



STATIC WATER LEVEL MEASUREMENT



# WS116 ANALOG OUTPUT ADAPTER USER MANUAL

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# WS116

# ANALOG OUTPUT ADAPTER

# USER MANUAL

## TABLE OF CONTENTS

PRODUCT OVERVIEW..... 4

QUICK START GUIDE..... 5

CAUTIONS:..... 6

INSTALLATION..... 7

WELL SOUNDER CONFIGURATION..... 9

FREQUENTLY ASKED QUESTIONS..... 10

SPECIFICATIONS..... 11

ADDITIONAL NOTES..... 12

WARRANTY AND SERVICE..... 13

## PRODUCT OVERVIEW



The WS116 Analog Output Adapter is an accessory for use with Eno Scientific's Well Sounder instruments. The Well Sounders have the ability to provide user configurable output signals for high alarm, low alarm or level indication. This adapter contains circuitry to condition and make those outputs available for the user. The Analog Output Adapter has the ability to provide an output from the well sounder as a 0-5 VDC voltage level as well as a 4-20 mA current loop signal.

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 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 outside terminals, or for a 4-20ma current loop use the 2 inside terminals.
3. **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 0-5V output!**

External power applied to the 0-5V output 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 use with a current loop source over 30V!**

The 4-20ma regulator in the output adapter will be damaged if used to regulate voltages in excess of 30V.

### **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

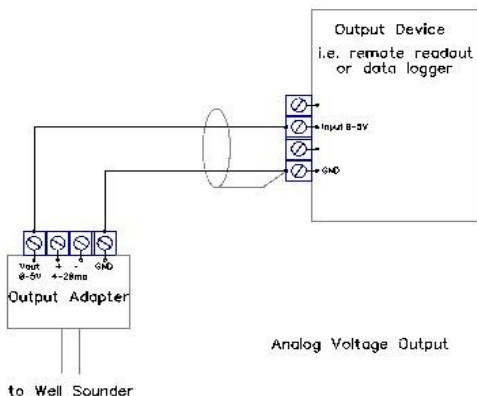
The Well Sounder, probe and adapters while weather resistant are not water proof and should be mounted preferably in a covered location where they will be protected from direct exposure or allowed to lie in puddles.

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.



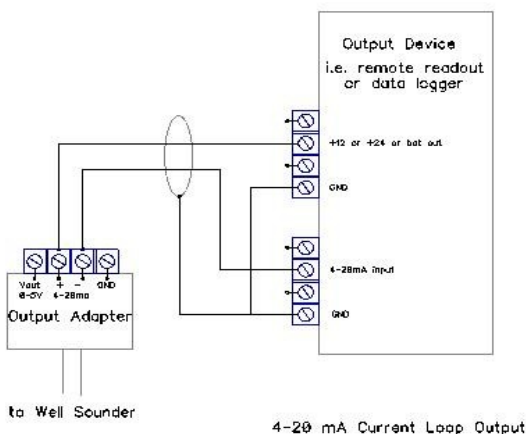
### 0-5 volt installation:

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.



### 4-20 ma installation:

The analog adapter is a passive or slave device, meaning that the power to drive the current loop is supplied by either the target device or an external power supply. The adapter acts a throttling valve to control the current through the loop. The voltage used to power the loop should not exceed 30 volts DC.





## WELL SOUNDER CONFIGURATION

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. (This is also converted to 4-20ma in the output adapter.) 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 (4ma) when the depth is 50 or less, and it will be 5 volts (20ma) 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.

Q: How far can a 4-20ma signal be transmitted?

A: The current loop is limited by the resistance of the loop. The driving voltage determines the maximum resistance value. Using 12 volts to power the loop, the maximum loop resistance is 550 ohms. At 24 volts, it is 1150 ohms. This resistance includes the resistance of the wire and the resistance of the receiving device. So for example, a typical receiving device has about a 250ohm resistance. At 12 volts, there would be 300 ohms available for cable resistance, which for 24 gauge wire would be about 50 ohms per 1000 ft, or a maximum of about 6000 ft.

# SPECIFICATIONS

## POWER:

External Power for current loop: 6 to 30VDC.

## 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.

4-20 ma into 550 ohms with 12 volt supply or 1150 ohms with a 24 volt supply.

**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](http://www.enoscientific.com).

