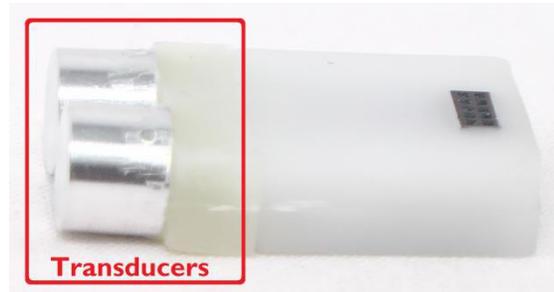
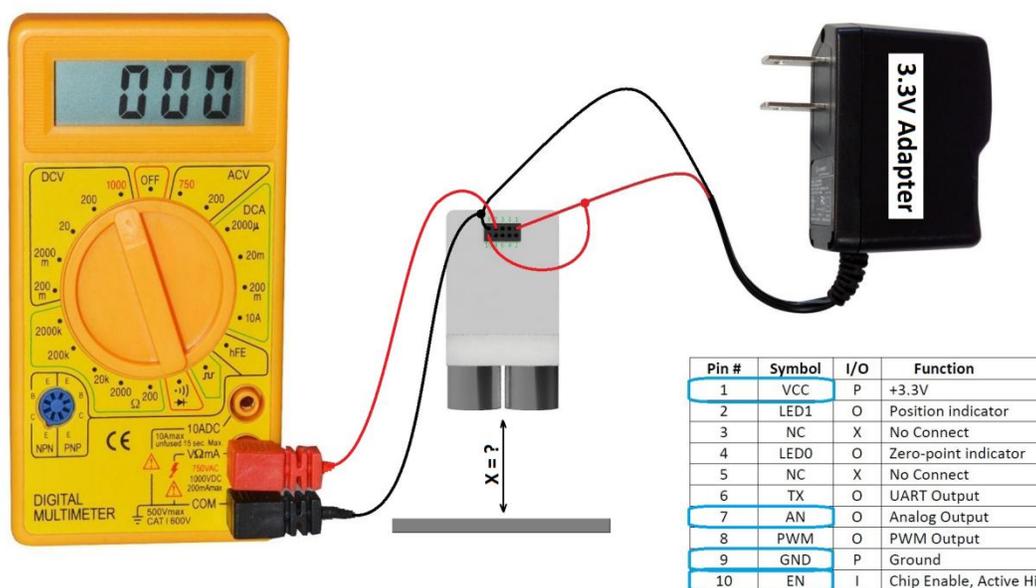


**IMPORTANT NOTES**

- Transducers of alignG-S are the most sensitive components of the sensor. Applying a mechanical pressure or shock/impulse to the transducers will affect the sensor's calibration. Please never carry or mount the sensor by its transducers and please do not attach any material such as tape or glue to the transducers.
- alignG-S is a 3.3V device. Applying a higher voltage to any pins of alignG-S may permanently damage it. In order to turn on alignG-S with higher voltages, use proper external modules.

**USING THE ANALOG OUTPUT OF alignG-S**

Analog output of alignG-S is one of the simplest outputs to check the measurement of the sensor. Connect a 3.3V power source to Pin#1 (VCC, +) and Pin#9 (GND, -), and connect Pin#10 (Enable, E) to +3.3V. Then, Check the analog output of alignG-S (Pin#7) using a voltmeter (Connect the voltmeter to Pin#7 and Pin#9).



Pin #	Symbol	I/O	Function
1	VCC	P	+3.3V
2	LED1	O	Position indicator
3	NC	X	No Connect
4	LED0	O	Zero-point indicator
5	NC	X	No Connect
6	TX	O	UART Output
7	AN	O	Analog Output
8	PWM	O	PWM Output
9	GND	P	Ground
10	EN	I	Chip Enable, Active Hi

Place alignG-S in a distance of about 20mm from any surface such as a 3D printer bed and measure the voltage. To convert the measured voltage to the distance, divide it by 644.69. For example if the measured voltage is 2.32V; Distance=  $2.32/644.69 = 0.0035986 \text{ m} = 3.60 \text{ mm}$ .

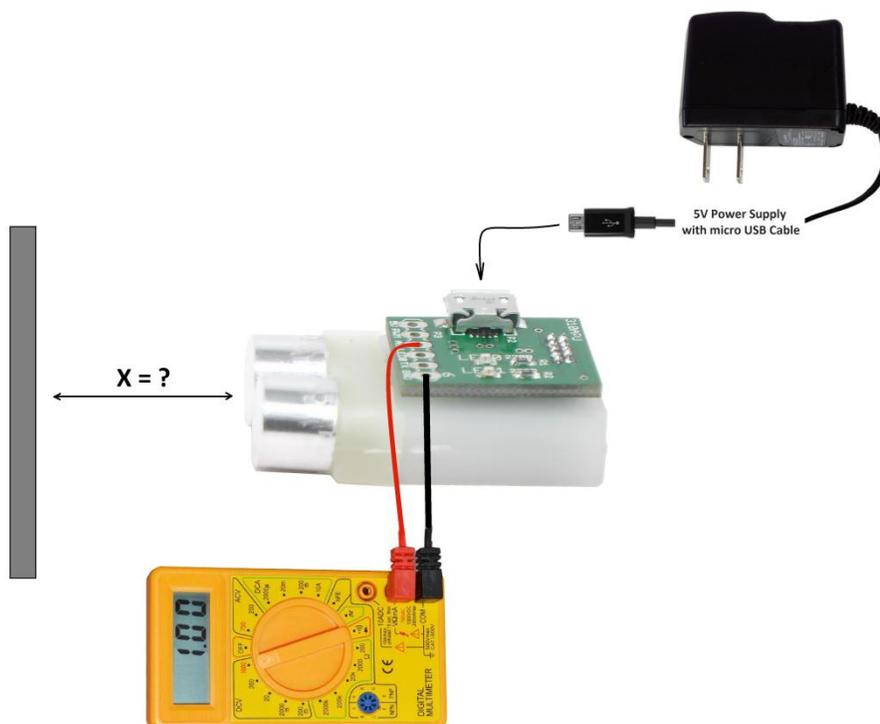
2.5/25  $\mu\text{m}$  Precision Ultrasonic Proximity/Distance Sensor

The absolute measurement range of alignG-S is half of the sound wavelength (about 4.6mm). So, if one continuously moves alignG-S away from the under test surface, the analog output voltage increases from 0V to about 3V and becomes zero again and goes to 3V, and it repeats.

alignG-S has a refresh rate of about 1.75s. So, after displacing the alignG-S, wait for at least 1.75 seconds; then, measure the analog voltage.

### USING THE ANALOG OUTPUT OF DEVELOPMENT BOARD

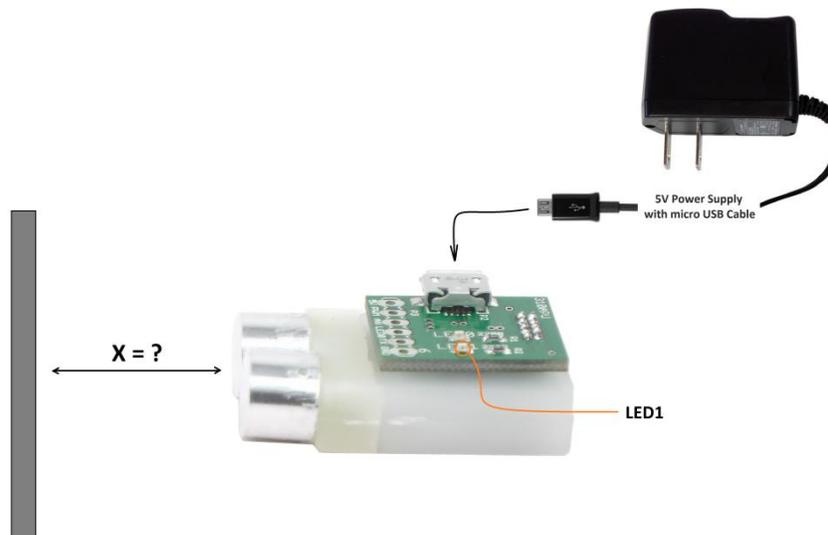
The development board simplifies the wiring and allows to power the sensor using a 5V power supply. Correctly connect the development board to alignG-S as shown in Figure below. Simply connect a 5V adapter to mini-USB port of development board. Check the voltage of “An” and “GND” pins of the development board using a voltmeter.



Place alignG-S in a distance of about 20mm from any surface such as a 3D printer bed and measure the voltage. To convert the measured voltage value to the distance, divide it by 644.69. For example if the measured voltage is 1.00V; Distance=  $1.00/644.69 = 0.0015511 \text{ m} = 1.55 \text{ mm}$ .

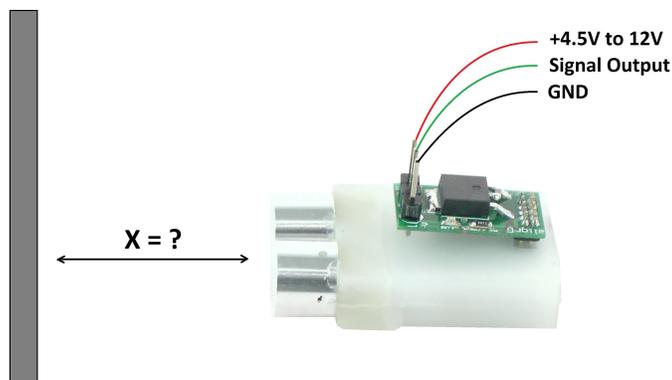
### USING LED1 SIGNAL OF DEVELOPMENT BOARD

LED1 provides a simple indication for bed leveling without the need for any external measurement tool such as a multimeter. LED1 allows to compare the distance from two different points. Install alignG-S somewhere on the printer head or on Z-Stage. Correctly connect the development board to alignG-S as shown in Figure below. Simply connect a 5V adapter to mini-USB port of development board. Place the sensor in 20mm proximity of the surface. Move alignG-S back and forth until LED1 starts blinking. At this time, very slowly, move the sensor until LED1 stops blinking and has a solid light. This is the zero point to compare the distance. Now, move the x-y plane to any desired point. If there is any difference between the Z distance of the new point and the zero point, LED1 starts blinking.



### USING THE PROXIMITY OUTPUT OF 3D PRINTER ADAPTER

The 3D Printer adapter simplifies the wiring and allows to replace any 3 pin capacitive, magnetic, or optical proximity sensor with alignG-S. This module is compatible with 4.5V-12V 3D printer main boards. Correctly connect the development board to alignG-S as shown in Figure below. Simply connect the VCC (+) pin to the VCC pin of the main board, GND (-) pin to the GND pin of the main board, and the Signal pin to the z-end stop (or other proper input) pin of the 3D printer main board.

2.5/25  $\mu\text{m}$  Precision Ultrasonic Proximity/Distance Sensor

The signal output is always Hi (similar to the connected VCC voltage). When the sensor is in 10mm proximity of the 3D printer bed, the signal output pin becomes Lo (GND).

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