

Kapsch TrafficCom

TRP-4010-2xB.

Standard Transponder Multi-Protocol.

The TRP-4010-2xB is a battery powered transponder for implementation of EFC and ITS services. The unit is capable of providing pan-European interoperability by supporting DSRC functionality according to both the European CEN standards and the Italian specifications.

The transponder is fully compliant with harmonized EFC specifications and standards such as A1, CESARE/PISTA, CARDME and EN 15509 and it also supports other application types such as AVI, parking, access. The multi-application architecture provides separate security domains for the applications in order for different entities to have access to different parts of the user memory.

The transponder multiprotocol functionality for CEN and Italian DSRC, will automatically switch to the proper protocol based on the type of roadside system.

The transponder fulfills requirements for demanding applications such as high-speed multi-lane free-flow applications as well as slow congested traffic in stop-and-go situations.

Data security and integrity is secured by a high degree of integration in combination with efficient built-in cryptographic func-



tions based on the DES and triple-DES algorithms.

The transponder provides feedback to the driver through configurable buzzer sounds that are activated from the roadside system.

The user can easily install the unit to the inside of the windscreen by following installation instructions that are available in a user's manual or at the Kapsch web

portal. The unit can be removed from the mounting bracket and, if allowed by the issuer, it can be used in more than one vehicle.

The TRP-4010-21B version, contains an in-bracket detection functionality, that notices when the unit is removed from its bracket. This feature can also be configured to allow DSRC communication only when the unit is mounted in the bracket.



Installation in car using TRP-4090-00A (behind or beside the rear view mirror)
Depth of transponder from windscreen: 20 mm.



Installation in heavy vehicle using TRP-4090-01A (at the bottom and centre inside)
Depth of transponder from windscreen: 35 mm.



Features.

- > Product Range:
 - > TRP-4010-20B basic
 - > TRP-4010-21B with In-bracket detection
- > Fully proven in demanding multi-lane high and low speed applications.
- > Compliant with CEN DSRC/EFC/AVI standards
- > Compliant with Italian DSRC specifications
- > Compliant with interoperability specifications and standards
- > High security through mutual authentication, and separate security domains
- > 4 Kbytes of application memory allows multiple DSRC-applications and several key generations
- > 7 years battery life time
- > Flexible configuration of buzzer sounds

Technical features.

Casing

- > Plastic material PC/ASA
- > Colour windscreen side: White
- > Colour cabin side: Black, Grey or White

Weight

- > 15g

Size

- > 63 x 40 x 10mm (excluding bracket)

Enclosure

- > IP40, Ref: IEC 60529

Power supply

- > 3V Lithium battery
- > Only active within the communication range of a DSRC roadside system
- > Typical battery lifetime more than 7 years @ 2000 DSRC-transactions/year
- > Battery-low indication available

User memory

- > RAM/Flash
- > Capacity: 4 Kbytes
- > Access only from the DSRC interface

Driver feedback

- > Buzzer (sound level: 55 dBA @ 1m)
- > Configurable buzzer tunes

Accessories

- > Bracket TRP-4090-00A (angled windscreen)
- > Bracket TRP-4090-01A (vertical windscreen)
- > Brackets are supplied with a cleaning tissue and a pre-mounted adhesive
- > Bracket colour: White
- > Customised package for individual transponder including installation manual and bracket

Customisation of casing

- > Optional pad-print on cabin and/or windscreen side
- > Ink-jet or laser printed serial number in text and in bar code (CODE 128)

DSRC compliance

In accordance with:

- > EN 12253 physical layer
- > EN 12795 data link layer
- > EN 12834 application layer
- > EN 13372 DSRC profiles 0/1 L1-B
- > ISO 14906 EFC Application Interface
- > ISO 17264 AVI Application Interface
- > EN 15509 EFC Interoperable Application Profile
- > EN 16312 AVI Interoperable Application Profile
- > GSS 3.2 (Global Specification for Short Range Communication)
- > ETSI ES 200 674-1 Italian DSRC Specification

Mean Time Between Failure (MTBF)

- > 700.000 hours
- > Ref: Bellcore Issue 6 Method I Case 3

Environmental conditions

- > Temperature range, storage: +5 °C to +40 °C
Ref: IEC 60721-3-1, class 1K21
- > Temperature range, operation: -25 °C to +85 °C
Ref: IEC 60721-3-5, class 5K2
- > Humidity: Max 95 % relative humidity, non condensing
Ref: IEC 60721-3-5, class 5K2

Vibration

- > Random: 3 m²/s³ 10–200Hz, 1 m²/s³ 200–500Hz
Ref: IEC 60721-3-5, class 5M3

Shock

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

Free fall

- > 1000mm, each face

Conformance

Compliant with the following EU directives

- > RED 2014/53/EU
- > RoHS 2011/65/EU
- > WEEE 2012/19/EU