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Connected Vehicle Roadside Unit (RSU)

Roadside unit

The Connected Vehicle Roadside Unit provides wireless communications from roadside infrastructure to vehicle On Board Units.

The Road Side Unit operates in 5.9 GHZ spectrum band (DSCRC and C-V2X) compatible with vehicle systems to provide very low latency required for high speed events, such as crash avoidance.

The Roadside Unit is packaged in a ruggedized weatherproof enclosure suitable for outdoor installation in all weather, including a standard power over Ethernet connection to the traffic signal controller requiring only a single CAT-5 or CAT-6 outdoor Ethernet cable for power and communications.

The Roadside Unit meets the U.S. Department of Transportation FHWA 4.1 specification including communications to vehicles, data security and Global Positioning System (GPS) reception for time of day and location.

In addition to USDOT requirements, the Roadside Unit includes a local Wi-Fi hot spot for remote maintenance or travel time applications and an optional LTE cellular backhaul for data upload / download.

The Roadside Unit also includes internal data storage for intersection map geometry without need to replace controllers.

As an option, the Roadside Unit can be ordered with software to manage a number of Roadside Units from a central location using area maps.

Key features

- Meets USDOT FHWA 4.1 Roadside Unit specifications

- Hi-speed, low-latency DSRC and C-V2X to vehicle On Board Units

- Browser-based service interface for easy configuration, diagnosis and remote software update

- High security level ensured by following Siemens security initiative process

- Compact, pole-mounting for limited space requirements

- Robust NEMA6P enclosure and connectors for harsh environments

- Power over Ethernet connection to signal controller or cabinet network switch (Siemens ruggedized power over Ethernet injector available separately)

- GPS receiver for location and time

- Local Wi-Fi hot spot for communications to nearby smart devices such as laptops, tablets and smart phones for pedestrian and cyclist safety applications (ready for travel time applications)

- LTE cellular radio for long distance backhaul to central system

- Optional software to manage multiple roadside units from a central system

- Includes all antennas and mounting hardware

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Technical details

- IEEE 802.11p 5.9 GHz Dual-Radio DSRC
- Receiver sensitivity of -97 dBm (802.11p)
- 3GPP Release 14 compliant LTE-V2X direct communications
- IEEE 1609.4, 1609.3 and IEEE 1609.2 security compliant
- Hardware Security Module for secure storage of V2x private keys and signature generation
- 2.4 GHz WiFi/Bluetooth hot spot to smart devices and for travel time applications
- GPS with 2.0 m CEP position accuracy and WAAS corrections support
- 2 x Ethernet with one Power over Ethernet for power supply
- LTE for cellular backhaul (plan not included)
- Browser-based WebGUI for remote diagnosis and configuration
- SAE J2735 2016 message set including MAP, SPAT, BSM, TIM, RTCM, SRM, SSM
- Meets USDOT FHWA Version 4.1 Roadside Unit specification
- OmniAir certified
- Sealed weatherproof enclosure and connectors
- Internal storage for MAP geometries
- Translates proposed USDOT V2I Hub signal controller message to SAE J2735 SPaT wireless message to vehicles.
- ~8000 ft (2500 meter) range, open-field, line-of-sight

CPU/Memory

- Dual core at 800 MHz for edge computing
- 1 GB RAM

Interfaces

- 2 x DSRC/WAVE
- 1x C-V2X(PC5)
- 2 x RJ45 10/100 MBit Ethernet
- 1 x 802.11 b/g/n WiFi and Bluetooth 4.0
- 1 x RS232
- 1 x LTE Cat4

Mechanics

- Dimensions: 11" H x 12" W x 3" D
  27 H x 31 W x 8 D cm
- Weight: approx. 9 pounds
- RSU Shell: Cast Aluminum, Anodized

Environmental

- Operating Temperature: -40 to 74°C
  -40 to +165°F
- Housing: Sealed, NEMA 6P

Power

- Input Power: 48 V PoE+ (802.3at)

Parts List

DSRC RSU		
RSU with Standard Firmware	Includes SPaT/MAP and TIM-based applications	TYZ:AAD17116-101
RSU with TMS Firmware	Includes SPaT/MAP and TIM-based applications and Triggered Message Sender enabling PCW and WWD	TYZ:AAD17116-104
RSU with TSP Firmware	Includes SPaT/MAP and TIM based applications and Transit Signal Priority	TYZ:AAD17116-105
RSU with TSP and TMS Firmware	Includes SPaT/MAP and TIM-based applications, Transit Signal Priority and Triggered Message Sender	TYZ:AAD17116-106

Dual Mode RSU		
RSU with Standard Firmware	Includes SPaT/MAP and TIM-based applications	TYZ:AAD17151-101
RSU with TMS Firmware	Includes SPaT/MAP and TIM-based applications and Triggered Message Sender enabling PCW and WWD	TYZ:AAD17151-104
RSU with TSP Firmware	Includes SPaT/MAP and TIM based applications and Transit Signal Priority	TYZ:AAD17151-105
RSU with TSP and TMS Firmware	Includes SPaT/MAP and TIM-based applications, Transit Signal Priority and Triggered Message Sender	TYZ:AAD17151-106

Accessories		
POE	Power Over Ethernet Injector	TYZ:PXX08913-001
Power Cable	Power Cable for POE	PHT04515P001
Surge Protection Device	Surge Protection Device for RSU	TYZ:PXX08942-001

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