroing process is successful, the monitor will return to measure mode and the display value will be zero. If a problem occurs during the zeroing operation, an error message will be displayed and the monitor will return to the Calibration menu.

```
ZERO

Immerse the sensor in
zero solution.

Press OK to accept
Press MENU to cancel
```
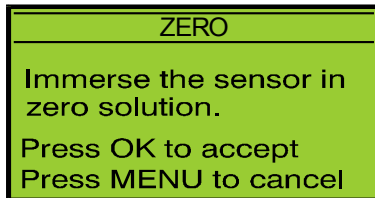
Figure 12 Zero - Preparation

```
ZERO

Collecting Data
75%
```

Figure 13 Zero - Collecting Data

10.6   Set Span

The Set Span function is used to set the calibration point for the instrument, which is used in the calculation of the displayed value. To calibrate the instrument, go to the Calibration menu, select Set Span and press the **OK** key.

Note: If an online calibration is being carried out, whilst in measure mode check that the display value is stable – it may be necessary to increase the damping level to stabilise the display value.

10.6.1   Step 1. Calibration Value Entry

The calibration value can be set to a value between 3 – 100% of the currently selected measuring range using the ↓←→↑ keys. This value should be set to the value of the

calibration solution. Once the correct value has been set press the **OK** key. Pressing the **MENU** key will exit the Set Span operation.

Note: The calibration value can only be set between 3 to 100% of the display range.

```
┌─────────────────────────────┐
│        CALIBRATE            │
│   ────────────────────      │
│                             │
│        25̲0̲0 mg/l            │
│   Use ↓←→↑ to set value     │
│   Press OK to accept        │
│   Press MENU to cancel      │
└─────────────────────────────┘
```

Figure 14 Set Span –Calibration Value Entry

10.6.2   Step 2. Calibrating

As indicated by the on display instructions, immerse the sensor into the calibration solution and press the **OK** key. The 740 Monitor collects data for the spanning operation for approximately 10 seconds to ensure that the span is set accurately. During this period do not move the sensor, as this could effect the span operation. If the spanning process is successful, the monitor will return to measure mode and the display value should be correct for the calibration solution. If a problem occurs during the spanning operation, an error message will be displayed and the monitor will return to the Calibration menu.

```
┌─────────────────────────────┐
│        CALIBRATE            │
│  ────────────────────       │
│  Immerse the sensor in      │
│  calbration solution.       │
│                             │
│  Press OK to accept         │
│  Press MENU to cancel       │
└─────────────────────────────┘
```
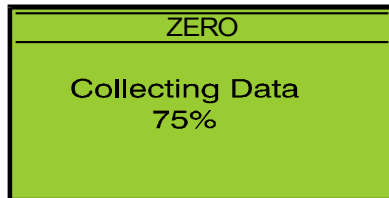
Figure 15 Set Span - Preparation

CALIBRATE

Collecting
70%

Figure 16 Set Span – Data Collection

10.7   Take Sample

The Take Sample and Enter Sample Result facilities 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 relating to the calibration solution for later use.

From the Calibration menu, select Take Sample and press the **OK** key. With the sensor immersed in the calibration solution, (The display value must be stable – this can be checked when in measure mode) press the **OK** key. The 740 Monitor collects data for the take sample operation for approximately 10 seconds, during this period do not move the sensor. If the take sample process is successful, the monitor will return to measure mode. If a problem occurs during the zeroing operation, an error message will be displayed and the monitor will return to the Calibration menu.

10.8   Enter Sample Result

When the take sample operation has been carried out, and the correct value for the calibration solution is known, the new calibration value can be entered using the Enter Sample Result menu.

To enter the new calibration value, from the calibration menu, select the Enter Sample Result menu and press the **OK** key. The calibration value can be set to a value between 3 – 100% of the currently selected measuring range using the ↓←→↑ keys. This value should be set to the value of the calibration solution. Once the correct value has been set press the **OK** key. Pressing the **MENU** key will exit the Set Span operation.

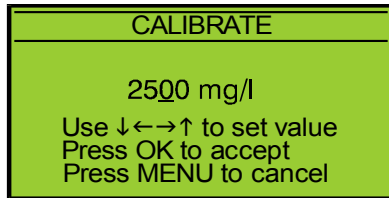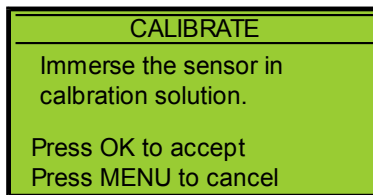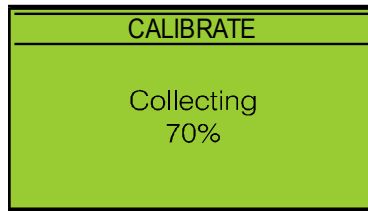***Note: The calibration value can only be set between 3 –100% of the display range.***

11   Information

11.1   Profile Information

Details of the current (active) profile are displayed for user reference.

11.2   Software Version

This display indicates the software version and serial number of the instrument and is useful for recording and problem diagnosis.

11.3   Contact Information

This display provides contact information for Partech (Electronics) Ltd.

11.4   Battery Status

This display provides information on the charge status of the battery, this includes battery voltage, percentage charged and whether a charger is connected to the monitor

11.5   Sensor Input

This display provides basic diagnostic information about the sensor performance. The information can assist in the resolution of monitoring problems, it is likely that Partech will request information from this display when providing technical support.

12   Instrument Security

The 740 Monitor can be locked to prevent unauthorised access to the configuration menus by using a password. The user password is a 4 digit number that can be set to any value the user chooses. When supplied new, the user password is set to 1000, we recommend that this is changed when the instrument is installed.

Note: The factory default password is 1000, if the user password has been forgotten please contact Partech technical support.

12.1   Lock Instrument

The user will be prompted for the entry of the user password, when entered correctly the instrument will be locked. The instrument can only be locked with the correct user password thus avoiding accidental/unauthorised locking.

Once the instrument is locked, the user will be asked for the password when attempting to carry out any operation other than:

- •   Switching the monitor ON or OFF

- •   Selecting a previously configured profile

12.2   Change Password

The method of changing the user password is described in the monitor configuration section of this manual.

13   Error Messages

When the instrument detects an error condition, an error message will be displayed. All the error messages are described below:

13.1   Measurement

13.1.1   Display Over Range

Calculated display value greater than selected display range maximum, either change display range or check calibration is correct.

13.1.2   Display Under Range

Calculated display value less than selected display range minimum, check calibration

13.2   Sensor

13.2.1   No Sensor

No sensor detected on input to monitor, if sensor is connected and wiring is okay either sensor fault or monitor fault.

13.2.2   Sensor Low Limit

Sensor input signal is too low possible, sensor fault.

13.2.3   Sensor High Limit

Sensor input signal is too high possible, sensor fault.
 Calibration

13.2.4   Not Available - Sensor Fault

If one of the above sensor faults is present, it is not possible to perform a calibration. Clear the sensor fault and try again.

13.2.5   Sensor Input Too High (Set Zero)

The data collected for the zero operation was above the allowed maximum for a zero operation. This can be caused by a dirty zero solution, fouling on the sensor or a fault with the sensor.

13.2.6   Sensor Input Too Low (Set Zero)

The data collected for the zero operation was below the allowed minimum for a zero operation. This generally indicates that the sensor is faulty.

13.2.7   Sensor Input Too Low (Set Span)

The data collected for the calibration operation was below the allowed minimum for the span to be set. This occurs when sensor signal in the calibration solution is too close to

the sensor signal in the zero solution. This can be caused by too clear a calibration solution, or a fault with the sensor.

14   Battery Charging

14.1   Battery

The instrument contains a Nickel Metal Hydride battery pack that supplies it power for operation. This type of battery has been selected for its ease of use - it does not have to be fully discharged prior to charging. It is therefore possible to "top up" the battery charge as and when required, this is particularly useful prior to the instrument being used for a long period.

14.2   Charger

The 740 Monitor can be charged using either the mains or car charger available from Partech. When connected to the monitor, the charging LED gives a visual indication of charging status.

Charging LED Colour	Status
Unlit	Charger not connected or switched off
Red	Charging
Orange	Nearly charged
Green	Fully charged

15   Maintenance

In normal operation the instrument requires no routine maintenance other than an occasional clean with a damp cloth.

15.1   Sensor Replacement

Should it be necessary to replace the sensor the following procedure should be used:

1.   Unscrew the eight screws in the back of the monitor.

2.   Carefully separate the two halves of the monitor, when the two halves are approximately 30mm apart, unplug the keypad connector and completely remove the front of the monitor.

3.   Locate the sensor terminals, unscrew the four terminals and remove the sensor wires. Slacken the cable gland and remove the sensor cable.

4.   Feed the replacement sensor cable through the cable gland and connect the sensor wires as indicated on the circuit board. Ensure that the terminal screws are securely tightened.

5.   Plug the keypad connector into its socket ensuring that it is properly aligned. Replace the monitor front and refit the eight retaining screws.

6.   Switch the monitor on and following the instructions supplied with the replacement sensor enter the its factory calibration data.

7.   The instrument is now ready for use.

16   Presets Measurements

The configuration of each preset measurement is shown below:

	Name/Type	Measurement Title	Units	Display Range	Damping Rate	Calibration Value
1	STW Final Effluent 0 - 100 mg/l	Final Effluent	mg/l	0 - 200.0	Fast	100.0
2	STW NAS 0 - 1000 mg/l	M.L.S.S	mg/l	0 - 2000	Fast	1000
3	STW NAS 0 - 10000 mg/l	M.L.S.S	mg/l	0 - 20000	Fast	10000
4	Formazin 0 - 100 FTU	Turbidity	FTU	0 - 200.0	Very Fast	100.0
5	Formazin 0 - 1000 FTU	Turbidity	FTU	0 - 2000	Very Fast	1000
6	Formazin 0 - 4000 FTU	Turbidity	FTU	0 - 20000	Very Fast	4000
7	Fullers Earth 0 - 100 mg/l	Suspended Solids	mg/l	0 - 200.0	Fast	100.0
8	Fullers Earth 0 - 1000 mg/l	Suspended Solids	mg/l	0 - 200.0	Fast	100.0
9	Fullers Earth 0 - 10 g/l	Suspended Solids	g/l	0 - 20.00	Fast	10.00
10	Fullers Earth 0 - 20 g/l	Suspended Solids	g/l	0 - 20.00	Fast	10.00
11	Milk (Full Fat) 0 - 10 %	Suspended Solids	%	0 - 20.00	Fast	10.00
12	User Defined	Suspended Solids	mg/l	0 - 2000	Fast	1000

17   *User Profile setup Record*

The form below can be used to record the configuration of a profile

740 Monitor Profile Record	
Profile Number	
Profile Name	
Profile User	
Profile Date	
Measurement Title	
Units	
Display Range	
Damping Rate	
Calibration Value	
Constant A	
Constant B	
Constant C	

18   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

18.1   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 (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

19   Technical Specification (should be last section)

19.1   Electrical Information

Power Supply..................................Internal Rechargeable Battery Pack
Charge Input...................................11 - 14 VDC (2.1mm Plug centre positive)
Partech Charger.............................90-264 VAC (47-63 Hz) Universal Supply
European, US or UK Plug Style
EMC Conformity.............................EN 50081, EN 50082
Adjustment.....................................via Membrane Keypad
Operating Temperature...................-20 to + 60° C
Display..5 Digit, Grapghical SmartFluid™ LCD

19.2   Physical Features

Enclosure Material..........................ABS
Enclosure Dimensions....................224 × 106 × 39 mm (h × w × d)
Weatherproof Rating.......................IP65
Weight (no sensor)..........................0.5 kg

19.3   Software Features

Number of User Profiles..................10
Preset Calibrartions........................Formazin
Fulller's Earth
Normal Activated Sludge
Milk (Full Fat)
Units of Measurement.....................mg/l
g/l
ppm
FTU
NTU
%SS
User Defined
Display Ranges..............................0-20.00
0-200.0
0-2000
0-20000
Auto Power Off...............................5 mins

20   Preparation of Fullers Earth

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

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

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

- The water used should be freshly distilled or de-mineralised

- Ensure the container used for the solution is clean

- During preparation and use, keep the solution covered to prevent contamination

- When using the solution it must be continually stirred to ensure accurate and consistent measurements and to prevent settling

21   Preparation of Formazin Turbidity Standard

21.1   Health & Safety Precautions

The chemicals used when following this procedure are harmful, therefore the correct safety precautions must be carried out. During handling, avoid inhalation and contact with the eyes or skin. Wash hands thoroughly after use. Refer to the data sheets for further details of the chemicals used.

21.2   Method of Preparation

he preparation of a Formazin Turbidity Standard should be carried out with great care. Absolute cleanliness should be observed at all times to avoid any contamination of the solution.

All water used should be freshly distilled or de-mineralised. During preparation and use, keep the solution covered to prevent contamination.

- Dissolve the Hydrazinium Sulphate 10g into 1 litre of water. Stir the solution thoroughly.

- Dissolve the Hexamine 100g into 1 litre of water. Stir the solution thoroughly.

- Pour the above solutions into a 2.5 litre Winchester or similar type amber glass bottle and mix thoroughly. Allow the mixture to stand undisturbed for 24 hours at 25°C. The resultant solution will have a turbidity of 4000 FTU.

- Prior to use the standard should be mixed thoroughly. i.e. before pouring out the standard, shake the bottle well.

21.3   Preparation of Dilution's

The 4000 FTU standard can be used to prepare solutions of lower values by diluting with water. The formula below can be used to calculate the ratio of water to 4000 FTU standard to produce a solution of the required value.

$$W = \frac{4000}{A} - 1$$

W = parts water to 1 part 4000 FTU standard
A = Required FTU value

21.4   Calibration

When Formazin solutions are used for calibration/testing of sensors, sufficient solution is required such that the sensor is completely immersed. When using light scatter sensors it is important that the sensor is positioned away from the sides and bottom of the container to prevent the light being reflected.

21.5   Storage Life

The turbidity standard should be stored in the Winchester bottle and kept in a cool dark place. The bottle should be labelled to identify its content and also the date of preparation should be recorded. The 4000 FTU standard has a shelf life of one year after which it should be discarded and a fresh solution should be prepared.

Solutions made by diluting the 4000 FTU standard should also be stored in suitably labelled amber glass bottles and kept in a cool dark place. Solutions above 400 FTU have a shelf life of one month after which they should discarded. Solutions below 400 FTU should be prepared from the 4000 FTU standard daily.

Solutions can be used outside of the storage lives specified above but any results taken must acknowledge this and be accepted as less accurate. When using solutions, watch for flocculation (the particles in the solution will appear to link together), if this occurs discard the solution and prepare a fresh standard.

22   Declaration of CE Conformity

The manufacturer   Partech (Electronics) Ltd
Address   Charlestown
    St Austell
    Cornwall
    PL25 3NN

herewith declares that the product
Part Number   172030
Product   740 Monitor

is in conformity with the standards noted below:

EN 50081-1 (1992)   EMC Generic Emission Standard
    Residential, commercial & light industry

EN 50082-1 (1994)   EMC Generic Immunity Standard
    Residential, commercial & light industry

following the provisions of European Directives:
- ◆   89/336/EEC   EMC Directive:
  Electromagnetic Compatibility

- ◆   73/23/EEC   Low Voltage Directive:
  Electrical equipment designed for use within
  certain voltage limits

The CE Symbol confirms that this product conforms with the above mentioned norms and regulations.

Roger Henderson, Technical Director, August 24, 2001