LCU-40APW

Features

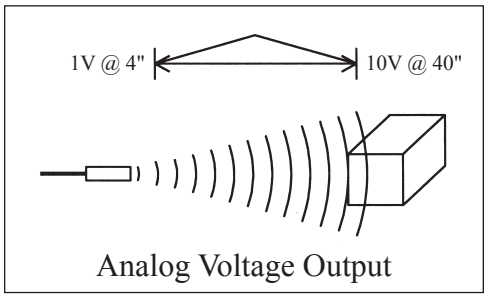
- Low Cost
- Analog Voltage Output
- Pulse Width Output
- Narrow Sensing Beam
- Self Contained Sensor
- Compact Design
- Input Voltage 11.8 - 30VDC
- Reverse Polarity Protection

The LCU-40APW analog ultrasonic sensor is a self contained sensor in a PVC housing with 1" NPSM mounting threads. It is powered by 11.8 - 30VDC with reverse polarity protection. The LCU-40APW comes with analog voltage and pulse width outputs.

The analog voltage output is calibrated at the factory and requires no adjustment in the field. The analog voltage is fixed at 250mV per inch resulting in 1V @ 4" and 10V @ 40". Distance to a target can be calculated with the following formula.

$$d = V_{OUT} \div 0.25$$

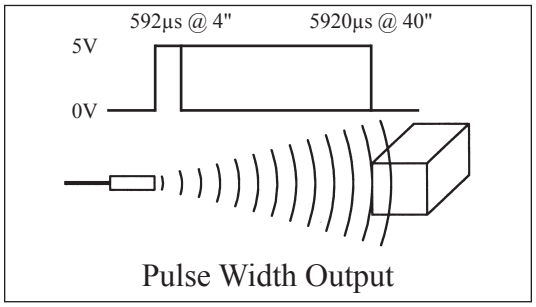
Where distance (d) is in inches and analog voltage output (V_{OUT}) is in Volts.



Analog Voltage Output

The pulse width output is a direct measurement of the time of flight. Time of flight is the time required for sound to travel from the sensor to a target, reflect off the target and travel back to the sensor. When using the pulse width output distance to a target is 148µs per inch, with a constant air temperature of 20°C. Distance to a target can be calculated with the following formula.

$$d = PW_{OUT} \div 148$$



Pulse Width Output

Where distance (d) is in inches and pulse width output (PW_{OUT}) is in µs.

When the LCU-40APW is used in applications with variations in air temperature the output readings can be compensated for the air temperature change. The distance changes by approximately 0.17% per °C.

For example an increase in air temperature from 20°C to 30°C increases the speed of sound resulting in lower analog voltage and pulse width outputs. After determining the distance from the analog voltage or pulse width output the distance would need to be increased by 1.7% to compensate for the 10°C temperature increase.

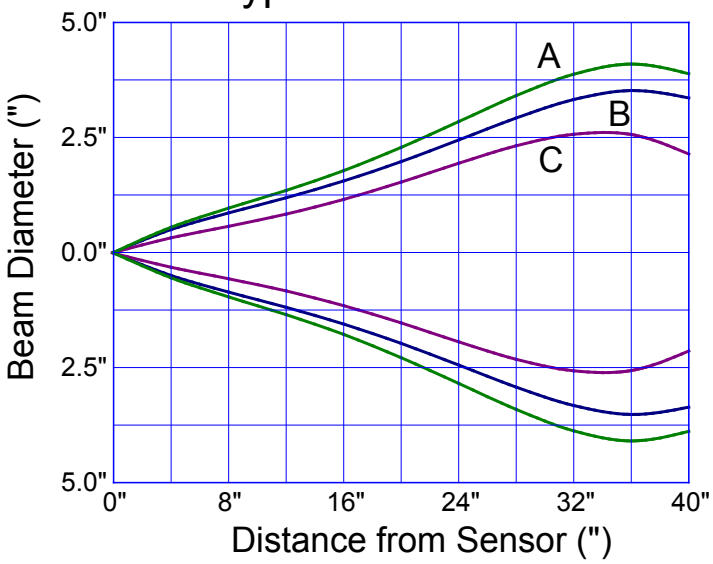
The LCU-40APW has a 4 position terminal block for power and signal connections. The LCU-40APW-M8 has a 4 pin M8 receptacle and the LCU-40APW-M12 has a 4 pin M12 receptacle for connecting a quick disconnect (QD) cable for power and signal connections.

The LCU-40APW is designed to take advantage of today's PLC and computer analog input cards. The analog card chosen will determine the resolution of the system. The numerical values that are programmed into the PLC or computer will determine the zero and span.

If a set point or set points are required in the application, please refer to Migatron's SPC-701, SPC-704, or M-1000 set point controller products. Both the SPC-704 and M-1000 can also provide 24VDC to power the sensor.

Specifications:

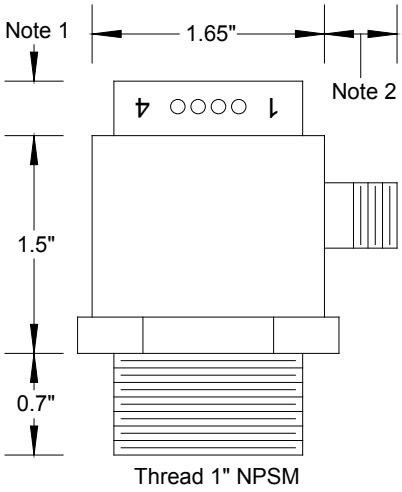
Operational Range:	4 - 40"
Power Input:	11.8 - 30VDC Reverse Polarity Protected
Input Current:	30mA, Typical
Ambient Temperature:	0 - 60ºC or 32 - 140ºF
Humidity:	0 - 95% Non-Condensing
Housing:	PVC with glass filled epoxy resin sensing face
Outputs:	
Analog Voltage	Analog Voltage Output Non-Adjustable 250mV per inch (1V at 4" & 10V at 40") Load 4.7K Ohms to infinity Short Circuit Protected
Pulse Width	Positive Pulse 5Vp with 90K Ohm load, Typical 3.3Vp with 6.8K Ohm load, Typical
Transducer Frequency:	170kHz, Typical
Response Time:	
Analog Voltage	10 - 250ms, Typical
Pulse Width	10ms, Typical
Weight:	3 ounces



Beam Pattern Legend

A - 4" x 4" Flat Target Perpendicular to Beam
B - 3" Diameter Rod
C - 0.625" Diameter Rod

Fig. A



Note 1: Add 0.375" for LCU-40APW
Note 2: Add 0.35" for LCU-40APW-M8
Add 0.45" for LCU-40APW-M12

Fig. C

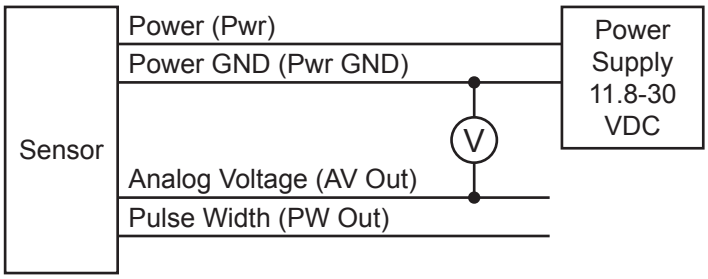


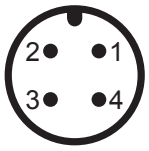
Fig. B

1 = Pwr
2 = Pwr GND
3 = AV Out
4 = PW Out

Fig. D

1 = Brown = Pwr
2 = White = AV Out
3 = Blue = Pwr GND
4 = Black = PW Out

Fig. E



1 = Brown = Pwr
2 = White = AV Out
3 = Blue = Pwr GND
4 = Black = PW Out

Fig. F

PART NUMBER	RANGE	OUTPUT / DESCRIPTION
LCU-40APW	4 - 40"	1 - 10VDC Analog and Pulse Width
LCU-40APW-M8	4 - 40"	1 - 10VDC Analog and Pulse Width - Cable Sold Separately
LCU-40APW-M12	4 - 40"	1 - 10VDC Analog and Pulse Width - Cable Sold Separately
F32-5070042	Cables for LCU-40APW-M8	2 meter QD Cable, Pico 4-Pin Snap-In - Sold Separately
F32-5070053		2 meter QD Cable, Pico 4-Pin Locking - Sold Separately
F32-5001183	Cables for LCU-40APW-M12	2 meter QD Cable, M12 4-Pin 22 AWG - Sold Separately
F32-5001186		5 meter QD Cable, M12 4-Pin 22 AWG - Sold Separately

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