

### Kapsch TrafficCom

## **OBU-5310-00A.** *On-Board Unit.*

**The OBU-5310 is the result of Kapsch 25 years of experience in EFC and ITS in-vehicle units. With its roots in the proven high volume design of Kapsch GNSS OBUs, this third generation OBU is capable of providing pan-European service without compromising the reliability, integrity and security as of previous generation.**

The OBU is designed to meet the challenges and opportunities of road user charging and ITS in modern systems. It is in line with the EETS directive supporting regional and multinational interoperability schemes. The combination of latest GNSS and a multiprotocol 5.8 GHz CEN / UNI DSRC enables an efficient hybrid EFC solution benefitting from the strengths of both technologies. All combined into one compact and stylish windscreen mounted unit. A wide range of GNSS based EFC charging schemas are supported.

The OBU includes functionality to automatically adopt its behaviour depending on its location. This includes features like position reporting and detection of charge objects. The setup of the OBU functionality and the definition of geoobjects can be managed remotely.

The implementation of the latest GNSS technology in combination with sensor fusion technology provides high accuracy and availability in even the toughest conditions such as urban canyons. It has advanced TTFF reducing functionality.

The OBU is designed to fulfil the high security requirements that are applicable for high volume interoperable payment systems. This includes features such as data encryption, authentication, cryptographic access control and tamper detection.

Installation and activation of the OBU can be performed by the user in a matter of minutes. The OBU is attached to the windscreen with an adhesive and connected to the vehicle power system with a cigarette lighter connector. It is also possible to install a fix connection to the vehicle power system.



In-vehicle ITS devices may be connected to the OBU via BLE interface. The OBU can provide location information to this device as well as exchange data between the in-vehicle ITS device and an ITS back end system.

The OBU comprises a Human-Machine Interface for configuration and supervision of the unit. It consists of buttons, display, buzzer and LEDs. The Interface is flexible and provides user selectable language and character set.

## Features.

- > Supports all current types of DSRC and GNSS based tolling concepts
- > Compliant with the EETS related GNSS and DSRC standards
- > Supports interoperability specifications such as GSS/A1/CARDME/CESARE/PISTA/IAP/LAC/CCC
- > Location dependent configuration capability
- > Supports handling of up to 100,000 geo-objects
- > Remote management of parameters, firmware and geo-objects
- > Multi toll context vehicle class management
- > Data authentication/encryption based on a secure core concept
- > Intuitive HMI with display, buttons, LEDs and buzzer
- > Applications Programming Interface for third party developers
- > Compact and stylish casing providing optimal orientation of both antennas and HMI
- > Casing tampering detection/reporting and critical data deletion
- > Provides location data and transparent mailbox services to an in-vehicle ITS device via Bluetooth or USB
- > More than 30 days of standalone data storage capacity for typical usage
- > More than 3h of operation by means of rechargeable battery
- > Fully independent DSRC functionality powered by dedicated lithium battery

## Technical features.

### GNSS receiver

- > Simultaneous and integrated support of GLONASS and GPS. Galileo ready
- > Accuracy 2.5 m (CEP50)
- > TTFF cold 26 s typ
- > TTFF aided 2 s typ
- > TTFF hot 1 s typ
- > SBAS (EGNOS, WAAS and MSAS)

### GSM/GPRS communication

In accordance with:

- > EN 301511 harmonized Standard for Mobile stations in the GSM 900 and DCS 1800 bands
- > 3GPP 51.010-1 mobile station conformance specification – part 1

### DSRC communication

In accordance with:

- > ETSI ES 200 674 Italian DSRC specifications
- > EN 12253 physical layer
- > EN 12795 data link layer
- > EN 12834 application layer
- > EN 13372 DSRC profiles 0/1 L1-B
- > ISO 14906 EFC / 17264 AVI application interface
- > ISO 12813 (CCC)
- > ISO 13141 (LAC)
- > EN 16312 AVI Interoperable Application Interface
- > EN 15509 EFC Interoperable Application Profile
- > GSS (Global Specification for Short Range Communication)

### Power supply

- > External power 8 – 32 V DC
- > 12 V DC average 40 mA, peak 1000 mA
- > 24 V DC average 20 mA, peak 500 mA
- > 3.6 V Li-Ion re-chargeable battery
- > 3 V LiMnO<sub>2</sub> battery for DSRC
- Typical battery lifetime more than 7 years @ 2000 transactions/year

### Human-machine interface

- > 2" LCD display
- > 4 buttons up/down and OK/NOK
- > 2 green/red status LEDs and 1 white aux LED
- > Buzzer for both DSRC and GNSS

### User memory

- > Data storage 128 MB (flash)
- > Operational data: 2 MB (flash)
- > DSRC user data: 4 KB

### Housing

- > Enclosure: IP41, IEC60529
- > Casing: Polycarbonate/ASA
- > Dimensions: 134 mm x 76 mm x 29 mm (excluding windscreen mounting bracket)
- > Colour:
  - > White section towards windscreen (NCS0603)
  - > Black section towards vehicle cabin (NCS9000)
- > Weight: 198 g (excluding windscreen mounting bracket)

### Installation

- > With bracket that is fixed to the windscreen with adhesive
- > Connection to power supply (cigarette lighter plug) via a 3 m cable
- > Optional fix installation to the vehicle's power system with ignition signal support

### Geo-object capabilities

- > 3 levels of geo-zones with individual configuration
- > Supports up to 100,000 geo-zones

### Radio compliance

- > According to EN 300 328
- > According to EN 300 674
- > According to EN 301 511
- > According to EN 303 413

### Safety

- > OBU according to EN 62368-1
- > Battery according to EN 62133 2<sup>nd</sup> ed

### Electromagnetic compliance

- > According to EN 301 489-1, -3, -17, -19, -52

### Environmental conditions

- > Temperature range, storage: +5 °C to +40 °C  
Ref: IEC 60721-2-1, class 1K2
- > Temperature range, operating: -25 °C to +85 °C  
Ref: IEC 60721-2-1
- > Humidity: Max 95 % relative humidity, non-condensing  
Ref: IEC 60721-3-5, class 5K2

### Vibration

- > Random 3 m<sup>2</sup>/s<sup>3</sup> 10 – 200 Hz, 1 m<sup>2</sup>/s<sup>3</sup> 200 – 500 Hz  
Ref: IEC 60721-3-5, class 5M3

### Shock

- > 300 m/s<sup>2</sup>, half sine, 6 ms  
Ref: IEC 60721-3-5, class 5M3

### Bump

- > 150 m/s<sup>2</sup>, half sine, 11 ms  
Ref: IEC 60721-3-2, class 2M2

### Free fall

- > 1,000 mm, each face

### MTBF

- > 120,000 h according to Telcordia (Bellcore) SR-332

### Type approval

- The on-board unit is compliant with the European directives:
- > RED 2014/53/EU
  - > RoHS 2 2011/65/EU
  - > WEEE 2012/19/EC

### Bluetooth

- Bluetooth Low Energy