

Kapsch TrafficCom

TS3290/00B. *On-Board Unit.*

The Kapsch OBU (on-board unit) TS3290/00B is the in-vehicle part of the Kapsch Satellite Tolling solution which facilitates the implementation of road user charging schemes based on geographical positions obtained from Global Navigation Satellite Systems (GNSS).

The OBU makes use of the latest GNSS and GSM technologies which are combined into one compact unit that also contains a DSRC (Dedicated Short-Range Communication) interface according to the CEN TC278 DSRC standards.

The TS3290/00B is in line with the EETS (European Electronic Toll Service) directive and it supports regional and multi-national interoperability schemes.

The TS3290/00B supports both on-board as well as central system based detection of charging events.

The OBU includes functionality to automatically adopt its behaviour depending on its location (geo-object functionality). This includes features like position reporting and detection of charge objects. The set-up of the OBU functionality and the definition of geo-objects can be managed remotely.

The implementation of the latest GNSS technology provides high accuracy and availability in even the toughest conditions such as urban canyons. It also provides advanced TTFF (Time To First Fix) reducing functionality.

The OBU is designed to fulfil the high security requirements that are applicable for high volume interoperable payment systems such as multinational truck tolling schemes. This includes features like 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 the USB interface. The OBU can provide location information to these devices 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 CEN DSRC and GNSS based tolling concepts
- > Compliant with the EETS related GNSS and DSRC standards
- > Supports DSRC 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
- > Casing tampering detection/reporting and critical data deletion
- > Provides location data and transparent mailbox services to an in-vehicle ITS device via 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 CEN DSRC functionality powered by dedicated lithium battery

Technical features.

GNSS receiver

- > Simultaneous and integrated support of GLONASS and GPS. Galileo ready.
- > Accuracy 2.5m (CEP50)
- > TTFF cold 28s typ
- > TTFF warm 26s typ
- > TTFF hot 1s 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:
- > EN 12253 physical layer
 - > EN 12795 data link layer
 - > EN 12834 application layer
 - > EN 13372 DSRC profiles (set L1-B)
 - > EN ISO 14906 EFC application interface definition
 - > TS 13141 (LAC)
 - > TS 12813 (CCC)
 - > EN 15509 (IAP)
 - > GSS (Global Specification for Short Range Communication)

Power supply

- > External power 10 – 36V DC
- > 12V DC average 40mA, peak 1000mA
- > 24V DC average 20mA, peak 500mA
- > USB power 5V DC, average 120mA, peak 500mA
- > 3.6 V Li-Ion re-chargeable battery
- > 3 V LiMnO₂ 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
- > Green/red status LED & blue Aux LED
- > Buzzer for both DSRC and GNSS

User memory

- > Data storage 32MB (flash)
- > Operational data: 2MB (flash)
- > DSRC user data: 4KB

Housing

- > Enclosure: IP41, IEC60529
- > Casing: Polycarbonate/ABS
- > Dimensions: 137 mm x 81 mm x 42 mm (excluding windscreen mounting bracket)
- > Colour:
 - > Light grey section towards windscreen (RAL7035)
 - > Dark grey section towards vehicle cabin (RAL7016)
 - > Black, middle section and frame (NCS9000)
- > Weight: 238 g (excluding windscreen mounting bracket)

Installation

- > With bracket TS3220/23A that is fixed to the windscreen with adhesive
- > Connection to power supply (cigarette lighter plug) via a 3m 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 300 440
- > According to EN 300 674
- > According to EN 301 511

Safety

- > OBU according to EN 62368-1
- > Battery according to EN 62133 2nd ed.

Electromagnetic compliance

- > According to EN 301 489-1, -3, -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 3m²/s³ 10–200Hz, 1m²/s³ 200–500Hz
Ref: IEC 60721-3-5, class 5M3

Shock

- > 300m/s², half sine, 6ms
Ref: IEC 60721-3-5, class 5M3

Bump

- > 150m/s², half sine, 11ms
Ref: IEC 60721-3-2, class 2M2

Free fall

- > 1,000mm, each face

MTBF

- > 370,000h 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