



Integrating the McCrometer Ultra Mag Flowmeter/Controller
 Sensor Application Note #18

Overview

This Sensor Application Note will detail the integration and configuration issues when using the McCrometer Ultra Mag Flowmeter/Controller. The Ultra Mag Controller is a highly programmable flow controller/display with a variety of inputs and outputs. The Ultra Mag includes an instrumented section of pipe designed to be installed in-line of the flow application, pipe sizes from 2" (50 mm) to 36" (900 mm) are available. Visit www.mccrometer.com for more information on the Ultra Mag Controller and accessories or contact Canary Systems directly.



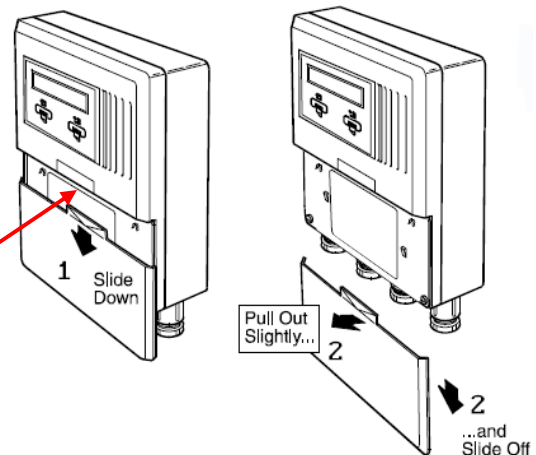
The Ultra Mag Controller directly calculates flow in both directions and totalizes in user configurable units which provides highly accurate flow monitoring.

Note: The gage types shown in the MultiLogger Configuration section are included in MultiLogger v4.3.10 and higher. The current version may be downloaded from the Support area at our website.

Serial Communications Interface

This Sensor Application Note will describe how to utilize the RS-232 connection of the Ultra Mag. The RS-232 connection provides better quality flow reporting including totalizing which is not available using the analog outputs. Consult the *Ultra Mag Installation and Operation* manual for direction on the using the analog outputs.

The primary RS-232 connection is available under the terminal cover, see the instructions at right for removing the front cover.



Gage types and wiring are supported for the Campbell CR800 and CR1000 controllers.

CR800	CR800/1000	Description	Wire Color	RS-232 DE9F
C1/C3	C1/C3/C5/C7	Transmit Data (TD)	Green	2
C2/C4	C2/C4/C6/C8	Receive Data (RD)	White	3
5V	5V	Data Terminal Ready (DTR)	Red	7
G	G	Ground	Black	5

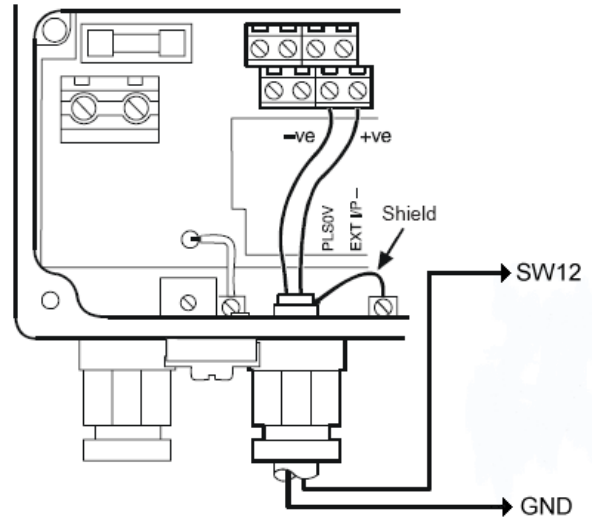
Note: Use the control port pairs to match the COM port being utilized, e.g. for the CR800 COM1 use C1 & C2, COM2 uses C3 & C4, etc.

Totalizer Reset Interface

The Totalizer Model selections in MultiLogger include programming to provide a control signal to reset the Total Flow outputs of the Ultra Mag. This requires a second connection of the **SW12** and **GND** connections between the control module and Ultra Mag. Connections to the wiring blocks of the Ultra Block are found by removing the 4 screws on the corners of the access panel below the RS-232 connection.

The diagram at right illustrates the Ultra Mag connection points for the SW12 and GND connections. If shielded cable is used for the connection then only connect the shield drain wire at the Ultra Mag, at the location shown at right.

Reset of the totalizers is accomplished by output of a 1 second pulse of the SW12 signal (12VDC) after each measurement cycle.



Note: By default the Ultra Mag is configured for *Inpt Clr*, or to reset the totalizers based on the signal input from the MCU. However, this setting should be checked prior to deployment. It can be done through the front panel display or via serial connection using a terminal emulation program such as Hyperterminal. The menu tree and directions for checking the setting using either method are found in the *Ultra Mag Installation and Operations Guide*.

MultiLogger Configuration

Configuration in MultiLogger is straight-forward. There are **Gage Type | Make | Model** selections for retrieving Flow and Totalizer values from the Ultra Mag. Use the **Direct Connect** channels to configure the measurements. Contact Canary Systems if other outputs are desired. The Ultra Mag supports Flow, Flow %, Forward Total Flow, Reverse Total Flow, Net Flow, Alarm and Velocity.

Note: Units of the Flow and Totalizer are configured directly using the Ultra Mag display/keypad. Consult the *Ultra Mag Installation and Operation Guide* for instructions configuring units.

CR800 Gage Type | Make | Model selections:

Type	Make	Model	Instruction File	Description
Digital	McCrometer	Ultra Mag Flow Com1	gt_ultramag_flow_com1.cr8	Ultra Mag Flow connected to COM1
		Ultra Mag Flow Com2	gt_ultramag_flow_com2.cr8	Ultra Mag Flow connected to COM2
		Ultra Mag Total Com1	gt_ultramag_total_com1.cr8	Ultra Mag Totalizer connected to COM1
		Ultra Mag Total Com2	gt_ultramag_total_com2.cr8	Ultra Mag Totalizer connected to COM2

CR1000 Gage Type | Make | Model selections:

Type	Make	Model	Instruction File	Description
Digital	McCrometer	Ultra Mag Flow Com1	gt_ultramag_flow_com1.cr1	Ultra Mag Flow connected to COM1
		Ultra Mag Flow Com2	gt_ultramag_flow_com2.cr1	Ultra Mag Flow connected to COM2
		Ultra Mag Flow Com3	gt_ultramag_flow_com3.cr1	Ultra Mag Flow connected to COM3
		Ultra Mag Flow Com4	gt_ultramag_flow_com4.cr1	Ultra Mag Flow connected to COM4
		Ultra Mag Total Com1	gt_ultramag_total_com1.cr1	Ultra Mag Totalizer connected to COM1
		Ultra Mag Total Com2	gt_ultramag_total_com2.cr1	Ultra Mag Totalizer connected to COM2
		Ultra Mag Total Com3	gt_ultramag_total_com3.cr1	Ultra Mag Totalizer connected to COM3
		Ultra Mag Total Com4	gt_ultramag_total_com4.cr1	Ultra Mag Totalizer connected to COM4

Sample Instruction File

Below is a sample CR800 instruction file for reading the Totalizer output of the Ultra Mag connected to COM1 (C1 & C2).

```
'Read Totalizer UltraMag Flow Controller connected via RS-232 to COM1 (C1& C2)
'Use SW12 to Reset the Totalizer after reading

'Open our serial port
SerialOpen (Com1,4800,0,1000,255)

'Send <CR> for attention
SerialOut (Com1,CHR(13),"",0,0)
Delay (0,1,Sec)

'Send Read menu command
SerialOut (Com1,"1"+CHR(13),"",0,0)
Delay (0,1,Sec)

'Send FWD Flow command
SerialOut (Com1,"3"+CHR(13),"",0,0)
SerialFlush(Com1)

'Get response
SerialIn (sInBuf,Com1,200,"",50)

'Parse out results if responded
If Len(sInBuf) > 20 Then
    'Remove characters before 3>
    SplitStr(sOutBuf,sInBuf,"3>",1,4)

    'Split out Flow
    SplitStr(ScratchLoc(1),sOutBuf,"",1,0)

    'Copy to our reading loc
    Reading_Loc = ScratchLoc(1)
Else
    Reading_Loc = -99999
EndIf

'Initiate BYE sequence
Delay (0,2,Sec)
SerialOut (Com1,"Q"+CHR(13),"",0,0)
Delay (0,1,Sec)
SerialOut (Com1,"Q"+CHR(13),"",0,0)
Delay (0,1,Sec)
SerialOut (Com1,"Q"+CHR(13),"",0,0)
Delay (0,1,Sec)

'Close our port
SerialClose (Com1)

'Reset our flow totalizer
SW12 (-1)
Delay (0,1,Sec)
SW12 (0)
```