

# Transponder Unit TS3203/10A (basic).



## Description.

The TS3203/10A is the most compact model in the Premid® TS3200 series of Transponder Units and is fully compliant with European CEN DSRC/EFC standards.

The combination of its small size and attractive colour schemes makes the Transponder a natural choice for every issuer that wishes to increase user acceptance of its DSRC-based charging system whether based on high speed interurban multi-lane free flow, urban congestion charging applications or plaza-based operations.

The functionality of the Transponder enables interoperability according to the most common harmonised specifications, including A1, CESARE/PISTA and CARDME.

The user memory can be structured in several elements and this flexibility makes the TS3203/10A an ideal choice for Electronic Fee Collection as well as for other applications.

Data security and integration is ensured by a high degree of integration in combination with efficient integral cryptographic functions based on the DES and triple-DES algorithms.

The Transponder has a configurable buzzer that may be activated from the roadside System to provide an enhanced, yet simple driver interface.

User acceptability is further assured through a mounting bracket that makes installation straightforward and retains the Transponder securely yet still permits it to be removed by the user.

## Features.

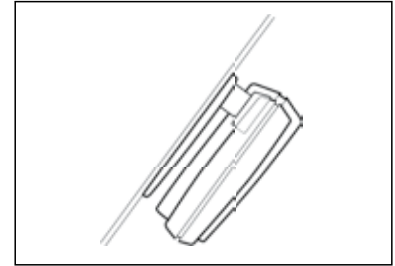
- Fully proven in single lane and Multi Lane Free Flow applications
- Enables high speed operation • Compatible with CEN DSRC Specifications
- Compatible with GSS, A1, CARDME and CESARE/PISTA • Supports e-purse functionality
- Mutual authentication to resist spoofing • Ultra-fast DES and 3-DES algorithms
- Supports several key generations • Supports multiple applications
- 1600 bytes of access-protected data memory • Battery lifetime in excess of 7 years
- Configurable buzzer tunes • Available in different colours



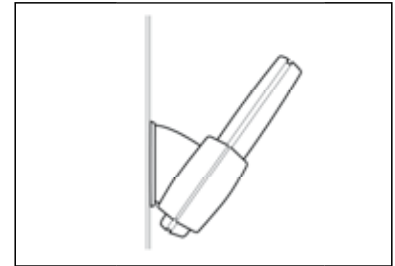
## Technical:

<p><b>DSRC communication</b></p> <ul style="list-style-type: none"> <li>In accordance with <ul style="list-style-type: none"> <li>EN 12253 Physical Layer</li> <li>EN 12975 Data Link Layer</li> <li>EN 12834 Application Layer</li> <li>EN 13372 DSRC Profiles 0/1, L1-B</li> <li>EN ISO 14906 EFC Applications Interface Definition</li> <li>GSS (Global Specification for Short Range Communication)</li> </ul> </li> <li>Centre Frequency: 5.8 GHz</li> <li>Uplink subcarriers: 1.5 and 2.0 MHz</li> </ul>
<p><b>Power Supply</b></p> <ul style="list-style-type: none"> <li>Built-in 3 V Lithium battery</li> <li>Typical battery lifetime more than 7 years @ 2000 transactions/year</li> </ul>
<p><b>User Memory</b></p> <ul style="list-style-type: none"> <li>Type: RAM (battery backed-up)</li> <li>Capacity: 1600 bytes</li> <li>Access only via the DSRC-interface</li> </ul>
<p><b>Man-Machine Interface</b></p> <ul style="list-style-type: none"> <li>Buzzer 55 dBA @ 1 m</li> <li>Configurable buzzer tunes</li> </ul>
<p><b>Casing</b></p> <ul style="list-style-type: none"> <li>Bi-coloured PC/ABS</li> <li>Standard colour styles: Blue, Yellow, Beige, Grey</li> </ul>
<p><b>Weight</b></p> <ul style="list-style-type: none"> <li>32 g</li> </ul>
<p><b>Dimensions</b></p> <ul style="list-style-type: none"> <li>74 mm x 47 mm x 18 mm (Transponder without bracket)</li> </ul>
<p><b>Accessories</b></p> <ul style="list-style-type: none"> <li>Bracket TS3220/10A, TS3220/11A including cleaning tissue</li> <li>Brackets are available in same colours as the Transponder</li> </ul>

<p><b>Installation in Cars</b> (raked windscreens)</p> <ul style="list-style-type: none"> <li>With bracket TS3220/10A at the top and centre of the windscreen inside (behind or beside the rear view mirror)</li> <li>Depth of transponder from windscreen: 23 mm</li> </ul>						
<p><b>Installation in Lorries and Buses</b> (vertical/near vertical windscreens)</p> <ul style="list-style-type: none"> <li>With bracket TS3220/10A at the bottom and centre of the windscreen inside</li> <li>Depth of transponder from windscreen: 53 mm</li> </ul>						
<p><b>MTBF</b></p> <ul style="list-style-type: none"> <li>650 000 hours</li> <li>Ref: MIL-HDBK-217F</li> </ul>						
<p><b>Temperature range, storage</b></p> <ul style="list-style-type: none"> <li>+5 °C to +40 °C</li> <li>Ref: IEC 60721-2-1</li> </ul>						
<p><b>Temperature range, operating</b></p> <ul style="list-style-type: none"> <li>-25 °C to +85 °C</li> <li>Ref: IEC 60721-2-1, (including heating effect due to solar radiation)</li> </ul>						
<p><b>Humidity</b></p> <ul style="list-style-type: none"> <li>Max 95% relative humidity, non condensing</li> <li>Ref: IEC 60721-3-5, Class 5K2</li> </ul>						
<p><b>Vibration</b></p> <table border="0"> <tr> <td>• Random</td> <td>1 m<sup>2</sup>/s<sup>3</sup></td> <td>10 - 200 Hz</td> </tr> <tr> <td></td> <td>0,3 m<sup>2</sup>/s<sup>3</sup></td> <td>200-500 Hz</td> </tr> </table> <ul style="list-style-type: none"> <li>Ref: IEC 60721-3-5, Class 5M2</li> </ul>	• Random	1 m <sup>2</sup> /s <sup>3</sup>	10 - 200 Hz		0,3 m <sup>2</sup> /s <sup>3</sup>	200-500 Hz
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<p><b>Free fall</b></p> <ul style="list-style-type: none"> <li>1000 mm, Each face</li> </ul>						
<p><b>Enclosure</b></p> <ul style="list-style-type: none"> <li>IP40</li> <li>Ref: IEC 60529</li> </ul>						



Installation in car using TS3220/10A.  
Depth of transponder from windscreen: 23 mm.



Installation in Lorry/bus using TS3220/11A.  
Depth of transponder from windscreen: 53 mm.

<p><b>Electrostatic discharge</b></p> <ul style="list-style-type: none"> <li>4 kVp (direct), 8 kVp (indirect)</li> <li>Ref: EN 301489-1, -3</li> </ul>
<p><b>Electromagnetic immunity</b></p> <ul style="list-style-type: none"> <li>AM1 kHz: 3 V/m, 80 - 1000 MHz</li> <li>Ref: EN 301489-1, -3</li> </ul>
<p><b>Electromagnetic emission</b></p> <ul style="list-style-type: none"> <li>30 - 230 - 1000 MHz, 40 - 40/47-47 dBµV/m</li> <li>Ref: EN 301489-1, -3</li> </ul>
<p><b>Type Approval</b></p> <ul style="list-style-type: none"> <li>The Transponder is compliant with the European directives: R&amp;TTE 1999/5/EC EMC 89/336/EC LVD 73/23/EC</li> </ul>

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