



## Hamburg (visitable at short notice)

## SMART CONTROL FOR URBAN COMMERCIAL TRAFFIC (SMART CARGO BIKE)

*Application for local logistics with data transmission and sensor technology*

### SUMMARY

Electric cargo bikes are an efficient and environmentally-friendly alternative for commercial traffic, making them a future solution for both intralogistics and interlogistics (last mile logistics). Thanks to motorization, routes can be covered without any great effort. With the support of the electric motor and the assistance service, the "Smart Cargo Bike" achieves high average speeds, even when carrying additional cargo weight. The use of new controllers, data transmission and sensors enables increased energy efficiency and safety, predictive maintenance in fleet management and the collection of traffic data.

### PROJECT DESCRIPTION

The project partners are developing a smart cargo bike. The design of the propulsion system consists of a low-maintenance drive and a modern controller, which achieves optimum motor control with a newly developed control algorithm and enables increases in efficiency. Assistance systems have also been implemented. The energy storage unit is designed to recover kinetic energy (recuperation) and is intended to provide both a long range and a long useful lifetime. The frame of the electric cargo bike is a lightweight construction made of carbon.

### REFERENCES

Trinamic project page: <https://www.trinamic.com/leichtlast>

TU Braunschweig project page: <https://www.ifr.ing.tu-bs.de/de/ag-regelungstechnik/forschung/elektrische-maschinen/forderprojekt-leichtlast/>

### INDUSTRIE 4.0 – FEATURES

- Braking assistant: Optical distance and speed measurement with lidar sensor system
- Predictive maintenance: Transmission of data regarding condition of vehicle for timely maintenance and repair
- Tracking: Collection of environmental and traffic data



### PARTNERS



### SOLUTION

Electrifying the cargo bike enables optimum adjustment to logistics requirements. Data transmission enables monitoring of the vehicle's condition as well as timely maintenance and repair in fleet management. In addition, information relevant to the customer is generated and transmitted, thus allowing real-time tracking of the fleet and optimized fleet service via a platform solution.

A braking assistant based on a lidar sensor system supports braking by anticipating situations ahead, which is particularly relevant to safety when heavy loads are being transported. The result is increased energy efficiency and safety. Furthermore, environmental and traffic data is collected on journeys with the "Smart Cargo Bike" and optimized in fleet management.

### CONTACT

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### STANDARDIZATION APPROACHES

The aim is to develop a generic drive description for lightweight electrical vehicles with recovery of kinetic energy. Relevant factors are the range as well as the durability and sustainability of the components. Standards are not available to any great extent.