

Description of Product as Marketed

VSN240-s WIRELESS SENSOR

VDS240 Wireless Vehicle Detection System

In-Pavement Wireless Vehicle Sensor

Measures Deviation of Earth's Magnetic Field

Traffic Count, Speed, Vehicle Presence & Type Freeways, Intersections,
Parking Lots & Gates

Rapid Deployment & Updates "Over the Air"

The Sensys Networks VSN240-s is an in-pavement wireless vehicle sensor designed for both permanent and temporary deployment in all traffic conditions, from freeways to intersections to parking lots to gates. The VSN240-S detects vehicular traffic and reports it back to an AP240 access point. The VSN240-s measures the X, Y and Z components of the Earth's magnetic field and analyzes these components to determine the presence or absence of a vehicle at its location.

In a typical freeway count station application, one VSN240-s is deployed in each lane of traffic.

Where individual vehicle speeds are desired, two VSN240-s devices can be deployed in each lane at a known distance from each other, typically 2m, in a manner similar to current inductive loop deployment.

The VSN240-s can be glued, using a custom two-part adhesive, to the surface of the pavement similar to a raised pavement marker, or in regions where snow plow activity prohibits surface deployment, in a depression in the pavement or even buried under the pavement (see VSN240-f).

Data Collection and Reporting

The VSN240-s measures the Earth's magnetic field using a magneto resistive sensor, sampled at 128Hz.

The VSN240-s automatically computes the "baseline" magnetic field (called "off"), and reports deviation of this field from this baseline at the presence of a vehicle (called "on").

The VSN240-s synchronizes its sample clock with the AP240, and therefore the data collected from one VSN240-s can be compared against another VSN240 to determine the length and the speed of a vehicle.

There are three modes of operation: Event Mode, Data Mode, and Sleep Mode. The mode of operation and the parameters of operation can be selected from

the AP240.

In event mode, a sequence of off-on and on-off events is transmitted to the AP240 in a packet. The latency, number of events, minimum reporting interval, maximum reporting interval, synchronization of reporting, and other parameters are selectable via the AP240.

In data mode, the actual output samples of the magnetic sensor are reported to the AP240. Reporting is performed in packets representing 125ms of data (16 samples) for the X, Y, and Z axes of the Earth's magnetic field.

In sleep mode, no data is reported to the AP240, saving power in the VSN240-s.

Wireless Interface

The VSN240-s implements the Sensys Nanopower Protocol, a TDMA protocol that allows for both high performance and long battery lifetime. Each VSN240-s is individually addressable, and transmits its data in a time-slot assigned by the AP240. Messages can be sent by the AP240 to set parameters on the VSN240-s, and to send commands to the VSN240-s such as changing its mode of operation.

Up to 32 VSN240-s can operate on a single radio channel reporting with a minimum reporting interval of 125ms. More VSN240-s can be deployed by either using an additional AP240 on a different channel, or by increasing the minimum reporting interval.

Another major feature of the VSN240-s is that its firmware can be updated “over the air” to ensure that the installed base of detectors can benefit from feature enhancements and software bug fixes.

Recommended distances between an AP240 access point and the VSN240-s are as follows:

AP240 Recommended Maximum AP240 to VSN240-f

12ft (4m) 75ft (25m)
18ft (6m) 105ft (35m)
24ft (8m) 150ft (50m)

VNS240-s Dimensions:

Length: 13.6 cm | 5.35 inches
Width: 9.2 cm | 3.6 inches
Height: 2.2 cm | 0.9 inches

RF Specification

IEEE 802.15.4 Standard Compliant Radio
2.4GHZ ISM Band

Programmable Event Reporting Parameters

Transmit Interval in seconds: 0.125, 0.25, 1, 2, 3, 5, 6

Reporting Latency in seconds: 0.125, 0.25, 0.5, 1, 2, 5, 10, 30

Durability

Expected in-pavement lifetime of 5 to 7 years, depending on traffic volume.

Environmental

NEMA 6P / IP 68

Temperature: -40C to +80C

VSN240-f WIRELESS SENSOR

VDS240 Wireless Vehicle Detection System

In-Pavement Wireless Vehicle Sensor

Measures Deviation of Earth's Magnetic Field

Traffic Count, Speed, Vehicle Presence & Type Freeways, Intersections,
Parking Lots & Gates

Rapid Deployment & Updates "Over the Air"

The Sensys Networks VSN240-f is an in-pavement wireless vehicle sensor designed for permanent deployment in all traffic conditions, from freeways to intersections to parking lots to gates. The VSN240-f detects vehicular traffic and reports it back to an AP240 access point. The VSN240-f measures the X, Y and Z components of the Earth's magnetic field and analyzes these components to determine the presence or absence of a vehicle at its location.

In a typical freeway count station application, one VSN240-f is deployed in each lane of traffic.

Where individual vehicle speeds are desired, two VSN240-f devices can be deployed in each lane at a known distance from each other, typically 2m, in a manner similar to current inductive loop deployment.

The VSN240-f is installed flush with the pavement surface in a 2" deep cored hole. Installation can be completed in less than 15 minutes.

Data Collection and Reporting

The VSN240-f measures the Earth's magnetic field using a magneto resistive sensor, sampled at 128Hz.

The VSN240-f automatically computes the “baseline” magnetic field (called “off”), and reports deviation of this field from this baseline at the presence of a vehicle (called “on”).

The VSN240-f synchronizes its sample clock with the AP240, and therefore the data collected from one VSN240-f can be compared against another VSN240-f to determine the length and the speed of a vehicle.

There are three modes of operation: Event Mode, Data Mode, and Sleep Mode. The mode of operation and the parameters of operation can be selected from the AP240.

In event mode, a sequence of off-on and on-off events is transmitted to the AP240 in a packet. The latency, number of events, minimum reporting interval, maximum reporting interval, synchronization of reporting, and other parameters are selectable via the AP240.

In data mode, the actual output samples of the magnetic sensor are reported to the AP240. Reporting is performed in packets representing 125ms of data (16 samples) for the X, Y, and Z axes of the Earth’s magnetic field.

In sleep mode, no data is reported to the AP240, saving power in the VSN240-f.

Wireless Interface

The VSN240-f implements the Sensys Nanopower Protocol, a TDMA protocol that allows for both high performance and long battery lifetime. Each VSN240-f is individually addressable, and transmits its data in a time-slot assigned by the AP240. Messages can be sent by the AP240 to set parameters on the VSN240-f, and to send commands to the VSN240-f such as changing its mode of operation.

Up to 32 VSN240-f can operate on a single radio channel reporting with a minimum reporting interval of 125ms. More VSN240-f can be deployed by either using an additional AP240 on a different channel, or by increasing the minimum reporting interval.

Another major feature of the VSN240-f is that its firmware can be updated “over the air” to ensure that the installed base of detectors can benefit from feature enhancements and software bug fixes.

Recommended distances between an AP240 access point and the VSN240-f are as follows:

AP240 Recommended Maximum AP240 to VSN240-f

12ft (4m) 75ft (25m)

18ft (6m) 105ft (35m)

24ft (8m) 150ft (50m)

VNS240-f Dimensions:

Length: 7.4 cm | 2.9 inches

Width: 7.4 cm | 2.9 inches

Height: 4.9 cm | 1.9 inches

RF Specification

IEEE 802.15.4 Standard Compliant Radio

2.4GHZ ISM Band

Programmable Event Reporting Parameters

Transmit Interval in seconds: 0.125, 0.25, 1, 2, 3, 5, 6

Reporting Latency in seconds: 0.125, 0.25, 0.5, 1, 2, 5, 10, 30

Durability

Expected lifetime of 8 to 11 years, depending on traffic volume.

Environmental

NEMA 6P / IP 68

Temperature: -40C to +80C