



Convert 4675LV Output to Flow and Output to SDM-A04

Overview

The Geokon 4675LV measures level in a weir using a force transducer with weight attached. It provides high accuracy and more stable results compared to pressure transducer type weir monitors.

This application note will detail configuring the 4675LV using MultiLogger, converting the output (in feet) to flow and then outputting the values to the SDM-A04. The output to the SDM-A04 will be scaled for 0gpm = 1000mVDC and full-scale of 300gpm = 5000mVDC. The scaling values can be adjusted by editing the instruction file.

Note: This example assumes you have the instruction file `sdm_a04_status.ins` listed in the last section. Contact Canary Systems to obtain this file, alternately edit the default `sdm_a04_status.ins` file in the `\Program Files\MultiLogger` folder (MultiLogger version 3.x or older) or in the `\Program Files\MultiLogger\INS` folder (MultiLogger version 4.x or newer).

MultiLogger Configuration

There are 3 steps to the configuration, as detailed below.

1. Configure Channels

The measurement channel must be configured, the example assumes the multiplexer has been configured. Use the first channels of the multiplexer, up to 4 may be configured to match the 4 outputs of the SDM-A04.

Note: The Zero Reading must be obtained in the field. It is recommended to run the Zero function to obtain these results. Enter the (negative) Gage Factor in inches or millimeters per digit from the 4675LV Calibration Sheet. Measure the depth of water at the time of the Zero Reading and enter this value as the Offset shown above, it must be the same units as the Units Conversion selection.

The Set SDM-A04 Status selection converts from level to flow using the following formula for a V-notch weir:

$$Q = 302.1(h + 0.007)^{2.5}$$

Where; h = head in feet, Q = flow in gpm.

In addition the instruction file moves the flow values to User Locations beginning with 20. The first channel is copied to User Location 20, the second to User Location 21, etc.

The instruction file does not include any alarm functionality, however this could be added if desired.

The **Input Locations** form can be used to enter alarm monitoring for the flow values if desired.

2. Configure Input Locations

The flow values are copied to User Location 20 and higher, use the **Program | Input Locations** form to configure these locations. This includes storing the values, configuring the **Label** and **Description** and monitoring for alarms using the **Check Alarms** selections. See the following example for the first flow channel.

The screenshot shows the 'Configure Input Locations' dialog box. On the left, a list of locations from 11 to 22 is shown, with '20' selected. To the right, the configuration for location 20 is displayed. The 'Store Location' checkbox is checked. The 'Label' field is 'CH1_FLOW', 'Description' is 'User Location 2', 'Units' is 'None', and 'Reserved' is 'UserLoc2'. The 'Check Alarms' section includes a gear icon, a lightbulb icon, and a 'Type' dropdown set to 'Low and High'. Below this, 'Alarm Low' is set to '0' and 'Alarm High' is set to '300'. At the bottom of the dialog are three buttons: 'Help' (with a question mark icon), 'Accept' (with a green checkmark icon), and 'Cancel' (with a red X icon).

3. Configure Output Device (or Storage Device for MultiLogger 3.x and older)

The flow values scaled to mV must be sent to the attached SDM-A04, this is done by configuring the **Output Device**, use the **Set SDM-A04 Output** selection from the list. Note in MultiLogger version 3.x and older this option was labeled **Storage Device**.

The screenshot shows a configuration field for the 'Output Device'. It features a gear icon on the left, followed by a lightbulb icon and the text 'Output Device:'. To the right is a dropdown menu with the text 'Set SDM-A04 Output'.

Modified Instruction File sdm_a04_status.ins

```
;Convert weir level in feet to flow
;Formula: Q = 302.1(h + .007)^2.5

;Add .007 and move to SDM location
P34   Z=X+F ;
1:[MuxReadingLoc++ ] X Loc ;
2:[.007 ] F ;
3:[SDM1Loc++ ] Z Loc ;

;Load our power
P30   Z=F ;
1:[2.5 ] F ;
2:[0 ] Exponent of 10 ;
3:[ScratchLoc1 ] Z Loc ;

;Raise to power
P47   Z=X^Y ;
1:[SDM1Loc++ ] X Loc ;
2:[ScratchLoc1 ] Y Loc ;
3:[SDM1Loc++ ] Z Loc ;

;Multiply
P37   Z=X*F ;
1:[SDM1Loc++ ] X Loc ;
2:[302.1 ] F ;
3:[SDM1Loc++ ] Z Loc ;

;This still needs a scaling factor for the +/-5000mV range of the SDM-A04
;We have Flow results now - copy to Input Locations
P31   Z=X ;
1:[SDM1Loc++ ] X Loc ;
2:[UserLoc2++ ] Z Loc ; Start with UserLoc2 because VWDSP uses UserLoc1

;Now apply scaling - 0gpm = 1000; 300gpm = 5000
P37   Z=X*F ;
1:[SDM1Loc++ ] X Loc ;
2:[13.333 ] F ;
3:[SDM1Loc++ ] Z Loc ;

P34   Z=X+F ;
1:[SDM1Loc++ ] X Loc ;
2:[1000 ] F ;
3:[SDM1Loc++ ] Z Loc ;

;Check for out-of-range conditions
P89   If (X<=>F) ;
1:[SDM1Loc++ ] X Loc ;
2:[4 ] Comparison Code Option (<) ;
3:[1000 ] F ;
4:[30 ] Command Code Option (Then Do) ;

P30   Z=F ;
1:[1000 ] F ;
2:[0 ] Exponent of 10 ;
3:[SDM1Loc++ ] Z Loc ;

P95   End ;

P89   If (X<=>F) ;
1:[SDM1Loc++ ] X Loc ;
2:[3 ] Comparison Code Option (>=) ;
3:[5001 ] F ;
4:[30 ] Command Code Option (Then Do) ;

P30   Z=F ;
1:[5000 ] F ;
2:[0 ] Exponent of 10 ;
3:[SDM1Loc++ ] Z Loc ;

P95   End ;
```