

# KWJ-WSN CO Industrial

## Wireless Carbon Monoxide Sensor



### Technical Overview

#### General Description

KWJ's WSN CO detects ambient Carbon Monoxide levels from 0 - 1,000 ppm in ambient air and transmits the data wirelessly to the KWJ-WSN Dashboard. KWJ-WSN CO delivers low level health monitoring not provided by other off the shelf CO detectors.

#### Features

- Measures CO up to 1,000 ppm.
- High Accuracy ( $\pm 5\%$ )
- Advanced Printed Electrochemical Sensor Technology
- Long Life/Low Power Battery Operation
- Free KWJ-WSN basic online wireless sensor monitoring and notification system to configure sensors, view data and set alerts via SMS text and email.

#### Principle of Operation

##### *Electrochemical CO, Ambient Diffusion*

15 minutes after the battery is installed, the sensor will accurately measure the ambient CO level and send data to the KWJ-WSN Online Sensor Monitoring and Notification System. The data is stored in the online system and can be reviewed and exported. Notifications can be set up through the online system to alert the user when thresholds have been met or exceeded.

The KWJ-WSN CO is pre-configured with the following alert thresholds to provide essential data on low levels of CO and to protect you from immediately dangerous conditions:

- CO exceeding 50 ppm
- CO exceeding 125 ppm
- CO exceeding 400 ppm
- TWA (time weighted average) CO > 50 ppm

There are also several pre-configured thresholds that are user changeable to allow further customization of your alerts so you can receive notification about lower levels of CO.

#### Solar Power Option

KWJ-WSN Industrial Sensors are powered by a replaceable 3.6 V battery (included).

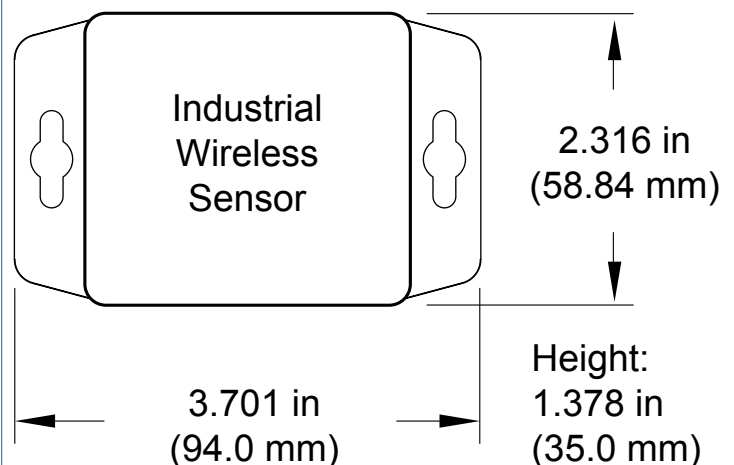
An optional solar powered version is also available. The solar powered sensor uses a Lithium Iron Phosphate rechargeable battery in conjunction with a solar power cell, extending the life of the battery.

#### KWJ-WSN Industrial Sensors Electronics Specifications

- Power: replaceable 3.6V battery (included)
- Communication: RF 900, 868 and 433 MHz
- Dimensions: 3.7" x 2.23" x 1.38"
- Antenna: 3dBi RP SMA antenna
- Operating Temperature:  $-40^{\circ}$  to  $85^{\circ}\text{C}$  ( $-40^{\circ}$  to  $185^{\circ}\text{F}$ )
- Transmission Range: 300 - 350 ft. non-line-of-sight\*
- Battery Life: at 1 hour heartbeat setting, battery will last ~ 4-5 years.\*\*


\* Actual range may vary depending on environment.

\*\* Battery life is determined by sensor reporting frequency and other variables.



#### Applications

- Apartment/condominium/high-rise buildings
- Hospitals
- Malls/Retail centers
- Schools/Day Care facilities
- Business parks

Technical Specifications	
Supply Voltage	2.0 - 3.6 VDC *
Current Consumption	0.7 $\mu$ A (sleep mode) 2 mA (radio idle/off mode) 2 mA (measurement mode) 25 mA (radio RX mode) 35 mA (radio TX mode)
Operating Temperature Range (Board Circuitry and Battery)	-40°C to +85°C ( -40°F to +185°F ) **
Optimal Battery Temperature Range	+10°C to +60°C ( +50°F to +140°F )
Optimal CO Sensor Temperature Range	-10°C to +40°C
Optimal CO Sensor Humidity Range	5% to 95% RH
Operating Range	0 - 1,000 ppm ***
Accuracy	$\pm$ 5% ****
Enclosure Rating	NEMA 1, 2, 4, 4x, 12 and 13 rated, sealed and weather proof
Certifications	 900 MHz product; FCC ID: ZTL- RFSC1 and IC: 9794A-RFSC1. 868 and 433 MHz product tested and found to comply with: CISPR 22:2008-09 / EN 55022:2010 - Class B and ETSI EN 300 220-2 V2.4.1 (2012-05).

\* Hardware can not withstand negative voltage. Please take care when connecting a power device.

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

\*\*\* If application exceeds 1000 ppm the sensor will return a maximum reading of 1000 ppm.

\*\*\*\* At ambient conditions (25 °C, 50% RH)

## Caution/Notice:

The KWJ-WSN CO will deliver essential information about low level and immediately dangerous levels of CO via the KWJ-WSN Dashboard, text message and email alerts. **PLEASE NOTE THE KWJ-WSN CO DOES NOT INCLUDE AN AUDIBLE ALARM. WE RECOMMEND YOU INSTALL A KWJ AUDIBLE ALARM (SOLD SEPARATELY) OR A SUPPLEMENTAL UL RECOGNIZED CO ALARM TO AUDIBLY ALERT YOU TO DANGEROUS CONCENTRATIONS OF CO.** This product is designed for application in both ordinary environments (normal room temperature, humidity and atmospheric pressure), and harsh environments such as those with excessive dust, water, and chemical exposure.

## Type 1, 2, 4, 4X, 12 and 13 NEMA Rated Enclosure:

KWJ Engineering'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).

Use this product within the specified temperature range. Higher temperature may cause deterioration of the characteristics or the material quality of this product.

For more information about our products or to place an order, please contact our sales department at 1-800-472-6626.

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



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### Additional Notes of Operation

#### Setup Considerations

It is recommended that the user install no more than 15 sensor modules per gateway due to wireless bandwidth limitations if all sensors alarm in response to 400 ppm simultaneously.

#### Default Notification Settings

- OSHA (Industrial) setting includes thresholds for 50, 125, and 400 ppm as well as 50 ppm 8-hour TWA.
- Health Level setting includes the OSHA thresholds as well as TWA thresholds of 9, 13, 16, 25, and 35 ppm.
- NOTE: Be aware that some user-defined thresholds may conflict with the default settings. In the case of a conflict, the default notification will be applied.

#### Default Notification Levels

##### OSHA & Safety Notification Setting

Title	Notify When (all day)	Transmit Interval	Fixed or User Changeable
CO Exceeds 50 ppm	CO > 50 ppm	10 min	Fixed
CO Exceeds 125 ppm	CO > 125 ppm	1 min	Fixed
CO Exceeds 400 ppm	CO > 400 ppm	15 sec	Fixed
TWA CO Exceeds 50 ppm	TWA CO > 50 ppm	10 min	Fixed

##### Health-Level Notification Settings (Low-Level Warnings)

Title	Notify When (all day)	Transmit Interval	Fixed or User Changeable
CO Exceeds 25 ppm	CO > 25 ppm	10 min	Changeable
TWA CO Exceeds 9 ppm	TWA CO > 9 ppm	10 min	Changeable
TWA CO Exceeds 13 ppm	TWA CO > 13 ppm	10 min	Changeable
TWA CO Exceeds 16 ppm	TWA CO > 16 ppm	10 min	Changeable
TWA CO Exceeds 25 ppm	TWA CO > 25 ppm	10 min	Changeable
TWA CO Exceeds 35 ppm	TWA CO > 35 ppm	10 min	Changeable

#### Sensor Mounting and Installation Tips

- It is recommended to install sensors in a conspicuous location to facilitate airflow around the sensor.
- Installing sensors near an opening where CO may be regularly present (garage door, etc.) may cause readings to periodically spike, and may affect TWA calculations.
- **It is recommended for maximum immediate CO protection, that the user install a UL approved commercially available carbon monoxide detector with an audible alarm, or a KWJ Alarm Module, to work alongside the KWJ-WSN CO modules.**

#### CO Safety

While your KWJ-WSN CO sensor is an excellent measure of protection from CO exposure, it is also recommended that you keep the following in mind if you are ever away from your dashboard or the device receiving notifications:

The initial symptoms of CO poisoning are similar to the flu (but without the fever). They include:

- \* Headache
- \* Fatigue
- \* Shortness of breath
- \* Nausea
- \* Dizziness

***If you suspect that you are experiencing CO poisoning, leave the area and get fresh air immediately. You could lose consciousness and die if you stay in the affected area. Get medical attention immediately and inform medical staff that CO poisoning is suspected. Call the Fire Department to determine when it is safe to reenter the area.***

#### LIMITED WARRANTY

KWJ Engineering warrants to the original purchaser that this product shall be free from any defect in the materials or workmanship for 1 year from the date of purchase (excluding the battery). This warranty does not cover wear and tear due to normal use. It does not apply to any product that has been subjected to misuse, abuse, neglect, accident, tampering or unauthorized repairs, failure to follow the instructions in the manual, or use under conditions outside those recommended in the data sheet. KWJ Engineering may elect to replace the unit, at no extra cost, with the same or a similar unit rather than repair it. In the event of replacement with a new or reconditioned instrument, the replacement unit will continue the warranty of the original unit. If the product should become defective during the warranty period, please return it through your distributor, or call KWJ Engineering at (800) 472-6626 or e-mail at sales@kwjengineering.com to receive return instructions and a Return Materials Authorization (RMA) number.

Except as provided herein, KWJ Engineering makes no warranties, express or implied, including warranties of merchantability and fitness for a particular purpose. KWJ Engineering shall not be liable for loss of use of this instrument or other incidental or consequential damages, expenses or economic loss, or claims for such damage or economic loss.