

SmartCom for Windows

Edition 1.2

*User
Manual*



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Overview

SmartCom for Windows allows you to communicate with all Greenspan Smart Sensors. SmartCom provides full configuration, monitoring and data retrieval for Greenspan Smart Sensors using either Direct Connection cable or remote communications via landline or Cellular Phone.

New features of *SmartCom for Windows* include:

- ❖ Logical Organisation of Instruments into Groups and Locations for easy sensor management.
- ❖ Wizard for adding new Locations to the group.
- ❖ Viewing of Location properties off-line.
- ❖ Integrated Data Collection and Graphical Viewing of data.
- ❖ Structured directories for storing collected data from Locations.
- ❖ Location connection information stored in local database.
- ❖ More Intuitive Layout of Sensor Properties and Functionality.
- ❖ Use of standard Windows Modem (TAPI) Control Panel Settings for remote access.
- ❖ Automatic Periodic Data Retrieval using **SmartPoll** program.
- ❖ Automatic Alarm Dial Back Notification using **SmartStandby** program. (Please refer to help screens on extension programs for further detail).
- ❖ **Online Help** – pressing <F1> at any time while running SmartCom displays detailed help similar to this manual.

SmartCom for Windows Components

SmartCom for Windows includes two main components:

Direct Link

This program is a simpler version of SmartCom which bypasses the Location Explorer Interface to provide faster connection to a Location. It is suitable for Direct Com Port Connections only.

To connect to a sensor, select the Com Port and click the connect button. Once connected to the sensor the user has the full range of SmartCom functionality available to them but no local Database records of changed or existing Sensor Properties are stored by the software. This version of the Software is recommended for the casual field visit or for technical staff examining the sensor.

SmartCom

This is the full version of SmartCom which includes the *Location Explorer* Interface to provide management of individual and/or multiple sensors. This version of the software is the recommended version for customers wanting management of sensor(s) and their logged data.

Installation

Communication with the logger is through the PC's RS232 port and SmartCom for Windows. The following steps should be followed:

Place installation CD in drive, and follow on screen instructions.

Both comm ports may be accessed by SmartCom, the default is Com port 1. To access Com port 2, select 'Direct' and Com2 from Connection option in Properties. Alternatively this may be set when selecting New Location.

A Typical Logging Sequence

This is a brief overview of the main steps involved in SmartCom for Windows operation. The following sequence can be used to start, collect data and stop a new logging operation:

Run SmartCom and from the Main Menu of Location Explorer select:

Location

1. Create New Location if required or select existing location.
2. Once communication is established with sensor, select Properties and set Scan time and Record time. Turn on any additional functions as required, e.g. alarms.

Start Logger

1. From Logger Control menu, select Start Logger.
2. Select Clear Memory, if the previous content of memory is not required.
3. Click Start Logging and set datum's if required (pressure only).
4. Check that Logging Active indicator is Flashing.
4. Exit Logger Control by selecting Monitor Control and check readings are as expected.
5. Select Disconnect and exit program, disconnect communications cable.

To Check a Logging Session

1. Connect communications cable and run **SmartCom**.
2. Double click location or select Connect from main menu. Monitor Control will automatically display current readings. This will not interrupt the logging session.

To End a Logging Session

1. Select Stop Logger from Logger Control menu.
2. Enter any comments in the Comments field if required.

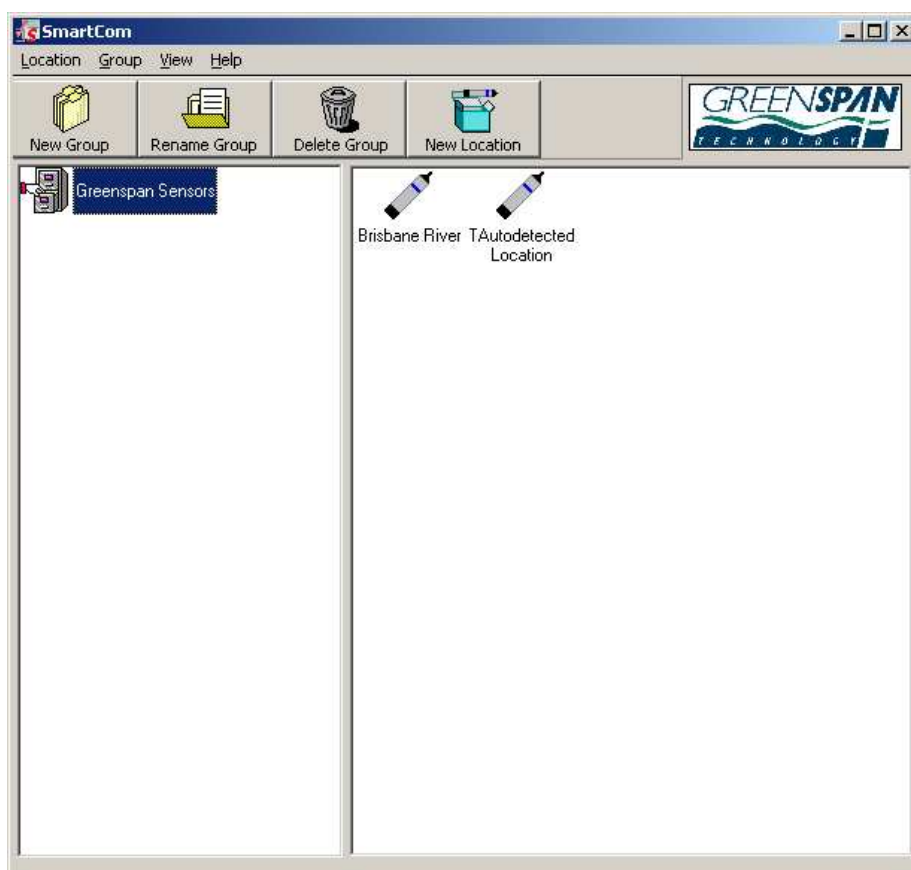
3. Click on Stop Logging button.
4. Select Collect Data , data will be placed in a file at the directory specified under Data File in Properties.
5. When data is downloaded, it can be immediately viewed, if required by selecting View Data in Aquagraph.
6. Select Disconnect and exit program, disconnect communications cable.

Note: The data stored in memory can be retrieved at any time without affecting the stored data. The sensor will continue logging (if selected) and storing data. If a sensor is logging it can be stopped for a period of time and restarted.

USING SMARTCOM for WINDOWS

Location Explorer Window

The SmartCom Program utilises a Location Explorer Window. This is a “Windows Explorer” like view of the Groups and Locations defined in the system. Information about the groups and Locations defined in the system is displayed in the form of a system map. The system map uses a split screen view. The left hand side (Group List) shows the groups, and the right hand side shows the Locations defined in each group (Locations List). The Location List has two viewing modes which are activated via the Main Menu – View Sub Menu.



Icons – Displays Name and Instrument Type Icon for each Location Only.

Details – Displays summary Information about a Location (E.g. Name, Instrument Type, Model Type, Connection Type, Last Accessed ... etc).

A **Group** is defined as any logical collection of Locations. Typical examples of grouping could be on the basis of catchment area, or sensor type or by ownership of sites.

A **Location** is any individual Greenspan Smart Sensor and its associated Data.

Location Explorer Menu – Group Options

The Location Explorer provides the following tools for a selected group:

- ❖ New Group
- ❖ Rename Group
- ❖ Delete Group
- ❖ New Location

New Group

This option will create a new group.

Rename Group

Select a group by clicking on it then select this option to change the name of the group.

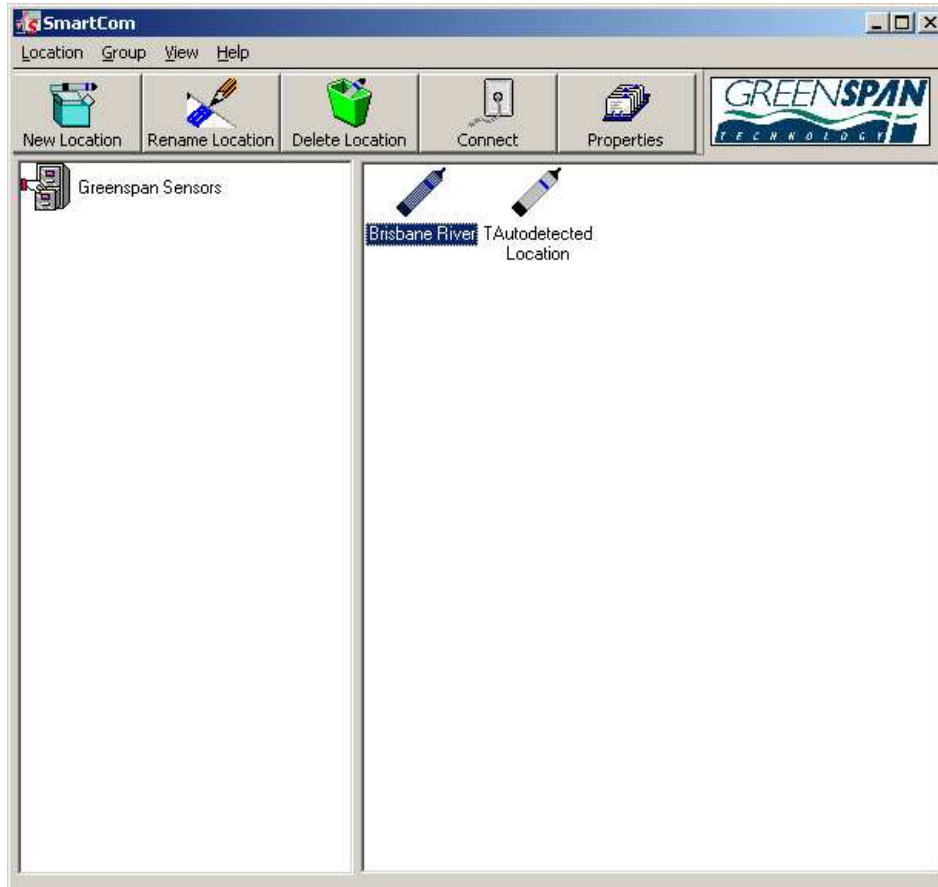
Delete Group

If you wish to delete a Group, then that group must be empty of Locations before this can be done. This option is only available for an Empty Group. You will be asked to confirm this action before the group is deleted.

New Location

This option will add a new Location into the currently selected group by running the **Add Location Wizard**.

(refer to Add Location Wizard detail below)



Location Explorer Menu – Location Options

The Location Explorer provides the following tools for a selected Location:

- ❖ New Location
- ❖ Rename Location
- ❖ Delete Location
- ❖ Connect
- ❖ Properties

New Location

This option will add a new Location into the currently selected group by running the *Add Location Wizard*. (refer to Add Location Wizard detail)

Rename Location

Select a Location then click this option to change its name.

Delete a Location

Select a Location then press Delete Location Button.

You will be asked to confirm that you wish to delete the Location. This action will remove the Location from *SmartCom for Windows's* database.

Connect

This will attempt to establish communications with the selected Location, based on its connection settings. The *Communications Status Window* will update as communication is attempted. Any connect *errors* will be displayed. If a connection is successfully established the *SmartCom Connection* Window is displayed

Properties

The properties option allows you to change the offline properties, (i.e. The Connection Settings and Data and Data Retrieval Defaults) All other properties are read only and can only be changed online (i.e. when the Location is connected to the PC). However the read only properties are indicative of the state of the sensor at last time it was accessed online. See *Location Properties* Section.

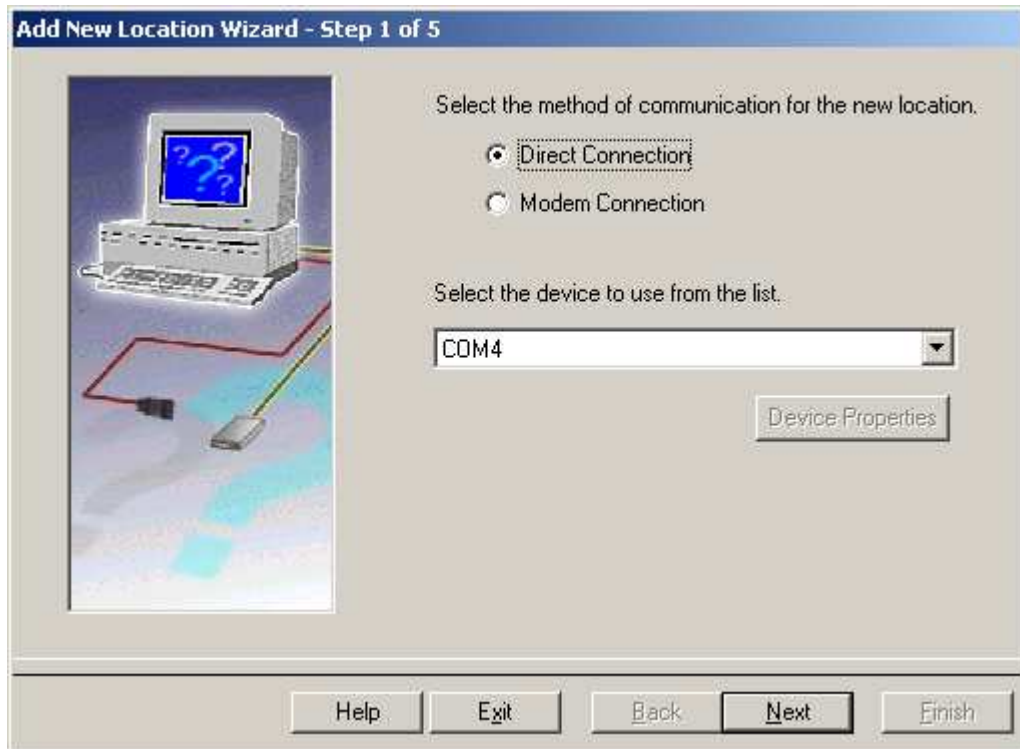
Create Desktop Shortcut:

By right clicking the mouse on a selected Location then from the displayed menu select Create Desktop Shortcut you can create a shortcut for that location on your desktop for easier reference to your sensors. The next time you wish to connect to that sensor all you have to do is double click on the Icon on your desktop for a particular location.

Add Location Wizard

To add a new Location into a group, click on the Add Location Button on the toolbar, or select Group Setup/Add Location from the menu.

The Add Location wizard will then appear.



Step 1: Select Communication Information

The wizard needs to know the path to take to establish communications with the Location. The paths that are available are via:

Direct Connection

If the instrument is connected to your PC with a direct cable, then select Direct Connection. Most people who visit field sites with a laptop computer will use this option. Simply Select the COM port you wish to use.

Modem Connection

If the Location is at a remote site and has a means of remote communication (e.g. landline or mobile phone), then select Modem Connection.

Set the device properties of your modem for use with Greenspan Sensors. (The settings required for the advanced Connection Settings are Use Error Control – ON, Required to Connect – ON, Compress Data – OFF and Use Cellular Protocol – OFF.)

Once the Modem has been selected, enter the phone number for the Location. The number can contain any *extra dial commands* that may be required for the modem. Click Next and continue to **Step 2**.

Step 2: How to create the new Location

In order to add the new Location to the group, the wizard needs to know what type of instrument it is going to communicate with. There are three options available.

- **Auto Detect**
- **Create using Template**
- **Create using Blank**

Auto Detect

Using this feature is **highly recommended**, and is set as the default.

The Auto Detect feature uses the communication information you provided in **Step 1**, to communicate with the Location then interrogate and find the type of Sensor at a Location. Because it reads the information directly from the sensor it will detect all the required details automatically.

Select this option then click Next to go to **Step 4**.

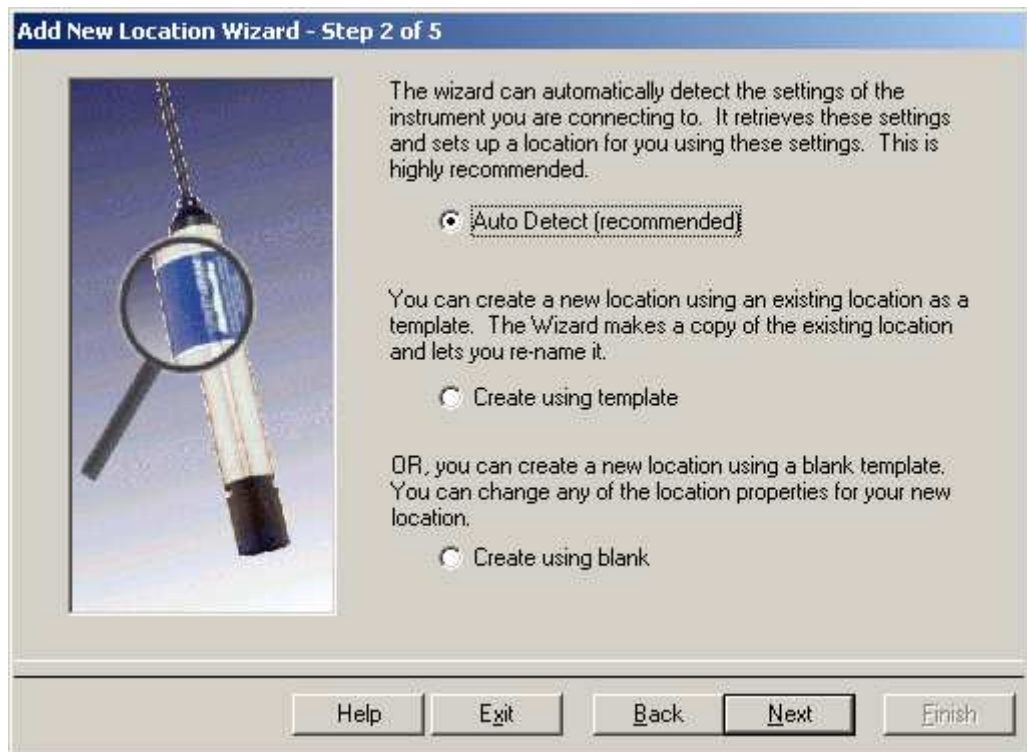
Using a Template

For the more advanced user. This option lets you make a copy of an existing Location, and rename it. This may be convenient if other Locations containing identical Instrument and Model Types are available and are copied to allow setting up new Locations in an identical manner.

Select this option then click Next to go to **Step 3**.

Using a Blank

For experienced user and Technical Support. This option allows you to set up a standard Location from a list of available Instruments and Models. Select this option then click Next to go to **Step 4**.



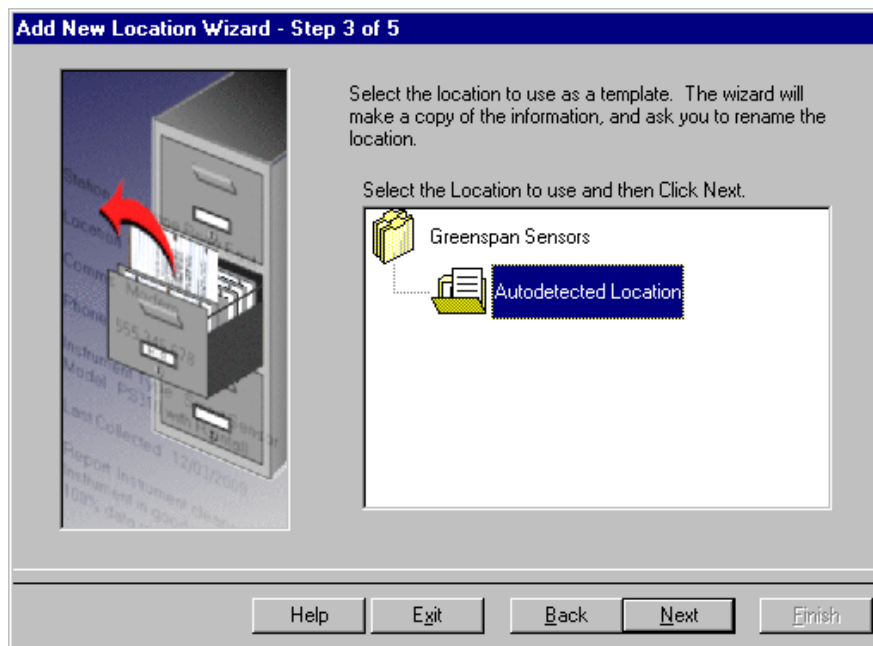
Step 3 : Select a Location to use as a Template

The wizard now asks for the existing Location about to be copied. The Location that you select should be identical in Instrument and Model Type to the new Location. If it is not – then go **Back** to **Step 2** and select the Auto Detect feature.

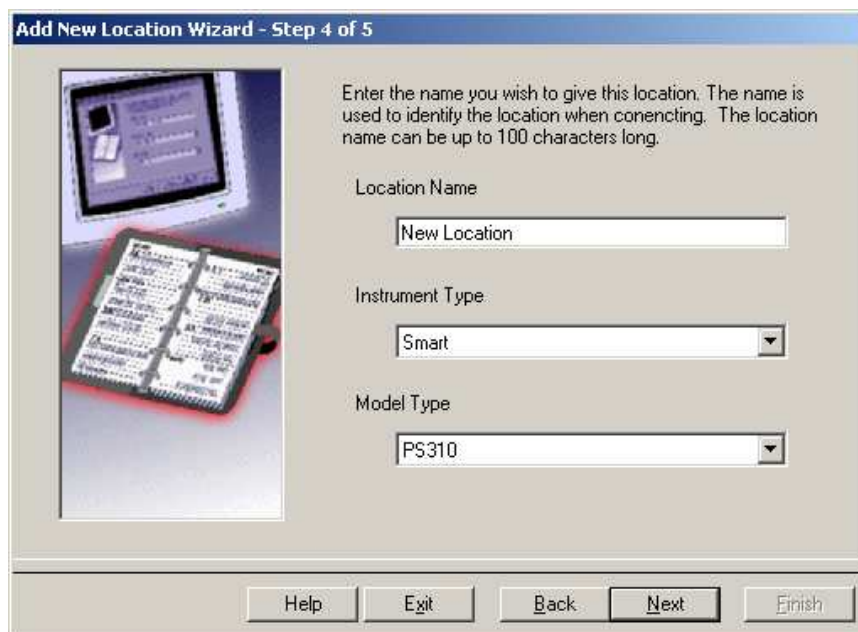
Select a Location from the list available and click Next to go to **Step 4**.

Step 4 : Name the Location and Select Type

The wizard has almost completed adding the Location. All that is needed now is a new name for the Location and to confirm the Instrument and Model Types.



The Location Name can be up to 100 characters in length, and should be as descriptive of the Location site as possible.



The Location name displayed in Step 4, will depend on your selections in **Step 2** and **Step 3**.

An Auto Detect Location will default to being called **Auto Detect Location**.

If a Template was used, it will be called **Copy of <Location name>**

And if created from a blank the default name will be **New Location**

The Instrument and Model Type options displayed in Step 4, will depend on your selections in **Step 2** and **Step 3**.

An Auto Detect Location will show only one Instrument Type and Model that can be selected. This is the Instrument Type and Model detected during the Auto Detection. If it is something other than what should be displayed, or what you expect should be displayed, then go back and check the communication properties in **Step 1**, and repeat the process.

If a Template was used, it will show only one Instrument Type and Model for selection.

This is the Instrument Type and Model properties for the Location that was selected in **Step 3**.

If a Blank was used, then all Instrument Types and their appropriate Models are available. Select the applicable Instrument Type and then the applicable Model for the new Location.

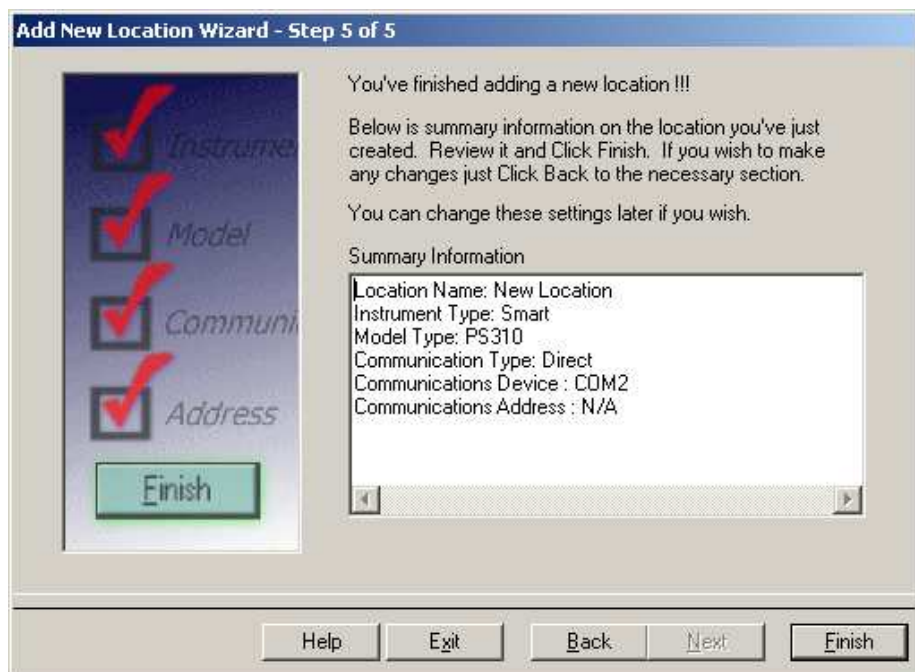
Once all this is done you can click Next to continue to **Step 5**.

Step 5 : Finished

The wizard has finished gathering all the information it needs to create the Location successfully. All that remains is to review the summary information and check that it is correct. If something is not correct go Back and fix the mistake before clicking Finish.

If so click on the **Finish Button** and the information will be written to the database.

The **Location List** will then be updated to include the new Location.



The SmartCom Connection Window

The SmartCom Connection Window provides all the tools necessary to Monitor a Location, edit the Location instrument properties and manage the data and logging functions of the Location. A Connection Window is opened every time you connect to a **Location** whether that be from **DirectLink** or the **Location Explorer**.



Logger Status

The Green or Red lights Flash to indicate whether the logger is active or not.

Logger Information

The monitor screen also shows information on the Scan Time, Record Time, Logger Clock Time/Date and the Session Duration (How long connection has been online for – Useful for Mobile Connections)

Schedule: (Only used with Smart Series II)

This shows information about the schedule. It displays in a cyclic fashion showing "Number of Scans (#Scan)", "Interval"; which is the current scan time, the time the schedule last logged and the condition of the schedule; e.g. (Stopped).

Scan / Record Time: (Only used with Smart Sensors)

This shows information about the current scan and record time settings.

Logger Clock:

This displays the current date and time as read by the logger.

Session Duration:

Displays how long the sensor has been in use. (Important to know when using mobile connection).

Disconnect

This button terminates the current online session and takes the user back to either the **DirectLink** or the **Location Explorer** Window. (Depending on which one launched the Connection Window).

Monitor Current Values Tab

The Connection Window defaults to the Monitor Current Values screen.

The Monitor Current Values screen shows all the channels that are enabled for a particular **Location**.

The Channels are displayed down the screen in the following order...

Water Quality Channels

- ❖ *Rainfall Channel Information (if applicable)*
- ❖ *Rainfall Total (if applicable)*
- ❖ *Hour Total (if applicable)*
- ❖ *Day Total (if applicable)*
- ❖ *Sampler Channel Information (if applicable)*
- ❖ *Channel Information, eg DO Temp EC etc (if applicable)*
- ❖ *Location Battery Voltage*
- ❖ *Location Memory Used*

Current Reading

This is the current reading that was taken by the Location. It is updated at approximately the Location's **Turn on Time** Rate.

The screenshot shows the 'SmartCom Connection' window for 'Brisbane River'. The status bar indicates 'Not Logging' (red light) and 'Logging Active' (green light). The scan and record times are 00:01:00, and the logger clock shows 00:20:38 on 01/09/94. The session duration is 00:12:39. A clock icon is also present.

Channel Name	Current Reading	Last Logged	Units
<i>DO</i>	<i>+0009.53</i>	<i>+999.999</i>	<i>ppm</i>
<i>Temperature</i>	<i>+0019.04</i>	<i>+999.999</i>	<i>deg C</i>
<i>EC</i>	<i>+00045.5</i>	<i>+999.999</i>	<i>us/cm</i>
<i>pH</i>	<i>+0005.60</i>	<i>+999.999</i>	<i>pH</i>
<i>Battery</i>	<i>+0012.41</i>	<i>N/A</i>	<i>Volts</i>
<i>Memory Used</i>	<i>000000</i>	<i>N/A</i>	<i>Bytes</i>

At the bottom of the window, there are buttons for 'Monitor Current Values', 'Logger Control', and 'Disconnect' (with a disconnect icon).

Last Logged

This is the last reading stored in the internal datalogger of the Location. Data is stored at either the **Record Rate** or whenever the particular Channel varies by more than **the Data Variation Value** for that Channel.

Units

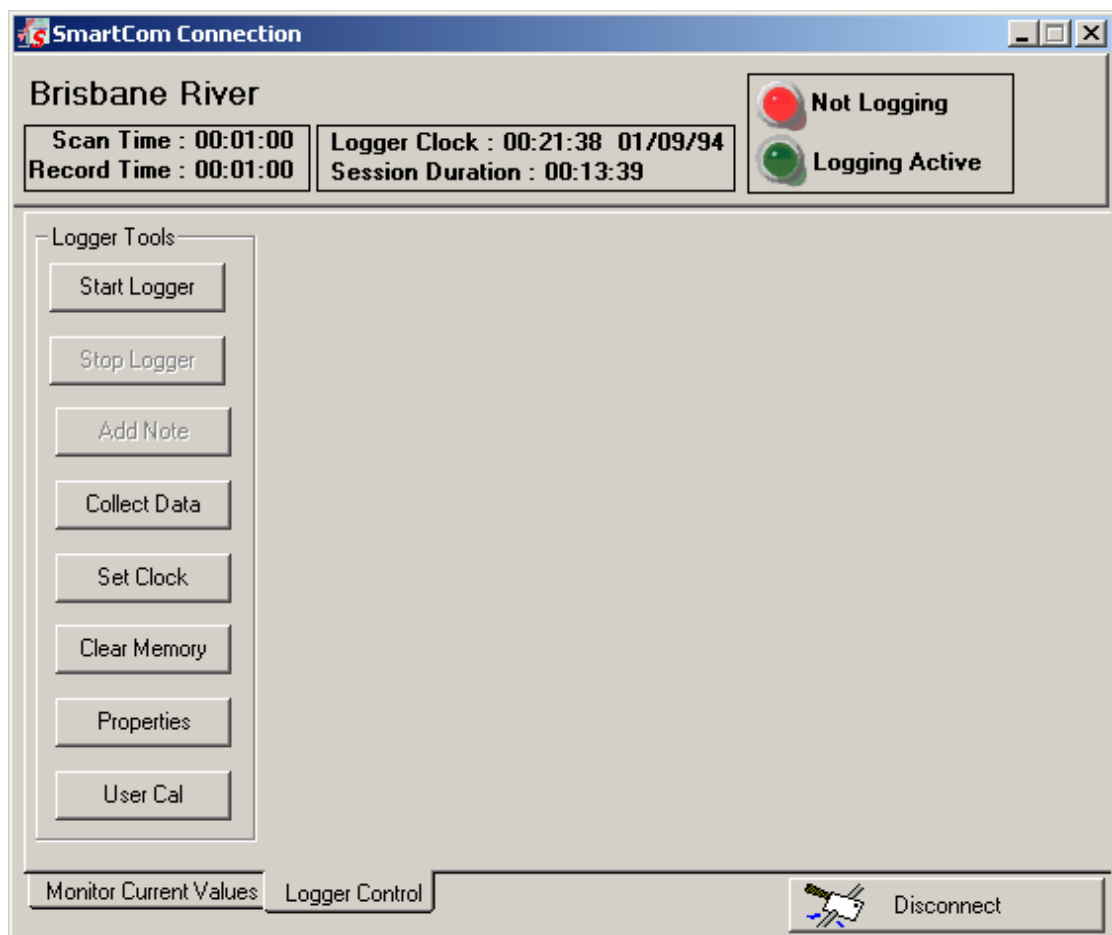
These are the units in which the readings for each Channel are displayed.

Monitor Clock

The Monitor Clock Indicates the progress (and time remaining) for the latest request of monitor data.

Logger Control Tab

The Logger Control Tab Tools are used to carry out data logging tasks for the Location. All the Tools (buttons) required are stored in one convenient location on this screen.



Logger Tools

There are eight Tool buttons available in the Tool area.

- ❖ Start Logger
- ❖ Stop Logger
- ❖ Add Note
- ❖ Collect Data
- ❖ Set Clock
- ❖ Clear Memory
- ❖ Properties
- ❖ User Cal

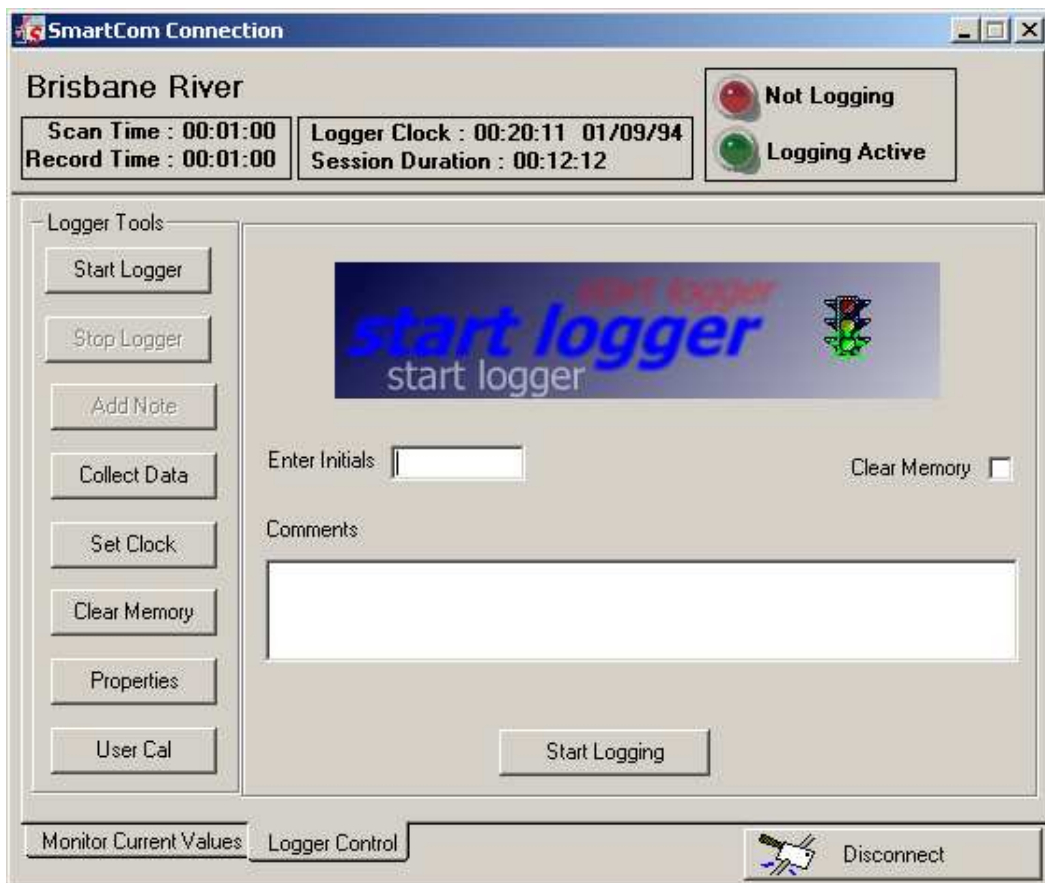
Each of these Tools has information associated with it that will appear in the Tool Information area. The user is required to complete this information and then press the button at the bottom of the Tool Information area to confirm the action. If another Tool button is pressed then the information for that tool is displayed.

Start Logging

The Start Logging tool button starts the internal datalogger of the Location. This Tool button will only be available if the internal datalogger of the Location is not logging (*Stop Logger*).

When selecting Start Logger, on the left-hand side of the screen you are given the option to enter information in the Tool Information area on the right-hand side of the screen.

The information entered is stored in the Location datalogger.



Enter Initials

Enter the initials of the person / persons Starting the datalogging. This is so when other people retrieve data from the Location they can see who started the datalogger running and at what time and date.

Comments

Enter any comments or information of note about when you started the Location logging. For example, “Started logging after installation of sensor” or “Starting logging after sensor cleaning and calibration”.

The comment can be up to 115 characters long.

Clear Memory

Tick this box to clear the Location of all old data before it starts logging new data. This option is recommended for new installations, or where you are going to be leaving the Location unattended for a long period of time.

To Start Logging

Once the information entered is to your satisfaction, press the **Start Logging** button on the RIGHT HAND side of the screen.

For a Smart Sensor, if the Instrument has a Pressure Channel, a Datum Window will appear for the user to enter a Height Datum and click OK.

The Datum value allows the user to enter a value to which all further logged values are referenced. In air, with the sensor held vertically, the Datum should be 000.000mm (ie zero depth) but it may be adjusted to read (for example) 001.000 to consider local reference levels.

For example, if the sensor is placed in a water body of known depth, say 20m, the Datum can be set to 20.000m to ensure that the absolute depth readings are correctly referenced to this value. The final reading will be calculated as the Datum minus the sensor reading. For example if the sensor reading was 15m the final reading will be 5m.

Set the sign number to a positive or negative and then set the appropriate value as required, if no Datum is required, leave at zero.

Logger Status

The Green light will now Flash to indicate the logger is active.

Countdown: (Smart Sensor II only)

When the user clicks on the **Start Logger** button, a window will appear. In this window there is a time countdown to when the logger will start. This is very useful when synchronising other devices with the start of the logger.

Restart Logger: (Smart Sensor II only)

After the logger has started, the user may want to start logging again if the conditions were not right. Instead of stopping the logger and repeating the process for the beginning, all the user has to do is click on the start button again. (The button text will change from "Start Logging" to "Restart Log#1"). When the restart button is pressed, the logger will stop and start again after the logger "counts down". Each time the Smart Sensor II is restarted, the information about the logger conditions, will be stored to a data file. If the restart button is pushed again, then the button will display "Restart Log#2". When the logger is stopped or disconnected, then the restart button will be reset to "Start Logging" again.

Stop Logging

The Stop Logging tool button stops the internal datalogger of the Location. The Tool button will only be available if the internal datalogger of the Location is currently logging (**Start Logger**).

When selecting Stop Logger, on the left-hand side of the screen it is necessary to enter information in the Tool Information area on the right-hand side of the screen.

The information entered is stored in the Location datalogger.



Enter Initials

Enter the initials of the person/persons Stopping the datalogger. This is so when other people retrieve data from the Location they can see who stopped the datalogger running and at what time and date.

Comments

Enter any comments or information of note about when you stopped the Location logging. For example, “Stopped logging to clean sensor head” or “Stopped logging to remove sensor from field for calibration”. The comment can be up to 115 characters long and is stored in the data file. This information does not appear in Aquagraph.

To Stop Logging

Once the information entered is to your satisfaction, press the **Stop Logging** button at the RIGHT HAND side of the screen.

For a Smart Sensor, after a Short Wait, a Check Values Window will Appear.

Enter Check Values

check values
check values
check values

Pressure Check : +999.999 metre

Temperature Check : +999.999 deg C

EC Check : +999.999 us/cm

pH Check : +999.999 pH

Rainfall Check : +00000.0 mm

OK Cancel

Enter values for the particular channels that are of interest at the Location. A Check value does not modify the data readings in any way, but is purely a text entry to highlight a particular channel or value. Click OK to Continue.

For an Analyser, if a schedule is currently running, a warning message will be displayed and the user asked if they wish to continue Stop logging. If they do, the logger will only be stopped once the schedule is finished. The Status of the Logger will only be updated if on the Monitor Screen.

Logger Status

The Red light will now Flash to indicate the logger is inactive.

Add Note

The Add Note tool button allows the user to store information in the internal log file of the Location. This Tool is only available when the Location is logging (**Start Logging**). It provides a means of manually recording comments in the data file during Location visits.



When adding a note to a Location it is necessary to enter some information. The information that is entered, including a time and date, is stored in the Location datalogger and displayed with the retrieved data.

Enter Initials

Enter the initials of the person / persons Visiting the Location. This is so when other people retrieve data from the Location they can see who Visited the Location and at what time and date.

Comments

Enter any comments or information of note about when you visited the Location. For example, "Checked current Pressure reading against site gauge".

The comment can be up to 115 characters long.

To Enter the Information

Once the information entered is to your satisfaction, press the Upload Notes button.

For a Smart Sensor, after a short wait a Check Values Window will appear.

Enter values for the particular channels that are of interest at the Location. A Check value does not modify the data readings in any way, but is purely a text entry to highlight a particular channel or value. Click OK to continue.

Logger Status

The Green light will remain Flashing to indicate the logger is still active.

Collect Data

The Collect Data tool button retrieves stored data from a Location. The Tool button is available whenever the PC is connected to a Location.

To collect data successfully, you are required to enter some information. This information appears in the Tool Information area on the right-hand side of the screen.

The information that you enter is used to identify what data to collect from the Location, and where to put that data once it is collected.

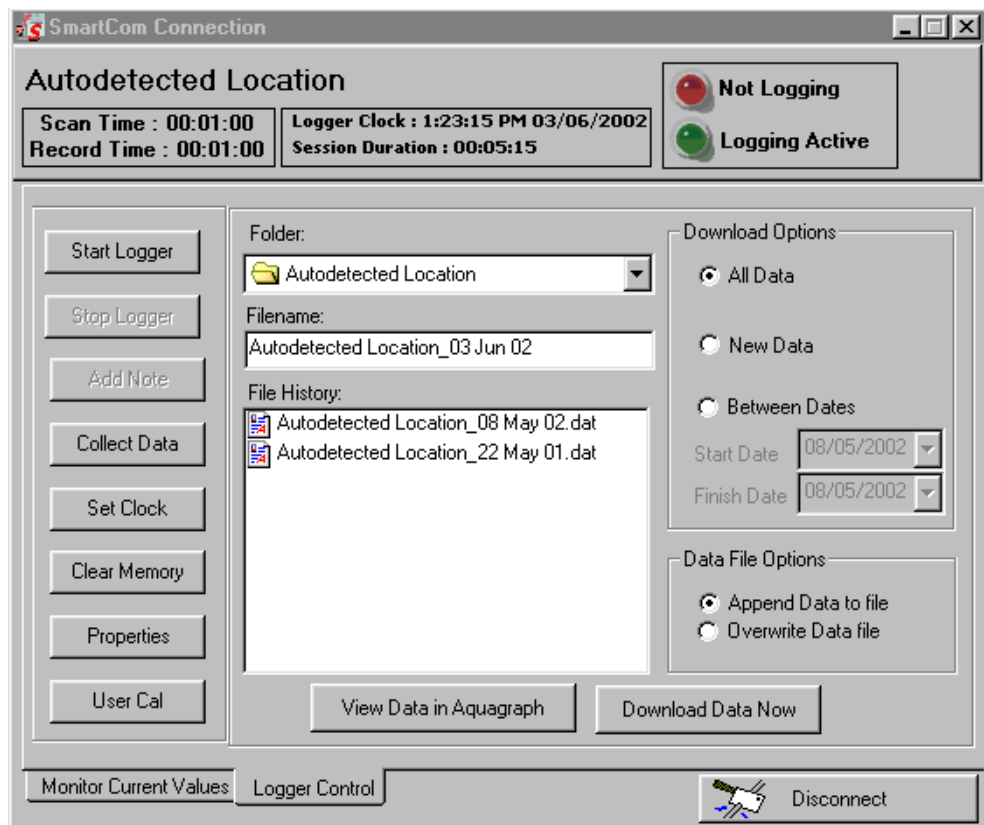
Collect Options

Select which data to collect from the chosen Location.

- ❖ **Collect New Data:** Collects only the new data since you last collected data from the Location (Smart Sensor). The Smart Series II Logger only allows the collection of new information that is specific to the desired user. Multiple users logging on to the same sensor have access only to their own data and no other user's data.

Note: If it is the first time you are collecting new data it will collect all the data

- ❖ **Collect All Data:** Collects all the data currently stored in the Location
- ❖ **Collect Between Dates:** Collects data that was stored between a defined Start and Stop Date.



Data File Options

Selects what to do with existing files.

- ❖ **Overwrite:** Overwrites existing file with newly collected data.
- ❖ **Append:** SmartCom checks the date of the last entry and will only append new data to the existing file that is later than that date.

Folder

Select the data folder to use for this Location. This is the folder that the collected data will be stored in. The default data folder name (from the *Location Properties*) is used.

Filename

Select/Enter the data file name to use for this Location. This is the file that the collected data will be stored in. A default data file name consisting of the Location Name and the Current Date is used.

View Data in AquaGraph

Launches Aquagraph with the currently selected/entered data file name. This is useful for data verification and simple reporting.

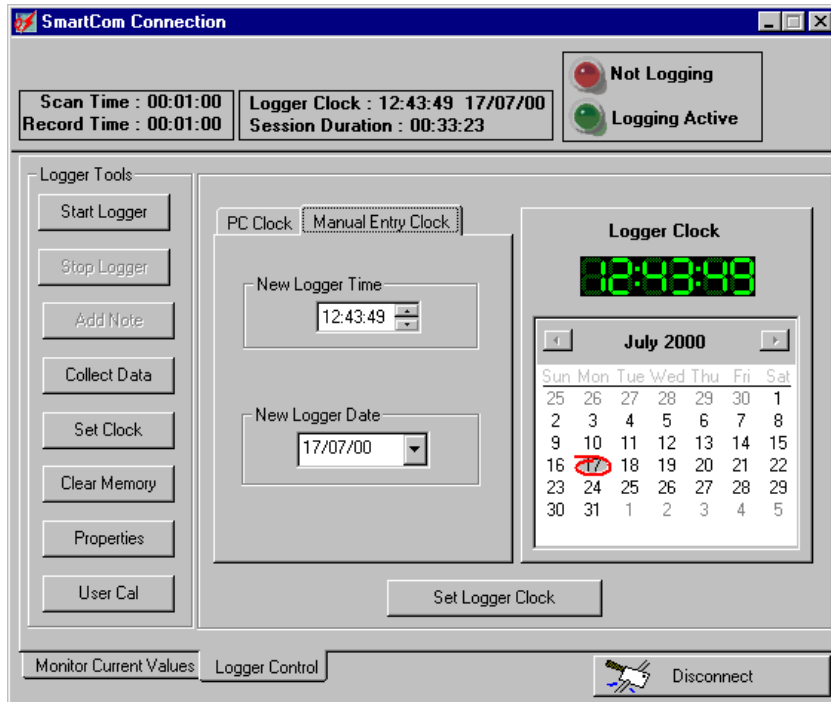
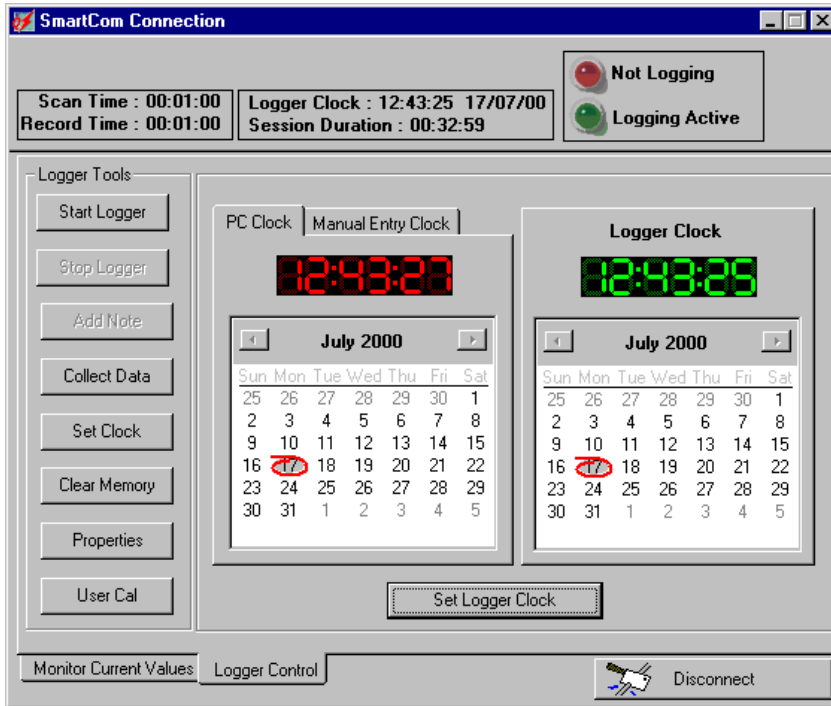
To Collect Data

Once the information entered is to your satisfaction, press the Collect Data button on the RIGHT HAND side of the screen.

A Collection Status window will be displayed. A progress Line Count will indicate how much data is being collected and when the collection is finished.

Set Clock

The Smart Sensor /Smart Series II /Analyser has its own internal clock which should be checked and set as required. This tool is not available if Logging is Active. There are two options for setting the logger clock:



Logger clock

Displays the Current Logger Date and Time (Read Only).

PC clock

Displays the Current PC Date and Time (Read Only).

Manual Entry Clock

This option allows the user to manually enter the new time and date by setting the **New Logger Time** and **New Logger Date** Fields.

Set Logger clock

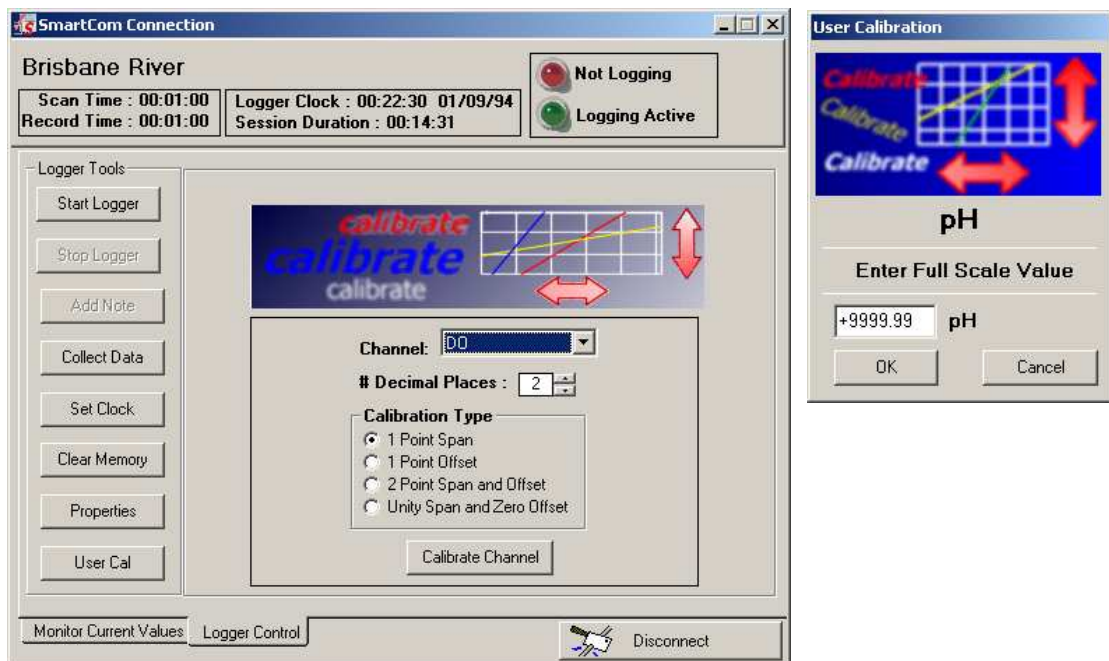
This button Synchronises the Logger Clock with either the PC Clock or a Manually Entered Date/Time as selected above. It does not affect the PC clock.

Clear Memory

This Button Clears the Loggers Memory. The User is asked to verify the operation. A Status Window is shown whilst the memory is being cleared. The Memory Clear operation can be verified in the Monitor Screen by checking the Memory Used equals zero. (This tool is not available if Logging is Active.)

User Cal

Individual Sensor/Analyser Channels may be re-calibrated by the user with this tool. It also allows the precision of a channel to be changed. This tool is not available if Logging is Active. There are a number of options within User Cal.



Channel

Displays a list of channels that can be recalibrated. The battery channel can not be user calibrated for a Smart Series II logger.

#Decimal Places

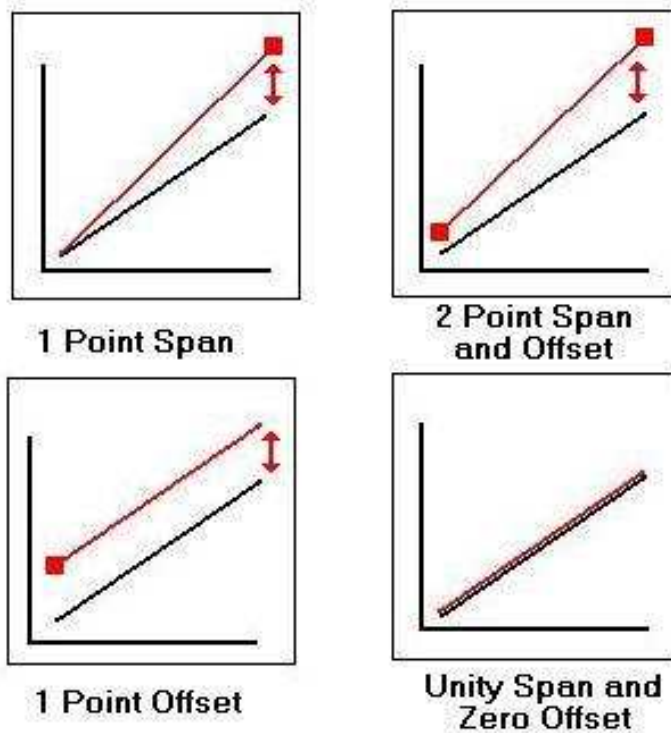
Displays/Sets the current Precision of the selected channel.

Calibration Type

Selects one of four methods of Re-Calibration.

1. 1 Point Span – Perform a Full Scale Span Re-Calibration Only.
2. 1 Point Offset – Perform a Zero Scale Offset Re-Calibration Only.
3. 2 Point Span and Offset – Perform a Full Scale Span Re-Calibration and a Zero Scale Offset Re-Calibration Only.
4. Unity Span and Zero Offset – Undo any User Cal Operations. (i.e. Restore Factory Cal)

Please refer to the Smart Sensor User Manual **010-0005-SS** for further information on the use of this feature.



The four calibration methods: (The black line is the original or current curve settings for the sensor and the grey line indicates how the method changes that original curve).

1 Point Span:

This method is used when the sensor has already been calibrated at some stage. To obtain an accurate calculation, the upper limit value entered should be when the input is at its maximum. (Refer to Figure above). Both curves start at zero, but it's only altered by 1 point at the upper limit. When this value is entered then new curve is then calculated.

1 Point Offset:

The Offset method keeps the original shape of the curve, but performs a shift. The offset can be performed along any point of the curve, however is generally taken from zero.

2 Point Span and Offset:

This method is the most commonly used as the curve can be altered at both the upper and lower limits to give a completely new curve. Having the two points means that the curve can be offset and spanned at the same time.

Unity Span and Zero Offset:

This function will perform a unity span multiplication ($\times 1$) and a Zero Offset addition ($+ 0$) and will undo any changes that were made by the user and return the sensor to its default or factory settings.

Calibrate Channel:

Before the sensor can be calibrated it must be setup with a calibration reference. (Refer to Smart Sensor User Manual **010-0005-SS** for calibration details).

Location Properties (Smart Sensor)

Each Location has unique properties. The settings are used by *SmartCom for Windows* to determine how the Location functions, how to identify and communicate with the Location, and where to store data from the Location.

The properties are divided into the following groups. Editing the properties is available any time in *SmartCom for Windows*. (Note that certain properties are not able to be edited when ONLINE and OFFLINE)

ONLINE is defined as operation while communicating with a sensor (logging or not logging) and all other times are defined as OFFLINE.

Smart Sensor/PS2100 Editable Properties (✓)

Property	On-line (Not Logging)	On-line (Logging)	Off-line
General	✓		
Channels	✓		
Connection			✓
Data File	✓	✓	✓
Sampler	✓	✓	
Alarms	✓	✓	
Averaging	✓		
Phone Dial In Times	✓	✓	
LED Flasher	✓	✓	

Aqualab/Editable Properties (✓)

Property	On-line (Not Logging)	On-line (Logging)	Off-line
General	✓		
Reagents	✓		
Connection			✓
Data File	✓	✓	✓

Properties Window - Buttons

The properties window has three buttons at the base of the window. Their action is similar to the task bar in Windows.

Apply Button

Sends the changes that have been made to the Location Properties to the Location, but keeps the Location Properties Window open. This is used to make changes one by one and see what effect those changes have on other Location Properties.

OK Button

Sends the changes that have been made to the Location Properties to the Location, and closes the Location Properties Window. It then returns to the Window from which it was opened, i.e. either the Group Window or the Connection Window.

Cancel Button

Cancels any changes to the Location Properties and closes the Location Properties Window.

General Properties (Smart Sensor)

The General properties are used to quickly identify general information about the Location.

The screenshot shows the 'Location Properties' dialog box with the 'General' tab selected. The 'Location Settings' section contains the following fields:

- Location Name: Brisbane River
- Instrument Type: Smart
- Model: CS304
- SiteID: 008954
- Sensor Turn-On Time: 06
- Scan Time: 1 Minute
- Record Time: 1 Minute

Buttons at the bottom include 'Apply', 'OK', and 'Cancel'.

Location Name

The name used to identify the Location in the *Locations List*. The name can only be edited when viewed in the Locations List and is always read only in the Properties Window. For *DirectLink* the Location Name is assigned the SiteID (See Below).

Instrument Type

The type of instrument that is present at the Location. This is set when a Location is Added using the *Add Location Wizard* and is always read only in the Properties Window.

Model

The model of instrument that is present at the Location. This is set when a Location is Added using the *Add Location* and is always read only in the Properties Window.

SiteID

An alternative name used to identify the Sensor. The difference between the SITEID and the Location Name is that the SiteID is stored on the sensor and the Location Name is stored in the SmartCom database. The SiteID can only be modified while ONLINE

Sensor Turn-On Time

Defines the time to wait after the sensors have been powered up, before a measurement is taken. This setting can only be modified while ONLINE.

The feature allows the sensor electronics to stabilise and perform any pre-measurement self-calibration that may be required.

****Please Note****

The turn-on time has been factory set to suit the particular instrument, and should only be changed after consultation with Greenspan Technology.

Scan Time

The time between each reading, taken by the instrument. Pick from the list of times available.

This setting can only be modified while ONLINE.

Every Scan Time, the instrument will turn its channels on, wait for the specified *Turn-on time*, and then take a measurement of the channels. All channels are measured every Scan Time.

The Scan Time is used in conjunction with the *Data Variation Value* or *Alarm Values* to check to see if an event or alarm has occurred.

If no *Data Variation Value* or *Alarms Values* need to be checked, it is recommended that the Scan Time and *Record Time* be made equal.

Note: The maximum Scan Time is 1 Hour

Record Time

The time between readings being stored in the Location's internal datalogger.

Pick from the list of times available. The list will only reflect times that are a function of the *Scan Time*. For example, if a Scan Time of "10 minutes" is set then only multiples of 10 minutes will be available in the list, i.e. 10, 20, 30 etc. minutes...1, 2, 3 etc. hours etc.. You will not be able to select 1 minute or 5 minutes as a Record Time in this example, as they will not be available from the list.

This setting can only be modified while ONLINE.

Channel Properties (Smart Sensor)

The Channel properties are used to turn on and off available channels, to set how data is measured and stored and set alarm levels on a particular channel.

Channel Properties can only be changed while ONLINE.

The screenshot shows the 'Location Properties' dialog box with the 'Channels' tab selected. The 'Enabled' checkbox is checked. The 'Settings' section contains the following fields: Name (DO), Units (ppm), Last Reading (+0009.47), and Data Variation Value (+1000.00). The 'Alarm Information' section contains a table with columns for Enabled, Trigger, and Re-enable. The 'Low Alarm' row has Enabled unchecked, Trigger +0000.00, and Re-enable +1000.00. The 'High Alarm' row has Enabled unchecked, Trigger +1000.00, and Re-enable +0000.00. The dialog box has 'Apply', 'OK', and 'Cancel' buttons at the bottom. On the left side of the dialog, there are vertical tabs for 'DO', 'Temperature', 'EC', and 'pH', with 'DO' currently selected.

	Enabled	Trigger	Re-enable
Low Alarm	<input type="checkbox"/>	+0000.00	+1000.00
High Alarm	<input type="checkbox"/>	+1000.00	+0000.00

Channel Tabs

For each Channel that is available at a Location. A Tab will be displayed on the left hand side of the Channel Properties page. The name used on each Channel Tab will be the name of the Channel that is available at the Location.

Standard Channel Properties

This displays the Enable Status, Units, Data Variation Value and the Current Reading.

Enable Check Box

This check box should be ticked if the channel is to be measured and stored by the Location. If it is not ticked, then the channel will not be enabled, it will not be measured, stored, or displayed on the *monitor screen*.

Data Variation Value

The Data Variation Value is used to perform event logging of the particular channel. It is useful for filtering the data to ensure only significant changes/variations (events) are recorded.

The change is calculated between the current Scan and the last logged reading. If the Scan reading is different than the last logged reading by an amount greater than the Data Variation Value, then the reading is stored.

Setting the Data Variation Value to the largest number possible effectively turns it off, e.g. +999.999.

Alarm Information

A High Alarm and a Low Alarm can be set for each channel. This is used to either Dial Out to an office PC when these conditions are met AND/OR turn on an on-site alarm beacon, siren or other device.

**** Please Note ****

Any alarm information set for individual channels will only be functional if Alarms are enabled in the *Alarms Tab*.

Low Alarm

Enable this alarm by ticking the enable box. When enabled the Location compares the current reading for the channel with the **trigger** value. If the reading is BELOW the trigger value an Alarm will be raised.

After the Alarm has been raised, the current channel reading will continue to be checked against the Re-enable value. If the reading rises ABOVE the Re-enable value then the Alarm will be turned off and the readings will be checked against the Trigger value once again.

Readings are taken every *Scan Time*.

High Alarm

Enable this alarm by ticking the enable box. When enabled the Location compares the current reading for the channel with the **trigger** value. If the reading is ABOVE the trigger value an Alarm will be raised.

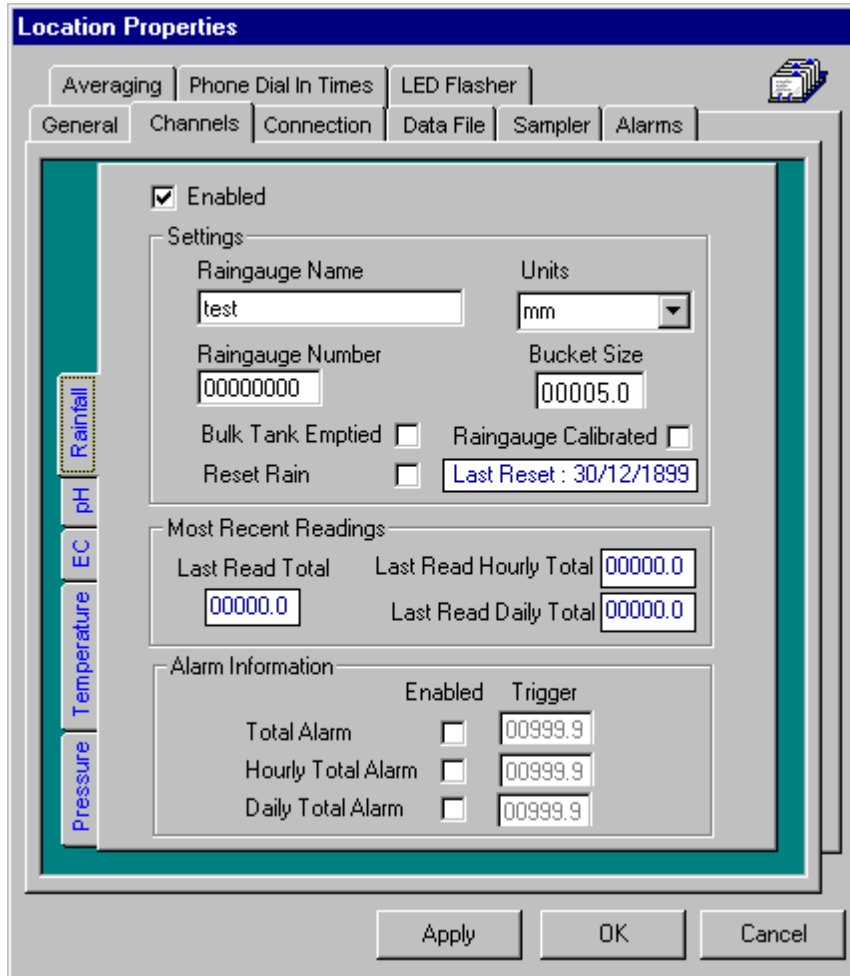
After the Alarm has been raised, the current channel reading will continue to be checked against the Re-enable value. If the reading drops BELOW the Re-enable value then the Alarm will be turned off and the readings will be checked against the Trigger value once again.

Readings are taken every *Scan Time*.

Rainfall Properties

If your sensor has a rain gauge then a Rainfall Channel tab will appear as one of the channels.

Rainfall requires extra properties as it has three different totals associated with it, rather than just one reading every scan. There are also facilities to Name the rain gauge and change the bucket size and units.



Enabled

Click here to turn Rainfall on. No other properties will be available until this check box is ticked.

Raingauge Location Name

Enter a Name to identify the raingauge. Can be omitted.

Gauge Number

Enter a number to identify the raingauge. Can be omitted.

Units

Select mm or inches. These are the units that will be displayed in the monitor screen.

Bucket Size

The bucket size of the tipping bucket in value of units. e.g. 0.2 for 0.2mm bucket if units are mm. If units are inches then it would be 0.2 inches bucket size.

Raingauge Calibrated

Indicates whether the rain gauge has been calibrated. Stored in the data file if ticked.

Bulk Tank Emptied

Indicate whether the bulk collection tank has been emptied. Stored in the data file if ticked.

Reset

Reset the totalisers for Hourly, daily and total rainfall. This should be done whenever you Start Logger at a new installation.

Rainfall Alarm Information

All alarms for Rainfall are High Alarms and as such operate in the same manner as the High Alarm for any given channel.

There are three high alarms available. One for each type of rainfall total

Hourly Total Alarm

Checks the current total for the last hour against the trigger value. If the hourly total is ABOVE the trigger value then raise an alarm. Only one alarm will be raised while the hourly total is above the trigger point. If the Hourly rainfall total drops BELOW the trigger point the Hourly rainfall alarm will be re-enabled.

Daily Total Alarm

Checks the current total for the last day against the trigger value. If the daily total is ABOVE the trigger value then raise an alarm. Only one alarm will be raised while the daily total is above the trigger point. If the Daily rainfall total drops BELOW the trigger point the Daily rainfall alarm will be re-enabled.

Total Alarm

Checks the current total since starting against the trigger value. If the total is ABOVE the trigger value then raise an alarm. Only one alarm will be raised while the total is above the trigger point. If the rainfall total drops BELOW the trigger point the rainfall alarm will be re-enabled.

FlowMeter Properties: (Smart Sensor)

If your sensor has a flow meter then a FlowMeter Channel tab will appear as one of the channels. (Firmware Version 2C144 or greater required)

FlowMeter has a cumulative total associated with it that is determined by the record time. There are also facilities to Name the FlowMeter and change the Pulse Size and units.

Enabled:

Click here to turn FlowMeter on. No other properties will be available until this is check box is ticked.

FlowMeter Name:

Enter a Name to identify the FlowMeter. Can be omitted.

FlowMeter Number:

Enter a number to identify the FlowMeter. Can be omitted.

Units:

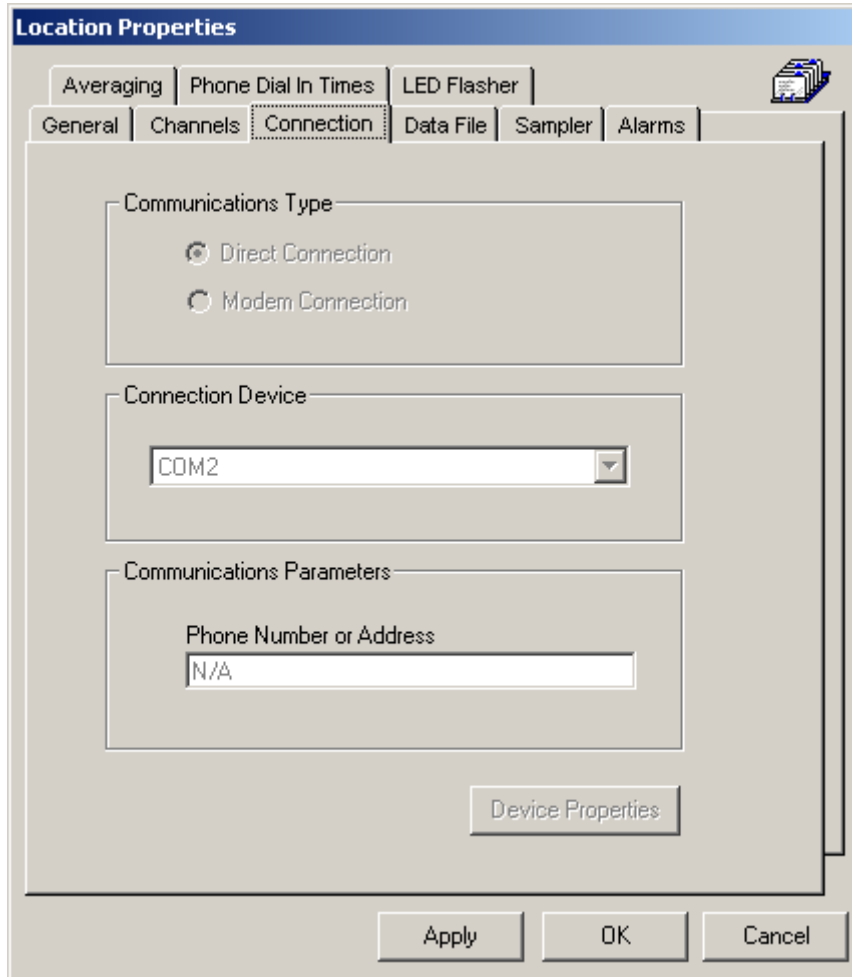
Select units of the FlowMeter. These are the units that will be displayed in the monitor screen.

Pulse Size:

The value each FlowMeter pulse represents in the specified units. Valid range is 0.0 to 9.9

Connection Properties (Smart Sensor)

The Connection Properties are used to edit the way in which the PC communicates with the Location. These properties are only available while OFFLINE.



Communications Type

Select whether to connect to the Location via a direct connection or via a modem.

Direct Connection

Connect the Location directly to a PC COM Port using a direct communications cable.

Modem Connection

Use a Modem on the PC to dial the Location over the telephone line.

Connection Device

This is the PC device to use to communicate to the Location. The options available from the list change with the selection of *Communications Type*.

If *Direct Connection* is selected, only the COM Ports available will be displayed in the list.

If *Modem Connection* is selected, only the Modems on the PC will be displayed in the list.

Communications Parameters

If *Modem Connection* is selected this section will become visible. Enter the phone number to call for the Location. Otherwise this section will be invisible.

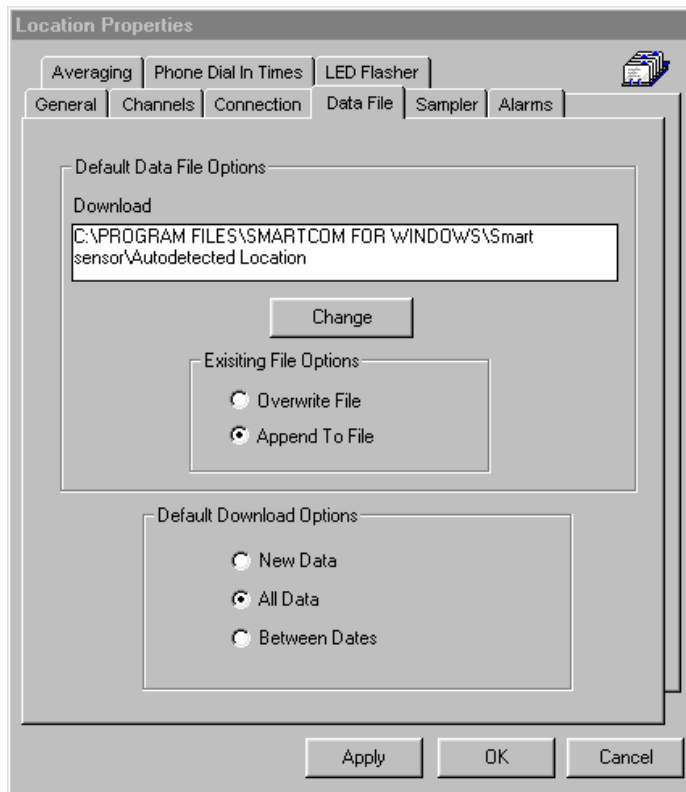
Device Properties

If *Modem Connection* is selected this button will become visible. Use it to set up the Modems Connection Settings..

Data File Properties (Smart Sensor)

The Data File Properties are used by *SmartCom for Windows* to determine which data is collected from the Location (as a default), and where to put that data once it is collected (as a default).

These properties are available ONLINE and OFFLINE. All properties are default only and can be overridden at Collection Time.



Current Path

This is the DEFAULT data file path where collected data is stored. *SmartCom for Windows* will always use this path to store collected data from this Location. The DEFAULT file name and location can be changed by clicking the Change Button.

Existing File Options

This is the DEFAULT action undertaken when collecting data to an existing file. Choose either **Overwrite File** or **Append To File**.

Connection Device (DEFAULT)

This defines the data collected from the Location (as a default). *SmartCom for Windows* will always use the options chosen here as a default when asking what to collect from the Location. Choose either **New Data**, **All Data** or **Between Dates**.

Sampler Properties (Smart Sensor)

The Sampler Properties are used by the Location to determine when to trigger an Autosampler to take a water sample. These properties are only available while ONLINE.

The screenshot shows the 'Location Properties' dialog box with the 'Sampler' tab selected. The 'Enabled' checkbox is unchecked. The 'Trigger Channel' is set to 'D0'. Under 'Sample Trigger', 'Periodically' is checked with a '1 Hour' interval. 'Samples Taken' is 000000. The 'Trigger Points' table has 24 columns, all containing '+9999.99'. The 'Deadband Value' is '+0000.00'. Buttons for 'Apply', 'OK', and 'Cancel' are at the bottom.

Trigger Points																							
Deadband Value: +0000.00																							
1	+9999.99	7	+9999.99	13	+9999.99	19	+9999.99	25	+9999.99	31	+9999.99	37	+9999.99	43	+9999.99	49	+9999.99	55	+9999.99	61	+9999.99	67	+9999.99
2	+9999.99	8	+9999.99	14	+9999.99	20	+9999.99	26	+9999.99	32	+9999.99	38	+9999.99	44	+9999.99	50	+9999.99	56	+9999.99	62	+9999.99	68	+9999.99
3	+9999.99	9	+9999.99	15	+9999.99	21	+9999.99	27	+9999.99	33	+9999.99	39	+9999.99	45	+9999.99	51	+9999.99	57	+9999.99	63	+9999.99	69	+9999.99
4	+9999.99	10	+9999.99	16	+9999.99	22	+9999.99	28	+9999.99	34	+9999.99	40	+9999.99	46	+9999.99	52	+9999.99	58	+9999.99	64	+9999.99	70	+9999.99
5	+9999.99	11	+9999.99	17	+9999.99	23	+9999.99	29	+9999.99	35	+9999.99	41	+9999.99	47	+9999.99	53	+9999.99	59	+9999.99	65	+9999.99	71	+9999.99
6	+9999.99	12	+9999.99	18	+9999.99	24	+9999.99	30	+9999.99	36	+9999.99	42	+9999.99	48	+9999.99	54	+9999.99	60	+9999.99	66	+9999.99	72	+9999.99

Enabled

If this check box is ticked then the Sampler Output Trigger is enabled and the triggering properties become available. In order to use the Sampler the Alarm Output and LED Flasher must first be disabled. (i.e. If you are ONLINE and cannot enable the Sampler, check that Alarm Output and LED Flasher are both disabled).

Trigger Channel

Select from the List of Channels that are available. Only one channel can be used to trigger a sampler. This channel will then have its readings compared to the *trigger points*.

Sampler Trigger

The sampler can be triggered by three different methods and all can be employed at the same time.

On Trigger Point

If this box is ticked the Sampler will be triggered whenever the selected Trigger Channel value is greater than or equal to the levels set in the Trigger Point section.

Periodically

Every time the period entered expires, the Sampler will be triggered, regardless of the state of the trigger channel or logging.

Every Log

Every time data is logged by the Location, whether by Record Time or Data Variation, the sampler will be triggered.

Trigger Points

There are 24 trigger points. Their default is all set to a large number (e.g. +999.999) – effectively ensuring there is no triggering.

Any number of trigger points can be set, up to a maximum of 24. Any unused trigger point should be set to a large value (+999.999).

Each time the Trigger Channel passes through a Trigger Point, the Sampler will be triggered, and the sample count incremented. If a deadband value is entered the sampler will only be triggered in accordance with the deadband.

Deadband

The deadband value is applied to each Trigger Point and prevents unwanted re-triggering from occurring around a Trigger Point.

Deadband is useful for eliminating the effect of the cyclic motion of waves, or other constantly changing conditions when monitoring.

For example, for a pressure sensor, if the deadband value is set to +000.300 with a Trigger Point set to +020.000, the sampler will be re-enabled 300mm above 20 metres and 300mm below 20 metres and triggered each time it passes through 20 metres.

If the pressure oscillates around 20 metres within the deadband range of \pm 300mm no extra triggering will occur.

If the pressure falls **BELOW** the deadband, i.e. +019.700, the +020.000 Trigger Point is re-enabled and the sampler is triggered the next time the pressure passes through +020.000.

If the pressure rises **ABOVE** the deadband, i.e. +020.300, the +020.00 Trigger Point is re-enabled and the sampler is triggered the next time the pressure passes through +020.000.

Samples Taken

This is a count of the number of times the Sampler has been triggered since it was last reset.

Reset Sampler Counts

Resets the number of Samples Taken, back to zero (0). This should be done each time a Location that has the sampler enabled is started.

Alarm Properties (Smart Sensor)

The Alarm Properties are used by the Location to determine what action to perform in the event of an enabled alarm for any channel. It also contains information on General alarms that apply to the whole Location and not only one particular channel.

These properties are available ONLINE only.

The screenshot shows the 'Location Properties' dialog box with the 'Alarms' tab selected. The dialog has several sections:

- General:** Contains checkboxes for 'Alarm Dial-Out Enabled' and 'Alarm Output Enabled', both of which are currently unchecked.
- Last Alarm Information:** A text box displaying 'Saturday, 30 December 1899 12:00:00 AM'.
- General Alarms:** A table with columns 'Enabled' and 'Trigger'.

	Enabled	Trigger
Battery Low	<input type="checkbox"/>	11.90
Memory Used High	<input type="checkbox"/>	050000
- Alarm Dial Out Times and Numbers:** A table with columns 'Window#', 'Start Time', 'Stop Time', and 'Phone Number'.

Window#	Start Time	Stop Time	Phone Number
1	00:00	00:00	
2	00:00	00:00	
3	00:00	00:00	
4	00:00	00:00	

At the bottom of the dialog are 'Apply', 'OK', and 'Cancel' buttons.

Alarm

An Alarm occurs when the reading for any enabled channel is found to meet the specified alarm criteria, OR

An Alarm occurs when the Location Battery Volts or Memory meets the enabled **General Alarm** criteria.

Alarm Dial-Out Enabled

Tick this box to enable the Location to dial-out upon an **Alarm** occurring.

If an alarm occurs and if the location is connected to a communication device then the **Alarm Dial Out Times and Numbers** are used to dial the specified numbers at the appropriate time of day.

If left not ticked, No Alarm Dial-Out will take place.

Alarm Output Enabled

The Alarm Output Enabled check box will only be available if the Sampler has not been enabled and the LED Flasher is not enabled. If you wish to use the Alarm Output, these other options have to be unticked before you can proceed.

If it is available, tick this box to enable the Alarm Output contact to be closed when an *Alarm* occurs.

General Alarms

There are two General Alarms. Battery Voltage Low and Memory Used High. Enable either of these alarms by ticking the box next to the Alarm. If enabled, enter the value that will be used to trigger the alarm. Typical alarm values are shown below.

Battery Volts ~ *9.00 Volts*

If the Battery Volts reading drops below the trigger value, then an Alarm will occur.

Memory Used ~ *450 KiloBytes*

If the Memory Used goes ABOVE the trigger value, then an Alarm will occur.

Alarm Dial-Out Times and Numbers

If Alarm Dial-Out is enabled then these options will be available.

There are 4 windows of Times and Numbers to call if an Alarm occurs.

Each Window has an ON Time, an OFF Time, and a Number to Call.

If an Alarm occurs, then the Times for each Window will be checked in order (1 through 4) to find a match.

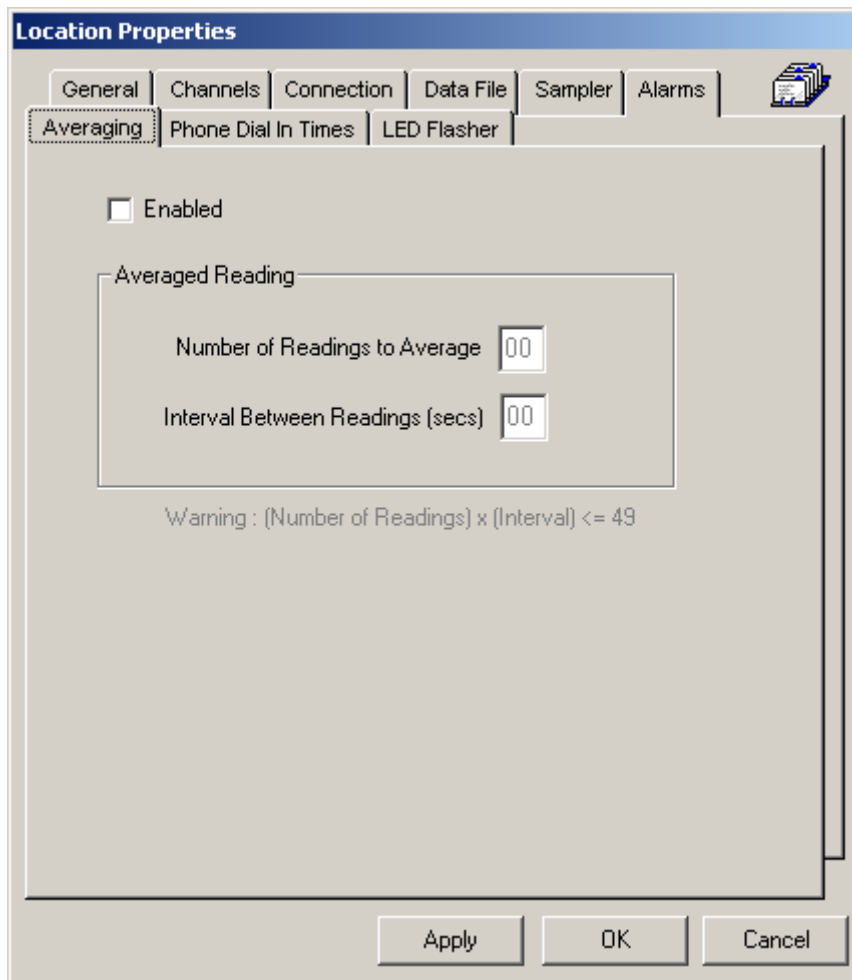
If the current time is between the ON and OFF times then a match is found and the number for that Window will be dialled. If the current time is not between the ON and OFF times a match is not found and the Window will be skipped until the current time is within the ON and OFF times. When the current time IS within the ON and OFF Times for that Window, the Number will be dialled.

If no ON Time, OFF Time or Number is entered, then that Window will be skipped.

Averaging Properties (Smart Sensor)

Because environmental conditions are not necessarily constant, it is useful to be able to average a number of readings over a period of time, smoothing out high and low frequency fluctuations. The Averaging properties are used by the Location to take a number of readings of all the channels, at each Scan Rate. The average of these readings for each channel then becomes the new reading for that Scan.

These properties are only available ONLINE.



The screenshot shows a software dialog box titled "Location Properties". It has several tabs: "General", "Channels", "Connection", "Data File", "Sampler", "Alarms", "Averaging", "Phone Dial In Times", and "LED Flasher". The "Averaging" tab is selected. Inside the dialog, there is a checkbox labeled "Enabled" which is currently unchecked. Below this is a section titled "Averaged Reading" containing two spinners: "Number of Readings to Average" and "Interval Between Readings (secs)", both set to "00". A warning message below the spinners reads: "Warning : (Number of Readings) x (Interval) <= 49". At the bottom of the dialog are three buttons: "Apply", "OK", and "Cancel".

Enabled

Tick this box to enable the averaging. When enabled all the other properties become available.

Number of Readings to Average

This is defined as the number of readings that the Sensor stores in a temporary location to calculate an average reading. One sample is taken each ***Interval Between Readings***

Interval Between Readings

The Interval Between Readings is defined as the period between samples.

Typical values for smoothing the cyclic wave fluctuations of ocean water for example, may be 12 samples and 10 seconds respectively ie, every 10 seconds a sample is taken until a total of 12 have occurred. A calculated average of the 12 samples is then produced which is stored as a logged value.

Note: The minimum interval between reading is 2 seconds

Averaging Warning

There are some points of note, in relation to averaging. Because the Averaging takes place every Scan Time, it is very important that the Averaging Interval does not exceed the Scan Time. If this was to occur the averaging would still be taking place from a previous scan when the new scan started.

A range of values can be calculated based on the product of the Interval and the Number of Readings. The maximum value for this product will be displayed on the screen as a *warning formula* that must be met. If this product is exceeded or the Averaging Interval exceeds the Scan Time, an error message will be displayed, and *SmartCom for Windows* will return the user to the Averaging screen to allow for correction.

Phone Dial-In Times (Smart Sensor)

The Phone Dial In Times are used by the Location to control power to a cellular phone connected to the Location. This is to conserve power, as if is not enabled the Cellular Phone will be powered on at all times.

These properties are only available while ON-LINE.

Location Properties

General Channels Connection Data File Sampler Alarms

Averaging **Phone Dial In Times** LED Flasher

Dial In Times Enabled

Dial In Times

Window#	Start Time	Stop Time
1	00:00	00:00
2	00:00	00:00
3	00:00	00:00
4	00:00	00:00
5	00:00	00:00
6	00:00	00:00
7	00:00	00:00
8	00:00	00:00

Power Off Delay

00:00

Apply OK Cancel

Enabled

Phone dial in times are only applicable if you have a Cellular phone connected to the Location, if not, this box should not be ticked.

Tick this box to enable the Phone Dial In Times. If this box is not ticked and a Cellular Phone is attached to the Location – then the Cellular Phone will be powered on at all times.

Power Off Delay

This is the amount of time, after a Dial Out has occurred, that the cellular phone system will remain turned on. It provides the user time to access the sensor information remotely after an alarm has occurred, outside normal power on window times.

Dial-In Times

There are eight (8) groups of dial in times available, they are checked by the Location in order, 1 through 8.

If the Location's current time is within the ON and OFF Time inclusive, for any of the eight groups, then the Cellular Phone will be turned on.

The Dial-In Times are used to provide "windows of time" when the Cellular phone will be switched on. This is useful to conserve power in remote applications.

LED Flasher (Smart Sensor)

The purpose of the LED Flasher is to indicate that the Location is operational.

The LED Flasher is used in conjunction with the MA and SA range of interface adaptors. Flashing of the LED indicates that the sensor connected to a Location is active.

These properties are only available while ON-LINE.

Enabled

Flashing the LED in these boxes uses the same output that is used to trigger the sampler and alarms. As a result, the LED Flasher cannot be enabled while either the Sampler or Alarm Output are enabled.

If the Sampler or Alarm Output is enabled, then this check box will not be available. If you wish to use the LED Flasher, you must first disable both the Sampler and the Alarm Output.

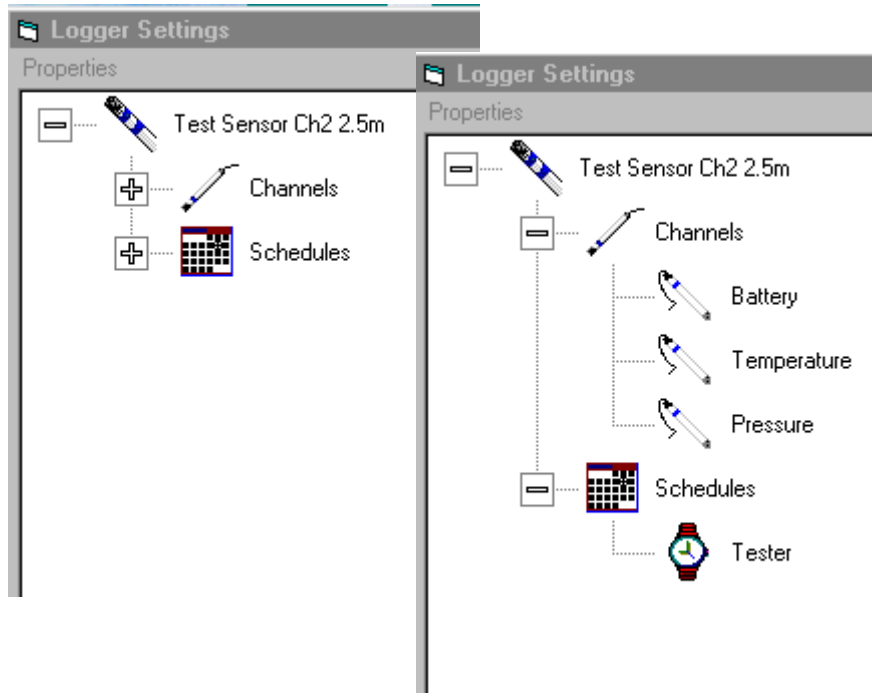
Tick this box to enable the LED Flasher.

LED Flash Rate

This is the amount of time to wait between Flash's of the LED. The LED will Flash for a period of approximately 0.5 of a second, every Flash Rate.

Location Properties (Smart Series II)

This screen has been split into two sections. On the left there is a "Tree View" menu screen and the right displays what is currently selected in the menu. The tree view menu will display the name of the sensor and icon. Displayed in the window to the right will be the sensor's general settings. (See section **General Properties**)



Tree View Menu –Un-expanded and Expanded

If you click on the name of the sensor or the positive sign, then this will display the options of the sensor. Those options are Channels and Schedules.

If Channels is selected then the details of all the channels will be displayed on the right of the screen. (See section **Channels Details**). Under the Channels heading are the three channels; battery, temperature and pressure. If any of these channels are selected then their properties are displayed on the right of the screen. (See section **Channels Main Window**).

If the Schedules are selected the details of the schedule/s running will be displayed. (See section **Schedule Details**). Under the Schedule Heading it shows the names of the schedules that are currently running. There should always be one running with a maximum of two and on the right should be the schedule properties. (See section **Schedule Main Window**)

All of these options can also be found and used manually by clicking the Properties Tab at the top left hand corner of the screen. It also contains to other properties that can not be reached from the tree view menu. They are **Communications** and **Data Field** properties.

General Properties (Smart Series II)

The General Properties window displays all the general properties of the sensor when it is initially configured. The General Properties window contains following fields:

Location Name:

Name given to the sensor, by the user, during the setup process. This is a read-only field that can only be changed during setup. This value is stored locally in the SmartCom program.

Logger Name:

This is the standard name given to sensor by the user and is stored externally on the actual sensor. This name can be changed user at any stage. Useful if a different person wants to use the same sensor. The name stored on the sensor can be read and changed by the new user.

Sensor ID:

This is the serial ID number of the sensor.

Factory Calibration Date:

The date when the sensor was last calibrated.

Firmware version:

The version of Firmware installed in the sensor.

Memory Used:

The amount of memory that the sensor has used to log data.

Memory Free:

The amount of memory left for the sensor to log data.

Communications Properties (Smart Series II)

Communications Window

The Communication Window details the methods and settings used in connecting to the PS2100 device. They are displayed among the following sections:

Communication Type Window:

Select whether you want to connect to the Location via a direct connection or via a modem. (Note that at present the user is not able to connect to the PS2100 via a modem).

Communication Device Window:

This field can be changed to choose how the sensor is connected to the computer, e.g. **Com Port 2**

Data File Properties (Smart Series II)

Data File Window

The Data File Properties are used by *SmartCom for Windows* to determine what data is collected from the Location (as a default), and where to put that data once it is collected (as a default).

These properties are available ONLINE and OFFLINE. All properties are default only and can be overridden at Collection Time.

Download Directory:

This is the DEFAULT data file path in which to store collected data. *SmartCom for Windows* will always use this path to store collected data from this Location. You can change this DEFAULT file name and location by clicking the Change Button.

Existing File Options:

This is the DEFAULT action to undertake when collecting data to an existing file. Choose either Overwrite File or Append To File.

Connection Device (DEFAULT):

What to collect from the Location (as a default). *SmartCom for Windows* will always use the options chosen here as default when asking what to collect from the Location. Choose either **Collect All Data**, **Collect Since Last Retrieve** or **Collect Between Dates**.

Channels (Smart Series II)

Channels Details Window

This window displays the individual channels of the sensor and their last recorded readings. The left hand column in the windows displays the **Monitor Channel Name**, containing the sensor's channels. This middle column, **Last Reading**, shows the last recorded values for each of the channels. The right hand column, **Date Last Logged**, contains the date and time at which the value was last recorded.

The tick boxes at the beginning of each of the channels allows the user to select which of the channels that will be displayed in the **Monitor Current Values Window**. The Pressure channel must always be enabled.

Channels Main Window

For example, the PS2100 contains three different channels; **Battery**, **Temperature** and **Pressure**. Selecting any one of these in the tree view, to the left of the screen, will display the **Channels Main Window** containing each of their specified values.

The Channels Main Window contains the following fields:

Channel Name, **Unit Name**, **Unit Type**, **Channel Precision**, **Data Variation Value Enable**, **Data Variation Value**, **Last Reading** and **Alarms Tab**. The pressure channel also contains another field, being the **Advanced Tab**.

Channel Name:

The name of the channel currently selected.

Name: Unit

This is the label that user wants to define the data as. This field has no bearing on the conversion, e.g. DEG or CELSIUS or C

Unit Type:

This is to select the actual units that are used in the conversion.

Warning:

There is no check made between the Unit Name and the Unit Type, e.g. If the user wants feet to be the units used and enters in the Unit name, but the Unit Type says metres, then it might read in feet, however the value will be calculated in metres.

Data Variation Enabled:

If the tick box is select, it allows the user to define what the **Data Variation Value** is.

Data Variation Value:

The Data Variation Value is used to perform event logging of the particular channel. It is useful for filtering the data to ensure only significant changes/variations (events) are recorded.

The change is calculated between the current Scan and the last logged reading. If the current Scan reading is different than the last logged reading by an amount greater than the Data Variation Value, then the reading is stored.

Last Reading:

This window displays the last recorded value of the channels selected. It also shows what the date the event occurred and when.

Alarm Properties (Smart Series II)

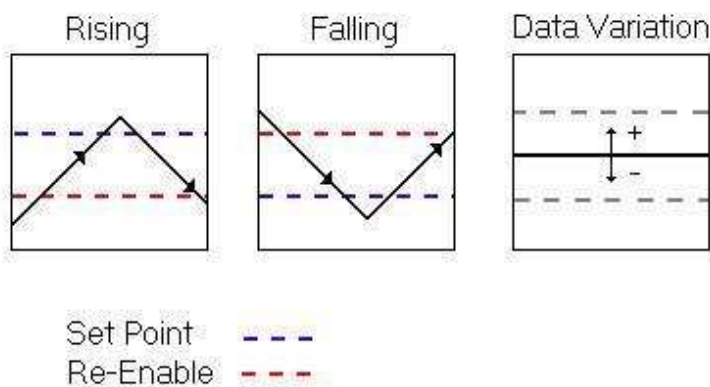
Alarm Operation:

Alarms can be setup, for each of the channels so that when a certain condition or event occurs, it is placed into a log file. There are four alarms the user can select and set for four different events that could occur.

Each Alarm consists of three sections. Once the alarm is enabled, when the tick box is pressed, a **Condition**, **Set Point** and **Re-Enable** values can be configured.

Condition:

The condition is how the actual event is triggered. This can happen in three ways. When the data is rising, when it is falling and when the **Data Variation Value** changes by a certain amount. **Rising** triggers when the condition rises above the set point. **Falling** is when the condition goes below the set point and **Data Variation** is when the condition changes by the set point amount.

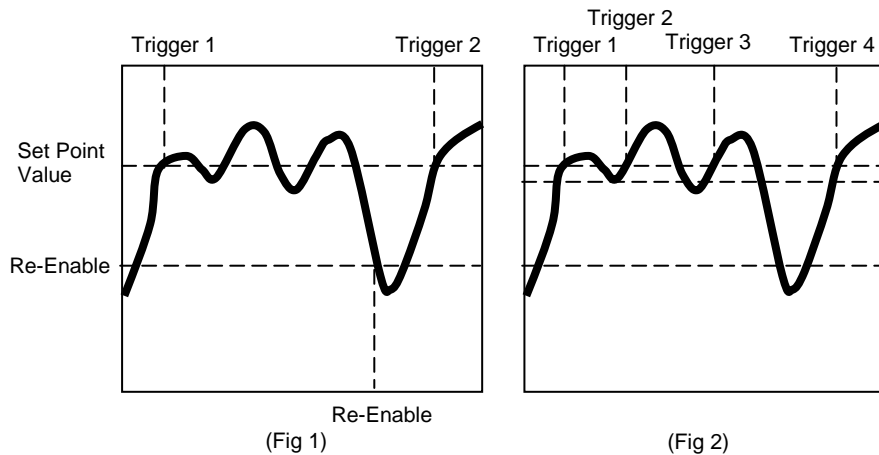


Set Point:

The set point is what value the user sets that will trigger the alarm.

Re -Enable:

The Re- Enable is the value that will reset the alarm in order for the alarm to trigger again and give accurate reading (Hysteresis). The Re -Enable is not used when using **Data Variation Value**. In fig 1, the Re-Enable is used and the correct number of alarms are logged. However in fig 2 when the Re-Enable is too small, the alarm triggers every time the value goes above the set point value even when these might be very small fluctuations. Therefore the Re-Enable value must be large enough to obtain correct results.



Example:

Problem: If the user had a situation where they require to log the event when ever the temperature goes above 25°C.

Solution: Firstly **Enable** the alarm. Then select the **Condition** and set to **Rising**. Now set the **Set Point** to +25.00 (25°C) and the **Re-Enable** to +20.00 (20°C).

What Happens? When the temperature goes above 25°C the alarm will be triggered and the event is logged. Now for the alarm to trigger an event again, first it must fall below the Re - Enable and then back up over 25°C. This is to ensure there are no minor fluctuations around the Trigger value that causes unwanted logging.

General Rules:

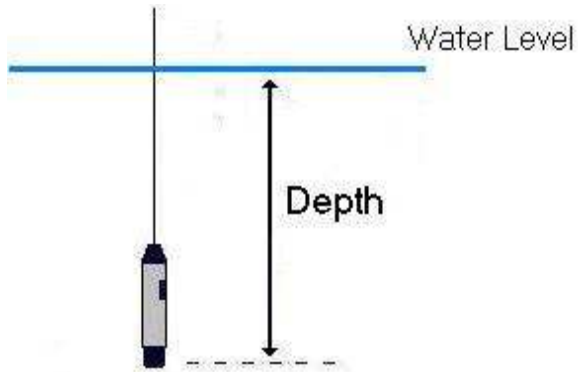
- If the Condition is set to Rising then the Re -Enable Value must be below that of the Trigger value and if the condition is set to Falling Trigger, then the Re -Enable Value must be greater then the Trigger value.

Advanced Tab (Smart Series II)

The Advanced Tab is only used when there are extra options available for a channel

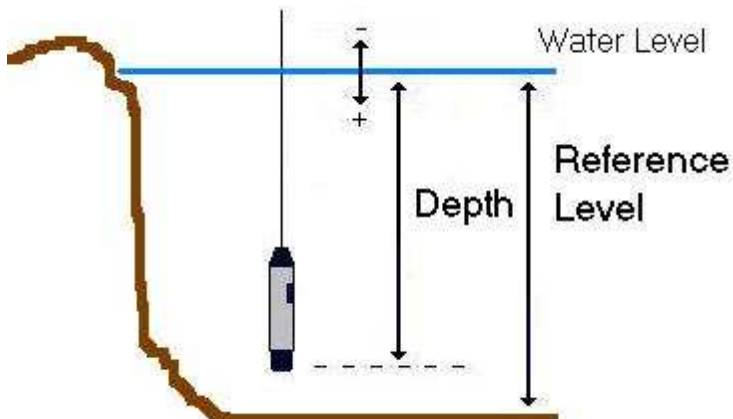
Pressure Channel:

Depth: This is just a straight forward reading with the sensor doing nothing more than recording the depth from the water level down to the location of the sensor.



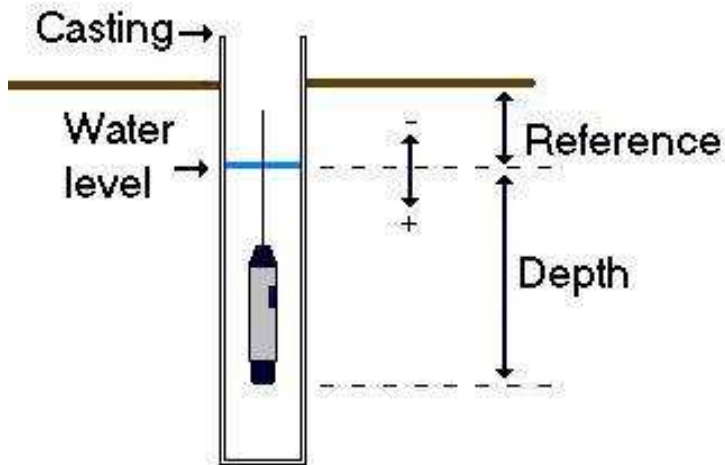
Surface Level Option:

This option allows the user to know the actual depth of the water, from the water level to the base. First the user must update the sensor using the update sensor button. Then enter a reference value, which is the value actually measured with a tape measure. The sensor reports what depth it measures, then the difference between the sensor depth and the reference level. Once the Apply Button is pressed the sensor is calibrated and these settings are used for all future readings.



Top of Case:

This method is used for bore well readings. The user measures the distance from the top of the bore well case down to the water level. This is the reference level. The update button is pressed and the reference value is entered. After the Apply Button is pressed the sensor is calibrated from the difference between the two. Then as the water rises and the sensor reads a greater depth, the level of water between the surface and the top of the case, decreases proportionally.



There are two other areas in the **Advanced Tab** and they are **Conversion Information** and **Reference**.

Conversion: The conversion information is used for controlling the depth conversion depending on the Density of the water. Different types and temperatures of water affect the density, which in turn will affect the depth reading. Select a density that will correspond to your particular application.

Warning: Don't edit these values unless you have advanced knowledge of the water's temperature and type.

Reference: The reference section is used only with the **Surface Level** and **Top of Case** logging. For user examples please refer to Surface Level and Top of Case above.

Example:

Problem: You want to implement a flood warning system on a dam.

Solution: Select the **Advanced Tab** then click on the **Surface Level** button. First update the sensor and select your reference level (The depth from the bottom of the dam to the surface of the water, recorded with tape measure = 20m). The **Current Reading** is 15m, so the sensor calibrates itself by adding 5m to the depth reading of the sensor. Any reading from the calibrated sensor will provide the true depth of the water level from the bottom. For instance if the sensor reads that there is 13m above it, it adds 5m from the calibration making it 18m. Therefore the true depth of the water is 18m and the dam has dropped 2m.

Battery Channel

Internal Battery: Specify if you are using Internal batteries with the PS2100

External Battery: Specify if you are using an External battery with the PS2100

Schedule Details Window (Smart Series II)

The Schedule Details Window provides an overview of what schedules have been run or that are currently in use. It details the **Schedule Name**, when the Schedule started or will start (**Start Method**), when the schedule has finished or when it is due to (**Stop Method**) and the number of scans that have been completed (**Scans Completed**)

Main Window

The Schedule Main Window displays the current settings of the selected schedule and provides further information into the operation of the schedule.

Note: SmartCom requires that there must be at least one and no more than two schedules running at any time. 16 schedules may be stored in SmartCom, however only a maximum of two can be held in the logger memory.

Schedule Enabled:

The current schedule can be enabled or disabled using this tick box. (See section **Schedule Tree View**)

A maximum of 2 schedules can be enabled at anyone time.

Schedule Name:

Enter a Name to identify the Schedule you are creating, the maximum number of characters allowed is 15. The Name you give the schedule should also unique to identify this schedule

Channels Used in Schedule:

This window displays the channels that have been currently selected for that schedule. To add channels to a schedule, click and drag the desired channel from the left hand side to the right hand window.

To delete a channel from the Channels Used List Right Click on the desired Channel and select the appropriate menu option.

Note: A schedule must have at least 1 Channel

The main functionality of the schedule window comes from the two tabs. (See Logging Type and Averaging)

Schedule Tabs (Smart Series II)

Averaging

The Averaging Tab allows the user, when the Averaging Enabled check-box is selected, to take an average of the data received. This function is when the environmental conditions are not constant and the smoothing of high and low frequency variances are required.

Number of Readings to Average:

The number of readings that the sensor stores in a temporary memory location, to work out the averaged result. One sample is taken each "Interval Between Reading".

Interval Between Reading:

The value entered in this field defines the period between each of the samples.

Example:

If the user required to average the cyclic wave fluctuations of ocean water and say they wanted 12 samples at 10 sec per sample. This means that every 10 seconds a sample is taken until 12 have occurred. Then the calculated average of the 12 samples is stored as a logged value.

Note:

The product of the "Number of reading" and the "Reading Interval" must not exceed that of the scan time. If this was to occur then the averaging from the previous scan would still be taking place in the new scan. Logarithmic logging will only be applied when the product of these two exceeded the scan time.

Logging Type (Smart Series II)

Basically there are two different methods used for the logging. They are **Linear Logging** and **Logarithmic Logging**.

Linear Logging:

Logging of data at regular intervals over a certain scan time.

Scan Time:

The time between each reading taken by the instrument. Pick from the list of times available.

Every Scan Time, the instrument will turn its channels on, wait for the specified Turn-on time, and then take a measurement of the channels. All channels are measured every Scan Time.

The Scan Time is used in conjunction with the Data Variation Value, Alarm Values or Triggering to check to see if an events or alarm has occurred.

If no Data Variation Value or Alarms Values need to be checked, it is recommended that the Scan Time and Record Time be made equal.

Record Time:

The time between readings being stored in the Location's internal datalogger.

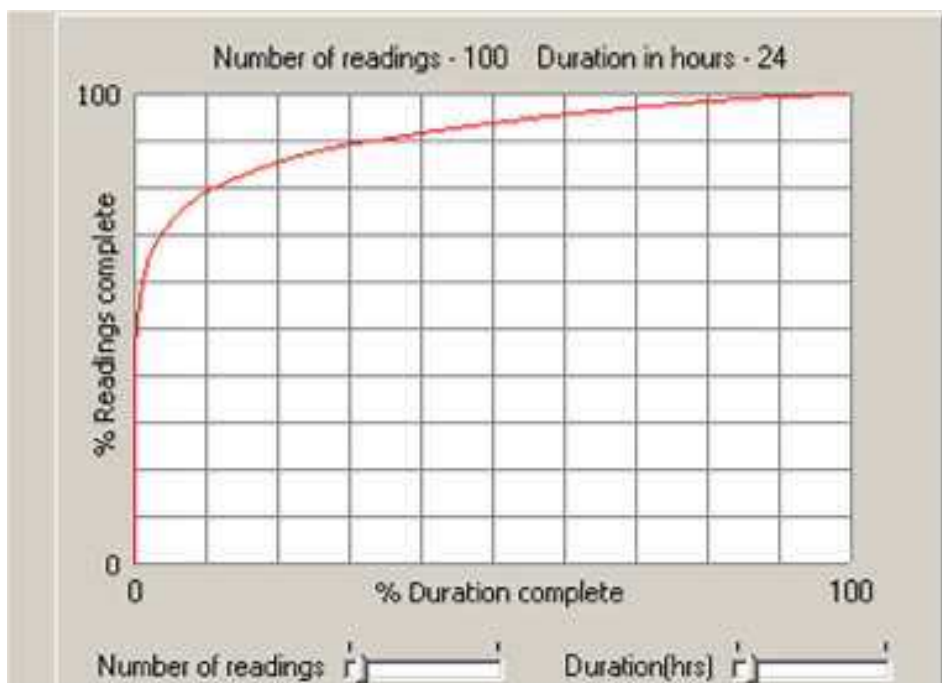
Pick from the list of times available. The list will only reflect times that are a function of the Scan Time. For example, if a Scan Time of "10 minutes" is set then only multiples of 10 minutes will be available in the list, i.e.. 10, 20, 30 etc. minutes & 1, 2, 3 etc. hours etc. You will not be able to select 1 minute or 5 minutes as a Record Time in this example, as they will not be available from the list.

Max Number of Scan:

This value can be set so that the schedule can stop scanning when that number of scans has been reached.

Logarithmic Settings (Smart Series II)

Logarithmic Logging is used when the data medium is changing rapidly at the beginning and this rate slows down toward the end. In this case linear logging is not practical as to obtain correct results from the start, the scan time and record time would have to be very small. Hence to log the whole event from start to finish would require a lot of memory. However with the use of the logarithmic logging smaller record intervals can be allocated to the start and then the interval can be increased as the event proceeds over time. An application of this is the "pump draw down test". At the beginning the well fills very rapidly then gradually, the rate at which it fills, slows down. A logarithmic schedule can be set up to map this situation using (**Number of Reading** and **Duration(hrs)**). Once those two fields have been entered, SmartCom will apply the appropriate logarithmic curve.



As well as moving the bars, in the "**Number of Readings**" and the "**Duration**", with the mouse, it is also possible to use the keyboard for more accurate readings. The arrow keys moving the bars one step at a time, while **page-up** and **page-down** moves the bars faster, in bigger steps.

Number of readings - 100 Duration in minutes - 60					
Elapsed time	Average	Data	Cumulative time	Average	Data
	interval(secs)	points		interval(secs)	points
0-10 secs	0.476	21	0-10 secs	0.476	21
10-20 secs	1.250	8	0-20 secs	0.690	29
20-30 secs	2.000	5	0-30 secs	0.882	34
30-60 secs	3.333	9	0-60 secs	1.395	43
1-10 mins	16.875	32	0-10 mins	8.000	75
10-100 mins	144.023	25	0-100 mins	36.006	100
100-1,000 mins	0.000	0	0-1,000 mins	0.000	100
1,000-10,000 mins	0.000	0	0-10,000 mins	0.000	100

OK

If the user clicks on the grid, a pop-up box will appear showing the details about how many logs occurs in what time period. The left hand side shows the Elapsed time and the Average Interval and Data Points for that period. The Right hand side is the same data, however it is the Cumulative results shown.

Click OK to make this dialog box disappear and return to the Properties window

Start Method (Smart Series II)

There are three ways that a schedule can start. By time, by a trigger, or manual start

Time:

When time has been enabled, the user enters the time and date they which to start the schedule.

Trigger:

For a schedule to be started from a Trigger, there must be another schedule already running to trigger from, otherwise this option is not available. The other schedule defines the channel that will cause the present schedule to start from a trigger. To set a schedule to start from a trigger; first the user must choose a **Channel** to trigger on. (**Note that the channel that the user wants to use, must also be enabled in the other schedule, otherwise no trigger will occur**). This can be one of the three Pressure, Temperature or Battery, however they must be selected to be used. Next the user must define a point for the trigger to occur (**Set Point Value**). The user must then define how the event will occur (**Condition: It can be rising, falling or Data Variation Value**). A **ReEnable** point, must also be defined that determines the value where the trigger will be reset. (For more information on similar operation see **Alarm Tab Operation**)

Example:

Problem:

If the user wanted to monitor the depth of a river for flood monitoring.

Solution:

To capture when the river rises above a certain height using one schedule, it would be necessary to log at fairly close intervals - this would use up memory very quickly. Flooding does not occur very often so one log per day would be sufficient for recording purposes. However, in heavy rain, once per day logging may not be enough. Therefore, a way around this situation is to set up two schedules. The first schedule is setup to be your everyday logger with its scan time scanning every 10min, but only logging once. That would provide the everyday data. Setup the other schedule to start on a trigger, so that if the water rises above a certain point, a trigger is generated. This event is recorded and when the water falls below a certain defined point, the schedule will again be triggered, but this time it will be stopped. The first schedule continues to run as normal.

Manually:

When you Start the Logger in the Logger Control screen the schedule starts.

Stop Method (Smart Series II)

There are three ways that the schedule can stop. By time, trigger and manual.

Time:

When time has been enabled, the user enters the time and date they which to stop the schedule.

Trigger:

For a schedule to be stopped from a Trigger, there must be another schedule already running to trigger from, otherwise this option is not available. The other schedule defines the channel that will cause the present schedule to stop from a trigger. To set a schedule to stop from a trigger; first the user must choose a **Channel** to trigger on. (**Note that the channel that the user wants to use, must also be enabled in the other schedule, otherwise no trigger will occur**). This can be one of the three Pressure, Temperature or Battery, however they must be selected to be used. Next the user must define a point for the trigger to occur. (**Set Point Value**). The user must then define how the event will occur. (**Condition: It can be rising, falling or Data Variation Value**). They must also define a **ReEnable** point, which means the value where the trigger will be reset. (For more information on similar operation, see section **Alarm Tab Operation**)

Manual:

When you Stop the Logger in the Logger Control screen the schedule stops.

Add Schedule Wizard (Smart Series II)

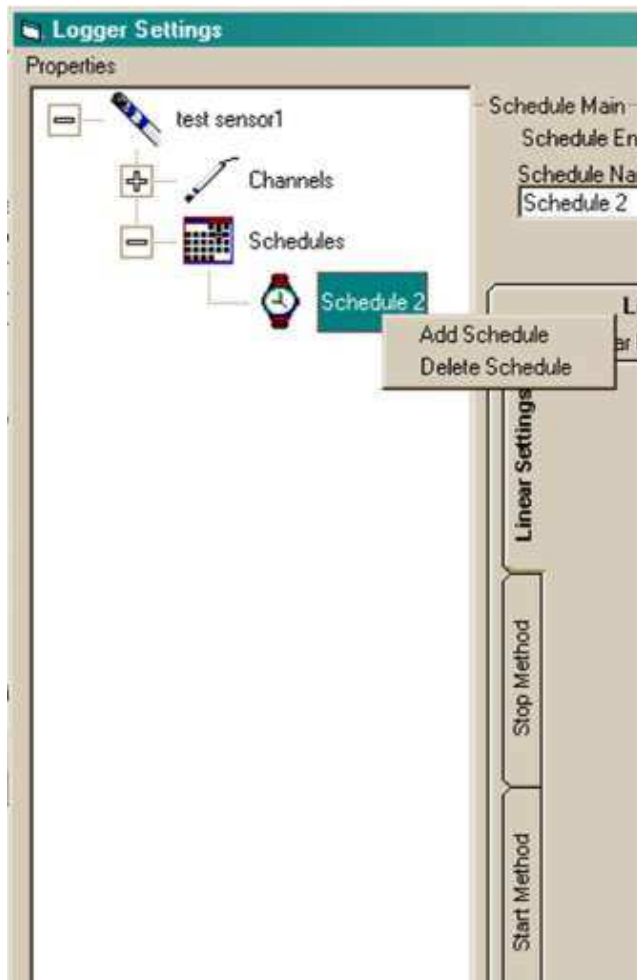
Step1: Introduction

Schedules form the basis of the Smart Series II. Many of the functions performed in SmartCom are performed on Schedules. The main function of a schedule is to collect data within specified parameters.

Note: A maximum of 15 schedules can be defined for each location.

Adding Schedules to the PS2100: -

In the menu click on Properties then Schedules then Add Schedule. This will start the Wizard, which will help in adding a new schedule to the sensor. Alternatively, navigate the Tree View to the Schedule Node. Right click on the already set-up Schedule (called Tester) then click on Add Schedule, which will also start the Wizard.



Follow the wizard to the end, click Finish at the end, you will now see the schedule you just set-up in the Tree View.

Step2: Schedule Name

Enter a Name to identify the Schedule you are creating, the maximum number of characters allowed is 15. The Name you give the schedule should also be unique to identify the schedule.

Step3: Select Channels

This window displays the channels that have been currently selected for that schedule. To add channels to a schedule, click and drag the desired channel from the left hand side to the right hand window.

To remove channels you have added to the schedule click the << button, which will remove the channels you just added to the schedule.

Step4: Measurement Types

There are two types of measurements you can use Linear and Logarithmic. Select the type of measurements you want to take by clicking the appropriate option at the top of the form.

Linear Logging:

The values in a Linear schedule are evenly distributed over time. Use Scan Time and Record Time to determine how often data is logged.

Max # Scans:

You can specify the number of scans that a schedule can perform, this might be useful if you wish to conserve memory or you want only a specific amount of data for a certain event.

Logarithmic Logging:

During a logarithmic schedule the readings are taken at very short intervals at the start and gradually increases as the schedule progresses. (See documentation for more details about Logarithmic Logging)

To set the number of readings and the amount of time for the schedule to run use the sliding bars below the graph. The maximum number of readings are 1000 and the maximum amount of time is 240 minutes. Because of the nature of this type of logging you will find that as time progresses the variation in the depth is minimal. This is why there is a limitation on the number of readings and times.

Averaging:

Because environmental conditions are not constant, averaging smooths out the high and low fluctuations. This is achieved by taking multiple sensor readings of the channels at the Scan Time.

For a Logarithmic schedule the logger automatically determines the best values to use.

Step5: Start Schedule Method

Starting a schedule can be done three ways. To start the schedule logging you must Start Logging in the Logger Control screen.

Manual:

A schedule may be started manually if the trigger and time methods are not used. This feature can also be selected in the wizard setup, by checking the tick box.

Trigger:

For a schedule to be started from a Trigger, there must be another schedule already running to trigger from, otherwise this option is not available. The other schedule defines the channel that will cause the present schedule to start from a trigger. To set a schedule to start from a trigger; first the user must choose a Channel to trigger on. (**Note that the channel that the user wants to use, must also be enabled in the other schedule, otherwise no trigger will occur**). For PS2100 this can be either Pressure, Temperature or Battery, however they must be selected to be used. Next the user must define a point for the trigger to occur (Set Point Value). The user must then define how the event will occur (Condition: It can be rising, falling or Data Variation Value). A Re-Enable point, must also be defined that determines the value where the trigger will be reset. (For more information on similar operation, see section **Alarm Tab Operation**)

Time:

When time has been enabled, the user enters the time and date to start the schedule.

Step6: Stop Schedule Method

Manual:

A schedule may be stopped manually if the trigger and time methods are not used. This feature can also be selected in the wizard setup, by checking the tick box.

Trigger:

For a schedule to be stopped from a Trigger, there must be another schedule already running to trigger from, otherwise this option is not available. The other schedule defines the channel that will cause the present schedule to stop from a trigger. To set a schedule to stop from a trigger; first the user must choose a Channel to trigger on. (**Note that the channel that the user wants to use, must also be enabled in the other schedule, otherwise no trigger will occur**). This can be one of the three Pressure, Temperature or Battery, however they must be selected to be used. Next the user must define a point for the trigger to occur (Set Point Value). The user must then define how the event will occur (Condition: It can be rising, falling or Data Variation Value). A Re-Enable point must also be defined, that determines the value where the trigger will be reset. (For more information on similar operation See **Alarm Tab Operation**)

Time:

When time has been enabled, the user enters the time and date to stop the schedule.

Revert to linear logging after schedule has stopped:

When the Logarithmic schedule finishes (reaches the Number of Readings) the schedule will revert to a Linear schedule with a Scan and Record Time determined by the interval last used in the logarithmic logging. (**Note: Revert to linear is only used when using logarithmic logging**).