Multilog GPRS

Basic User Manual for a DataGate™ installation with HWMOnline™

Version A

Warning: This manual contains important safety and operating information. Please read, understand and follow the instructions in the manual.

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Introduction

Thank you for choosing an HWM data logger(s), we trust it will provide you with many years of service.
The individual configuration of your logger(s) may differ slightly from the detailed descriptions that follow, but any additional setup information that you need, can easily be obtained from our customer support team.

Unpacking

As you unpack your new logger, please confirm that you have the following parts required to install the equipment. If there are any omissions, please contact our sales team to rectify or supply the missing parts.

- Multilog GPRS data logger
- Radwin Software CD-ROM (also available at www.hwm-water.com)
- External GPRS Antenna (optional)
- COM AE Comms Cable (optional – available in serial or USB types)
- Connection cables (optional)
- Connection hose for a pressure logger (optional)
- External battery and appropriate cable (optional)

Please dispose of your waste packaging responsibly.

Before proceeding to site for physical installation, please take the time to configure your logger in an office environment. Most settings can be configured before visiting site and this will save time at the point of install, especially if the weather is bad.

You will need to have:-
A valid HWM DataGate™ account with appropriate username and password. See DataGate™ setup later in this manual.
A PC with Windows 7 or 8 installed (Radwin also supports Windows XP & Vista)
A USB to Serial adaptor (if required to use with serial COM AE cable).
A description and reference number for the installation site:

The reference number is split into a Zone and Location format to allow for grouping of individual “Locations” into larger regions or “Zones”.
The format of the number is configured during the initial installation of the software but essentially is a 7 character code, e.g. AB123CD

The SIM card installed into the logger and a good GPRS signal on site for the chosen network (Roaming SIMs are also available):

This is already done for you if you ordered a data package with the logger.
See appendix A if you have purchased a data pack & SIM separately.

Installing the software

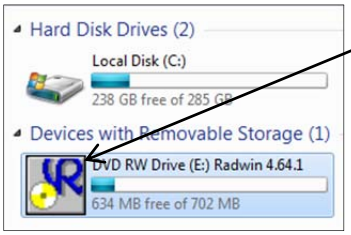
1. Insert the CD-ROM supplied into your CD drive. (If your PC does not have a CD drive, then either copy the files from the CD-ROM onto a memory stick, or download and run the Radwin installation file from the HWM website at www.hwm-water.com)

2. When prompted:-

Click <<Run Installer>>

If the prompt does not appear automatically, please open the CR-ROM folder using Windows explorer (My Computer).

Double Click the CD-ROM icon to run the installer



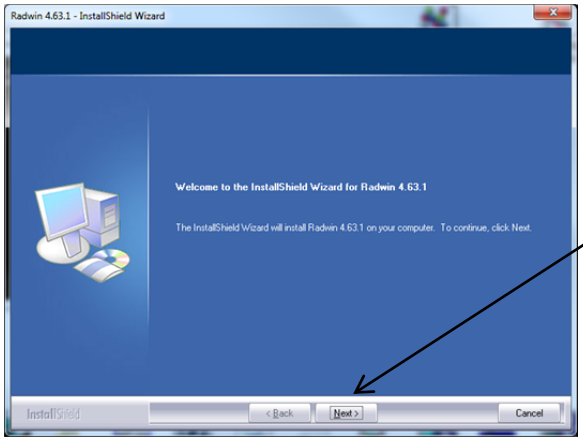
3. Now click <<Radwin>> from the Installer

Click to install Radwin software.

Note Radwin Lite is only for specialist use.

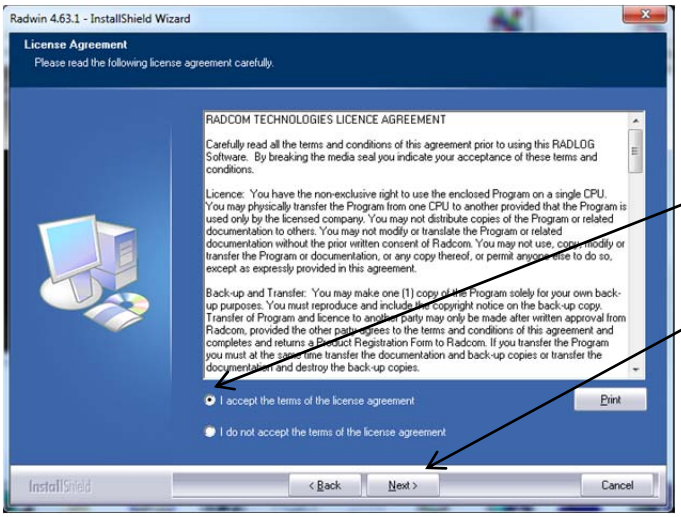
The I/R Driver is normally installed automatically, however, in case it does not in step 7 below, please click the <<USB I/R Reader Driver>> after the main installation is complete.

4. When prompted by the InstallShield Wizard to install:



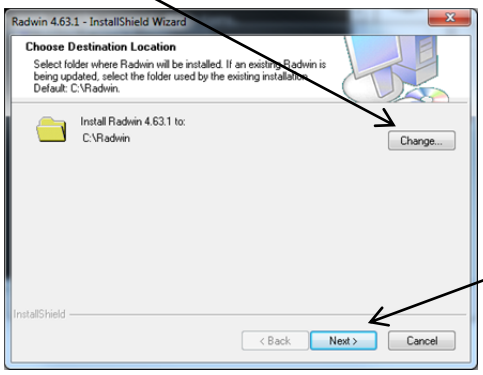
Click <<Next>>

5. Read and agree the terms of the Licence agreement to continue:



Click the <<I accept…>> radio button, then Click <<Next>>

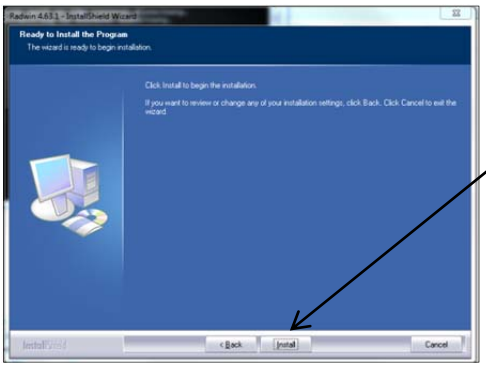
6. Choose the Destination folder you wish to install to by clicking <<Change>>



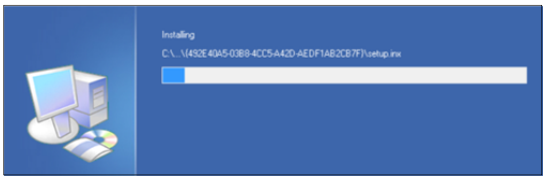
or to accept the default installation (recommended) click <<Next>>

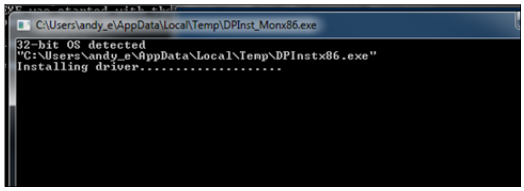
Note: Ensure that you choose a folder that you have read/write access to. Check with your IT team if you are not sure.

7. The installation process now has all the information it needs to proceed so click <<Install>> to continue



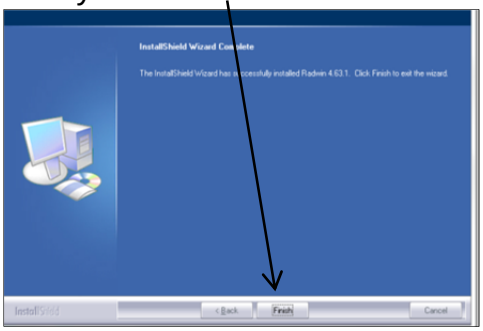
Wait while the installation completes…



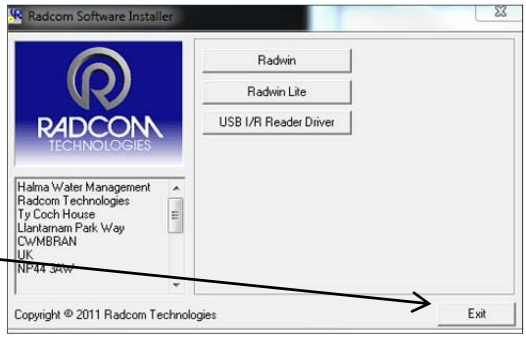


and the I/R Driver installs…

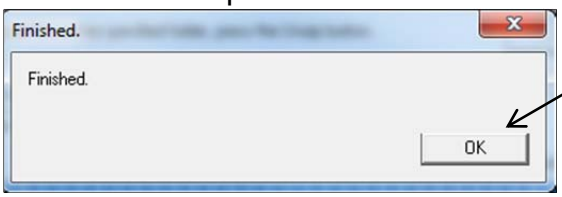
8. Finally click <<Finish>> to close the InstallShield Wizard.



9. Then click <<Exit>> to close the Installer.



10. If you have installed from a downloaded file instead of the CD you will see the extra window below.
The Installation process has now finished so click <<OK>> to confirm.



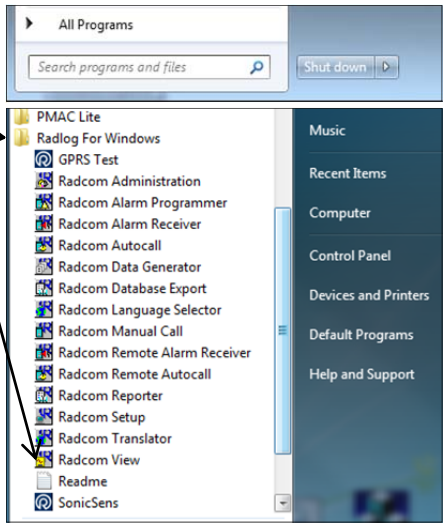
First time run of Radwin

Once you have installed Radwin you need to make some initial setup choices and configurations.

Creating your first Database

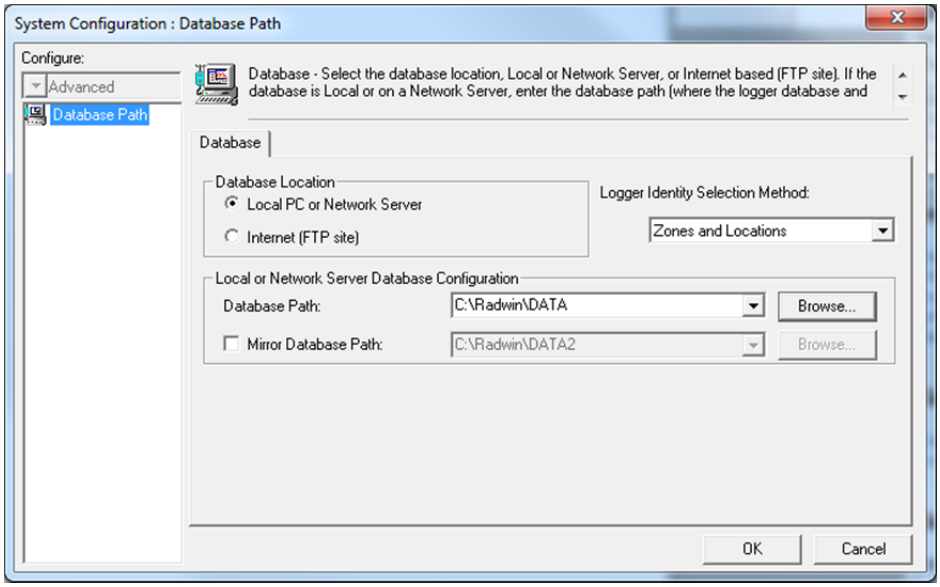
1. From the start menu, click <<All programs>> and find the program group "Radlog for Windows"

2. Click <<Radlog for Windows>> to expand the group and then click <<Radcom View>>

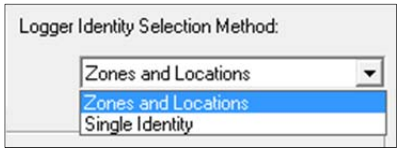


You may wish to "Pin" the program to your taskbar for convenience. To do this, **right** click on the Radcom View icon and select "Pin to Taskbar" from the pop up menu. The program can now be conveniently started from the taskbar.

3. After the program starts you will be automatically prompted to set up a new database path
   This is for local storage of configuration information and any data that you may directly download from the logger or from DataGate™ after site installation.



A note about Logger Identity Selection Method:-



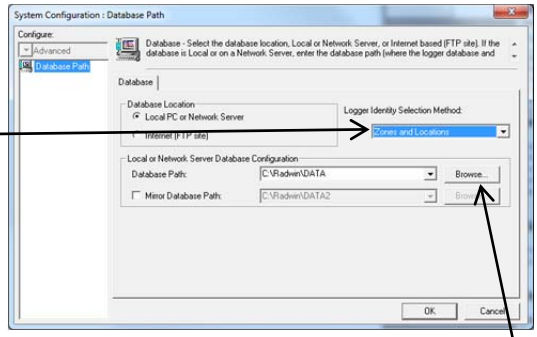
A logger is identified with a single 7 digit reference ID.
If you select *Single Identity* from the menu then you can use the full 7 digits how you like.
E.g. account no, customer number, etc.

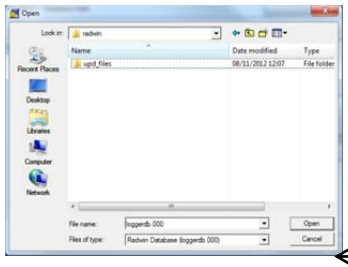
However, when installing a larger fleet of loggers, Radwin allows you to group individual logger *Locations* into larger *Zones*. This allows for geographic regions (*Zones)* to be easily indexed where large fleets are involved.
So, Locations refer to loggers
Zones **contain** Locations (loggers)
Many Zones may be created
Each Zone may contain many Locations (loggers)

For example, split a town up into Zones then split the Zones up into Locations and deploy loggers within each Zone.

If you choose this (default) option you will be prompted (later on) to decide how the 7 digits are allocated. E.g. ZZ/LLLLL means you can have up to 99 zones with 99,999 loggers in each zone, or ZZZ/LLLL gives 999 zones with 9,999 loggers in each and so on.
In this way you can develop an indexing method to allow you to quickly find sites you wish to examine.

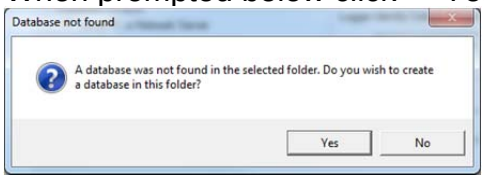
4. From the Logger Identity Selection Method, choose the option as described above.



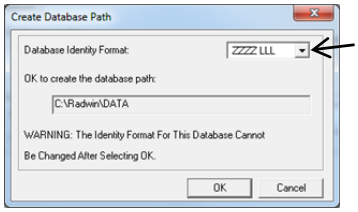


If you wish to change to location of the folder where the database is stored, click <<Browse…>>
Then navigate to the desired folder and click <<Open>> to choose the folder.

When prompted below click <<Yes>> to confirm the folder choice.



5. Now click <<OK>> to create the database.



If you chose *Zones and Locations* in step 4, chose your format for the ID number. The default is the UK postcode format, e.g. AB12 3CD

Then click <<OK>> to continue.

Note: The Database format CANNOT be changed from this point. If you need to change it later you will need to delete the \DATA folder and start again.

If you have upgraded to this edition of Radwin from an earlier version, then the database format that was chosen in the previous edition will be maintained.

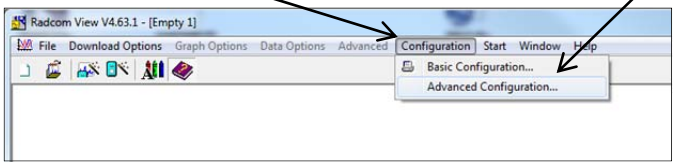
Setting up the communications cable

Note: The following instructions assume the use of the COM AE USB comms cable connected to a PC USB port or a COM AE Cable connected to a PC serial port.

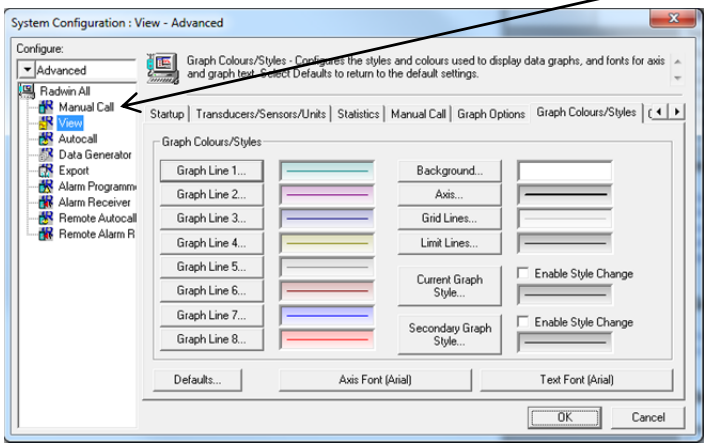
1. Connect the USB plug to a spare USB port on your computer or the Serial plug to a spare Serial port on your computer.

2. Connect the Cable 10 pin milspec connector to the corresponding logger connector and ensure it is locked home –

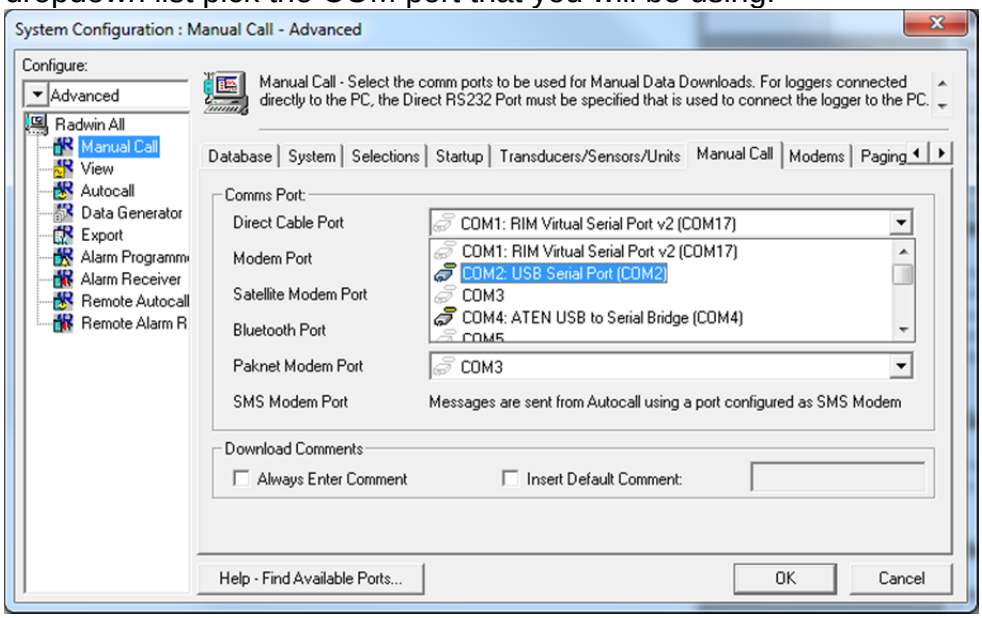
Start Radcom View again (unless already running) and from the menu select <Configuration> and then <Advanced Configuration…>



3. The menu below shows details all the setup functions available to Radwin, for the Communications port configuration click the <<Manual Call>> item from the list.



4. The *Manual Call* menu now appears, from the *Direct Cable Port* dropdown list pick the COM port that you will be using.



A note about COM port choice:

In the example above of a Laptop, you can see 3 COM ports listed, the numbers and descriptions vary from PC to PC but to summarise the types:-

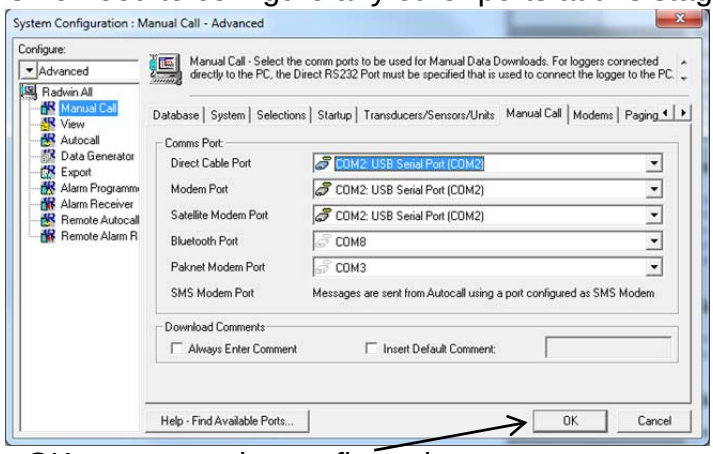
- *RIM Virtual Serial Port* (e.g. COM1:) should be ignored as Radwin will not communicate via these types of ports. These often have high COM numbers (above 10).
- *USB Serial Port* (e.g. COM2:) is a genuine COM port that can be used with Radwin and is usually the USB Comms cable.
- *USB to Serial Bridge* (e.g. COM4:) is also a genuine COM port that can be used and is generally a USB to Serial adaptor cable.

If you are using a Desktop computer or a Laptop with a docking station, you may also see a *Communications Port*. This is also a valid choice for your *Direct Cable Port*, however there is usually more than one so check the physical indication by the socket on the back of the computer.

Tip: If you are using a USB connection, you can check you have the right one as follows:-

i. Look down the list and note each COM number that is not empty.
ii. Click <<Cancel>> to close the *System Configuration* menu.
iii. Remove the USB plug from the PC.
iv. Repeat steps 0 to 4 above and look for the one that has disappeared. This is the COM port you need to select in step 4.
v. Click <<Cancel>> to close the *System Configuration* menu again.
vi. Reinsert the USB cable **IN THE SAME PORT AS BEFORE** and repeat steps 0 to 4, selecting the COM port noted in step iv above.

5. There is no need to configure any other ports at this stage.



Click <<OK>> to save the configuration.

6. Congratulations, you are now ready to begin configuring your new data logger.

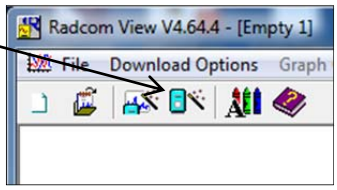
Programming your first logger

With the logger connected to the computer as in the previous section, you now need to run the configuration wizard to set your logger ready to send in data.

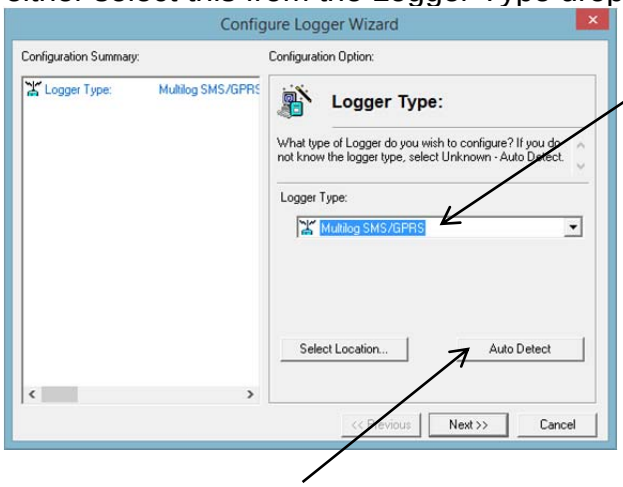
Using the Configure Logger wizard

1. If you have not already done so, run the “Radcom View” program.

2. From the menu, click the  button to launch the programming Wizard

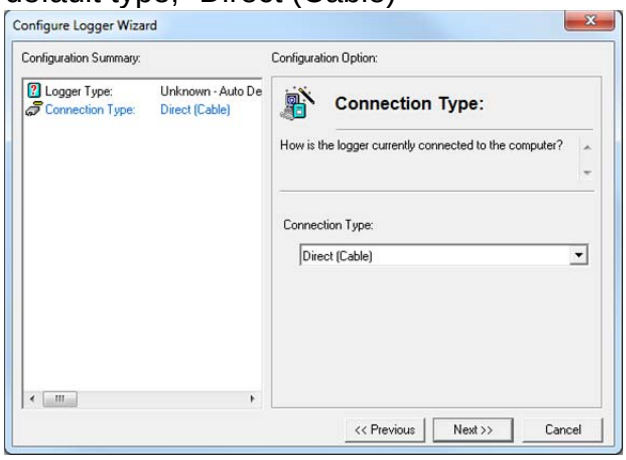


3. Radwin now needs to know the type of logger you are using. You can either select this from the Logger Type drop down menu



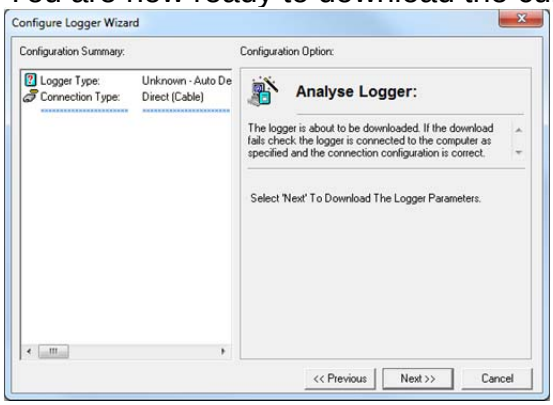
or click the <<Auto Detect>> button to allow Radwin to discover the type automatically.
Then click <<Next>> to continue.

4. You need to tell Radwin how the logger is currently connected to the computer. As you are physically connected to the logger, choose default type, “Direct (Cable)”



then click <<Next>>

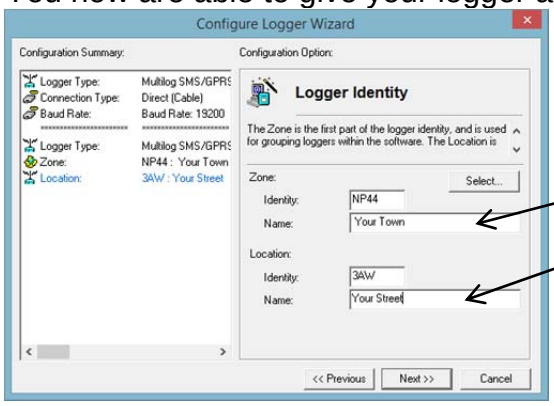
5. You are now ready to download the current settings from the logger,



so click <<Next>> to continue.

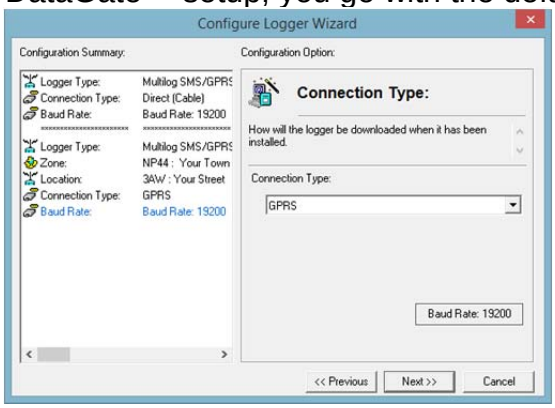
6. Radwin will now retrieve the current settings from the logger,

7. You now are able to give your logger a unique identity



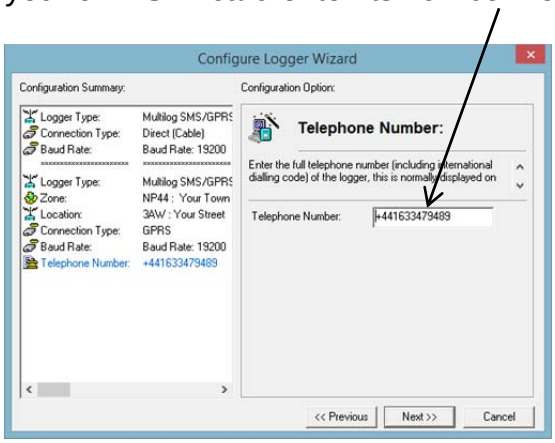
Enter the details in the four fields according to your chosen Zone and Location plan as described on page 8 and then click <<Next>>

8. You now need to define how the logger will transfer its data. For this DataGate™ setup, you go with the default setting, **GPRS**,



so click <<Next>> to continue.

9. Each logger **must** have a unique Telephone number. If you are using your own SIM card enter its number here in international format;



otherwise the Telephone number of the SIM card supplied in the logger will be automatically entered.

Click <<Next>>
(Answer <<Yes>> to the warning if prompted)

10. You now need to configure the channels (1 channel per signal/sensor) that you wish to use.

A note about logger channels:

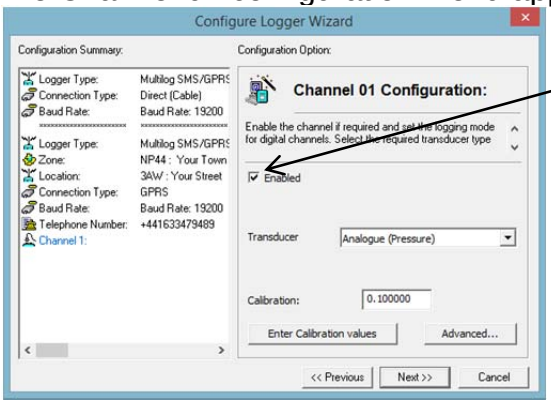
The Multilog is available in several different configurations for Pressure, Flow and other sensors. Data is presented to the viewer in Channels and Channel numbers are allocated in the factory by priority of sensor type. So, where fitted, analogue sensors, e.g. Pressure transducers, Depth measurement devices and 4-20mA flow sensors, will always come through on CH1 and digital inputs, e.g. pulse counters, will take any remaining channel numbers.

Radwin automatically detects the configuration of the logger and will prompt you according to the type of Transducer appropriate to that input.

The following example will set up 1 pressure transducer and 1 flow channel for a logger configured in the factory for 1 pressure and 2 x unidirectional flow.

For more specific details on other variants or if you experience problems, please contact HWM support.

11. The Channel 01 configuration menu appears as below:-

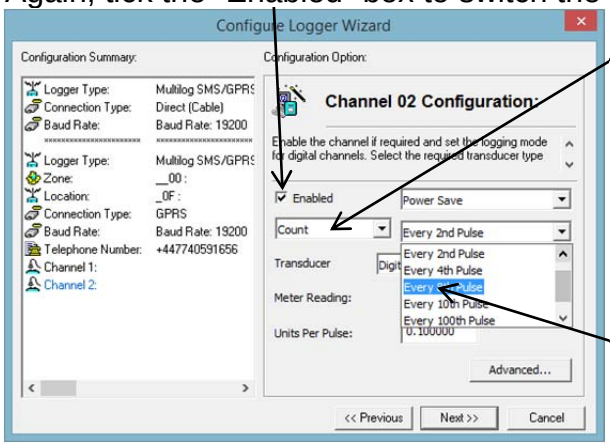


To turn ON the Pressure channel, tick the “Enabled” box.

The default transducer is for a pressure transducer with a Calibration factor of 0.1. If you are configuring any other type of sensor, please refer to HWM support.

Click <<Next>> to continue.

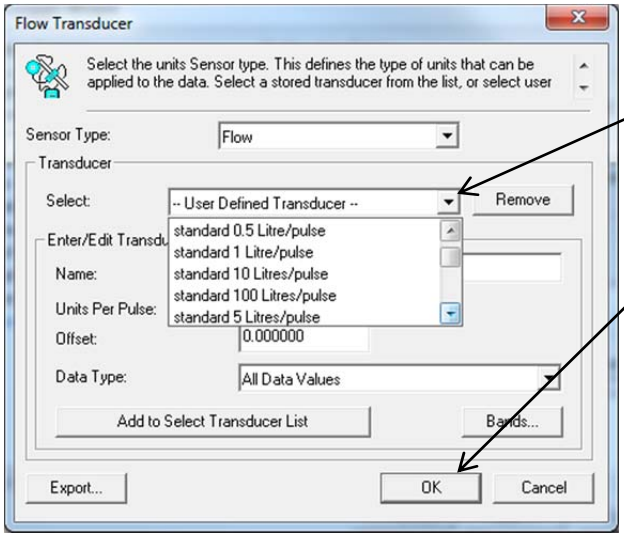
12. The Channel 02 configuration menu appears as below:-
    Again, tick the “Enabled” box to switch the channel ON.



Choose how the logger will measure pulses from the dropdowns, “Count” counts each pulse received by the logger, “Event” converts the time between pulses for slow flow rates.

If you do not wish to count every pulse for high rates, choose “Every nth pulse”.

13. As you are configuring a Digital pulse input, you need to configure the number of Units Per Pulse to match the output from the Pulse Unit on your meter. Check your meter for these details Click <<Configure>> to select your transducer type.



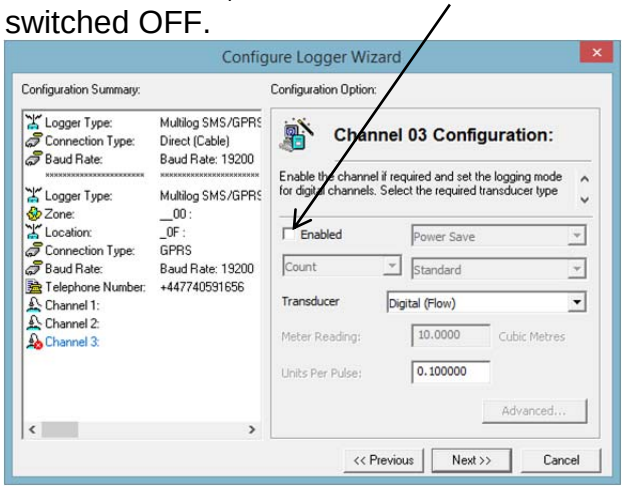
From the drop down list, choose the pulse rate or sensor type that matches the Pulse Unit that is fitted to your meter.

Then click <<OK>> to store this setting and return to the channel menu.

Click <<Next>> as in step 11 to move to CH3.

Note: You can also enter the pulse rate manually, simply click in the Unit Per Pulse box and enter the value, take care over the decimal place.

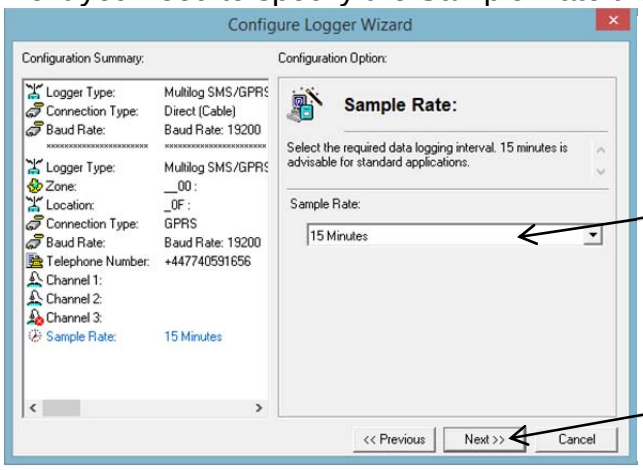
14. For Channel 03, leave the “Enabled” box un-ticked to leave the channel switched OFF.



Click <<Next>>

Note: If you leave an unused channel Enabled (ON) you will simply see flatline data on the viewing platform.

15. Next you need to specify the Sample Rate that you require.



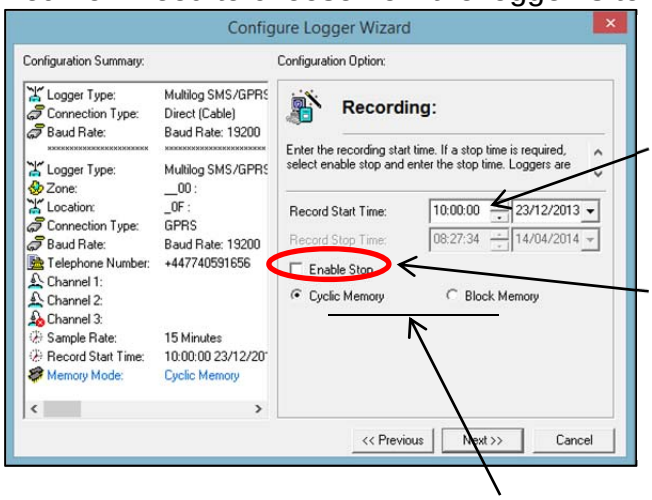
In most cases the default setting of 15 minutes will be sufficient, however, if you wish to change the rate, simply select a period from 1m to 24hrs from the dropdown menu.

Click <<Next>> to move on.

A note about Sample Rates:

- For a digital input (e.g. flow), the sample rate equates to the number of pulses counted during the period set. So, if 900 pulses were counted over the 15m sample rate set above, this equates to 1 pulse/sec and if you have set 10ltr/pulse in step 13, then the final result is 10litres/sec.
- For an analogue input (e.g. pressure, depth, etc.) the logger takes a background measurement every 30 seconds (or the sample rate, whichever is smaller).
  This background measurement is then averaged across the sample period selected. So if you set a 15m “Sample Rate” above, then the logger will record the average of the 30 readings taken during the 15m period selected.
  If you choose a sample rate faster than 30s, then the background sample period with adjust automatically to match it, **however this will reduce battery life**

16. You now need to choose how the logger is to record data.



If you wish to Start recording from a specific time, enter the “Start Time” here.

If you wish to Stop recording at a specific time, tick the “Enable Stop” box and enter the time you wish to stop recording data here.

Choose between “Cyclic Memory” or “Block Memory” by clicking on either of the two buttons here.
“Cyclic Memory” means that when the logger’s memory becomes full, it continues to record new data by overwriting the oldest data first.
“Block Memory” means that when the logger’s memory becomes full it simply stops recording and any new data will be lost.

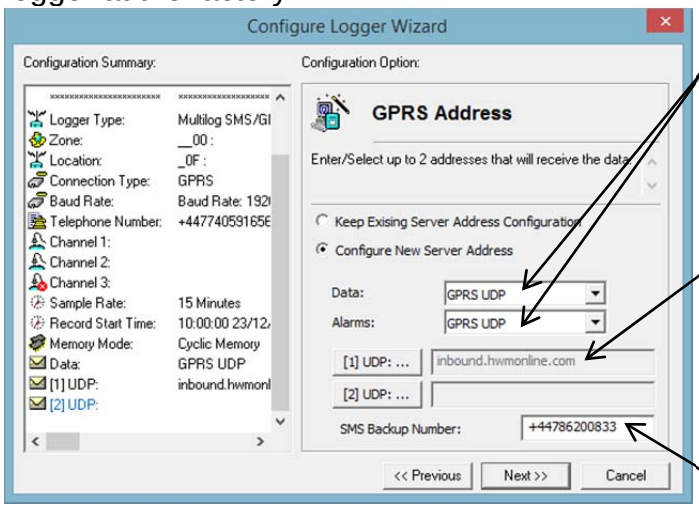
Note: In most cases where the logger is calling into a central system via a communications network, the default settings will be correct. (No Stop Time and Cyclic memory).
If you do not specify a start time, then the logger will start recording as soon as the Wizard completes.

17. Click <<Next>> to continue.

Configuring the Data Transfer Settings

In the following steps, it is assumed that the logger being installed is a standard DataGate™ (HWM data warehouse) installation. If you have a bespoke data warehouse, the communications address may be different. Please obtain these settings from your HWM account manager.

18. In most cases the settings will have been already programmed into the logger at the factory.

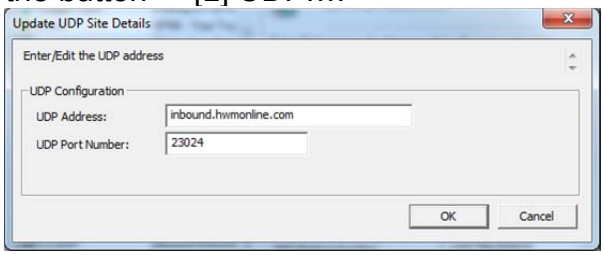


GPRS UDP is the type of communication protocol used with DataGate™ for Data and Alarm transfer.

[1] UDP… is the internet address where data from the

This number is where SMS (text) messages are sent (once per day) in the event that a GPRS connection has not been made during the previous 24hours. The example above shows the DataGate™ number, for other data warehouses please refer to your HWM account manager for this number.

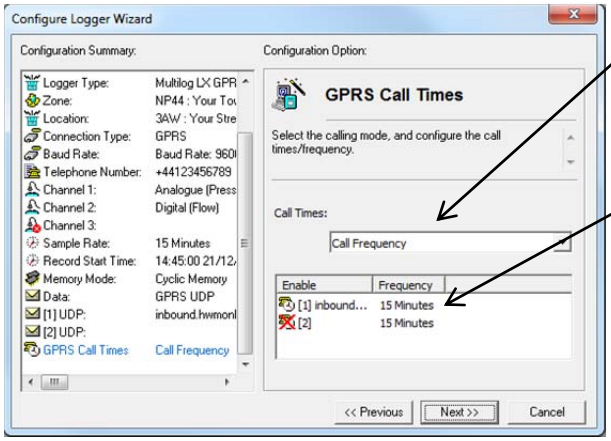
ⓘ Note: If you have a different UDP address to enter into the logger, click the button <<[1] UDP:…>>



Here you can now enter the internet address and port number for the data warehouse you are using. Click <<OK>> to confirm.
If you wish the logger to send data to two different addresses, click the <<[2] UDP:…>> button and enter the details for the second warehouse as above.

Please be aware that sending data from the logger to two different addresses will increase your data usage as two separate messages will be sent, it is more data (and cost) efficient to send the data to one warehouse and have it forwarded to the second via land based connections.
Your HWM account manager can help with such requirements.

19. The GPRS Call Times allow you to choose how often the logger will attempt to contact the data warehouse. There are 4 different modes available for data call timing.

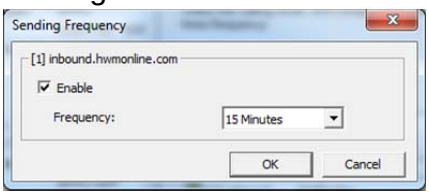


Choose the desired "Call Times" mode from the dropdown menu, and then double click on the call time that you wish to adjust.

Note: the 2 different addresses specified in step 18 can be configured separately. Double click the second clock "[2]" to enable the logger to send data to the second address.
Don't forget to tick the "Enable" box to turn the timer ON.

Call Time Modes

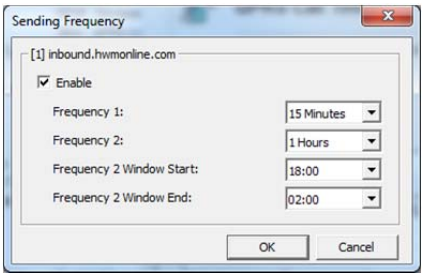
i. "Call Frequency" mode (Factory Default – 12hrs, 2 calls/day) In this mode you simply specify how many minutes pass before making the next data call.



Choose your desired frequency from every:
5 minutes (480 calls/day) to
12 hours (2 calls/day)
then click <<OK>> to store

Note: Maximum is 3 calls/day without an external battery.

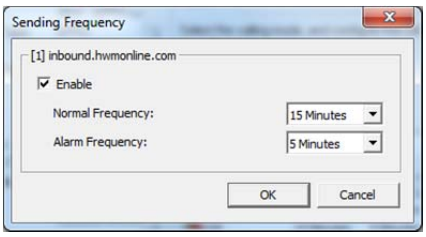
ii. "Dual Call Frequency" mode allows you to specify 2 different call in rates for 2 different time periods of the day. E.g. a lower rate during the night.



Choose your desired main frequency (as above).
Then choose the secondary frequency.
Next choose the time that the secondary rate will start.
Finally choose the time when the secondary rate will stop. Click <<OK>> to store.

In this example the logger will send in data every 15 minutes during the day but only once per hour between 18:00 and 02:00 in the night. This helps to reduce data costs.

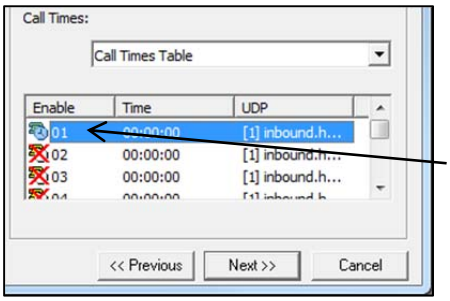
iii. “Dual Alarm” mode allows you to set a different call in rate whilst a logger is in an alarm condition.



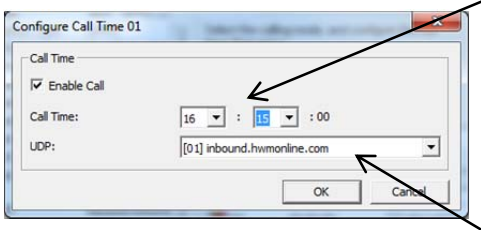
Choose the normal frequency and then specify the frequency during the alarm condition. Then click <<OK>> to store.

In this example the logger will call in every 5 minutes if an alarm is configured in the logger.

iv. “Call Table” mode allows you to specify up to 8 individual call in times.



First double click the <<Timer Event>> you wish to adjust from the table

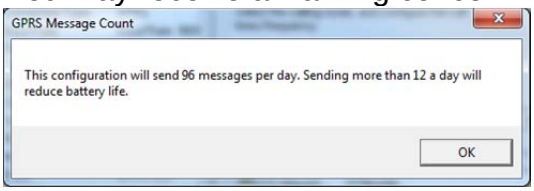


then enter the time that you wish the time that you wish the logger to call in.

If you have more than one address to send data to (step 18 above), select the destination address here.

Click <<OK>> to store.

You may receive a warning concerning battery life:-



Click <<OK>> to continue.

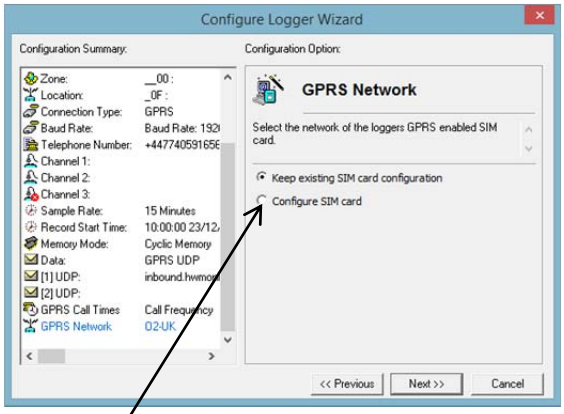
Note: Some Call Time Modes are only supported with the connection of an external battery (or power supply).

Configuring the Data Transfer Settings

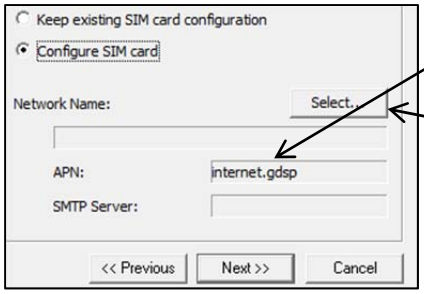
It is important that the GPRS settings for the chosen network are configured correctly, otherwise the logger will not be able to connect to DataGate™.

If you have specified your logger with SIM and data package, then these settings will have been programmed at the factory, therefore you can simply click <<Next>> to move on to step 22.

If you are using your own data package, follow the steps below:-



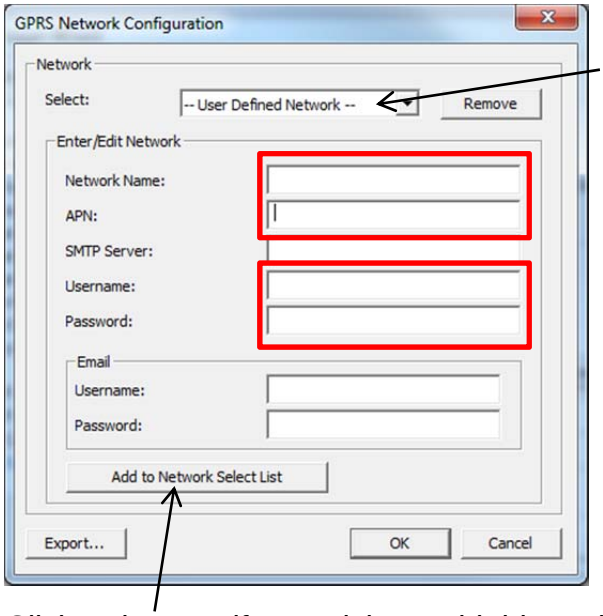
20. Click <<Configure SIM card>> to show the current settings.



Here you see the currently programmed settings.

Click <<Select>> if you wish to enter new ones or click <<Next>> to move on.

21. You now need to provide the Network Details for your data package.



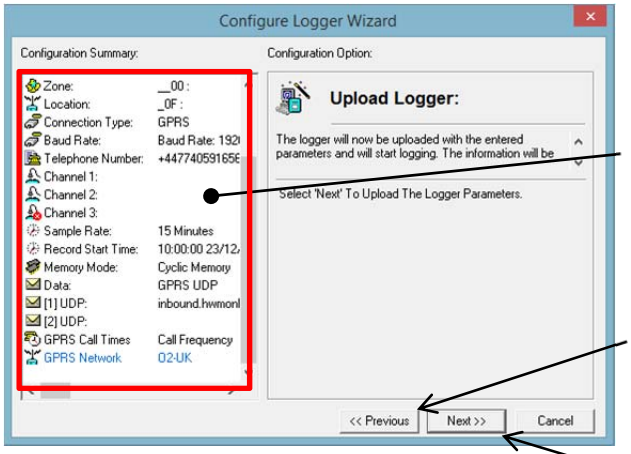
If your network is listed in the drop down box, select it and click <<OK>>

Otherwise complete the appropriate details in the sections highlighted. For a GPRS logger connecting to a data warehouse such as DataGate™, then the fields, “Network Name”, “APN”, “Username” and “Password” are required and will be provided by your SIM supplier.

Click <<here>> if you wish to add this to the Network List for next time, then click <<OK>> to store the settings.

22. At the next screen only set power windows if you require to GSM into the logger using a modem – the power windows provide times when the logger modem is awake to receive incoming calls. Click <<Next>> to move on.

23. Radwin now has all the information it needs to program your logger.

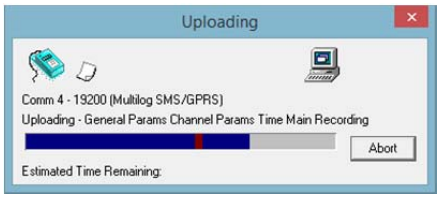


It is a good idea to check down the configuration summary at this point as this is your last chance to correct any errors before programming.

Click <<Previous>> to return through the menus to make any corrections.

I

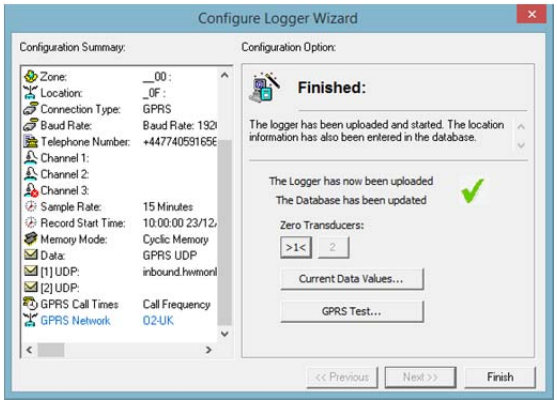
To begin the programming sequence, Click <<Next>>



Programming will now take place…
Note: That the bar will turn Red once programming begins.
Note: If the programming step fails at this point simply wait 60secs and retry.

24. Radwin has now completed the programming sequence for your logger and stored its details on your computer. Unless you specified a delayed start time in step 16, it is now recording and will begin data transfer at the next appropriate time slot.

NOTE: If you have specified a call in rate higher than 8 times a day in step 19, this this will only come into play once an external battery is connected. Until then, the logger will only call in twice per day.



If you wish to confirm that the data communication link is working correctly then refer to the instructions in the next section **before** continuing, otherwise click <<Finish>> and the Wizard will close.

Data Communications Confirmation – GPRS Test

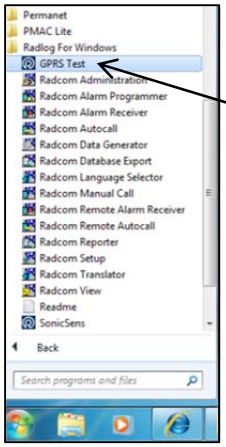
It is important to confirm that your logger is communicating with the data warehouse before you leave site (or to be confident, your office), so you should undertake a GPRS test before you leave the logger in the field.

1. Connect an appropriate GPRS antenna to the FMEA socket on the logger. The location on the logger can vary depending on the configuration of logger ordered, but the picture below illustrates a typical connection.

   Note: If this is the final aerial connection, ensure that the connector is tightened with spanner or pliers (torque of 2Nm) to prevent water ingress to the antenna plug as this will reduce performance.

2. Ensure the COM AE comms cable is correctly connected to the logger (see page 10.)

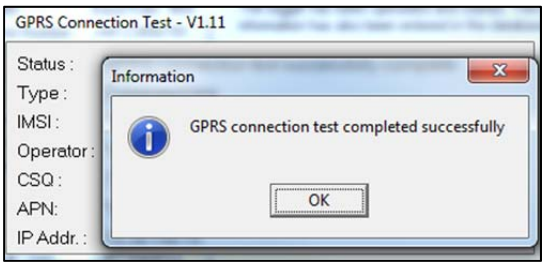
3. If you have just completed the Radwin Wizard from the previous section (page 23, step 24), then click <<GPRS Test…>>



   Otherwise, from the Radlog for Windows program group, run the GPRS Test program.

   Note: The GPRS test is also available in the advanced utilities menu which will be discussed later.

4. The GPRS Test program will now automatically execute a communications check with the data warehouse, DataGate™ and deposit a test message that can be checked later on.



The test will take a few minutes and will confirm that the communication is successful.

Troubleshooting a GPRS test failure.

There are a number of reasons why a GPRS test may fail,

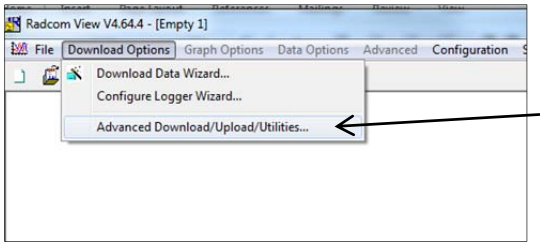
the following points should be checked before calling HWM support for assistance:-

Possible Problem	Solution
Network Busy due to excessive traffic. Commonly occurs around schools.	Retry the test after a few minutes.
GPRS signal not available at your location. Not all Cell masts carry GPRS traffic	The logger will call into the data warehouse once per day using an SMS message.
Network signal not strong enough. You need a CSQ (reported by the GPRS test) of at least 8 or above for reliable communications.	Relocate the antenna if possible or try alternative antenna configurations. Ensure antennas are vertically orientated where possible. See aerial placement notes section.
APN settings incorrect.	The GPRS tester knows about a large number of cellular networks and will try as many settings as possible and correct any error automatically. If there is still a failure, then you need to check with your network operator that you have the correct settings for your SIM.

If you continue to experience problems with communication, you may need to check the network coverage in your location. Radwin with an HWM logger allows you to conduct a site survey so you can be sure you chose the right cellular network for your site.

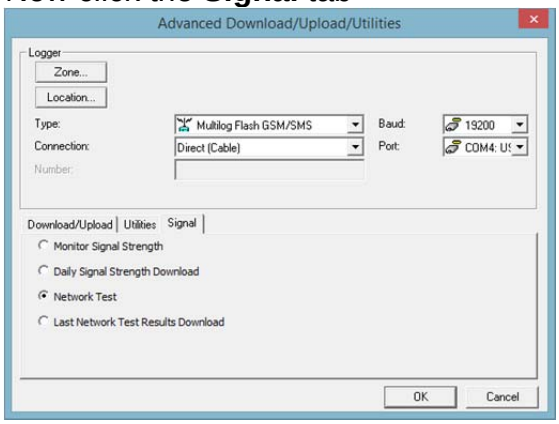
Performing a network test

1. From the Radcom View menu bar,



select Download Options and then <<Advanced Upload/Download Utilities…>>

2. Now click the **Signal** tab

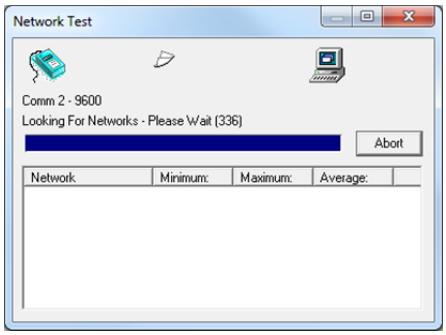


Select your logger **Type** from the dropdown menu (Multilog SMS/GPRS)

Next click the <<Network Test>> button

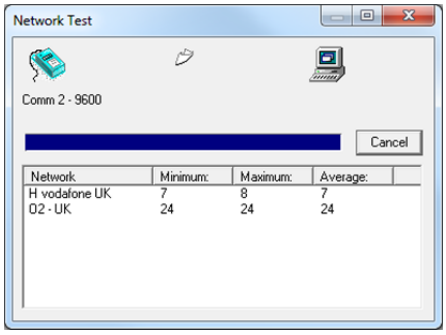
Finally click <<OK>> to start the network scan.

3. The logger will now start a network test



The test can take about 3 minutes to complete, so please be patient.

4. Radwin will then display the results of the test in the window below:-



Here the result shows a good signal with O2, but a marginal signal with Vodafone, therefore an O2 equipped logger is the suitable logger for this result.

Click <<Cancel>> to return to the utilities page.

Note: You can also chose the <<Monitor Signal Strength>> button in step 2 which will show live signal strength for your current network.

Installing your logger at site

Having performed all the steps in the previous sections, you should now be confident that your logger is configured for your purposes and is communicating correctly in a controlled environment. The next step is to physically install you logger on site.
Every site installation is unique with various types of connections, positioning or environmental conditions possible, therefore this book cannot hope to cover all variants, however the following sections offers some Best Practice ideas to follow when fitting your logger to ensure you get the best service.

Note the following illustrates the LX logger – the principles outlined are the same for Multilog data loggers

Recommended locations in common chamber types

Metal

Letterbox

Studded


Heavy Metal Lids

Plastic

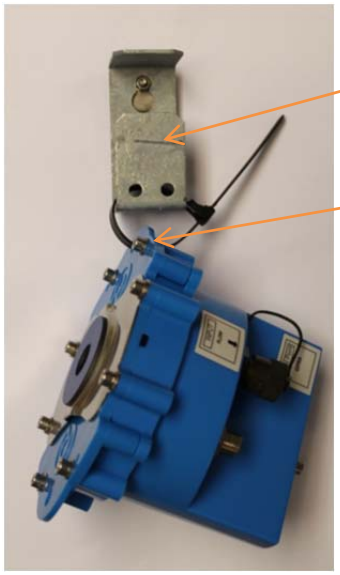
Atplas Oval Lid

Atplas round lid (Square or round frame)

Talbot – Round Lid

Talbot – Flip Lid

<u>Wall Mounted (e.g. in utility cabinets)</u>



Installation bracket available from HWM.

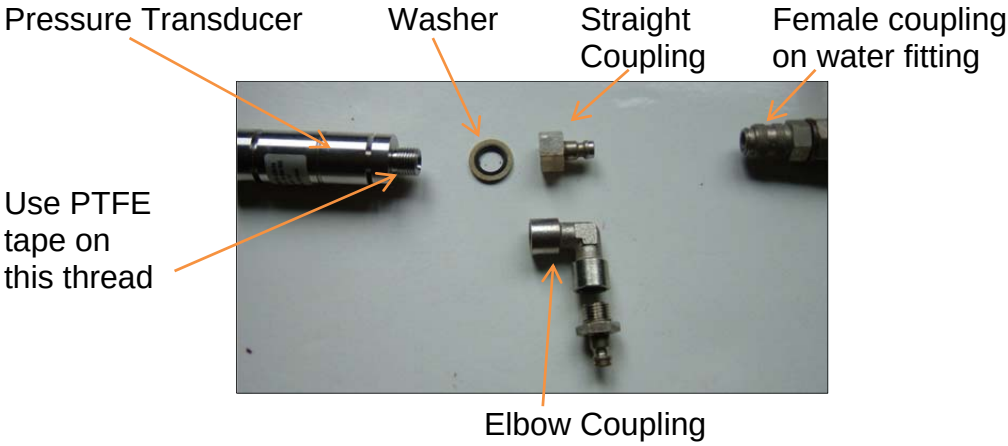
Cable tie passed through one of the holes in the logger top plate.

Connecting the sensors - Pressure

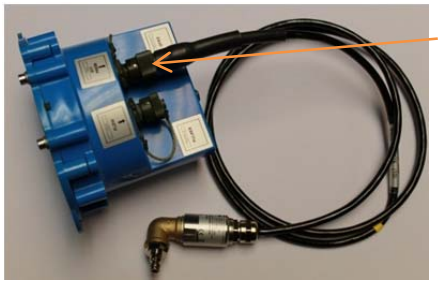
For **internal** pressure transducer, simply connect the pressure tapping on the pipe to the pressure sensor on the logger. There is no calibration required and the logger is ready to start recording.

IMPORTANT: Ensure that the connecting hose is adequately insulated to prevent freezing. If the hose freezes there is a danger that the pressure transducer in the logger can be permanently damaged.

For an **external** pressure transducer, 2 styles of coupling kits are available, straight or elbow.
First assemble the coupling to the transducer:-



Then connect the assembled pressure transducer to the water fitting:-



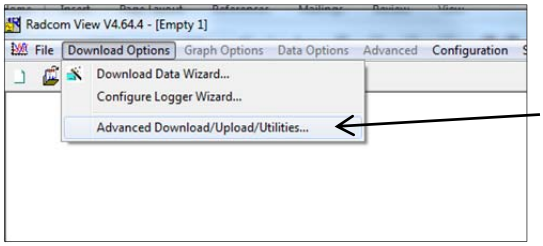
Connect the Plug to the EXT. PRESS socket on the logger. Ensure you feel the ‘Click’ as the connector locks into place.

You now need to calibrate (pair) this assembled pressure transducer to the logger, this is detailed in the next section.

Calibrating an external pressure transducer to the logger

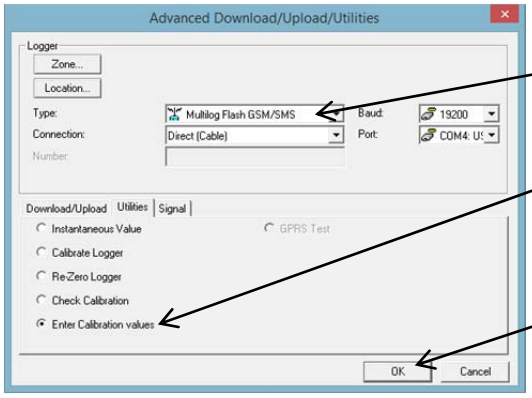
Each pressure transducer carries calibration on its cable that you need to program into the data logger. This effectively 'pairs' the transducer to the logger to provide accurate sensor data. Failure to do this next step will result in erroneous data being recorded.

1. From the Radcom View menu bar,



select Download Options and then <<Advanced Upload/Download Utilities…>>

2. Now click the **Utilities** tab

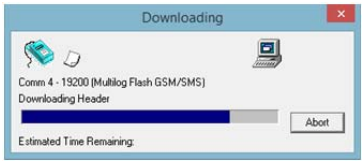


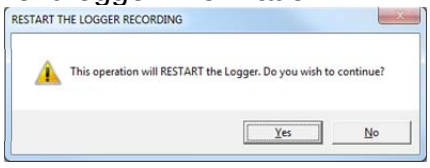
Select your logger **Type** from the dropdown menu (Multilog SMS/GPRS)

Next click the <<Enter Calibration values>> button

Finally click <<OK>> to start the calibration process.

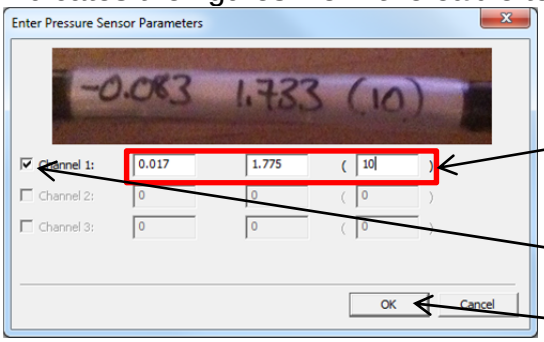
3. Radwin will now download the current logger information





You will see a warning that this operation will restart the logger. This is normal and is simply a warning that there will be a data collection restart performed as part of the process. Simply click <<Yes>> to acknowledge the warning.

4. Next you will need to enter the details for your cable, the picture indicates the figures **from the cable** to enter – <u>Do not enter these!</u>

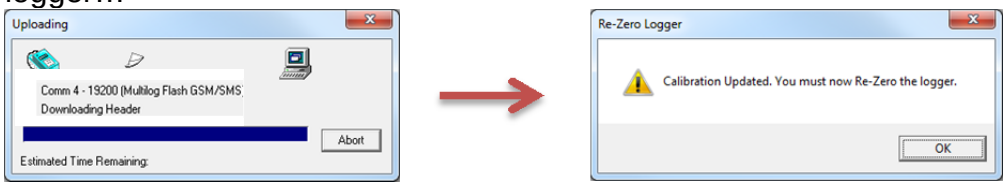


Enter the 3 numbers **<u>from the cable</u>** in the <u>3</u> boxes

Ensure you tick the box on the left to confirm that the numbers you enter are to be loaded.

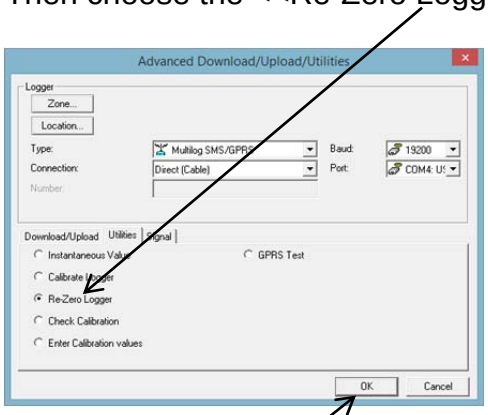
Then click <<OK>>

5. The Calibration settings you entered will now be programmed into the logger…



6. You will receive a warning that you now need to Re-Zero the logger. As part of the pairing process you also need to set the atmospheric zero point, so click <<OK>> to confirm the message.

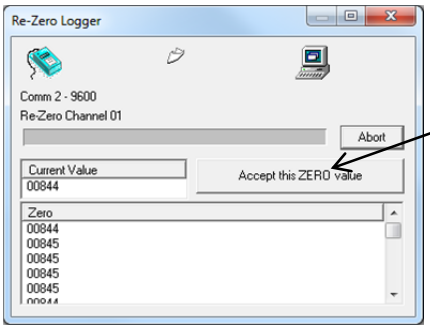
7. Then choose the <<Re-Zero Logger>> button from the Utilities menu



and click <<OK>>

You will receive another restart warning, click <<Yes>> to accept.

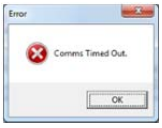
Radwin will then start the zeroing process by measuring the current pressure value – note this is a raw data value, not a real pressure reading.



Let the values being read settle for a little while (about 15secs), then click the <<Accept this ZERO value>> button.

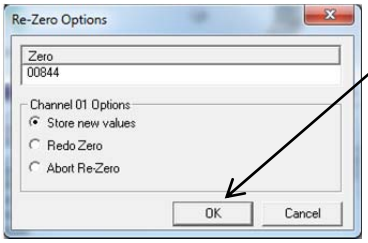
Remember you MUST have the transducer disconnected from the water supply during this step otherwise you will record negative pressures.

Note : If you wait too long, Radwin will timeout.



Simply click <<OK>> and go back to step 7

8. You are now ready to set the zero point into the logger, so click



<<OK>> to continue, or if you are unhappy select Redo or Abort and click <<OK>>

When prompted 'Store the new Zero value' click <<OK>>

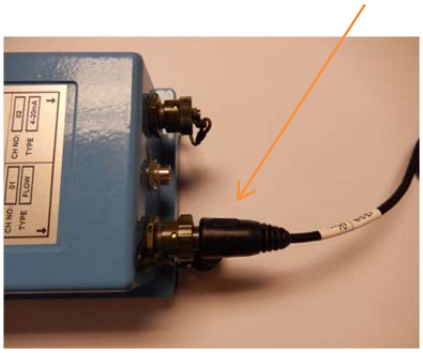
9. Radwin will now store the measured zero value into the logger as the zero reference point for the site.

10. You can now connect the sensor to the water fitting

Male pushes into the female, you may need to push this outer ring up to get both parts to fit together correctly

Connecting the sensors - Flow

If you are using a pulse unit (or connecting cable) provided by HWM, then simply connect it to the FLOW socket on the data logger.



If you are making a connection to an existing pulse unit and need to splice bare tails together, then it is important that a waterproof connector housing is used, such as the "Tuff-Splice" enclosure.

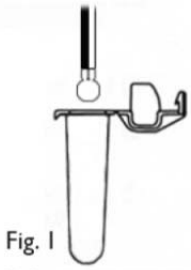


Fig. 1
Splice wires using supplied crimp connectors.
(DO NOT STRIP WIRES BACK).

Fig. 2
Insert spliced wires into the gel filled tube.

Fig. 3
Close Tuff-Splice lid for secure seal.

Final Connection

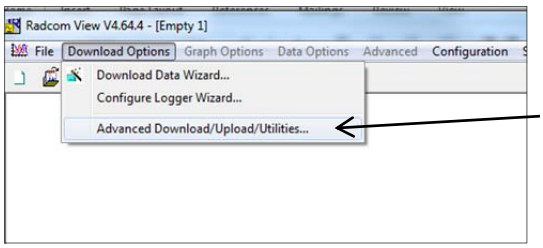
Note that Long data connections should always be made using screened cable. The use of screened cable will ensure maximum rejection of interference from outside sources. Always use a common ground point without creating ground loops

See appendix (page 52) for further information on pulse cables

Taking an Instantaneous reading from the logger

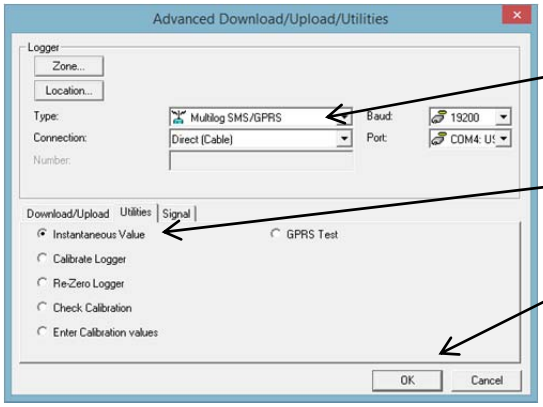
You are now ready to confirm that the logger is measuring real data from the sensors by taking an Instantaneous Value.

1. From the Radcom View menu bar,



select Download Options and then <<Advanced Upload/Download Utilities…>>

2. Now click the **Utilities** tab

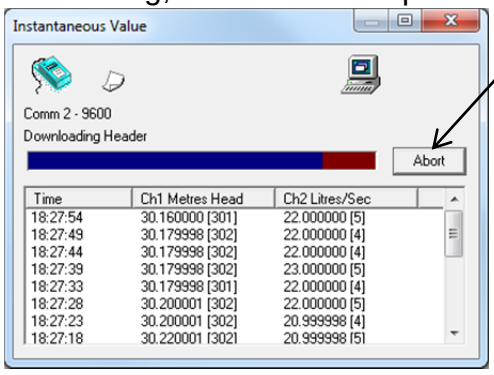


Select your logger **Type** from the dropdown menu (Multilog SMS/GPRS)

Next click the <<Instantaneous Value>> button

Finally click <<OK>> to start the calibration process.

3. Radwin will now start reading the current sensor values that the logger is receiving, so for our example Pressure Flow logger, we see



Click <<Abort>> when you wish to finish alternatively Radwin will automatically timeout after a period of a few minutes.

Example Ch1 reading Pressure in Meters Head and Ch2 reading water Flow in Litres/Sec.

The reading taken is the average over the sampling period specified, so in our example the last value is 30.16m and 22.0l/s over the last

15m. So if you have just connected your logger, you may have to wait a few minutes for the reading to stabilise. The value in the square brackets [301] & [5] is the raw uncorrected value being measured or counted over 2 seconds.

Note: If the flow readings do not meet your expectations, then check your connections and your calibration factors have all been entered correctly. If you still have incorrect readings, you may have a faulty pulse unit on the meter which will need to be replaced

Aerial installation considerations

The method of installation should be carefully selected depending on whether the logger has an internal or external aerial (external aerial types cannot be used without an aerial fitted)

Signal strength within the cellular network can vary dramatically even within the same cell; proximity to the transceiver, type of antenna, position and angular orientation of the antenna, all have a significant effect on the ability of a device to reliably communicate with the cellular network. To ensure reliable GSM/GPRS data communications it is essential that the most suitable antenna is selected and it is mounted in the most appropriate location.

If you have an internal antenna version, the logger may need to be tried in several positions & orientations before finding the optimum position.

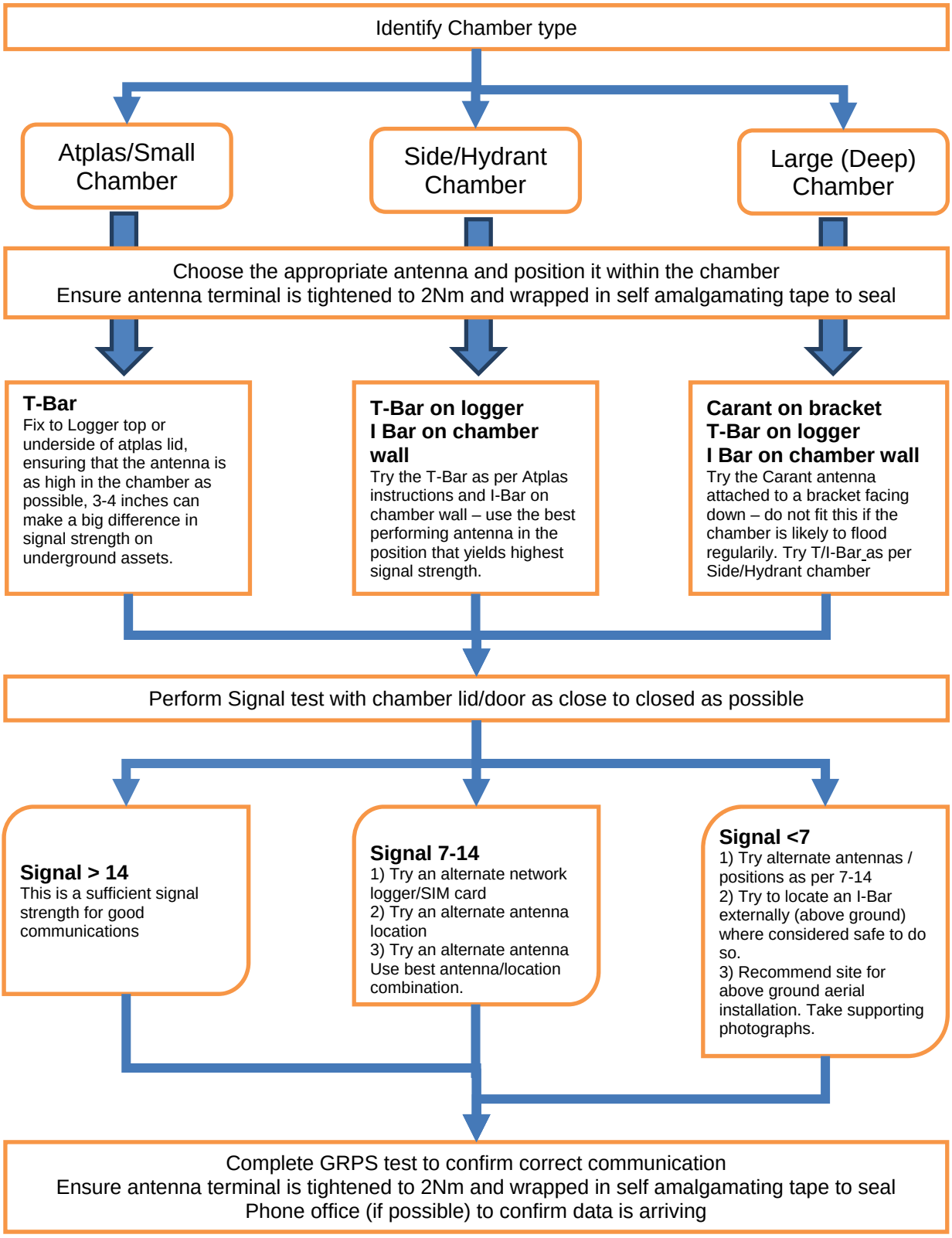
Installing a device without considering the type of antenna and its installation constraints can lead to disrupted and unreliable data communications and accelerated battery consumption. The following gives practical advice on how to minimise potential problems.

General Considerations

- Always perform multiple signal strength tests moving the antenna to different positions (please see below for description of signal strength test results).
- When performing Signal Strength Tests ensure that the chamber lid/cabinet door is in as close to normally closed position as possible to ensure an accurate result.
- Use the Radwin Network Test function to establish the service provider with the strongest signal at the particular location. (See page 26)
- Consider changing service providers when reviewing the results from the Network Test.
- Deploy the antenna as close to the surface as practically possible, especially when installing in a large chamber.
- If the device is installed in an underground chamber consider, where possible, locating the antenna in a secure position outside the chamber.
- Ensure that the antenna connector is in good condition and correctly tightened (finger-tight is not sufficient for the type of connectors used). Adequate tightening of the connector (2Nm) reduces the risk of water ingress and thereby signal attenuation as a result of changes in impedance.
- Never attempt to modify the dielectric seal of the antenna connector, it is designed to keep moisture away from conducting parts which lead to corrosion and attenuation.

- Consider using secondary environmental protection for the antenna connector such as self-amalgamating tape.
- If a logger is installed in a chamber that is likely to flood (e.g. an Atlantic Plastics chamber), position the logger upside-down in the chamber to avoid unnecessarily submerging the antenna connector.
- Use the shortest possible antenna lead.
- Where long transmission leads are required, consider using a low-loss alternative to corrugated copper cables, e.g. Times Microwave white braided coaxial cable.
- The signal emitted from any antenna submerged under water will be significantly attenuated; place the antenna in a location where it will not become submerged.
- Always ensure that the latest firmware is installed in the device.

Installation Process Decision Tree

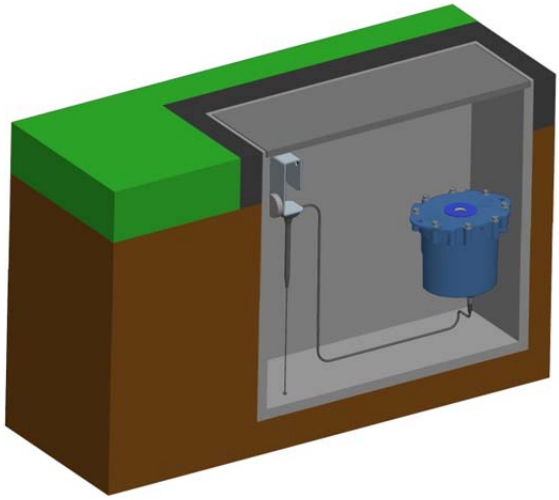


Cellular Network Signal Strength (as measured by Radwin Network Test)

0-7	Insufficient, the device may be able to register with network but will not be able to send or receive data.
7-14	Marginal, depending upon the ambient conditions data transmission may be possible, important to select the correct antenna and install it in the most suitable location.
14-21	Adequate, Data transmission should be reliable.
21+	Ideal, Strong signal strength data transmission will be reliable.

Antenna Options

Carant – For most installations the Carant antenna will give the best performance.

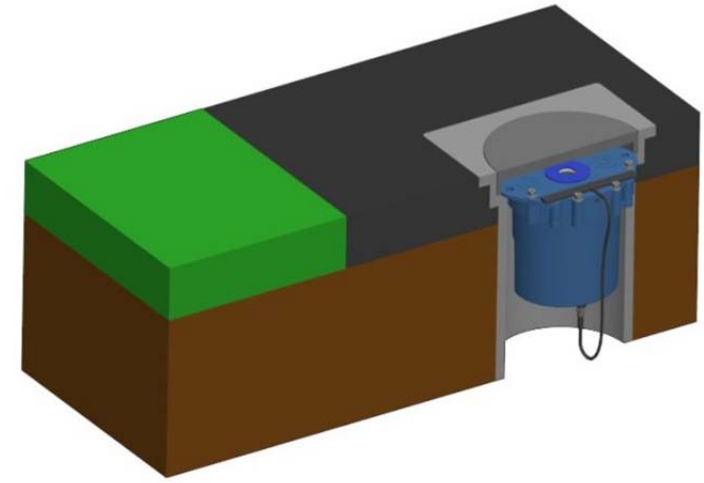


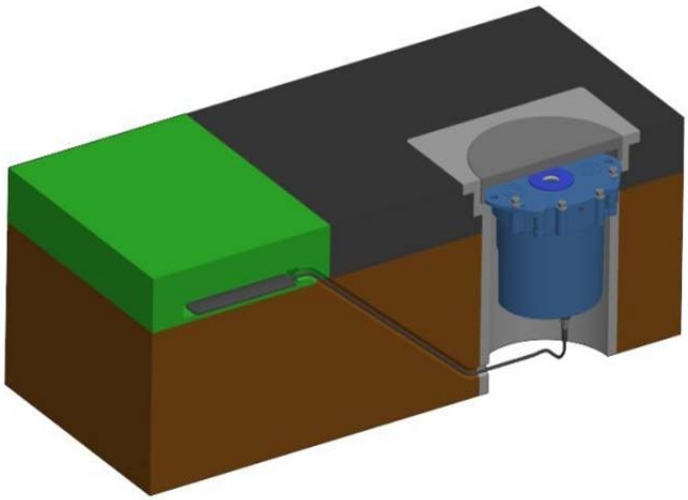
Carant Installations Considerations

For optimum performance the antenna requires a metal grounding plane, consider installing a metal bracket made of a ferrous material to attach the magnetic base of the antenna.

- Install the antenna near to as close to the surface in large underground chambers, ensuring that the lid will not interfere with the antenna when being opened/closed.
- This antenna is vertically polarised, it should always be installed in the vertical orientation.
- Never bend the radiating element of the antenna
- The Carant can also be attached to an installation bracket mounted to an existing marker post

T-Bar – This antenna is ideal for installing on top of the device especially in locations with restricted space.

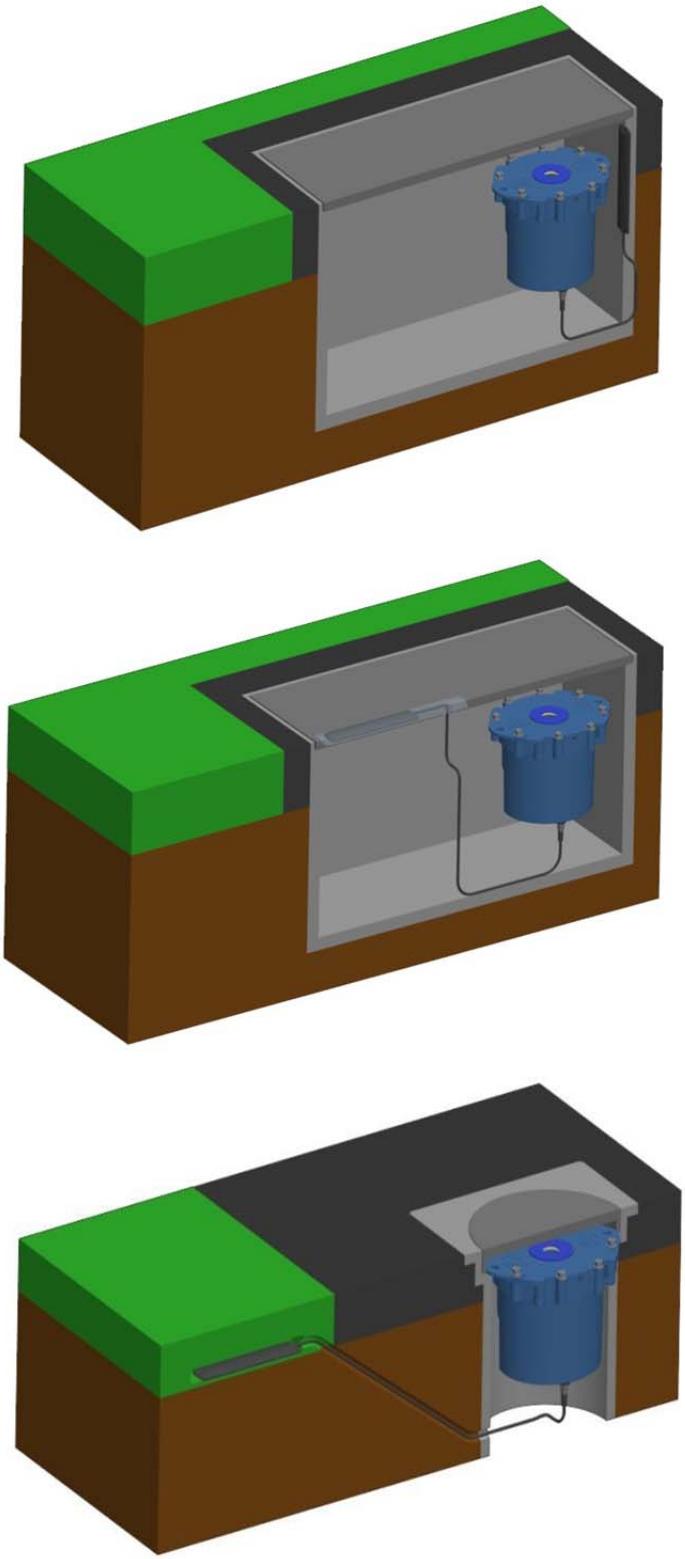


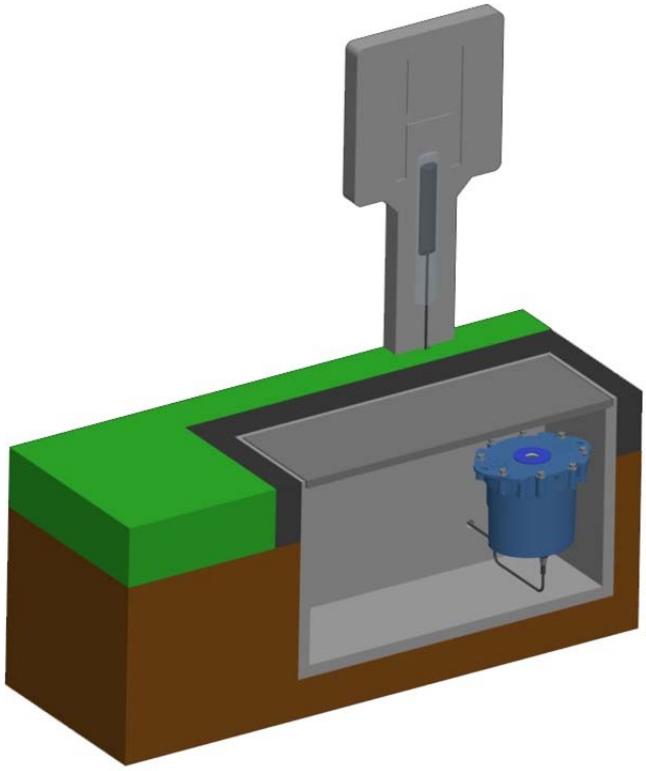


T-Bar Installations Considerations

- If burying the antenna, ensure it is not deep
- Adhere the antenna to external structures using marine quality adhesive (such as the brand ‘Goop’).
- Keep the antenna cable as short as possible, 0.5m.
- Avoid attaching the T-Bar to a metallic surface as this can adversely affect signal strength and performance, however it may be better than underground

I-Bar – The physical construction of this antenna makes it ideal for attaching to structures external to subsurface chambers.





I-Bar Installations Considerations

- Antenna can be attached to the side wall of a small chamber or to the top side of the chamber lid.
- With the use of a longer cable version (or an extension cable where absolutely necessary) and a sealing compound, this antenna can also be fitted in the ground, on marker posts, in cracks or brickwork near by to the chamber.
- If the antenna is to be placed outside the chamber care must be taken to physically protect both the antenna and cable from damage. This can be done by burying the cable or installing a suitable conduit.
- Avoid attaching the T-Bar to a metallic surface as this adversely affects signal performance

Adding an External Battery Pack

If you wish to make frequent data calls, then you will need to attach an external battery pack to your logger.
There are 3 types available

The number in the battery pack refers to the call in frequency that you can have to achieve a 5 year service.
So, the EXTBATTBOX60VF will last 5 years if the logger calls in once per hour, the EXTBATTBOX30 will last 5 years with a frequency of every 30 minutes (twice an hour) and the EXTBATTBOX15 will last 5 years with a frequency of every 15minutes (4 times an hour).

Choose the battery size most appropriate to your need.

Important: When placing the battery in the site, ensure that it is not crushing any cables other parts of the installation as they are heavy devices.

You have now completed your site installation and confirmed that the logger is operating and transmitting its data to DataGate™ (or your local data warehouse). The next section deals with how to use DataGate™ and HWMOnline™.

Installation checklist
Before you leave site, review the following items to be sure that the installation is going to be a good one.

- ☐ Have you calibrated and zeroed your pressure transducer?
- ☐ Have you run an instantaneous value to confirm data quality?
- ☐ Have you run the Radwin Wizard and set all calibration factors?
- ☐ Have you run a GPRS test to confirm communications quality?
- ☐ Have you confirmed the GPRS message was received by DataGate™?
- ☐ Have you sealed any joins in the pulser cable?
- ☐ Have you recorded all your site information, serial nos, photos, etc?
- ☐ Have you closed all open chambers and recorded any damage?
- ☐ Have you left all wiring tidy and safe – not tied to ladders?
- ☐ Have you removed all your installation tools?
- ☐ Have you recorded the GPS location of the logger?

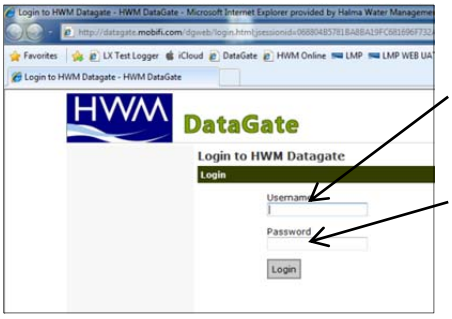
Using HWM DataGate™

DataGate™ is the HWM secure data warehouse and is the data storage system behind the HWMOnline™ viewing platform (see later in this guide). DataGate™ stores the data messages from the logger and the information required for displaying all the logger details on HWMOnline™.
When you ordered your logger(s) with your HWM account manager, you will have been supplied with a Username and Password to the HWM systems. You can use DataGate™ to view your logger information and add additional information such as a meaningful site name, GPS location details, useful notes about the site, etc.

The following section explains how to log in to the system, enter basic logger details and explain what the information provided means. DataGate™ and HWMOnline™ are supported by most internet browsers, but for the purposes of this guide, Internet Explorer is assumed.

1. Locate your Username and Password and using your internet browser navigate to http://datagate.mobifi.com

2. Enter your username and password and click <<Login>>

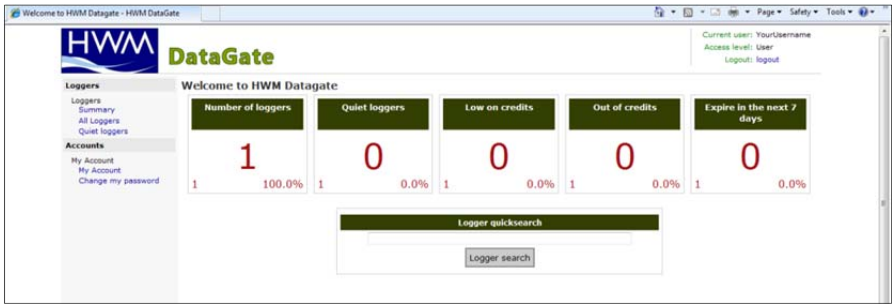


Your Username

Your Password

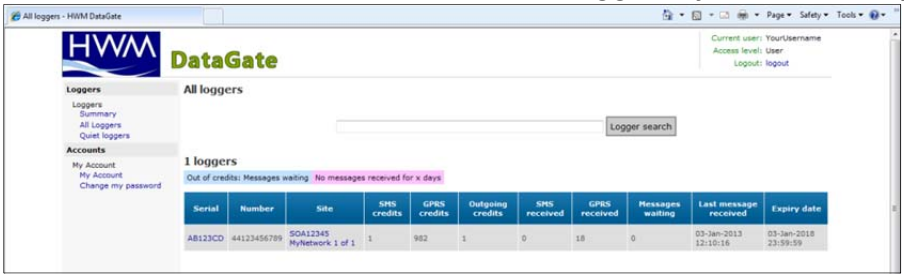
Note that passwords are case sensitive.

3. Once logged in, you will be presented with the main Summary screen. Here you can see a quick view of your logger fleet, showing the number of loggers in your fleet, the number of loggers that are not calling into DataGate (quiet), the number of loggers that are low or out of GPRS credits and the number of loggers whose contract is about to expire.



4. To see the full list of your loggers, click <<All Loggers>> from the left hand pane or if you know some detail about your logger, e.g. phone number or site info, enter it into the Logger quicksearch box and click <<Logger search>>.

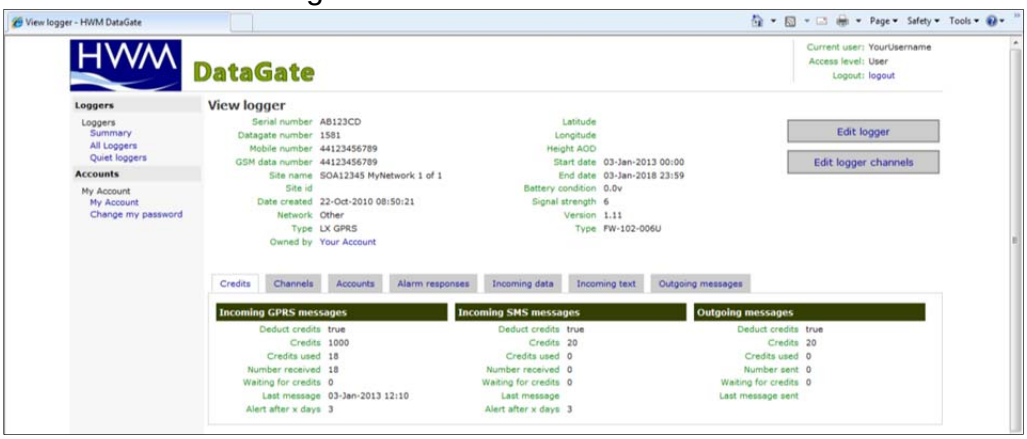
5. You will now see a list of all the loggers you have requested.



In this view from Left to Right the list shows:-

i. The logger serial number
ii. The logger's GSM telephone number
iii. The site ID for the logger
iv. The number of SMS message credits remaining
v. The number of GPRS credits remaining
vi. The number of outgoing message credits remaining
vii. The number of SMS messages received from the logger
viii. The number of GPRS messages received from the logger
ix. The number of messages waiting for additional credits to be loaded
x. The date and time that the last message was received from the logger
xi. The expiry date for the contract

6. Click either the logger serial number or the site ID for the logger you wish to examine/configure.

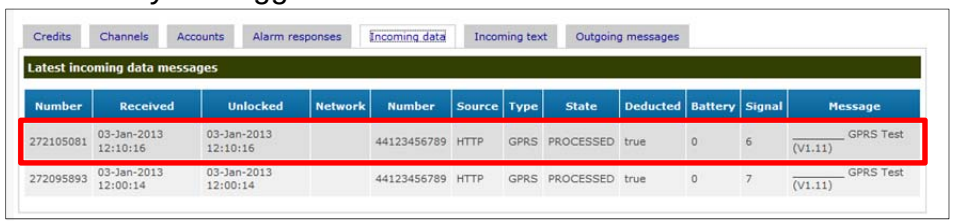


This screen displays the full details about the logger you have chosen, the example above corresponds to the logger that you configured in previous sections so you can now see all the data concerning your logger.

Most information regarding the logger will have been entered for you already by HWM, but the following steps will show you how to confirm reception of the GPRS test conducted earlier and how to adjust the Site details, such as Site ID and GPS position.

7. To verify the reception of messages, Click on the <<Incoming text>> tab

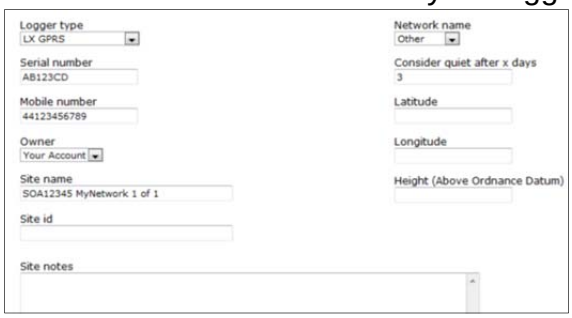
this will display a list of the last 100 messages received by the logger:-



In this view the GPRS test message that the logger sent in step 4 on page 24 can be seen (highlighted) confirming that the logger can successfully communicate with the data centre.

8. To edit the site information about the logger, click the <<Edit logger>> button. 

9. You can now enter/edit the information about your logger:-

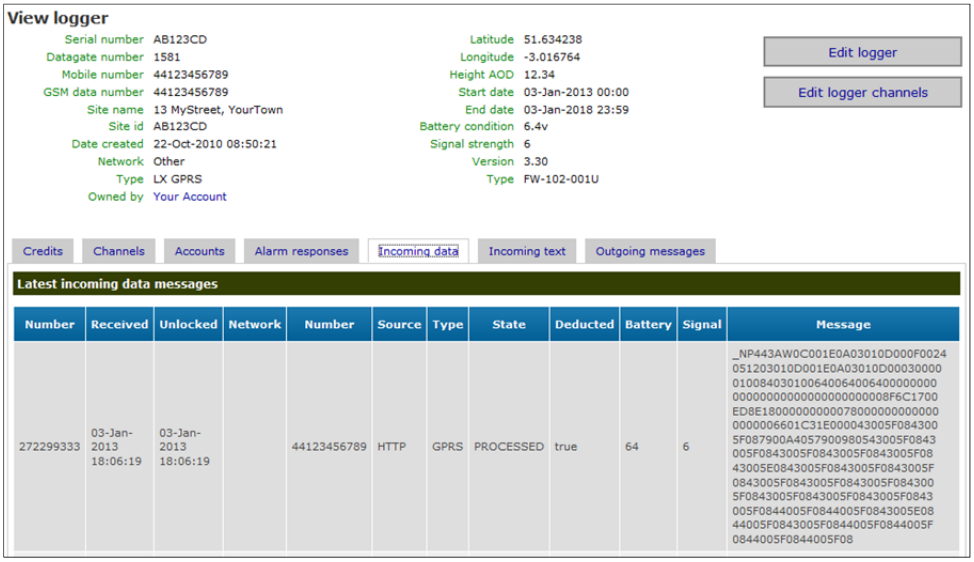


Fields that you can safely adjust are as follows:-

i. Mobile number – Where HWM fit the SIM card, this number is entered by the factory. If you have installed your own SIM card, enter the number here. This number must **exactly** match the one entered in step 9 on page 15, but **without** the leading '+'.
ii. Site Name – This is a long character string (up to 70 chars) for details of the logger location, e.g. 13 MyStreet, YourTown.
iii. Site ID – This is a shorter id, usually but not limited to the Zone/Location code of the logger, e.g. AB123CD.
iv. Site notes – This is a free entry field where you can put any relevant information you like, such as "Outside no 17" or "regularly overgrown", etc.
v. Consider quiet after x days – This allows you to define how long to wait before being alerted that the logger has stopped sending in data. When a logger is quiet for longer than the entered value, the entry in the "All Loggers" list will show in pink. The logger will also appear in the "Quiet Loggers" list.
vi. Latitude and Longitude – This is the precise location for the logger and allows HWMOnline™ to display the loggers location on a map.
vii. Height (Above Ordnance Datum) can be useful for computer network modelling.

10. Once you are satisfied you have all the information entered how you wish it, click <<Update Logger>> to store the data. 

11. Some information in the “View Logger” screen is only available once the logger has begun to call in. The Battery condition displays the voltage of the logger battery (or that of the external battery pack if connected) and the Signal Strength (also called CSQ) is the current GSM network signal strength. These two values are updated each time the logger makes a successful data call:-



So you now should have a complete set of information regarding your logger and by watching the “Incoming data” you can see its data transfer history.

Any further information regarding DataGate™ can be obtained from HWM support or your account manager.

Using HWMOnline™

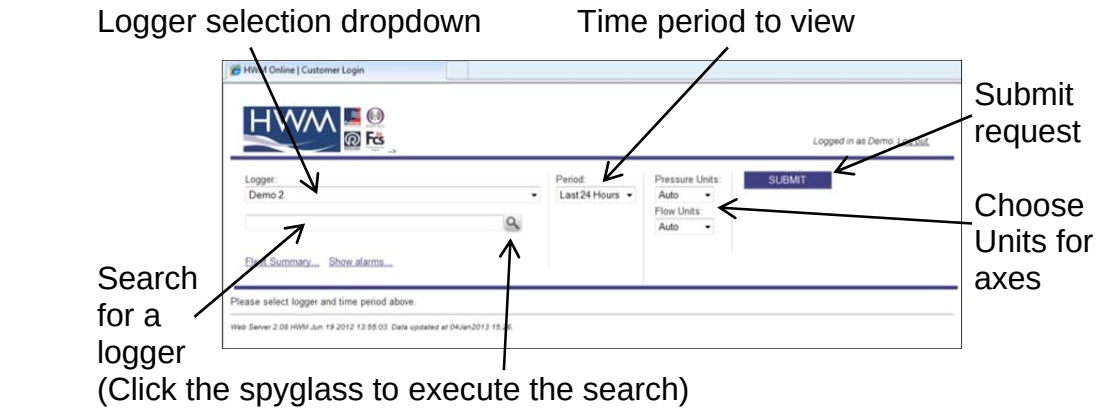
HWMOnline™ is a web viewing and management package for viewing the data for your fleet of loggers.
HWMOnline™ uses the data stored in the DataGate™ data warehouse to display charts for the data recorded by the loggers and other useful information like the location of the loggers.
If you have HWMOnline™ as part of your package, you will use the same username and password that was provided to you by your HWM account manager.

Viewing your data

1. Open a new web browser window and navigate to www.hwmonline.com

You will be asked to enter your Username and Password details.

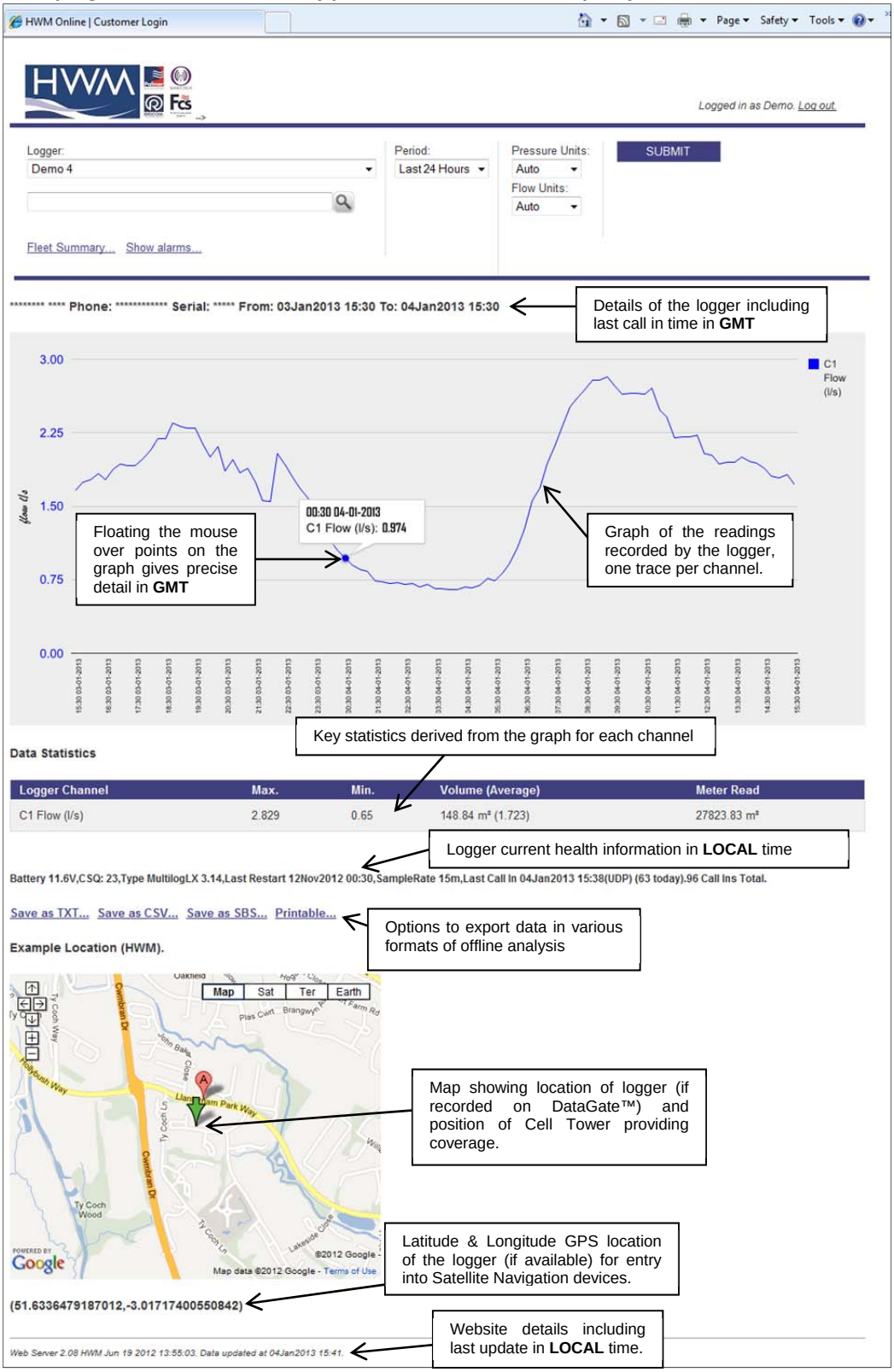
2. Once logged in successfully, you will see the main window below



3. Chose the logger you wish to view and the appropriate period & units and click <<SUBMIT>>
HWMOnline will then retrieve your data from DataGate™ and display it on the page.

Note: If your logger has not been able to communicate with DataGate™ then the message “No Data Has Been Received For This Location.” will appear. Investigate the cause of the communication issue of contact HWM support for assistance.

4. The page below shows a typical result of a site query:-



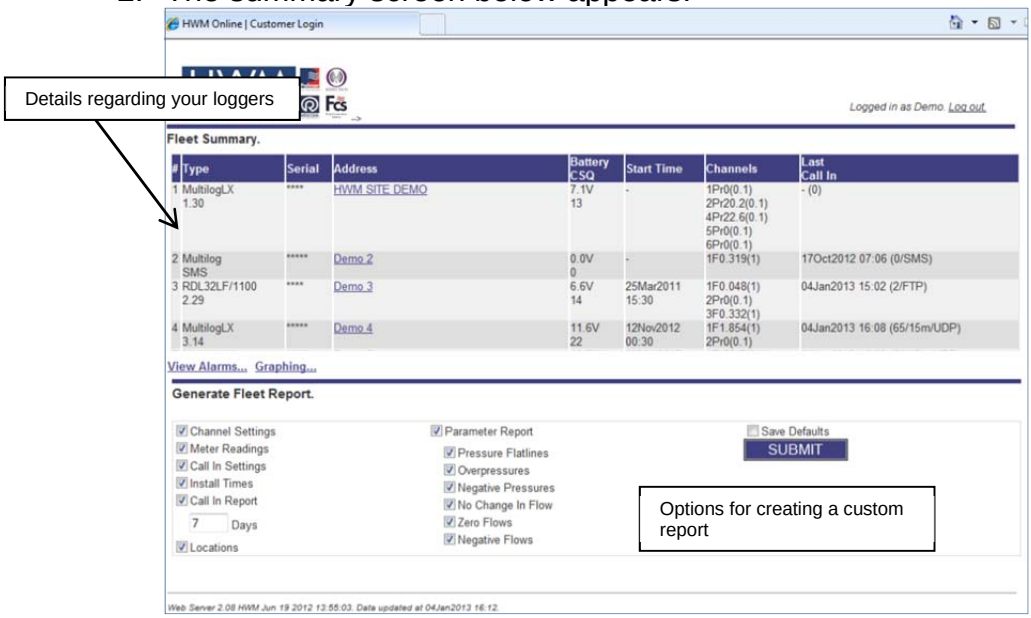
Note: The resolution of the graph reduces the more data you display. If you wish to zoom into an area of interest, use the “Custom” time Period and enter the precise range you wish to view.

Viewing information about your logger fleet

HWMOnline can also be used as a fleet management tool.

1. From the Home screen click the "Fleet Summary…" link.

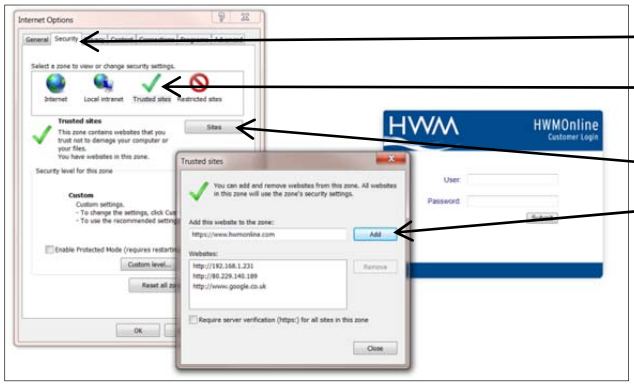
2. The summary screen below appears:-



3. From this screen you can either choose a logger to view or you can create a bespoke report containing details of your whole fleet of loggers.
   Tick the appropriate boxes in the "Generate Fleet Report" area and then click the <<SUBMIT>> button. Depending on how big your fleet is, this may take a few minutes to create. You can then choose to save the report file or open it immediately in MS Excel.
   Experiment with the settings until you find a format that you like, then tick the <<Save Defaults>> box so HWMOnline™ will remember the style for the next time.

A note about security settings

HWMOnline is hosted as an https:// site. If you do not see the maps on your browser, check your internet security options and add HWMOnline as a trusted site:-

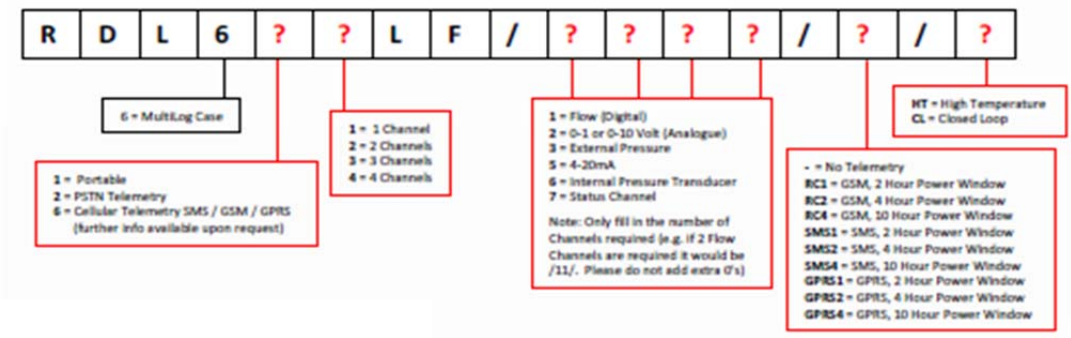


Select "Tools", "Internet options" and "Security".
Click "Trusted sites", then the <<Sites>> button
Click <<Add>> to add HWMOnline as a trusted site, then <<Close>> & <<OK>>.
You may need to restart your browser.

Technical Specifications

Sensor Input	Digital	Uni- or bi-directional pulse. Instrument powered or non-powered sensors eg PD100.
		Up to 128 pulses per second.
	Analogue	Internal Pressure Transducer
		0-20 bar / 0-200 metres head / 0-300 psig, repeatability ±0.1%.
		External Pressure Transducer (volt) or Transmitter (mA)
		0-20 bar / 0-200 metres head / 0-300 psig, repeatability ±0.1%
		4-20mA from isolated sensor
		0-1v, 1-5v, or 0-100mVolt
Logging Features	Memory	Primary recording 48,720 readings.
		Can be programmed to read continuously (cyclic mode) or for a specific period of time (block).
		Secondary recording 6,144 readings.
	Frequency	Sample Period - in 1 seconds increments, up to 24 hours settings independent for primary and secondary channel.
	Alarms	Minimum or maximum duration-triggered threshold alarm per channel. 16 Alarms per logger. Each alarm out comment field 16 characters. Can be programmed to auto dial up to 16 telephone numbers on alarm with telemetry option (ie 1 per alarm)
	Logger ID	Up to 8 alphanumeric characters – can be programmed with GIS number. Also readable factory set serial number in firmware
	Site ID	Up to 127 alphanumeric characters.
	Clock	On board 24 hour real time clock with date facility.
	Secondary Channel	Can be programmed to record either fast data, average minimum, average maximum or time interval between pulses (for data smoothing).
	Logging Modes.	Count and Event logging modes independent for both recordings
Communication	Serial	RS232 by MIL connector for connection to Rad Link hand held programming and data collection unit, laptop PC, desktop PC or Rad Net GSM telemetry unit. Programmable upto 19,200 Baud.
	Internal PSTN modem (option)	2,400 Baud Optional PSTN land line internal modem
	Cellular modem (option)	Quad Band Cellular modem (900, 1800, 850 and 1900 MHz) Optional power up time window to receive instructions by SMS
Physical	Dimensions	250H x 175W x 90D mm (9.9”H x 6.9”W x 3.6”D)
	Construction	Die-cast aluminium enclosure, powdercoat spray painted
	Weight	1.6 Kg (3.5 lb) [4.5 Kg (9.9 lb) Multi Log GSM 4hr]
	Operating Temp	-20 to +70°C (-5 to +160°F)
	Ingress protection	IP68 submersible
	Power	Lithium Thionyl-Chloride cell operational for 5 years under standard operating conditions, complete with low battery alarm

MultiLog Ordering Matrix



Appendix – Additional Information

Pulsers

There are many different types of pulse cable in use for connecting to meters. Below is a selection of pulse types and wiring configurations that may be useful. The variations are changing all the time so if your particular meter is not shown below, please contact your meter supplier for connection details.

Picture	Pulse Cable	Alternatives		HWM Cable
	Red			Blue
	Blue			Green
	Red	Brown		Blue
	Black	White		Green
	Red	Brown		Blue
	Black	White		Green
	Red	Brown	Red	Blue
	Black	White	Blue	Green
	White			Blue
	Brown			Green
	Yellow			Yellow
	Brown			
	White			
	Brown			Blue
	White			Green
	Blue			Blue
	Green			Green
	Red	Brown		Blue
	Black	White		Green
	Red	Yellow		Blue
	Black	Black		Green
		White		Yellow

Aquamaster connections – Yellow wire is Flow Channel 2 where required.

Picture	Pulse Cable	Alternatives		HWM Cable
Aquamaster Bulgin 	Blue			Blue
	Green			Green
	Yellow			Yellow
Aquamaster Souiau 	Blue			Blue
	Green			Green
	Yellow			Yellow

Meters & Pulse Value Guide

There are many different varieties of meters in use. Below is a selection of water meters with their appropriate pulse calibration factors that may assist in setup. If your particular meter is not shown below, please contact your meter supplier for pulse factor details.

Meter Type	Pulse Switch	Image	Litre per Pulse for logger
PSM			Meter register with 4 RED digits cal = 0.5
PSM			Meter register with:- 2 RED digits cal = 50 3 RED digits cal = 5
MSM Black			1
MSM Grey			1
Scocam Schlumberg			See label On screen for pulse value
Sappell			1

Sensus HRI A3			1
Actaris			See table 1
Helix 4000 Up to 100mm			Fitted at position:- 0.01 Cal = 10 0.1 Cal = 100 1 Cal = 1000
Helix 4000 Above 150mm			Fitted at position:- 0.01 Cal = 10 0.1 Cal = 100 1 Cal = 1000
Helix 3000 Up to 100mm	PD10 Or LRP		10
Helix 3000 Above 150mm	PD10 Or LRP		100
Helix 2000 Up to 100mm	PD10 Or LRP		10
Helix 2000 Above 150mm	PD10 Or LRP		100
Helix 2000 Master 40mm	PD10 Or LRP		1
Helix 2000 Master 50,80 &100	PD10 Or LRP		10

Actaris Flostar-M			See table 1
Actaris Woltex			See table 1

Meters used in conjunction with Cyble pulse units:-

All pulse values contained in the table below are expressed in litres/pulse.
Where an Emitter-S is necessary, the pulse value indicated on the register label should be used.

		Cyble k factor					
		1	**2.5**	**10**	**25**	**100**	**1000**
Meter type	**Size(s) (mm)**						
Aquadis	**15, 20, 25, 30, 40**	1	2.5	10	25	100	1000
	65	10	25	100	250	1000	10000
Flostar-M	**All**	10	25	100	250	1000	10000
Woltex	**50, 65, 80, 100, 125**	10	25	100	250	1000	10000
	150, 200, 250, 300	100	250	1000	2500	10000	100000
	400, 500	1000	2500	10000	25000	100000	1000000
Isoflo Combination *(Main)*	**50, 65, 80, 100**	10	25	100	250	1000	10000
	150	100	250	1000	2500	10000	100000
Isoflo Combination *(Bypass)*	**All**	1	2.5	10	25	100	1000

Table 1

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