



STATIC WATER LEVEL MEASUREMENT



WS115 BREAKOUT ADAPTER USER MANUAL

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PRODUCT OVERVIEW



The WS115 Breakout Adapter is an accessory for use with Eno Scientific's Well Sounder instruments. The Well Sounders have the ability to accept input from standard pulse type flow meters as well as provide user configurable output signals for high alarm, low alarm or level indication. This adapter provides access to make those outputs available for the user.

The adapter connects to the well sounder through the 8 pin mini-DIN probe connector. This requires a probe splitter to enable use of the probe and output adapter at the same time.

QUICK START GUIDE

The output adapter is ready to go right out of the box.

1. **Attach the adapter to the well sounder.** Remove the probe from the meter and attach the probe splitter. Attach the probe to one of the connectors and the output adapter to the other. Make sure that the plugs are fully inserted.
2. **Attach the flow meter wiring.** Attach the flow meter wires to the screw terminals on the adapter, observing the polarities on the label. +5 volts is provided for flow meters which require 5 volt power. Attach the flow meter ground line to GND and the flowmeter signal line to IN.
3. **Attach the output wiring.** Attach the output wires to the screw terminals on the adapter, observing the polarities on the label. For a 0-5V output, use the 2 right terminals, where GND is negative and OUT is the 0-5v output.
4. **Set well sounder to enable flow meter.** Turn on the well sounder and press the SET button repeatedly until the screen displays FLOW METER. Then press the UP/DOWN buttons to select ENABLED. Then press SET again to set parameters for the flow meter.
5. **Set well sounder for output.** Turn on the well sounder and press the SET button repeatedly until the screen displays OUTPUT. Then press the UP/DOWN buttons to select the output desired. Then press SET again to set parameters for the selected output type.

CAUTIONS:

The Well Sounder and adapters are not water proof!

They are resistant to rain and splashing but not saturation or submersion. This is also true for the meter unit and the probe. They will be damaged if submerged.

Do NOT connect external power to the +5V or OUT terminals!

External power applied to the +5 or OUT terminals will damage the well sounder and output adapter. Care must be taken to insure that voltage spikes or induced transients are not conducted into the unit.

Do NOT exceed 6 volts on the IN terminal!

External power applied to the +5 or OUT terminals will damage the well sounder and output adapter. Care must be taken to insure that voltage spikes or induced transients are not conducted into the unit.

Use surge suppressors and grounding on signal lines!

When connecting the well sounder to remote equipment through the RS232 port or analog outputs, care is required to prevent ground loops, lightning induced transients etc from reaching the well sounder. Over voltage and surge protectors and proper grounding should be used if this is a possibility.



INSTALLATION

The Well Sounder, probe and adapters while weather resistant are not water proof and should be mounted preferably in a covered location where they will be protected from direct exposure or allowed to lie in puddles.

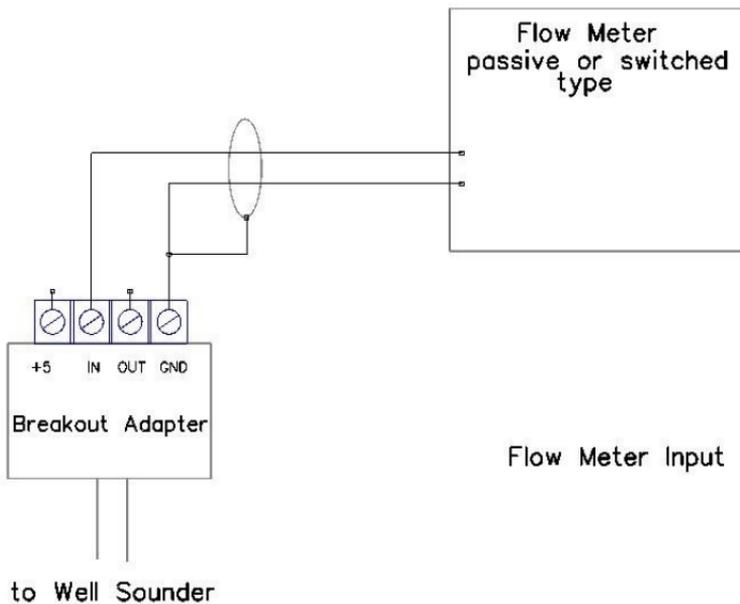
Plug the adapter into a probe port on the well sounder. Use a probe splitter if it will be used while the probe will also be required.



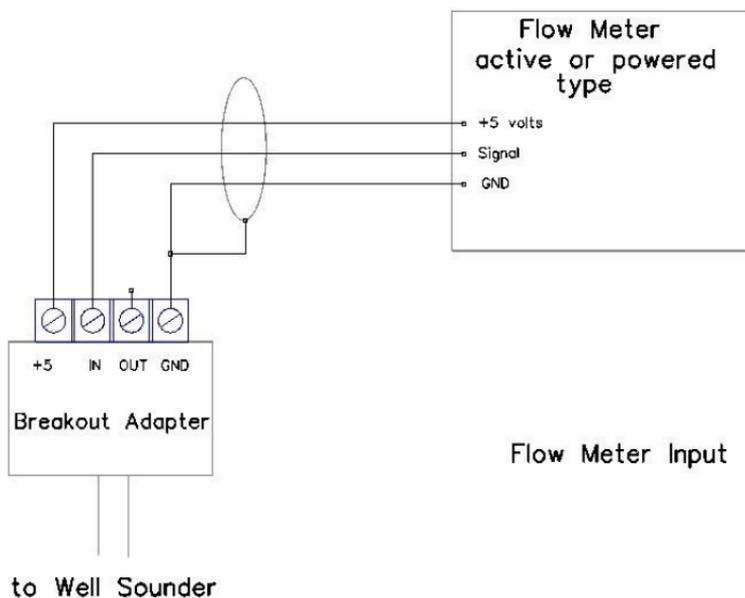
Flow Meter Installation:

There are two standard types of flow meters which are compatible with the well sounder: passive or switch type or active pulse type.

The switch type are very simple switch closures which close each time a defined amount of water passes through the meter. There are 2 wires coming from these flow meters which are not polarized so that it does not matter which way they are hooked up. Attach them to the adapter as follows:

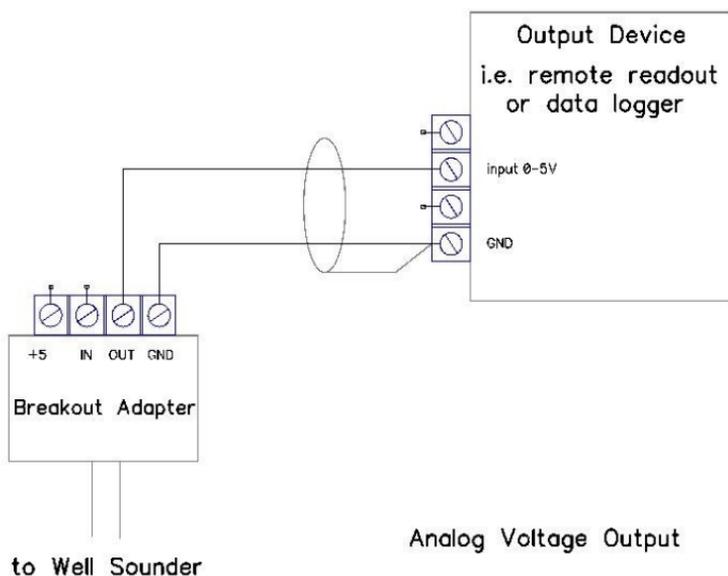


Active flow meters require some power for their internal circuitry to measure the rotation of a paddle wheel or equivalent. Those requiring 5VDC and outputting a 0-5v or TTL pulse or transition are compatible with the well sounder. Follow the flow meter directions to identify which wires go where.



0-5 volt installation:

Wiring for a 0-5 volt output requires two wires as shown below. Shielded wire is not required but recommended where used in an electrically noisy environment or where the wire run may be some distance. Wire gauge 28 or larger is recommended.



WELL SOUNDER CONFIGURATION

FLOW METER:

Turn on the well sounder then press the SET button repeatedly until FLOW METER is displayed. Then press the UP or DOWN button until it reads ENABLED.

When the flow meter is enabled on the Well Sounder, the Well Sounder monitors the input for any change in voltage level and records a count for each level change. Caution: some flow meters output a full pulse for a count (i.e. the voltage goes from low to high and then back to low again). The Well Sounder will count this as two counts, and must be compensated for when setting the scale factor by adjusting it to half.

The scale factor is used to calculate how much flow has passed for each count. The Eno Scientific flow meters output full pulses and have scale factors like .0057 gallons per pulse for the 1" flow meter. So since the flow meter outputs full pulses the entered scale factor should be half of that or .00285 gallons pre count. Once this is set, the Well Sounder will increase the total flow by .0057 gallons each time it receives a pulse. The total flow and flow rate can be observed on the display screen as the flow meter is running.

To set the scale factor, press the SET button once again to show the calibration screen. This can be done with an automatic calibration or manually entering a scale factor. Press UP or DOWN to select AUTOMATIC or MANUAL calibration.

AUTOMATIC - by selecting automatic on the set screen after enabling the flow meter from the keypad, the following screen says "up to start". A self calibration routine is initiated when the user presses the UP button. The total flow is cleared, and the Well Sounder counts all pulses until the DOWN button is pressed. A new screen then asks the user to input the total amount of water pumped between the up and down button presses. When finished, press the ENTER button to calculate and store the new scale factor.

A typical calibration sequence is to point the pump output into an empty 5 gallon bucket with the pump off. Press the UP button to start, when the bucket is full, press the DOWN button. Set 5 gallons as the amount pumped and press ENTER. This procedure will also compensate for irregularities in the flow meter installation such as elbows or reducers in the line.

MANUAL - By selecting manual on the set screen after enabling the flow meter asks the user to input the scale factor in gallons per pulse (liters per pulse). Remember to adjust the scale factor by half when full pulses are output from the flow meter. Press the DISP button to return operation and the UP or DOWN button to show the flow.

REMOTE - It is also possible to set the scale factor using the procedure described in the remote operation section, by typing "Fjnnnnnn" where nnnnnn is the scale factor, and then return.

Analog Output:

Press the SET button on the well sounder repeatedly until the display reads OUTPUT. Then press the UP or DOWN buttons to select the type of output desired. Select High or Low Alarm or Analog 0-5v to enable the output as well as additional setup screens.

Once the output type is selected, press the SET button to set the parameter for the output. If high or low alarm was selected, then the next screen will read ALARM SETPOINT – this screen is added to the set screens when the high or low alarm feature is activated. Press the up or down button to select the level at which the output level is driven high.

If analog out was selected then the next 2 screens reads ANALOG HIGH SETPOINT/ ANALOG LOW SETPOINT. Press the UP or DOWN button to select the range over which the output voltage will vary from 0 to 5 volts. So for example, if the Analog High is set to 100 and the Analog Low is set to 50, then the output level will be 0 volts when the depth is 50 or less, and it will be 5 volts when the depth is 100 or more, and vary linearly in between.

FREQUENTLY ASKED QUESTIONS

Q: How far can a 0-5v signal be transmitted?

A: In theory, there is no limit. However, in real life factors such as induced electrical noise and input impedance of the receiving device will limit the usable range. A well shielded cable and larger conductors will maximize the range. The input impedance of the receiving device forms a voltage divider which will drop part of the voltage across the cable resistance. Larger conductors will minimize this problem.

SPECIFICATIONS

ENVIRONMENTAL:

Temperature: -10 to 110 F

Humidity: 10 to 90% non-condensing.

PHYSICAL:

Dimensions: 2x2x.75"

Control Unit Weight: 1.6 oz.

OUTPUTS:

0-5 volts at 20 ma.

INPUTS:

0-5 volt pulses or level transision.

Switch closure – 5 volt sensing voltage through 10k ohms.

ADDITIONAL NOTES

WARRANTY AND SERVICE

Eno Scientific warrants to the user that all products manufactured by Eno Scientific, will be free from defects in workmanship and materials for 1 year from the date of shipment.

Eno Scientific warrants to repair or replace any such defective equipment or part (determined to our satisfaction to have a defect in workmanship or original material) upon receipt and inspection of such defective equipment to Eno Scientific with all shipping pre paid by the user.

In no event shall Eno Scientific be liable for any direct, indirect or consequential damages, abuse, acts of third parties (rental equipment), environmental conditions or other expenses which may arise in connection with such defective equipment. This warranty shall not apply to damage of equipment caused by incorrect installation, usage, lightning, storage, alteration or inadequate care.

This warranty does not apply to parts, assemblies or devices not manufactured by Eno Scientific which are covered by other manufacturers' warranties. There are no warranties except as specifically provided in writing herein.

Contact Eno Scientific with any warranty or service questions.

For additional information, please visit our website at www.enoscientific.com.

