# MULTILOG2 USER GUIDE:

# INSTALLATION AND SETUP

## (Supplement for models supporting WITS protocol)


This manual contains important safety and operating information.
Please read, understand, and follow the instructions in the manual and any safety / approvals documents shipped with the device.

TABLE OF CONTENTS

# 1 INTRODUCTION

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

The "Multilog 2" is a multi-purpose data logger device that can be built and configured to suit specific applications; several models are available. Please contact your sales representative for help with selection of an appropriate model for your application.

## 1.1. DOCUMENTATION AND SUPPORT OF PRODUCT

This user-guide is written for a sub-set of the Multilog 2 logger family; those models that support the WITS protocol (Worldwide Industrial Telemetry Standards). These models have a different software version to regular Multilog 2 models but share many similarities in their construction, operation, and setup. This user-guide is therefore a supplement to, and should be read in conjunction with, the regular Multilog 2 documentation (listed below):

| Document Number | Document Description |
|---|---|
| MAN-147-0001 | Multilog 2 User Guide |
| MAN-130-0017 | User Guide: IDT (PC version) - Logger User Interface. |

This user-guide covers the following model families:

| Model Number | Device Description |
|---|---|
| WL / * / * / * | Multilog 2 logger (with support for WITS protocol). |

Refer to the Multilog 2 user guide for details on installing the logger and connecting it to other equipment. Also refer to any datasheets or user-guides that may be relevant to sensors used within the installation.

Basic logger settings are common to all Multilog 2 models. You should therefore also read the relevant parts of the IDT (PC version) user-guide, which provides guidance on confirming or modifying the basic settings of your logger. The IDT user-guide will describe setup to use various sensors, and other features, such as alarms.

Certain features found in models that support the WITS protocol differ from those available in standard Multilog 2 loggers. This user-guide provides details of the differences (additional or changed features) present in the models that support WITS. Any deletions will not be detailed within this user-guide but will be apparent by their absence when using the IDT tool.

To view your data a viewing tool is required. This will be, for example, a SCADA system.

⚠ **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 descriptions used throughout this manual refer to the functionality that was available within the logger samples used. This can vary from device to device. Therefore, always refer to the IDT screens 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 online help, please contact the HWM Technical Support team on +44 (0) 1633 489479, or email cservice@hwm-water.com

## 1.2. Safety Considerations

Product certification is dependent on model supplied; please check the product labels for the following approvals marks:

**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.
- Installations should be carried out by appropriate technicians with suitable training.
- Ensure suitable protective clothing is worn and working practices are followed during installation and maintenance.
- Check with the site owner or supervisor for any additional safety requirements before commencing work.

## 1.3. Operating Temperature

Refer to the product's 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:

## 2.1. DEVICE – OVERVIEW

The unit supplied is a variant of the HWM Multilog 2 logger. The logger must be fixed in position, connected to sensor equipment, and connected to an antenna on site. It must then be programmed by the installer using a tool known as IDT (Installation Diagnostic Tool). This includes setup of basic logging and call-in settings. Ensure any adjustments made in IDT are saved to the logger.

IDT is used to create a 'bulk' file and an 'inc' file. These files contain the information of the initial logger configuration. (The 'bulk' file is a HWM proprietary format, and the 'inc' file is in a standard WITS format).

The logger will be regarded as an outstation by a WITS Master Station. The 'bulk' and 'inc' files should be imported into the WITS Master Station that is responsible for the outstation; contact your system administrator for details. After the files have been imported, should any further configuration changes be required they can be made from the WITS Master Station which updates the 'inc' file with the changes. The 'bulk' and 'inc' files are maintained to be able to remotely restore the logger configuration (in case it reports the configuration has been corrupted, e.g., during a battery change).

The logger is not permanently connected to the network but connects periodically via a cellular network modem to deliver its data and to check for any configuration updates. An external battery pack (or d.c. power supply) is required to be fitted to the logger in order to provide the required power for the additional communications overhead imposed by the WITS (DNP3) protocol. (Refer to the Multilog 2 User Guide for details of adding an external battery pack).

# 3. Installation and use of IDT

## 3.1. IDT Installation

Refer to the IDT user-guide for details on how to install the IDT software.

## 3.2. Using IDT for Logger Configuration

Connect the logger to the PC (USB port) using a Multilog 2 communications cable. Run the IDT software and click the Read Device button.

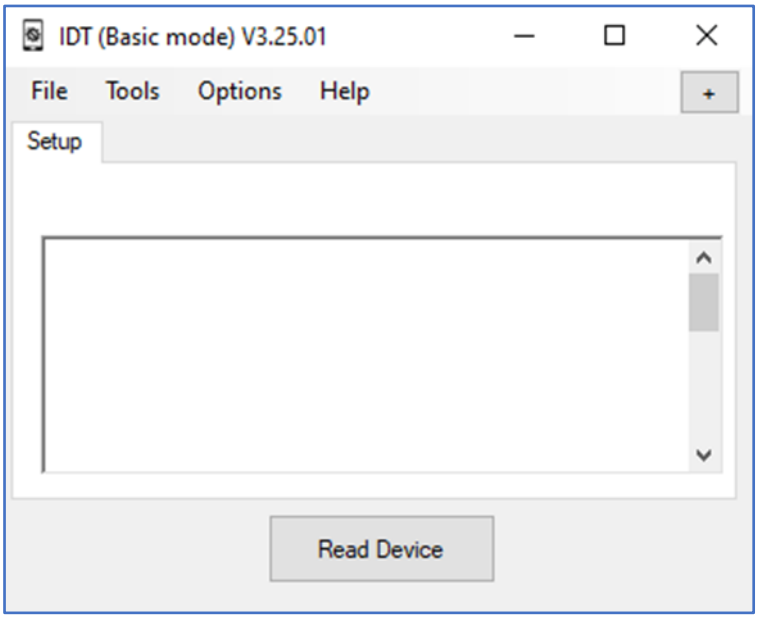


Figure 1. IDT (PC version) - Initial screen with 'Read Device' button

## 3.3. Password Entry

After the logger configuration is read, IDT recognises the logger type, and the ‘Security Passcode Entry’ box will appear.

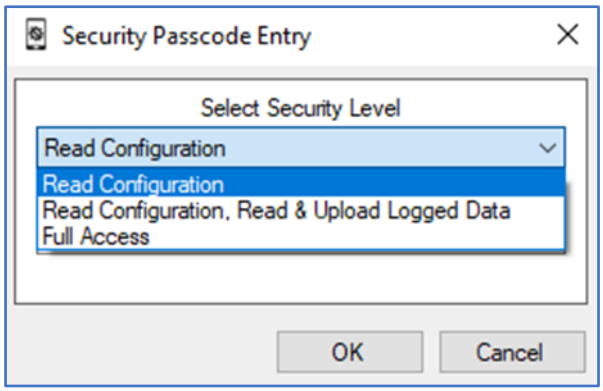


Figure 2. Security Passcode Entry. Select a security level

Select the security level that you require for your work activity. To check and modify settings, a security level of 'Full Access' should be chosen.

Once selected, enter the password for the chosen level, and then click on the 'OK' button.

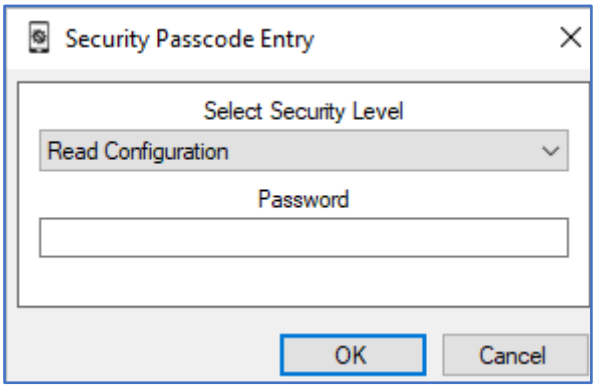


Figure 3. Security Passcode Entry. Enter the password

The default passwords are:

| **SECURITY LEVEL:** | **DEFAULT PASSWORD:** |
|---|---|
| Read Configuration | User |
| Read Configuration, Read & Upload Logged Data | Operator |
| Full Access | Admin |

(These can be changed from within the WITS Master Station).

## 3.4. WITS Strings Entry

Locate the 'WITS strings' panel in the 'Setup' tab.

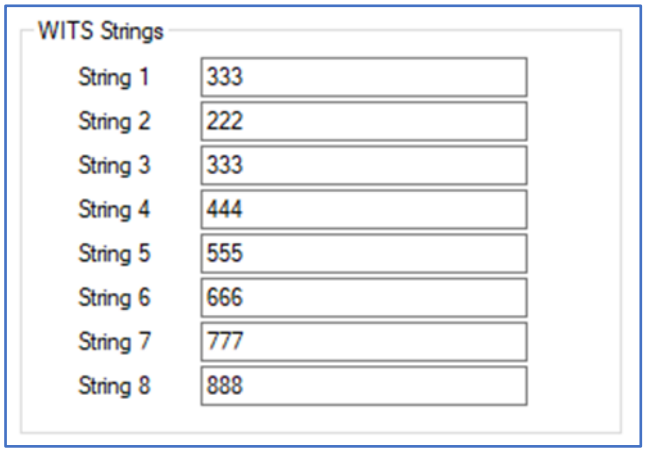


Figure 4. WITS strings panel

Enter the string (text) information required for the outstation. (See also section 3.8). The content of each string depends on the string-use policy of the customer.

## 3.5. Data Delivery

### 3.5.1. Data Destination

Set the data destination to be the WITS Master Station.

⚠ **Note**: Up to 2 extra WITS Master Stations can be specified. These act as backup stations in case the logger has difficulties with communications to the primary station.

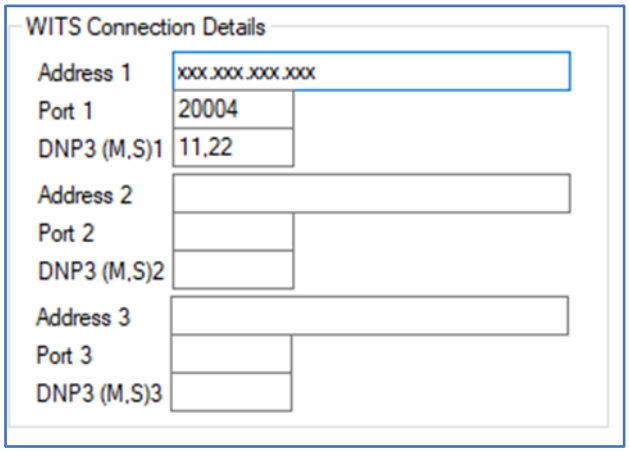


Figure 5. Enter connection details for up to 3 WITS Master devices

The address field will need to be entered as an IPV4 address, or as a domain name.

⚠ **Note**: Some SIM cards supplied by HWM-Water require the server IP address to be whitelisted. Contact HWM support if in doubt or if this is required and has not been done. (Each server address is required to be whitelisted).

Enter the required port number.

The 'DNP3 (M,S)' entry indicates the address of the master (WITS Master Station) and the slave (this logger) separated with a comma.

### 3.5.2. Call-in Frequency

Set the logger to call-in to the server at the desired frequency (i.e., select a mode of 'Freq' and set the time interval between call-ins). Set the logger to use a protocol type of 'WITSTCP'.

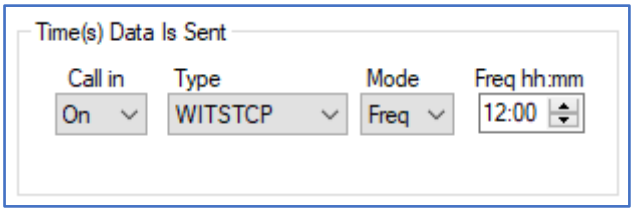


Figure 6. Setup of WITS protocol and call-in frequency

⚠ **Note**: Multilog 2 models that support WITS protocol will always require an external battery pack to be fitted due to the additional communications overhead imposed by the DNP3 protocol. Ensure the battery is connected. Connection of a battery pack will de-activate the normal logger restriction of making no more than 2 calls per day, without the need to enable the 'Call Restriction Disable' control. However, the installer should limit the call-in frequency to avoid premature battery exhaustion.

## 3.6. Logging Parameters

Configuring the data logging parameters in detail is covered by the IDT User Guide. This supplementary guide summarises how to set a simple pressure and flow channels.

### 3.6.1. Accessing Channel Setup

Locate the 'Logging Channels' panel in IDT.

Click on the cog icon ( ) to configure an existing channel.
Alternatively, click on the plus sign ( ) to add another channel.

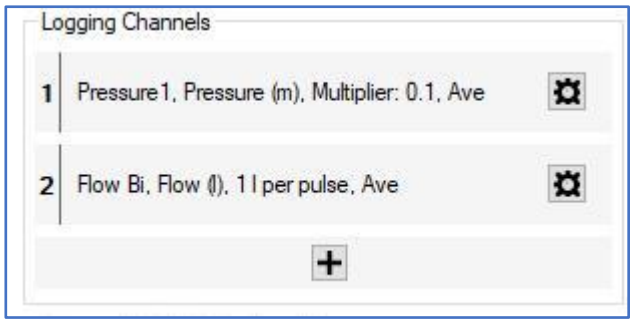


Figure 7. Access to configured channels or adding a channel

### 3.6.2. CHANNEL SETUP SUMMARY

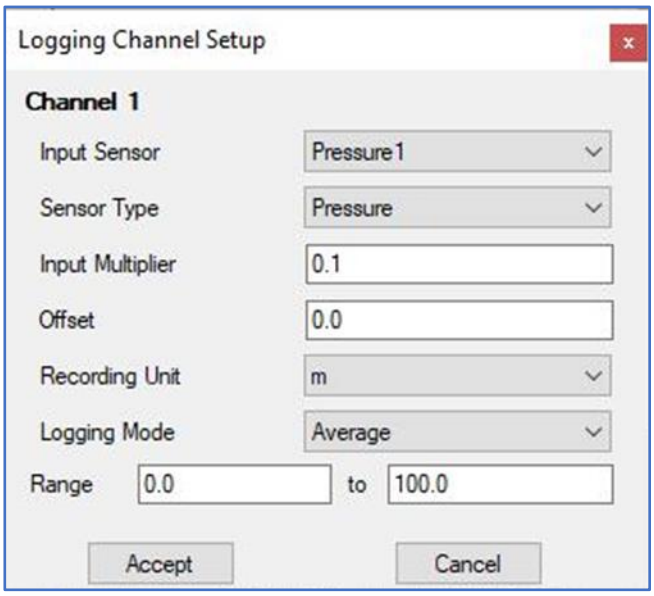


Figure 8. Example channel setup window (pressure)

The input multiplier is applied to raw sensor values to convert the output value into the required unit of measure. You can (if needed) also apply a fixed offset after scaling with the input multiplier.

The 'logging mode' should normally be set to determine how the data value of the logged point is produced, (e.g., the average of several discrete samples). However, for these models, the logger will disregard the setting as it produces a variety of outputs (see section 3.8).

Ensure that the logger is calibrated to use the sensor. E.g., for a cabled pressure sensor, where applicable, tick the 'update cable values' box and then enter calibration values that are on the cable.


Figure 9. Ensure logger is calibrated for using the sensor

When finished, click on 'accept'.

⚠ **Note**: Multilog 2 models that support WITS protocol have two 'Range' fields included in the channel setup (see Figure 9). These should be set to the lower and upper range of the expected values.

The parameters for flow channels follow the same pattern. Refer to the IDT user guide for additional information.

### 3.6.3. CONFIGURE SAMPLE INTERVAL

Locate the 'Logging Parameters' panel in IDT.

The Logging Parameters panel includes fields used to set the background sample interval and the Logged datapoint creation interval (each logged datapoint is normally the average of several discrete background samples).

Set the values as required.

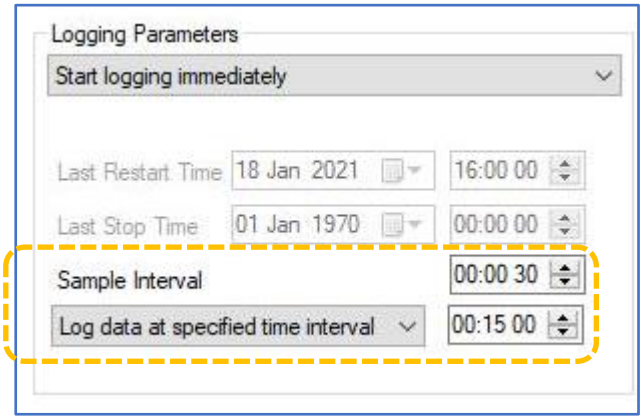


Figure 10. Setup of measurement intervals

⚠ **Note**: The period between samples ('sample interval' setting) also determines the time between samples for any High Speed Sampled Data channels (see section 3.8).

## 3.7. Applying the Configuration to the Logger (Save Settings)

### 3.7.1. Update Logger

Once the configuration settings have been updated in IDT, they should be saved to the logger using the 'Setup Device' button at the bottom of the IDT window.

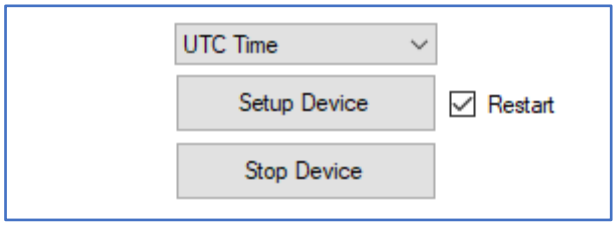


Figure 11. Save configuration using 'Setup Device' button

### 3.7.2. Saving the Configuration Files (Bulk and Inc)

When the settings are saved to a logger, the configuration is also saved to the PC as a 'Bulk' File and an 'Inc' file. This file can be found in the WITSBLKINC folder in the IDT install directory, normally C:\HWM\IDT.

- The 'Bulk' file can be used by the WITS Master Station to reset the device to a known state.
- The 'Inc' file produced by IDT is for the initial logger setup in WITS format. Inc files can also be used by the WITS Master Station to track any subsequent incremental changes it makes to the logger configuration.

## 3.8. Point Allocation (Data Outputs)

The logger produces digital (i.e., numeric) data from a variety of sensor types; it does not matter whether the sensor electrical output was originally analogue or digital in nature. The WITS Master Station refers to numeric data as being 'Analog'.

The logger references an outgoing datapoint stream as being a 'Channel'. The WITS Master Station references a stream of data as being a 'point'.

The logger channel numbering scheme starts with channel '1'. The WITS Master Station point numbering scheme starts at point '0'.

A WITS Master Station has an extensive number of 'points' available to store data. Some are for 'analogue' types of data. Others are for binary types of data (these can handle a single binary bit, such as a status flag). Still others are of the type 'string' (these can be used for any purpose that requires text items to be stored, such as postal address or location information).

The points available for use are allocated as follows:

| | |
|---|---|
| Analog 0-9 | Primary logging channels.<br>Data represents a 'spot' measurement of the logger channels.<br>Analog 0 – 9 corresponds to logger channels 1 – 10, respectively. |
| Analog 20-29 | Minimum channels.<br>Data represents the minimum value obtained by background sampling between the production of logged datapoints.<br>'20' corresponds to channel 1 minimum, '21' to channel 2 minimum, etc. |
| Analog 30-39 | Maximum channels.<br>Data represents the maximum value obtained by background sampling between the production of logged datapoints.<br>'30' corresponds to channel 1 maximum, '31' to channel 2 maximum, etc. |
| Analog 40-49 | Average channels.<br>Data represents the average value obtained by background sampling between the production of logged datapoints.<br>'40' corresponds to channel 1 average, '41' to channel 2 average, etc. |
| Analog 10-19 | ROC (Rate of Change) channels.<br>Data represents the difference between each successive value obtained by background sampling.<br>'10' corresponds to channel 1, '11' to channel 2, etc. (See Note below). |
| Analog 50-59 | Hi-Res channels (High Speed Sampled Data).<br>This data represents the set of values obtained by the background sampling process.<br>'50' corresponds to channel 1, '51' to channel 2, etc. (See Note below). |
| Binary 0-5 | No change states.<br>The logger makes a judgement that there has been no change in the input for some time and sets a flag to indicate this.<br>It is possibly a fault condition. (e.g., a disconnected sensor).<br>'0' corresponds to channel 1, '2' to channel 2, etc.<br>(Only possible to configure for the first 6 logger channels). |
| Binary 6-11 | MNF states<br>This changes state whenever the MNF alarm has been activated or has been released.<br>'6' corresponds to channel 1, '7' to channel 2, etc |
| String 0-7 | String points. (Refer to section 3.4). |

⚠ **Note**: The logger only generates output data (points) for channels that have been set up and are operating.

Rate of Change (ROC) data is sent in floating-point format, but only gets sent when a channel's Rate of Change alarm is active.

Hi-Res data for a channel is only sent upon receiving a request from the WITS Master Station, or when an alarm is activated.

## 3.9. WITS Utilities

The WITS utility is provided within IDT for the purpose of making files that can be used by the WITS Master Station to re-program certain settings or functions within the logger; these may be standard WITS features or useful non-standard features. IDT does not require the pre-load of any logger configuration in order to generate the files; they are stand-alone commands suitable for any Multilog 2 logger that supports WITS and is of a suitable configuration.

The file produced by IDT must be loaded into the WITS Master Station, from where it can be sent to the loggers through the WITS file mechanism.

The logger collects the command (contained in the file) when it next calls in to deliver data. The command is acted upon immediately following data delivery, and without any subsequent re-start of the logger.

### 3.9.1. Accessing WITS Utilities

WITS Utilities can be found under the Tools menu.

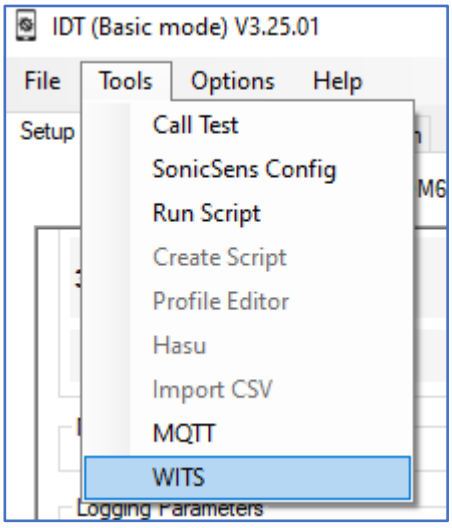


Figure 12. Accessing WITS utilities

The WITS Utilities window will appear, containing several tabs. Each tab acts independently and will produce a file after clicking the 'OK' button. The files can be found in the WITSBLKINC folder in the IDT install directory, normally C:\HWM\IDT.

### 3.9.2. MODIFYING PASSWORDS

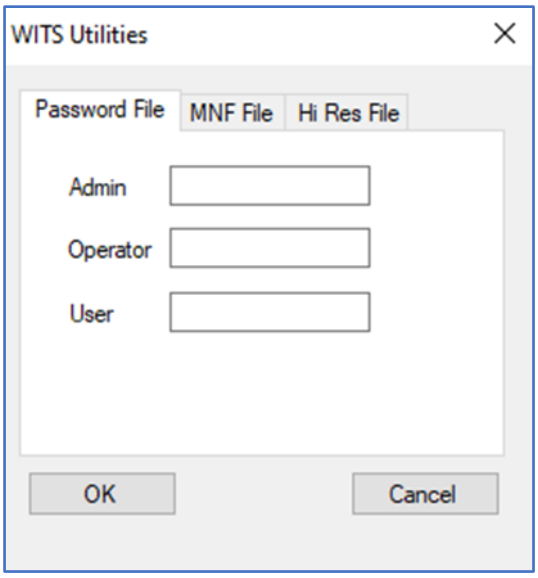


Figure 13. Update of passwords for IDT access

The 'Password File' utility allows the passwords for local access to the logger (i.e., when using IDT) to be changed remotely via the WITS Master Station.

Select the 'password file' tab. Add the three new passwords in the space provided. All three password fields must be completed.

A file with the name "passcodes" is created.

⚠ **Note**: Ensure the passwords are recorded and kept safely. Lost passwords can be over-written by a new upload through the WITS Master Station. However, if a logger is not calling in, the only way to recover a lost password for IDT access is via a return to an authorised HWM service centre.

### 3.9.3. MODIFYING A MINIMUM NIGHT FLOW (MNF) ALARM

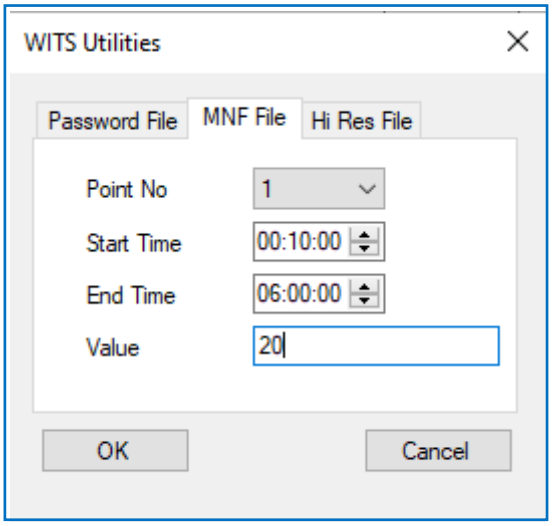


Figure 14. Update of MNF parameters

The 'MNF File' utility refers to the 'Minimum Night Flow' alarm. In summary, this alarm is raised when the water flow does not drop below a threshold during an expected period of low water consumption (typically during the night). The MNF utility allows the alarm parameters to be changed remotely via the WITS master.

Select the 'MNF file' tab.

Select the channel that is required to be modified (using the "point no." selector).

Add the time-window and ('Value') flow-rate threshold in the space provided. (Choose a value of flow which will be reliably above what will usually be the minimum water consumption rate).

A file with the name " multilogmnf " is created.

### 3.9.4. REQUESTING HI-RES DATA (HIGH SPEED SAMPLED DATA)

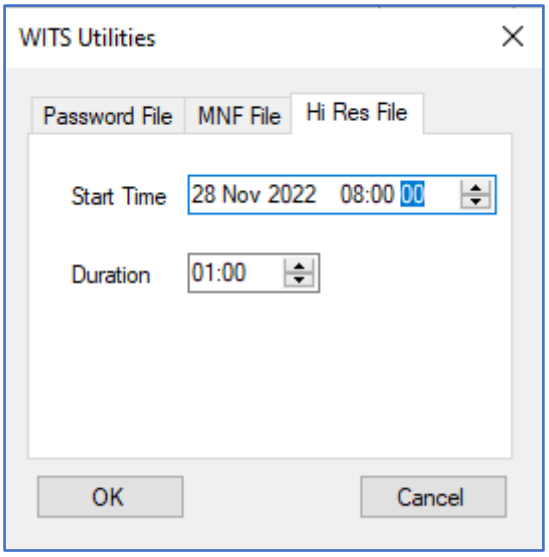


Figure 15. Hi Res file setup

The logger has a block of memory into which it is continuously recording "high speed sampled data" (also known as 'Hi-Res' data within IDT). The memory used for storing the data is of a fixed size and (when full) the oldest data is over-written. Whenever an alarm first becomes active, the logger automatically sends in 30 minutes of the most recent Hi-Res data.

This utility is used to request additional Hi-Res data from a period in the past (future events are out of scope). Up to 2 hours of data can be requested. Typically, this can be from up to a week in the past but depends on the number of channels in use and the sample rate of the logger.

Select the 'Hi Res File' tab.

Enter the start time and duration. Then click on OK.

A file with the name "highresdata.txt" is created.

The logger will send whatever data it has for the selected period.

# 4. Troubleshooting, Maintenance and Spares

Refer to the Multilog 2 user guide for details.

HWM-Water Ltd.
Ty Coch House
Llantarnam Park Way
Cwmbran
NP44 3AW
United Kingdom
+44 (0)1633 489479
www.hwmglobal.com