Remote Monitoring for Business

ALTA® Wireless Ultrasonic Ranging Sensors

General Description

The ALTA® Wireless Ultrasonic Sensor can be used in various applications to measure distances between the sensor and objects in its path. The sensor features autocalibration algorithms which allow it to adapt to variable environmental conditions and compensate for temperature and humidity effects.

Key Features

▸ Measures distance between the sensor and objects in its path.
▸ Resolution: 1 centimeter
▸ Accuracy:
  ▸ Commercial: ± 5% FS
  ▸ Industrial: ± 1% FS
▸ Auto-calibration algorithms allow sensor to adapt to variable environmental conditions
▸ Configurable thresholds for critical condition monitoring
▸ Industrial sensor comes standard with a detachable lead and mounting hardware

Principles of Operation

The ALTA Wireless Ultrasonic Sensor sends a high-frequency sound pulse to measure distance based on a user-configurable time interval or Heartbeat. On every Heartbeat, the sensor produces a high-frequency sound pulse. The sensor uses the speed of sound and the time difference between sending and receiving the sound pulse to determine the distance to an object. This measurement is then sent to the gateway, making the data available in iMonnit or another approved data service.

WARNING: Tanks with liquid in them must be vented. Otherwise, condensation will accumulate on the lens and render readings inaccurate.

Example Applications

▸ Liquid Level Detection
▸ Object/Vehicle Detection
▸ Inventory Status (based on distance measurement)
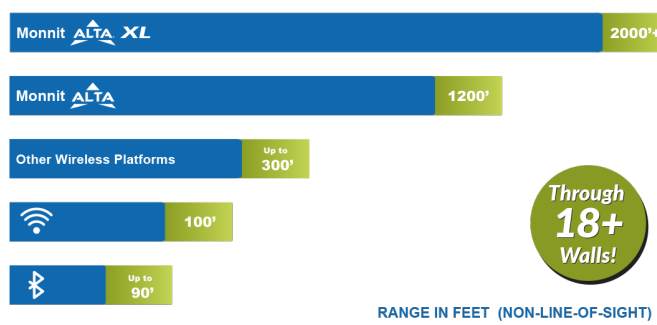▸ Additional applications

Features of Monnit ALTA Sensors

• Wireless range of 2,000+ feet through 18+ walls[1]
• Frequency-Hopping Spread Spectrum (FHSS)
• Best-in-class interference immunity
• Best-in-class power management for longer battery life[2]
• Encrypt-RF® Security (Diffie-Hellman Key Exchange + Advanced Encryption Standard (AES)-128 Cipher Block Chaining (CBC) for sensor data messages)
• Sensor logs 2000 to 4000 readings if the gateway connection is lost (non-volatile flash, persists through power cycling):
  - 10-minute Heartbeats = ~ 22 days
  - 2-hour Heartbeats = ~ 266 days
• Automatic over-the-air updates to sensor firmware (future-proof)
• Free iMonnit Basic Online Wireless Sensor Monitoring and Notification System to configure sensors, view data, and send alerts via SMS text, email, and voice call

1 Actual range may vary depending on the environment and gateway.

2 Battery life is determined by the sensor reporting frequency and other variables. Other power options are also available.
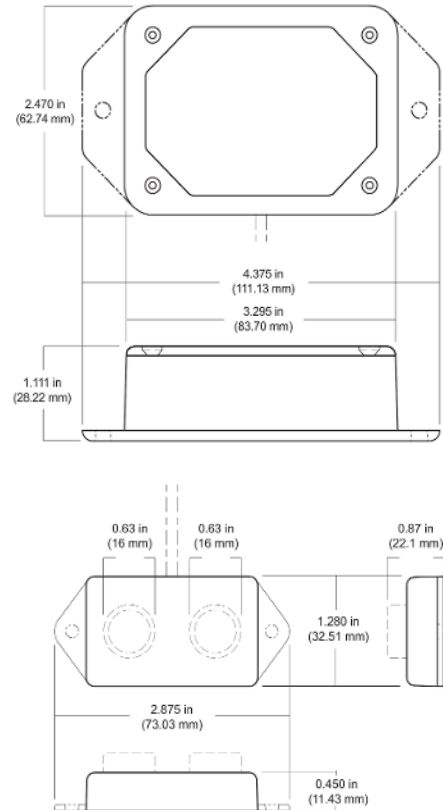
Wireless Range Comparison

Monnit ALTA XL	2000'+
Monnit ALTA	1200'
Other Wireless Platforms	Up to 300'
(WiFi)	100'
(Bluetooth)	Up to 90'

Through 18+ Walls!

RANGE IN FEET (NON-LINE-OF-SIGHT)

Technical Specification | ALTA® Wireless Ultrasonic Sensors		
Commercial	Sensor resolution	1 cm
	Minimum Measurement Distance	10 cm
	Maximum Measurement Distance	400 cm
	Sensor Accuracy	5% FS (can be calibrated for further accuracy)
Industrial	Sensor resolution	1 cm
	Minimum Measurement Distance	20 cm
	Maximum Measurement Distance	750 cm
	Sensor Accuracy	+/- 1% full scale
	Detachable Connector	M12, 5-pin, circular, waterproof
	Mounting Installation Hole	1 5/8" or 42 mm +/- 2 mm
	Mounting Panel Thickness	3/4" or 20 mm or less
	Mounting Hardware Overall Size	2 1/4" or 57 mm
ALTA Wireless	Data logging	Sensor logs 2000 to 4000 readings if gateway connection is lost (non-volatile flash, persists through power cycling): 10-minute Heartbeats = ~22 days - 2-hour Heartbeats = ~266 days
	Wireless protocol	ALTA Proprietary Frequency-Hopping Spread Spectrum (FHSS)
	Wireless transmission power (EIRP)	50 mW (900MHz), 25 mW (868 MHz), 10 mW (433 MHz)
	Wireless range	2,000+ ft. through 18+ walls with the ALTA XL® Gateway
	Security	Encrypt-RF® (256-bit key exchange and AES-128 CTR)
General	Battery voltage range	2.0 to 3.8 VDC
	Operating altitude (non-pressurized environments)	-15.2 to 1,982 m (-50 to 6,500 ft)[1]
	Storage altitude (non-pressurized environments)	-15.2 to 3,048 m (-50 to 10,000 ft)[1]
	Operating humidity	5 to 85% RH (non-condensing)
	Certifications	900 MHz sensors: **FCC ID: ZTL-G2SC1** and **IC: 9794A-G2SC1**. 868 and 433 MHz sensors tested and comply with: **EN 55032**: 2015/A11:2020; **EN 55035**:2017/A11:2020; **ETSI EN 300 220** V3.2.1 (2018-06); **ETSI EN 301 489-3** V2.2.0. (2021-11); and **ETSI EN 303 645**. All sensors tested and comply with: **EN 61010-1** and **EN 60950** and meet **RoHS 2015/863** and **REACH 224** (June 2022), according to **IEC 63000**:2016/AMD1:2022.

1. Operating and storage altitude without DC power supply is -30.48 to 9144 m (-100 to 30000 ft).
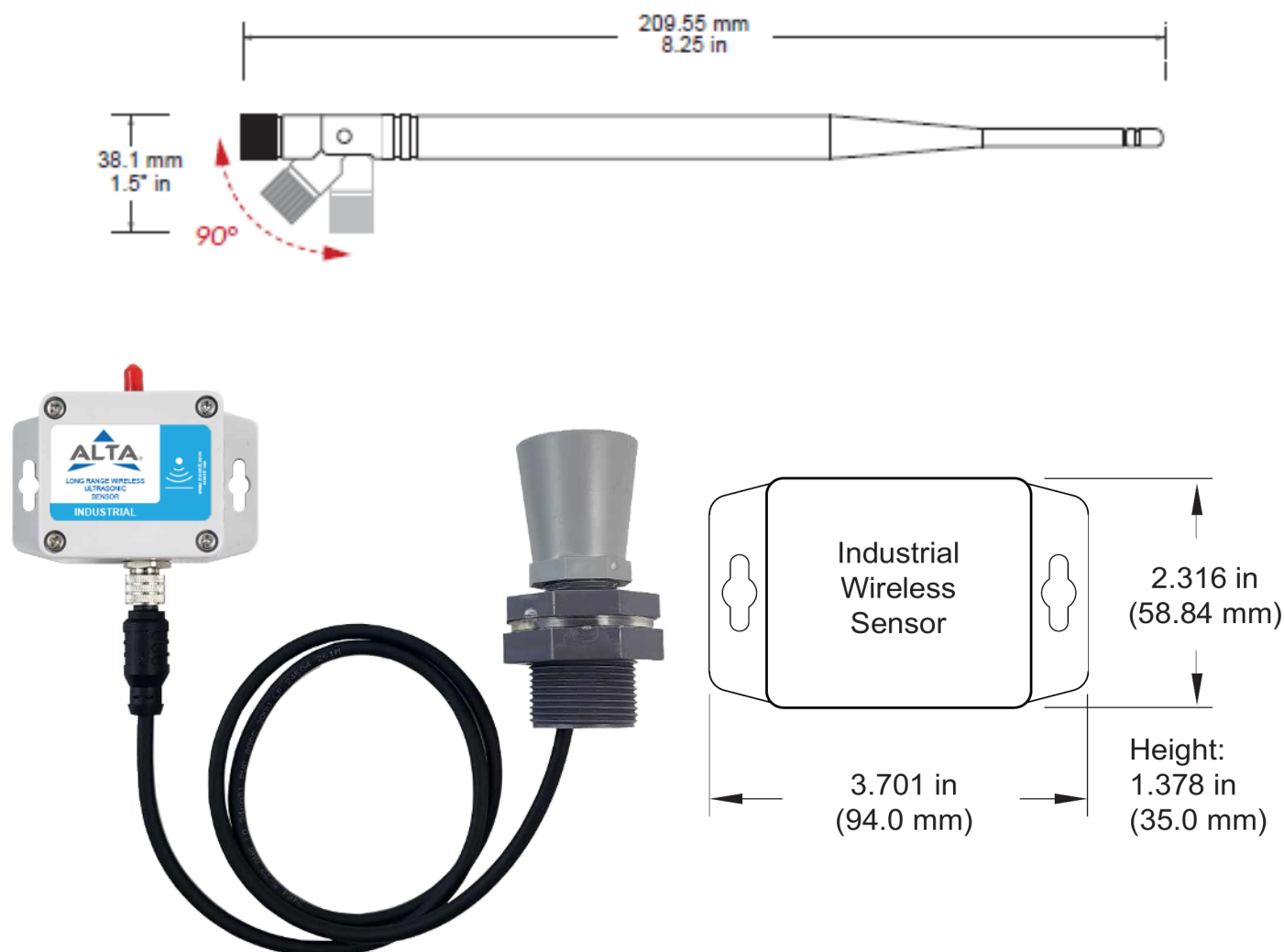
The sensor reports the distance between the sensor and the object in its path.

Technical Specifications | ALTA® Enterprise Wireless Ultrasonic Sensor	
Battery[1]	2x 1.5V AA Alkaline, 1500 mAh, (standard) 2x 1.5V AA Lithium, 3000 mAh, (optional)
Battery Life	4+ years expected
External line-power option[2]	Input voltage: 5.0-12.0 V, greater than 0.1A, less than 100mVp-p noise Power jack: 2.1 x 5.5 mm barrel, center positive
Operating temperature range with given power sources [3]	-18°C to 55°C (0°F to 130°F) - AA Alkaline Batteries -25°C to 60°C (-13°F to 140°F) - AA Lithium L91 Batteries 0°C to 40°C (32°F to 104°F) - US 5V Power Supply 10°C to 40°C (50°F to 104°F) - International 5V Power Supply
Lead Length	3 feet (30.48 cm)
Minimum Measurement Distance	10 cm
Maximum Measurement Distance	400 cm
Sensor Accuracy	5% FS (can be calibrated for further accuracy)
Wireless antenna type	1/4-wave, 20 gauge wire whip, 3.5" (900/868MHz), 7" (433MHz)
Weight	3.7 ounces (105 g)

1. Hardware can't withstand negative voltage. Please take care when inserting and removing batteries.
2. Batteries will provide backup power when the external power is removed.
3. Operating below 0°C (32°F) degrees will reduce battery life.

209.55 mm
8.25 in

38.1 mm
1.5" in

90°

Industrial
Wireless
Sensor

2.316 in
(58.84 mm)

3.701 in
(94.0 mm)

Height:
1.378 in
(35.0 mm)

Technical Specifications | ALTA® Industrial Wireless Ultrasonic Sensors	
Battery	1x 3.6V AA Lithium Thionyl Chloride, 1500mAh, pre-installed
Battery Life	4+ years expected
Operating temperature range[1]	-25°C to 80°C (-13°F to 176°F)
Minimum Measurement Distance	20 cm
Maximum Measurement Distance	750 cm
Sensor Accuracy	+/- 1% full scale
Lead Length	3 feet (30.48 cm)
Wireless antenna type	1/2-wave waterproof dipole with RP-SMA connector and swivel neck; dBi of 3.0 (900/868MHz) or 2.5 (433 MHz); length of 8.27" (210mm) (900/868MHz) or 7.68" (195mm) (433 MHz); diameter at thickest point of 0.55" (14mm)
Weight	4.7 ounces (133g)
Enclosure rating	NEMA 1, 2, 4, 4x, 12, and 13 rated, sealed, and weatherproof
UL rating	UL Listed to UL508-4x specifications (File E194432)

1. Operating below 0°C (32°F) degrees will reduce battery life.

Commercial-Grade Sensors

Monnit commercial-grade sensors are designed for applications in ordinary environments (normal room temperature, humidity, and atmospheric pressure). Do not use these sensors under the following conditions, as these factors can deteriorate the product characteristics and cause failures and burnout.

- Corrosive gas or deoxidizing gas: chlorine gas, hydrogen sulfide gas, ammonia gas, sulfuric acid gas, nitric oxide gas, etc.
- Volatile or flammable gas
- Dusty conditions
- Low-pressure or high-pressure environments
- Wet or excessively humid locations
- Places with salt water, oils, chemical liquids, or organic solvents
- Where there are excessively strong vibrations
- Other places where similar hazardous conditions exist

Use these products within the specified temperature range. Higher temperatures may cause deterioration of the characteristics or the material quality.

Industrial-Grade Sensors | Type 1, 2, 4, 4X, 12, and 13 NEMA-Rated Enclosure

Monnit's industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for indoor and outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust and the damaging effects of water.

- Safe from falling dirt
- Protects against wind-blown dust
- Protects against rain, sleet, snow, splashing water, and hose-directed water
- Increased level of corrosion resistance
- Will remain undamaged by ice formation on the enclosure