

## Wireless Pulse Counter - Single Input

### General Description

The wireless pulse counter can be connected to the pulse output of a system (water meter, power meter, etc.) to count the number of actuations within a given time frame.

- Counts the number of pulses in given time frame, or aggregates pulses in an ongoing accumulation.
- 3 filter settings: No filter, 4 Hz filter, and 40 Hz filter.
- Capable of counting passive (open/closed switch) and active (Up to +15 VDC) pulses.
- Capable of counting the positive edge, negative edge, or both edges of a pulse.

### Principle of Operation

The wireless pulse counter is an electronic counter capable of counting passive(open/closed switch) or active (Up to +15 VDC) pulses. The counter includes 3 software configurable low pass filter settings (No filter, 40 Hz filter, or 4 Hz filter). The pulse counter filters pulses with pulse widths greater than those designated in the technical specifications. For example, if the 4Hz filter is set, the pulse counter will count a pulse if the pulse width is longer than 250 ms, if the pulse width is shorter than 250 ms it will be completely or partially filtered (See the Technical Specification table for detailed filtering information). The sensor can be set to send an alert through the ICARE Online Sensor Monitoring and Notification System when a given number of pulses have been reached within a set time frame. Alerts from the ICARE system are sent as they happen (in real time) via SMS text or email.

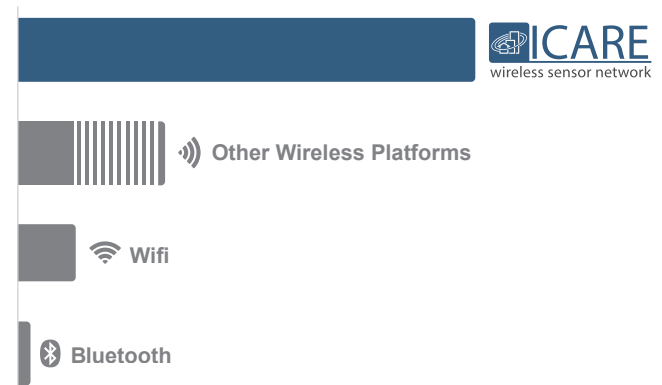
### Example Applications

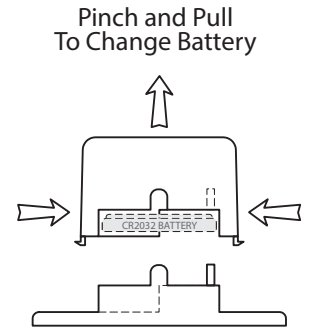
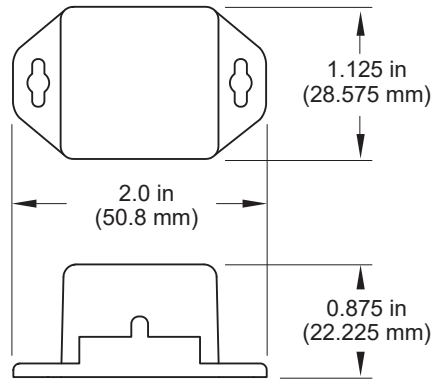
- Water, gas and air flow meters
- Door access counter
- Turn style counting
- Forklift seat switches
- Button or switch integration
- Production line tracking
- Many additional applications

### Features of ICARE Sensors



- Wireless range of 1,200+ feet through 12+ walls \*
  - Frequency-Hopping Spread Spectrum (FHSS)
  - Improved interference immunity
  - Improved power management for longer battery life \*\* (12+ years on AA batteries)
  - Security (Diffie-Hellman Key Exchange + AES-128 CBC for sensor data messages)
  - Onboard data memory stores up to 3200 readings per sensor:
    - 10-minute heartbeats = 22 days
    - 2-hour heartbeats = 266 days
  - Over-the-air updates (future proof)
  - Online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email
- \* Actual range may vary depending on environment.  
\*\* Battery life is determined by sensor reporting frequency and other variables. Other power options are also available.

### Wireless Range Comparison





## Commercial Coin Cell Wireless Pulse Counter | Technical Specifications

Supply voltage	2.0–3.6 VDC *		
Current consumption	0.2 $\mu$ A (sleep mode), 0.7 $\mu$ A (RTC sleep), 570 $\mu$ A (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)		
Operating temperature range (board circuitry and coin cell)	-7°C to +60°C (20°F to +140°F) **		
Optimal battery temperature range (coin cell)	+10°C to +50°C (+50°F to +122°F)		
Maximum count	4294967296 (32 bit number)		
Input voltage	0 to 15 Volts DC		
Detection wires	High impedance (2-wire), 3 ft length		
Counter operation	Positive and/or negative edge pulses		
Compatibility	Open collector NPN switches (passive) Mechanical switches (passive) 0–15V driven source (active) ***		
Max input pulse rate/min pulse width with passive input ****		Max Pulse Rate	Min Pulse Width*****
	No Filter	~ 2 KHz	~ 0.5 ms
	4 Hz Filter	~ 4 Hz	~ 250 ms
	40 Hz Filter	~ 40 Hz	~ 25 ms
Integrated memory	Up to 3200 sensor messages		
Wireless range	1,200+ ft non-line-of-sight		
Security	256-bit key exchange and AES-128 CTR		
Weight	0.7 ounces		
Certifications	  900 MHz wireless product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1.		

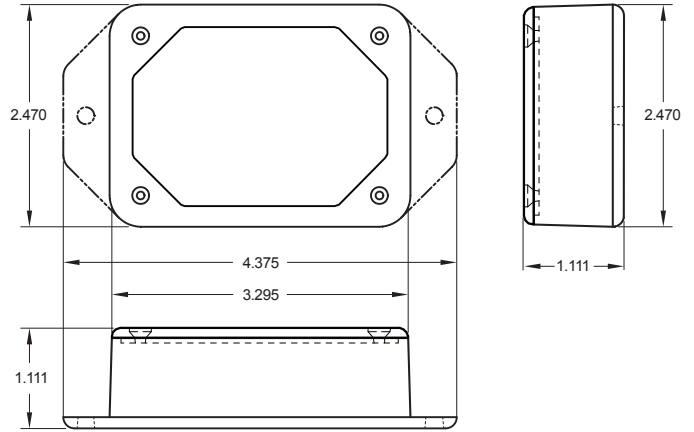
\* Hardware cannot withstand negative voltage. Take care when connecting a power device.

\*\* At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.



\*\*\* Low Pulse: 0 Volts to 0.2 \* VBatt, High Pulse: 0.8 \* VBatt to 15 Volts.

\*\*\*\* High pulse count rates can impact battery life. AA battery powered sensors are recommended if counting pulses faster than 1x per second.

\*\*\*\*\* Input pulse rate must be less than specified Max Pulse Rate and input pulse width must be greater than specified Min Pulse Width to ensure the input pulse is counted.



## Commercial AA Wireless Pulse Counter | Technical Specifications

Supply voltage	2.0–3.6 VDC (3.0–3.6 VDC using power supply) *		
Current consumption	0.2 $\mu$ A (sleep mode), 0.7 $\mu$ A (RTC sleep), 570 $\mu$ A (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)		
Operating temperature range (board circuitry and batteries)	-18°C to 55°C (0°F to 130°F) using alkaline -40°C to 85°C (-40°F to 185°F) using lithium **		
Optimal battery temperature range (AA)	+10°C to +50°C (+50°F to +122°F)		
Maximum count	4294967296 (32 bit number)		
Input voltage	0 to 15 Volts DC		
Detection wires	High impedance (2-wire), 3 ft length		
Counter operation	Positive and/or negative edge pulses		
Compatibility	Open collector NPN switches (passive) Mechanical switches (passive) 0–15V driven source (active) ***		
Max input pulse rate/min pulse width with passive input ****		Max Pulse Rate	Min Pulse Width*****
	No Filter	~ 2 KHz	~ 0.5 ms
	4 Hz Filter	~ 4 Hz	~ 250 ms
	40 Hz Filter	~ 40 Hz	~ 25 ms
Integrated memory	Up to 3200 sensor messages		
Wireless range	1,200+ ft non-line-of-sight		
Security	256-bit key exchange and AES-128 CTR		
Weight	0.7 ounces		
Certifications	  Industry Canada	900 MHz wireless product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1.	

\* Hardware cannot withstand negative voltage. Take care when connecting a power device.

\*\* At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

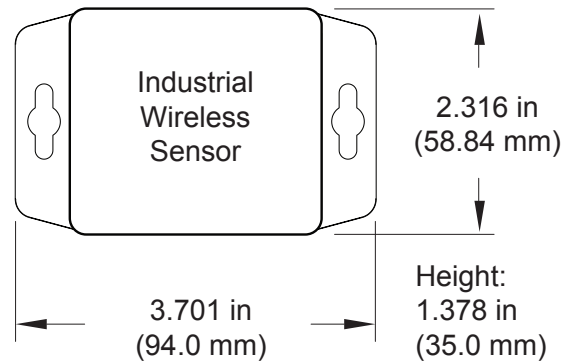
\*\*\* Low Pulse: 0 Volts to 0.2 \* VBatt, High Pulse: 0.8 \* VBatt to 15 Volts.

\*\*\*\* High pulse count rates can impact battery life. AA battery powered sensors are recommended if counting pulses faster than 1x per second.

\*\*\*\*\* Input pulse rate must be less than specified Max Pulse Rate and input pulse width must be greater than specified Min Pulse Width to ensure the input pulse is counted.

## Power Options

The standard version of this sensor is powered by two replaceable 1.5 V AA sized batteries (included with purchase). This sensor is also available with a line power option. The line powered version of this sensor has a barrel power connector allowing it to be powered by a standard 3.0–3.6 V power supply. The line powered version also uses two standard 1.5 V AA batteries as backup for uninterrupted operation in the event of line power outage. Power options must be selected at time of purchase, as the internal hardware of the sensor must be changed to support the selected power requirements.



## Industrial Wireless Pulse Counter | Technical Specifications

Supply voltage		2.0–3.6 VDC (3.0–3.6 VDC using power supply) *		
Current consumption		0.2 $\mu$ A (sleep mode), 0.7 $\mu$ A (RTC sleep), 570 $\mu$ A (MCU idle), 2.5 mA (MCU active), 5.5 mA (radio RX mode), 22.6 mA (radio TX mode)		
Operating temperature range (board circuitry and battery)		-40°C to +85°C (-40°F to +185°F) **		
Included battery	Max temperature range	-40° to +85°C (-40° to +185°F)		
	Capacity	1500 mAh		
Optional solar feature	Solar panel	5VDC/30mA (53mm x 30mm)		
	Charging temperature range	0° to 45°C (32° to 113°F)		
	Max temperature range	-20° to 60°C (-4° to 140°F)		
	Included rechargeable battery	600 mAh/>2000 charge cycles (80% of initial capacity)		
	Solar efficiency	Optimized for high and low-light operation ***		
	Charging efficiency	5% ***		
	Luminous sustainability	Minimum of 10,000 LUX ***		
Maximum count		4294967296 (32 bit number)		
Input voltage		0 to 15 Volts DC		
Detection wires		High impedance (2-wire), 3 ft length		
Counter operation		Positive and/or negative edge pulses		
Compatibility		Open collector NPN switches (passive), mechanical switches (passive), 0–15V driven source (active) ****		
Max input pulse rate/min pulse width with passive input *****			Max Pulse Rate	Min Pulse Width*****
		No Filter	~ 2 KHz	~ 0.5 ms
		4 Hz Filter	~ 4 Hz	~ 250 ms
		40 Hz Filter	~ 40 Hz	~ 25 ms
Integrated memory		Up to 3200 sensor messages		
Wireless range		1,200+ ft non-line-of-sight		
Security		256-bit key exchange and AES-128 CTR		
Weight		4.7 ounces		
Enclosure rating		NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof		
UL rating		UL Listed to UL508-4x specifications (File E194432)		
Certifications			900 MHz wireless product; FCC ID: ZTL-G2SC1 and IC: 9794A-G2SC1.	

\* Hardware cannot withstand negative voltage. Take care when connecting a power device.

\*\* At temperatures above 100°C, it is possible for the board circuitry to lose programmed memory.

\*\*\* Solar circuitry works indoors with low light. Light present 25% of day yields 125% of operating power to support 10-minute heartbeats.

\*\*\*\* Low Pulse: 0 Volts to 0.2 \* VBatt, High Pulse: 0.8 \* VBatt to 15 Volts.

\*\*\*\*\* High pulse count rates can impact battery life. AA battery powered sensors are recommended if counting pulses faster than 1x per second.

\*\*\*\*\* Input pulse rate must be less than specified Max Pulse Rate and input pulse width must be greater than specified Min Pulse Width to ensure the input pulse is counted.

## Commercial Grade Sensors

ICARE 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 oxides 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 temperature may cause deterioration of the characteristics or the material quality.

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

ICARE's Industrial sensors are enclosed in reliable, weatherproof NEMA-rated enclosures. Our NEMA-rated enclosures are constructed for both indoor or outdoor use and protect the sensor circuitry against the ingress of solid foreign objects like dust as well as the damaging effects of water (rain, sleet, snow, splashing water, and hose-directed 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



For more information about our products or to place an order, please contact our sales department at 586-899-1150.

Visit us on the web at [www.icaremonitoring.com](http://www.icaremonitoring.com).

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