TRP-4010-1xA
Premium Transponder.

The transponder TRP-4010 is the most compact model in the Kapsch range of transponders and on-board units that are compliant with the European DSRC standards. With the premium customisation possibilities, it can be adopted to support branding schemes for the issuer, user groups or other sponsors.

The TRP-4010 transponder is fully compliant to the latest harmonized EFC specifications and standards such as A1, CESARE/PISTA, CARDME and EN 15509. Further it fully supports other applications as AVI, parking, access, etc. By providing different security domains for the different applications, different entities can have access to different parts of the user memory.
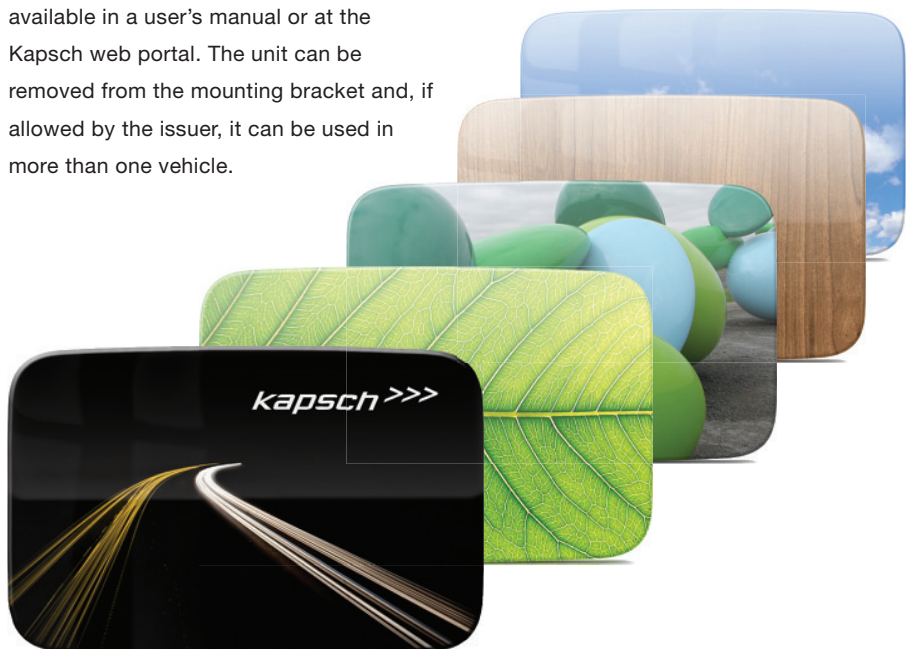
The transponder fulfills the performance requirements in the CEN standards that are proven also in demanding applications such as high-speed multi-lane free-flow applications as well as slow congested traffic in stop-and-go situations.
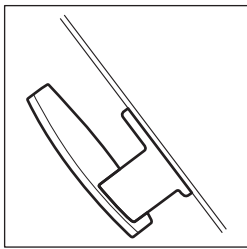
Data security and integrity is secured by a high degree of integration in combination with efficient integral cryptographic functions based on the DES and triple-DES algorithms.

The transponder provides feedback to the driver through configurable buzzer sounds that can be activated from the roadside when the transponder passes by.
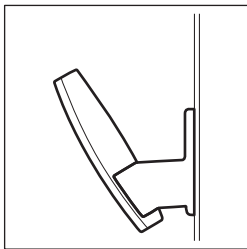
The user can easily install the unit by following installation instructions that are available in a user's manual or at the Kapsch web portal. The unit can be removed from the mounting bracket and, if allowed by the issuer, it can be used in more than one vehicle.

The TRP-4010-11A contains an in-bracket detection functionality, that notices when the unit is removed from its bracket and prevents communication with the unit whenever it isn't in the bracket.

Installation in car using TRP-4090-00A (behind or beside the rear view mirror) Depth of transponder from windscreen: 23 mm.

Installation in heavy vehicle using TRP-4090-01A (below the rear view mirror) Depth of transponder from windscreen: 53 mm.

Features.

- Premium branding by glossy in-plastic high definition graphics and pad-print
- Fully proven in demanding multi-lane high and low speed applications
- Compliant to CEN DSRC/EFC/AVI standards
- Compliant with interoperability specifications and standards
- High security through mutual authentication, and several security domains
- 4 Kbytes of application memory allows multiple applications and several key generations
- 7 years battery life time
- Flexible buzzer configuration
- In-bracket detection, TRP-4010-11A only

Technical features

Casing
- Plastic material ASA
- Windscreen side: White
- Cabin side: High definition graphics molded into plastic

Weight
- 15 g

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

Enclosure
- IP40, ref: IEC 60529

Power Supply
- 3 V Lithium battery
- Typical battery lifetime more than 7 years @ 2000 transactions/year

User memory
- RAM / Flash
- Capacity: 4Kbytes
- 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 (vertical windscreen)
- Brackets are supplied with a Cleaning Tissue and a pre-mounted adhesive.
- Bracket colour is white.
- Customised package for individual transponder including installation manual and bracket.

Customisation of casing
- In-mould high definition graphics on cabin side
- Optional pad-print on 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 (Global Specification for Short Range Communication)

Mean Time Between Failure (MTBF)
- 700 000 hours
- Ref: Bellcore Issue 6 Method I Case 3

Environmental conditions
- Temperature range, operation
  - +5°C to +40°C
  - Ref: IEC 60721-2-1, class 1K2
- Temperature range, storage
  - -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 m^2/s^2 10-200 Hz
  1 m^2/s^2 200-500 Hz
- Ref: IEC 60721-3-5, class 5M3

Shock
- Half-sine 300 m^2/s^2, duration 6 ms
- Ref: IEC 60721-3-5, class 5M3

Free fall
- 1000 mm, each face

Conformance
- Compliant with the following EU directives:
  - R&TTE 1995/5/EC
  - EMC 2004/108/EC
  - LVD 2006/95/EC
  - RoHS 2011/65/EC
  - WEEE 2012/19/EC

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