

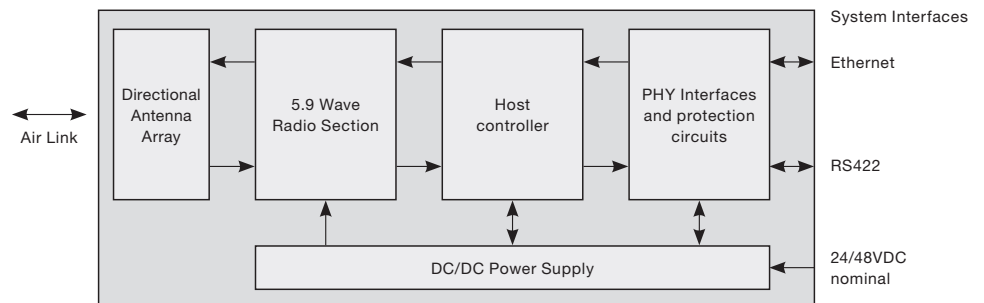
5.9 GHz WAVE Tolling Transceiver TRX-9450.



The 5.9 WAVE Tolling Transceiver TRX-9450 is a 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 tolling environments. 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.

The design concept and basic technologies are derived from extensive experience in developing and producing microwave devices dedicated to road tolling applications in single lane (SL), as well as the open road tolling environment, based on multilane free flow (MLFF) concepts.

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



Short Product Description.

TRX-9450 transceivers are part of Kapsch TrafficCom’s 9000 series communication devices

intended for 5.9 GHz DSRC applications.

They are provided on a hardware platform designed and optimized for harsh roadside environments.

WAVE Radio and Antenna Array.

The radio unit meets 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.

A Kapsch patented antenna design allows 2-dimensional localization of radio sources within the communication zone.

Host Controller.

The powerful micro controller manages communication with the vehicle's on board devices utilizing IEEE 1609 WAVE compliant communication and exchanges transactions with the host system. It also handles authentication and encryption security required for tolling applications.

Interface and Protection Circuits.

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

DC/DC Power supply.

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

Mechanical Design.

All previously mentioned 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 Specification:

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
Channels 172, 174, 178, 180, 182, 184
- Radiated power
+33dBm EIRP maximum, adjustable
- Supply voltage 24/48V nominal
- Power consumption max. 15W

Antenna:

- built-in directional

Environmental Conditions:

- Operating temperature range (full spec)
-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 60068-2-30 Db

- MTBF
≥ 200,000h under normal environmental conditions
- Security (digital signature and encryption)
3DES, AES, ECC (optional)
- Interfaces
Multichannel RS485 IBB – Inter Beacon Bus
- Bus
10/100 Ethernet optionally
- Protocol standards
IEEE 802.11p
IEEE 1609

Mechanical layout TRX-9450
(all dimensions in mm)

