

Application Note:

Math Modules: Flow: Instantaneous Flow of a V-notch Weir

Defining the Problem:

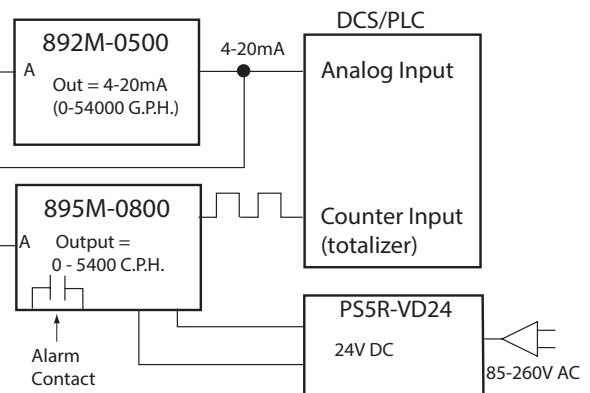
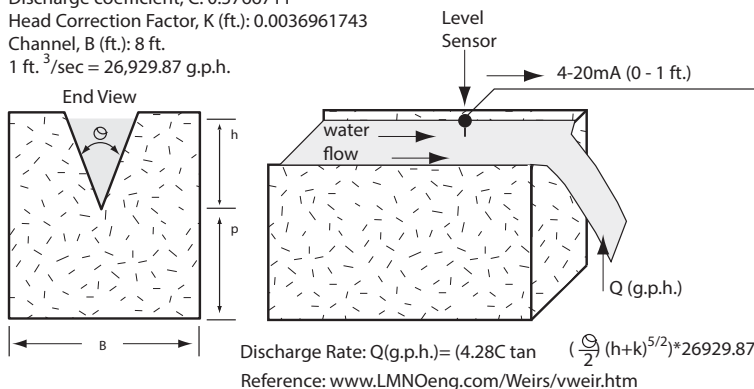
Calculate the discharge rate Q (g.p.h.) output of a V-notch weir.
Provide a 4-20mA output for flowrate and frequency output for totalization and alarm output for high-level alarm.

Solution:

[Model 892M-0500](#) DC output math module
[Model 895M-0800](#) freq. output math module
[Model 800C-SIP](#) software interface package
Optional: [Model PS5R-VD24](#) power supply

System Diagram:

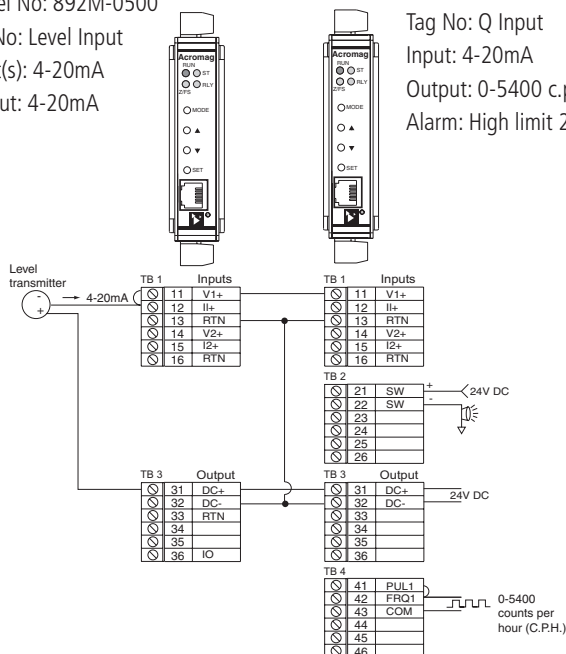
V-notch weir: Find Q (g.p.h.)
Notch angle, $\theta = 60$ degrees
Head, h = 0 to 1 ft.
Discharge coefficient, C: 0.5766711
Head Correction Factor, K (ft.): 0.0036961743
Channel, B (ft.): 8 ft.
1 ft.³/sec = 26,929.87 g.p.h.



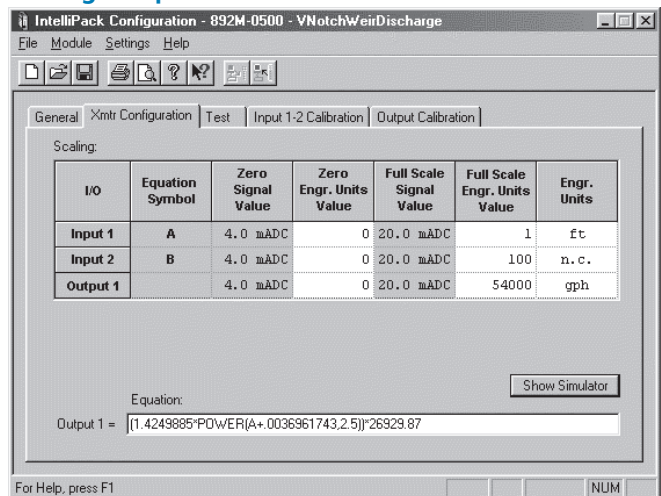
Wiring Diagram:

Model No: 892M-0500
Tag No: Level Input
Input(s): 4-20mA
Output: 4-20mA

Model No: 895M-0800
Tag No: Q Input
Input: 4-20mA
Output: 0-5400 c.p.h.
Alarm: High limit 20mA



Scaling & Equation:



Output Equation:
(1.4249885*POWER(A+.0036961743,2.5))*26929.87

The equation above calculates discharge rate Q (g.p.h.) based on the level (height) measurement on input A. The "power" function shown raises "A+.0036961743" to the "2.5" power.