

# Ultrasonic Level Sensor (Optional Cellular Modem)

## Low Voltage Range (6—30 VDC)

### Standard and Sanitary Mounting



730 The Kingsway Peterborough , Ont. K9J6W6 Canada  
 Tel: (705) 740 – 2010 Web: www.abmsensor.com

#### Features

- 1) Plug and play. Mount the sensor and connect power. Sensors with the optional cellular modem will automatically connects to the Sensor Server.
- 2) Output 4 - 20 mA loop current.
- 3) Built in temperature compensation.
- 4) Web access to measurement history, calibration and diagnostics. (Cellular Option)
- 5) Self adjusting technology eliminates unwanted echoes.
- 6) Self cleaning feature reduces build up on the transducer face.
- 7) Range up to 60 feet (18.2 meters).
- 8) Temperature range -40 to 120°C.
- 9) Sanitary mounting available.
- 10)PVC, SS316L or TEFLON materials for transducers.



#### APPLICATIONS

- 1) Any liquids and solids.
- 2) Food and pharmaceutical.
- 3) High temperature applications.
- 4) Sanitary

#### MECHANICAL

Conduit Entry: 1/2" NPT Hole  
 (PVC Conduit only for PVC Housing )

Enclosure : Aluminum - 94V0  
 : PVC or SS316L

Sensor : Standard - PVC,

High Temp. : Optional - Teflon (standard mtg. only)

HTP. (5 Bar) : S.S. (1 1/2" or 2" sanitary only)

Ingress Protection: NEMA 6 (IP68)

#### ENVIRONMENTAL

##### **Temperature Ratings**

Electronics Enclosure: -40 to 140°F (-40 to 60°C)  
 Continuous Operation

PVC & Standard Sanitary Nozzle:

- 40 to 140°F(-40 to 60°C)

Teflon Nozzle: - 40 to 266°F(-40 to 130 °C)

S.S. HTP Sanitary: -40 to 266°F(-40 to 130°C)

*(1/2 hour steam cleaning. It is recommended that the sensor be removed for longer cleaning cycles. Not for continuous operation.)*

**Pressure Standard:** 2 bar

**Optional:** 5 bar max. using HTP Sanitary Sensor or special HP- PVC Sensor.

**Installation Category:** Class II

#### Electrical Specifications

**Power:** 6 to 30 VDC

**Output:** 4 - 20mA output 6.1uA resolution, 750 Ohms max load. Optional Cellular Data to Sensor Server.

#### 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

#### OPERATIONAL

Accuracy : +/-0.1% of Max. span (in Lab)  
 +/-0.25% of max. range (typically in field)

Response Time: Programmable through web interface.

Calibration : Push-button or web Interface.

Temperature Compensation : In transducer

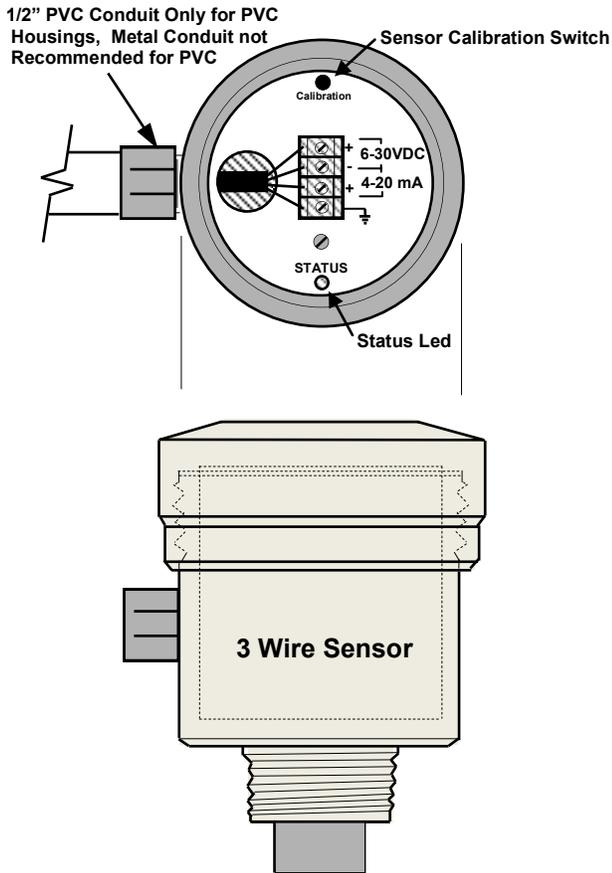
#### Technical Specifications

Range Code	Beam Angle	Operating Range in Liquids	Resolution	Mounting
045	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. 0.24 - 9.1 m	0.13" 3.4 mm	3.0"/ 2.0" NPT 1.8"Ø x 2.25" H
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

# Ultrasonic Sensor (Optional Cellular Modem) User Manual



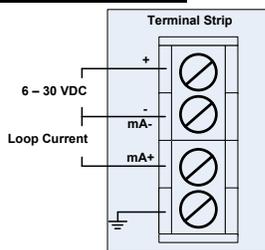
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**Fig. # 1 - "Sensor" Wiring Connection**

### Wiring

A 2 pair 22 AWG 300V shielded cable (Belden 9302) is recommended.



### Calibration with Push-button

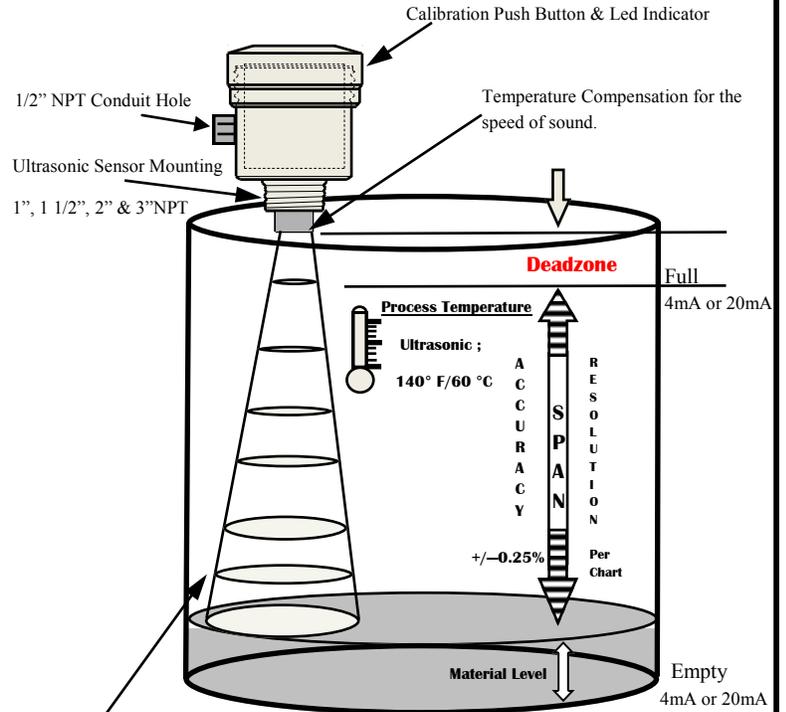
The calibration button has 3 functions: "update server now", program the 20 mA distance or the 4 mA distance to correspond to the current material height. The number of seconds the button is pressed determines which function will be executed. See Table 1 for button timing.

- Pressing the button until the LED turns off, then green causes the sensor to connect to the server and post the current measurement, any logged measurements and download any calibration changes.
- The calibration button can be used to set the "4 mA" or "20 mA" distance to the current target distance. Pressing and holding the calibration button will cause the LED to change color as per Table 1 below.

Example, pressing the button for greater than 7 seconds will cause the LED to turn off, then green, then yellow. Releasing the button while the LED is yellow will set the 20mA current to the actual material height.

## Typical Installation

Direct Mounting Ultrasonic Sensor - Simply thread sensor directly into metal or plastic nozzle.



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. If data logging is enabled the measurement is stored. If data logging is off or the maximum number of measurements has been logged then the sensor connects to the server and post the measurements.

Button Pressed (Seconds)	LED Color	Description
< 2	Off	If the button is pressed less than 2 seconds it is ignored and no action is taken.
> 2	Green	Take a measurement and connect to the server now. (Cellular enabled only.)
> 7	Yellow	Program the 20mA distance equal to the current material height.
> 12	Red	Program the 4mA distance equal to the current material height.
> 17	Off	Button pressed greater than 17 seconds it is ignored and no action is taken

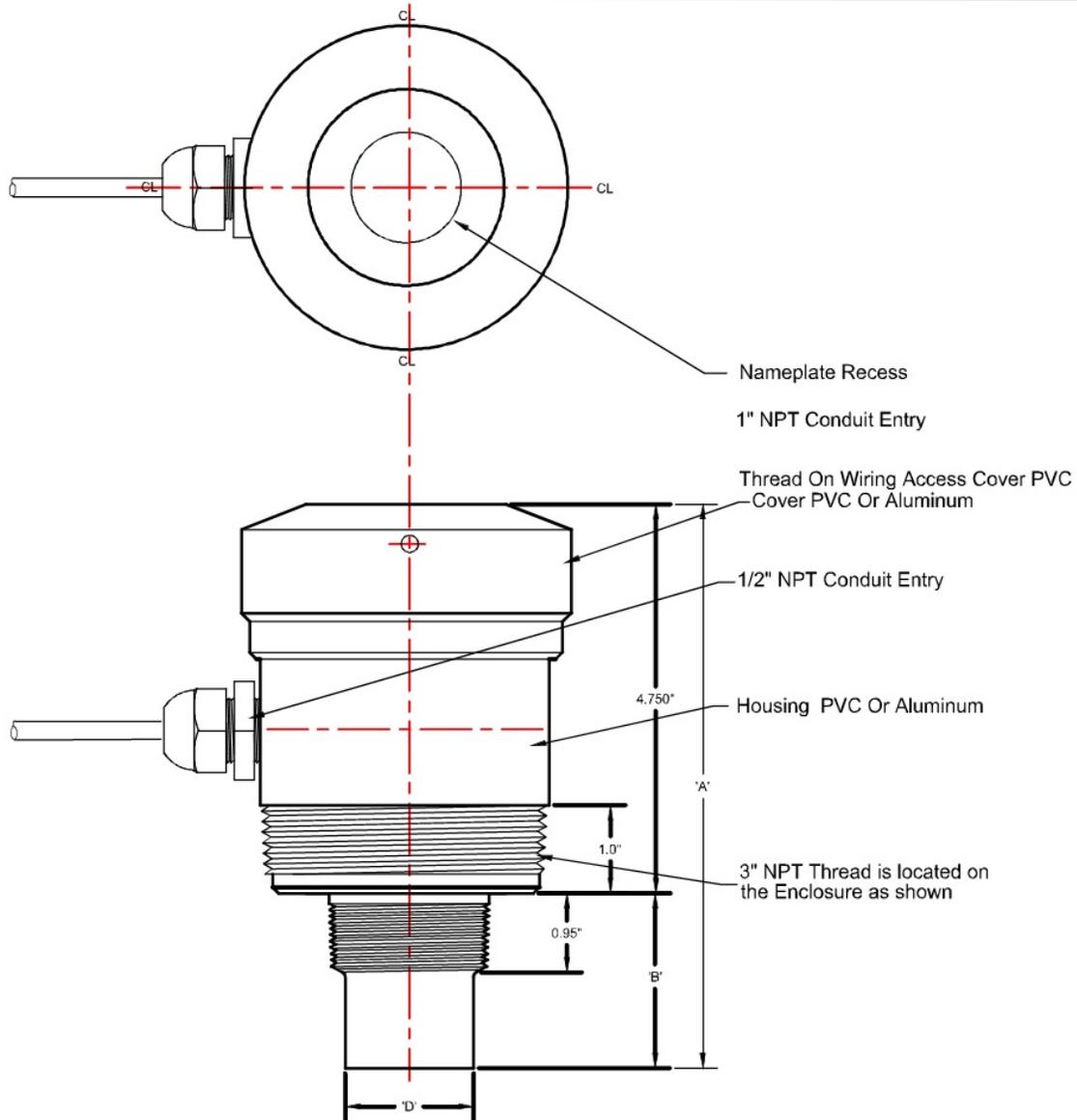
Table 2: LED color and timing. Symbols < "less than", > "greater than"

LED Order

# Ultrasonic Sensor (Optional Cellular Modem) Dimensions



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Model #	Operating Range	Operating Frequency	Mounting Thread NPT	Dimension 'A'	Dimension 'B'	Dimension 'D'
ABM300-045ULCM-ALPVC	60' (18.2m)	45 KHz	3"	7.75"(197mm)	3.0"(76.2mm)	3.0"(76.2mm)
ABM300-052ULCM-ALPVC	50' (15.2m)	52 KHz	3"/2"	7.8"(198mm)	3.05"(77.5mm)	2.2"(55.9mm)
ABM300-070ULCM-ALPVC	30' (9.1m)	70 KHz	3"/2"	7.0"(178mm)	2.25"(57.2mm)	1.8"(45.7mm)
ABM300-080ULCM-ALPVC	20' (6.1m)	80 KHz	3"/2"	7.0"(178mm)	2.25"(57.2mm)	1.8"(45.7mm)
ABM300-081ULCM-ALPVC	16' (4.9m)	81 KHz	3"/1.5"	6.85"(174mm)	2.1"(53.3mm)	1.5"(38.1mm)
ABM300-148ULCM-ALPVC	9' (2.7m)	148 KHz	1"	6.75"(172mm)	2.0"(50.8mm)	1.1"(27.9mm)