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X1 Ranging Module Pro™ w/USB Scope

SensComp's X1 Ranging Module Pro™ w/ USB Scope option and electrostatic ultrasonic sensor system provides a complete sensor solution to simplify your product design and packaging.

Features

- 50 KHz Electrostatic Transducer with SMT Electronic Circuitry
- Range: 0.5' – 20.0'
- Analog Output: 0 to +5 VDC
- Independent Push-Button Settable Zero and Span Adjustment of Analog Output
- Target Detect LED Indication
- Analog Output Temperature Compensated
- Built In USB Oscilloscope Function
- PC and Laptop Compatible (OS Windows® XP or VISTA)

Part No.

X1 Ranging Module Pro™ OEM Kit

Part Numbers (PID#): I - Instrument Grade
 E - Environmental Grade
 O - Open Face

X1 R.M.Pro-I	X1 R.M.Pro-E	X1 R.M.Pro-O	Analog OUTPUT	RANGE
#606760	#606763	#606766	5VDC	0.5 – 20 Feet

Benefits

- Compact Design
- Can be Triggered Internally or Externally
- Excellent Receive Sensitivity
- Push Button Range Settings for Quick and Easy Set-up
- Built-in PC Scope Function to View ECHO, REC and Analog Output Signals

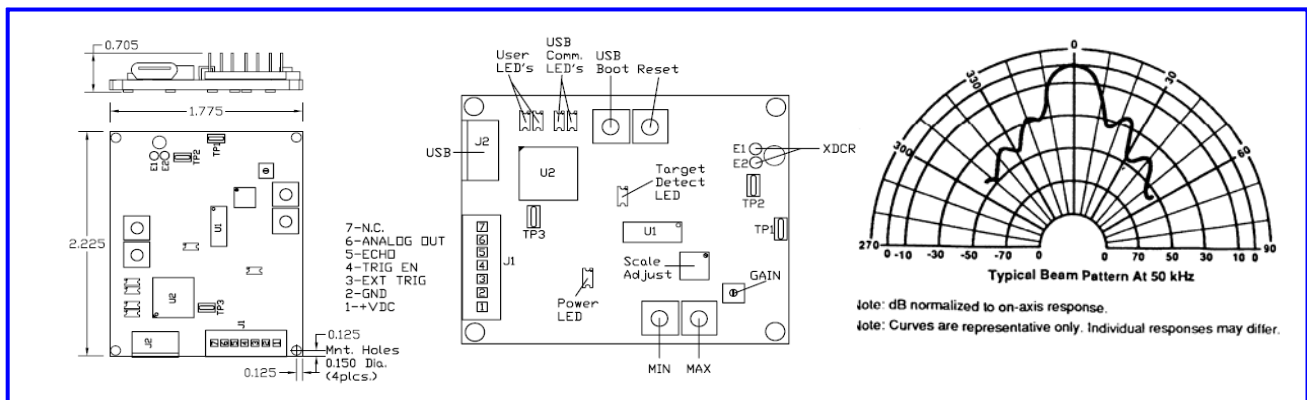
Applications

Level Measurement, Proximity Detection, Presence Detection, Robotics, Teaching Tool and Engineering Students.

Description



The X1 Ranging Module Pro™ w/USB Scope option sensor provides a total system in a compact package, containing an ultra sensitive electrostatic transducer and the supporting circuitry to provide a 0 to +5 VDC output with fully independent zero and span adjustments over the entire operating range of detection from 0.5' - 20'. This sensor can be externally triggered, or can continually sense at a 10 Hz rate. Using the X1 Ranging Module Pro™ software (Windows® XP or VISTA), the unit provides ECHO, REC and Analog Output signals to display on your PC. Screen images may be printed or saved for future reference.



X1 Ranging Module Pro™ w/USB Scope

***Instrument Grade, *Environmental Grade, and *Open Face Specifications**

*For additional information about transducer specifications please visit our website www.senscomp.com

*****Specifications subject to change without notice.**

<p>Distance Range: 0.15 - 6.10 M (0.5' – 20.0')</p> <p>Accuracy (over entire range) ± 0.1%</p> <p>Beam Pattern See Graph (Typically 15° nominal)</p> <p>Repetition Rate (astable).....10 Hz May be externally triggered up to a 50 Hz rate</p> <p>Output Voltage (Analog) 0 to 5 VDC</p> <p>Output Current (maximum)..... 5 mA</p> <p>Output Response Time: Analog output is filtered to the approximate formula: $V_{OUT} = 0.9 (V_{new \ value}) + 0.1(V_{past \ avg. \ value})$</p>	<p>Power Requirements.....8 to 24 VDC</p> <p>Max. Current..... 30 mA (2A peak for .5mS)</p> <p>Operating Temperature.....-40 to +85° C (-40 to 185° F)</p> <p>Weight 17 grams (0.6 oz)</p> <p>Dimensions..... 2.225" x 1.775"</p> <p>Transducer Housing, Standard Finish</p> <p>Instrument Grade Flat Black Cold Rolled Steel</p> <p>Environmental Grade..... 304 Stainless Steel</p> <p>Open Face..... Parylene Coated 304 Stainless Steel</p>
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General Installation Procedures

1. Always mount the sensor's transducer in a suitable dry location. The X1 Ranging Module Pro™ w/ USB Scope is designed to be used indoors or in protected environments only. The X1 Ranging Module Pro™ w/Environmental Transducer and the X1 Ranging Module Pro™ w/Open Face Transducer is designed for harsher environments and higher humidity conditions. Excessive moisture in the circuit board (and transducer) will result in damage and improper operation, and will void all warranties.
2. Mount the sensor PCB and transducer 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. As supplied the X1 Ranging Module Pro™ has been calibrated to factory specifications. If necessary, adjust the gain to the minimum setting necessary to insure reliable target detection (excessive gain can result in false detections).

WARNING: DO NOT USE PRODUCT IN ANY AIRCRAFT, AVIATION, NUCLEAR OR MEDICAL APPLICATION OR IN ANY APPLICATION TO PROTECT LIFE OR AS A SAFETY DEVICE.

Calibration Procedures (if required)

1. Apply DC power (see requirements above).
2. Connect a DC voltmeter's (DVM) Plus (+) lead to the Analog Output (pin 6) and the DVM Minus (-) lead to Common (pin2).
3. Place the target at the maximum desired distance for the full scale voltage output. Depress and hold the "MAX RANGE SET" push button, and wait for the LED indicator to stop flashing and the transducer generates a "chirp" sound before releasing. The sensor is now calibrated to your desired target distance for full scale analog voltage output.
4. Place the target at the desired minimum distance for the zero voltage output. Depress and hold the "MIN RANGE SET" push button, and wait for the LED indicator to stop flashing and the transducer generates a "chirp" sound before releasing. The sensor is now calibrated to your desired target distance for zero analog voltage output.

***** Note: Reversing the MIN/MAX distances when setting the range will reverse the slope of the analog output.**

5. Scale Adjustment: Place the target to assure maximum voltage output (set in step 4). Adjust the "SCALE Adjust" potentiometer until a +5.0 VDC reading is obtained.
6. Gain Control: The X1 Ranging Module Pro™ sensor gain was pre-set at the factory for optimum performance. To re-calibrate the "GAIN Set" potentiometer, place the target at the maximum desired detection distance. Rotate the GAIN potentiometer fully counter-clockwise (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 -----+8 to +24 VDC regulated power source with a 30 mA current capacity (2 Amp peak for .5mS).
- Pin 2** – GND-----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 X1 Ranging Module Pro™ to accept an external trigger signal. Enable by connecting (pin 4) to common (pin 2).
- Pin 5** – ECHO-----PWM, 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 analog output.
- Pin 7** – N.C.