VEHICLE IGNITION INTERLOCKING WITH BREATHALYSER AND GPS TRACKER

INTRO

Alcohol remains the most commonly used substance and addiction in many countries. The fact is, drivers with high blood alcohol concentrations are at much greater risk of traffic accidents. It means more crashes, property losses, injuries, and deaths. That is why corporate fleet drivers' breath testing routine alongside comprehensive vehicle tracking and data monitoring becomes not only an attractive option but a smart investment.

CHALLENGE

Did you know, according to the drunk driving statistics data collected by thezebra.com, more than a quarter (25%) of all traffic-related deaths directly result from alcohol impairment? Every day in the USA alone, about 28 people die in drunk-driving crashes — that's one person every 52 minutes, and it costs more than $132 billion each year. That is a colossal number and might be one of the biggest and continues for decades tragedies on roads.

Dangers of drinking and driving are many: slow reaction time, lack of coordination, reduced concentration, decreased vision, inhibited judgment. Sadly, alcohol (or driving under influence) has long been known as a roadway killer since the dawn of the motor industry. Inevitably, it results in higher insurance rates and taxes, human, medical and property costs. Not to mention, family, friends and co-workers grieve, intense sadness, anger or even revenge.

One of the strategies to prevent alcohol-impaired driving in corporate fleets is mandatory sobriety and breath testing procedures before starting vehicle ignition. To help fleet managers and business owners with that, Teltonika Telematics has successfully developed the 'Alcotester Check' functionality.

SOLUTION

It includes driver's authentication method based on the 1-Wire communication bus system combining contactless Radio-frequency identification (RFID) card, 1-Wire RFID reader, immobilizer scenario, SPECIAL category vehicle tracker Teltonika FMC125 and breathalyser Alcovisor Mercury for drivers' blood alcohol content (aka BAC) limit checks and ignition interlocking. The latter communicates with a GPS device via serial port RS-232 and USB connector.

The breathalyser uses an electrochemical fuel cell to measure the alcohol concentration from the sample of the expired breath from an individual (in this case - the driver). If alcohol is present, a corresponding voltage is generated from the fuel cell, which is proportional to the alcohol content of the sample provided. After that, the voltage level is converted to BAC respectively, which is then displayed. For a convenient power supply, it can be connected to a vehicle cigarette adaptor.

Alcovisor Mercury model can perform two types of tests - 'Screening Test' (aka 'Passive Mode') to detect alcohol presents or absents ('Alcohol Detected' or 'No Alcohol') with reusable sampling cup attached to sample port and 'Standard Test' (aka 'Active Mode') to get the accurate BAC results using a disposable mouthpiece attached to sample port. Because of practical measures, we utilise only the 'Screening Test' in this use case.

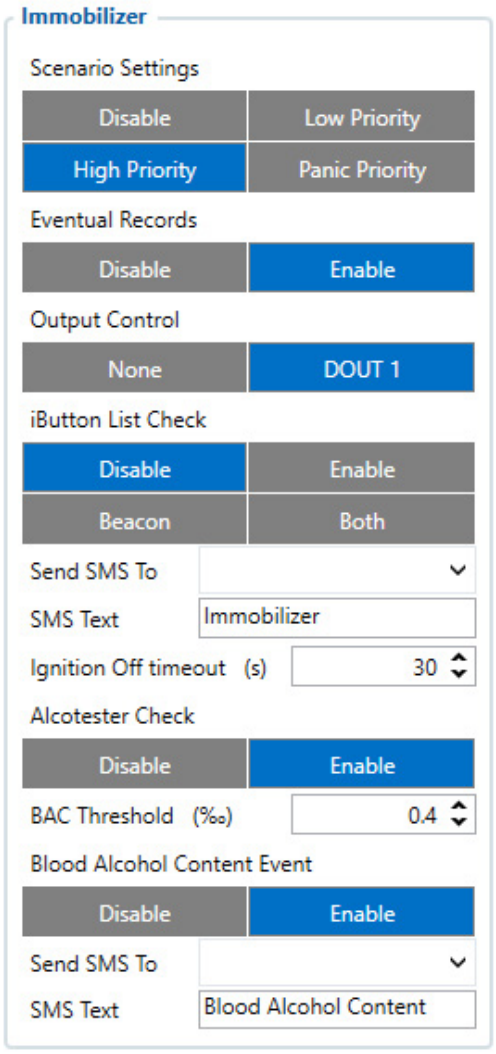
How it works - both, 1-Wire RFID reader and breathalyser have to be mounted inside the vehicle, connected to the Teltonika GPS device and set up accordingly. To start a vehicle engine, two steps must be passed successfully, one after another - driver's authentication and alcotester check routine. If any of them fail, the ignition starter will remain disconnected to prevent driving. The relevant events data and alert notifications will be initiated and sent to a dedicated server and FM platform to be monitored by fleet management and/or the person in charge.

To get through, every fleet driver is given an RFID card with the unique factory-programmed 64-bit identification number. When starting a shift, a person has to authenticate itself by bringing an RFID card nearer to a 1-Wire RFID reader. If it is successful, the next step - alcotester check procedure. To do so, a driver has to breath to a reusable sampling cup attached to the sample port of a breathalyser. If alcohol is found in the breath sample, alcotester check fails what stops immobilizer authorisation.

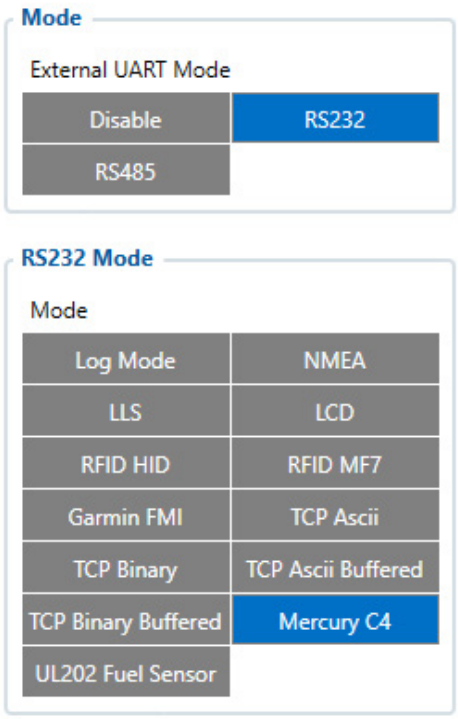
Finally, if both steps, driver's authentication and alcotester check, passed successfully, the 'start of shift' event electronic date and time stamp will be generated and registered, an ignition starter engaged. A vehicle driving is authorised, and an employee is welcome to start his/her duties. If not, vehicle driving remains restricted, and a driver has to follow an internal company procedure for this matter.

When a shift has finished, and a driver is done for the day, the RFID card has to be touched to 1-Wire RFID reader again to generate 'end of shift' electronic stamp, and now vehicle ignition can be switched off for good.

How to set up - to make ignition interlock work correctly, the FMC125 vehicle tracker has to be set up using Teltonika configurator. Firstly, the 'Alcotester Check' option has to be enabled within the 'Immobilizer' feature as shown below:



Secondly, GPS tracker RS-232 mode with breathalyser Mercury model has to be configured allowing corresponding data communication between two devices. To provide an electrical connection, USB connector pins TXD and GND of Alcovisor Mercury should be connected to RS-232 port pins RXD and GND of FMC125 tracker accordingly. Also, the breathalyser unit has to be calibrated as advised by its manual.

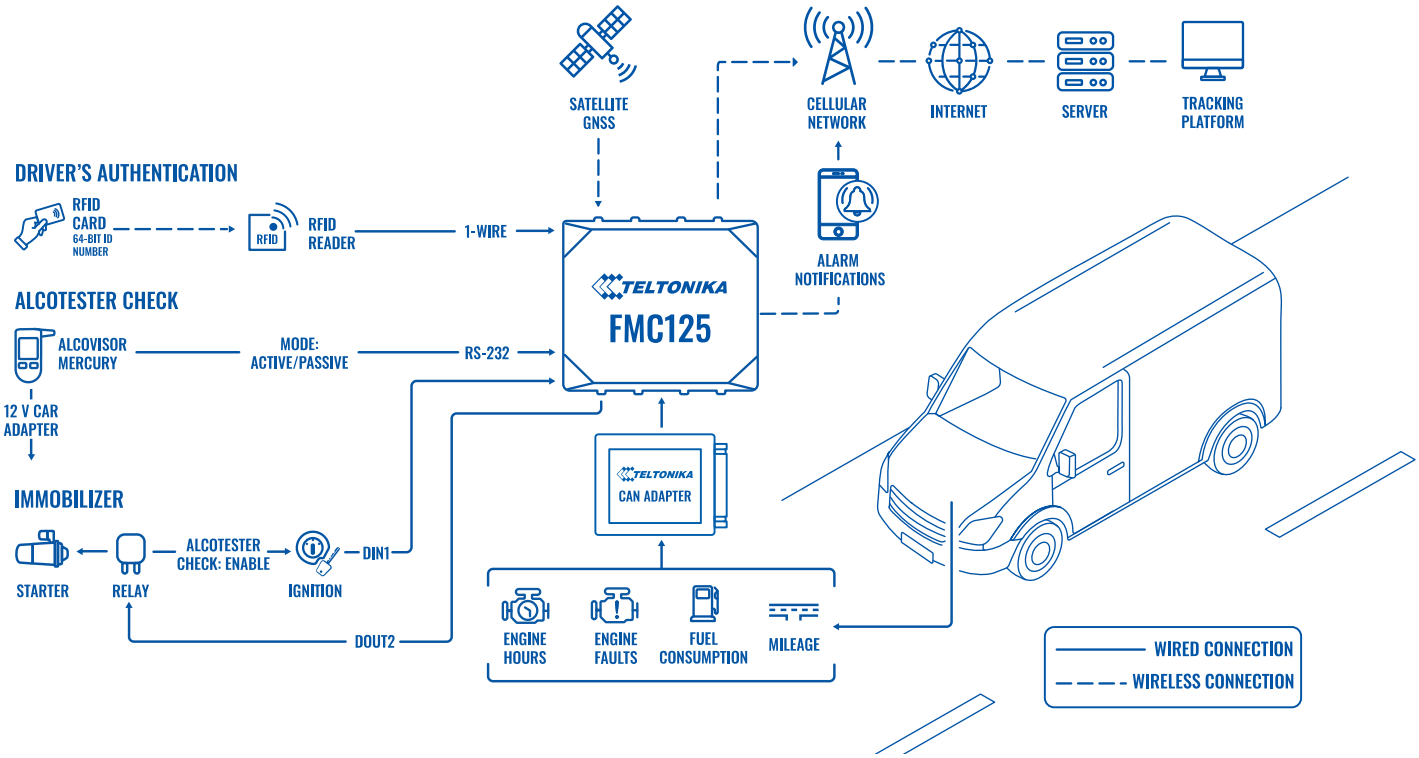


The vehicle ignition interlock method can be successfully applied for most corporate fleets using light vans: telecoms, internet and cable service providers, utility service businesses, postal office, sanitation, construction, manufacturing and processing, non-food retail, wholesale companies and others.

With the help of GPS trackers, the corporate fleet current status monitoring and maintenance routine can be turned into an automated process making sure that vehicles are kept in the right condition all the time. Model FMC125 alongside with LV-CAN200 adapter offers beneficial features to ensure smooth and efficient operations: CAN Bus data readings, and many handy scenarios such as Green Driving, Over Speeding, Excessive Idling, Towing and Crash detection, Auto Geofence, Trip to name a few.

Teltonika vehicle trackers firmware updates and configuration changes can be made using the recently renewed FOTA WEB tool too. It is a powerful software solution helping to manage GPS devices swiftly and efficiently. To sum up, the ignition interlocking tackles a few significant challenges simultaneously - highly harmful drunk driving habits and incidents, drivers' authentication, automated workforce time measuring, fleet vehicles tracking, monitoring, and management.

TOPOLOGY



BENEFITS

- **Major risk factor, drunk driving, quick fix for good** – driving under the alcohol influence problem is resolved in corporate fleets once and for all with a minimum effort and maximum results.
- **Increased road safety -** fewer alcohol-related road crashes, collisions, property losses, severe injuries and fatalities.
- **Improved loss ratio and enterprise profitability** - by utilising the 'Alcotester Check' feature, corporate fleets will improve drivers' habits, discipline and safety, lessens risky driving behaviours, accidents, cargo losses, repairs, maintenance, insurance and medical expense, and operational cost resulting in a better ROI, cash flow, and profits.
- **Extensive Teltonika GPS tracker functionality to serve company needs -** abundant feature set, flexible configuration, CAN Bus readings, multiple usage scenarios and benefits, handy detections such as speeding, excessive idling, unplug, towing, crash help to compliment alcotester check functionality and optimise fleet management.
- **Hassle-free drivers' authentication and time tracking, monitoring, and management -** accurate and easy-to-use personnel clocking method utilising 1-Wire technology, relevant vehicle GPS trackers, and accessories. Data is accessible anytime and anywhere via PC, tablet, and smartphone.

WHY TELTONIKA?

We offer time tested top-quality Teltonika GPS tracker FMC125 with extensive functionality and adaptor LV-CAN200 combo to serve company needs. No doubt, their abundant feature sets including 'Alcotester Check', flexible configuration, practical CAN Bus data readings, variety of handy usage scenarios will benefit corporate fleets anywhere around the world.

From the start of the company 23 years ago until today, Teltonika 1,600 strong and growing team has manufactured 15.5 million IoT devices, helped to succeed thousands of customers and partners worldwide. We are the right place to get all you need to succeed - an impressive variety of certified GPS trackers, accessories, and solutions for any use case imaginable in vehicle telematics. Our innovative approach, extensive global market knowledge, state-of-the-art production facilities with automated robotic assembly lines and customer support meeting your expectations give us a competitive edge and make Teltonika Telematics a business partner of choice.

FEATURED PRODUCT

FMC125

RECOMMENDED PRODUCTS

FMM125, FMU125, FMB125

RECOMMENDED ACCESSORIES

1-WIRE RFID READER, LV-CAN200