



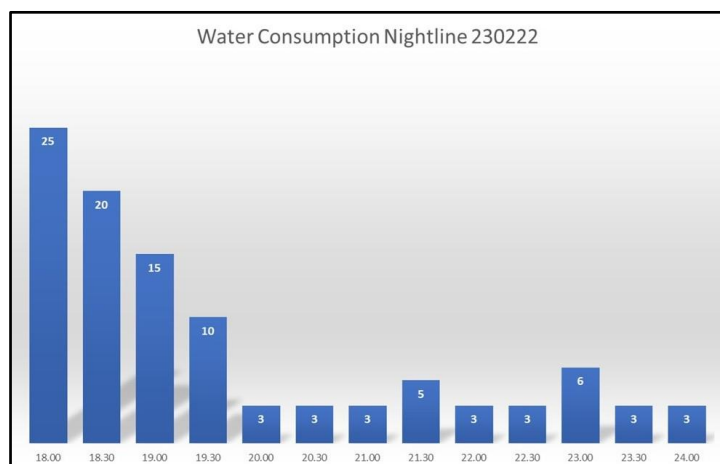
Made in Britain

# **FIXED and POCKET PLUS Ultrasonic Clamp-on Flowmeters**

## **Datalogging and Serial Communications**

**Version 1.0**

**13th March 2023**



**Copyright Sonic Driver Ltd 2023**

# **Contents**

## **1.0 Introduction**

## **2.0 Description**

## **3.0 Real Time Clock Operation**

### **3.1 Date**

### **3.2 Date Format**

### **3.3 Time**

## **4.0 Serial Communications**

### **4.1 Baud**

### **4.2 Parity**

## **5.0 Datalogger**

### **5.1 Interval**

### **5.2 Erase**

### **5.3 Energy Record**

### **5.4 Download**

## **6.0 PC Software**

## **7.0 Streaming**

### **7.1 Line Printer(LPT)**

### **7.2 Diagnostic**

## **8.0 Testing**

### **8.1 Logger**

### **8.2 Serial**

## **9.0 Specification**

## 1.0 Introduction

The Sonic Driver FIXED-UFM and POCKET PLUS-UFM have integral internal datalogger functionality included as standard.

When activated the datalogger records data at a user defined time interval.

The logged data can be downloaded to a PC for subsequent analysis using spreadsheets or other software.

In addition the UFM's can output serial data in streaming mode, which can be logged on an external device such as a PC, the datalogging capacity is now only limited by the storage capacity of the external device.

## 2.0 Description

The FIXED-UFM has an internal 16MB datalogger memory capacity, see **Specification**.

The POCKET PLUS-UFM has an internal 4MB datalogger memory capacity.

The datalogger memory is non-volatile and data is retained when power to the UFM is turned off.

The logging interval can be programmed from 1 to 255s. A value of 0 turns the datalogger Off.

All data is date and time stamped using a real time clock with battery backup, see table(1).

Flow Velocity
Flow Rate
Flow Positive Total
Flow negative Total
Flow Net Total
Energy
Energy Rate
Energy Positive Total
Energy negative Total
Energy Net Total
Inlet Temperature
Outlet Temperature
Speed of Sound in Fluid

**Table(1) Logged data list**

Values are logged in the units selected in the flowmeter.

Data is saved in ASCII, comma separated, text readable format.

Data download is initiated at the UFM.

The FIXED-UFM can download using USB or RS232 serial communications.

For RS232 download to a PC a USB-RS232 converter cable is required, see **Specification**.

The POCKET PLUS-UFM downloads using USB serial communications.

The baud rate and parity of the serial communications can be selected by the user.

When connected to a computer USB port, USB charger or USB Power bank the POCKET PLUS-UFM is powered over the USB. This allows for extended datalogging sessions.

### **3.0 Real Time Clock Operation**

The following user options can be configured;

#### **3.1 Date**

Set the Real Time Clock(RTC) date. The UI checks for illegal entry and leap years.

#### **3.2 Date Format**

Select date format from a list for the FIXED-UFM;

- dd/mm/yy
- mm/dd/yy
- yy/mm/dd

The date format is fixed at dd/mm/yy for the POCKET PLUS-UFM.

#### **3.3 Time**

Set the RTC time, uses 24-hour format. Only enter hours and minutes. The time format is hh:mm.

### **4.0 Serial Communications**

The following user options can be configured;

#### **4.1 Baud**

The user is prompted to select the communication baud rate from a list;

- 9600
- 19200
- 57600 (FIXED-UFM only)
- 115200

#### **4.2 Parity**

The user is prompted to select the communication parity from a list;

- None
- Even
- Odd

In addition it is possible to select the **Mode** of serial communications to be *Line Printer(LPT)* or *Diagnostic* streaming, see **Streaming**.

## **5.0 Datalogger**

The following user options can be configured;

### **5.1 Interval**

The user is prompted to enter a datalogger interval.

Entering a value for **Interval** starts datalogging. An Interval of zero turns the data logger off.

When the interval is met then all meter measurement values are written to the datalogger memory.

Allowed values are ranged 0 to 255s, default 0s meaning off.

### **5.2 Erase**

The user is prompted to erase the datalogger memory by selecting On/Off. By default memory is not erased.

### **5.3 Energy Record**

On the FIXED-UFM the user is prompted to turn logging of energy rate and totalisers On/Off. By default energy rate and totalisers are not logged.

This option is always on for the POCKET PLUS-UFM.

### **5.4 Download**

The user is prompted to download the datalogger memory over USB or RS232 (FIXED-UFM only) by selecting On/Off. By default memory is not downloaded.

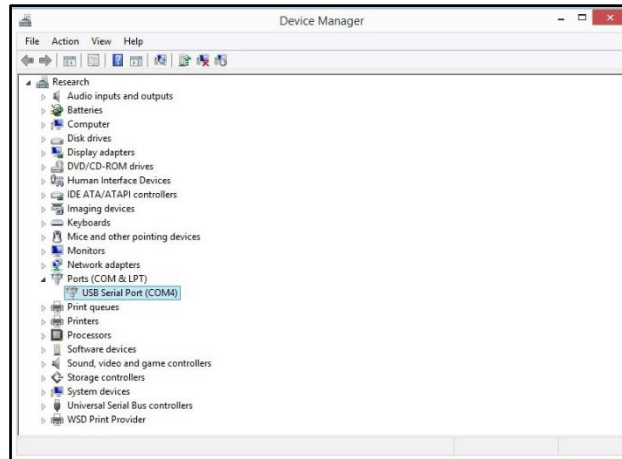
## 6.0 PC Software

There are many terminal programs available for download on the WWW. Sonic Driver engineers have used PuTTY for many years.

PuTTY can be downloaded and installed from <https://putty.org/>

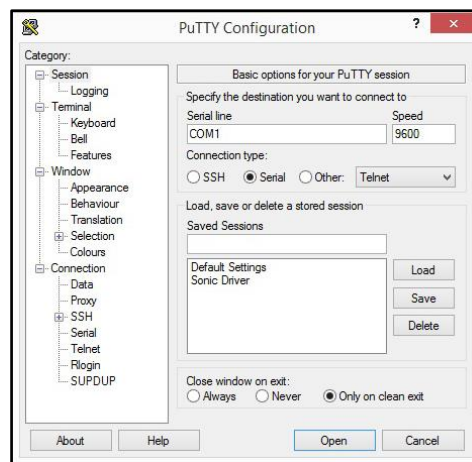
Connect the UFM to the PC using USB or a USB-RS232 converter cable.

In Device Manager note the number of the virtual com port that is created, see figure(1).



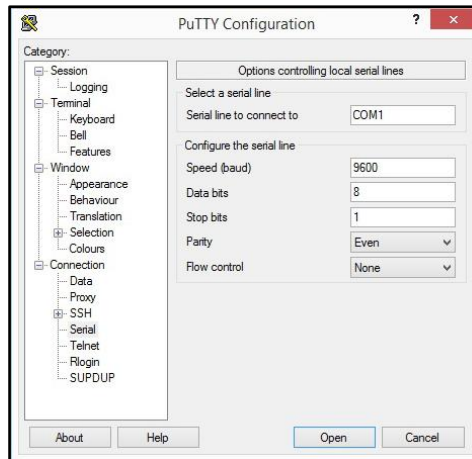
**Figure(1) Device manager showing com port**

In the PuTTY Configuration tick **Connection type** *Serial* and enter the *com port* at **Serial line** see figure(2).



**Figure(2) Comport Configuration**

Under **Connection**, left hand side bar, select **Serial**, see figure(3).

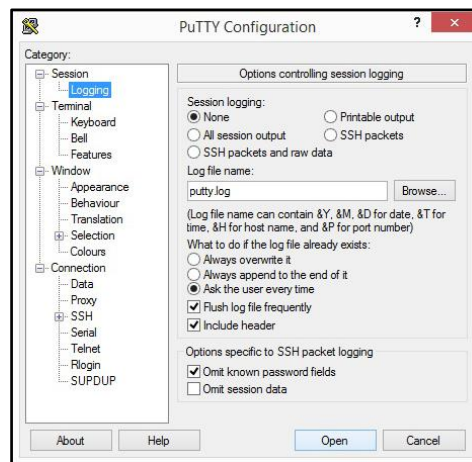


**Figure(3) Serial Configuration**

Set **Speed(baud)**, and **Parity** to suite the setting in the UFM.

**Data bits** is 8 bits, **Stop bits** is 1 bit, **Flow control** is *None*.

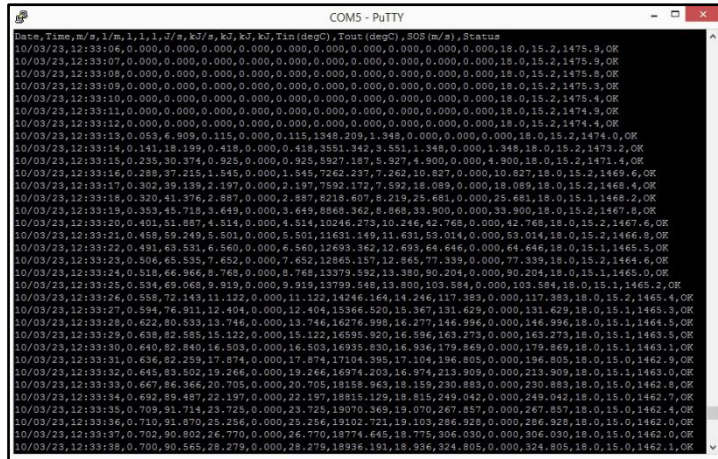
Under **Session** select **Logging**, see figure(4). Select **Session logging** as **All session output** and enter a **Log file name** and path as desired. It is recommended to give this file a **.csv** file name extension so that spreadsheets will recognise its format.



**Figure(4) Logging Configuration**

Click **Open** and the terminal screen will appear.

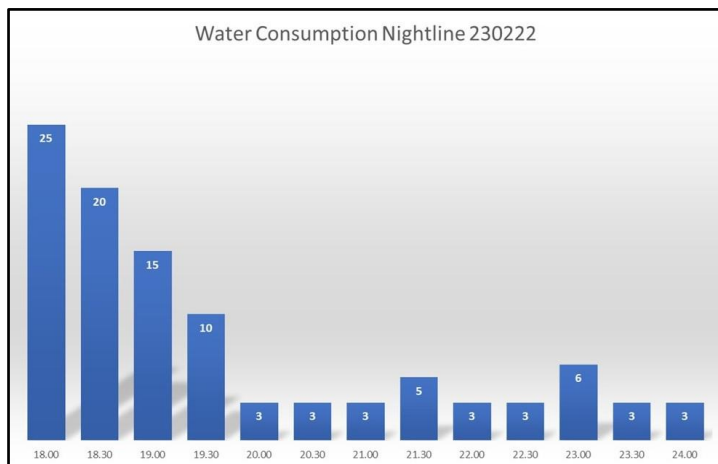
On the UFM set **Download** to **Yes**. A progress bar will appear at the UFM and data will start to stream into the PuTTY terminal screen, see figure(5). If logging has been selected in PuTTY the data will be saved to a file as each byte is received.



**Figure(5) Data Streaming**

When download is complete close PuTTY.

The .csv data file can now be imported into spreadsheet or other analysis programs, see figure(6).



**Figure(6) Typical data presented as a spreadsheet graph**

The data in table(1) will appear with date and time stamps in columns, each row recorded at the set log interval.

The top row contains the units of the values in each column.

## 7.0 Streaming

Streaming is a very useful feature of the UFM if it is possible to leave a PC, laptop or tablet device attached to the UFM for an extended period of time.

### 7.1 Line Printer(LPT)

By selecting *LPT* as the serial **Mode** then measurement values are continuously streamed to the PC.



## 7.2 Diagnostic

By selecting *Diagnostic* as the serial **Mode** then diagnostic values are continuously streamed to the PC.

If a PuTTY download is opened and left open on the PC then streaming will continue until it is closed or the flow measurement is stopped.

## 8.0 Testing

On the UFM it is possible to test the datalogger function and memory.

### 8.1 Logger

This option allows the user to test the function of the UFM datalogger and its memory. In order to carry out the test the logger memory needs to be erased blank.

On the POCKET-PLUS-UFM it is possible to test the USB serial communications.

### 8.2 Serial

This option allows the user to test the function of the UFM serial communication by streaming a test message.

## 9.0 Specification

	<b>FIXED-UFM</b>	<b>POCKET PLUS-UFM</b>
<b>Capacity(MB)</b>	16	4
<b>Duration(Hours)*</b>	48	12
<b>Interval(s)</b>	0/1 to 255	0/1 to 255
<b>Serial Link</b>	USB/RS232	USB

Duration(Hours)\* at 1 second interval.

For RS232 download a USB-RS232 converter cable is required. A suitable cable would be USB-RS232-WE-1800-BT-3.3, USB to RS232 converter cable, wire-ends, 3V3, 1.8m. Farnell order code 2352006.

**Sonic Driver Ltd**