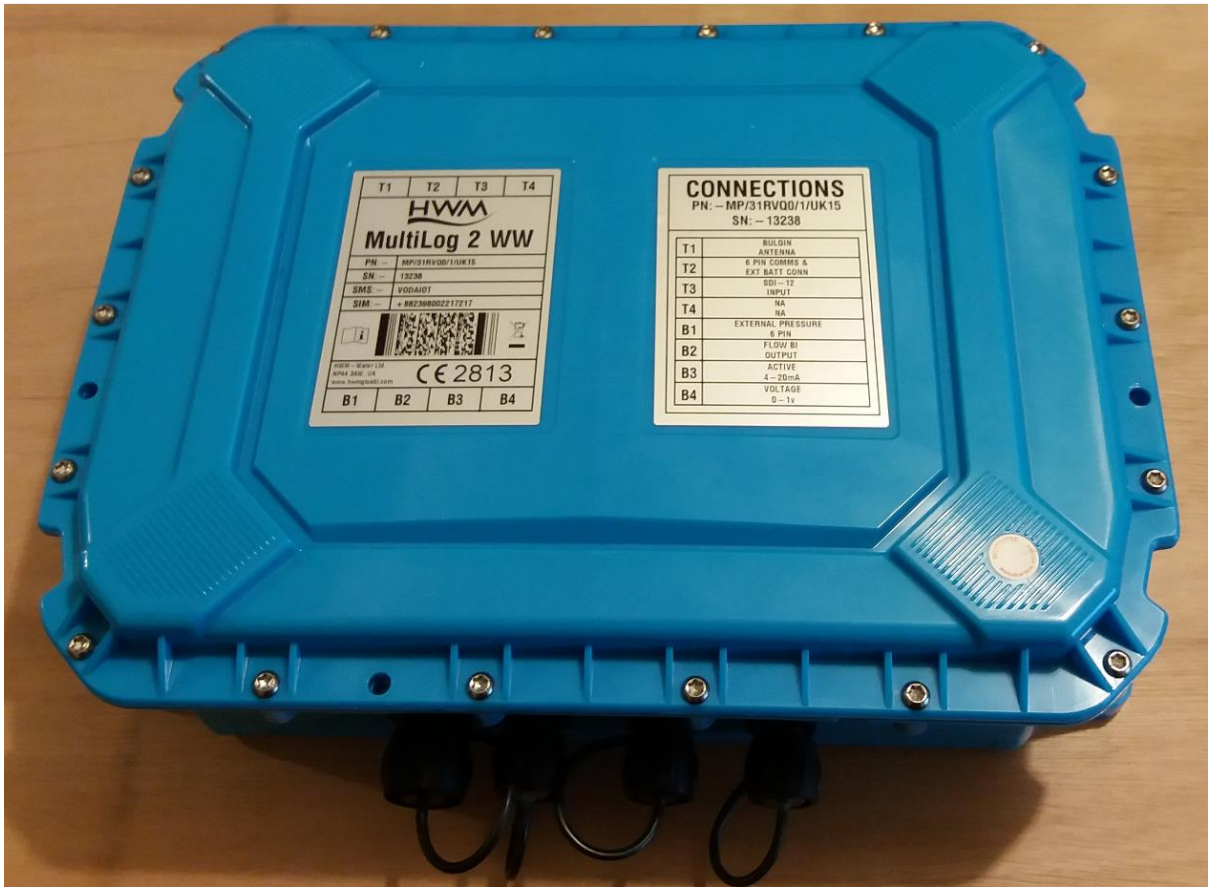
User Guide: Multilog 2 WW.
Installation and Setup.



Warning:	This manual contains important safety and operating information. Please read, understand, and follow the instructions in the manual and also the safety / approvals document shipped with the device.

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1 INTRODUCTION

1.1 DOCUMENTATION AND SUPPORT OF PRODUCT

Thank you for choosing a HWM device. We trust it will provide you with many years of service.

The "Multilog2WW" device is multi-purpose data logger that can be built and configured to suit a specific application of the device; several versions are available within the logger family. Please contact your sales representative for help with selection of the appropriate model for your application.

This user-guide covers the following model families:

Model Number(s)	Description
MP/*/*/*	Multilog2WW logger.

This user-guide should be read in conjunction with relevant parts of the IDT (PC version) user-guide. Refer to the IDT user-guide (MAN-130-0017) for additional or latest information.

This user-guide provides details of the logger operation, how to install and setup the product.

Note: The system periodically has new features and changes released, thus you may observe slight changes from the diagrams and features shown in this manual. In addition, the screen shots and menu descriptions used throughout this manual refer to the specific functionality that was installed within the logger samples used. This can vary from device to device, therefore always refer to the on-screen menu to determine which features are available on your device.

HWM provides support of the logger devices by means of our customer support webpages:

https://www.hwmglobal.com/help-and-downloads/

Should you have any questions that are not covered by this manual or the system's online help, please contact the HWM Technical Support team on +44 (0) 1633 489479, or email cservice@hwm-water.com

1.2 SAFETY CONSIDERATIONS

Safety Note:

Before continuing, carefully read and follow the information in the "**Safety Warnings and Approvals Information**" document supplied with the product. This provides general safety information.

Retain all documents for future reference.

Before using this product, make a risk assessment of the installation site and expected work activity. Ensure suitable protective clothing is worn and working practises are followed during installation and any maintenance.

WARNING: When this equipment is being used, installed, adjusted or serviced this must be undertaken by suitably qualified personnel familiar with the construction and operation of the equipment and the hazards of any utility network.

1.3 OPERATING TEMPERATURE

Refer to the logger Datasheet or your sales representative for guidance on the storage and operating temperature range of the device. Ensure the unit is within the operating temperature range prior to installation.

2 OVERVIEW AND PREPARATION FOR USE

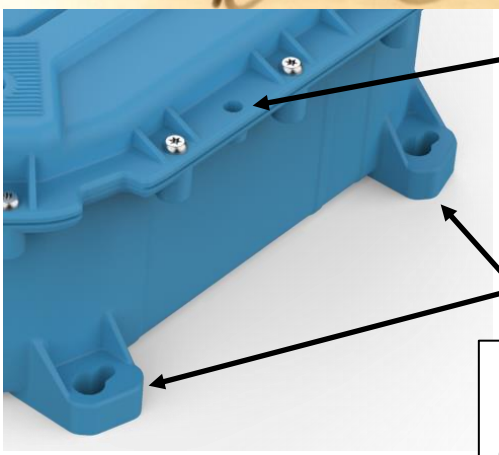
2.1 LOGGER - DEVICE OVERVIEW

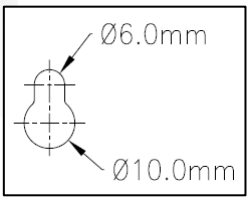
The Multilog2WW logger family is flexible in design and can be built to suit a variety of uses.

An example is shown opposite.

Your logger may be different to the one illustrated; several models exist within the Multilog2WW family.

The loggers are of a waterproof construction and have waterproof connectors for attaching the sensors and antenna. The connectors can exit the unit via either the top or bottom of the case.





The logger includes 4 key-hole shaped mounting lugs, (spaced 300mm x 157mm apart). The logger may be fixed to a wall using flat-headed screws using the holes.

There are 3 additional holes passing through both sides of the case; these can be used for applications requiring anti-tamper seals to be applied.

The top surface of the unit can be identified using the shape of the keyholes.

It can also be identified from one of the labels on the front of the unit.

The connector locations are identified as:

- T1, T2, T3, T4
  (on the top surface) and
- B1, B2, B3, B4
  (on the bottom surface).

They appear in the sequence shown on the label.

2.2 PREPARING A LAPTOP PC (OR SIMILAR DEVICE) FOR USE WITH LOGGERS

The logger devices require a user-interface in order to setup and test the unit. This is provided by means of a HWM software tool which is to be installed onto a Personal Computer (or similar device). The PC must have a USB port and Internet capability (for occasional use).

The required software tool is "IDT" (PC version). This runs under the Microsoft Windows operating system. To install IDT, follow the instructions within the IDT user-guide (see also section 2.5.1).

The installer is required to be familiar with the use of IDT (PC version). Refer to the relevant section of the IDT user-guide for guidance during setup of the Multilog2WW logger.

2.3 LOGGER OPERATION

The logger is powered by a non-rechargeable Lithium battery. The software is designed to minimise battery use and thereby prolong the expected battery life. However, battery life is also affected by user-programable settings. The user is advised to set the logger to keep tasks and sample frequencies to the minimum requirements of the intended use in order to manage battery power effectively.

The unit can also operate from an (optional) additional external HWM battery unit (see opposite); various battery sizes are available.

Where supplied, the external battery power is used to extend the battery life of the system or for more frequent communications with the host server.

The logger is normally shipped from the factory in an inactive state (referred to as "shipping mode") to preserve the life of the battery. When activated (see section2.5.4), the logger will go into the state of "Recording" and begin repetitive logging of the various sensors fitted to the unit, according to its configuration and settings.

The logger can operate using two time periods, known as the "sample period" and also the "log period". It will sample the sensors at the *sample rate* to create temporary measurement samples; this is a repetitive background task. After taking several measurement samples, some statistical functions can be optionally applied to produce a *datapoint* that is logged (saved) at the *log rate*; these form the recorded (logged) measurements and are saved into an area of memory which is referred to as the "primary recording". The log period is always a multiple of the sample period.

If the logger has the feature enabled, it can also be set to occasionally save additional data into a “secondary recording” memory area, (e.g., data sampled at a higher frequency).

Note: This is not available on all supplied units and must be arranged through your sales representative before placing an order; it has implications concerning expected battery life of the unit).

In addition, the logger will have daily tasks at set times, such as uploading its un-sent data over the internet. When sending data, the logger waits to receive confirmation from the server that the data was received without error; If confirmation is not received, it will re-send the data at the next call-in time.

The logger can be programmed to monitor data for certain patterns or conditions and can send a message if it should detect a match. Commonly, this is used for setting a condition that can be an indication of an “alarm”. The message can be sent to either the server (the usual destination) or another device.

An installer can also download a local copy of the data to a PC using the IDT software tool. IDT can be used to inspect the data on-site, or it can also be used to forward data to the server (e.g., If the logger has been unable to make recent contact with the server).

Refer to the IDT user-guide for details of its possible uses. The IDT user-guide also provides an introduction to basic, general-purpose, logger operation; this may provide further information.

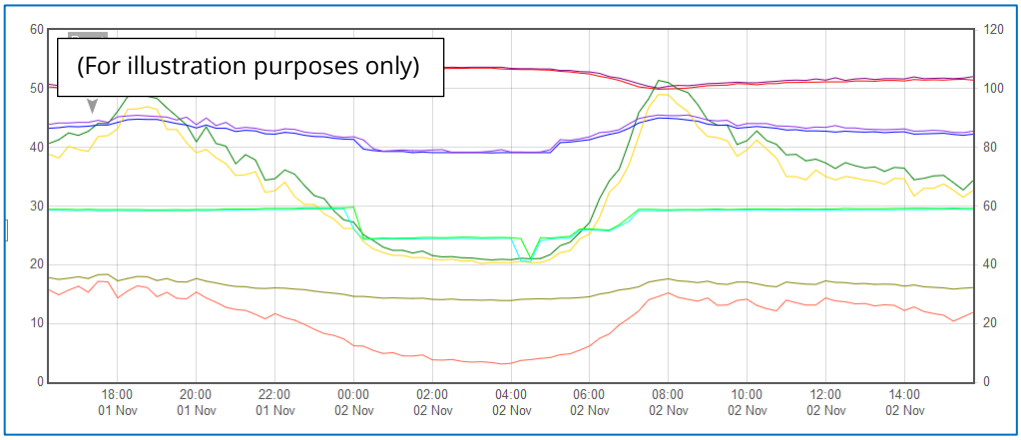
2.4 SERVER INTEGRATION – STORING AND VIEWING DATA

The logger includes an interface (referred to as a modem) that provides access to the internet via the cellular mobile communications network. A SIM card is used to give access of the network.
Measurement data is initially stored within the loggers, until the next call-in time. The data can then be uploaded to the server using an encrypted format. Typically, the server used to receive and store the data will be a HWM DataGate server, although other servers may be used in conjunction with HWM software.

The logger data may be viewed using a viewing portal which has access to the data stored on the server. (Refer to the relevant user guide for details of how your data viewing can be used to view the logger data).

2.4.1 DataGate Server / Data viewing portals

When integrated with HWM's DataGate server, the logger's measurement data can be stored centrally and made available to users via a viewing portal (website).



The data can be viewed remotely / graphically by anyone with a suitable user account (and password) using a standard web-browser.

DataGate can also forward any alarms received from the unit to all users that have subscribed to them; one logger alarm message can be distributed to multiple DataGate users.

DataGate can also (by arrangement with your sales representative) be used to export logger data to other servers.

Some administrative setup of the server and the viewing portal is normally required to facilitate receiving, storing, and presenting logger data correctly. These topics are not covered by this user guide.

Depending on the type of sensors used with the logger your data may be alternatively viewed via a dedicated website which is designed to better present data from the sensor. Refer to the sensor user-guide or IDT app user guide to see if this is appropriate or discuss with your HWM representative regarding which viewing portal to use.

2.5 COMMUNICATING WITH THE LOGGER

To communicate with the logger, a PC is required, along with a HWM software utility called "**I**nstallation and **D**iagnostic **T**ool", or more commonly known as IDT (PC version).

Note: There is another version of IDT, the IDT (mobile app version).
The app version of IDT is not compatible with this logger device.

2.5.1 Download of IDT (PC version)

IDT (PC version) and its user-guide can be downloaded from the HWM Customer Support website, or from the following webpage:
https://www.hwmglobal.com/idt-support/
Note: The user has to be registered by HWM and have a password to gain access).

Refer to the IDT User-guide for information on how to install and use the tool.

2.5.2 Connecting the comms cable

A communications cable is required to connect the logger to a USB port of a PC.
(HWM cable part-number: CABA2093).

The interface for the communications cable on Multilog2WW is normally positioned at location "T2" and is shared with the connector used for any external battery.

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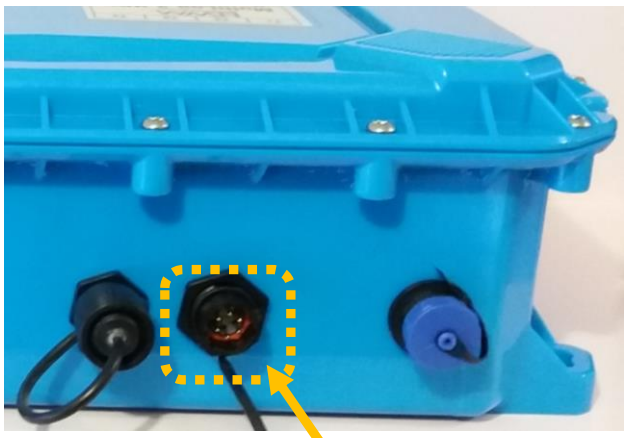


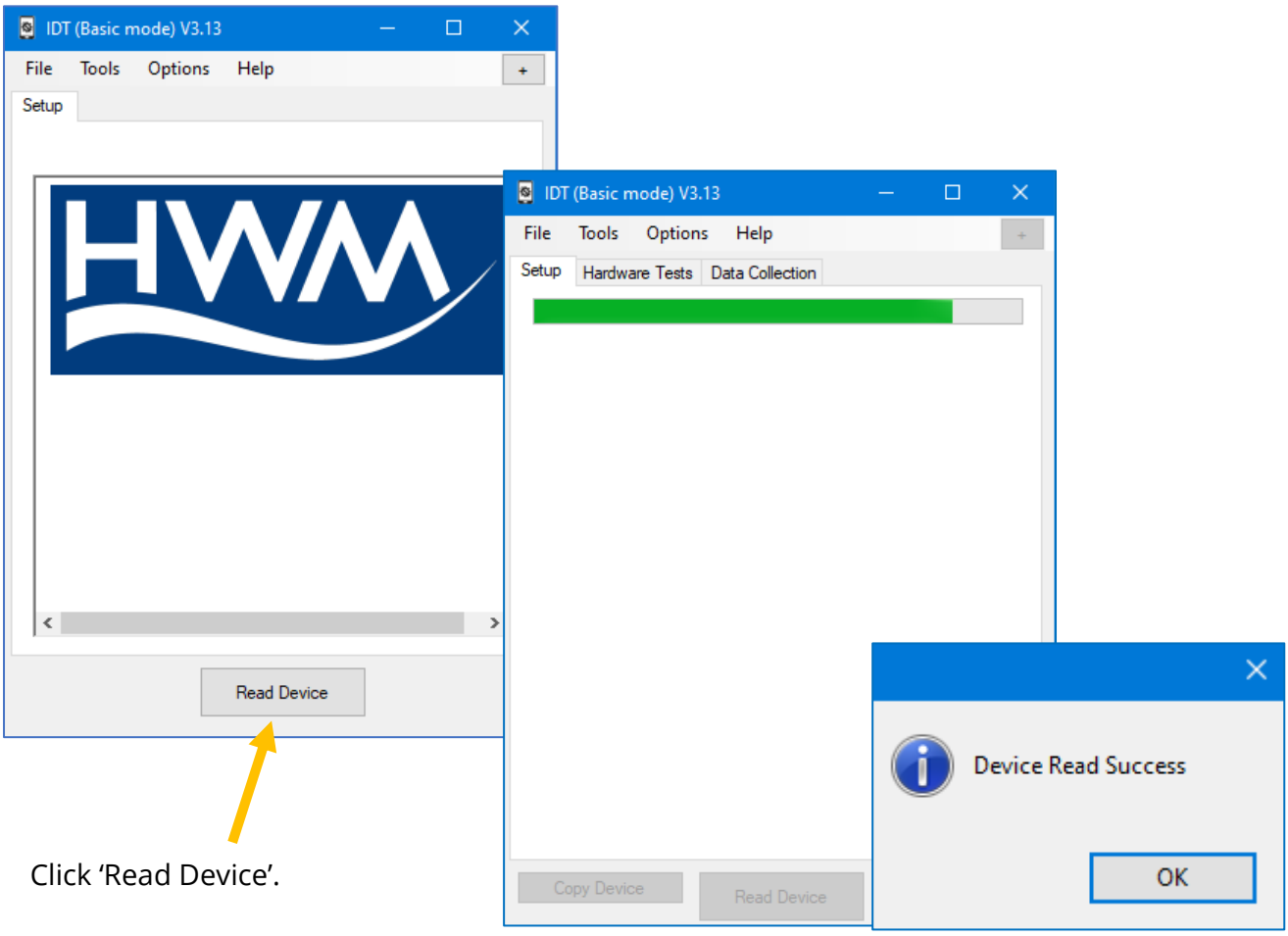
Attach the 6-pin communications cable to the 6-pin comms interface.

Plug the USB end of the cable into a standard USB port of a PC.

(If an external battery is fitted, it may be temporarily removed, but be sure to re-connect it before leaving the installation site).

It is now possible to communicate with the logger using IDT.

2.5.3 Loading Logger settings into IDT

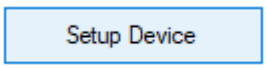


Click 'Read Device'.

A progress bar will show across the top of the page. When completed, an information box will appear stating 'Device Read Success'. Click "OK" to clear the box.

The IDT-PC program has now read a copy of the unit's program (settings) into the "current program" memory area.

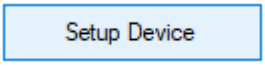
The settings can be changed within IDT but note that the unit itself is not updated with any of the program changes unless the user later saves the settings stored in IDT back into the logger by clicking on the "Setup Device" button.



2.5.4 Activating the logger / Start recording of logged data

When Multilog2WW is shipped from the factory it is put into a “Shipping Mode” (see section 9.3). This mode is designed to preserve its battery life whilst being shipped or in long term storage; most functions of the logger are deactivated, but the unit will detect communications from the IDT tool.

To use the logger, it must first be *activated,* which can usually be done by saving the freshly read settings back into the device.
(i.e. Clicking on the Setup Device button).

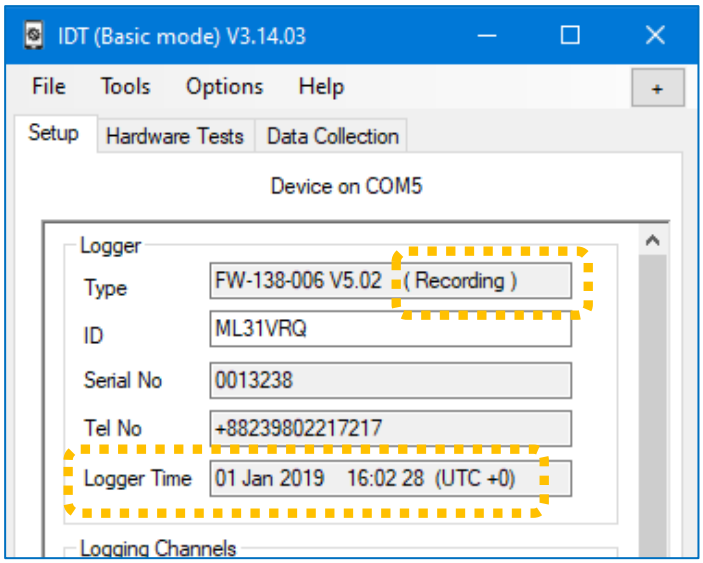


Note: The above assumes start-up setting of the unit is set to “start logging immediately”, but other options are possible; Refer to the IDT user-guide for further information.

2.5.5 Displaying logger device information / logging status

After reading the logger’s programmed settings, the current recording status of the Logger panel in the setup tab.

Note: Ensure that prior to leaving an installation site, the logger is in a state of “Recording”, as shown.



The logger date and time should also be the *local time* for wherever the logger is installed. Confirm this is the case before proceeding. The offset of local time from UTC is shown in brackets.

The remaining contents of this panel are discussed in the IDT manual.

3 SETUP AND TEST OF THE LOGGER / USING IDT

The Multilog2WW logger is largely compliant with the general-purpose basic logger functionality described in the IDT User-Guide.

Refer to the IDT guide for information regarding setup (or confirmation of setup) of Multilog2WW.

e.g.

- Setup of logger to local time.
- Setup of measurement timing requirements.
- Setup for interface operation.
- Setup for converting sensor measurements to logged data-points.
- Ensure logger is activated (recording).
- Setup for communications.
    - Setup for accessing the cellular network.
    - Setup for data delivery
      (destination server, delivery method, delivery times).
- Setup of additional features:
    - Triggers for alarm conditions
- Test of the logger and communications to the server.

The IDT tool can also be used with Multilog2WW for other purposes.
e.g.

- Local download of and display of data whilst making a visit to the installation site.

4 INTERFACES AND SENSORS SUPPORTED

Note: Support for specific interfaces or functions vary and are dependent upon the model supplied.

4.1 PHYSICAL FEATURES / IDENTIFYING CONNECTOR FUNCTIONS

Refer to section 2.1 for a description of the physical features of the logger, including the label that provides identification of interface positions.

Another label on the front of the logger shows the model number (part-number) of the unit.
e.g., MP/31RVQ0/1/UK15 (shown opposite).

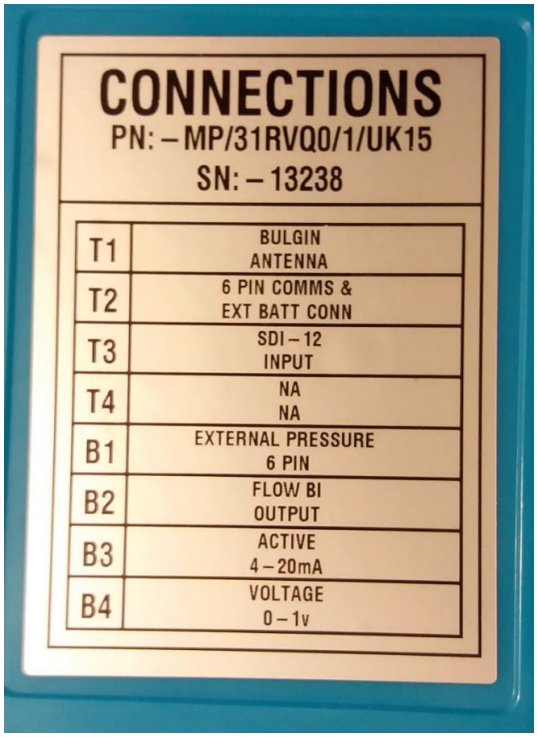
It also shows the serial number.
e.g., 13238 (shown opposite).

The label then shows a table which states the type of interface that is fitted at each of the positions.

The table shows:

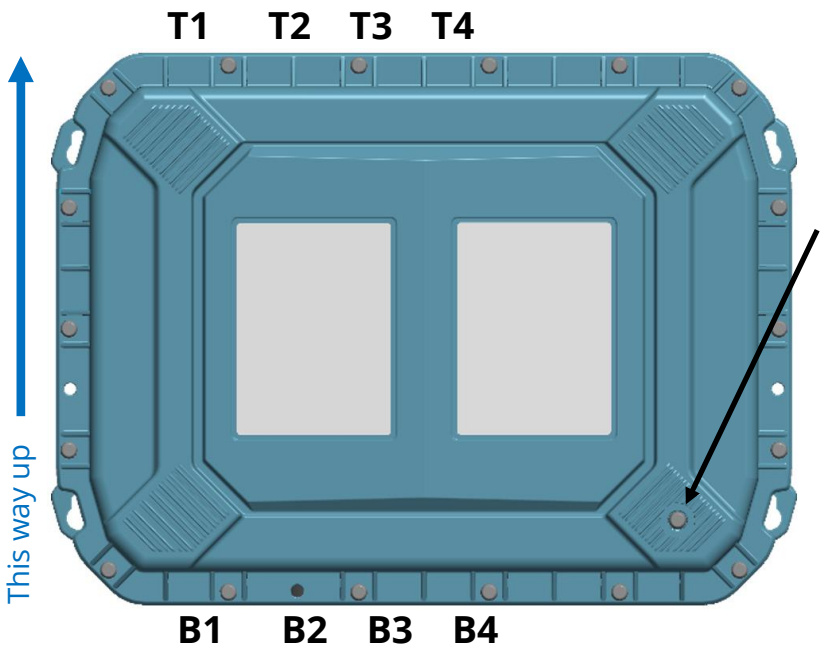
- Antenna (connector type)
- Communications and external battery input
- Unused locations (labelled "NA" or blank)
- Sensor type that should be attached.
  (or an electrical interface type if it is a multi-purpose interface).

Note: The table content will vary according to model (part-number) supplied.



All connector positions are shown opposite, although usually not all are used, depending on the model part-number ordered.

For optimal battery life, mount "this way up" as shown by the direction of the arrow in the diagram.



Do not remove seal. (For factory use only).

4.2 SUPPORTED INTERFACES

(Supplied interfaces are dependent on model part-number)

Pressure Inputs:	**Description**
4-pin Connector	External Pressure transducer (Options: Standard or High Temperature or High accuracy).
6-pin Connector	(As above. Includes ground screen).
(direct) Coupling	Internal Pressure Transducer (Options: 20 bar, 30 bar).

Digital Pulse Inputs:	**Example Use (Bi Flow)**
4-pin Connector	1 channel input (Pulses/Direction) producing 1 logical channel output: “net flow”.
4-pin Connector	2 channel inputs (Forward & Reverse pulses) combined to 1 logical channel output: “net flow”.
	Example Use (Uni Flow)
4-pin Connector	2 x 1 channel input (Pulses) producing 2 x 1 logical output channel outputs: “unidirectional flow”.
	Example Use (Status)
4-pin Connector	2 x 1 channel Status input producing 2 x 1 logical channel output: “Status”.

Digital Outputs:	**Description**
3-pin Connector	2 x Digital Output channel (configurable use).

Voltage inputs:	**Description**
4-pin Connector	Voltage Input (0-1V) ; passive
4-pin Connector	Voltage Input (0-10V) ; passive

Current inputs:	**Description**
4-pin Connector	Current Input (4-20mA) ; passive
4-pin Connector	Current Input (4-20mA) ; active

Temperature inputs:	**Description**
4-pin Connector	External Temperature Input (RTD)
6-pin Connector	External Temperature Input (RTD) ; (includes ground screen)

Serial Comms inputs:	**Description**
4-pin Connector	Modbus
4-pin Connector	SDI-12
Custom Sensor inputs:	**Description**
4-pin Connector	SonicSens2 (Ultrasound distance / depth sensor).

6-pin	Connector	SonicSens3 (Ultrasound distance / depth sensor).
4-pin	Connector	Raven Eye Interface (Modbus interface with power feed for a Radar Flow meter).

4.3 LOGGER CHANNEL TYPES AND DATA INTERPRETATION

Refer to the IDT (PC version) user guide for an introduction to this topic.
For most sensor interfaces, follow the general guidance within the IDT user-guide; the logger complies with the description and examples of setup provided therein.
However, some HWM sensors require specialised setup screens or have their own user-guide which provides further guidance.

The various tabs within IDT for the setup and test of the logger will have considerable variation in content depending on the logger model number and the sensors being installed.

Where required, IDT can be used to check or make any changes to the logger settings.

Note: The logger will usually have settings pre-programmed by the factory prior to shipping. However, **the installer has responsibility for confirming the settings are appropriate** for use at the installed site.
If you have specific requirements this can be discussed with your HWM sales representative at the time of ordering the loggers.

4.4 DIGITAL PULSE INPUT INTERFACE

The Digital Pulse Interface has various applications of use including the detection of meter output pulses.

4.4.1 Meter Pulse support

The logger can be configured to support several versions of meter pulse signalling (listed in section 4.2).

From the meter pulses, the logger can be used to:

- Measure Flow rates through the meter.
- Track meter reading values (provide automated meter reading).

4.4.2 Digital Inputs

The logger digital input can be configured for general-purpose use in detecting switch contacts. This has many uses.

e.g.

- Detection of door / window / equipment-access openings for security purposes.

4.5 SDI-12 INTERFACE SUPPORT

The logger SDI-12 interface provides the ability to *expand the logger* by linking it to other equipment via this serial interface. The external equipment drives any sensor electronics; one or multiple sensors may be attached to it.

SDI-12 is a protocol in which the logger can make a request for a sensor reading to the attached equipment. The equipment responds when the sensor measurement has been obtained.

Obtaining a sample of measurement data is done via the SDI-12 driver, and the data-stream will then behave like any other and require similar setup for the channel regarding what the data actually represents. The SDI-12 driver will require certain parameters to be set-up in order to match the attached unit in order for the equipment to operate correctly with the logger.

Refer to IDT user-guide regarding how to set up the SDI-12 driver parameters. This must be read in conjunction with the user-guide of the equipment that is being attached.

4.6 MODBUS INTERFACE SUPPORT

The logger MODBUS interface provides the ability to *expand the logger* by linking it to other equipment via this serial interface. The external equipment drives any sensor electronics; one or multiple sensors may be attached to it. These results are made available to the logger by reading them from certain registers over the Modbus link.

Modbus is a protocol in which the logger can operate as the master device, sending setup instructions and other information to the attached device, which operates in slave mode. This includes the ability to address each register and (depending on the attached unit) read and write to the registers.

Obtaining a sample of measurement data is done via the MODBUS driver, and the data-stream will then behave like any other and require similar setup for the channel regarding what the data actually represents. The Modbus driver will require certain parameters to be set-up in order to match the attached unit in order for the equipment to operate correctly with the logger.

Refer to IDT user-guide regarding how to set up the Modbus driver parameters. This must be read in conjunction with the user-guide of the equipment that is being attached.

4.7 "RAVEN-EYE" COMPATIBLE INTERFACE SUPPORT

Note: "Raven-Eye" is a registered trademark of Flow-Tronic S.A.

The logger provides an interface that supports a Non-Contact RADAR Flow meter, which detects the flow speed occurring at the surface of moving water. The interface is based on Modbus, but in addition provides a suitable power-feed to the attached sensor equipment. The power is not continuous but provided only when the logger requires a measurement from the sensor equipment.

It is possible to obtain additional information from the sensor equipment, should it be required. The dimensions of the water channel can be given to it and also the water depth within the channel; from these the unit can calculate the cross-sectional fluid area and average fluid speed. The flow rate in the water channel can then be obtained by multiplying fluid area by average fluid velocity.

The water channel dimensions have to be measured and entered on site.

To provide water depth information for the equipment, an additional sensor (such as the SonicSens3) is also required. The logger coordinates the transfer of the water depth information into the Raven-eye equipment.

4.8 SONICSENS3 (ULTRASOUND DISTANCE / DEPTH SENSOR) SUPPORT

The SonicSens3 interface supports connection of a SonicSens3 Ultrasound sensor. The interface provides power and communications to the sensor, which measures distance to a fluid surface. By input of other parameters (e.g. distance from the bottom of the water channel) the logger can calculate water depth. It can also derive a variety of other measurements such as flow rates if situated near an open weir.

4.9 SONICSENS2 (ULTRASOUND DISTANCE / DEPTH SENSOR) SUPPORT

The SonicSens2 interface supports connection of a SonicSens2 Ultrasound sensor. The interface provides communications to the sensor, which measures distance to a fluid surface. By input of other parameters (e.g. distance from the bottom of the water channel) the logger can calculate water depth. It can also derive a variety of other measurements such as flow rates if situated near an open weir.

4.10 ANALOGUE VOLTAGE INPUT SUPPORT

The logger supports a general-purpose voltage input interface for connection to suitable analogue sensors which support a voltage output.

Available ranges: 0 to 1 volt (d.c.), 0 to 10 volt (d.c.).

The interface will require setup require calibration factors and other setup for the channel regarding what the data actually represents. Refer to IDT user guide for details.

4.11 ANALOGUE CURRENT INPUT (4 to 20 mA) SUPPORT

The logger supports a general-purpose 4 to 20 mA input interface for connection to suitable analogue sensors which support a 4 to 20 mA output.

The logger can support a passive interface (providing a current sink for sensor equipment that has its own power from which to source the current).

The logger can support an active interface (provides a 24V power feed for sensor equipment to use).

The interface will require setup require calibration factors and other setup for the channel regarding what the data actually represents. Refer to IDT user guide for details.

5 INSTALLATION

5.1 SUMMARY OF INSTALLATION STEPS

- Check the logger is suitable for use and that you have the required sensor attachments. Check all cables are of a suitable length.
- Connect an appropriate communications cable and begin communications with the logger. (Refer to section 2.5).
- Update the logger firmware if required.
  (Refer to the IDT manual for guidance; consider downloading any existing data from the logger prior to upgrade).
- Use IDT to:
    - Program a local time-zone into the logger (check or modify).
    - Set the action or time when the Logger is to Start-up and begin recording (logging).
    - Set Timing intervals for making measurements (Sample interval and log interval). They should be configured to suit your use of the device and any specific logging requirements.
    - Check / modify channel settings for producing datapoints.
      (Refer to the IDT user-guide for guidance details regarding setup of the specific sensor interface).
        - Configure the logger interfaces to match the sensor or other equipment that the logger connects to.
          (There will be considerable variation in the requirements for this, depending on the interfaces that are fitted to the logger and the sensors or other equipment being used).
        - Map the sensor data to appear as a data channel within the logger. This is a logical channel that is used for communication with the server to which the logger will be uploading its logged measurement data.
        - The numeric data-stream must be characterised as to what the numbers represent.
        - Apply any required statistical functions to the background measurement samples in order to produce logged data-points (saved values).
    - Where required, undertake the setup of any additional options related to the channel. (e.g., add an initial meter reading, pulse replication setting, sensor calibration; these will be dependent on sensor and logger use).
      (Refer to the IDT user-guide for guidance details regarding and any additional setting options related to an interface).
    - Setup any required trigger conditions for activating a logger alarm messages and also conditions for the alarm to clear.
    - Attach the sensors and (if required) re-calibrate / re-zero them.

    - Test the logger sensors are functioning correctly.
      (Some can be done pre-installation; others post installation).
    - Set the logger up for data delivery to the server.
      Call-in times.
      Server contact details.
      SIM / Modem settings required to access the cellular data network.
    - Check / modify the communications settings of device, as required:
      Call-in settings,
      Data Destination settings,
      SIM settings (access parameters for the network),
      Modem settings (Cellular Network technology).
- Install the logger and sensors.
- Install the antenna and test.
- Verify the setting changes have been saved.
- Verify the equipment is working (Recording) prior to leaving site.
- Ensure details of the site of logger deployment are recorded.
  (The administration for the server could be handled by office staff, or the installer could use the HWM Deployment app).

5.2 INSTALLING THE LOGGER

The logger must be mounted in a suitable location where the sensors attached to it can reach their intended installation points. Position loggers, sensors, and antenna away from sources of electrical interference such and motors or pumps.

Refer to the orientation shown in the diagram in section 4.1; The logger should be installed as shown for optimum battery performance.

Check for any access issues for using on-site communications (e.g., access to attach the comms cable).

Use the keyhole mounting holes to fix the logger in position. Anti-tamper seals can also be used if required to bear witness if anyone has interfered with the installation by disassembling the logger. (See diagram in in section 4.1)

Ensure the antenna can be mounted in a suitable location where the radio signal will be of sufficient strength to call into the cellular network.

The cables should be routed without causing any hazards. Do not allow any equipment to rest on cables or connectors as crush damage can result.

Note: Certain sensors have their own instructions regarding installation requirements and their configuration using IDT.
Follow the additional guidance where available.

Where required, any tubing for internal pressure transducers connected to water should be protected from frost with foam insulating pipe covers. These can be supplied upon request at additional cost or sourced locally from a hardware store.

5.2.1 Verification of the configuration.

Prior to disconnecting the communications cable, ensure the program settings stored in IDT have been transferred to the logger; Click the Setup Device button, as described earlier. It is recommended to check the settings to check the configuration has been correctly saved. (i.e. Click the “Read device” button and confirm all settings are correct).

Check also that the status is also set to “Record”.

5.2.2 External Battery

If the system is to be installed with an external battery (optional, but sometimes required to increase the length of service of the system), mount it in a suitable location near the logger. It must be connected to the logger via the connector labelled “Ext batt”.

The external battery may be temporarily disconnected during parts of the installation (whilst the Comms cable is required to be used) but must be re-connected at the end of system installation.

5.3 INSTALLING THE ANTENNA AND TESTING CELLULAR COMMUNICATIONS

Only use HWM-provided antenna for use with your logger, to ensure the radio interface meets approvals requirements (safety, etc).

An antenna with the appropriate connector should be selected and attached, tightening finger-tight only. No sharp bends should exist in the cable routing of the antenna.

If possible, avoid locations where the antenna could be adversely affected (e.g., by an occasional flood condition).

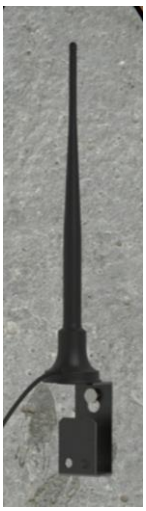
IDT should be used to check that the logger can connect to the cellular network and that the antenna is in the optimal position for the site.

- Choose a suitable antenna for the installation and decide on its initial position.
- Determine the network technology being used and the appropriate signal quality limits that should be used (refer to the IDT user-guide).
- Perform Network Signal tests to confirm the logger connects to the mobile network and find the best location of the antenna.
- Perform test calls to confirm the logger can communicate with the DataGate server via the internet and (if required) SMS.

(Details of use of IDT for making these tests are provided in the IDT app user-guide).

Trouble-shoot a test-call failure if required, following the advice in the IDT app user-guide. Further information is given in the HWM Antenna Installation Guide (MAN-072-0001), and on the webpage https://www.hwmglobal.com/antennas-support/

Monopole Antenna



For most installations, a monopole antenna will give acceptable performance.
Installation Considerations:

- The antenna has a magnetic base to be used for mounting.
- For optimum performance, the antenna requires a "ground plane" (metal surface). Consider installing a metal bracket made of a ferrous material to attach the magnetic base of the antenna if space allows or signal strength is marginal.
- When installing the antenna in large underground chambers it should be positioned close to the surface.
- Ensure that any chamber lid will not interfere with the antenna or cables 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 antenna can also be attached to an installation bracket mounted to an existing marker post.
- Where an antenna is held in place by magnets, ensure the weight of any cables does not excessively load the magnet so as to detach it from the installed location.
- Do not allow any equipment to rest on the antenna connector as crush damage to the connector or antenna cable can result.

For other antenna options and additional installation guidelines, refer to the documents available on the HWM support webpage:
https://www.hwmglobal.com/antennas-support/

Troubleshooting a Call Test failure

There are a number of reasons why a Call 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 and at peak travel times.	Retry the test after a few minutes.
Network signal not available at your location. Not all Cell masts carry data traffic	Relocate the logger to an area that has a data service or change to a different network provider.
Network signal not strong enough. You need a CSQ (reported by the Call test) of at least 8 for reliable communications.	Relocate the antenna if possible or try alternative antenna configurations.
APN settings incorrect.	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.

6 CONNECTING SENSORS AND OTHER DEVICES

6.1 EXTERNAL BATTERY PACK

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

Various sizes are available.

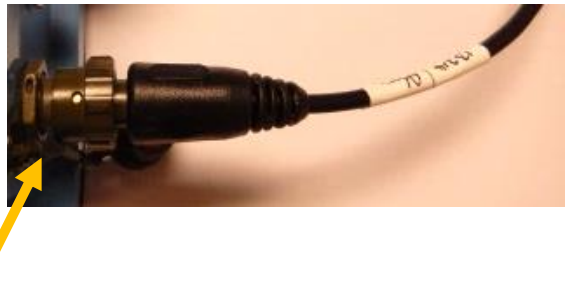
Attach the battery to the logger ensuring that the connector is fully located, so that it is water-tight.

The batteries are heavy devices. When positioning the battery, ensure that it is not crushing any cables or tubes within the installation.
Also respect any orientation arrows on the pack. Following this instruction will give optimal battery life.

6.2 FLOW (METER PULSE) CABLE

If you are using an open-ended connection cable provided by HWM for connection to a meter interface or pulse unit, then simply connect it to the relevant socket on the data logger.

(Note: It will be labelled according to the type of interface, such as "Flow-Uni" or "Flow Bi").



Flow input connector on logger.
(For illustration purposes only;
Logger shown is not Multiolog2WW)

When making a connection to Multilog 2 from a pulse unit 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.

Final Connection

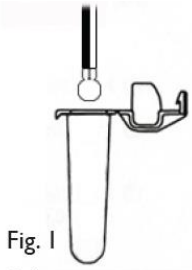


Fig. 1
Splice wires using supplied crimp connectors.

(DO NOT STRIP WIRES BACK).

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

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

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.

6.3 Pressure Sensors

6.3.1 Internal pressure sensors

For an **internal** pressure transducer, simply connect the pressure to be measured via a suitable hose (with fittings) to the pressure sensor on the logger.

There is no calibration required and the logger is ready to start recording.

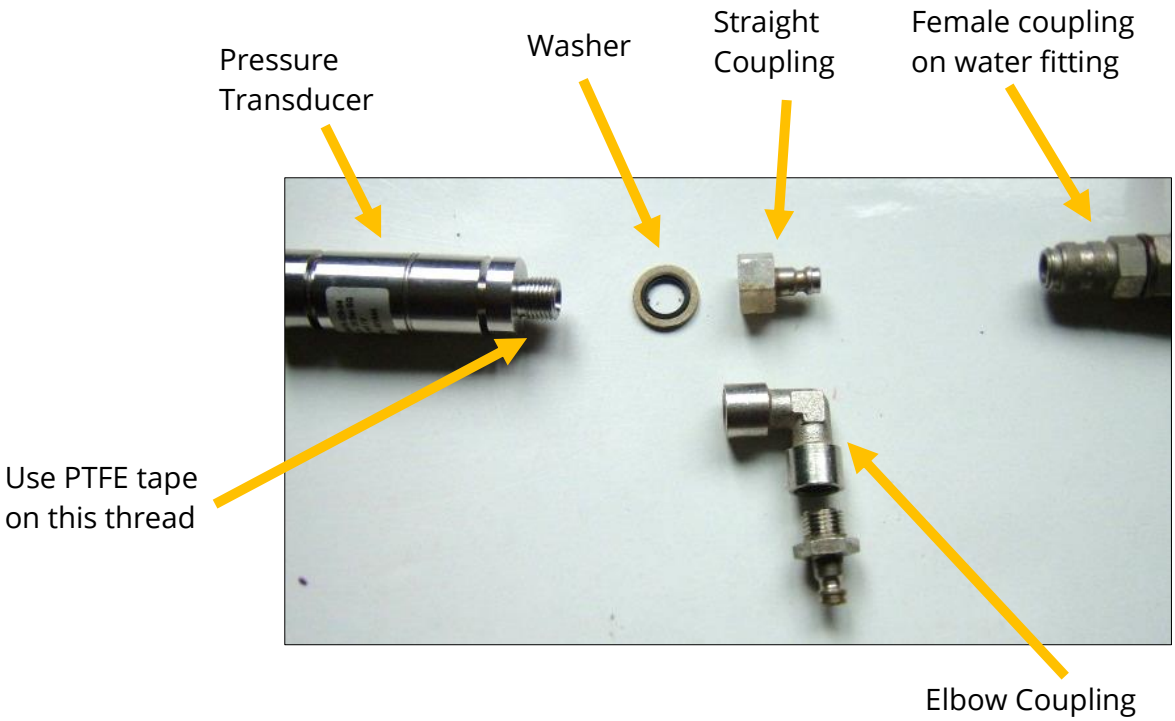
IMPORTANT: Ensure that the connecting hose is adequately insulated to prevent freezing.
If the hose freezes there is a danger that the pressure transducer in the logger can be permanently damaged.

Pressure input on logger.
(For illustration purposes only;
Logger shown is not Multiolog2WW)

6.3.2 External pressure sensors

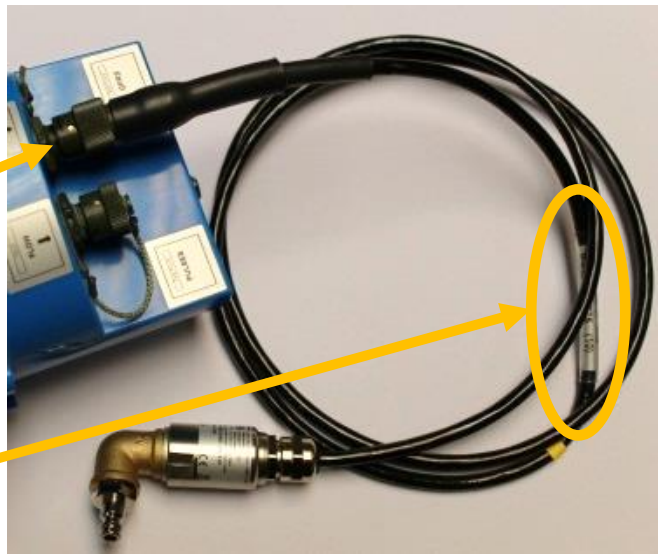
For an external pressure transducer, two styles of coupling kits are available: Straight or elbow.

First assemble the coupling to the transducer:-



Then connect the assembled pressure transducer to the logger:

Connect the Plug to the External Pressure interface on the logger.
Ensure you feel the 'Click' as the connector locks into place.



Add the details from the calibration label on the cable into the logger using IDT (Refer to the IDT user-guide).

7 VIEWING YOUR DATA

The logger usually calls into a server, where the data can be stored for the entire deployment period to a site.

Site data is best viewed with the viewing tool (usually a website) linked to the server that is used as the data-store. For certain applications, the viewing tool can display the status of *multiple* deployed devices simultaneously (e.g., a representation of the status of each site where a logger is deployed onto a map). Refer to the appropriate manual or instructions for your viewing tool for guidance.

IDT is not designed to support such fleet-wide views of data. However, the data of the connected logger can downloaded and stored in IDT. IDT can then be used to view a single logger's data graphically. (Refer to the IDT app user-guide for instructions on how to do this).

8 TROUBLESHOOTING

The data from the logger does not appear on the server:

- Check the settings for the SIM card to access the mobile data network.
- Ensure the logger uses the correct data destination URL and port-number for your server.
- Check call-in times have been set.
- Check antenna is attached and in an OK condition.
  Check signal quality and strength parameters are suitable. Re-locate the antenna if required.
- Make a Call Test and confirm OK.
- Ensure your server is correctly configured to receive and present the data.

9 MAINTENANCE, SERVICE AND REPAIR

Unauthorised servicing will void the warranty and any potential liability for HWM-Water Ltd.

9.1 REPLACEABLE PARTS

Antenna

- Only use antenna recommended and provided by HWM.

For details of antenna options and part-numbers to order, refer to the following link: https://www.hwmglobal.com/antennas-support/

Batteries

- Only use batteries and parts recommended and provided by HWM.
- Batteries are only replaceable by a HWM approved service centre or relevantly trained technician. Contact your HWM representative for more details if required.
- Batteries can be returned to HWM for disposal. To arrange the return, complete the on-line RMA form: https://www.hwmglobal.com/hwm-rma/
  Refer to the Safety Warnings and Approvals Information for guidelines of the packing requirements.

SIM-card

- SIM-cards are replaceable by a HWM approved service centre or relevantly trained technician.
- Only use consumable parts recommended and provided by HWM.

9.2 RETURN OF PRODUCT FOR SERVICE OR REPAIR

When returning product for investigation or repair, be sure to follow the instructions of your distributor to document why the product is being returned.

If returning to HWM, this can be done by completing the on-line RMA form: https://www.hwmglobal.com/hwm-rma/

Refer to the Safety Warnings and Approvals Information for guidelines of the packing requirements.

Prior to shipping, put the equipment into Shipping mode (see section 9.3).

If soiled, ensure the unit is cleaned with a mild cleaning solution and soft brush, disinfected, and dried prior to shipment.

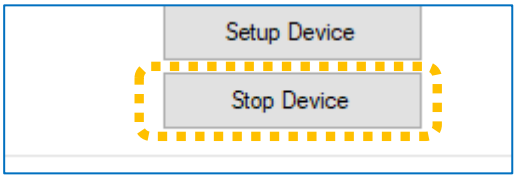
9.3 Putting the equipment into Shipping Mode

Before long term storage, moving an installed unit, or shipping for repair, the logger should be put into "Shipping mode". Be sure to upload any unsent data before this operation.

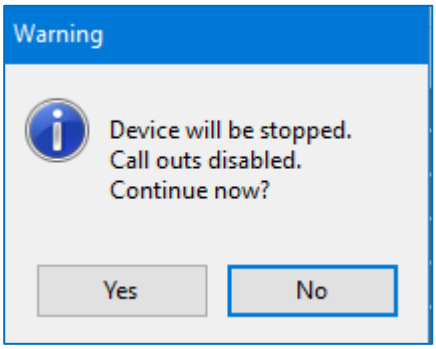
To put the logger into shipping mode:

- Read the current configuration of the logger using IDT.

- From within the "Setup" tab, scroll to the end of the settings panels and click on the "Stop Device" button.

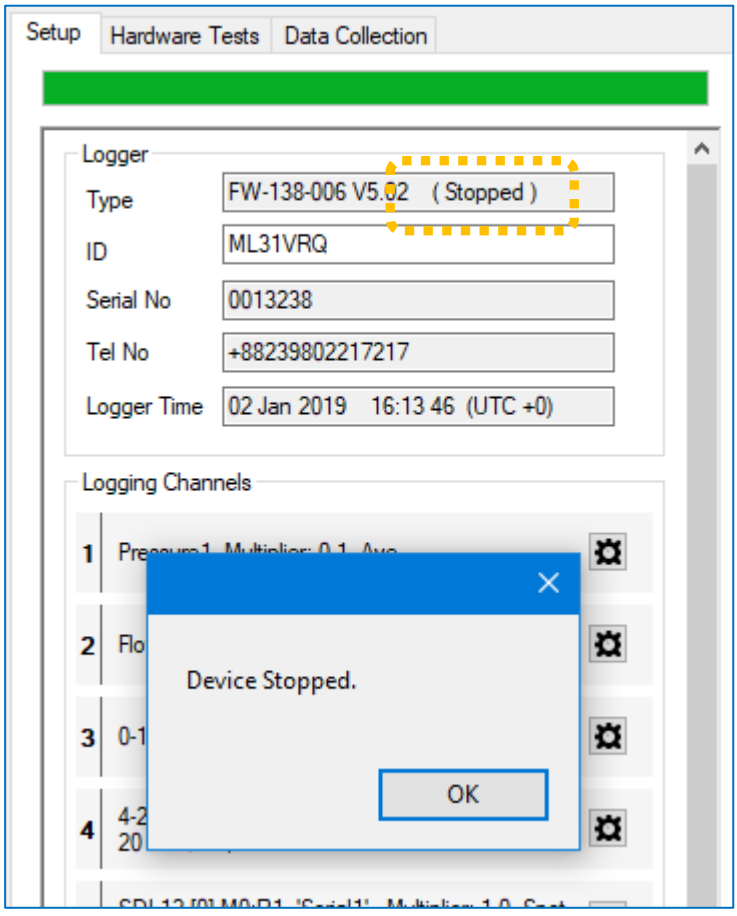


- Click "Yes" when warned that calls will be stopped.



- The unit will be re-programmed. IDT will warn that the logger device has been stopped.

- Click "OK" and confirm that the status of "(Stopped)" is shown at the top of the IDT Logger panel.



Note: The unit may now be re-packed for shipping or long-term storage.

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