

Self Adjusting "Smart" dual frequencies 6.3 & 26 GHz , 26 & 78 GHz Radars for any Solid Materials

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FEATURES - 2,3 and 4 Wire

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

APPLICATIONS

Solids with Dust such as Cement, Coal , Aggregates ,
Sand and plastics (powders, pellets)

MECHANICAL

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

ENVIRONMENTAL

Temperature : - 40 to 140°F (- 40 to 60°C)

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 Std. : - 40 to 140°F (- 40 to 60°C)

c/w Teflon De-coupler: - 40 to 350°F (- 40 to 177°C)

Material Dielectric : $\epsilon_r > 1.4$

Max. Pressure : 5 bar (without De-coupler)

TECHNICAL SPECIFICATIONS

Model	Range	Res.	Accuracy	IP	Operation
ABMX00 - 017R6R2 ABMX00 - 017R2R7	5 m 17 ft.	+/- 3 mm	+/-0.03%	IP68	R6 = 6.3GHz R2 = 26GHz R7 = 78GHz
ABMX00 - 033R6R2 ABMX00 - 033R2R7	10 m 33 ft.	+/-3 mm	+/-0.03%	IP68	R6 = 6.3GHz R2 = 26GHz R7 = 78GHz
ABMX00 - 050R6R2 ABMX00 - 050R2R7	15 m 50 ft.	+/- 3 mm	+/-0.03%	IP68	R6 = 6.3GHz R2 = 26GHz R7 = 78GHz
ABMX00 - 100R6R2 ABMX00 - 100R2R7	30 m 100 ft.	+/- 3 mm	+/-0.03%	IP68	R6 = 6.3GHz R2 = 26GHz R7 = 78GHz
ABMX00 - 140R6R2 ABMX00 - 140R2R7	42 m 140 ft.	+/- 3 mm	+/-0.03%	IP68	R6 = 6.3GHz R2 = 26GHz R7 = 78GHz
ABMX00 - 240R6R2 ABMX00 - 240R2R7	73 m 240 ft.	+/-3 mm	+/-0.03%	IP68	R6 = 6.3GHz R2 = 26GHz R7 = 78GHz
ABMX00 - 340R6R2 ABMX00 - 340R2R7	103.6 m 340 ft.	+/-3 mm	+/-0.03%	IP68	R6 = 6.3GHz R2 = 26GHz R7 = 78GHz



**Radar 6.3 / 26 GHz Dual
Frequency**



**Radar 26 / 78 GHz Dual
Frequency**

Note - Minimum Range starts at the lower tip of the antenna or horn bottom for high dielectric materials (water). For low dielectric materials allow longer Minimum Range.

OPERATIONAL

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 : 6.3 GHz & 26 GHz ,26 GHz & 78 GHz

Loss of Echo : Hold 3 min., 22mA or 2 mA. output ,
or no loss of echo.

Transmit Power : 50 uW average

Calibration : Via communications port (required)

Diagnostics : (Echo Profile) via communications port

Antenna : Horn HR6 - 4" or 6" Dia.

: Horn HR5 - 5" c/w Extension for low
dielectric & dusty powder materials.

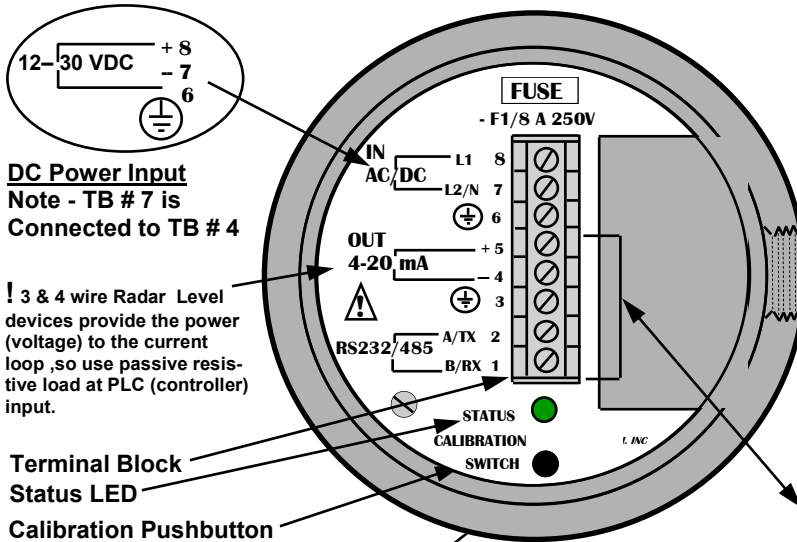
ELECTRICAL SPECIFICATIONS

Power	Description
ABM400 AC	115 VAC 60 Hz or 230 VAC 50 Hz (+/-20%) , 1.7 VA
ABM300 DC	12 to 30 VDC , 0.07 A max @ 24 Vdc R load max. = $(V_s - 6) / 24$ mA
ABM200 DC	20 to 30 VDC , R load max. = $(V_s - 14) / 25$ mA
Output	4-20 mA Output 6.1 uA resolution

3 & 4 Wire Radar Sensors User Instruction Manual

Inter-Connection Diagram

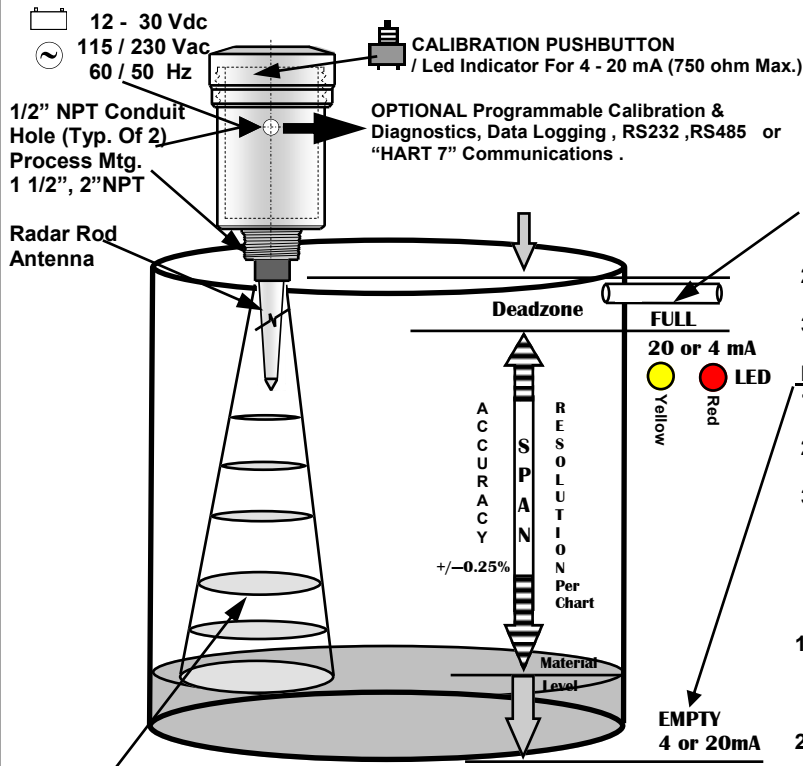
Top View of Sensor (Access Cover Removed)



NOTE — Use only 1/2" NPT Conduit

Typical Installation

- 1) Radar unit must be installed into metal fitting with the antenna pointing downward.
- 2) Do not mount in the center of a domed tank.



Operation - An 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.

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

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.

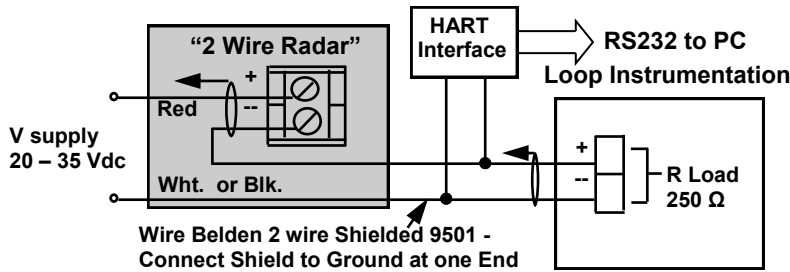
For Radar to turn the Low Dielectric Materials operation mode

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

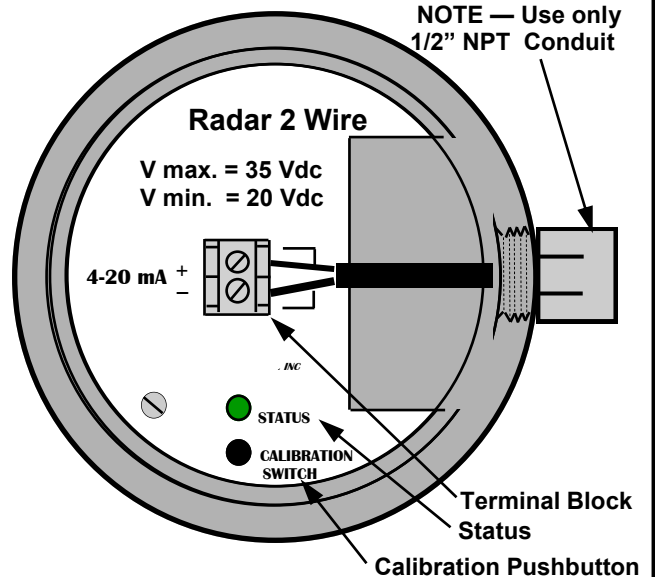
- 1) To turn the Low Dielectric Materials ON. Push button and hold until LED goes OFF after the sequence of Yellow ,Red and turns Off. The Low Dielectric Material operation is On when the LED'S Green light blinks constantly.
- 2) To turn the Low Dielectric Materials OFF. Push button and hold until LED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

2 Wire Radar Sensors User Instruction Manual

Fig. # 1 - "2 Wire Sensor" Wiring Connection



Top View of Sensor (Access Cover Removed)



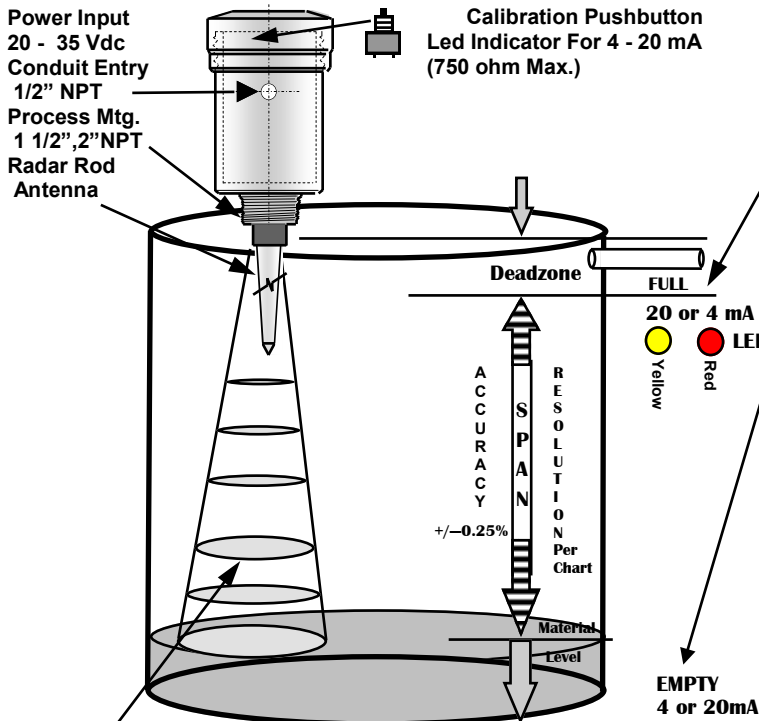
FCC INFORMATION TO RADAR USERS

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.

Typical Installation

1) Radar unit must be installed into metal fitting with the antenna pointing downward.



Wiring Information

- Ground shield at one end only.
- All terminal block wiring must be rated for 250V.
- 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

- 2 Wire shielded 24 AWG , 300 V

Calibration — 4 -20 or 20 - 4 mA Output

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

1. Calibration mode LED color is blinking 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 at Yellow or Red and observe LED flashes to acknowledge the calibration.

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

1. Calibration mode LED color is blinking 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

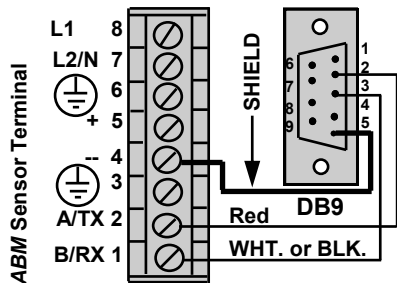
ON and OFF (this mode is recommended for materials with dielectric constant lower than 4 and also to eliminate multiple reflections in tank.)

- 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 gives two short blinks.
- 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 blinking Green.
- 3) Or use "Hart 7" communication software (Fig. #1).

Operation - 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 and converted to an output signal directly proportional to the material level .

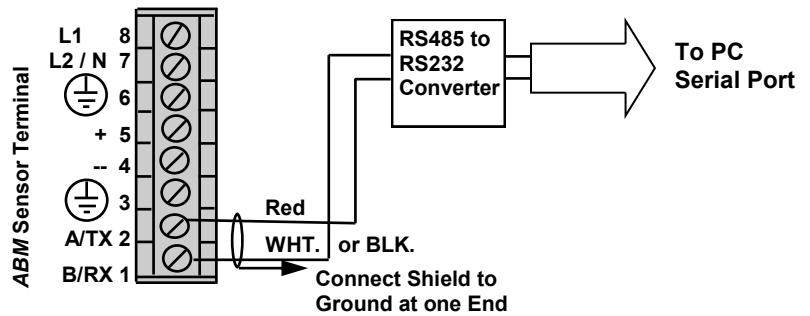
3&4 Wire Ultrasonic and Radar Sensors Communication Interconnection Dtl.

Fig. # 1 RS232 Connection



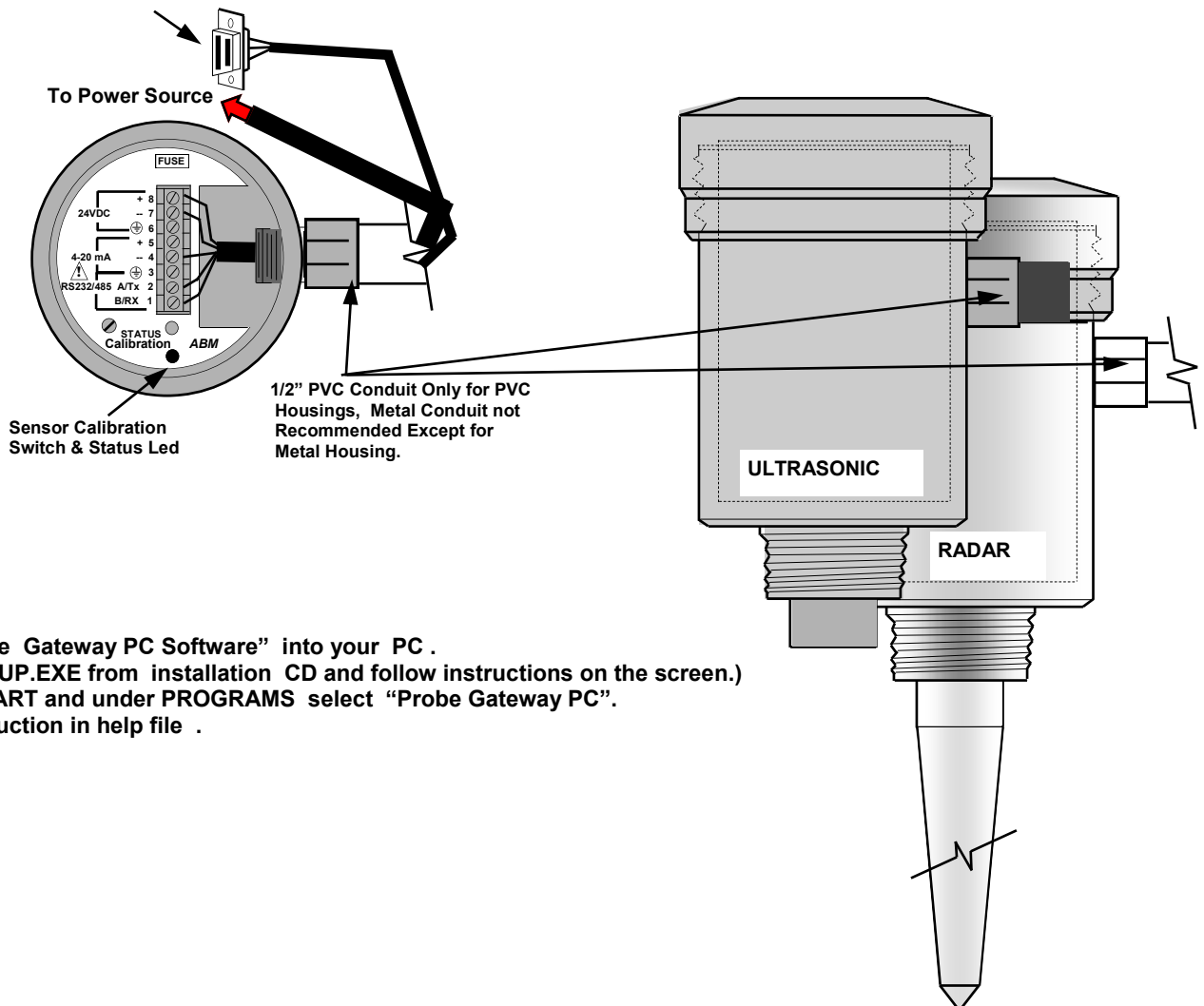
Note – Connect the shield to ABM Sensor Terminal #4.

Fig. # 2 RS485 Connection



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

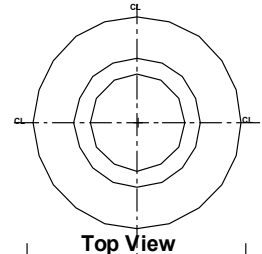
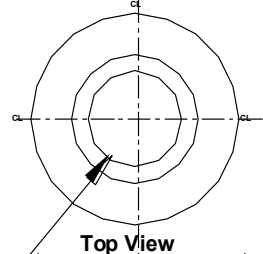
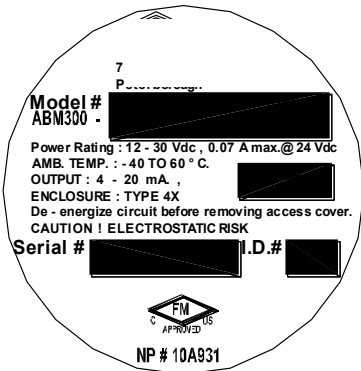
Connect to Serial Port of PC, use Extension Cable length as required, Refer to Fig.# 1 or # 2 For Wiring Dtl.



- 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 .

2,3 & 4 Wire Radar Level Measurement Sensors Outline Dtl.

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F



Nameplate Recess Thread on Wiring Access Cover (Aluminum or S.S.)

Electronics Enclosure Aluminum or S.S. 3.5" Ø O.D.

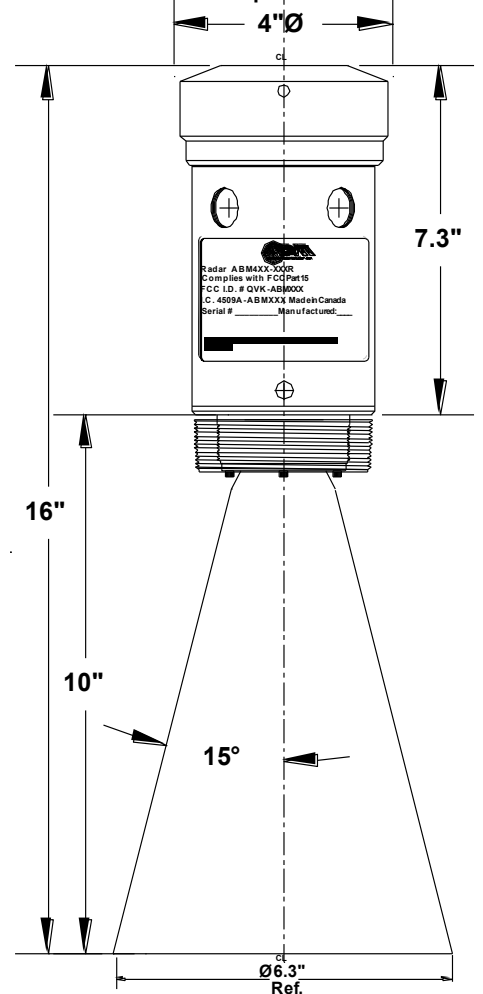
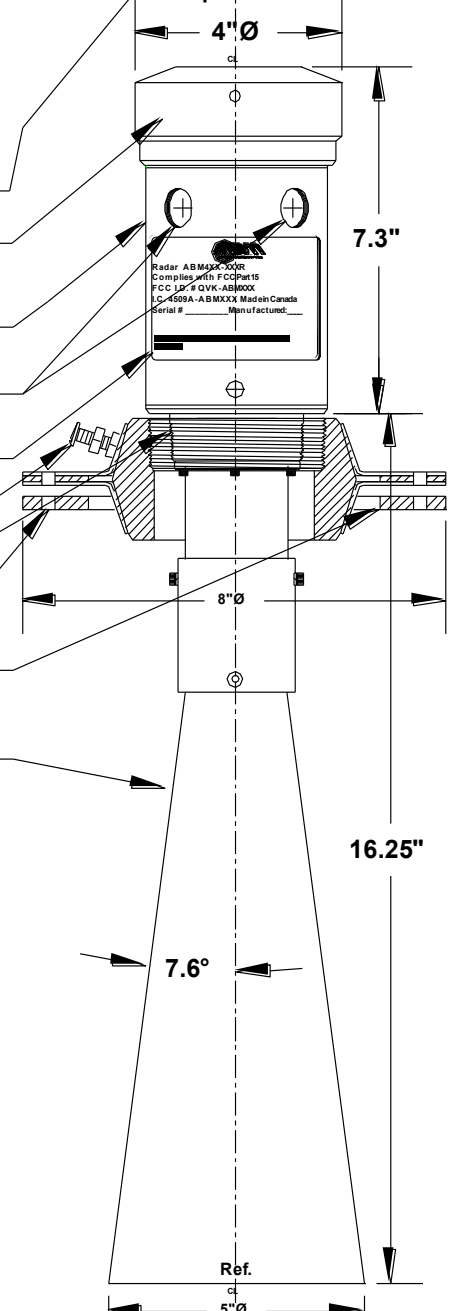
1/2" NPT Conduit Entry (Typ. of 2)

FCC Approval Nameplate 1/4"-20 Swivel Nut & Lockscrew

Mounting Thread 1 1/2" or 2" NPT 6 Holes 0.25" Ø on 7.0" Mtg. Circle

1/4" Thk. Rubber Gasket Material Supplied

Antenna Horn Aluminum



Radar Std. 6.3 GHz & 26 GHz c/w Horn

Radar Std. 26 GHz c/w Horn & Aimer

3 & 4 Wire Radar Level Sensor Outline Detail

10A836R2