Kapsch CBX-9360

C-V2X Onboard Communication Unit

CBX-9360 is an onboard C-V2X communication box from Kapsch. It provides 3GPP LTE-V2X wireless communication for IEEE WAVE standards for applications within the Connected Vehicle environment and ITS applications based on communication technology in general. Equipped with various interface options it is ready to cover all V2X needs from a mobile onboard unit perspective. The CBX-9360 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 C-V2X Onboard Communication Unit supports 5.9GHz radio channels compliant to 3GPP Rel.14 LTE-V2X PC5 sidelink standards and is based on a high performance Linux driven dual-core 64 Bit single board computer platform utilizing extensive interface capabilities. It operates with standard 12/24V vehicle power supply and passive cooling.

The versatile platform comes with standard compliant C-V2X communication stack as needed for deployment in IEEE WAVE™ based connected vehicle systems.

The CBX-9360 is ready for a complete integration within the C-ITS environment. The communication capabilities cover besides the 3GPP LTE-V2X wire-less communication also Wi-Fi or Bluetooth to stay fully connected to a designated HMI and cellular (LTE) integration option to a dedicated management center. Additional physical interfaces like Gigabit Ethernet and GPIOs enable customer and applications specific adaptions and communication possibilities.

As mobile unit it completes the full end-to-end V2X solution from Kapsch, consisting of V2X Roadside Units and a dedicated Connected Mobility Control Center (CMCC) Software.

Independently if it is used in emergency vehicles to ensure traffic light preemption, on public transport means to keep the bus on schedule, to increase safety while creating awareness of service vehicles or in different pilots, demonstrat-ing the current and future possibilities of Connected Vehicles (V2X), the CBX-9360 covers all these opportunities in one unit.

CBX-9360 comes with LTE V2X PC5 sidelink capabilities..

Technical features

ITS communication standards
- LTE-V2X 3GPP Rel.14
- SAE J2735 2016 / 2020
- IEEE WAVE™ standard set

C-V2X radio characteristics
- 3GPP LTE-V2X Rel. 14 radio
- Freq.-band: 5.850 to 5.925GHz *2)*
- 20 (/10) MHz channel spacing
- LTE-V2X PC5 sidelink
- Sensitivity: typ.-95dBm
- 2nd antenna for diversity

Wireless communication
- Bluetooth module
- Cellular modem module (3G/LTE) *3)*

Positioning and timing
- Multi-GNSS (GPS, GLONASS[2)], Galileo, BeiDou[2)])

Computer platform
- 1,33GHz, 64 Bit, dual core
- x86 CPU architecture
- 1GB RAM ECC
- 4GB Flash
- uSD memory extension *3)*

Power supply
- 12/24V DC

Enclosure
- IP 31

External interfaces
- 3x GP input & 3x GP output
- 2x 5.9 GHz antenna (Fakra Z)
- 1x GNSS antenna (Fakra C)
- 1x BT antenna (Fakra I)
- 2x LTE antenna (Fakra D) *3)*
- 1x GbE (RJ45)

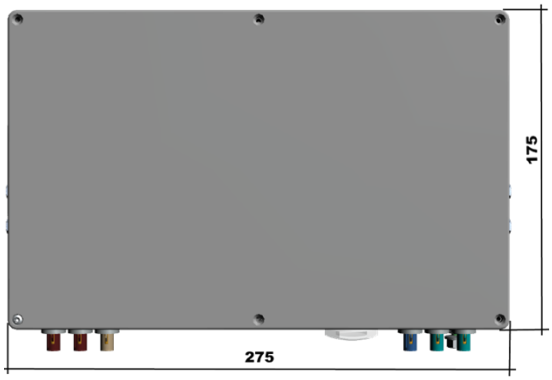
Environmental conditions
- Operation: -40°C to 75°C
- Storage: -40°C to 85°C

Security
- Hardware Security Module, ECC
- FIPS 140-2 level 3 compliant, CC EAL4+

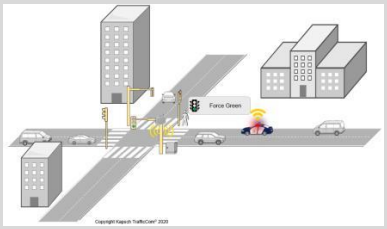
Mechanical
- Aluminum base
- Dimensions: 275x175x70 mm

General conformity
- FCC[2)]

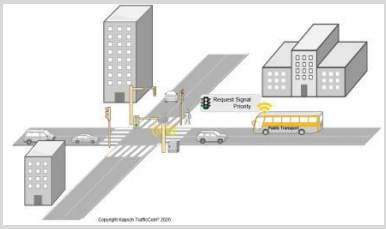
1) Alternative
2) Subject to local regulations.
3) Option.



The CBX-9360 can be used in a variety of applications to enable vehicles to receive the traffic signal phase and timing and requesting traffic light prioritization and many more to increase safety and efficiency at once. Few examples are listed below.

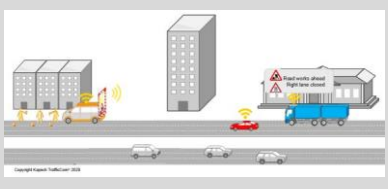


Emergency Vehicle Preemption



Transit Signal Priority

Stationary (Emergency) Vehicle Warning



Roadworks Warning / Slow Traffic