



**GadgEon**

Engineering Smartness

# **SOLAR POWERED VEHICLE TRACKER**

Version 01



## Solar Powered Vehicle Tracker



A fleet management solution provider wanted to develop a solution that report any abnormal operating condition of the vehicle, like dangerous driving or crashes . The tracker itself is powered by solar to avoid connection to vehicle battery.

### Results / Outcomes

- A complete solution as per Customer specification has been developed and deployed
- The solution enabled business to monitor and track driver behaviour and receive alerts in case of dangerous driving and consequent accidents
- Centralized monitoring of vehicles ensured that the drivers always took the most optimal routes
- Geo-fencing allowed the business owners to get alerts as soon vehicle crosses specified boundaries
- Device are independent of vehicle battery and hence no worries about draining vehicle battery.
- Significant cost savings from disciplined driving patterns resulting in reduction in accident cases and maintenance cost of the vehicle.



## System Design and Implementation Details

### Vehicle tracking device

The tracking device is installed in vehicles that ensured adequate exposure to sunlight for charging the batteries from solar power. The device has its own onboard accelerometer to detect abnormal motions like sudden brakes, crashes and heavy acceleration. An STM32 MCU with FreeRTOS is used as the main controller. The tracker uses a cellular modem (Ublox SARA) to communicate with the cloud server.

The tracker has an onboard GPS module for location tracking. In case a GPS fix is not achieved, then the location is determined by cell phone tower positioning. The system has a fuel gauge to monitor the battery status and communicate to the cloud application.

Software is designed to collect the location, acceleration and battery status periodically and communicate them to the cloud. The software is heavily optimized to reduce battery consumption. The tracker also supports over the air firmware upgrade from the server. Necessary customization for the bootloader was performed for firmware upgrade.

Hardware was developed using ORCAD tool.



## System Design and Implementation Details

### Server application (third party)

The AWS hosted application allows fleet owners to track their fleet, define geo-fence for their vehicles, generate reports regarding individual drivers score according to the data collected. System also generate alerts on critical events like crashes.

Firmware update for field trackers can also be initiated from the server application.

# THANK YOU



**GADGEON SMART SYSTEMS PVT LTD**  
VI 405/E1, Fathima Tower, Maleppally Road, Thrikkakara PO,  
Kochi, Kerala, PIN: 682021, India

CONTACT – INDIA  
Hari Nair : +91 9895 01 58 80

**GADGEON SYSTEMS INC**  
881 Yosemite Way, Milpitas, CA 95035, USA

CONTACT – USA

Wes Schropp – VP Sales :

p [408-621-2570](tel:408-621-2570) | e [wes.schropp@gadgEon.com](mailto:wes.schropp@gadgEon.com)

Mani – Regional Director Sales

p [678-900-0874](tel:678-900-0874) | e [mani.ram@gadgEon.com](mailto:mani.ram@gadgEon.com)



[sales@gadgeon.com](mailto:sales@gadgeon.com)