





## Optimum Instruments WMS Flow Meter



### SETUP AND PROGRAMMING

#### Buttons

Button Symbol	Description
<b>MENU</b> 	Press and hold the MENU button for 3 seconds to enter or exit the Programming Mode at any time. SD-Card can be inserted into the unit when the backlight is on in order to download the internally logged data.
<b>Up arrow/MAX</b> 	Press the Up arrow/MAX button to scroll through the menus or to increment the value of a digit.
<b>Right arrow/RESET</b> 	Press the Right arrow/RESET button to access a submenu, move to the next digit when entering a value, or adjust decimal position during programming.
<b>Return/ACK</b> 	Press the Return/Ack to return to the parent menu of a submenu.

## Main Menu Display Functions & Messages

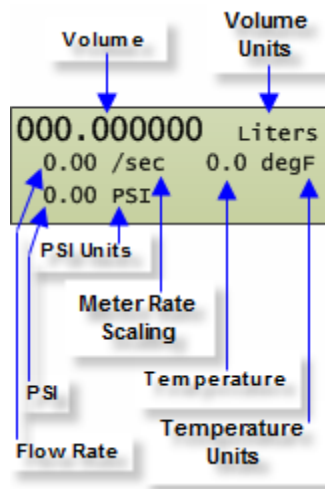
The meter displays various functions and messages during setup, programming, and operation. The following table shows the main menu functions and messages in the order they appear in the menu.

Each of the menu items shown below has a corresponding submenu that is used to adjust the associated setting. Settings adjusted in each submenu are saved immediately after a change is made and there is no need to hit any other keys to 'lock in' the change. If a submenu has multiple items to choose from, each item can be browsed one at a time using the Up arrow button. Hitting the Up arrow button when at the last item will restart the item display at the first item.

Display	Action/Setting
Volume Units	Enter the Volume Units menu where selection from Gallons, Liters, ft <sup>3</sup> (cubic feet), m <sup>3</sup> (cubic meters) can be made
K Factor	Enter the K Factor Value menu where the K-Factor value (in terms of the selected Volume Units) can be programmed
Rate Meter Scaling	Enter the Rate Meter Scaling menu where selection from /sec (seconds), /min (minutes), /hour (hours) can be made.
Flow Rate Units	Enter the Volume Units menu where selection from Gallons, Liters, ft <sup>3</sup> (cubic feet), m <sup>3</sup> (cubic meters) can be made
MODBUS	Enter the MODBUS address where selection from 1-99 can be made

## Main Menu

The Main Menu displays 8 fields providing information regarding the meter operation.



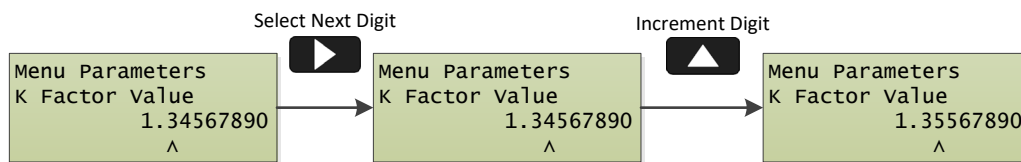
Field	Description
Volume	Displays the meters totalized volume
Volume Units	Displays the units of the totalized volume (as set in the Volume Units menu)
Flow Rate	Displays the flow rate (metered volume divided by the Rate Meter Scaling)
Rate Meter Scaling	Displays the rate units the flow is measured over (as set in the Rate Meter Scaling menu)

## Setting Numeric Values


The numeric values are set using the Right and Up arrow buttons. Press Right arrow to select next digit and Up arrow to increment the digit.

An arrow will appear on the LCD below the digit currently being changed.

The Up arrow will cycle between digits '0' through '9' and a decimal point '.' if a decimal point has not yet been placed. The decimal point is optional but if selected can only be chosen once. If the decimal point is to be repositioned, then the current position of the decimal point must be replaced with a digit and the new position of the decimal point can then be selected.

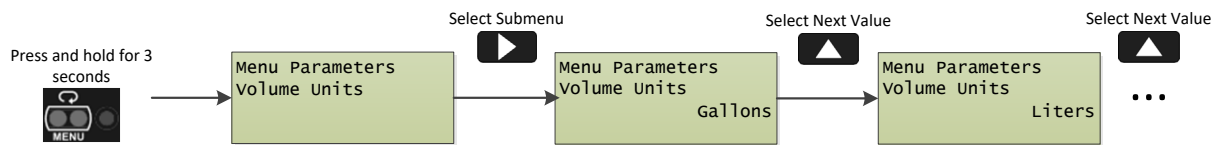


## Accessing the Menu

To access the menu, hold down the MENU button  for 3 seconds.

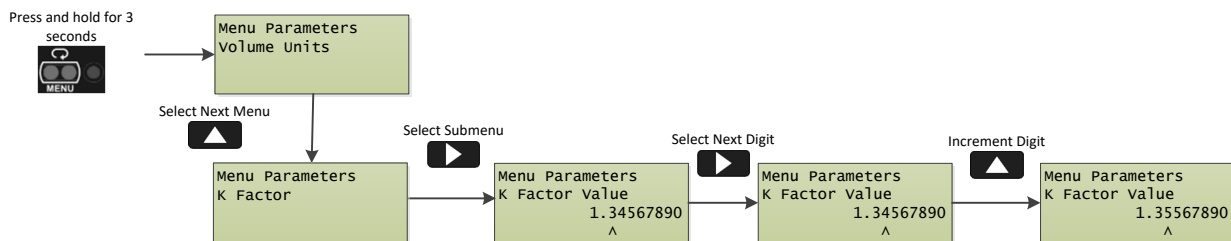
## Setting the Volume Units

The Volume Units menu is used to select the volume units to be totalled. The Up arrow button will cycle through the volume units available.



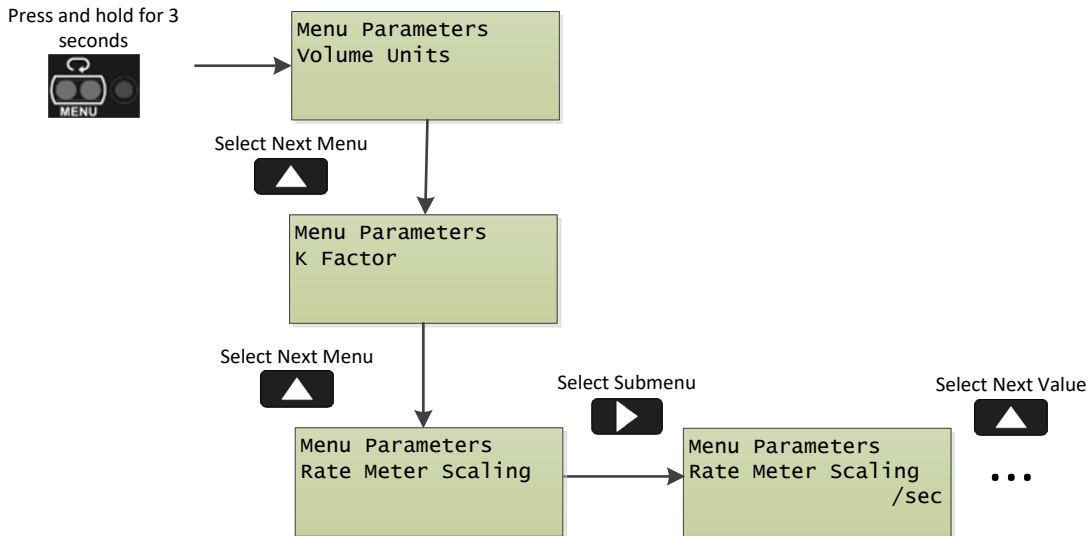
## Setting the K Factor

The K Factor menu is used to program the flow coefficient (expressed in pulses per unit volume) that is used to convert input pulses to the Volume on the display. It is important to note that the K Factor programmed must have the same unit volume as specified in the Volume Units menu or the incorrect totalized volume may be displayed. Setting of the K Factor is done as described in the Setting Numeric Values section above.



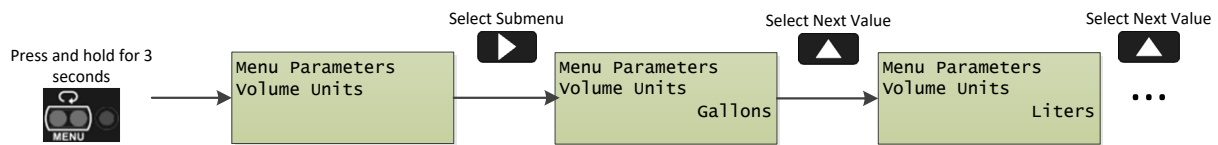
## Setting the Rate Meter Scaling

The Rate Meter Scaling menu is used to select the time over which the volume should be measured (resulting in the Flow Rate). The Up arrow button will cycle through the volume units available.



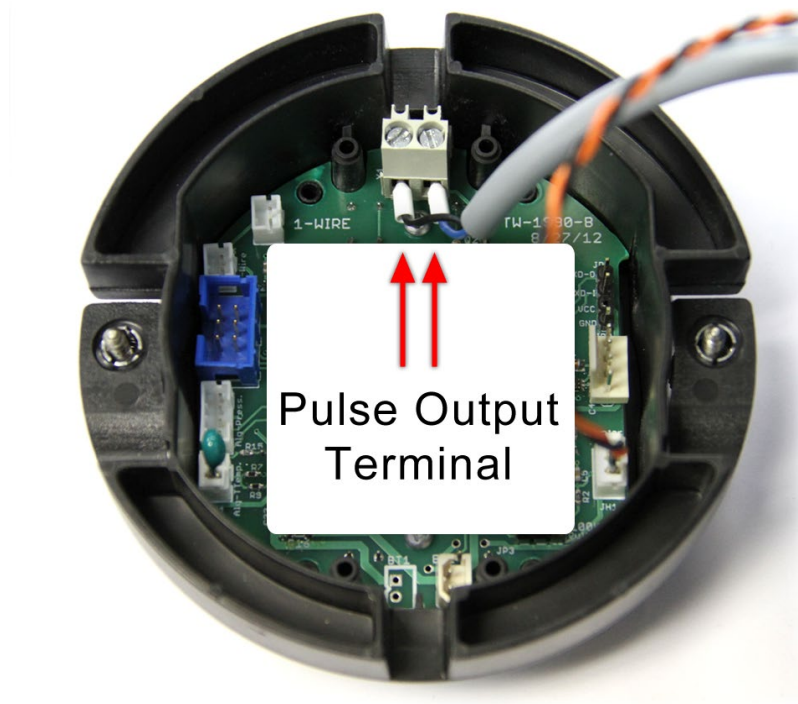
## Setting the Flow Rate Units

The Flow Rate Units menu is used to select the volume units to be totalled. The Up arrow button will cycle through the volume units available.



## Pulse Output

The pulse output will be pulsed with each complete volume unit received. If the Volume Units chosen are Gallons, then the output pulse will pulse once for every gallon received. The maximum pulse output frequency is 18 Hz. If the pulse output exceeds 18 Hz, pulses are accumulated and the pulse output will continue until all accumulated pulses have been output



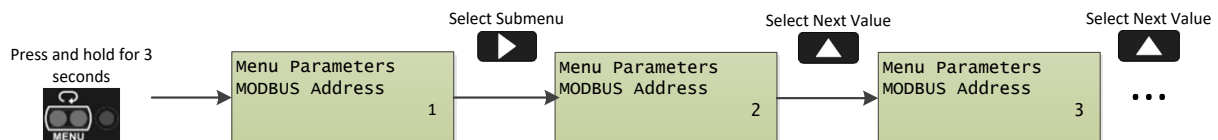
## MODBUS Communication



<b>+</b>	+12V Power Input
<b>E</b>	RS-485 Enable
<b>B</b>	RS-485 B
<b>A</b>	RS-485 A
<b>G</b>	Ground

## Setting the MODBUS Address

The MODBUS Address menu is used to select the starting address of the 6 registers supported. The Up arrow button will cycle through addresses from 1-99. RTU protocol is used.

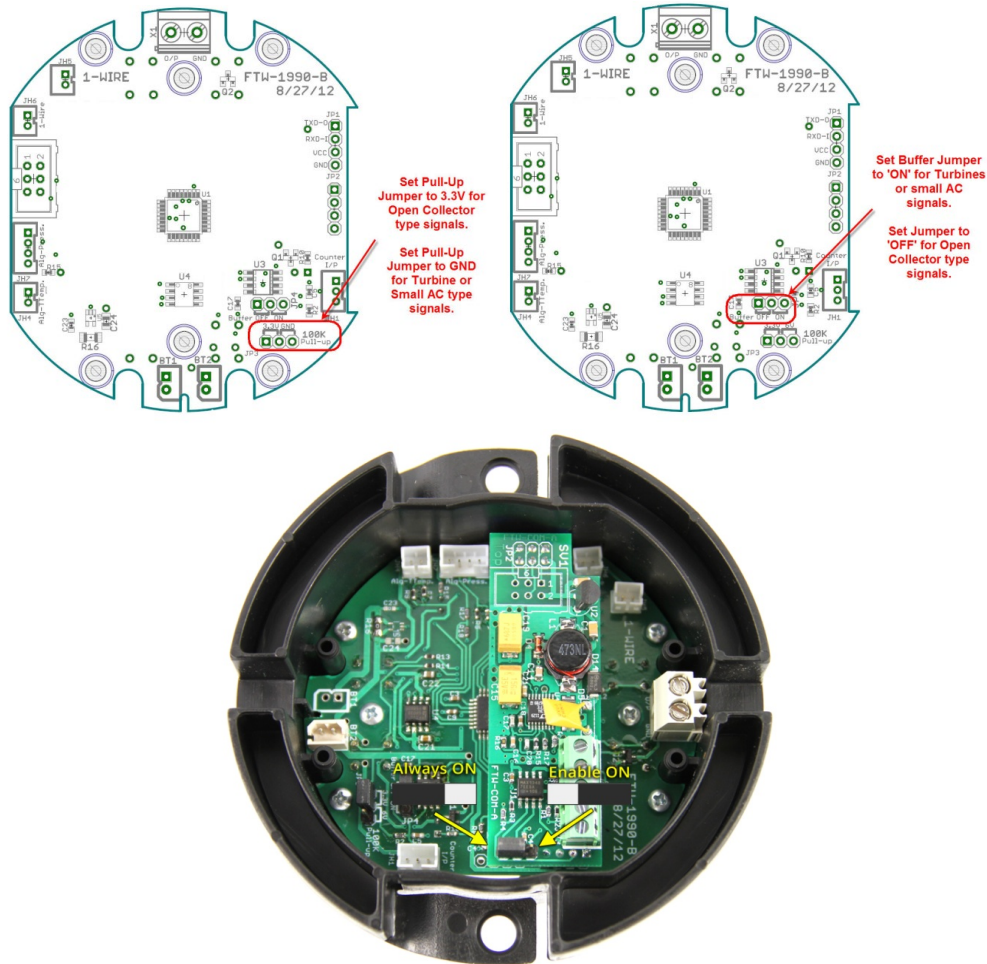


The 6 MODBUS registers are organized as:

- 0 and 1 are a long value of seconds.
- 2 and 3 are a float value of total volume.
- 4 and 5 are a float value of flow rate.



## Jumper Settings



To externally enable RS-485 set jumper to the Enable ON Position.

To have RS-485 always on set this jumper to Always ON Position

### Notes:


Both jumpers to the left for mag flow type meters.

Both jumpers to the right for turbine type flow meters

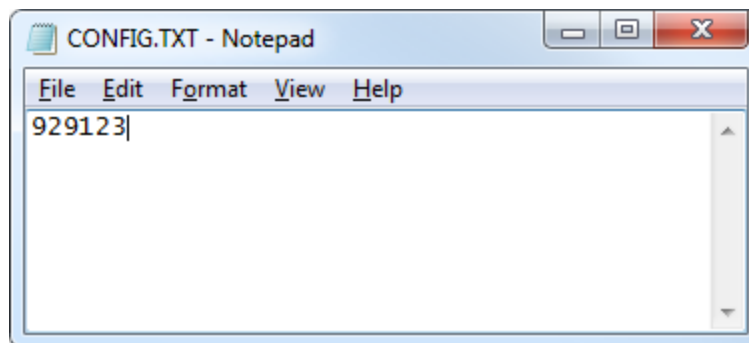
Change 100k pull-up to 2.2k pull up for mag flow type meters

## Setting the Unit Number

A Unit Number/Serial Number can be set for the unit to aid with organizing log files. To change a unit number for a meter head you have to make a CONFIG.TXT file on an SD-card. Ensure Windows is showing file extensions as by default they are turned off and you will end up with a CONFIG.TXT.txt file name. **All upper case is important.**

Name	Date modified	Type	Size
 CONFIG.TXT	09/05/2013 1:24 PM	TXT File	0 KB

Next open up the file with Notepad or similar and put in a **6 digit** unit number all by itself in the file such as: "929123" or "000004"



Save the file and then remove your SD-card from your computer. Insert the SD-card into the meter head after pressing MENU to wake the unit and let it go through a download process. It should then create a new log file with the correct number for you to verify.

## Formatting Internal Memory for Use

Formatting the internal memory **must be done** once for the logging to function properly. In order to clear all internal logged data and format the memory hold down RETURN while applying power and keep RETURN held down until you see “Clearing Logged Data” after which you can then let go of the button.

This process will take a few minutes and once it has completed, the unit will be in a test ready mode.

**Cycle the power until the Sample number shows greater than 40 to begin use!**

A Sample number greater than 40 indicates that the meter is ready to use. Sample numbers below 40 will loop through internal memory as it is in a test ready mode.

## Downloading Internal Memory

Formatting the internal memory **must be done** once for the logging to work correctly. The unit must also be in **run mode**.

Insert the SD-card into the meter head after pressing MENU to wake the unit and it will go through the download process. Once it has finished, eject the SD card and insert it into your computer. On the SD card there will be a log file with the unit number that can be copied and opened into Excel. You may need to sort the date/time column for the data to line up for use.

