



kapsch >>>
challenging limits

Kapsch TrafficCom

Kapsch RIS-9160. *V2X Roadside ITS Station.*

RIS-9160 is the latest generation Kapsch 5.9GHz Roadside Unit (RSU). RIS-9160 provides IEEE 802.11p™ wireless communication for both the ETSI ITS G5 and IEEE WAVE standards for applications within the Cooperative ITS (C-ITS) environment and ITS applications based on communication technology in general. Various configuration options and open interfaces contribute to the scalable and future proof RIS-9160 platform. The RIS-9160 provides fast data exchange between vehicles and the infra-structure e. g. Traffic Management Center or Signal Controllers to enable full capabilities of cooperative systems.

The V2X Roadside Unit supports up to two 5.9GHz radios and is based on a ruggedized high performance Linux driven dual-core 64 Bit single board computer platform utilizing extensive interface capabilities while keeping the advantages of Power Over Ethernet (PoE) feed-in and passive cooling.

The product comes with standard compliant V2X communication stack as needed for deployment in IEEE WAVE and ETSI ITS G5 based cooperative systems. A software development kit (SDK) is available for integrators and infrastructure operators allowing them the implementation of own software applications running on the device.

Due to its modular design the product is able to be delivered in different hardware

RIS-9160 represents the latest generation of Roadside ITS Stations (R-ITS-S) providing V2X applications a powerful computer platform for “Day 1” V2X use cases and beyond.

configurations. The major configuration options are realized via Plug-In add-on modules. The modularity helps sustainable infrastructure investments with respect to evolutions within the cooperative ITS environment, especially in technical, legislative and standardization aspects.

The IP67/NEMA 4X conform housing is



made of die cast aluminum designed for long life roadside deployments in rural and urban environments. Extended temperature range, shock and vibration durability combined with high MTBF are the key factors for sustainable, reliable and maintenance-efficient large-scale field deployments.

From an Operations & Maintenance perspective the product supports remote management capabilities based on technologies, methods and standards well established in the IT world.

The product targets the worldwide 5.9GHz ITS market and thus is compliant to EC R&TTE and US FCC radio regulations.

Interfaces:

- > IEEE 802.11
- > WAN Ethernet
- > WAN Cellular Network
- > Traffic Management Center / Central ITS Station
- > Traffic Light Controller

References:

- Eco-AT
- NordicWay
- ETSI Plugtest



Technical features.

ITS Protocol Standards

- > IEEE 802.11p™ / IEEE 802.11™
- > SAE J2735
- > ETSI ITS-G5 standard set
- > IEEE WAVE standard set

5.9GHz radio characteristics

- > IEEE 802.11p™ radio
- > Frequency band: 5.850 – 5.925GHz
- > 10MHz and 20MHz channel spacing
- > Max. output power: +21 dBm
- > Sensitivity: -95 dBm @ 6Mbps
- > Antenna 1 or 2 (for diversity)

Power supply

- > PoE 802.3at-2009
- > Max. 22 Watt (standard config.)

Positioning and Time (pps)

- > Multi GNSS (GPS, GLONASS, Galileo, BDS)

External Interfaces (incl. options)

- > 2x 5.9GHz Antenna 50 Ohm, N (+ 2x* (1+1*)x GBit Ethernet (1x PoE feed-in)
- > 1x GPS-in Connector (N)
- > 1x Auxiliary RF N (e.g. LTE, WiFi) *
- > 3x GPIO* in, 3x GPIO* out (optional)
- > 2x LED, 3-color (power, status)

Security

- > ECC
- > Hardware Security Module

Environmental Conditions

- > Operation: -40 °C to +75 °C
- > Storage: -40 °C to +85 °C
- > Protection: NEMA Type 4X, IP67

MTBF

- > 100.000 hours.

Mechanical

- > Aluminium die-cast
- > Dimension : 290 x 220 x 125 mm
- > Weight: max. 4,8kg.

General conformity

- > FCC, CE

Configuration Options

- > 2nd IEEE 802.11p™ radio
- > Cellular modem module (3G/LTE)
- > WiFi module
- > BT module
- > 3x GPIO in, 3x GPIO out

Computer Platform

- > 1,33 GHz, 64 Bit, dual-core
- > x86 CPU Architecture, 1GB RAM ECC
- > 4GB Flash
- > SD-Card Slot

