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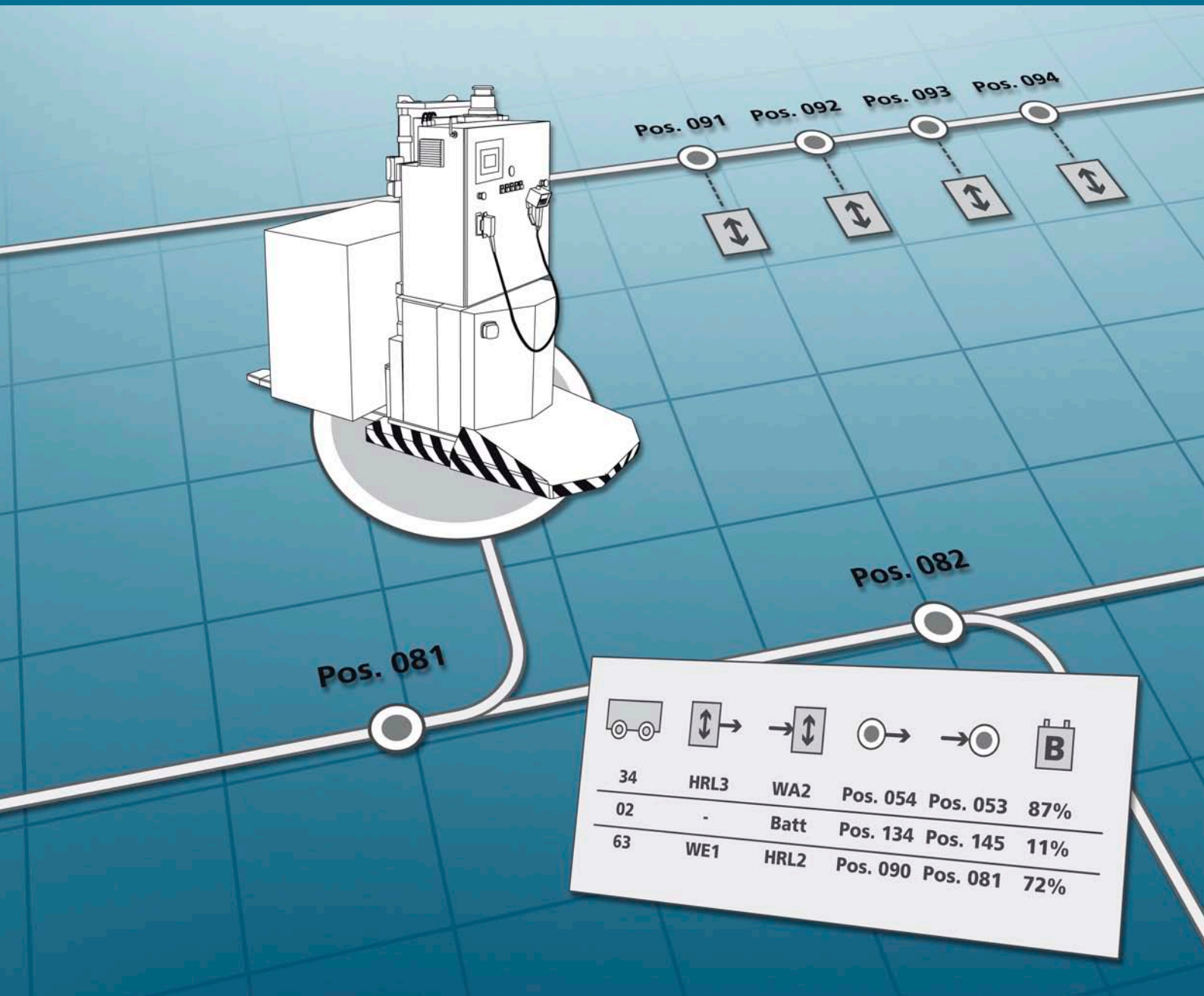
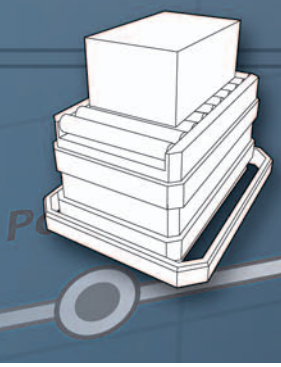
# openTCS®
# OPEN SOURCE CONTROL SYSTEM FOR AGVS



# openTCS

Open Transportation Control System



# OPEN SOURCE CONTROL SYSTEM FOR AGVS

Automated Guided Vehicle Systems (AGVS) are inhouse, floor-supported materials handling systems. They are used inside and outside of buildings and essentially consist of one or several automated guided vehicles and a guidance control system. (VDI Guideline 2510 Automated Guided Vehicle Systems)

**Situation**

Usually the operator of an Automated Guided Vehicle System receives a complete package from the supplier comprising vehicles and control system closely meshed with each other not or only to a limited extent allowing own changes. So the operator is, in the case of system extensions for example, dependent on the contribution of the supplier. This results in a considerable dependency of the operator on the supplier.

**Manufacturer-neutral Control System openTCS®**

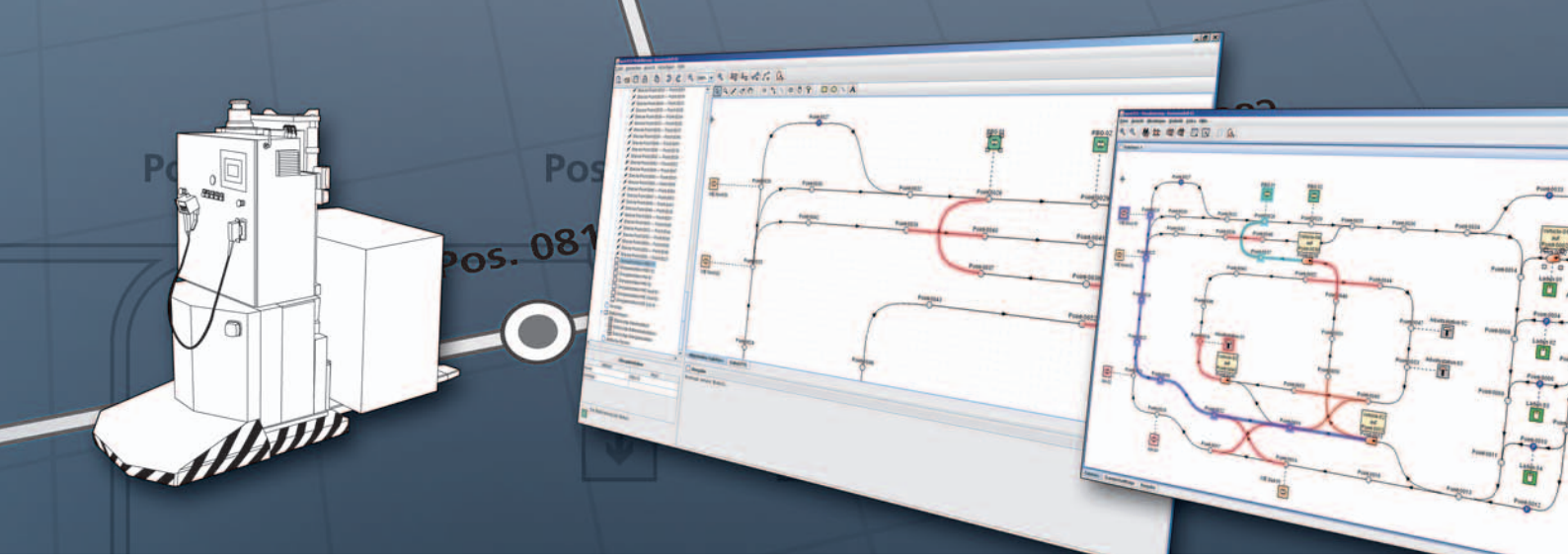
openTCS® is a control system software warranting independence. This software can be applied independently from certain vehicle manufacturers, vehicle types and characteristics. The field of application does not only cover AGVS, but all track guided discontinuous transport systems like suspension monorails and automated forklifts. Controlling any type of vehicle merely requires a suitable vehicle software driver that either can easily be programmed by the plant operator himself or can be developed by the openTCS® team. Any new vehicle driver can be added to the system by a simple plug-in concept and can immediately be used for controlling vehicles.

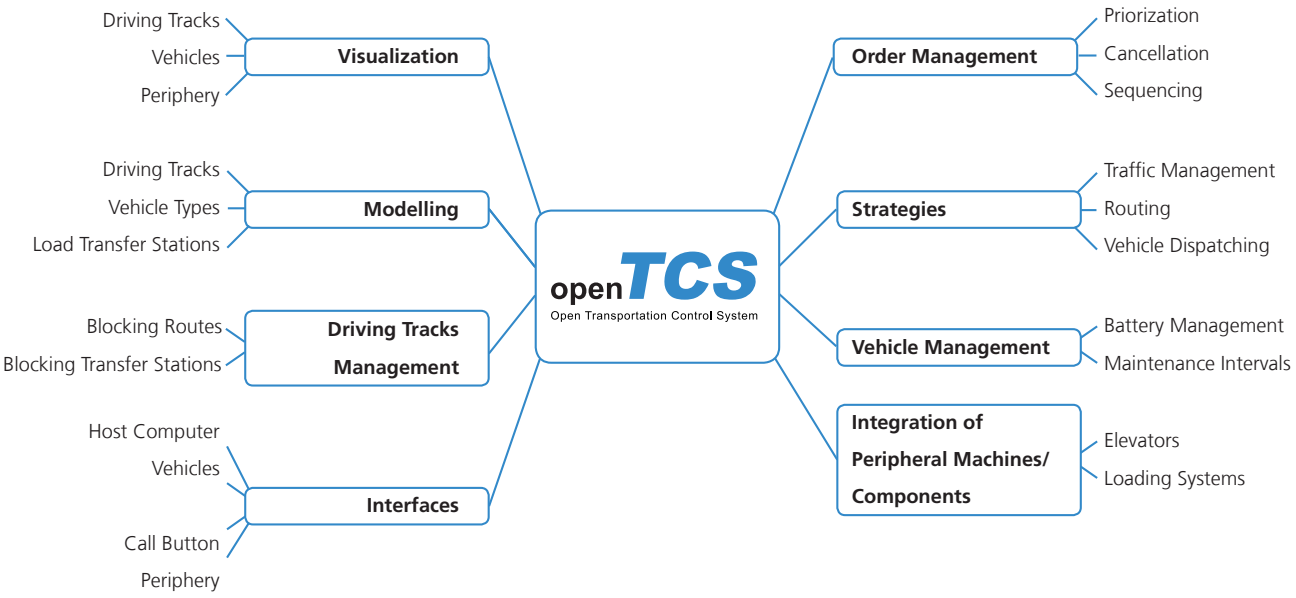
**Advantages for the User**

This makes the operator independent from the system supplier and provides investment security. Changes of the driving tracks, extensions of the vehicle fleet and adaptations of the strategies no longer require the obligatory support of the supplier.

**Advantages for the Vehicle Supplier**

To realize transport systems manufacturers of Automated Guided Vehicles also need a control system software taking over the overall coordination of multiple vehicles. They either have to develop the software by themselves – this being a considerable effort – or they have to buy the software from other manufacturers – this usually limiting the range for own modifications. openTCS® provides a sensible compromise between both variants. The development allows the vehicle manufacturer to start from an existing broad code base – in the best case making it possible to realize a transportation system without any further (software) development. At the same time any kind of change is possible in any part of the open system, e.g. to meet special requests of customers.






## Development

openTCS® was initially developed within the scope of the program InnoNet under the project title FAHRLOS publicly funded by the BMWA. Since then it has been published as FLOSS (Free/Libre Open Source Software) under the MIT license and is primarily being maintained and extended in funded projects by Fraunhofer IML. openTCS® is completely implemented in the programming language Java and thus applicable on every operating system a Java Runtime Environment exists for. Therefore the software can run on a Linux/Unix system as well as on a Windows or Mac-OS-X system.
You will find further information and the latest version of openTCS® at www.opentcs.org.
We would like to support you with the integration of openTCS® into your AGVS or to extend the software for you.

## At a Glance

- openTCS® is the flexible Open Source control system software for AGVS and provides optimal coordination of the vehicles in a system.
- openTCS® is easily expandable and the plug-in concept of the vehicle drivers allows to control every type of guided transport vehicle, besides AGVs also non-continuous conveyors as electrical monorails and mobile assembling platforms.
- openTCS® strategies, e.g. for routing and vehicle dispatching, are easily replaceable. Suitable strategies for typical applications in intralogistics are already integrated as configurable modules.

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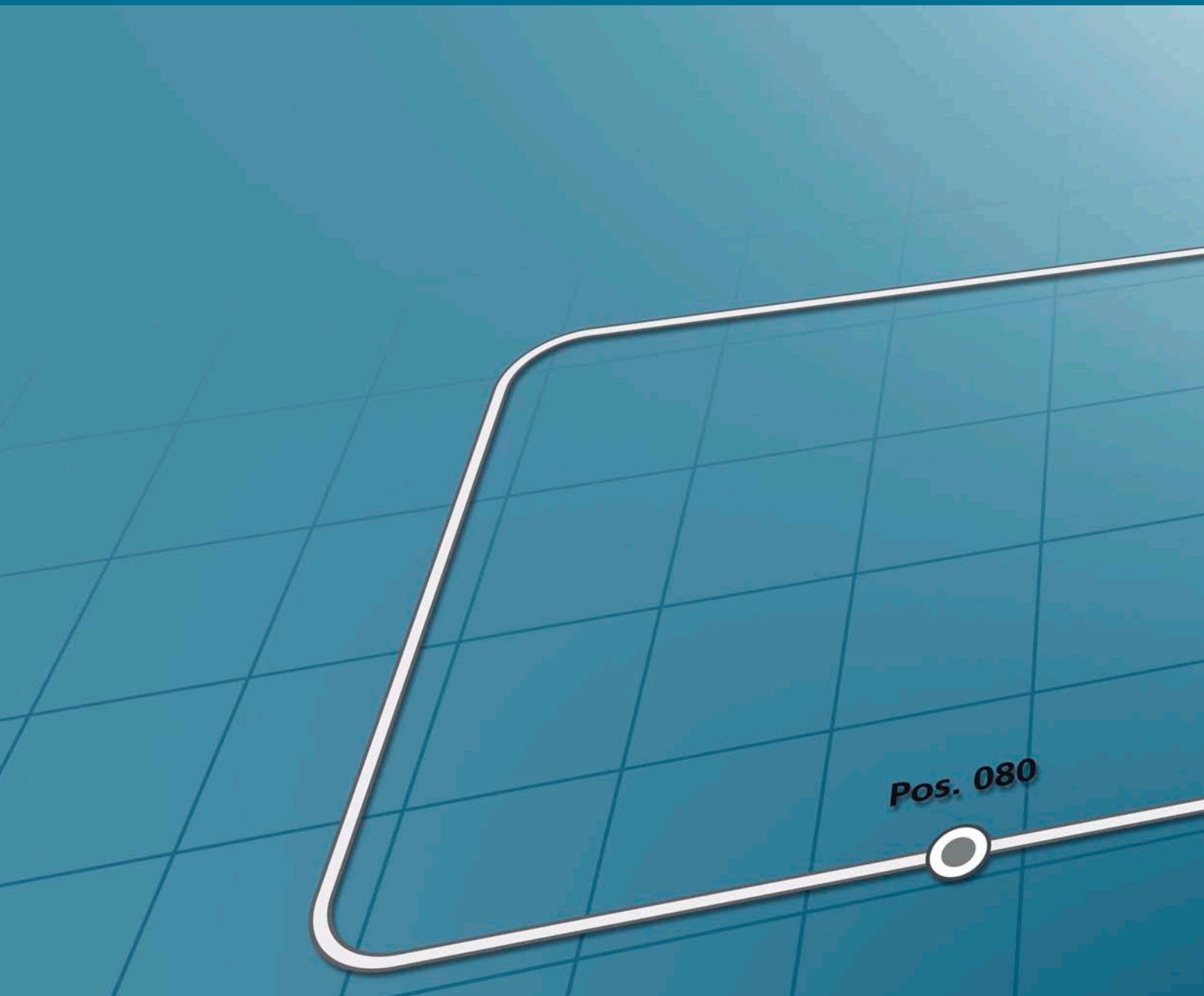
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