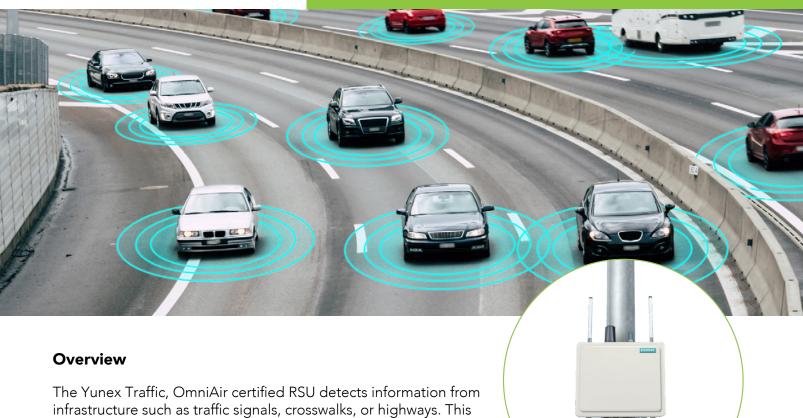# CONNECTED VEHICLE ROADSIDE UNIT (RSU)

INTELLIGENT WIRELESS COMMUNICATION FROM ROADSIDE INFRASTRUCTURE TO VEHICLE ONBOARD UNITS

Overview

The Yunex Traffic, OmniAir certified RSU detects information from infrastructure such as traffic signals, crosswalks, or highways. This information is then transmitted to oncoming vehicles equipped with onboard units, producing video and audio warnings in the vehicles. Additionally, Roadside units can coordinate traffic at intersections by processing the location of equipped vehicles and sending this information to a central management system.

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 updates

Power over Ethernet connection to signal controller or cabinet network switch

GPS receiver for location and time

Local Wi-Fi hot spot for communication

Technical Information

- C-V2X (Celluar – Vehicle to X)
- IEEE802.11p 5.9Ghz DSRC
- GNSS
- LTE
- Bluetooth travel time
- SPaT (Signal Phase and Timing)
- TIM (Traveler Information Message)
- TMS (Triggered Message Sender including PCW: Pedestrian Crossing Warning)
- TSP (Transit Signal Priority and Preemption)
- SAE J2735 messages including: MAP, SPaT, BSM, TIM, RSA, RCTM, SRM, SSM
- USDOT FHWA version 4.1
- USDOT V2I HUB 2.1 messages translation to SAE J2735

All 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 Yunex Traffic 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 (Yunex Traffic ruggedized power over Ethernet injector available separately)
- GPS receiver for location and time
- LocalWi-Fihotspotforcommunications 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

Technical Details

- IEEE 802.11p 5.9 GHz Dual-Radio DSRC & C-V2X
- Receiver sensitivity of -97 dBm (802.11p)
- 3GPP Release 14 compliant LTE-V2X direct communications (most current - see Qualcomm email)
- 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, RSA, 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

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

Power

- Input Power: 48 V PoE+ (802.3at)
- The maximum power consumption is 12 watts

Parts List

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

Accessories

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