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INSTALLING (FLASHING) SOFTWARE ON VEHICLES BY DRONE

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Technical task:
Manufactured vehicles that have not yet been delivered to the customer must frequently be updated (flashed) to new software versions. This happens regularly, especially in start situations.

Initial situation:
Updating to the latest software versions is currently carried out manually (plag and play) on the respective vehicle by employees and is time-consuming and costly. Finished vehicles are often no longer in the factories, but already in external storage areas, ports or at dealers. This significantly increases the effort of the flash.

Solution:
A drone with RFID antenna and GPS module flies autonomously over the external surfaces on which the vehicles are standing and recognizes which vehicle it is and whether an update is required via the already installed RFID tag. If an update is required, a connection to the vehicle is established via the drone "over the air" and the new software is played on the control units (e.g. via LTE/5G or via software packages carried on the drone). For better transmission and protection of the drone's batteries, it is conceivable that the drone will land on the vehicles (damage to the vehicles is avoided by appropriate measures). The software update process is stored as part of a process-reliable quality management system. A processing status is thus documented and transparent.

Advantages:
Localization of vehicles can be achieved by using existing RFID technology in the vehicles. The manual effort is replaced by the autonomously operating drone. A reduction in time and a significantly lower deployment of employees can be predicted. This represents a considerable cost reduction. In addition, several drones can be deployed in parallel.

Possible application:
In already completed projects it is obvious that it is possible to fly drones autonomously over a pre-defined area. The vehicles can be uniquely identified via a built-in RFID reader.
The active communication between the drone and the vehicle or its control units still has to be checked/developed.

The idea is shown schematically in Figure 1.

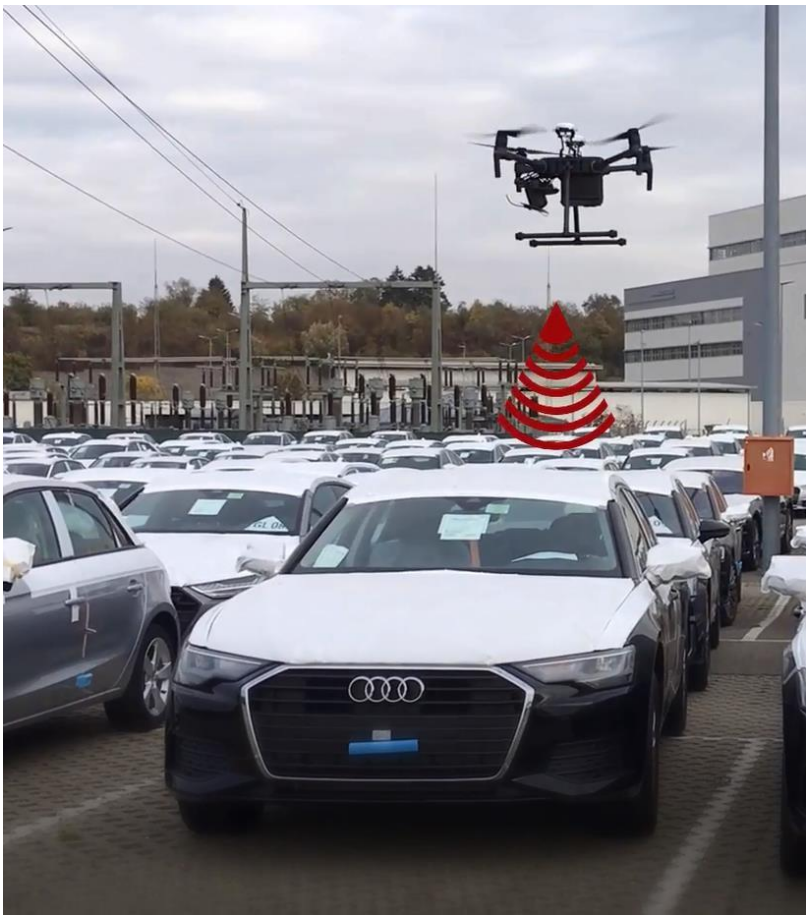

Figure 1: Vehicle was detected; drone sends software package to vehicle