

# 3 & 4 Wire Self Compensating Ultrasonic Transmitters - Standard Mtg. & Sanitary Ferrule Mtg.



730 The Kingsway Peterborough, Ont. K9J6W6 Canada  
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## FEATURES

S.S. 316L Face Material c/w Tri-Clamp Mtg. Base  
Simple push-button calibration (Accurate)  
Output 4-20 mA / 20-4 mA  
(Isolated on 4 Wire Model's only)  
Built-in temperature compensation  
Optional RS232 and RS485  
Communications with calibration, diagnostics  
and data logging software  
PLC compatible (Modbus RTU)  
Three & Four Wire Operation  
Self cleaning operation of sensor face



## APPLICATIONS

Food and Beverages Pharmaceutical /Water  
Chemical ,Oils , Wastewater ,Solids 025 & 045

## ENVIRONMENTAL

Temperature :  
Electronics Enclosure :- 40 to 140°F (- 40 to 60°C)  
Continuous Operation  
Std.Mtg. & Sanitary Nozzle :- 40 to 140°F(- 40 to 60°C)  
No Steam Cleaning (CIP)  
High Temp.(Teflon Sensor): - 40 to 266°F(- 40 to 130°C)  
(Std. Thread Mounting)  
S.S. Sanitary :- 40 to 266°F(- 40 to 130°C) for 1/2 Hr.  
(Ferrule & Face) Steam Cleaning. Remove sensor for  
longer Cleaning cycle ,recommended.  
Not for Continuous Operation  
Pressure : 5 bar Max. using High Temperature  
& Pressure Sensor  
Approvals CAN/CSA: C22.2 No. 1010.1-M92 +A2,  
CE: IEC 61010-1:90 + A1:92 +A2:95  
UL: 61010A-1(2002)  
Installation Category : Class II

## OPERATIONAL

Accuracy : +/-0.10% of max. range  
(in lab using 4-20 Ma current output)  
+/-0.25% of max. range (typically in field)  
Response Time: Standard Unit 2 - 3 echo's / sec.  
: Fast Protocol \*\*I.R. 10 - 30 echo's / sec.  
\*\* IF Required  
Beam Angle : 10 -12 degree at -3dB  
Loss of Echo : Hold 1 min., 22mA or 2 mA output  
Temp. Comp. : In transducer  
Calibration : Push-button or programmable  
via optional communications port  
Diagnostics : (Echo Profile) via communications port

## MECHANICAL

Conduit Entry : 1/2" NPT Hole (PVC conduit only)  
Enclosure : PVC-94V0 or Aluminum (25 KHz Excluded)  
Ingress Protection: NEMA 6 (IP68)

**CATALOGUE #** - On the Web return to Home  
Page & Refer to catalogue number Structure for  
ordering Information. In Product Documentation  
refer to page 3.

## ELECTRICAL SPECIFICATIONS

<b>Power</b>	115 VAC 60 Hz or 230 VAC 50 Hz
<b>ABM400 AC</b>	(+/-20%), 1.7 VA
<b>ABM300 DC</b>	12 to 30 VDC , 0.07 A max. @ 24 Vdc R load = (Vs - 6) / 24 mA
<b>Output</b>	4-20 mA Output 6.1 uA resolution
	750 Ohms (Isolated on 4 Wire only)
	Optional RS232 or RS485 communications port (3 & 4 Wire Only)

Range Code	Beam Angle	OPERATING RANGE In Liquids	Resolution	Mounting
025 Solids *	6°	1.4 - 90 ft. 0.40 - 27.4 m	0.41" 10 mm	6.0"/1.0" NPT 7.3"Ø x 7.6" H
045 Solids *	9°	1.0 - 60 ft. 0.30 - 18.2 m	0.27" 6.8mm	3.0" NPT 3.0"Ø x 3.0" H
052	12°	0.9 - 50 ft. 0.27 - 15.2 m	0.23" 5.7mm	3.0"/ 2.0" NPT 2.0"Ø x 2.7" H
070	12°	0.8 - 30 ft.	0.13"	3.0"/ 2.0" NPT
080	12°	0.7 - 20 ft. 0.21 - 6.1 m	0.088" 2.2 mm	3.0"/ 2.0" NPT 1.8"Ø x 2.25" H
081	12°	0.6 - 16 ft. 0.18 - 4.9 m	0.07" 1.8 mm	3.0"/ 1.5" NPT 1.5"Ø x 2.1" H
148	12°	0.4 - 9 ft. 0.12 - 2.7 m	0.04" 0.98 mm	3.0"/ 1.0" NPT 1.1"Ø x 2.0" H

\* Note Solids Range 1/2 Liquids Range Stated in Chart above

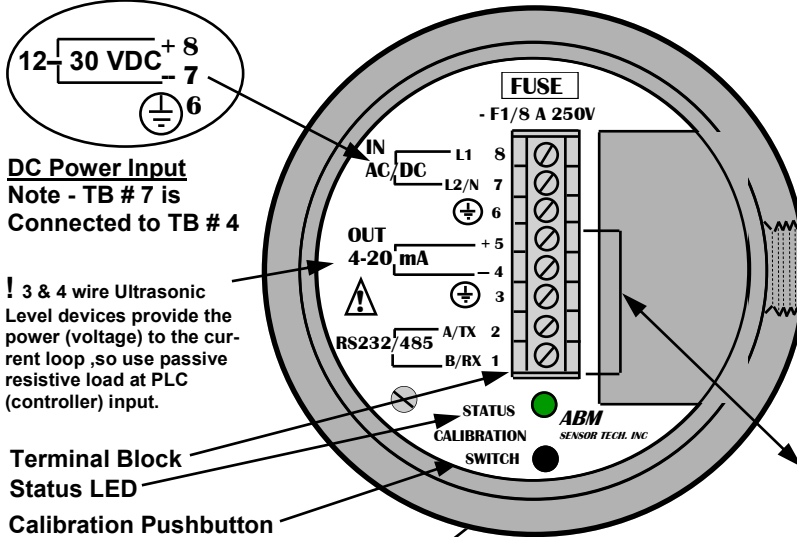
# 3 & 4 Wire Ultrasonic Sensors User Instruction Manual



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## Inter-Connection Diagram

### Top View of Sensor (Access Cover Removed)



**DC Power Input**  
Note - TB # 7 is Connected to TB # 4

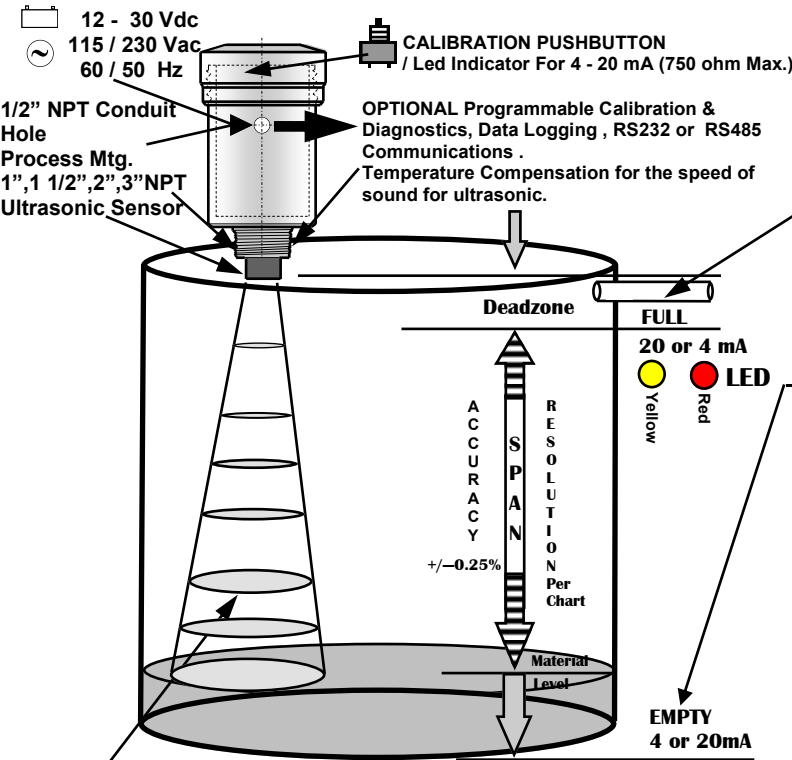
! 3 & 4 wire Ultrasonic Level devices provide the power (voltage) to the current loop, so use passive resistive load at PLC (controller) input.

**Terminal Block**  
**Status LED**  
**Calibration Pushbutton**

NOTE — Use only 1/2" NPT Conduit

### Typical Installation

- 1) Direct mounting ultrasonic sensor - Simply thread sensor directly into metal or plastic nozzle.
- 2) Do not mount in the center of a domed tank.



**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  
Communication 1 Pair 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 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
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.

#### LOSS OF ECHO—22mA or 2 mA (3.5 mA for 2 Wire)

1. To choose 22mA press and hold button until the light goes off—2 flashes
2. To choose 2mA press and hold button until the light goes off—1 flash

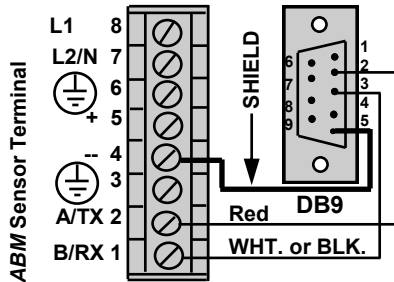
**Operation** - An ultrasonic pulse is transmitted from the ABM sensor . The pulse travels to the surface being monitored and is reflected off this surface back to the sensor . The time of flight is divided by 2 ,corrected with temp. and converted to an output signal directly proportional to the material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

# 3&4 Wire Ultrasonic Sensors Communication Interconnection Dtl.



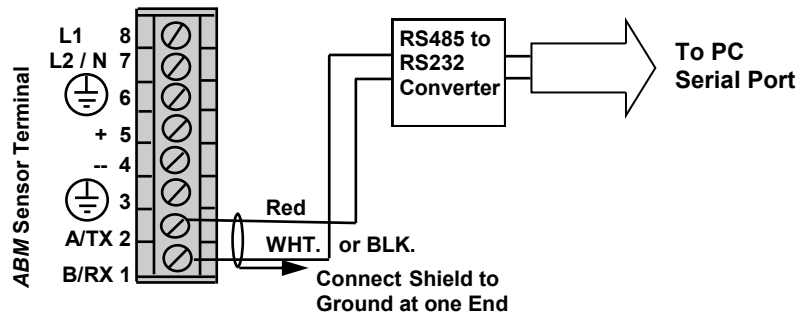
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**Fig. # 1 RS232 Connection**



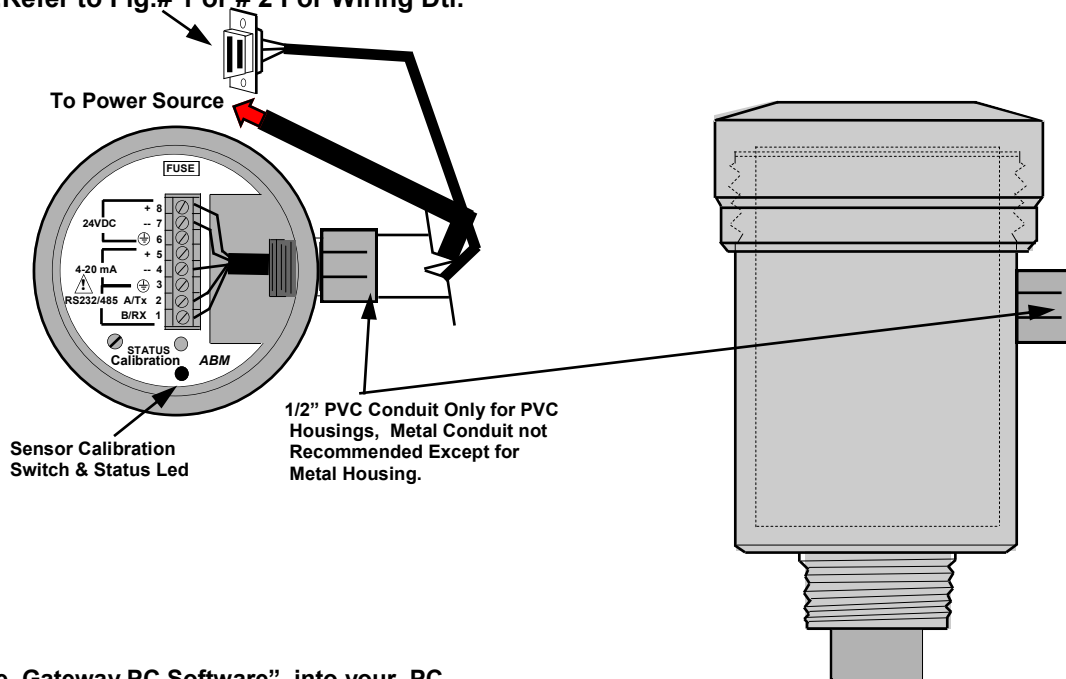
Note - Connect the shield to ABM Sensor Terminal #4.

**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.

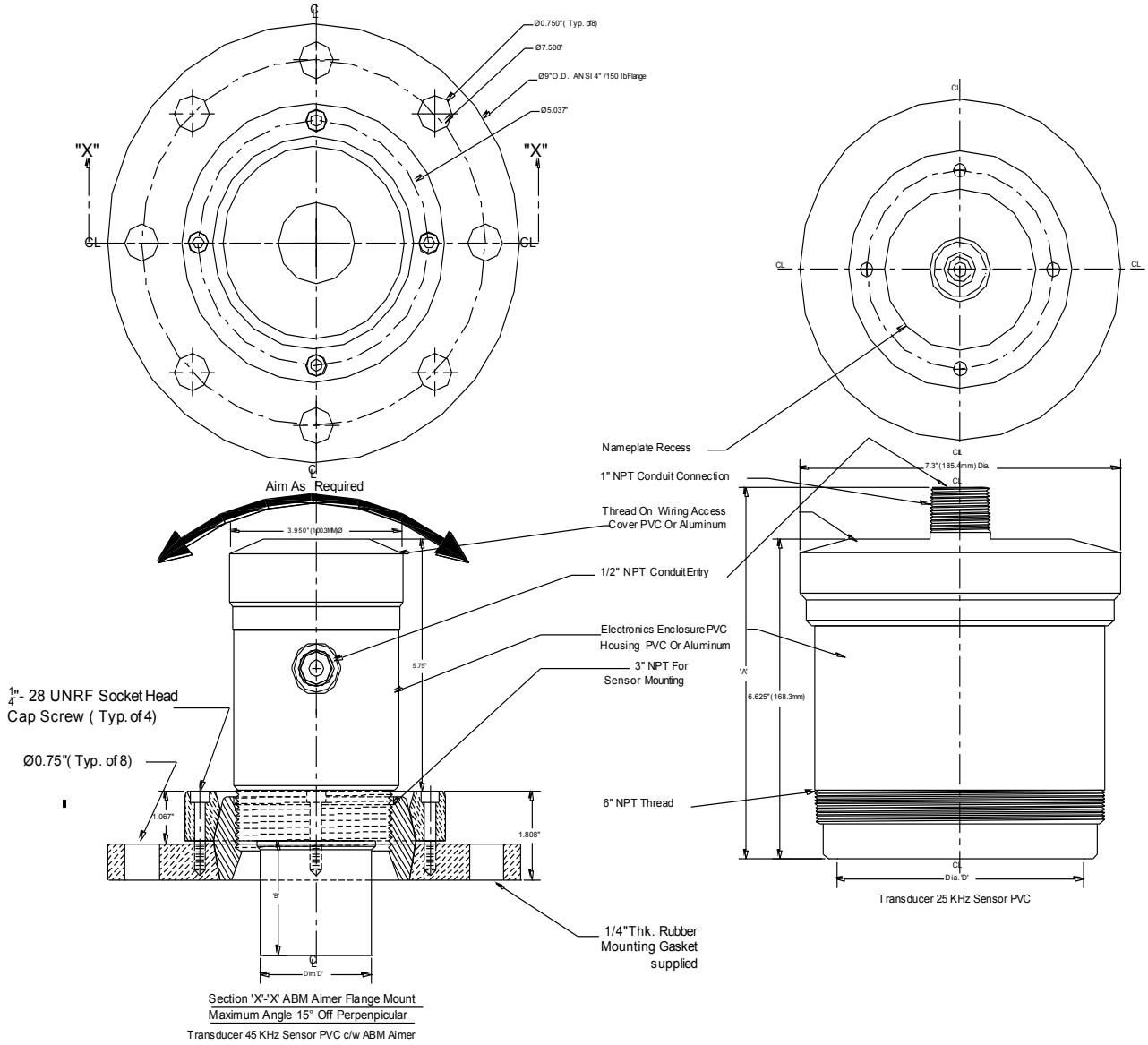


- 1) Load "Probe Gateway PC Software" into your PC.  
(Select SETUP.EXE from installation CD and follow instructions on the screen.)
- 2) Click on START and under PROGRAMS select "Probe Gateway PC".
- 3) Follow instruction in help file .

# 3 & 4 Wire Ultrasonic Transmitters & ABM Aimer Dimensional Dtl.



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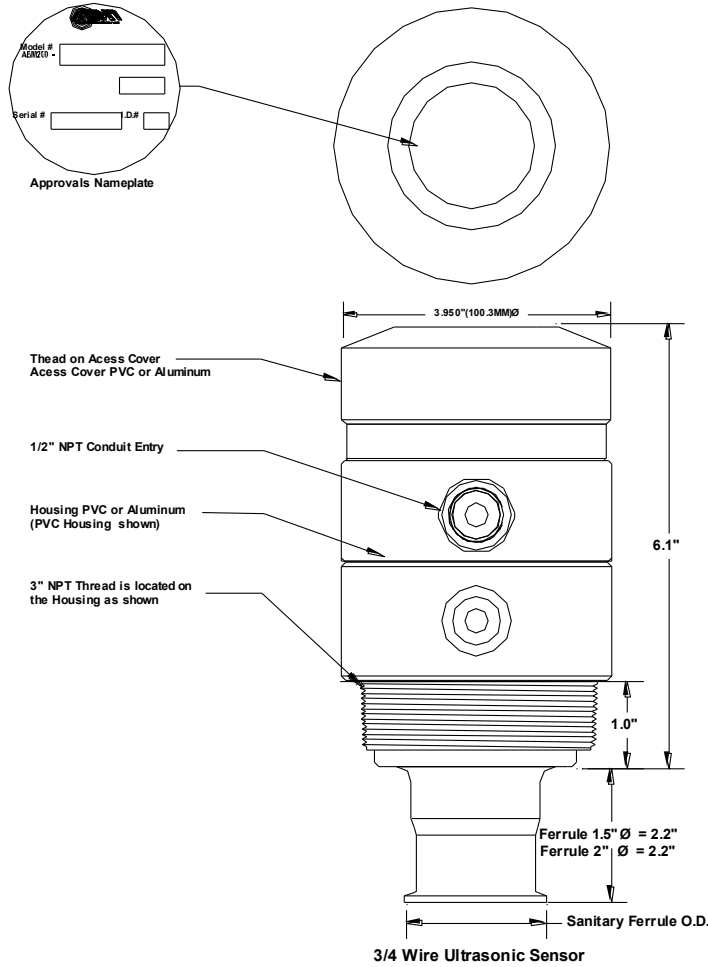


Level Sensor Housing						
Model #	Operating Range	Operating Frequency	Mounting Thread NPT	Dimension 'A'	Dimension 'B'	Dimension 'D'
ABMX00-025UL	90' (27.4 m)	25 KHz	6"1"	7.625" (194mm)	N/A	5.75" (146mm)
ABMX00-045UL	60' (18.2 m)	45 KHz	3"	7.75" (197mm)	3.0" (76.2mm)	3.0" (76.2mm)
ABMX00-052UL	50' (15.2 m)	52 KHz	3"1/2"	9.3" (236mm)	3.05" (77.5mm)	2.2" (55.9mm)
ABMX00-070UL	30' (9.1 m)	70 KHz	3"1/2"	8.5" (216mm)	2.25" (57.2mm)	1.8" (45.7mm)
ABMX00-080UL	20' (6.1 m)	80 KHz	3"1/2"	8.5" (216mm)	2.25" (57.2mm)	1.8" (45.7mm)
ABMX00-081UL	16' (4.9 m)	81 KHz	3"1.5"	8.4" (213mm)	2.1" (53.3mm)	1.5" (38.1mm)
ABMX00-148UL	9' (2.7 m)	148 KHz	1"	8.25" (210mm)	2.0" (50.8mm)	1.1" (27.9mm)

# 3 & 4 Wire Sanitary Ultrasonic Sensors Outline Dimensional Dtl.



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Level Sensor Housing				
Model #	Operating Range	Operating Freq.	Sanitary Ferrule O.D.	Ferrule O.D.
ABM 3/4XX-070UL	30' (9.1 m)	70 KHz	1 1/2"	2"
ABM 3/4XX-080UL	20' (6.1 m)	80 KHz	N/A	2.5"
ABM 3/4XX-081UL	16' (4.9 m)	81 KHz	N/A	2.5"
ABM 3/4XX-1480UL	9' (2.7 m)	148 KHz	1.9"	2.5"