Trailer Tag Project

Client:

John Smith, lead asset manager from Orange Trucking Company.

Budget:Ideally $4-$8 per trailer, given that this would be implemented over nearly 70,000 independent units.

Communication:

All source code and PCB schematics will be held on a GitHub repository, alongside documentation written to help Orange's in house techs diagnose and manage devices. Technical support will be offered in a ticket-by-ticket form.

Objectives:

A low amperage, standalone tracking device that can integrate into the existing 12V system on a dry van trailer to offer reliable tracking information in case of theft or other scenario of loss.

User Interaction

Ideally, user interaction will be minimal, apart from installation and configuration. The tracker should be easily installed behind the header board, with easy

access to the 7 way cable for simple electrical hookup. Configuration should be possible remotely, once the device is assigned to an account. Configuration and location logging should be done via a simple webGUI. Trouble codes should all be available on the webGUI. In case of loss of connection, time offline should trigger an alert and log how long each device has been offline. Finally, the device should ideally never require servicing, and in case of required firmware updates, they should all be possible remotely. In case of a damaged device, schematics and troubleshooting procedures will be available on the repository, as well as a manufacturer offered repair service.

Interface

The device will have a USB Type-C port for local flashing and software service. The device will also be rated for outdoor use, and protected in all conditions of weather.

Parameters

The device should fit in a 3"x5" rectangular space, and weigh less than 5 pounds. It will be rated IPX8 or higher for permanent exterior use, and be water, shock, and dust proof.

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Functions

The device will offer accurate, up to 50m, location logging for van trailers, with the goal being to offer an effective tool to a company managing tens of thousands of units.

Integration

The device will utilize IOT LTE networks to avoid a monthly cost per device while maintaining reliable tracking information.

Operational

The device's runtime will be restricted by how long a unit remains disconnected from an electrical system. The goal will be to have the tracker run independently for several months before requiring a charge, however the device will charge every time the unit is moved.

Life Cycle

The device will be easy and quick to produce, ideally built from easily sourced components for easy manufacturing and repair. Given that it is a tracker that will be installed in tens of thousands of units, long term support is a must. The goal

will be to support these devices for a minimum of 15 years, with extended support available.

Environments

This device will be stored on the interior of a van trailer, but must be rated for constant exterior use. Temperatures will vary from 115 degrees F to -20 degrees F, as these units travel all over the North American Continent.

Starting Point

This device offers similar functionality to other, vehicle specific, trackers, as well as the Apple Airtag. While the goal is to build a unique device with its own recognizable capability, the similarities must be acknowledged. The device will utilize open source tracking software and GSM/GPRS drivers.

Key Concerns

The device must be able to continue tracking without power for a certain amount of time, otherwise the usefulness of the tracker will be limited. Additionally, the device must be installed in such a way that it is not easily tampered with, and notifies an admin if it is being tampered with.

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Future

Awaiting Project Review, funding, and approval.