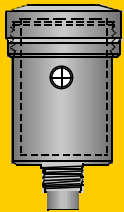




# Ultrasonic Level Transmitters Three & Four Wire Operation



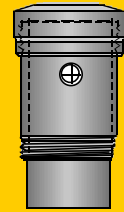
730 The Kingsway Peterborough, Ont. K9J6W6 Canada  
Tel: (705) 740 - 2010 Web: www.abmsensor.com  
Fax: (705) 740 - 2563 E-mail: general@abmsensor.com



ABM 300/400-148U

## FEATURES

- 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 Or RS485 communications
- Optional calibration (Limited Accuracy), diagnostic Data logging software
- PLC compatible



ABM 300/400-45U

## APPLICATIONS

- Food and Beverages
- Water/Wastewater
- Chemicals
- Oils
- Solids (Models 25U, 45U & 52U Below)



ABMXXX-XXUC ← C = Communications, Blank = no Comm.  
 XX = Operating Frequency, U = Ultrasonic  
 400 = AC Power, 300 = DC Power

## TECHNICAL SPECIFICATIONS

	MODEL	RANGE	RESOLUTION	MOUNTING
AC - 4 WIRE	ABM400-25U	1.4 - 90 ft. 0.40 - 27.4 m	0.41" 10 mm	6.0"/1.0 NPT
	ABM400-45U	1.0 - 60 ft. 0.30 - 18.2 m	0.27" 6.8 mm	3.0" NPT
	ABM400-52U	0.9 - 50 ft. 0.27 - 15.2 m	0.23" 5.7 mm	3.0"/2.0" NPT
	ABM400-70U	0.8 - 30 ft. 0.24 - 9.1 m	0.13" 3.4 mm	2.0" NPT
	ABM400-80U	0.7 - 20 ft. 0.21 - 6.1 m	0.088" 2.2 mm	2.0" NPT
	ABM400-81U	0.6 - 16 ft. 0.18 - 4.9 m	0.07" 1.8 mm	1.5" NPT
	ABM400-148U	0.4 - 9 ft. 0.12 - 2.7 m	0.04" 0.98 mm	1.0" NPT
DC - 3 WIRE	ABM300-25U	1.4 - 90 ft. 0.40 - 27.4 m	0.41" 10 mm	6.0"/1.0 NPT
	ABM300-45U	1.0 - 60 ft. 0.30 - 18.2 m	0.27" 6.8 mm	3.0" NPT
	ABM300-52U	0.9 - 50 ft. 0.27 - 15.2 m	0.23" 5.7 mm	3.0"/2.0" NPT
	ABM300-70U	0.8 - 30 ft. 0.24 - 9.1 m	0.13" 3.4 mm	2.0" NPT
	ABM300-80U	0.7 - 20 ft. 0.21 - 6.1 m	0.088" 2.2 mm	2.0" NPT
	ABM300-81U	0.6 - 16 ft. 0.18 - 4.9 m	0.07" 1.8 mm	1.5" NPT
	ABM300-148U	0.4 - 9 ft. 0.12 - 2.7 m	0.04" 0.98 mm	1.0" NPT

## MECHANICAL

- Conduit Entry 1/2" NPT Hole (PVC conduit only)
- Enclosure PVC-94V0
- Ingress Protection NEMA 4X (IP65)

## ENVIRONMENTAL

- Temperature - 40 to 140°F (-40 to 60°C)
- Pressure 1 bar
- Approvals Entela Certified #8294 - CSA 1010.1 & UL 61010A-1, Except ABM-25U Pending
- Installation Category Class II

## OPERATIONAL

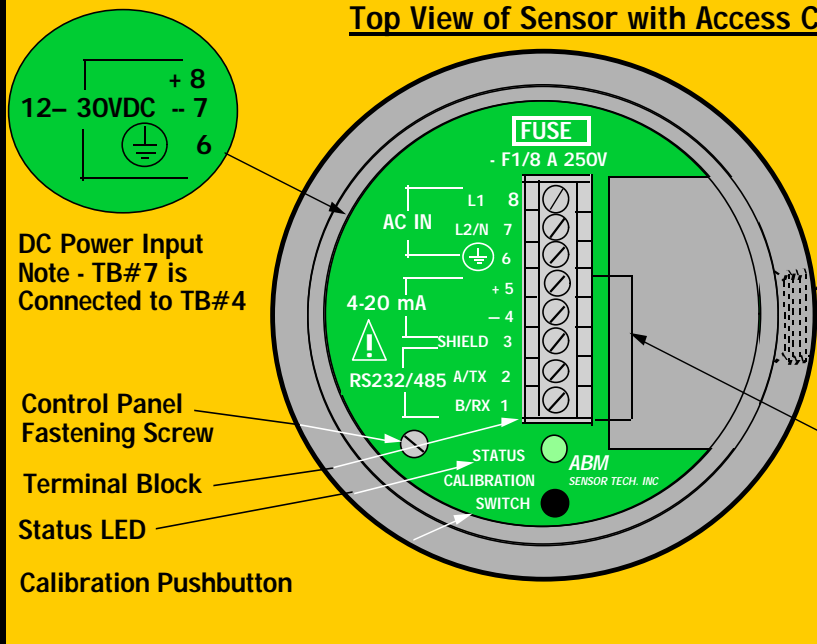
- Accuracy +/-0.25% of max. target range (in air)
- Beam Angle 10 -12 degree at -3dB
- Loss of Echo Hold 30 seconds, 22mA output
- Temperature Compensation In transducer
- Calibration Push-button or programmable via optional communications port.
- Diagnostics (Echo Profile) via communications port

## ELECTRICAL SPECIFICATIONS

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

# Inter-Connection Diagram

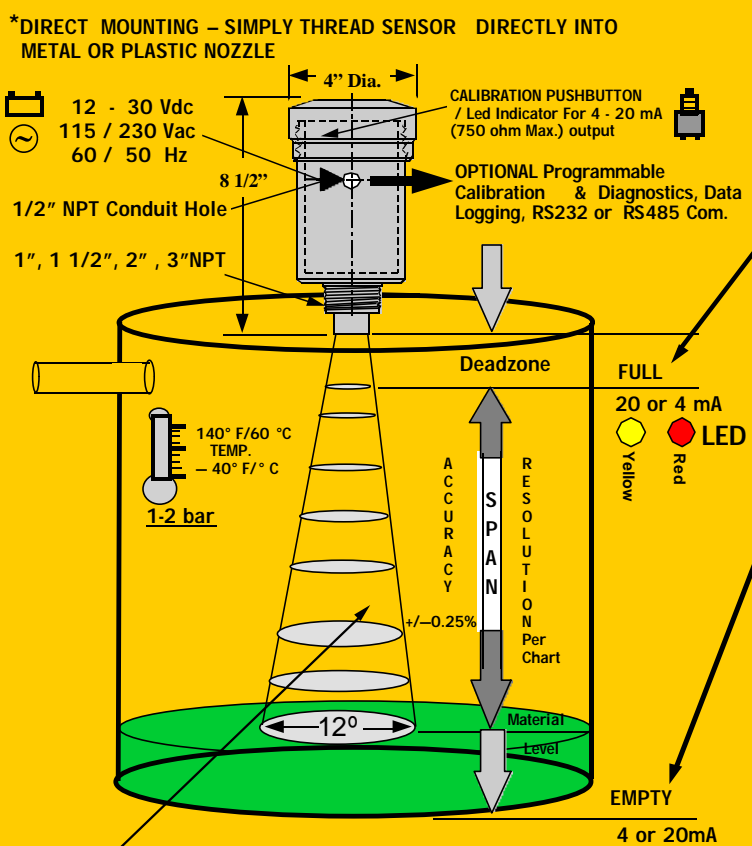
## Top View of Sensor with Access Cover Removed



NOTE – Use only 1/2" NPT PVC Conduit

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

## Typical Installation



## Calibration – 4-20 or 20 -4 mA Output

### FULL – Calibrate 20 mA or 4mA (Set Near Target)

1. Calibration mode LED color → Green
2. Push button → Hold for 3 seconds (20mA) until LED turns Yellow or Hold for 7 seconds (4mA) until LED turns Red
3. Release button, Observe, LED flashes to acknowledge

### EMPTY – Calibrate 4 mA or 20 mA (Set Far Target)

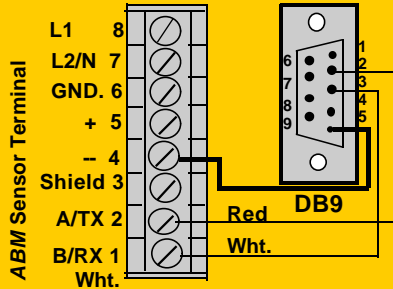
1. Calibration mode LED color → Green
2. Push button → Hold for 7 seconds ( 4mA ) until LED turns Red or Hold for 3 seconds (20mA) until LED turns Yellow
3. Release button, Observe, LED flashes to acknowledge

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

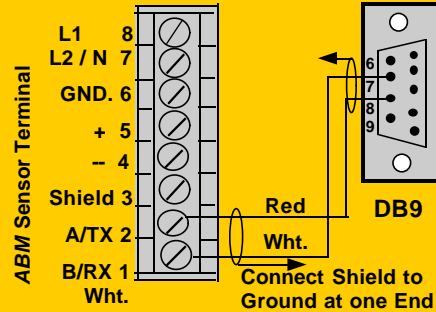
**ABM SENSOR TECHNOLOGY INC.**  
730 The Kingsway Peterborough , Ont. K9J6W6 Canada  
Tel: (705) 740 – 2010 Web: www.abmsensor.com  
Fax:(705) 740 – 2563 E-mail: general@abmsensor.com

# INSTRUCTION MANUAL 10A267 – ABM 300/400 (AC/DC) Sensors Communication For a Single Or Network Level Sensors With RS485/232

**Fig. # 1 RS232 Connection**

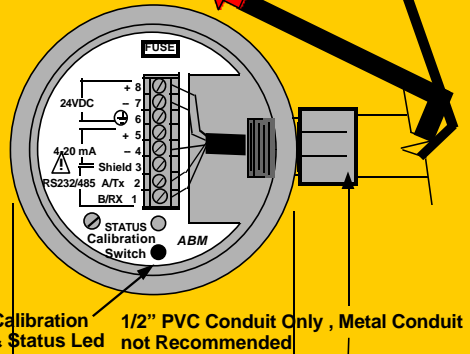


**Fig. # 2 RS485 Connection**



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

To Power Source



- 1) Load "Gateway Single Probe Software" into your PC .  
(Select SETUP.EXE from installation CD and follow instruction on the screen.)
- 2) Click on START and under PROGRAMS select "Gateway PC".
- 3) Select "Start Data Link". You will see two bar graphs, displaying the last 8 echoes & the current output .Traffic light icon at the screen bottom indicates communication status to probe.
- 4) Pick "Tools".

Screen displays the following parameters,

- :Reset Max. Temperature
- :Sensor I.D. with single probe is 2 and with network is 4,5,....
- :Empty Tank Distance calibration
- :Full Tank Distance calibration - programmable distance calibration with accuracy of 0.1"
- :Select Transducer Freq. 45 KHz 60' probe  
52.6 KHz 50' probe  
64.1 KHz 35' probe  
69.4 KHz 30' probe  
80.6 KHz 16' and 20' probes  
148.8 KHz 9' probe

:Temperature Scale

- 5) Show Calibration Data ,Screen displays the following parameters,  
:Sensor I.D. with single probe is 2  
:Current Frequency -shows the operating frequency  
:Empty Tank Distance  
:Full Tank Distance  
:Probe Software Rev.  
:D. Link Protocol  
:Max Temperature - shows the max. temperature of environment
- 6) Select Protocol :RS485/232  
:MODBUS RTU

7) Fix point Calibration (the same as using the probe calibration Switch ) is in the top left corner of the screen.

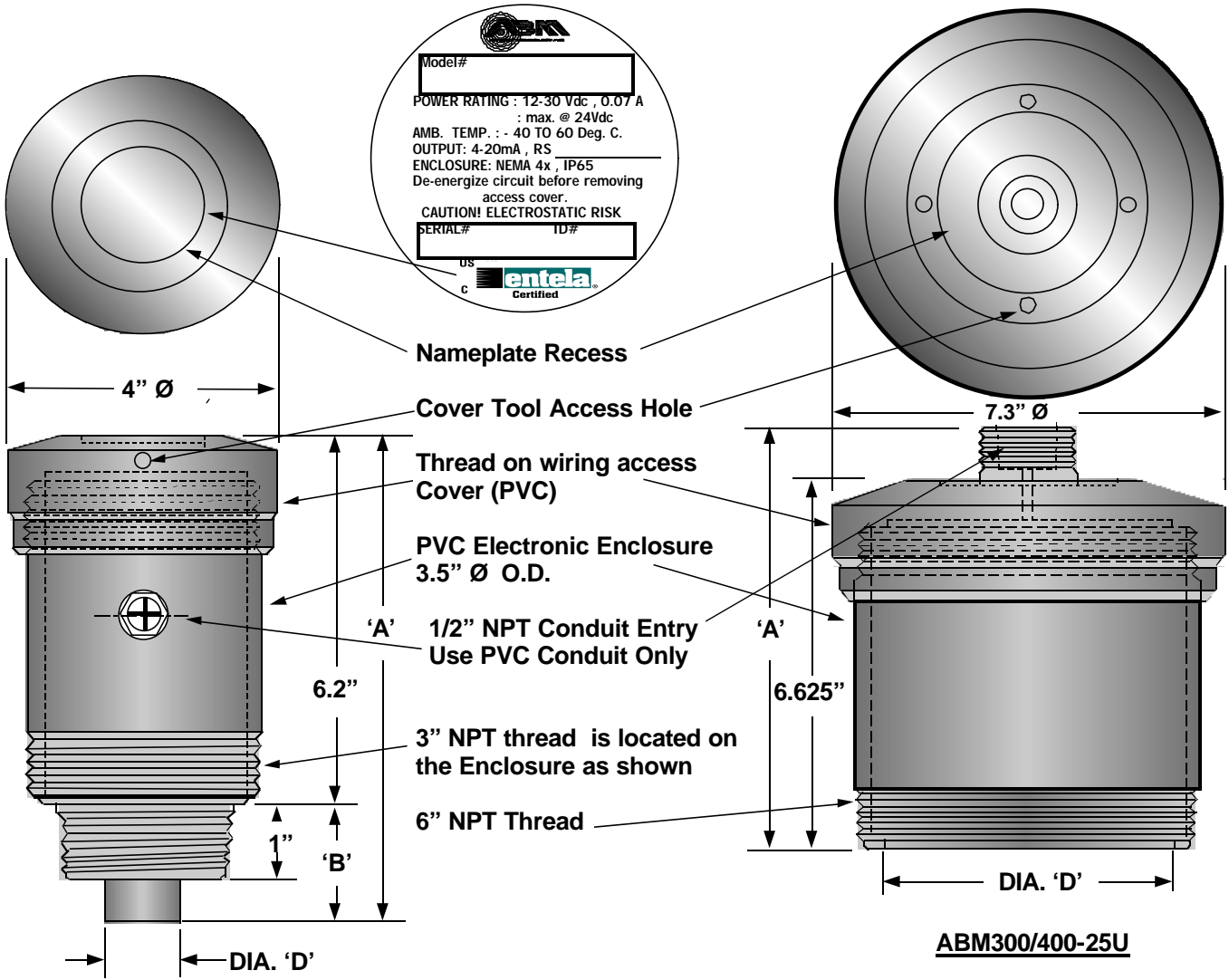
8) By selecting "Diagnostic" the screen displays all information on " errors", happy face- no errors , unhappy face - errors .

9) Echo chart displays information on stability of the echoes.


10) Echo Profile displays profiles of your ultrasonic probe . NOTE- when using this feature the probe is not in the measurement mode . To return to "measurement mode" exit the echo profile (select x ). Wait until you get the Data Link OK (green light on the Probe Status LED). On the "echo profile" you will see a marker where the software picked up an echo. To change target for different measurement, exit profile screen, wait for updated data, and again go to echo profile. The marker will pick up the new target .

11) Select Data Logging (Excel format) on FILE menu to collect history data for current and temperature in MS Excel format. Path for data collection: C:\ABM\GATEWAYPC\DATA\yyyy mm dd\sensorID\Data is collected for each sensor ID. The current is collected in 1 hour data files and temperature is collected in 24 hours data files. Use chart wizard in MS Excel to create the graph and view current and temperature data. The current data is collected every 0.5 second and temperature is collected every 1 minute. Select Data Logging (for Sensor Viewer) on FILE menu to collect history data for current and temperature for Sensor Viewer display. Follow instruction on Sensor Viewer Help menu.

12) Select AutoScan to collect data for all sensors connected in the network. Scanning time for one sensor is 30 seconds. Echo Profile display is disabled in Auto Scan mode.



Level Sensor PVC Housing						
Model #	Operating Range	Operating Frequency	Mounting Thread	Dimension 'A'	Dimension 'B'	Dimension 'D'
ABM300/400- 25U	90'	25 KHz	6" / 1 " NPT	7.625"	N/A	5.75"
ABM300/400- 45U	60'	45 KHz	3 " NPT	8.9"	3.0"	3.0"
ABM300/400- 52U	50'	52 KHz	3" / 2 " NPT	9.3"	3.05"	2.2"
ABM300/400- 70U	30'	70 KHz	2 " NPT	8.5"	2.25"	1.8"
ABM300/400- 80U	20'	80 KHz	2 " NPT	8.5"	2.25"	1.8"
ABM300/400- 81U	16'	81 KHz	1.5" NPT	8.4"	2.1"	1.5"
ABM300/400-148U	9'	148 KHz	1 " NPT	8.25"	2.0"	1.1"

<b>SCALE</b> NTS	<b>TOLERANCES</b> DECIMAL .x ±.05 .xx ±.01 .xxx ±.005		ANGULAR ± .5 deg		ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED	
<b>DATE</b> Nov. 13/02	<b>TITLE</b> ABM 300/400 Level Transmitter Sensor Outline Detail				10A231 R5 SHT. 1/1	
<b>DRAWN BY</b> HTV						