

An Introduction to Telematics Control Unit (TCU) and Telematics Gateway Unit (TGU)

Know about the differences and how TCU/TGU powers a Vehicle Telematics Solution

A typical vehicle telematics system consists of 4 fundamental components:

- A** Vehicle ECU network/ Car Head-Unit: In-Vehicle Network of **Automotive Electronic Control Units (ECUs)**, is a **interconnected network of micro-super computers (Automotive ECUs)**.

These **Electronic Control Units** help the **Telematics Device (Telematics Control Unit or Telematics Gateway Unit)** to **fetch the necessary** vehicle data like vehicle diagnostics data, speed, engine temperature, and more.

- B** Telematics Cloud server: Stores , processes and manages the **telematics data sent by the Telematics Control Unit or Telematics Gateway Unit.**

A Cloud based Telematics Server consists of the following components:



A web server



An application Server



A database

- C** The front-end application (Web/Mobile Dashboard): A web based or a mobile based application acts as an interface between the Telematics Cloud Server and the end-users.

This enables the end-users or enterprises to view, access and send/receive commands/output from the **telematics** cloud server.

- D** Telematics control unit or a Telematics gateway Unit: The central hardware module of a **telematics device** that collects, stores and transmits the data fetched from the **Electronic Control Units (ECUs)** to the telematics cloud server. This can either be a **Telematics Control Unit(TCU)** or a **Telematics Gateway Unit (TGU)**.

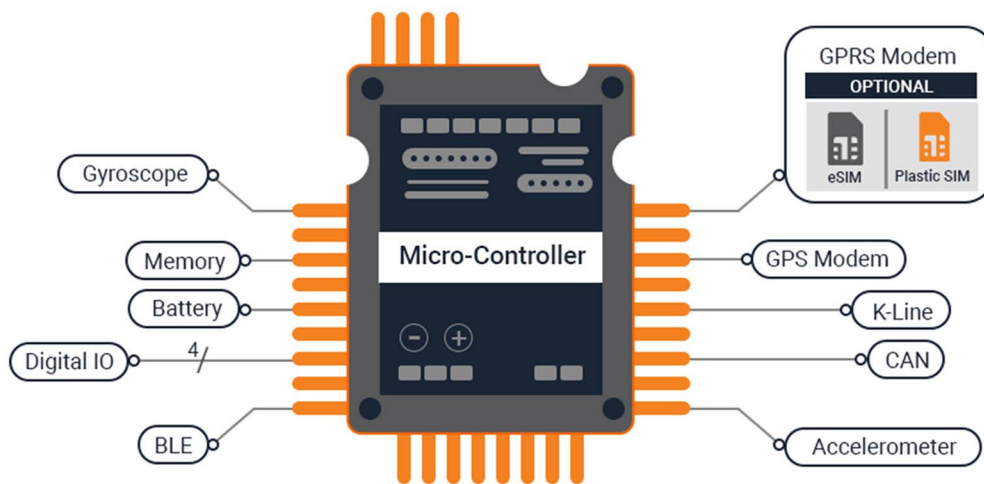
Whether your telematics product development project requires a **Telematics control unit** or a **Telematics Gateway Unit**, can be evaluated based on the following parameters:

- Complexities of the functionalities that your Telematics Product should support
- Expected Memory and Power Footprints
- Required Data throughput and data bandwidth
- Safety Criticality (**Functional Safety**)of the Hardware and Software involved

To successfully complete this evaluation, it is important for your Telematics Product design teams to understand the inherent differences between a **Telematics Control Unit (TCU)** and a **Telematics Gateway Unit (TGU)**.

Let us explore the key differences between **Telematics Control Unit** and **Telematics Gateway Unit**

Telematics Control Unit (TCU):



Architecture diagram of Telematics Control Unit

- Telematics control unit supports the following key functionalities:



Fleet tracking and management



Track and Trace

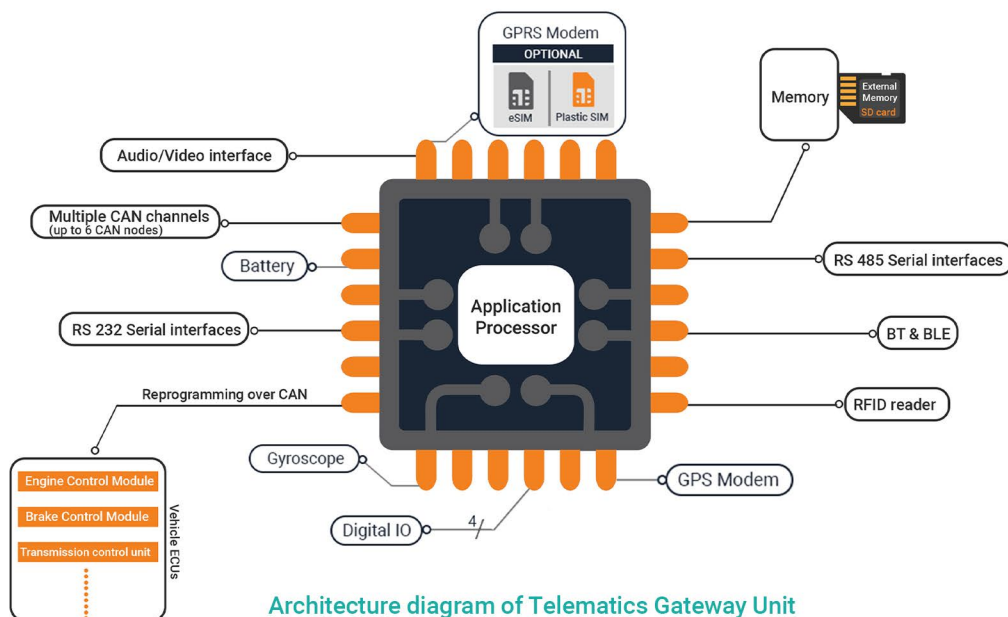


Remote vehicle diagnostics

- A TCU is designed on a Microcontroller Hardware Platform
(E.g: RL 78 Renesas RL78 Family , STMicroelectronics' STM32)

- Is a low-power solution with low-memory footprint. But offers a lower data throughput.
- Can store offline data for a shorter duration.
- TCU can communicate over CAN and dual CAN.
- The complexity of Hardware Circuit design is less .
- A Telematics Control Unit is used as a entry-level low-cost telematics solution.

Telematics Gateway Unit:



- Telematics control unit supports the following key functionalities:



Aggregation of (ECU)
vehicle usage statistics



Reprogramming of
Vehicle ECU



Remote vehicle
diagnostics

- A TGU is designed on an high-performance Application Processor Hardware Platform -. (E.g: ARM Cortex-M , Jacinto TI etc).
- Offers the advantage of higher data throughput. However, TGU design involves higher Memory and Power Footprint.

- Has the capacity to store offline data for a longer duration.
- A TGU is designed to communicate with multiple CAN networks (Upto 6 CAN network nodes).
- The complexity of Hardware Circuit design is higher, as compared to a TCU.
- Includes Audio/Video interface.
- Since a TGU Solution supports Vehicle ECU reprogramming, it is important that your Telematics Gateway Unit (TGU) is compliant with ISO 26262 Functional Safety Standards (ASIL B/ASIL C/ASIL D).

CONNECT WITH US

INDIA : +91 80 41694200

USA : +1-248-385-2017

GERMANY: +49 711-60 17 47-789

UK : +49 170 1688028

EMAIL : sales@embitel.com

Get in touch with our Team:



Vidya Sagar
Head- IoT & IVI
vidyasagar.j@embitel.com



Ratish Bhatt
Business Manager
ratish.bhat@embitel.com



Kuldeep Singh
Business Manager
kuldeep.s@embitel.com



CMMIDEV / 3SM
Exp. 2019-03-30 / Appraisal #26476

