

5.9 GHz WAVE Transceiver MTX-9450



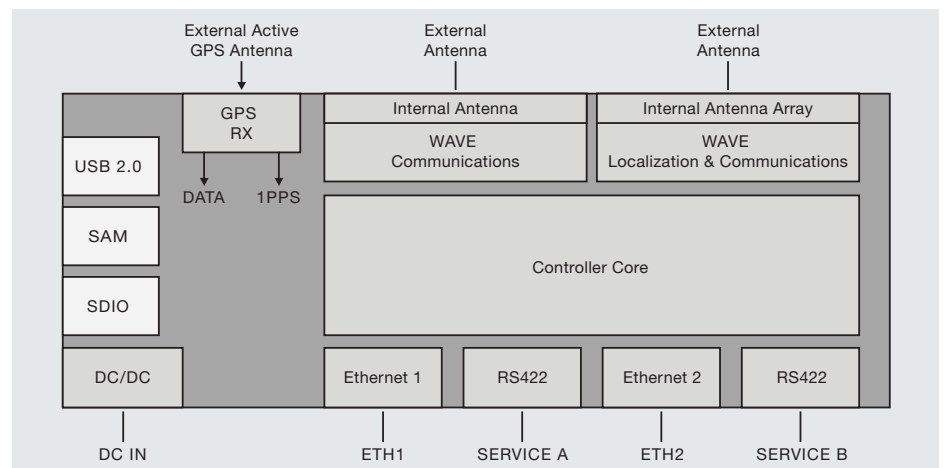
The 5.9 WAVE Transceiver MTX-9450 is a FCC certified, compact roadside infrastructure device realizing wireless communications in the 5.9 GHz Dedicated Short-Range Communication (DSRC) band. It supports the 802.11p WAVE standard for information exchange with on-board equipment in multi and single lane environments. In combination with the Kapsch Roadside Controller, the MTX-9450 Transceiver supports USDOT Safety Pilot safety applications including required IEEE 1609.2 security protocols. The transceiver’s built-in directed DSRC antenna enables localized communication zones, which reduce interference from adjacent receivers and facilitates localization of passing vehicles at the lane level. Additionally, the transceiver is supports external antennas.

The design concept and basic technologies are derived from extensive experience in developing and producing microwave devices dedicated to road tolling applications.

Short Product Description

MTX-9450 transceivers are part of Kapsch TrafficCom’s 9000 series communication devices intended for 5.9 GHz applications. They are provided on a hardware platform designed and optimized for harsh roadside environments.

The following block diagram shows the internal functional modules of the MTX-9450.



WAVE Radio Section and Antenna Array.

The radio units meet the Class C emission spectrum mask. Built-in directional antenna arrays provide radio coverage within an application specific communication zone. The radio section provides flexible parameterization to adapt to specific site conditions.

The antenna design allows 2-dimensional localization of radio sources within the communication zone.

When connected to external directional or omni-directional antenna, localization capability is not supported.

Host Controller.

The powerful micro controller manages communication with the vehicles on board devices utilizing IEEE 1609 WAVE compliant

communication and exchanges transactions with the host system.

It also handles authentication and encryption security in cooperation with the built-in SAM. The transceiver operating system is Linux based.

Interfaces.

The built-in GPS receiver provides 1PPS synchronization and time/location information for applications. An external GPS antenna is attached via Type N connector.

Two Ethernet interfaces may be used for application and service purposes.

DC/DC Power Supply.

The isolated high efficiency DC/DC converter supplies the device from any industrial 24/48VDC source.

Interface and Protection Circuits.

All incoming and outgoing signal and data lines are protected by a multi-level protection circuitry serving to provide adequate surge suppression, overvoltage protection and reverse polarity protection.

Mechanical Design.

All components are integrated in a rugged aluminum die cast.

The Radom for the built-in antenna is sealed to the radio frame thus supporting the overall NEMA 4X rating of the device. Surface finish of all metal parts resists all environmental stresses defined in the related standards.

Technical Features

Mechanical:

- Dimensions: 10.3 x 6.7 x 3.4 inches
420 x 200 x 86 mm
- Enclosure: Aluminum die-cast
- Weight approx.: 13lbs / 6kg

Electrical:

- Frequency band: 5.850 – 5.925 GHz
10MHz Channels:
172, 174, 178, 180, 182, 184
20MHz Channels:
173, 175, 177, 179, 181, 183
- Radiated power: +33dBm EIRP maximum, adjustable
- Supply voltage: 24/48V nominal
- Power consumption: max. 24W

Antenna:

- Built-in directional
- External via Type N connector

Environmental Conditions:

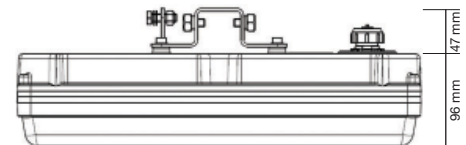
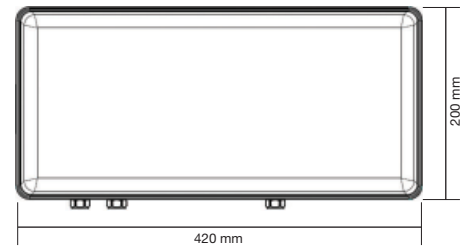
- Operating temperature range:
-30°F to +165°F (-34 °C to +74°C)
- Storage temperature range:
-40°F to +185°F (-40° C to +85° C)

- Protection classification: NEMA 4X, IP67
- Vibrations: MIL-STD 810F Method 514, Proc I, Category 24
- Shock: MIL-STD 810F Method 516.5, Proc IV
- Salt mist: IEC 60068-2-56 Cb and 60068-2-30Db
- MTBF: ≥ 200,000h under normal environmental conditions
- Security (digital signature and encryption): 3DES, AES, ECC (optional)
- 10/100 Ethernet
- Protocol standards: IEEE 802.11p and IEEE 1609

Interfaces:

- 2 x 10/100 Ethernet
- 2 x Serial RS4222
- 2 x external WAVE Antenna N connector female
- 1 x external GPS N connector female
- USB 2.0
- Secure Access Module - SAM

Mechanical layout MTX-9450



Kapsch Group

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Kapsch. Always one step ahead.