# VSN240-MP MicroRadar™ Sensor for Parking


Extensive testing has shown that wireless magnetometer and infrared sensors are not the best solutions for static parking applications, as neither provides consistent parking data in all conditions. The magnetic nulls and electromagnetic interference can cause limitations for wireless sensors, and infrared sensors are susceptible to dirt or oil.

After years of research and development, and with multiple patents pending, Sensys Networks announces the ultimate solution for a wireless parking sensor: MicroRadar™.

| | MicroRadar™ | Magnetometer | InfraRed |
|---|---|---|---|
| Immunity from vehicles adjacent to empty space | ✓ | ⊘ | ✓ |
| Robust RF performance | ✓ | ⊘ | ⊘ |
| Ignores nearby double parked vehicles | ✓ | ⊘ | ✓ |
| Accommodates dirt, dust, or oil on sensor | ✓ | ✓ | ⊘ |
| Not vulnerable to electromagnetic interference | ✓ | ⊘ | ✓ |
| Consistent performance in all lighting conditions | ✓ | ✓ | ⊘ |
| Maintains state reliably during long-duration session | ✓ | ⊘ | ✓ |
| Unaffected by slow-moving queues of nearby vehicles | ✓ | ⊘ | ✓ |

Sensys Networks MicroRadar™ incorporates an extremely low power, wide-band radar with a Sensys Networks Nano-Power Protocol radio. This compact in-ground sensor works on the same principle as any other radar. High frequency RF pulses are transmitted, bounced off a target object, and measured by a time-gated return RF mixer. RF reflections are analyzed to produce presence, distance, and motion measurements.

MicroRadar can precisely detect the onset of parking events and the clearance of cars from spaces. The radar is tuned for offset, minimum range, and maximum range based on installation configuration.

## Features and Functions

### Simple installation, long life

- Sensors install flush to pavement in about 10 minutes
- Eight year battery life

### On-street, off-street, truck parking and top-deck applications

- Actively measures presence of vehicles
- Parameters for range and off-set optimize any configuration
- Differentiates between large and small, stationary and moving
- Retains state no matter how long the parking event
- Precisely measures start of parking and end of parking
- Differentiates between transient detections and parking events

### Data for parking guidance and guided enforcement

- XML interfaces to parking guidance web sites and smart phone applications
  - Parkopedia, ParkMe
- SNAPS and Parking Session servers manage thousands of deployed sensors, archive data, and monitor system health
- Optional guided enforcement application
  - Supports Windows Mobile hand-held and Android tablets

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# VSN240-MP MicroRadar™ Sensor for Parking

## Functional Specifications

### Radio Specifications

| | |
|---|---|
| **over-the-air-protocol** | Sensys Networks NanoPower (SNP) protocol (TDMA) |
| **physical layer protocol** | EEE 802.15.4 PHY |
| **modulation** | Direct Sequence Spread Spectrum Offset Quadrature Phase-Shift Keying (DSSS O-QPSK) |
| **transmit/receive bit rate** | 250 kbps |
| **frequency band** | 2400 to 2483.5 MHz (ISM unlicensed band) |
| **frequency channels** | 16 |
| **channel bandwidth** | 2 MHz |
| **antenna type** | ceramic patch antenna (mounted below top surface of sensor) |
| **antenna field of view** | ±60° (azimuth & elevation) |
| **nominal output power** | +3 dBm |
| **spurious emissions** | • 30 - 1000 MHz: < -56 dBm<br>• 1 - 12.75 GHz: < -44 dBm<br>• 1.8 - 1.9 GHz: < -56 dBm<br>• 5.15 - 5.3 GHz: < -51 dBm |
| **typical receive sensitivity** | -101 dBm |

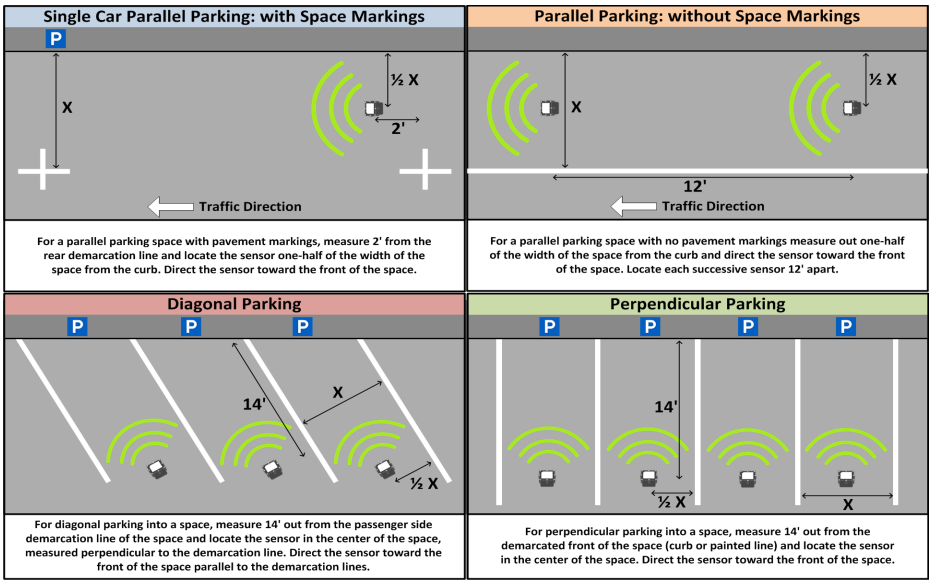
### Radar Specifications

| | |
|---|---|
| **frequency** | 6.3 GHz |
| **bandwidth** | >500 MHz |
| **radiated power** | within FCC class B limits |
| **maximum range** | 4' (1.2 m) to 10' (3 m) (selectable) |
| **calibration** | self calibrating |
| **sample rate** | 1/2, 1, 2, 4, and 8Hz (selectable) |

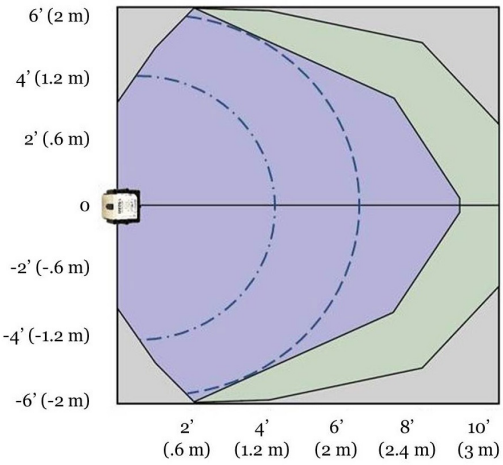
### Power, Physical, & Environment

| | |
|---|---|
| **power supply** | • non-replaceable primary Li-SOCI23.6V battery pack<br>• 7.2 Ah (nominal capacity) |
| **dimensions** | 2.9" x 2.9" x 2.3" (7.4 cm x 7.4 cm x 5.8 cm) |
| **weight** | 0.6 pounds / 0.3 kg |
| **environment** | • designed for mounting in-pavement or above ground/on a pole<br>• performance diminishes in standing water and in slushy conditions<br>• NEMA Type 6P enclosure<br>• IP67 ingress protection |
| **operating temp** | -40°F to 176° / -40°C to +85°C |

## Sensor Location Specification




## In-Road Detection Zone




*The purple and green areas depict sensor detection zones. The arcs represent range settings.*

## Compliance

| | |
|---|---|
| **safety** | 2006/95/EC |
| **EMC** | • FCC: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.<br>• 2004/108/EC |

**Local Distributor**