![SensComp logo] **SensComp))**

The Electrostatic
Ultrasonic Sensor Experts.

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SonaSwitch® MINI-A Ultrasonic Sensor

The SensComp SonaSwitch® Series MINI-A electrostatic ultrasonic sensor system provides a complete sensor solution to simplify your product design and packaging.

Features

50 KHz Electrostatic Ultrasonic Sensor with Integrated SMT Electronic Circuitry

Ranges from 1" to 12", 6" to 20' or from 12" to 40'

Analog Output from 0 to 5 VDC or from 0 to 10 VDC

Independent Push-Button Settable Zero and Span Adjustment of Analog Output

Range Window LED Indication

Analog Output Temperature Compensated

Specifications

*PID# 61600LF Shown

✓ RoHS   ✓ REACH COMPLIANT

Part No.

Part Numbers (PID#): SonaSwitch® MINI-A - Instrument Grade; SonaSwitch® MINI-AE - Environmental Grade; SonaSwitch® MINI-AO - Open Face
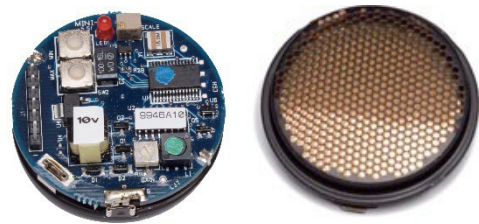
SonaSwitch®				
MINI-A	MINI-AE	MINI-AO	OUTPUT	RANGE
*616020LF	*616130LF	*616160LF	5VDC	1-12 inch
*616010LF	*616110LF	*616150LF	5VDC	0.5-20 feet
*616015LF	*616120LF	*616155LF	5VDC	1-40 feet
*616025LF	*616125LF	*616145LF	10VDC	1-12 inch
*616005LF	*616105LF	*616140LF	10VDC	0.5-20 feet
*616000LF	*616100LF	*616115LF	10VDC	1-40 feet

*RoHS Compliant

Benefits

Self-Contained Compact Design
Can be Triggered Internally or Externally
Excellent Receive Sensitivity
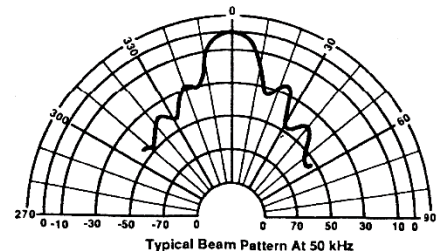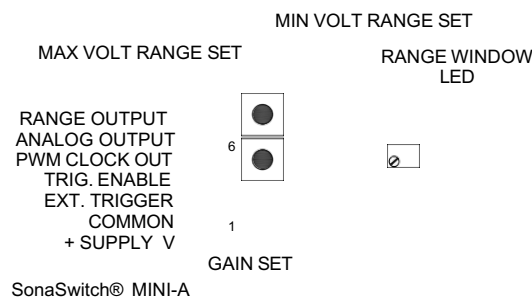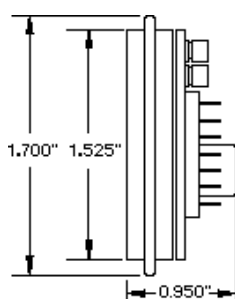Push Button Range Settings for Quick and Easy Set-up

Applications

Level Measurement, Proximity Detection, Presence Detection, Robotics, Educational Products

Description

The SonaSwitch® MINI-A Sensor provides a total system in a compact package, containing an ultra-sensitive electrostatic ultrasonic sensor and the supporting circuitry to provide a 0 to +5 VDC (or 0 to +10 VDC) output with fully independent zero and span adjustments over the entire operating range of detecting a target from 1-12 inches, 6 " - 20', or from 12" – 40' away. The SonaSwitch® MINI-A can be externally triggered or can continually sense at a 10 Hz rate.

1.700" 1.525"
0.950"

MAX VOLT RANGE SET
MIN VOLT RANGE SET
RANGE WINDOW LED

RANGE OUTPUT
ANALOG OUTPUT
PWM CLOCK OUT
TRIG. ENABLE
EXT. TRIGGER
COMMON
+ SUPPLY V

6
1
GAIN SET

SonaSwitch® MINI-A

SCALE ADJUST

Typical Beam Pattern At 50 kHz

Note: dB normalized to on-axis response.
Note: Curves are representative only. Individual responses may differ.

Beam Pattern

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. SEE

Rev. 2025-05-01

SonaSwitch® MINI-A Instrument Grade, Environmental Grade, and Open Face Specifications

Distance Ranges:
    0.025 - 0.3 M.........0.15 - 6.10 M ....0.3 -12.2 M
    (1.0 - 12 inches)......(0.5 -20 feet)........(1.0 - 40 feet)

Accuracy (over entire range) ....± 0.1%
                 (0.025-0.3 M range = ± 1.0%)

Beam Pattern........... See Graph (Typically 15° nominal)

Repetition Rate (astable)........................10 Hz
    May be externally triggered up to a 50 Hz rate

Output Voltage (Analog).........................0 to 5 VDC
                    (or 0 to 10 VDC)

Output Current (maximum) ....5 ma

Output Response Time:
    Analog output is filtered to the approximate formula:
        $V_{OUT} = 0.9\,(V_{new\ value}) + 0.1(V_{past\ avg.\ value})$

Power Requirements....... 8 to 24 VDC (for 5V output)
                12 to 24 VDC (for 10V output)
                (Maximum Current = 30 mA)

Operating Temperature......................... .. -40 to +85° C
                  (-40 to 185° F)

Weight ....17 grams (0.6 oz)

Dimensions
    Thickness ....0.950 inch
    Diameter...1.700 inch

Mounting Diameter.................................1.525 inch
    Use RTV silicone or edge clips to secure in place

Housing, Standard Finish
    Instrument Grade .... Satin Black Painted
                     304 Stainless Steel
    Environmental Grade ...... 304 Stainless Steel
    Open Face........................ Parylene Coated 304
                     Stainless Steel

General Installation Procedures

1. Always Mount the SonaSwitch® MINI-A in a suitable dry location. The SonaSwitch® MINI-A is designed to be used in indoors or protected environments only. The SonaSwitch® MINI-AE and the SonaSwitch® MINI-AO are designed for harsher environments and higher humidity conditions. Excessive moisture in the circuit board (and SonaSwitch® MINI-A Ultrasonic sensor) will result in damage and improper operation, and will void all warranties.

2. Mount the SonaSwitch® MINI-A as far off the ground as practical, in a location where environmental interference sources are minimized (examples are EMI sources, air nozzles, excessive air turbulence, etc.)

3. If necessary, adjust the gain to the minimum setting necessary to ensure reliable target detection (excessive gain can result in false detections).

4. As supplied the SonaSwitch® MINI-A has been calibrated and should function without further calibration. See manual for factory settings.

Calibration Procedures (if required)

1. Apply DC power (see requirements above) to the SonaSwitch® MINI-A (connector header pin 1)

2. Allow several minutes warm-up time for the SonaSwitch® MINI-A to reach operating temperature before calibrating the unit.

3. Connect a DC voltmeter's (DVM) Plus (+) lead to the Analog Output (pin 6) and the DVM Minus (-) lead to Common (pin2).

4. Place the target at the desired distance desired for the full-scale voltage output. This can be either the minimum range or the maximum range between the sensor and the target. Depress and hold the "MAX VOLT RANGE SET" push button and wait for the LED indicator to stop flashing and the Ultrasonic sensor generates a "chirp" sound before releasing. The SonaSwitch® MINI-A is now calibrated to your desired target distance for full scale analog voltage output.

5. Place the target at the desired distance desired for the zero-voltage output. This can be either the minimum range or the maximum range between the sensor and the target. Depress and hold the "MIN VOLT RANGE SET" push button and wait for the LED indicator to stop flashing and the Ultrasonic sensor generates a "chirp" sound before releasing. The SonaSwitch® MINI-A is now calibrated to your desired target distance for zero analog voltage output.

6. <u>Scale Adjustment:</u> Place the target to assure maximum voltage output (set in step 4).   Adjust the "SCALE Adjust" potentiometer until a +5.0 VDC (or +10.0 VDC) reading is obtained.

7. <u>Gain Control:</u> The SonaSwitch® MINI-S gain was pre-set at the factory for optimum performance. To re-calibrate the "GAIN Set" potentiometer, place the target at the <u>maximum</u> desired detection distance. Rotate the GAIN potentiometer fully counterclockwise (CCW). Slowly rotate the GAIN control clockwise (CW) until detection occurs. Rotate the Gain control CW an additional 1/16 turn.

   Note: Always calibrate the GAIN control for minimum gain required for reliable detection. Excessive gain may result in false target detection.

System Wiring Information

Pin 1 – Power Supply-------Requires a +8 to +24 VDC regulated power source with a 30mA current capacity
(The 0 to 10 VDC analog output requires a +12 to +24 VDC power source).

Pin 2 – Common -------------Common Return for DC power supply, analog output, and clock signals.

Pin 3 – External Trigger ----Accepts TTL compatible logic level clock signals (0-5 VDC).

Pin 4 – Trigger Enable------Allows the SonaSwitch® MINI-A to accept an external trigger signal. Enable by connecting
this pin (pin 4) to common (pin 2).

Pin 5 – Clock Output--------Delivers a TTL compatible echo return clock signal (0-5 VDC). This signal goes high at the
start of a cycle and returns to a low state when the returned echo from a target is detected.

Pin 6 – Analog Output ------0 to +5 VDC (or 0 to +10 VDC) analog measurement output.

Pin 7 – Range Output-------Delivers a TTL compatible Range indication signal (Logic 0) whenever the detected target
is between the MIN and MAX settings.

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