Kapsch TrafficCom

Preliminary datasheet

Elumian:
The Light-Powered Transponder

Expanding the TRP-4010 portfolio with innovation

The TRP-4010 series has long set the standard in DSRC tolling technology. Now, Elumian (TRP-4010-40E) expands this portfolio with an ambinet light-powered transponder that introduces a new era in advanced tolling solutions, combining efficiency, innovation, and sustainability. As the first in our light-powered transponder lineup, Elumian (TRP-4010-40E) paves the way for a more sustainable future in mobility.

Building on the proven strengths of TRP-4010, Elumian integrates ambient light-powered technology, eliminating the need for battery replacements while maintaining the same reliability, security, and ease of use. Designed for long-term sustainability with minimal maintenance, it delivers a cost-effi cient, environmentally friendly alternative without compromising quality.

Why Elumian?

Powered by light	Continuously harnesses natural and artificial light, indoors and out.
No maintenance	Eliminates the need for battery replacements and significantly reduces maintanance costs.
10+ year lifespan	Designed for long-term durability, reducing overall waste.

Kapsch Transponders

Driving sustainable innovation in mobility

At Kapsch, sustainability is at the core of our mission to create a future of mobility that's both innovative and environmentally responsible. Therefore, we have introduced packaging trays for the TRP 4010 transponder family based on moulded fibre, reducing plastic waste and the generated CO_2 emission per packaging by 65%. As we continue this journey through an eco-friendlier supply chain, we are actively working towards even more sustainable packaging and production solutions, reinforcing our commitment to a cleaner, greener future for mobility.

Key sustainability features of TRP-4010 Series:

Eco supply chain
- 99% of plastics sourced locally in the EU
- Over 75% of components from within the EU

Low carbon footprint
- Designed to minimize resource depletion
- Only transponder on the market aligned with EU taxonomy sustainability standards

Sustainable energy mix
- Over 55% of energy from renewable sources
- 100% electricity and cooling from renewable sources

Material innovation & circular economy
- Up to 25% of casing production uses reused materials
- Refurbishment extends product lifespan through component reuse.

By combining these principles with Elumian's breakthrough self-sustaining energy source, Kapsch TrafficCom continues to push the boundaries of sustainability in mobility solutions.

Elumian

Expanding sustainability through innovation

Elumian (TRP-4010-40E) builds on the proven sustainability features of the TRP-4010 series while introducing a self-sustaining energy source reducing dependency on traditional power sources and minimizing maintenance.

Key sustainability features of Elumian

Powered by Light

continuously harnesses both indoor and outdoor light.

10+ Year Lifespan

designed for long-term durability, reducing overall waste

Less Battery Waste

eliminates the need for battery replacements

No Maintenance

self-sustaining technology significantly reduces upkeep costs

Kapsch Transponders

A Commitment to quality

Kapsch transponder, including the TRP-4010 series and Elumian, are fully manufactured in Europe, ensuring the highest quality standards, rigorous production control, and a strong commitment to sustainability. By adhering to strict quality assurance processes and high sustainability benchmarks, they provide innovative, reliable, and future-ready solutions.

Designed for ease of use

Kapsch TRP-4010 transponder prioritize user experience, seamless integration, security, and efficiency across various applications. Their compact design allows for quick installation on the vehicle's windscreen and removal for use across multiple vehicles, if permitted by the issuer.

Regulatory compliance & security

The TRP-4010-40E is fully compliant with harmonized Electronic Fee Collection (EFC) specifications and standards, including A1, CESARE/PISTA, CARDME, and EN 15509. It supports a variety of applications, such as AVI, parking, and access control, with a multi-application architecture that provides separate security domains. This ensures controlled access to user memory with strong data protection. Security is further enhanced by built-in cryptographic functions, including DES, Triple-DES, and AES encryption, ensuring data integrity and secure transactions.

Elumian builds on this foundation by incorporating ambient light-powered technology, further reducing maintenance while maintaining the trusted performance of the TRP-4010 series.

Key Features

shared across the TRP-4010 family

Effortless installation:
Quick and secure windshield attachment with guided setup.

Flexible & multi-vehicle use:
Removable and transferable if permitted by the issuer.

Versatile applications:
Optimized for high-speed tolling, parking, and access control.

TRP 4010-40E Technical Features

Features
- Fully proven in demanding multi-lane high and low-speed scenarios.
- Compliant with CEN DSRC/EFC/AVI standards.
- 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.
- Self-charging battery powered by ambient light.
- Flexible configuration of buzzer sounds and patterns.

Casing
- Color windscreen side: White.
- Color cabin side: Black.

Weight
- 22-25g.

Size
- 63 x 40 x 15 mm.

Enclosure
- IP40, Ref: IEC 60529.

Power supply
- Rechargeable battery powered through ambient light harvesting.
- Only active within the communication range of a DSRC roadside system.
- Indefinite power supply until the end of life of the rechargeable battery (10+ years, 10,000 charging cycles).

User memory
- RAM/Flash.
- Capacity: 4 Kbytes.
- Access only from the DSRC interface.

Driver feedback
- Configurable buzzer tunes.

Customization casing:
- according to the branding guidance.
- Ink-jet or laser printed serial number in text and in bar code (CODE 128).

Accessories
- Bracket TRP-4090-00A (car windscreen).
- Bracket TRP-4090-01A (truck windscreen).
- Brackets are supplied with a cleaning tissue and a premounted adhesive.
- Bracket color: White.
- Customized package for individual transponder including installation manual and bracket.

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).

Environmental conditions
- Temperature range, before first-time use: +5 °C to +40 °C.
- Humidity: Max 95% relative humidity, non-condensing.

Vibrations
- Random: 3 m^2/s^3 10–200 Hz, 1 m^2/s^3 200–500 Hz.
- Ref: IEC 60721-3-5, class 5M3.

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

Conformance
Compliant with the following EU directives:
- RED 2014/53/EU.
- RoHS 2011/65/EU.
- WEEE 2012/19/EU.

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