



Multilog LX 2

Basic User Manual for DataGate™/ HWMOnline™ installation

Version 1.1



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

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WEEE and the Battery Directive

Waste Electrical and Electronic Equipment.

HWM-Water Ltd is a registered producer of Electrical and Electronic Equipment in the United Kingdom (registration number WEE/AE0049TZ). Our products fall under category 9 (Monitoring and Control Instruments) of The Waste Electrical and Electronic Equipment (WEEE) Regulations. We take all environmental issues seriously and fully comply with the requirements for collection, recycling and reporting of waste products.

HWM-Water Ltd is responsible for WEEE from customers in the United Kingdom provided that:

The equipment was produced by HWM-Water Ltd (Palmer Environmental / Radcom Technologies / Radiotech / ASL Holdings Ltd) and supplied on or after 13th August 2005
The equipment was supplied before 13th August 2005 that has been directly replaced HWM-Water Ltd products manufactured since 13th August 2005.

HWM-Water products supplied after 13th August 2005 can be identified by the following symbol:



Under HWM-Water Ltd's Terms and Conditions of Sale, customers are responsible for the cost of returning WEEE to HWM-Water Ltd and we are responsible for the costs of recycling and reporting on that waste.

Instructions for returning WEEE:

Ensure that the WEEE meets one of the two conditions above.

The waste will need to be returned in accordance with the regulations for transporting data loggers with lithium batteries.

- a. Pack loggers in strong, rigid outer packaging to protect them from damage.
- b. Attach a Lithium Warning Label to the package.
- c. The package must be accompanied by a document (e.g. consignment note) that indicates:
 - i. The package contains lithium metal cells;
 - ii. The package must be handled with care and that a flammability hazard exists if the package is damaged;
 - iii. Special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
 - iiii. A telephone number for additional information.
- d. Refer to the ADR regulations on shipping dangerous goods by road.

Return the WEEE to HWM-Water Ltd using a licensed waste carrier.

In accordance with the regulations, customers outside the United Kingdom are responsible for WEEE.

The Battery Directive

As a distributor of batteries HWM-Water Ltd will accept old batteries back from customers for disposal, free of charge, in accordance with the Battery Directive.

PLEASE NOTE: All lithium batteries MUST be packaged and returned in accordance with the relevant regulations for transporting lithium batteries.

A licensed waste carrier must be used for transporting all waste.

For more information on WEEE compliance or the Battery Directive please e-mail CSservice@hwm-water.com or phone +44 (0)1633 489 479

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, should be available from our website.

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 LX 2 data logger
- Software Installation Tool (IDT) from www.hwmglobal.com or CD-ROM
- External GPRS Antenna (optional)
- USB IR Reader (optional)
- Connection cables (optional)
- External battery and appropriate cable (optional)
- Hanging bracket for logger, external battery and logger (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.

You will need to have:-

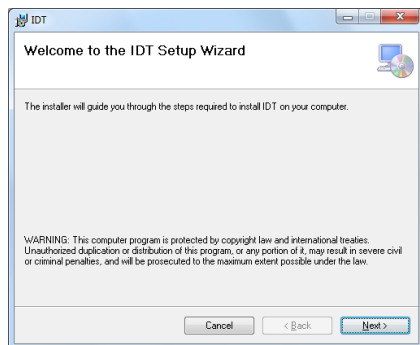
- A valid HWM-water.com account with username & password.
- A valid HWM DataGate™ account with username & password. See DataGate™ setup later in this manual.
- A PC with Windows 7/8/10 installed (IDT also supports Windows XP & Vista) 32bit and 64bit systems are supported.
 - Minimum Requirements are:-
 - 1GHz processor
 - 512Mb RAM
 - 2GB Disk Space
- A USB IR Reader for connection to the logger.
- A description and reference number for the installation site.
- 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 the appendix 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 installation file from the HWM website at www.hwmglobal.com)

NOTE: If you use proprietary archiving software, such as WinZip or 7zip, please ensure that you extract the files to a temporary folder using the automatic extraction buttons that maintain the original folder structure.

2. Ensure you have system administration rights for your computer, ask your IT department if you are unsure.
3. If the installation does not start automatically, locate and run the file “setup.exe” (in the IDTInstall/IDT folder), which installs the program and the necessary USB drivers for the device.



4. Follow the on screen installation instructions to complete the install of the IDT.

Should the automatic installation fail, please check with your system administrator that you have sufficient rights to install the driver or try installing the drivers manually.

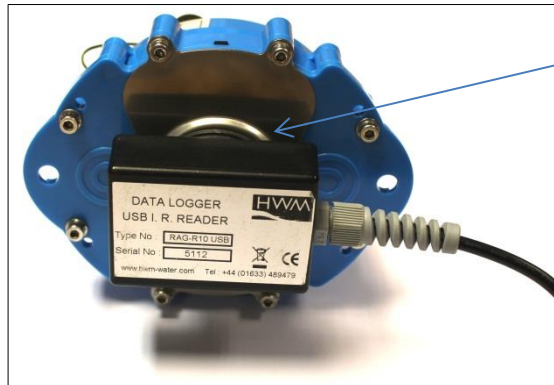
You may be required to update Microsoft.Net; the install file is included with the IDT setup files for your convenience.

Installation and site hardware Diagnostics Tool (IDT)

Once you have installed the IDT, connect the USB IR Reader to your PC.

The first time you connect your IR Reader to a new USB port, Windows will configure the driver, wait until this process is completed before proceeding.

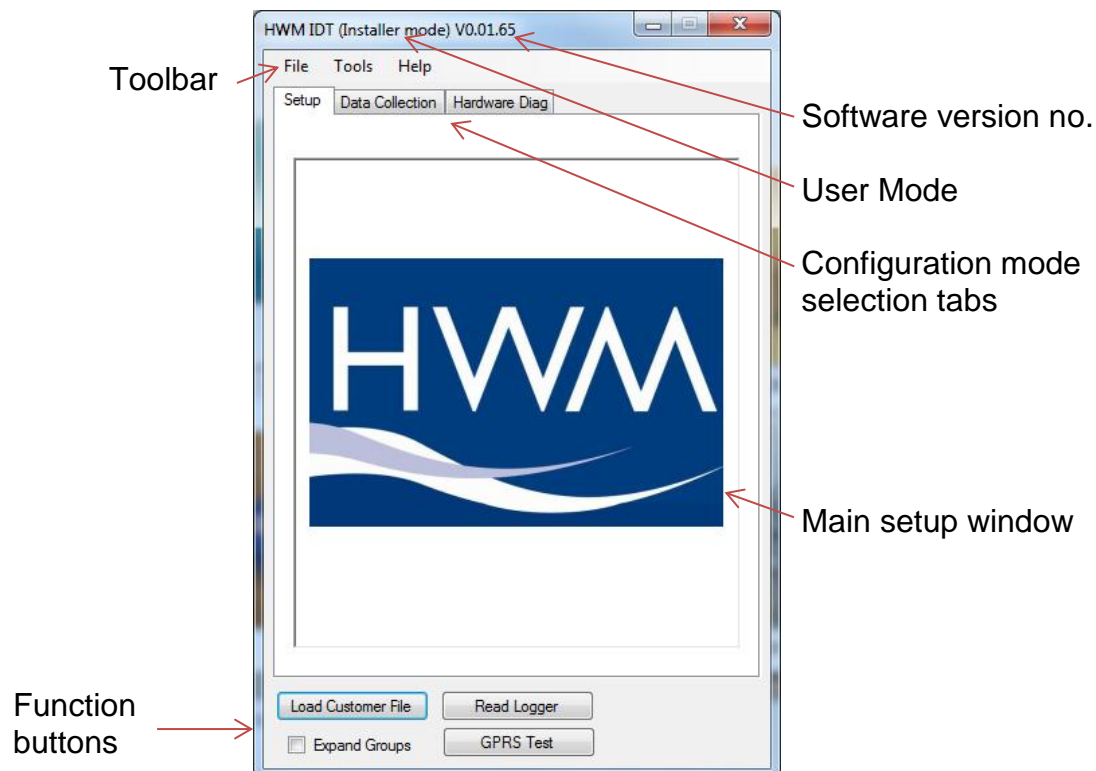
Position the reader head on the logger as shown below:



Take care to position the head over raised ring area around the window. The reader head will hold onto the logger by magnets in the ring around the window and this helps with positioning.

Reading the logger

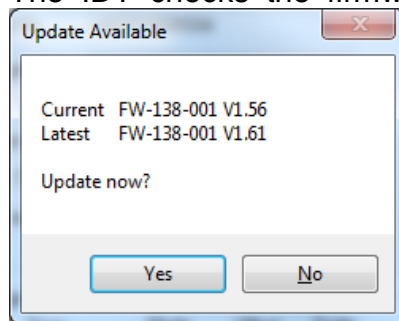
1. Run the "IDT" program.
2. The main window will appear of which the main items are:-



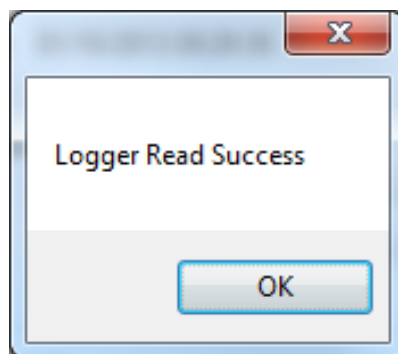
3. Now click the <<Read Logger>> button to load the current logger settings into the setup window.
4. The IDT will now download the current settings from the logger.

At this point the IDT will check to see if there is a more up-to-date version of the logger firmware available on your PC, if so, you will see the message "Update Available". Click <<Yes>> to update the logger, the process will take approximately 2 minutes, however the logger will be restarted so you may wish to transfer any logged data first, in which case click <<No>>.

The IDT checks the firmware version each time you read it.



5. Once all the settings have been loaded you will see this message, Click <<OK>> to start configuring your logger.



Configuring the logger

1. You will now see the main setup menu (expanded for illustration purposes)
The menu is structured in sections for easy setup and changes content depending on type of logger connected and software mode:

i) Logger Details including ID and SIM card phone number

ii) Logger start time and data capture interval (days or time of measurement period)

iii) Logger channel configuration including calibration factors (see appendix for info)

iv) Logger recorded meter readings

v) Cellular data service provider settings

vi) Data call settings

Data Destination details, the server address for the UDP data

vii) Backup call in timing details in case of main call failure or external battery exhaustion and SMS message destination number

viii) Alarm configuration (Advanced mode only)

Final Setup button and logger time zone selection

Main function buttons

HWM IDT (Installer mode) V1.00.02

File Tools Help

Setup Data Collection Hardware Diag

Unilog on COM38

Logger

Type FW-138-001 V1.66 (Recording)

ID COMLog1

Serial No 13

Tel No +447416695594

logger time 02/10/2013 13:56:19

Logging Parameters

Start Time 02/10/2013 09:55:00

Log Interval 0 days 00:15:00

☐ 24 Hours

Channel Configuration

	Type	Mode	Offset	Scale
Ch1	Flow1	Avg		1.000
Ch2	Flow2	Avg		1.000
Ch3	PCB-T	Avg		

Meter Readings

Meter read ch1 (m³) 00000008.420

Meter read ch2 (m³) 00000025.120

APN

☒ Use GPRS test to choose APN settings

☐ Use the following settings.

Time(s) Data is Sent

Address	Type	Mode	Freq hh:mm
On	UDP	Freq	00:15

Data Destination

Address inbound.hwmonline.com

Port 23024

Fail back dial time

18:00:00 Time 1

06:00:00 Time 2

SMS No. 310000202

Alarms

Alarm Call frequency hh:mm 00:05

MNF Window end hh:mm 06:00

Flow level units Litres/sec

☐ Alarms sent via SMS

Alarm SMS No

Cond 1 Cond 2 Cond 3 Cond 4 Cond 5 Cond 6

Persistence

1 out of 1

☐ Lower

☐ Upper

☐ MNF

☐ ROC

☐ Dif>

☐ Dif<

☐ Out Band

☐ In Band

Setup Logger

UTC Time

Load Customer File

Read Logger

GPRS Test

Expand Groups

2. Now you can enter the configuration you require for each section
 - i. **Logger** – enter the site ID that you wish for the logger, e.g. Postal/ZIP code up to 7 alpha-numeric characters and the telephone number associated with the SIM card. If you ordered a SIM with the logger, this will have been programmed already for you, otherwise enter the number from your service provider in international format (e.g. +44...)
 - ii. **Logging Parameters** – Accept the default start time or enter your own. Default start time is in the past so the logger will begin recording immediately. You can delay this start time by selecting one from the calendar or enter the time directly from your number keypad. Set your log interval by ticking the “24 hour” box or enter a shorter time in the time box. (Default is 15mins)
 - iii. **Logging Channels** – Here you can configure your connections and what data you wish to see.

From the dropdown box select the Type of data to appear on Channel 1. This will depend on your individual order, but you may have a selection like that show here. Click “-----” if you do not wish to use that channel.

Next choose what mode of collation you wish
 Avg = average reading over the log interval
 Min/Max = Min/Max values measured over the log interval
 Spot = The value at the log interval
 State= the state of the switch at the log interval

Now, if required, enter the scaling factor for the chosen Type of logger input, click in the box and enter the multiplication factor you require. See appendix for info.

- iv. **Meter Readings** – If you wish the meter reading to be sent through to HWMonline, enter the current value in the box(s). This needs to be configured on site as the timing is important, however it can be corrected later via HWMonline.
- v. **APN** – If you have ordered a data pack from HWM you can leave this setting alone (as below) as your logger will have been preconfigured by HWM.

If you have ordered your data service & SIM card, then you will need to separately configure your service. HWM recommends that you allow the GPRS test utility to search for these settings automatically, however if you wish to enter them manually, click the button beside “Use the following settings”

You can now enter your data service provider’s details into the appropriate boxes.

Alternatively select your network from the drop down list of presets

- vi. **Time(s) Data sent** – Here you specify the Call Out requirement for the logger. There are 2 modes available, SMS and UDP. SMS is a one way unacknowledged data transfer service using the common text messaging service. UDP is a true 2 way confirmed data transfer process via the internet over a GPRS connection. Both have advantages, however HWM recommends UDP wherever possible as this offers the most secure method of data transfer.

Switch on the Call out by selecting “1” in the Address selector, then choose UDP or SMS from the Type selector.

- vii. **Call Addresses** – These will usually have been entered at the factory and should not be adjusted, however if you have your own data server, then you can enter either the telephone number for your receiving modem, or the UDP address & port no for where the logger is to send its data.

The fall back times specified here instruct the logger what to do in the event of the primary Call Out requirement not being met. This can be for 2 reasons:-

- a. If a connected external battery goes flat, the logger will default from the normal call out requirement to a 2 times per day routine. The times of these calls are specified by both Fall back 1 & 2.
- b. If a GPRS data call cannot be completed due to non-availability of a GPRS service, then the logger will try to send an SMS message at the Fall back 1 time.

Now choose your Call out mode, this can be either “Freq” for a call made at a regular frequency throughout the day or “Time” to specify up to 8 individual times during the day. Enter either the frequency (e.g. 00:05 minutes) or the time for the call in the box.

- viii. **Alarms** – The Multilog LX 2 has a comprehensive alarm system that you can configure to send out Alarm messages when certain defined conditions are breached.

When an alarm condition is triggered a new call frequency can be specified to allow the observer to gain more up-to-date data during an event.

Minimum Night Flow is measured between Midnight and the time specified here.

Choose your flow units

If you want SMS alarm messages to be sent, tick this box and enter a phone number

There are 8 possible different alarm conditions that can be configured, select each one from the tabs.

Choose the main alarm channel and then the difference channel if making a comparison.

Set your persistence or trigger point, e.g. 3 occurrences out of 5 incidents triggers the alarm

Choose your type of alarm from the list:-

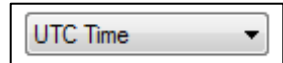
Lower or **Upper** Limit breach
 Minimum Night Flow (**MNF**) not met
 Rate Of Change (**ROC**) faster than x per minute
 Difference (**Dif**) between channels greater or less than limit
 Either **In** or **Out** of **Band** set by Upper & Lower levels

Enter the alarm threshold

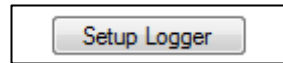
Enter the alarm clear Hysteresis

Note on Hysteresis: When an alarm is triggered, if the value is set to zero then immediately the threshold is re-crossed then another clear message will be sent. If there is a period when the alarm threshold is borderline, this can result in numerous messages for the same event. By specifying a value in the Hysteresis box, you can provide a window that allows the threshold to be repeatedly crossed without sending repeated messages. e.g with an Upper limit of 5 and a hysteresis of 1, the alarm will trigger at 5, but the clear message will not be sent until the value drops to below 4.

3. Final steps – By default the logger is set to UTC (Coordinated Universal Time, equivalent to GMT), however you can choose either an offset from this time, or for the logger to use your PC time.

A rectangular button with a light gray background and a thin black border. It contains the text "UTC Time" in a dark blue font, followed by a small black downward-pointing triangle on the right side.

When you are happy with all the settings click the <<Setup Logger>> button to program the logger.

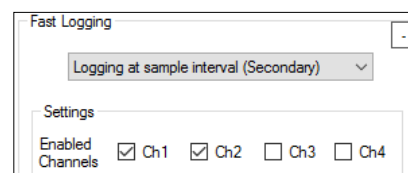
A rectangular button with a light gray background and a thin black border. It contains the text "Setup Logger" in a dark blue font.

Enhanced Recordings

The logger is capable of making additional recordings at higher than normal sampling rates. It works in two basic modes, Recording at specific times to allow you to manually set events to be recorded at higher speed and Recording triggered on alarm event where the logger monitors a sensor and if the value exceeds that programmed then the logger makes a recording.

1. Choose your Sampling Frequency.

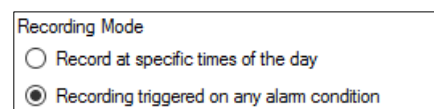
You can select either the base system Sample Interval, this is the rate that the logger normally samples at before making its average calculation, or you can choose one of the available Sampling Frequencies (greater than 1Hz).



A screenshot of the 'Fast Logging' settings window. It features a dropdown menu labeled 'Logging at sample interval (Secondary)' and a 'Settings' section with 'Enabled Channels' and checkboxes for Ch1, Ch2, Ch3, and Ch4.

2. If available, choose the channel you wish to sample. Note that the faster sampling rates are fixed to the primary analogue recording sensor, e.g. Pressure, so you cannot select any other channels.

3. Now choose your operating mode.



A screenshot of the 'Recording Mode' selection area. It contains two radio buttons: 'Record at specific times of the day' and 'Recording triggered on any alarm condition', with the latter being selected.

Recording at Specific times

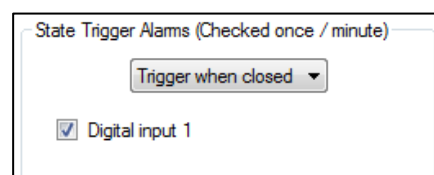
1. Choose the duration of the recording or set the Stop time for a specific time period.
2. Choose the repetition settings.
3. The logger will make recordings and send them to the data system at the pre-determined times.



A screenshot of the 'Recording at specific times' settings window. It includes fields for 'Start time' (23 Mar 2017 02:30 00), 'Duration of each recording' (15 minutes), and two 'Make' dropdown menus set to '2 recordings per day' and '10 minutes apart'.

Recording triggered by an external State Switch

1. Choose which switch state should trigger the recording.
2. Choose which digital input that the switch is connected to.
3. Logger will now start the accelerated recording when the switch is closed. Note that the state switch is sampled **once per minute** regardless of the sample rate setting. If faster rates of state checking are required, the standard alarms should be used.



A screenshot of the 'State Trigger Alarms (Checked once / minute)' settings window. It shows a dropdown menu set to 'Trigger when closed' and a checked checkbox for 'Digital input 1'.

Recording triggered on alarm event

1. Choose the amount of data to be stored before the alarm is triggered and duration of the recording.
2. Configure your alarm condition to trigger the recording. In this example, the logger will trigger a recording of 16mins (including 1m from before the trigger) when the alarm for the primary analogue channel (e.g. Pressure) passes the upper level of 52.0

☒ Recording triggered on any alarm condition

Recording Trigger Conditions

Trigger channel

☐ Low level trigger value

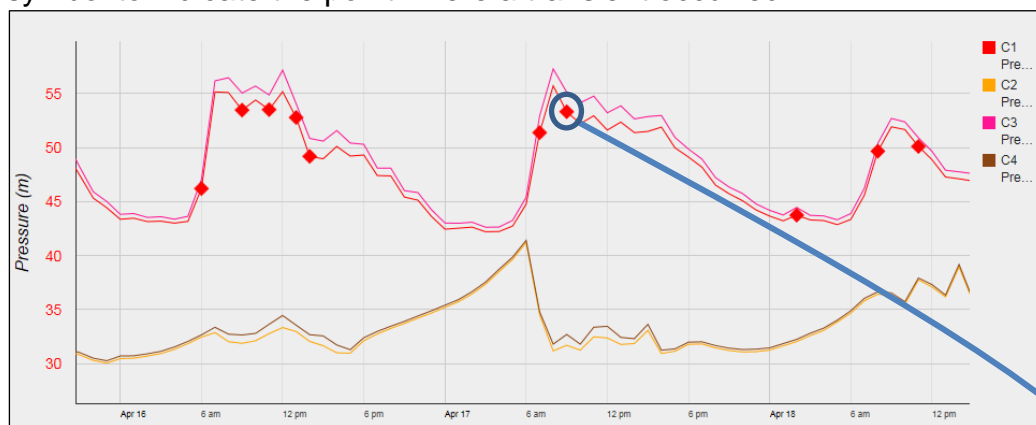
☒ High level trigger value

Include

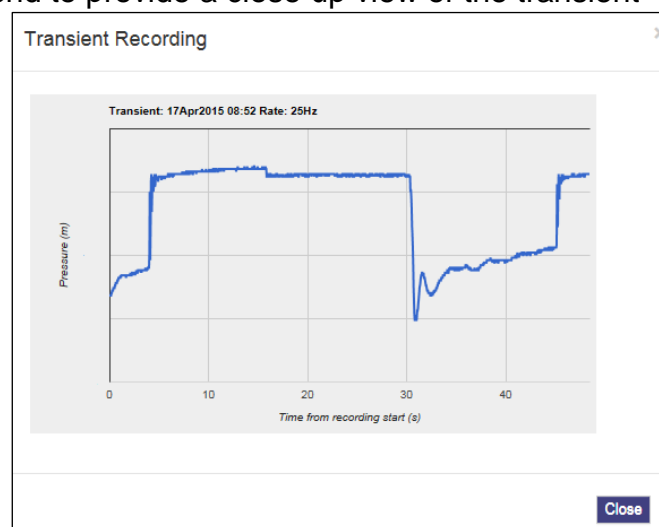
Duration of each recording

Additional notes:

The data will be displayed on HWMOnline as additional traces on the graph for a Sample Frequency setting of Sample Interval. For higher Sample Frequency rates the primary trace on HWMOnline will display a diamond symbol to indicate the point where a transient occurred.



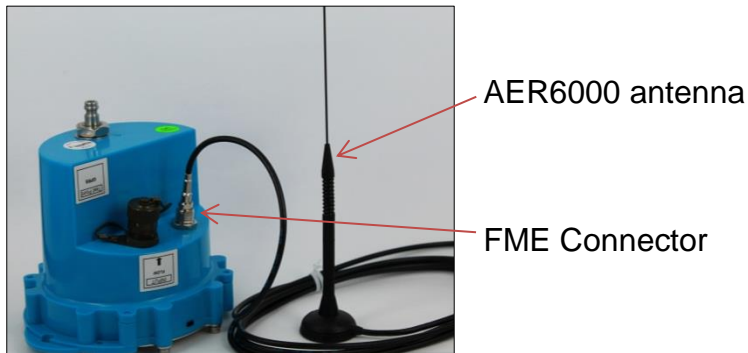
Click the diamond to provide a close up view of the transient



Data Communications Confirmation – GPRS Test

It is important to confirm that your logger is communicating with the data server 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.

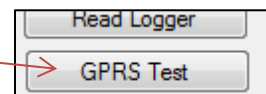
1. Connect an appropriate GPRS antenna to the FME socket on the logger. The location on the logger can vary depending on the configuration of logger ordered, but the picture below illustrates a typical connection.



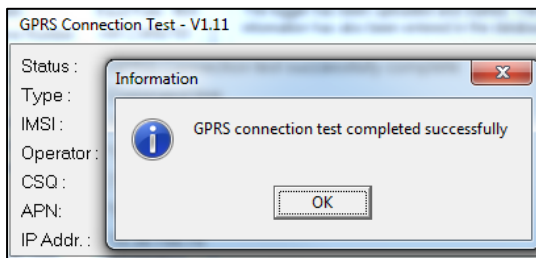
Note: If this is the final Antenna connection, ensure that the connector is tightened with spanner or pliers to prevent water ingress to the antenna plug as this will reduce performance. Do not over tighten.

2. Run the IDT and read your logger as in steps 1 to 3 above.

3. Now click the <<GPRS Test>> function button.



4. The GPRS Test program will now automatically execute a communications check with the data server, 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; relocate the logger if more frequent communications is required.
Network signal not strong enough. You need a CSQ (reported by the GPRS test) of at least 8 for reliable communications.	Relocate the antenna if possible or try alternative antenna configurations. Ensure antennas are vertically orientated where possible. See Antenna 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.

Antenna installation considerations

The method of installation at site should be carefully selected.

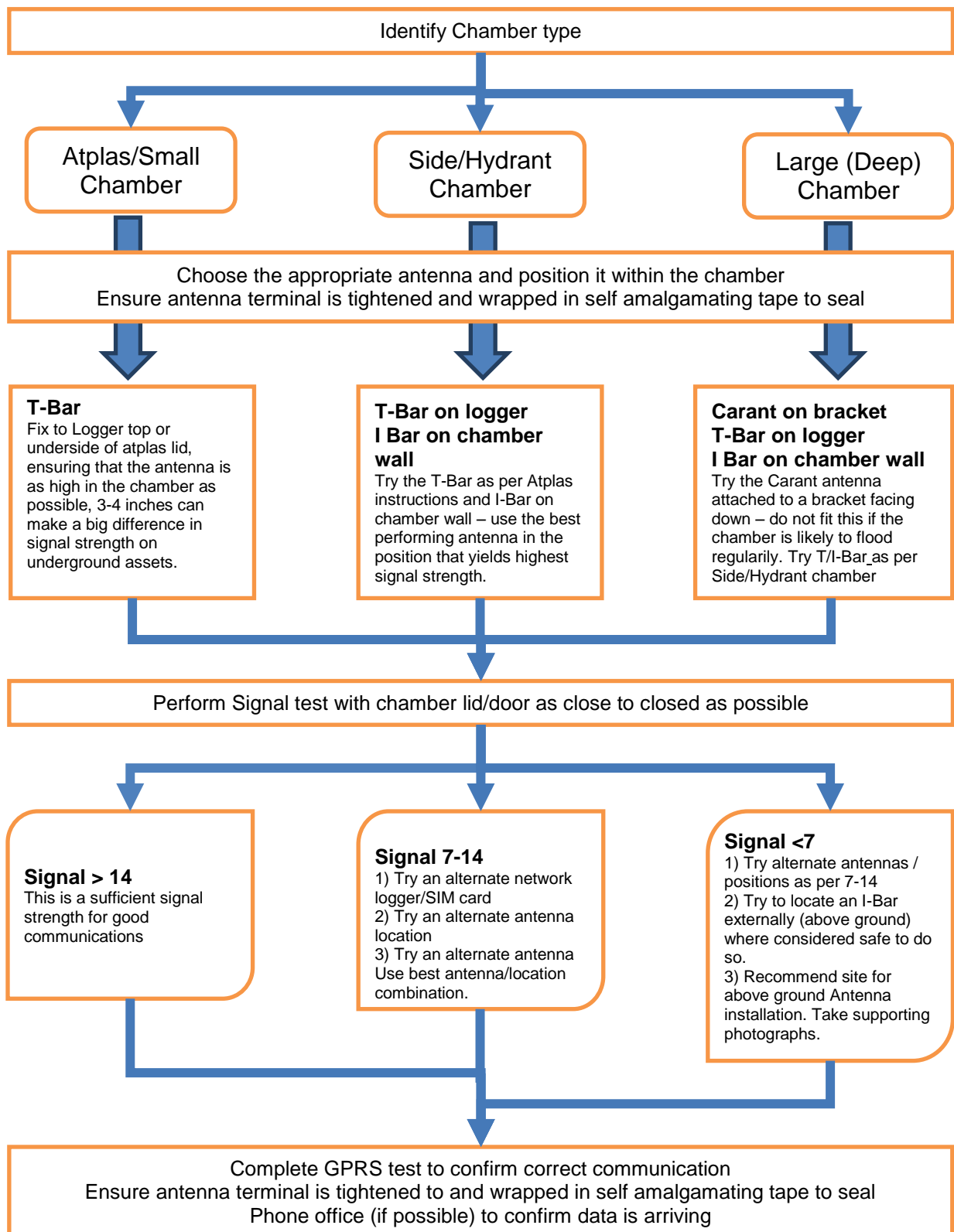
Signal strength within the cellular network can vary dramatically even within the same cell; proximity to the transceiver, type of antenna, position and angular orientation of the antenna, all have a significant effect on the ability of a device to reliably communicate with the cellular network. To ensure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

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.
- 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 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 and ensure that there are no kinks or tight radius bends in the cable. **A kinked cable can cause signal loss.**
- 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

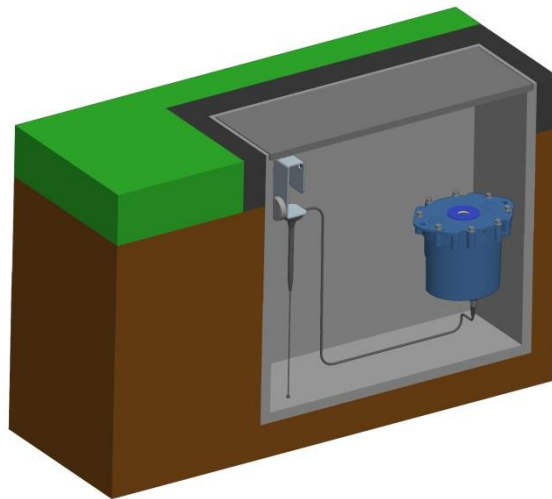


Cellular Network Signal Strength (as measured by CSQ Test)

- 0-7 Insufficient, the device may be able to register with network but will not be able to send or receive data reliably.
- 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 Monopole antenna – For most installations the Carant antenna will give the best performance.

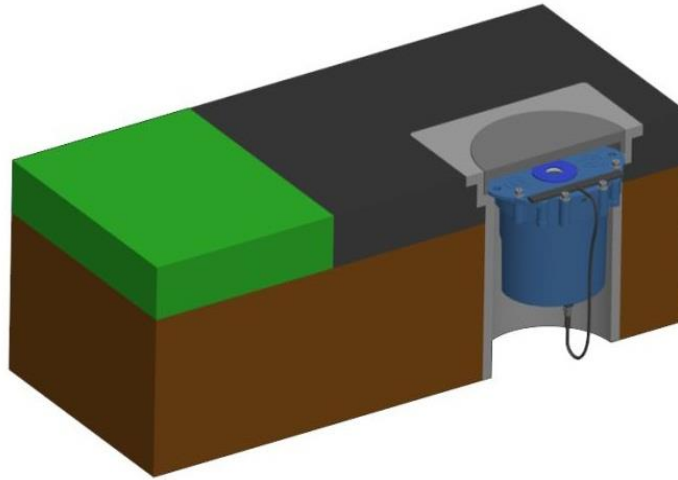


Carant Installations Considerations

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

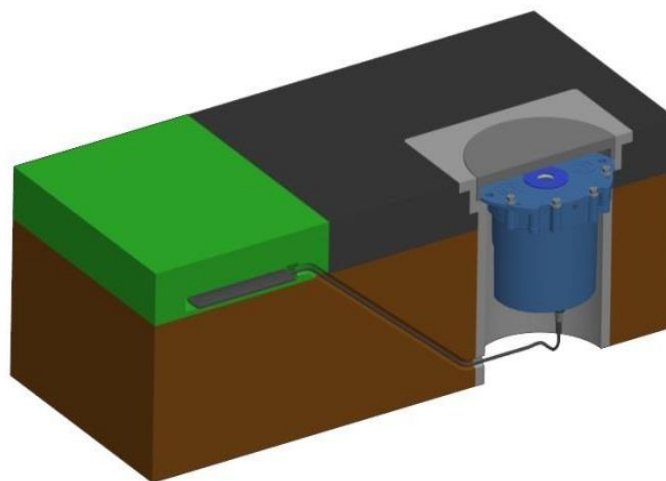
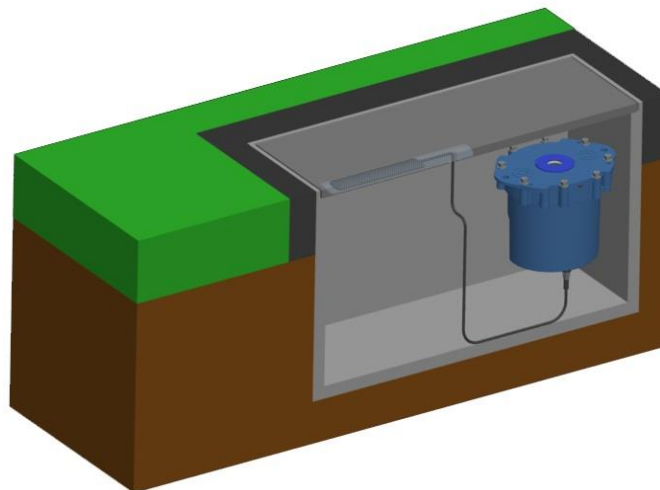
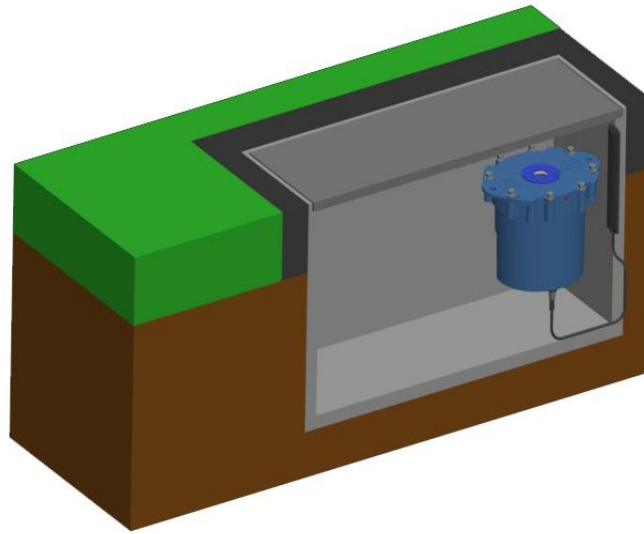
T-Bar – This antenna is ideal for installing on top of the device especially in locations with restricted space.

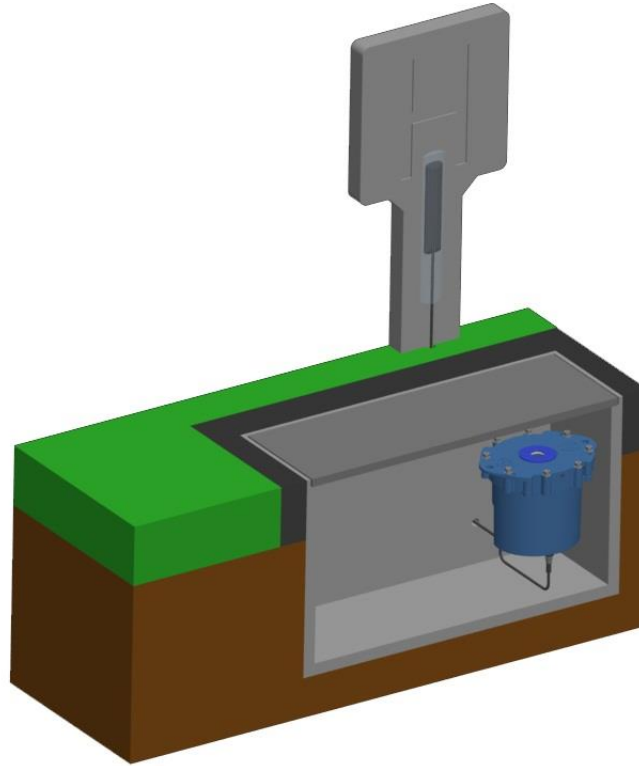


T-Bar Installations Considerations

- 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 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 I-Bar to a metallic surface as this adversely affects signal performance

Locating in plastic lidded chambers

Plastic lids usually have a metal plate fitted to the lid sometimes on the back or internal to the construction of the lid.

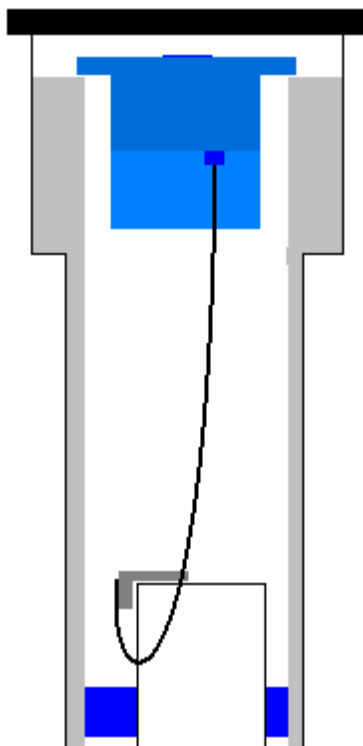
Internal aerial loggers may be more suitable for plastic lidded chambers but in some situations external aerials should be considered.

The frost plug should always be fitted so as not to interrupt radio reception.

Drilling into the side of a plastic chamber is not recommended and could be dangerous due to the high chance of damage to other services in close proximity.

Multilog LX 2 Installation in Atplas box

The design of the Multilog LX 2 means it is the correct size to rest on the ledges at the top of an Atplas chamber.



If the logger has an internal antenna, then it should be mounted in an offset position to avoid being directly underneath the metal plate moulded into the Atplas chamber lid.

Multilog LX 2 Installation in Talbot round lid box

The Talbot equivalent of the Atplas has a larger distance between the white ledges at the top of chamber meaning that when installed if there is vibration then the logger can slip off and fall to the bottom of the box.

To overcome this the logger should be fitted at an angle so the logger is in a “pre-slipped” position.

The a logger with an internal antenna should be mounted in an offset position to avoid being directly underneath the metal plate moulded into the Talbot chamber lid.



Multilog LX 2 Installation in Talbot – Flip Lid box

When correctly installed the Talbot flip lid box offers a smooth vertical tube with no available fixing point for the LX logger.



A magnet with “p” clip can be attached to the lid and the logger suspended from a cable tie.

A 6mm plastic tube can be pushed down the outside of the chamber and the logger hung on the protruding end.



Button – The button antenna is designed for mounting into chamber lids.



Button Installations Considerations

- Antenna needs to have the chamber lid drilled out as the top surface of the antenna needs to be 0.5mm below the surface of the lid to prevent damage.
- Use a 31mm core drill to make a suitable countersink in the lid to fit the antenna.



These are available from specialist tool suppliers.

- Once fitted, cover the top of the antenna with a resin epoxy such as Marine “Goop”

Installation pictures:



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.



Important: When placing the battery in the site, ensure that it is not crushing any cables or other parts of the installation as they are heavy devices. Also respect any orientation arrows on the pack to optimise battery life.

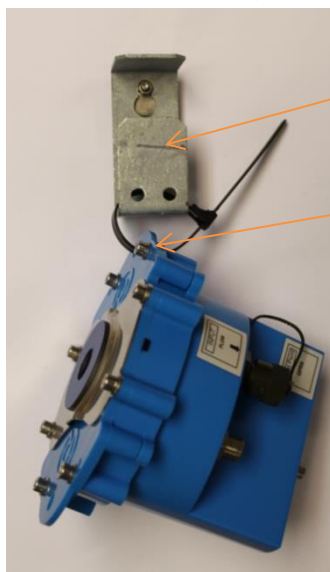
Installing your logger at site

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, the following recommendations will assist in a reliable installation.

- Keep the equipment neatly arranged in chambers so that cables are not crushed.
- Do not allow logger or battery to rest on the connectors as crush damage to cables can result.
- Ensure connections to any pulse cables are good and watertight (see page 27).
- Use wall mounting brackets where possible to keep the logger in clear space.
- Where space is tight, consider shortening flow cables to avoid squashing excess cable into small chambers.
- Position loggers away from sources of electrical interference such and motors or pumps.

Wall Mounted (e.g. in utility cabinets)



Installation bracket available from HWM.

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

Connecting the flow cable

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.



When making a connection to Multilog LX 2 you will normally need to splice the bare tails together. It is important that a waterproof connector housing is used, such as the “Tuff-Splice” enclosure available from HWM.



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.



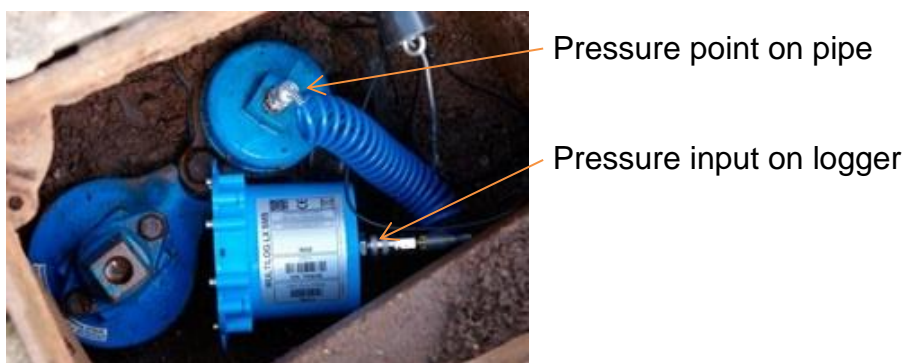
Final Connection

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 49) for further information on pulse cables

Connecting the sensors - Pressure

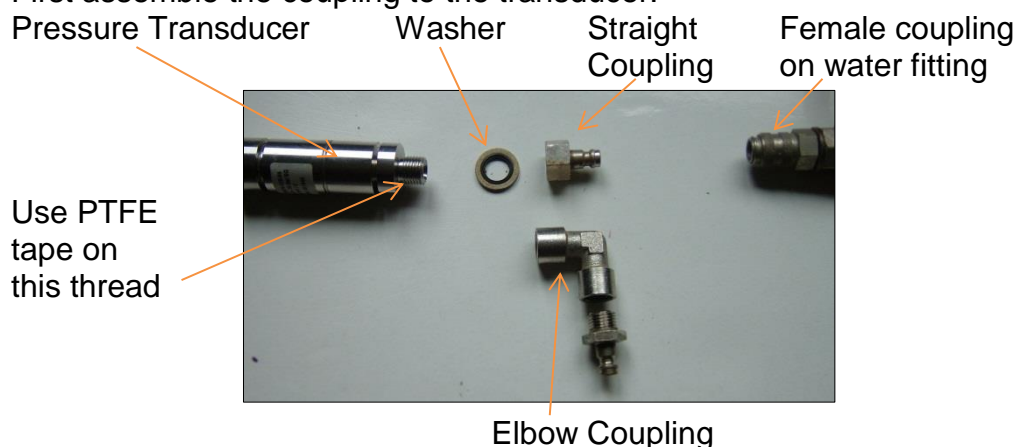
For **internal** pressure transducer, simply connect the pressure tapping on the pipe to the pressure sensor on the logger. There is no calibration required and the logger is ready to start recording.



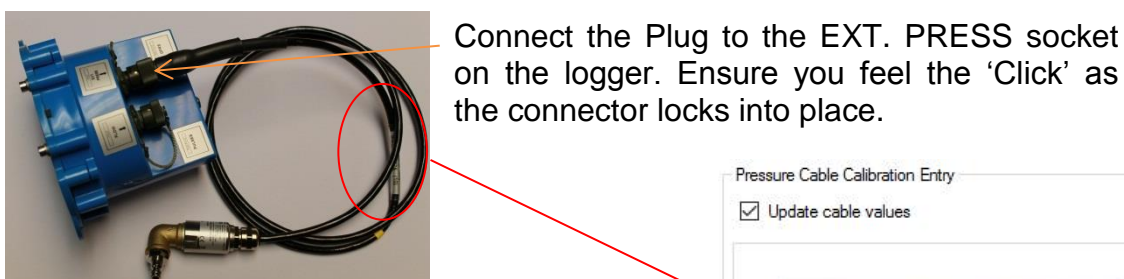
IMPORTANT: Ensure that the connecting hose is adequately insulated to prevent freezing. If the hose freezes there is a danger that the pressure transducer in the logger can be permanently damaged.

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:-



Ensure you enter the numbers from the cable into the IDT as shown

Pressure Cable Calibration Entry

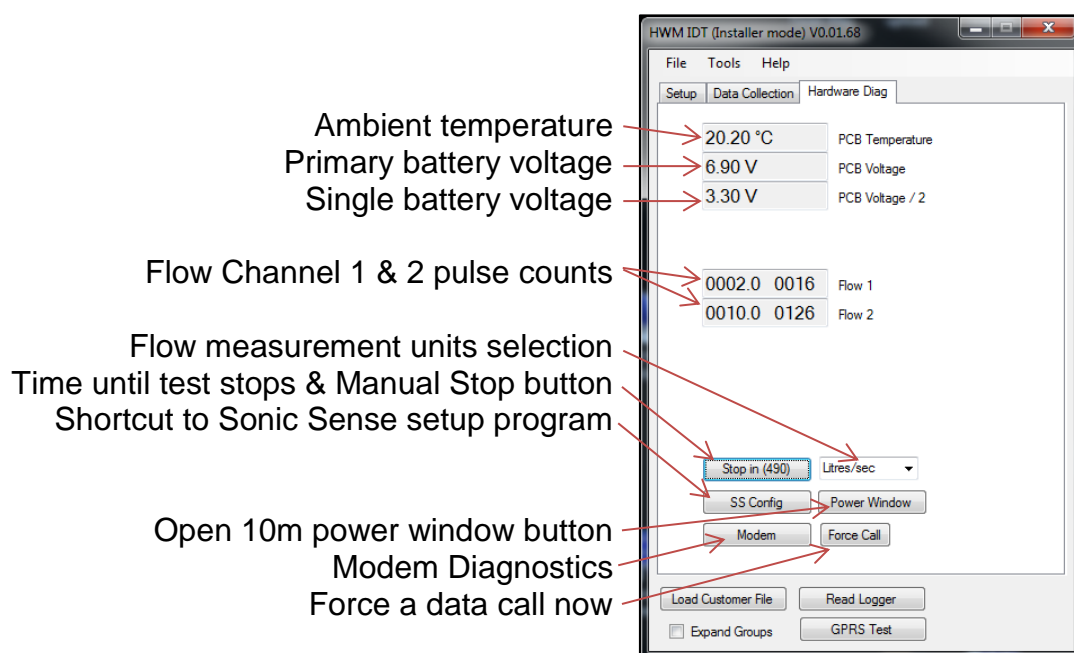
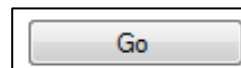
☒ Update cable values

☒ Ch 1 -0.131 1.636 (10)

Taking a reading from the logger and hardware diagnostics

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

1. From the IDT menu bar, click the <<Hardware Diag>> tab.
2. Click the <<Go>> button to start to check the operation of your installed system.
3. The IDT will now display its measurements for a period of 10 minutes to allow you to diagnose any issues with cabling.



When you are ready to stop the test just click the <<Stop>> button.

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.

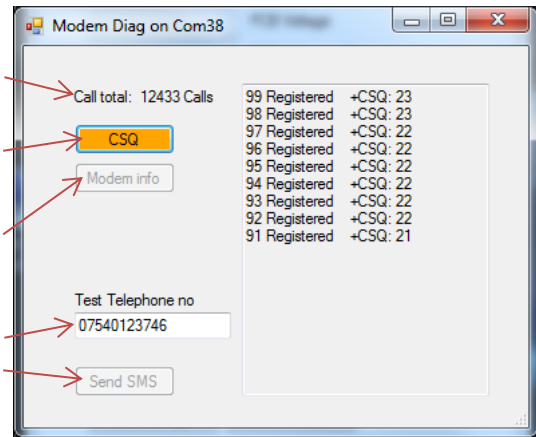
4. A “Power Window” allows you to keep the logger’s modem turned on for a period of 10 minutes. This allows you to close the chamber lid and send a text message to it to confirm that communications is still OK. See final site checks on page 31.
5. Pressing <<Force Call>> forces the logger to send its data in immediately. Useful for when you wish to shift a logger to a new site.
6. The <<Modem>> button allows some more advanced diagnostics to be performed on the modem.

Indicates total number of calls made

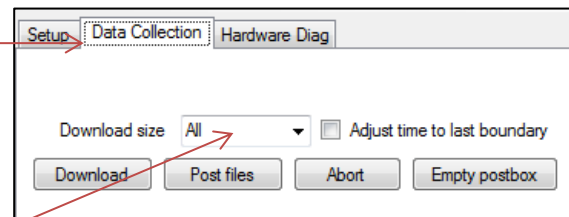
Provides the current signal strength

Provides the IMSI & IMEI numbers for the modem

Enter a mobile phone number here & click <<Send SMS>> to instruct the logger to send you an SMS test message.



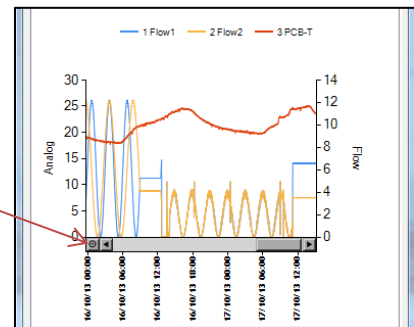
7. If you click the <<Data Collection>> tab you will now see a set of tools for downloading data from your logger for later uploading to the data server. It can also be of assistance for diagnosing problems.



a. From the Download size selection, choose how much data you wish to retrieve, from everything the logger has stored to any un-sent data since the last time the logger called in.

b. Click <<Download>> and the data will commence downloading. If you wish to stop the process, click <<Abort>> and the download will cease.

c. A small chart will now be displayed showing the data downloaded. By using your mouse to draw boxes in the graph area you can zoom into areas of interest. Click the small circles at the end of the drag bars to zoom out. By hovering your mouse over the points on the graph, you will see the exact value recorded.



d. If your logger is in a location where GPRS communication is not possible, you can now upload the data when you are next connected to the internet. Simply click <<Post files>> and all the data you have downloaded to your PC will be uploaded in one go. If you are downloading more than one logger in a route, all data is stored and transmitted together. If you decide that you do not wish to post the data you have downloaded, click the <<Empty postbox>> button to remove the downloaded data from your PC.

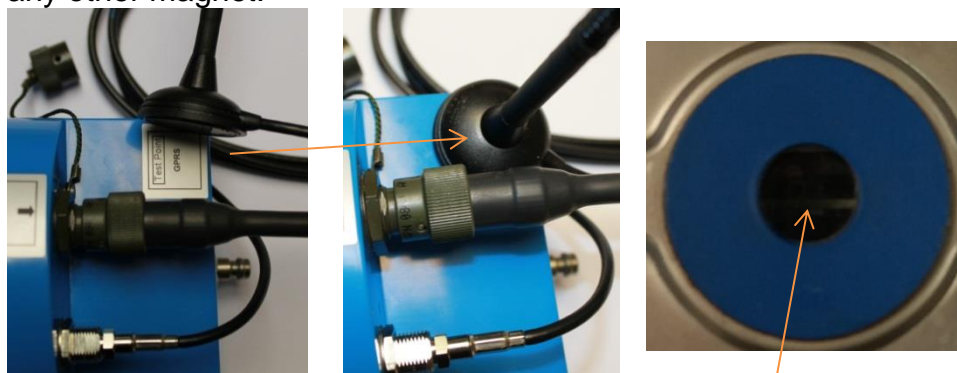
Final site commissioning checks

Having made all the configuration checks, checked all the wiring is good, verified the instantaneous values are what you need and confirmed communications with a GPRS test, there is one last check that you can make with your mobile phone to confirm everything is working as it should.

1. In the Hardware Diag tab, click the <<Power Window>> button to power up the logger for 10 minutes.

Alternatively you can wake up the logger with a magnet:

Hold a magnet for about 5 seconds over the label marked "Test Point GPRS". You can use the magnet on the base of the Carant Antenna or any other magnet.



Whilst holding the magnet, watch the LED in the window. It will go from flashing red once every 8 seconds to Flashing AMBER, RED, AMBER, RED during the modem initialisation (you can remove the magnet now). Once the logger has logged on to the cellular network the LED will flash Green. The logger is now ready to receive SMS test messages.

2. Close the chamber or cabinet such that everything is in its final positions.
3. Now using a standard mobile phone, send a text message to the SMS number of the logger (see page 7 for the number) including the international dialling code if needed.
The text message should read **TTTT#**
4. After a few seconds/minutes (depending on the network operator) the logger will send a message back to you with details of its current status.

Example response from a logger:

TTTT138-002 V01.70CSQ:1010.9VyouridRT hh:mm ss dd-mm-yy ...

5. To decipher the message returned, please refer to the table below:

Message	Description
TTTT	Original command text without #
138-002	Logger type number
V01.00	Firmware version in Logger.
CSQ: nn	Signal strength nn (nn = 6 to 30)
10.9V	Operating voltage
yourid	Your Logger ID
RT hh:mm ss dd-mm-yy	Real Time Clock setting
ST hh:mm ss dd-mm-yy	First Time the logger was started
LR hh:mm ss dd-mm-yy	Last Time the logger was re-started
Ch1 (A) 0029.0	Channel 1 29.0 units
Ch2 (A) 0002.2	Channel 2 2.2 pulses/sec

6. If the CSQ: value in the message is OK then the installation is complete. The logger will automatically go back to sleep after 10 minutes.
7. There can be delays in the SMS network, so the response to your message may not be immediate. If you have had no response in 10 minutes, re-open the chamber and using the modem diagnostic send yourself a test SMS. If this gets through then improve the location of the antenna and try again.



Note: Some Roaming SIM cards do not accept incoming text messages. Check with your service provider if you are unsure.

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 IDT 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 confirmed an SMS message with the chamber lid closed?
- ☐ 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?

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

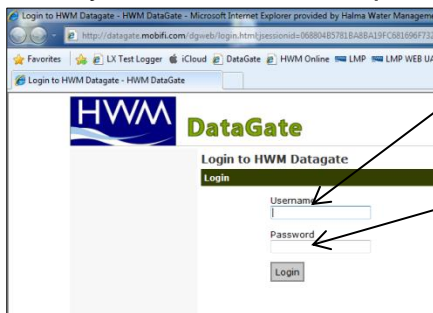
Using HWM DataGate™

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>>

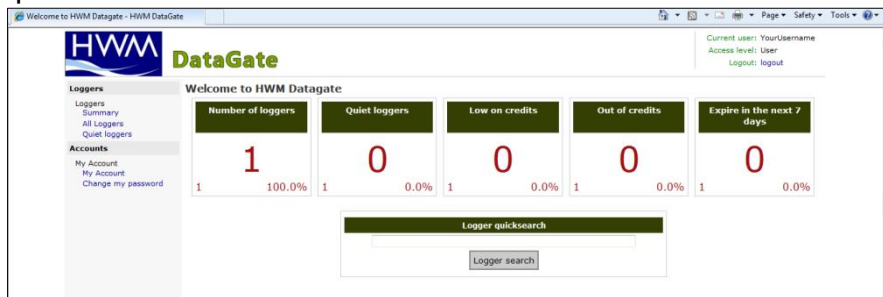


Your Username

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.

Serial	Number	Site	SMS credits	GPRS credits	Outgoing credits	SMS received	GPRS received	Messages waiting	Last message received	Expiry date
AB123CD	44123456789	SOA12345 MyNetwork 1 of 1	1	982	1	0	18	0	03-Jan-2013 12:10:16	03-Jan-2018 23:59:59

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

- The logger serial number
 - The logger's GSM telephone number
 - The site ID for the logger
 - The number of SMS message credits remaining
 - The number of GPRS credits remaining
 - The number of outgoing message credits remaining
 - The number of SMS messages received from the logger
 - The number of GPRS messages received from the logger
 - The number of messages waiting for additional credits to be loaded
 - The date and time that the last message was received from the logger
 - 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.

Serial number	Latitude
AB123CD	

Number	Longitude
44123456789	

Site ID	Height AOD
SOA12345 MyNetwork 1 of 1	

Date created	Start date
22-Oct-2010 08:50:21	03-Jan-2013 00:00

Network	End date
Other	03-Jan-2018 23:59

Type	Battery condition
LX GPRS	0.0v

Owned by	Signal strength
Your Account	6

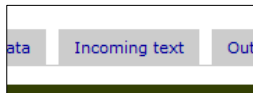
Version	Type
1.11	FW-102-006U

Credits	Channels	Accounts	Alarm responses	Incoming data	Incoming text	Outgoing messages
Incoming GPRS messages	Incoming SMS messages	Outgoing messages				

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:-

Latest incoming data messages											
Number	Received	Unlocked	Network	Number	Source	Type	State	Deducted	Battery	Signal	Message
272105081	03-Jan-2013 12:10:16	03-Jan-2013 12:10:16		44123456789	HTTP	GPRS	PROCESSED	true	0	6	GPRS Test (V1.11)
272095893	03-Jan-2013 12:00:14	03-Jan-2013 12:00:14		44123456789	HTTP	GPRS	PROCESSED	true	0	7	GPRS Test (V1.11)

In this view the GPRS test message that the logger sent in step 4 on page 14 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:-

Logger type LX GPRS	Network name Other
Serial number AB123CD	Consider quiet after x days 3
Mobile number 44123456789	Latitude
Owner Your Account	Longitude
Site name SOA12345 MyNetwork 1 of 1	Height (Above Ordnance Datum)
Site id	
Site notes	

Fields that you can safely adjust are as follows:-



- 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 2.i on page 8, but **without** the leading '+’.
- Site Name – This is a long character string (up to 70 chars) for details of the logger location, e.g. 13 MyStreet, YourTown.
- Site ID – This is a shorter id, usually but not limited to the Zone/Location code of the logger, e.g. AB123CD.
- 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.
- 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.
- Latitude and Longitude – This is the precise location for the logger and allows HWMOnline™ to display the loggers location on a map.
- Height (Above Ordnance Datum) can be useful for computer network modelling.

Update logger

View logger

Serial number

AB123CD

Latitude

51.634238

Datagate number

1581

Longitude

-3.016764

Mobile number

44123456789

Height AOD

12.34

GSM data number

44123456789

Start date

03-Jan-2013 00:00

Site name

13 MyStreet, YourTown

End date

03-Jan-2018 23:59

Site id

AB123CD

Battery condition

6.4v

Date created

22-Oct-2010 08:50:21

Signal strength

6

Network

Other

Version

3.30

Type

LX GPRS

Type

FW-102-001U

Owned by

Your Account

Edit logger

Edit logger channels

Credits

Channels

Accounts

Alarm responses

Incoming data

Incoming text

Outgoing messages

Latest incoming data messages

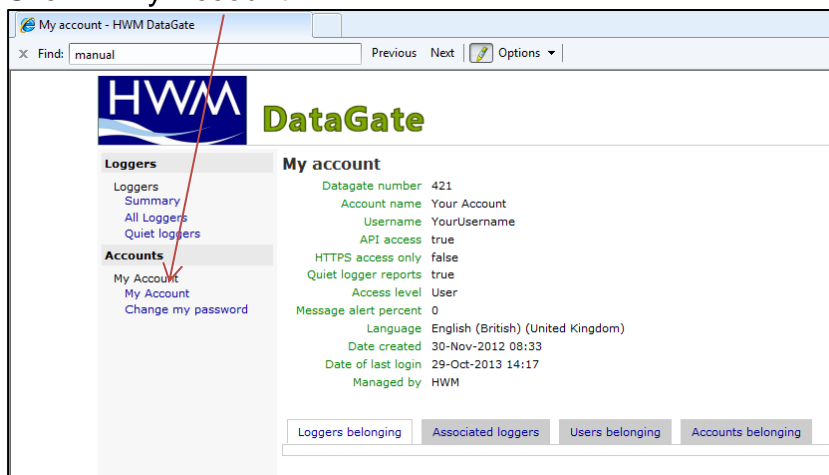
Number	Received	Unlocked	Network	Number	Source	Type	State	Deducted	Battery	Signal	Message
272299333	03-Jan-2013 18:06:19	03-Jan-2013 18:06:19		44123456789	HTTP	GPRS	PROCESSED	true	64	6	<div> <div>_NP443AW0C001E0A03010D000F0024</div> <div>051203010D001E0A03010D00030000</div> <div>010084030100640064006400000000</div> <div>000000000000000000000000000000</div> <div>000000000000000000000000000000</div> <div>ED8E1800000000000078000000000000</div> <div>0000006601C31E00043005F084300</div> <div>5F087900A4057900980543005F0843</div> <div>005F0843005F0843005F0843005F08</div> <div>43005E0843005F0843005F0843005F</div> <div>0843005F0843005F0843005F084300</div> <div>5F0843005F0843005F0843005F0843</div> <div>005F0844005F0844005F0843005E08</div> <div>44005F0843005F0844005F0844005F</div> <div>0844005F0844005F08</div> </div>

37

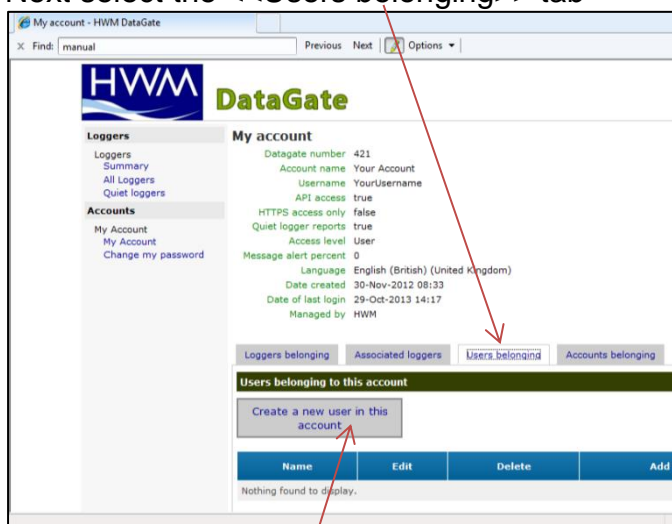
Setting up DataGate™ Alarm Recipients

You can configure DataGate™ to relay alarm signals from your logger to e-mail addresses and/or send SMS messages to mobile phones.
To add a new recipient for alarm messages, follow the steps below:

1. Click <<My Account>>

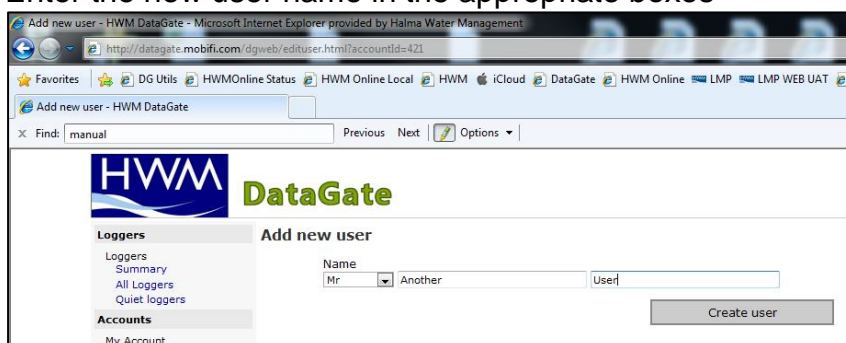


2. Next select the <<Users belonging>> tab



and click <<Create a new user in this account>>

3. Enter the new user name in the appropriate boxes



and click <<Create user>>

- Now click <<add>> in the “Add alarm” column

Loggers belonging Associated loggers Users belonging Accounts belonging

Users belonging to this account

Create a new user in this account

Name	Edit	Delete	Add alarm	Alarm actions				
Another User	edit	delete	add	Type	Address	Enabled	Edit	Delete
Nothing found to display.								

- Choose the “Type” of alarm from the dropdown – SMS or EMAIL

DataGate

Add new alarm

Type
SMS
EMAIL

Address

Enabled
☒

Create alarm action

then enter the SMS phone number or the e-mail address in the “Address” box.

and click the <<Create alarm action>> button.

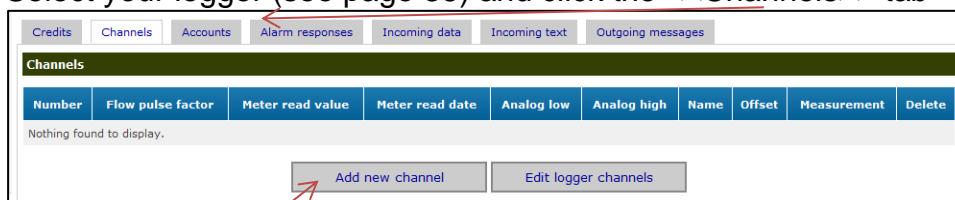
Name	Edit	Delete	Add alarm	Alarm actions				
Another User	edit	delete	add	Type	Address	Enabled	Edit	Delete
				SMS	447540123456	true	edit	delete

- You can add additional alarms for each user by repeating step 4 & 5 and additional users by repeating steps 2 - 5.

Setting up channel settings (optional)

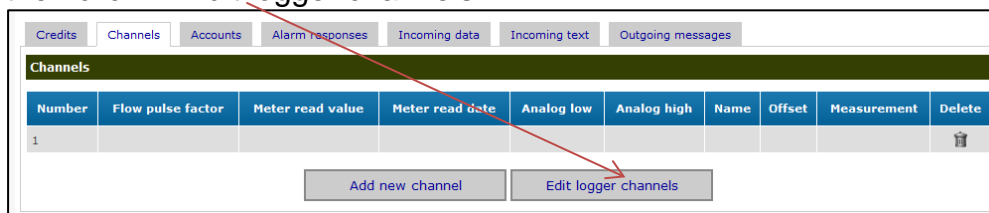
The Multilog LX 2 passes all its channel information automatically to HWMonline, however if you would like to change the channel description & type, manually add channels to DataGate™. The example below shows how to setup a new channel to be an Electricity channel.

1. Select your logger (see page 35) and click the <<Channels>> tab



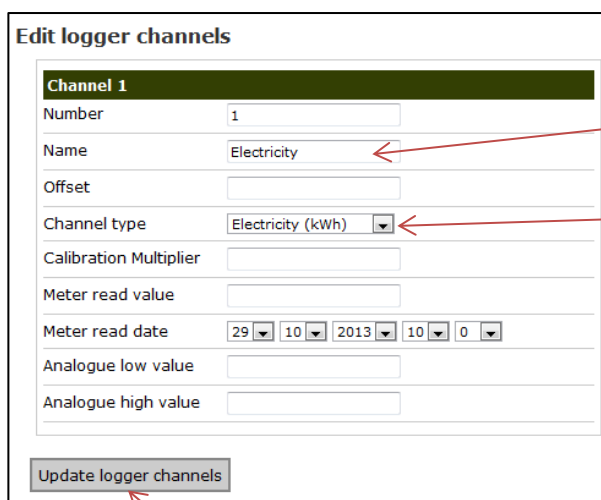
The screenshot shows the 'Channels' tab selected in the top navigation bar. Below the navigation bar, there is a table with columns: Number, Flow pulse factor, Meter read value, Meter read date, Analog low, Analog high, Name, Offset, Measurement, and Delete. The table is currently empty, displaying 'Nothing found to display.' Below the table, there are two buttons: 'Add new channel' and 'Edit logger channels'. A red arrow points to the 'Add new channel' button.

2. Click <<Add new channel>> once for each channel you wish to add, then click <<Edit logger channels>>



The screenshot shows the 'Channels' tab selected in the top navigation bar. Below the navigation bar, there is a table with columns: Number, Flow pulse factor, Meter read value, Meter read date, Analog low, Analog high, Name, Offset, Measurement, and Delete. The table now contains one row with the number '1' in the 'Number' column. Below the table, there are two buttons: 'Add new channel' and 'Edit logger channels'. A red arrow points to the 'Add new channel' button.

3. Enter the details for the channel you wish to configure



The screenshot shows the 'Edit logger channels' form. The form is titled 'Edit logger channels' and shows fields for 'Channel 1'. The fields are: Number (1), Name (Electricity), Offset (empty), Channel type (Electricity (kWh)), Calibration Multiplier (empty), Meter read value (empty), Meter read date (29/10/2013), Analogue low value (empty), and Analogue high value (empty). At the bottom, there is a button labeled 'Update logger channels'. A red arrow points to the 'Update logger channels' button.

Enter a reference name.

From the drop down, choose your channel type.

Click <<Update logger channels>> to store the new names.

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

Using HWMOnline™

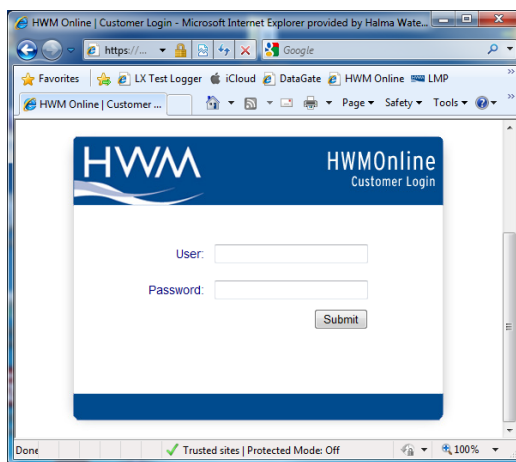
HWMOnline™ is a web viewing and management package for viewing the data for your fleet of loggers.

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

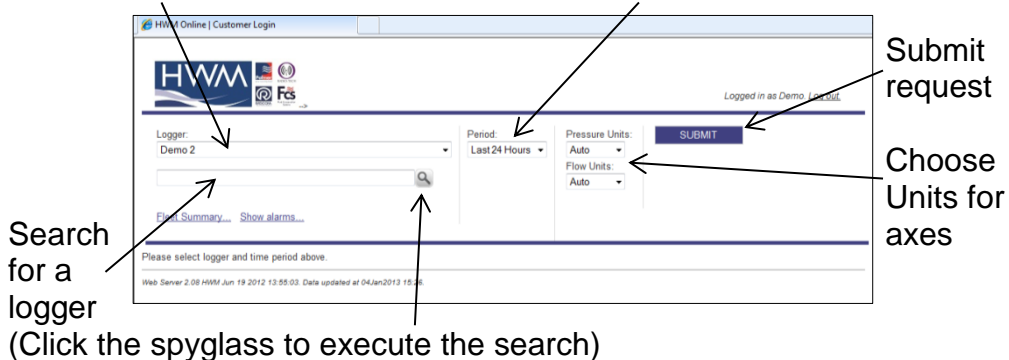


You will be asked to enter your Username and Password details.

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

Logger selection dropdown

Time period to view

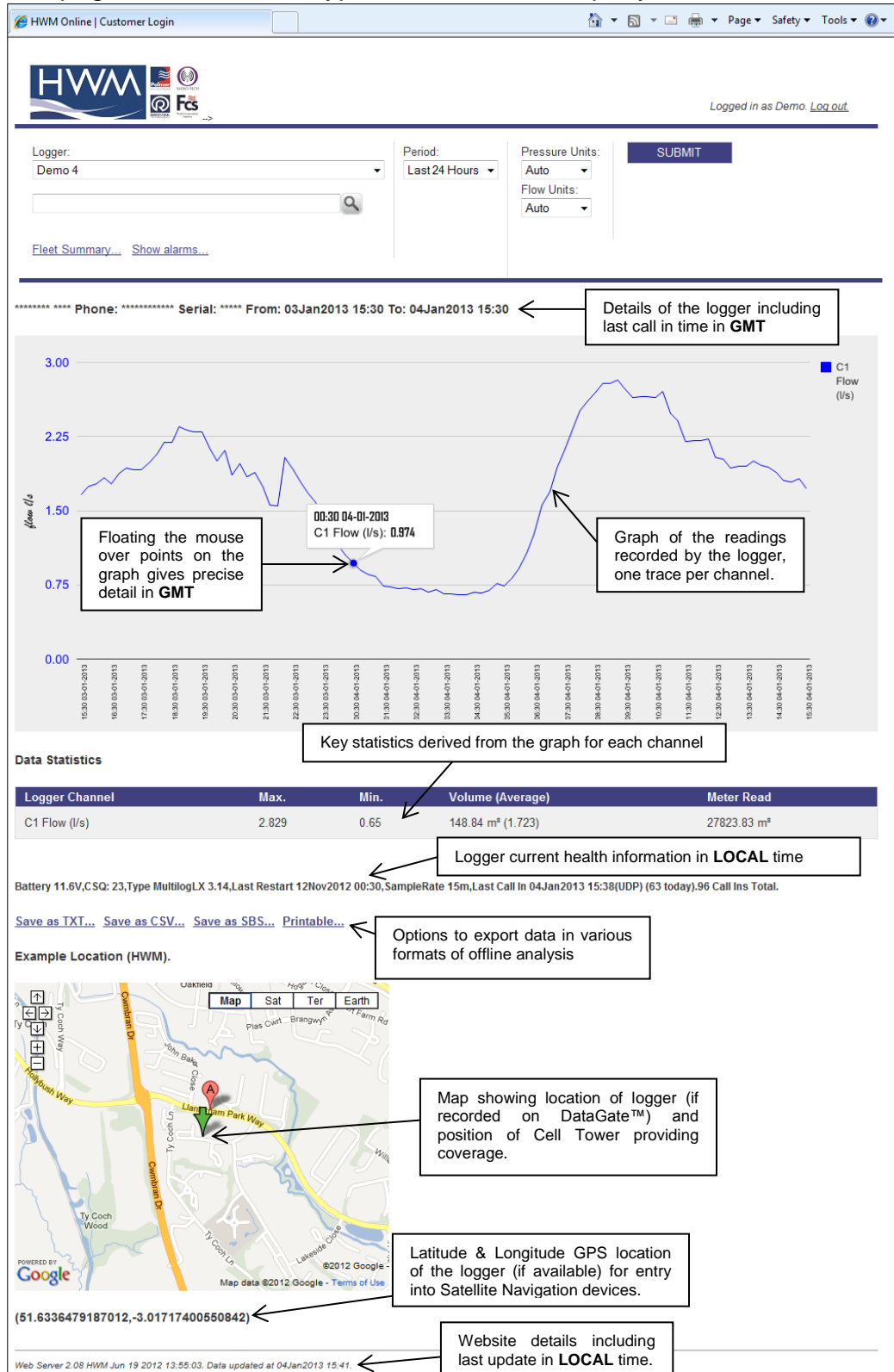


3. Chose the logger you wish to view and the appropriate period & units and click <<SUBMIT>>
HWMOnline will then retrieve your data from DataGate™ and display it on the page.



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 or 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:-

Details regarding your loggers

#	Type	Serial	Address	Battery	Start Time	Channels	Last Call In
1	MultilogX 1.30	****	HWM SITE DEMO	7.1V 13	-	1Pr0(0.1) 2Pr20.2(0.1) 4Pr22.6(0.1) 5Pr0(0.1) 6Pr0(0.1)	- (0)
2	Multilog SMS	*****	Demo 2	0.0V 0	-	1F0.319(1)	17Oct2012 07:06 (0/SMS)
3	RDL32LF/1100 2.29	****	Demo 3	6.6V 14	25Mar2011 15:30	1F0.048(1) 2Pr0(0.1) 3F0.332(1)	04Jan2013 15:02 (2/FTP)
4	MultilogX 3.14	*****	Demo 4	11.6V 22	12Nov2012 00:30	1F1.854(1) 2Pr0(0.1)	04Jan2013 16:08 (65/15m/UDP)

View Alarms... Graphing...

Generate Fleet Report.

☒ Channel Settings ☒ Parameter Report ☐ Save Defaults

☒ Meter Readings ☒ Pressure Flatlines ☐ SUBMIT

☒ Call In Settings ☒ Overpressures

☒ Install Times ☒ Negative Pressures

☒ Call In Report ☒ No Change In Flow

7 Days ☒ Zero Flows

☒ Locations ☒ Negative Flows

Options for creating a custom report

Web Server 2.08 HWM Jun 19 2012 13:55:03. Data updated at 04/Jan2013 16:12.

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 Options	Digital (Optional)	Uni- or bi-directional pulse Up to 64 pulses per second
	Analogue (Optional)	Pressure Internal or External Pressure Transducer 0-20 bar* / 0-200 meters head / 0-300 psig, 0.1% repeatability * Logger is calibrated to 10bar as standard. 20bar calibration must be specified at time of order if required. Other Leak noise, 0-10V, 0-1V, temperature or 4-20 ma variants.
	Serial Input (Optional)	Proprietary serial interface for SonicSens ultrasonic level monitors and third party devices like Serial Meters using Modbus, SDI12 and RS232
Logger Features	Memory	Standard recording 256,000 readings, optional up to 8 million readings
	Frequency	Variable logger sample rate from 1s* to 24hrs * This may affect battery life and communications cost
	Fast Logging (Secondary Channel)	Secondary, fast, channel supports sampling up to 25 Hz and record average, minimum, maximum, standard deviation or time interval between pulses (for data smoothing)
	Alarms	Multiple alarm options including Rate of Change, Profile, Minimum Night Flow and Threshold. Multiple SMS and email forwarding.
	Logger/Site ID	Logger ID up to 7 alphanumeric characters, readable factory set serial number in firmware and multiple alphanumeric fields available on DataGate
	Clock	On board 24 hour real time clock with date and auto correct facility
	Pulse Interval Timing	Count and Event logging modes independent for both channels. Pulse Interval Timing helps to smooth readings (e.g. leakage) in low flows by counting the time between each pulse (event mode). This is available in addition to totalling the pulses (count mode).
Communication	Local	Infra-Red reading head for connection to hand held devices, tablets, laptop, or desktop PC.
	Internal Cellular modem (Optional)	GPRS to HWM DataGate or customer specific server. SMS Back Up* SMS to HWM DataGate or customer server. Multiple messages per day. Quad band modem GPRS can send data down to every 15 mins, with appropriate battery pack 3G Compatible modem
	Accelerated Dial-in	Dial-in rate is increased if alarm situation is triggered. Logger can accelerate dial-in at alarm level for multiple applications – including SonicSens, Flow, Pressure, and other alarmed sensors.
Construction	Dimensions	110H (130H with int pressure sensor) x 150W x 105D mm.
	Weight	590 grams (1.3lb)
	Construction	Tough ABS plastic enclosure
	Operating Temp	-20 to +70°C (-5 to +160°F)
	Ingress protection	IP68 submersible
	Power	Operational for 5 years under standard operating conditions* Low battery alarm, external power connection for battery box & 3 rd party devices.

* Typical battery life expectancy is based upon achieving network registration regularly and with ease. If the GPRS-enabled network registration is unachievable, the logger will convert to SMS-only operation after 24 hours and will attempt to re-establish GPRS communication when possible. A signal strength test should be performed during installation.

Part Number make-up – LX/xxxxxxx/n/xxxxx

LX	/xxxxxxx	/n	/xxxxxx
HWM Logger Type No	Input Channel Configuration (see tables below)	Shipping Spec (See table)	Country code and customer specific variant option (See table)

Input Channel Type Matrix (/xxxxxxx)

Channel Type no	Description (Note: Add part number characters left to right in the group order shown below)
Power input options (only to be used if a dedicated connector is required) If required the B must be the first letter.	
B	External battery pack connection
Note: Items marked * refer to the input type immediately preceding them, e.g. BG selects a glanded power connection (Everything before the G/Y will be glanded into the same cable)	
*G	Glanded power cord & 4-pin plug for direct connection to battery pack in lieu of bulkhead connector (2m)
*Z	Unique cable that will be added as a line item to the SOA
Pressure input	
3	External Pressure connector input – 4 pin bulkhead
6	Internal Pressure transducer (10Bar)
7	Internal Pressure transducer (20Bar)
Note: Items marked * refer to the input type immediately preceding them, e.g. 6N selects 0.1% 10bar transducer	
*H	High temperature transducer
*N	High (0.1%) accuracy transducer
Pulse input (1, A, 4, 8 & 9 all include external battery input, additional external cables may be required)	
1	1 channel input (Pulses/Direction) producing 1 “net flow” output channel
A	2 channel inputs (Forward & Reverse pulses) combined to 1 “net flow” output channel (includes external battery input)
4	1 channel input (Pulses/Direction) producing Forward/Reverse flow logged separately on 2 output channels (includes external battery input)
8	1 channel input (Pulses) uni-directional pulse input producing 1 output channel (includes external battery input)
9	1 Status channel input producing 1 output channel
Note: Items marked * refer to the input type immediately preceding them, e.g. 1G selects a glanded 1 channel input (Pulses/Direction) producing “net flow” (Everything before the G/Y will be glanded into the same cable)	
*Y	Glanded “Y” option to connect to external battery pack in lieu of bulkhead connector (2.5m)
*G	Glanded pulse input in lieu of bulkhead connector
Other sensor inputs	
2	Voltage 0-10v
5	4-20mA
C	External temperature input
L	Leak Noise Sensor input
M	Modbus
Q	SDI-12
S	Serial channel input for Sonic Sense
SB	Serial channel input for Sonic Sense including External battery pack in 1 connector
V	Voltage 0-1v
Note: Items marked * refer to the input type immediately preceding them, e.g. MG selects a glanded Modbus connection	
*G	Glanded input in lieu of bulkhead connector
GPS Option	
X	GPS

Shipping Spec options (/n)

Shipping Spec no	Description
1	Factory Preset standard.
n	Contact HWM for any specific configuration, depends on order volume

Modem types and data option (/xxxxxx)

Modem Type no	Description
CCC xx	International country letter (determines the modem type)
nnn	Customer variant code nnn – For HWM use only.

Example UK & Europe GPRS Data Logger Order Codes		
(Note channel configuration codes run left to right numerals then letters in rising order)		
Old Radcom	New HWM	Description
R6861 300B 1300/GBN	LX/3NG/1/UK1	External 0.1% pressure, glanded Ext pwr, GPRS, HWM SIM & DataGate
R6862 6100 1300	LX/16/1/UK1	1 Channel (Pul+Dir), 10Bar pressure, GPRS, HWM SIM & DataGate
R6861 S000 1300	LX/S/1/UK3	Serial Sonic Sense, GPRS, No SIM fitted
R6861 1000 1300	LX/1/1/UK2	1 Channel (Pul+Dir), GPRS, Customer supplied SIM
	LX/88G/1/UK4	2 Channel (Pul) glanded, 3G, Customer supplied SIM & DataGate
	LX/MG/1/UK3	Modbus glanded, GPRS, No SIM
	LX/5/1/UK1	4-20mA, GPRS, HWM SIM & DataGate
	LX/3HL/1/UK2	High Temp 10Bar pressure, LNS, GPRS, Customer supplied SIM & DataGate
R6863 3880 1300/S1N	LX/388/1/UK1	External 0.1% pressure, 2 channel (Pul), GPRS, HWM SIM & DataGate
	LX/88/1/UK1	2 Channel(Pul), GPRS, HWM SIM & DataGate
	LX/1G/1/UK1	1 Channel (Pul+Dir) glanded, GPRS, HWM SIM & DataGate
	LX/886N/1/UK1	2 Channel(Pul), Int 0.1% 10bar pressure, GPRS, HWM SIM & DataGate
	LX/1G7/1/UK1	1 Channel (Pul+Dir) glanded, Int 20bar pressure, GPRS, HWM SIM & DataGate
	LX/1Y6NBY/1/UK1	1 Channel(Pul+Dir) Y glanded with external battery connection cable, Int 0.1% 10bar pressure, GPRS, HWM SIM & DataGate
	LX/883/1/UK1	2 Channel(Pul), Ext pressure, GPRS, HWM SIM & DataGate
	LX/88Q/1/UK1	2 Channel(Pul), SDI-12, GPRS, HWM SIM & DataGate
	LX/1M/1/UK1	1 Channel(Pul+Dir), MODBUS, GPRS, HWM SIM & DataGate
	LX/88S/1/UK1	2 Channel(Pul), Sonic Sense, GPRS, HWM SIM & DataGate
	LX/15/1/UK1	1 Channel(Pul+Dir), 4-20mA, GPRS, HWM SIM & DataGate
	LX/882/1/UK1	2 Channel(Pul), 0-10V, GPRS, HWM SIM & DataGate
	LX/L/1/UK1	Leak Noise Sensor, GPRS, HWM SIM & DataGate

Order Codes – Optional extras	
RAG-R10 USB	IR Reader / programming cable
CABA8472	Sonic Sense connection cable
AER8015	T-Bar antenna 0.5m
AER8020	I-Bar antenna 1.0m
AER8025	I-Bar antenna 3.0m
AER9010	Button antenna 0.5m
AER6001	High Gain antenna 5.0m
AER6003	High Gain antenna 8.0m
AER6002	High Gain antenna 10.0m
CABA8510	FME Antenna Extension 10.0m
CABA8510-1	FME Antenna Extension 8.0m
CABA8510-2	FME Antenna Extension 5.0m
CABA8510-3	FME Antenna Extension 2.0m



EC Declaration of Conformity

We declare that this Declaration of Conformity is issued under our sole responsibility and belongs to the object listed below:

MultilogLX2 GPRS DATA LOGGER

The object of this declaration is in conformity with the following EU harmonised legislation:

R&TTE Directive 99/5/EC

RoHS Directive 2011/65/EU

The following harmonised standards and technical specifications have been applied:

Article 3.2 (Radio) EN 300 220-1V1.3.1

Article 3.1.b (EMC) EN 301 489-1 V1.9.2, EN 301 489-3 V1.6.1

Article 3.1.a (Safety) EN 60950-1:2006/A2:2013, EN 60950-22:2006/AC:2008
EN 62311:2008

RoHS EN 50581:2012

Signature:

Name & Position: Dean Hook

Service and Quality Manager

Date: 16 - 3 - 17

Halma Water Management Ltd
Ty Coch House
Llantarnam Park Way
Cwmbran
NP44 3 AW
United Kingdom
Web Site: www.hwm-water.com

Warnings:

FCC warning statement:

- This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
 - (2) This device must accept any interference received, including interference that may cause undesired operation.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
 - Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada.

Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.



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
<u>Actaris</u> <u>Flostar-M</u>			See table 1
<u>Actaris</u> <u>Woltex</u>			See table 1

Meters used in conjunction with Cyble pulse units:-

All pulse values contained in the table below are expressed in litres/pulse.

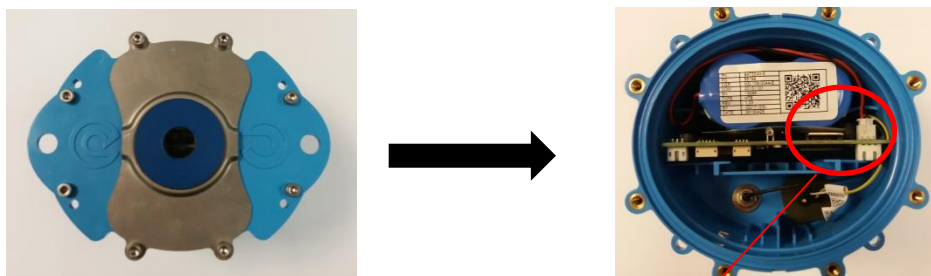
Where an Emitter-S is necessary, the pulse value indicated on the register label should be used.

		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

Fitting your own SIM card

1. Remove the lid of the logger taking care not to damage the seal.



2. Lift out the battery to allow easier access to the SIM card slot



3. Insert your new SIM into the empty slot as shown above.
Ensure the gold contacts face the board and the notch is to the left.
4. Replace the lid ensuring the screws are retightened to 1.5nm to ensure the logger remains water tight.
5. Proceed with programming the logger and ensure you enter the new SIM phone number into the software including the '+' symbol and the international dialling code with no spaces.
e.g. +4477xxxx.
This is an important step as the logger sends an SMS message to itself once a month to synchronise its clock. If the wrong phone number is entered, this can result in an international SMS message being sent.

SIMPLIFIED DECLARATION OF CONFORMITY

This simplified EU declaration of conformity referred to in article 10(9) shall be provided as follows:

Hereby, HWM Ltd declares that the radio equipment type transceiver is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at www.hwmglobal.com

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MAN-146-0001-B (Multilog LX 2 - Installation User Guide).docx

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