



# SATELLIC TOLL DETECTION

MODERN ON-BOARD APPLICATION FOR ACCURATE TOLL CHARGING

If electronic tolling systems based on autonomous on-board units (OBUs) are to be successful, accurate and reliable toll detection is a must. To ensure high

accuracy and reliability, Satellic Toll Detection comprises a number of functions run on the OBU.

## KEY FEATURES

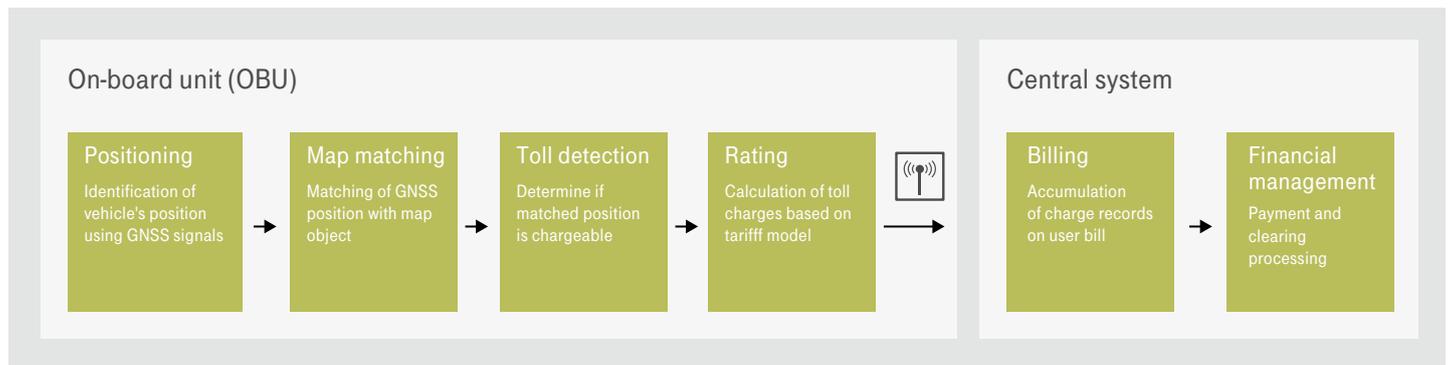
- Innovative map-matching algorithm detects use of toll roads by means of GNSS position signals
- Determination of relevant tariff data (e.g. kilometres driven, time, location, direction)
- Toll charge calculation
- Collection and aggregation of charge data
- Temporary storage of charge data in secure on-board storage system
- Secure transmission of charge data to the central system via GSM/GPRS

## BENEFITS

The on-board operation of Satellic Toll Detection delivers significant benefits:

- Robust privacy protection; no location data is transmitted to the central system
- Compliance with European privacy legislation
- Reduction in mobile communication costs and central processing equipment, as a result of reduced data transmission
- Increased user acceptance thanks to immediate display of toll fee

## FOUR KEY STEPS TO FLAWLESS TOLL CHARGING



### 1. POSITIONING

The OBU's integrated GNSS/GPS receiver provides GNSS information such as position, speed, orientation and confidence degree on a second-by-second basis.

### 2. MAP-MATCHING

Based on the GNSS data, the map-matching algorithm identifies the correct road segment on a digital map.

### 3. TOLL DETECTION

After the map-matching algorithm has verified that the vehicle has used a road segment, the toll detection process verifies whether or not this segment is part of a chargeable road network. To do this, the verification function searches in a toll-object table, which links every chargeable road segment to a toll object. If the detected segment is not part of a toll road network, all position data is immediately deleted.

### 4. RATING

If vehicles are driving on a chargeable road segment, the toll charge is calculated based on tariff rules linked to the toll object. This process is called rating and it generates a charge data record (CDR), which is securely transmitted to the central system for billing.

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