ERASMO

Enhanced Receiver for AutonomouS MObility

GSA/GRANT/03/2018

How ERASMO supports the implementation of C-ITS services

The ERASMO on-board unit (OBU) makes several important contributions and improvements to the performance, safety, and efficiency of autonomous driving and by extension, C-ITS services. It does this thanks to two key solutions: the V2X services it provides, which enable it to exchange information between vehicles and the surrounding environment in a cooperative, efficient way, and its high-integrity navigation fusion, which enables analysis of information and determines safety levels.

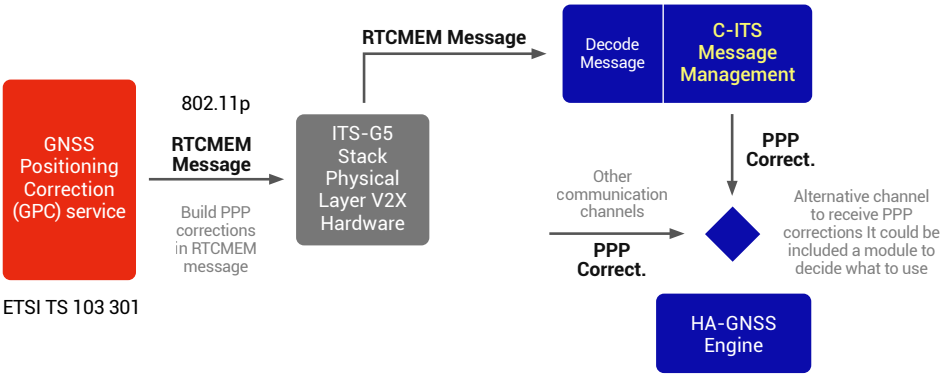
How do these solutions work in detail?

Let's start with the V2X solution. The OBU sends Cooperative Awareness Messages (CAM) to other cooperative systems including, among other fields, time, speed, position, and confidence level from reference position of the vehicle. The OBU uses ITS-G5 (802.11p) technology, operating on the 5.9GHz frequency band. The information is also standardized so that other hardware can easily read it. The ERASMO OBU will enable the creation of cooperative autonomous vehicles increasing the vehicle's situational awareness with a non-line-of-sight information layer.

On other hand, the OBU includes the GNSS positioning correction (GPC) service. This service is prepared to use positioning correction messages for GNSS in the RTCMEM message. The RTCM correction data is generated by the roadside unit (RSU) and it is used by the algorithms of the OBU allowing to increase the redundancy and safety of communication for GNSS corrections. It is an alternative channel to receive the PPP corrections if a problem is detected in the 4G/5G channel.

High Integrity Navigation Fusion is another essential part of the technology ERASMO has been developing. In broad terms, it solves the problem of providing the best possible solution in any particular situation by combining the information provided by the different available positioning systems implemented in ERASMO (HA-GNSS PPP-RTK, SPP, RFM and VINS) which are based on the many sensors present in the vehicle (GNSS receiver, IMU, vehicle sensors, cameras, mapping, among others), and moreover by providing an integrity layer, that is, the Protection Levels (PLs) associated to the vehicle position for different Integrity Risks (IRs).

Integration GPC Service: V2X(C-ITS) – Corrections



This integrity layer based on PLs and IRs allows measuring the probability that the vehicle is in a certain area (defined by the Protection Levels), thus measuring the confidence of the computed solution and helping an autonomous vehicle to know when the estimated location is safe and how to trust the information it's receiving. A good way to look at it is this: GPS is often accurate down to a meter or two, which poses no problems for a driver following a map or a walker looking for a particular address. With autonomous driving, however, errors of even centimeters could mean the difference between a safe situation and an accident. This is why ERASMO's integrity layer, which solves this problem, is so essential. How does it work? Imagine drawing a rectangle around the autonomous vehicle. The integrity layer shows the margin of error, and if the rectangle goes outside of the road or lane limits then the positioning estimate is not safe.

What is ERASMO?

Funded by the European Union Agency for the Space Programme (EUSPA), The ERASMO project was officially launched in June 2021. Its aim is to develop an innovative positioning On-Board-Unit (OBU) that enables highly automated driving. The project is being carried out by a consortium that includes Renault, Idneo, Kudan, GMV, ZN, Septentrio, and CNRS-UTC.

Find out more on: @ERASMO_GNSS ERASMO

ERASMO - Enhanced Receiver for AutonomouS Mobility: **https://erasmo-gnss.eu/**

septentrio heudiasyc utc gmv idneo RENAULT ZN kudan