

Self Adjusting "Smart" high Temperature Radar For Liquids Standard and Ex-proof Enclosures



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FEATURES

Self Adjusting Tracking Radar
 Programmable (recommended) and Simple push-button calibration
 Output 4-20 mA / 20-4mA (Isolated on 4 Wire Model's only)
 Optional RS232 OR RS485
 For communications with calibration, diagnostics & data logging software
 PL Compatible (Modbus RTU)
 Three or four Wire Operation

APPLICATIONS

Food and Beverages
 Water / Wastewater
 Chemicals with vapors

MECHANICAL

Conduit Entry : 1/2" NPT x 2
 Enclosure : Aluminum or S.S. - 94V0
 Ingress Protection : NEMA 6 (IP68)

ENVIRONMENTAL

Temperature : - 40 to 140°F (- 40 to 60°C)
 Approvals : FCC Part 15 - Low Power Communication Device

Explosion Approvals: FM & CSA for Can. & US
 Explosion Proof Class I, Div.1, Groups B, C, D:
 Dust-Ignition Proof Enclosure for Class II/III
 Div. 1, Groups E, F, G

Standard Approvals

FM(USA)

FM3810 (2005) Electrical Electronic Test, Measuring and Process Control Equipment
 ANSI/NEMA 250 (1991) :Enclosures for Electrical Equipment

FM(CAN.):

CSA C22.2 No. 1010.1 (2004) Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
 - Part 1: General Requirements

CSA C22.2 No. 94 (2011) Special Purpose Enclosures

Installation Category : Class II

PROCESS

Temperature : De-coupler & PTFE Rod - 40 to 350°F (- 40 to 177°C) ,
 c/w bottom flange & thermal gasket up to 300°C

Material Dielectric : $\epsilon_r > 2$

High Pressure : 5 bar (without De-coupler)

Catalogue # - On the Web return to Home Page & Refer to Catalogue Number Structure for Ordering information.
 In Product Documentation Refer to Page 4.

Radar Exp. Enclosure

Radar Standard Enclosure



OPERATIONAL

Operation : Pulse Radar
Accuracy : +/- 0.1% of max. range in lab using 4-20mA current output
 : +/-0.25% of max. range (typically in field)
Response Time: Standard Unit 2 - 3 echo's / sec.
 : Std. with less damping 6 echo's / sec.
 : Fast Protocol Unit 10 - 30 echo's / sec.
Frequency : 5.8 GHz or 6.3 GHz.
Loss of Echo : Hold 1 min., 22mA or 2 mA. output
Transmit Power: 50 uW average
Calibration : Via communications port (required)
Diagnostics : (Echo Profile) via communications port
Antenna : TEFLON PTFE High Temperature Antenna

Note - * Minimum Range starts at the lower tip of the antenna or horn bottom for high dielectric materials (water). For low dielectric material allow longer Minimum Range.
 Note - **Only 2" and 3" NPT Mounting available for High Temperature Radar.

TECHNICAL SPECIFICATIONS

Model	Range	Accuracy	Mounting
017	* - 17 ft.	+/- 3 mm	3", 2", 1 1/2" NPT **
033	* - 33 ft. * - 10 m	+/- 3 mm	3", 2", 1 1/2" NPT **
050	* - 50 ft. * - 15 m	+/- 3 mm	3", 2", 1 1/2" NPT **
100	* - 100 ft. * - 30 m	+/- 3 mm	3", 2", 1 1/2" NPT **

ELECTRICAL SPECIFICATIONS

Power	115 VAC 60 Hz or 230 VAC 50 Hz (+/-20%), 1.7 VA
ABM400 AC	
ABM300 DC	12 to 30 VDC, 0.07 A max @ 24 Vdc R load = (Vs - 6) / 24 mA
Output	4-20 mA Output 6.1 uA resolution
	750 Ohms (Isolated on 4 Wire only)
	Optional RS232 or RS485 communications port.

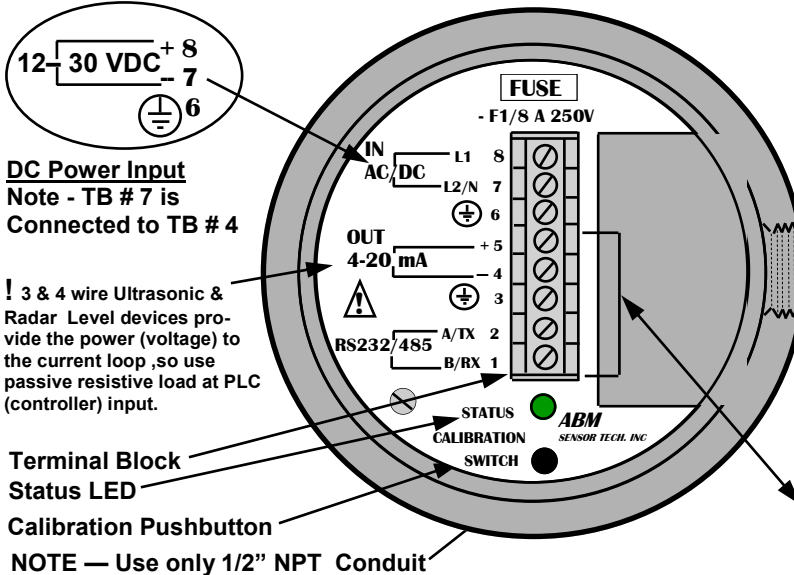
3 & 4 Wire Ultrasonic and Radar Sensors User Instruction Manual



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Inter-Connection Diagram

Top View of Sensor (Access Cover Removed)



FCC INFORMATION TO RADAR USERS

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING-Changes or Modifications not expressly approved by ABM Sensor Technology Inc. could void the user's authority to operate the equipment.

Wiring Information

- Ground shield at one end only.
- All terminal block wiring must be rated for 250V.
- Power input wiring must be protected by a 15A double pole circuit breaker .
- Terminal is for use only with equipment which has no live parts which are accessible .
- Terminal is for use with equipment which maintains basic insulation from hazardous voltage under normal and single fault conditions .
- Connection used at the remote end of external circuit .

Recommended Wiring

For AC Sensor —

Power 3 Wire unshielded 22 AWG , 300 V
 Current Output 1 Pair shielded 24 AWG , 300 V
 Communication 1 Pair shielded 24 AWG , 300 V

For DC Sensor—

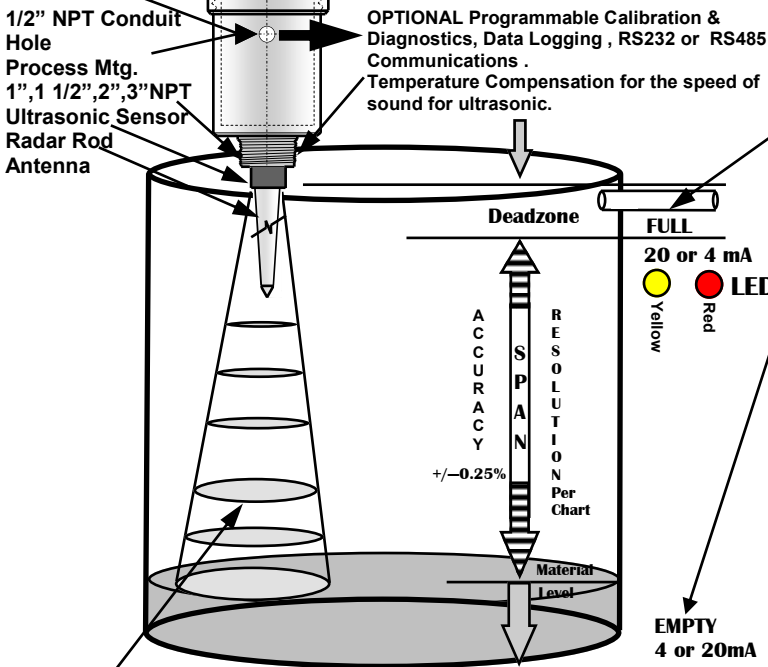
Power & Current output 3 Wire shielded 24 AWG , 300 V

Typical Installation

- 1) Direct mounting ultrasonic sensor - Simply thread sensor directly into metal or plastic nozzle.
- 2) Radar unit must be installed into metal fitting with the antenna pointing downward.
- 3) Do not mount in the center of a domed tank.

12 - 30 Vdc
 115 / 230 Vac
 60 / 50 Hz

CALIBRATION PUSHBUTTON / Led Indicator For 4 - 20 mA (750 ohm Max.)



Calibration — 4 -20 or 20 - 4 mA Output

For Radar programmable through communication is recommended.

FULL — Calibrate 20 mA or 4mA (Set Near Target)

1. Calibration mode LED color is Green. (for Radar Low Dielectric Materials has to be off)
2. Push button and hold until LED turns Yellow (20 mA) or push button and hold until LED turns Red (4 mA)
3. Release button and observe LED flashes to acknowledge the calibration.

EMPTY— Calibrate 4 mA or 20 mA (Set Far Target)

1. Calibration mode LED color is Green (for Radar Low Dielectric Materials has to be off)
2. Push button and hold until LED turns Red (4 mA) or push button and hold until LED turns Yellow (20 mA)
3. Release button at Yellow or Red and observe LED flashes to acknowledge the calibration.

For Radar to turn the Low Dielectric Materials operation mode

ON and OFF (this mode is recommended for materials with dielectric constant lower than 4 and also to eliminate multiple reflections in tank.)

- 1) To turn the Low Dielectric Materials ON. Push button and hold until LED goes OFF after the sequence of Yellow ,Red and turns Off. The Low Dielectric Material operation is On when the LED'S Green light blinks constantly.
- 2) To turn the Low Dielectric Materials OFF. Push button and hold until LED goes OFF after the sequence of Yellow , Red and Turns OFF. The Low Dielectric Material operation is OFF when LED is continuously Green.
- 3) Use communication software.

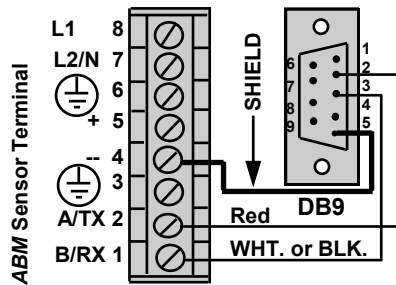
Operation - An ultrasonic/electromagnetic pulse is transmitted from the ABM sensor . The pulse travels to the surface being monitored and is reflected off this surface back to the sensor . The time of flight is divided by 2 ,corrected with temp. and converted to an output signal directly proportional to the material level .

3&4 Wire Ultrasonic and Radar Sensors Communication Interconnection Dtl.



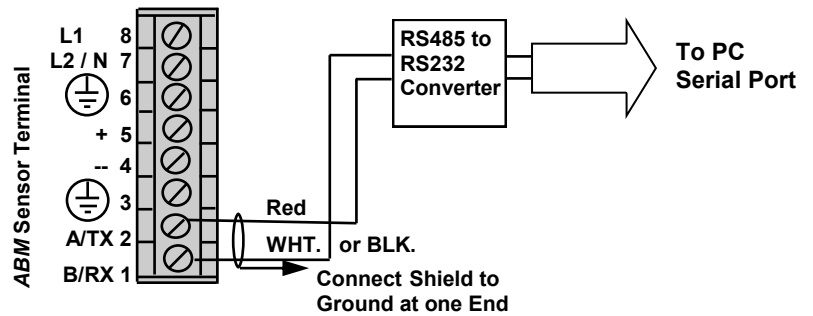
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Fig. # 1 RS232 Connection



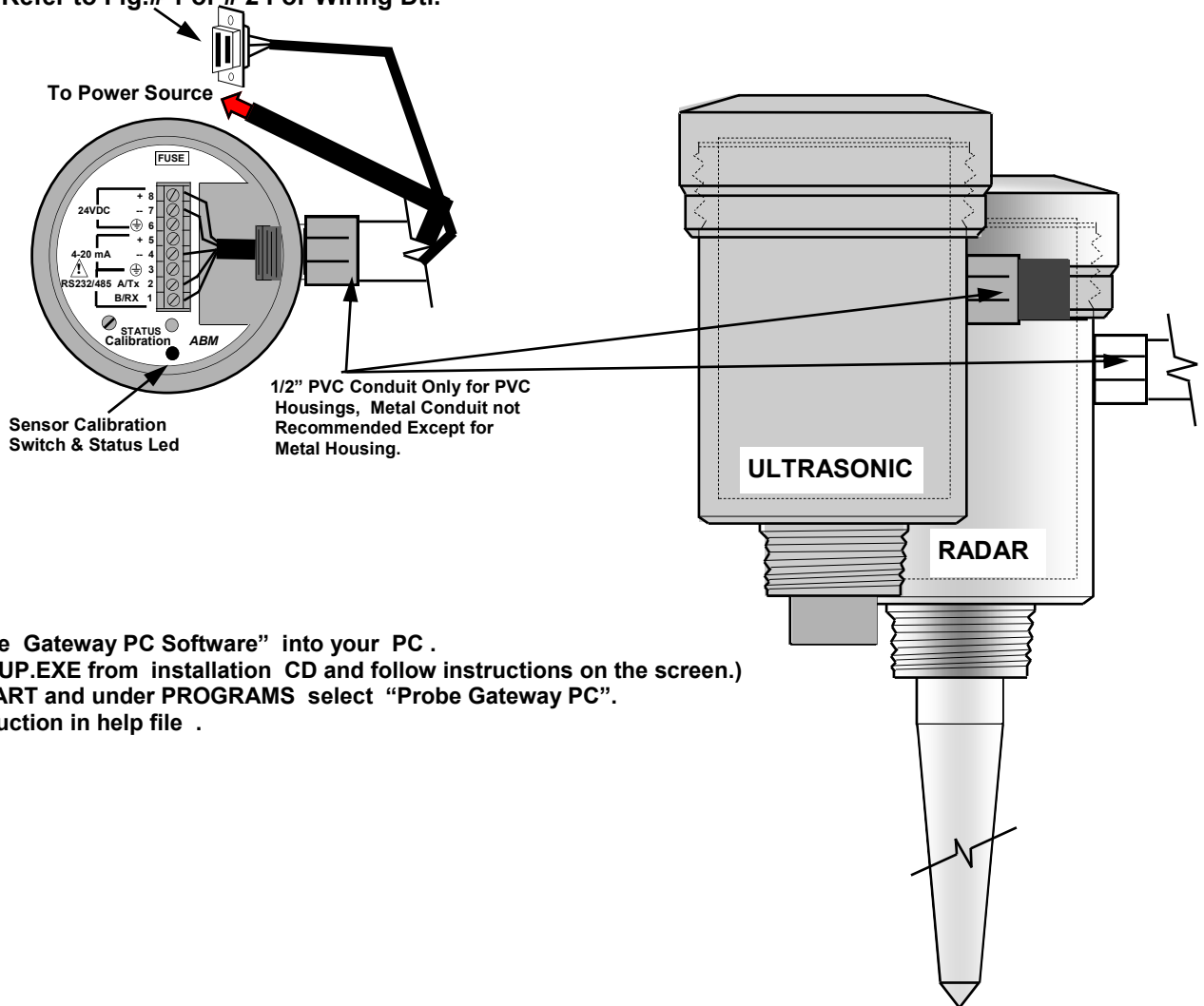
Note - Connect the shield to ABM Sensor Terminal #4.

Fig. # 2 RS485 Connection



Note - Connect the shield to ABM Sensor Terminal #3.

Connect to Serial Port of PC, use Extension Cable length as required, Refer to Fig.# 1 or # 2 For Wiring Dtl.

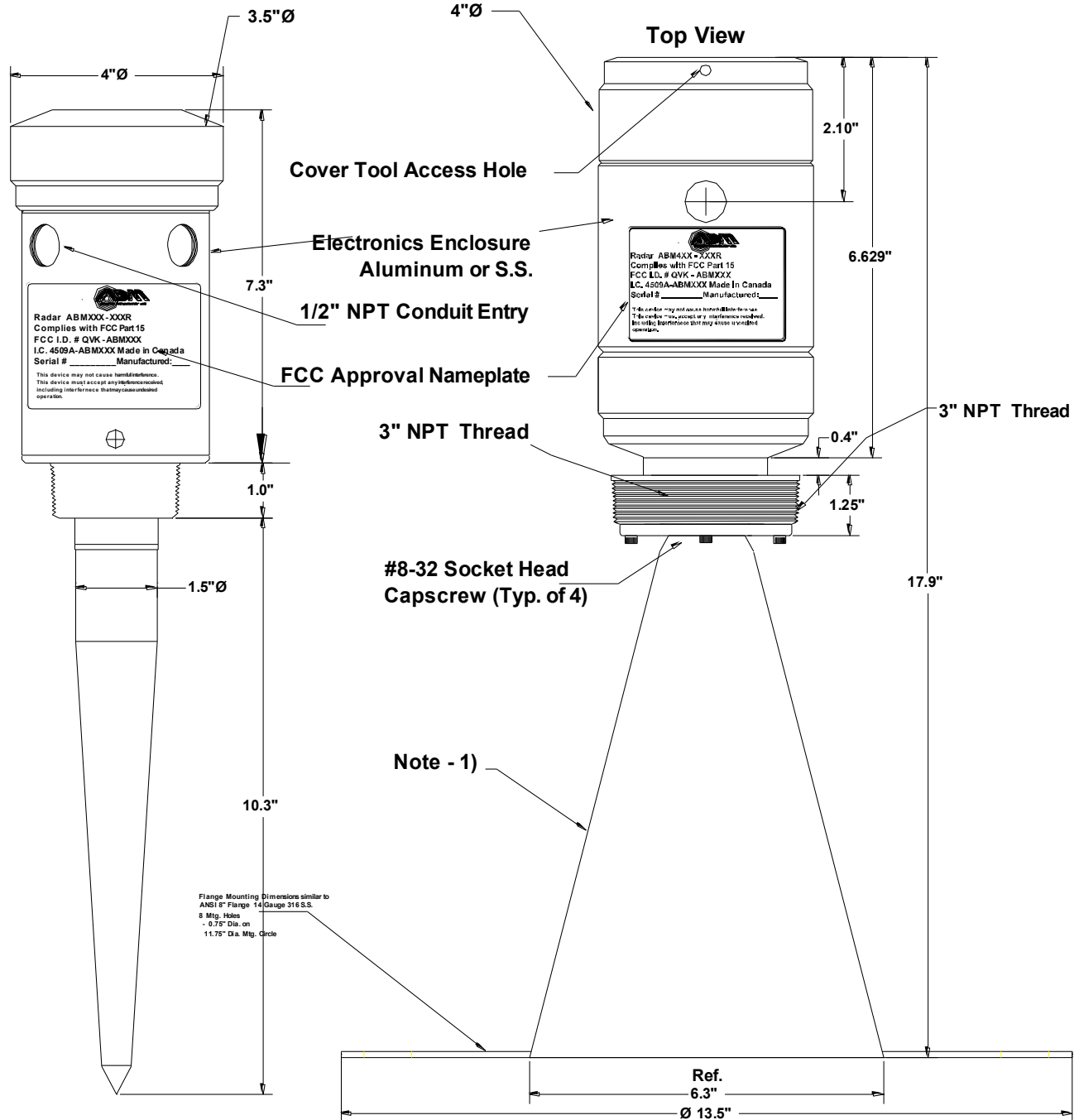


- 1) Load "Probe Gateway PC Software" into your PC .
(Select SETUP.EXE from installation CD and follow instructions on the screen.)
- 2) Click on START and under PROGRAMS select "Probe Gateway PC".
- 3) Follow instruction in help file .

Standard & Explosion-Proof Radar High Temperature Measurement Sensors Outline Dimensional Dtl.



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Standard Radar c/w High Temperature
TEFLON Antenna

Radar Exp. High Temperature
c/w 8" Horn

Notes - 1) Material - S.S. 316, 21 Gauge Sheet

3/4 Wire Radar IP68 Level Sensor with Horn Outline Detail